Please send all comments on the 2016 Hazard Mitigation Plan by October 16, 2016 to the Board of Selectmen

100 Winnacunnet Road
Hampton, NH 03842

Or by email to kostman@town.hampton.nh.us

Town of Hampton

Hazard Mitigation Plan

Adoption Date:_____

Approval Date:_____

Prepared by:
Hubbard Consulting LLC
www.hubbardconsultingllc.com

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Original Edition: July 21, 2004
2nd Edition: June 29, 2011
Updated Edition: -----, 2016

Chapter 1
INTRODUCTION

Authority

This Hazard Mitigation Plan was prepared in accordance with the Disaster Mitigation Act of 2000 (DMA), Section 322, Mitigation Planning. Accordingly, this Hazard Mitigation Plan will be referred to as the "Plan".

Funding Source

This Plan was funded by the NH Homeland Security and Emergency Management (HSEM) through an Pre Disaster Mitigation (PDM) Grant, with in-kind matching funds by the Town of Hampton.

Purpose

This Hazard Mitigation Plan is a planning tool to be used by the Town of Hampton, as well as other local, state and federal governments, in their effort to reduce the effects from natural and man-made hazards.

Introduction

On October 30, 2000 the President signed into law the Disaster Mitigation Act of 2000 (DMA 2000). The ultimate purpose of DMA 2000 is to:

- Establish a national disaster hazard mitigation program that will reduce loss of life and property, human suffering, economic disruption, and disaster assistance costs resulting from disasters, and
- Provide a source of pre-disaster hazard mitigation funding that will assist State and local governments in accomplishing that purpose.

DMA 2000 amends the Robert T. Stafford Disaster Relief and Emergency Assistance Act by, among other things, adding a new section, 322 – Mitigation Planning. This places new emphasis on local mitigation planning. **It requires local governments to prepare and adopt jurisdiction-wide hazard mitigation plans as a condition of receiving Hazard Mitigation Assistance (HMA) grants.** Local governments must review and if necessary, update the mitigation plan every five years to continue program eligibility. However, it is recommended that this Plan be reviewed/updated annually or after a hazard event to be consistent with Chapter 7.

Why Develop a Mitigation Plan?

The full cost of the damage resulting from natural hazards – personal suffering, loss of lives, disruption of the economy, loss of tax base – is difficult to measure. Our State is subject to many types of natural hazards: floods, hurricanes, severe winter weather, earthquakes, tornadoes, downbursts, and wildfires, all of which can have significant economic and social impacts. Some, such as hurricanes, are seasonal and strike in predictable locations. Others, such as floods, can occur anytime of the year and almost anywhere in the State.

Scope of the Plan

The scope of this Plan includes the identification of natural hazards affecting the town, as identified by the Hazard Mitigation Planning Committee. The hazards reviewed under the scope of this plan include those that are outlined in the State of New Hampshire's Multi-Hazard Mitigation Plan Update 2013. With one exception; due to no history or risk of avalanche in the Town, the Committee chose not to recognize the risk of this hazard in this Plan.

Flooding	**Earthquake**	**Lightning**
Dam Failure	**Hail**	**Severe Wind**
Drought	**Human Caused**	**Winter Weather**
Extreme Heat	**Hurricane**	**Wildfire**

Methodology

The Hazard Mitigation Planning Committee, with the assistance of Hubbard Consulting LLC, developed the contents of this Plan through a Hazard Mitigation Planning Process. During the first edition of this Plan, the Committee held a total of 10 meetings beginning on May 29, 2003 and ending on March 10, 2004. Two Public Information Meetings for the public to review and comment on the plan were held on May 29, 2003 and February 25, 2004. The Hampton Planning Board formally adopted the 2004 Plan on July 21, 2004. FEMA approved this Plan on _____

During the 2010 revision of the Plan Hubbard Consulting worked with the Town to update the Plan. There were a total of four committee meetings. Prior to the first meeting town department heads were notified and public notices were posted to residents and business owners inviting them to participate. The committee analyzed and revised Chapters 2, 3, 4, 5 and 6. The Board of Selectmen held a public hearing on May 16, 2011 to formally adopt the Plan. FEMA formally approved the plan on June 29, 2011.

The Plan was again updated in 2016. The Hampton Hazard Mitigation Planning Committee with the assistance of Hubbard Consulting LLC held a total of six meetings on April 14, 2016, May 13, 2016, May 26, 2016, June 8, 2016, June 23, 2016 and July 14, 2016. One public meeting was held on _____ (to be held 2 weeks before BOS meeting to adopt) to obtain input from the general public. Public notices were posted at the Town Office, Police Department and Town Website, inviting members of all town departments and boards, surrounding communities, businesses, academia, State agencies and non-profit agencies. In addition, email notifications were sent to adjacent communities, the Rockingham Planning Commission, the Chamber of Commerce and the NH HSEM. There were no members of the general public or anyone outside of the committee members that attended any of the committee meetings. The Emergency Management Directors from surrounding towns were notified of the Plan Update and asked to comment on the Plan (see Appendix B). The EMD and Deputy EMD from the Town of Seabrook attended one meeting and their comments were incorporated into the Plan. The committee analyzed and revised the following

sections of the Plan and provided input to update them: Chapters 1, 2, 3, 4, 5, 6 and 7. After acceptance by the committee, the Plan was submitted to the NH HSEM and FEMA Region 1 for formal Approval. The Board of Selectmen formally adopted the Plan on _____.

The committee developed this Plan as a result of the above meetings and the following planning process.

Step 1: Form a Hazard Mitigation Planning Committee

Prior to the first public information meeting the Town contacted town department heads and posted public notices to residents, business owners and neighboring towns, requesting that they consider serving on the Committee (See Appendix B). The Committee Members consisted of town staff. A press release was published in the local newspaper and town office inviting residents, businesses, neighboring communities, academia and other private non-profit interests to participate in the planning process.

Step 2: Set Hazard Mitigation Goals and Objectives

At the first working meeting the committee reviewed and made minor revisions to the town's Hazard Mitigation Goals. The Hazard Mitigation Goals were adapted from the State of New Hampshire's Natural Hazards Mitigation Plan. This first step is extremely important in helping the committee understand the purpose of the Plan and the direction it should go. (See the end of this chapter for the "Hazard Mitigation Goals of the Town of Hampton, NH".)

Step 3: Hazard Identification

The Committee members identified natural hazards and human-caused hazards that have or could potentially affect the Town of Hampton. The results of this step can be found in Chapters 2 and 3.

Step 4: Critical Facilities Analysis

The committee members created a Critical Facilities List for the town. The Critical Facilities List is divided into 3 sections: Facilities needed for Emergency Response; Facilities not necessary for emergency response; and places and populations to protect in the event of a disaster. The results of this step can be found in Chapter 4.

Step 5: Capability Assessment

The committee members identified what plans and policies are already in place to reduce the effects of hazards. The results of this step can be found in Chapter 5. Many of these plans and technical reports were reviewed and incorporated during the planning process, including the Hampton Emergency Operations Plan (2012) and the Vulnerability Assessment of Sea-level Rise and Coastal Storm Surge Flooding (2015).

Step 6: Develop Objectives
The Committee identified "Problem Statements" for each of the hazards identified earlier in the planning process. All of the hazards have at least one problem statement associated with them (See Problem Statement in Appendix B). These problem statements were then utilized as objectives in developing mitigation projects, as described in the next step.

Step 7: Develop Specific Mitigation Measures
As a result of the problem statements identified in step 6, the committee brainstormed specific projects or mitigation measures to address each hazard. The Committee Members used the "*Mitigation Project Identification Worksheet*", as shown in Appendix B, to identify mitigation projects that directly address the hazards affecting the community. Finally, the committee prioritized the top priority projects and listed them in the Mitigation Action Plan found at the end of Chapter 6.

Step 8: Adopt and Implement the Plan
After acceptance by the committee the Plan was submitted to the NH Homeland Security and Emergency Management and FEMA Region 1 for formal Approval. The Board of Selectmen formally adopted the Plan on _____. The letter of approval from FEMA Region 1 can be found in Appendix C.

With respect to any ongoing mitigation projects, the lead and support agencies/people for such activity will be tasked with implementing the Plan's mitigation projects. The committee approved the "Prioritized Mitigation Projects" list, which identifies responsibility, funding/support and a timeframe for each of the prioritized projects. The Emergency Management Director should be tasked with requesting annual reports as to the progress of each project.

Step 9: Monitor and Update the Plan
It is important that this plan be monitored and updated annually or after a presidentially declared disaster. Chapter 7 specifically addresses this issue.

Mitigation Goals, Objectives & Actions

During the 2016 update, the Committee reviewed the 2011 Hampton Hazard Mitigation Plan goals and made only minor revisions. The Goals were not modified for any substantial content, as there has not been any substantial change in development. The goals for the Town of Hampton are as follows:

1. To improve upon the protection of the general population, the citizens of the Town of Hampton and guests, from all natural and man-made hazards.

2. To reduce the potential impact of natural and man-made disasters on the Town of Hampton's Emergency Response Capability.

3. To reduce the potential impact of natural and man-made disasters on Critical Facilities in the Town of Hampton.

4. To reduce the potential impact of natural and man-made disasters on the Town of Hampton's infrastructure.

5. To improve the Town of Hampton's emergency preparedness and communication network.

6. To improve the Town of Hampton's disaster response and recovery capability, both pre and post event.

7. To reduce the potential impact of natural and man-made disasters on private property in the Town of Hampton.

8. To reduce the potential impact of natural and man-made disasters on the Town of Hampton's economy.

9. To reduce the potential impact of natural and man-made disasters on the Town of Hampton's natural environment.

10. To reduce the Town of Hampton's potential liability with respect to natural and man-made hazards.

11. To reduce the potential impact of natural and man-made disasters on the Town of Hampton's specific historic treasures.

12. To identify, introduce and implement cost effective Hazard Mitigation measures so as to accomplish the Town's Goals and Objectives.

13. To improve the process for declaration of federal disasters and quicken the reimbursement process.

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

2016 Hazard Mitigation Planning Committee

Name	Title/Affiliation
Chris Jacobs	Hampton Department of Public Works Director
David Hobbs	Hampton Police Department Deputy Chief
Fred Welch	Hampton Town Manager
Heidi Lawton	NH HSEM, Field Representative
Jameson Ayotte	Hampton Fire Department / EMS, Chief
Jamie Sullivan	Hampton Assistant Town Manager
Jason Bachand	Hampton Town Planner
Jen Hale	Hampton Department of Public Works, Deputy Director
Karl Ingoldby	Winnicunnet High School Facilities Director
Kristi Pulliam	Hampton Finance Director
Mark Gearreald	Hampton Town Attorney
Nathan Denio	Hampton Fire Department / EMS

Richard Sawyer	Hampton Police Chief / EMD
William Kennedy	Hampton Fire Department, Deputy Chief
Jane Hubbard	Hubbard Consulting LLC

The committee members listed above participated in regular committee meetings, provided departmental information, contributed in their field of expertise, reviewed and commented at committee meetings, reviewed drafts of the Plan and worked together to identify and prioritize mitigation projects.

Many thanks to all the hard work and effort from each and every one of you.
This plan would not exist without your knowledge and experience.
Thank you!

Chapter 2
COMMUNITY PROFILE

Community Description

The Town of Hampton is located in Rockingham County in southeastern New Hampshire, approximately 8 miles south of Portsmouth and 50 miles north of Boston, Massachusetts. It is bordered by the Atlantic Ocean to the east, the Towns of Seabrook and Hampton Falls to the south, the Towns of Exeter and Stratham to the west and the Town of North Hampton to the north. The total land area contained within the corporate limits of Hampton is 13 square miles. Development along the coast is primarily residential and recreational. The coast is characterized by sandy beaches, rocky headlands, and offshore reefs and ledges. Hampton Harbor, an inlet formed by the confluence of the Hampton and Taylor Rivers.

The 2005 Flood Insurance Study for the Town of Hampton summarizes the Principal Flood Problems as the following:

> "The low-lying coastal areas of Hampton are subject to the periodic flooding and wave attack that accompany coastal storms, such as northeasters and hurricanes. The majority of these storms cause damage only to low coastal highways, boats, beaches and seawalls. Occasionally, a major storm accompanied by strong onshore winds and high tides results in surge and wave activity that causes extensive property damage and erosion. Some of the more significant storms in the Hampton area include those of December 1909 and 1959 (approximately 160- and 15-year recurrence intervals, respectively, and February 1972 and 1978 (approximately 10- and 70year recurrence intervals respectively). These storms damaged harbors, marinas, commercial development, and residential developments in the flood prone coastal areas."

National Flood Insurance Program (NFIP)

Floodplains for this Plan are defined as the 100-year and 500-year flood hazard zones, as depicted on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM). Hampton participates in the National Flood Insurance Program (NFIP) administered by FEMA. In order to enable landowners to qualify for federally insured flood insurance, the Town, in its administration of site plan review, subdivision regulations and zoning, must regulate development in the floodplain using federal standards.

The Town's existing ordinance meets the minimum requirements of the NFIP, according to the latest Community Assistance Visit. The Town will continue to maintain procedures and regulations that are in compliance with the NFIP by conducting Community Assistance Visits (CAVs) and Community Assistance Contacts (CAC) with the Office of Energy and Planning and updating the Floodplain Ordinance as federal requirements are updated. The last CAV was conducted on July 28, 2015.

The town joined the NFIP on July 3, 1986 and is currently participating in the NFIP. The community has Digital Flood Insurance Rate Maps (DFIRM) and a Flood

Insurance Study dated May 17, 2005. According to the NFIP Policy and Claims report by FEMA, there are 1,796 NFIP policies. There have been 513 claims made since 1975; totaling $4,572,987 paid claims.

Table 2.1 NFIP Flood Policy Data

	Policies in Force	Premium	Insurance in Force	Number of Closed Paid Losses	$ of Closed Paid Losses
Single Family	724	$865,580	$150,928,600	369	$2,735,806
2-4 Family	288	$279,436	$59,034,100	69	$479,028
All Other Residential	724	$294,101	$105,771,400	29	$918,336
Non Residential	60	$151,792	$18,584,900	46	$439,817
Total	**1,796**	**$1,590,909**	**$334,319,000**	**513**	**$4,572,987**

Repetitive Loss:

Hampton is the largest repetitive loss community in the State of New Hampshire. There are 40 repetitive losses, which is an increase of 9 since the 2011 Plan. A total of $1,823,740 in repetitive loss claims have been paid by the NFIP.

Type of Resident	# of Repetitive Loss
Single Family	24
2-4 Family	7
All Other Residential	6
Non Residential	3
Total	**40**

The FEMA Flood Insurance Program monitors properties that have been subject to continued flooding claims through the National Flood Insurance Program (NFIP). These properties are designated as "Repetitive Loss" properties, which are defined as *"a building covered by a contract for flood insurance that has incurred flood related damages on 2 occasions during a 10-year period ending on the date of the event for which a second claim is made, in which the cost of repairing the flood damage, on the average, equaled or exceeded 25% of the market value of the building at the time of each such flood event."*

As noted earlier, the Town of Hampton has 40 Repetitive Loss Properties. Hampton is considered a Category B Repetitive Loss Community. This means that there are more than 2 Repetitive Loss Properties in the Town of Hampton. A Category B community is required to have a Repetitive Loss Plan, which is currently being updated and will be included in future editions of this Plan.

According to the 2001 Hampton Beach Master Plan, there are a total of 4,015 structures located in the 100-year floodplain (see Table 2.2 below).

Table 2.2 – Hampton Lots & Buildings in Flood Zones			
Zone	Structure Size (sf)	Structures	% of Total
Zone AE	2,347,020	2,285	56.9
Zone AO	294,593	260	6.5
Zone VE	5,632	5	0.1
Zone X	1,724,845	1,277	31.8
Zone X 500	233,430	188	4.7
Totals	4,605,520	4,015	100

Disaster Risk

Hampton is prone to a variety of natural hazards. These include: flooding, dam failure, hurricane, severe wind events (downbursts and tornadic activity), wildfire, drought, earthquake, lightning, hail, extreme heat, and severe winter weather, and man-made hazards. During the 2016 Update, the Committee made some changes to the hazard risk. The Committee came to a consensus to not include Avalanche and Landslide, as there is no real threat of these hazards. The following tables summarize the impact and probability of natural and man-made hazards.

Natural Hazards	**Human Impact**	**Property Impact**	**Business Impact**	**Severity**	**Probability*** *In 25 years*	**Risk** *Severity x Probability*
	Probability of death or injury 0: n/a 1: Low 2: Moderate 3: High 4: Catastrophic	Physical loss damage 0: n/a 1: Low 2: Moderate 3: High 4. Catastrophic	Interruption of service 0: n/a 1: Low 2: Moderate 3: High 4. Catastrophic	*Avg. of Human / Property / Business*	Likelihood this will occur 0: Improbable 1: Remote 2: Occasional 3: Probable 4: Frequent	0-3: Low 4-7: Moderate 8-11 High 12-16: Severe
Severe Winter Weather	3	3	4	3.3	4	13.2
Flood (River/Coastal)	2	4	3	3	4	12
Severe Wind *(Tornado/Downburst)*	3	4	3	3.3	3	9.9
Lightning	3	2	1	2	4	8
Hurricane	3	4	3	3.3	2	6.6
Extreme Heat	3	1	1	1.6	3	4.8
Wildfire	2	3	2	2.3	2	4.6
Dam Failure	1	3	1	1.6	2	3.2
Drought	1	2	2	1.6	2	3.2
Hail	1	2	2	1.6	2	3.2
Earthquake	3	3	3	3	1	3

Human Caused Hazards	Human Impact Probability of death or injury 0: n/a 1: Low 2: Moderate 3: High 4: Catastrophic	Property Impact Physical loss damage 0: n/a 1: Low 2: Moderate 3: High 4. Catastrophic	Business Impact Interruption of service 0: n/a 1: Low 2: Moderate 3: High 4. Catastrophic	Severity *Avg. of Human / Property / Business*	Probability* *In 25 years* Likelihood this will occur 0: Improbable 1: Remote 2: Occasional 3: Probable 4: Frequent	Risk *Severity x Probability* 0-3: Low 4-7: Moderate 8-11 High 12-16: Severe
Urban Fire	4	4	4	4	3	12
Civil Disorder	3	3	4	3.3	3	9.9
Utility Interruption	2	1	3	2	3	6
Haz Mat (Fixed)	2	2	3	2.3	2	4.6
Mass Casualty (Trauma or Medical)	4	1	2	2.3	2	4.6
Armed Attack (assault, sniper)	4	4	4	4	1	4
Haz Mat (Transport)	2	2	2	2	2	4
Radiological Release	4	4	4	4	1	4
Terrorist Attack (WMD)	4	4	4	4	1	4
Biological Terrorism	4	2	4	3.3	1	3.3
Bomb Threat	1	1	3	1.6	2	3.2
Transport Incident *(plane, train, etc.)*	3	3	3	3	1	3

*Probability Terms are defined as:

Improbable:	Not likely to occur in any 25 year period.
Remote:	Less than 1% probability in the next 25 year period.
Occasional:	Between 1% and 50% probability in the next 25 year period.
Probable:	Between 50% and 99% probability in the next 25 year period.
Frequent:	Near 100% probability in the next year.

CALCULATING POTENTIAL LOSS

It is difficult to determine the amount of damage that could be caused by natural or human-caused hazards because the damage will depend on the hazard's extent and severity, making each hazard event somewhat unique. Therefore, to calculate potential economic loss, we have assumed that structures impacted by hazards could result in damage of either 1% or 5% of the assessed value.

Based on this assumption, the potential loss from any of the identified hazards would range from $18,538,862 (1%) or $92,694,310 (5%) based on the 2015 town valuations which lists the assessed value of all structures in Hampton to be 1,853,886,200 (See table below).

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

Table 2.3 - Assessed Value of All Structures			
Type	**2015 Value**	**1% Damage**	**5% Damage**
Residential	$ 1,422,726,025	$ 14,227,260	$ 71,136,301
Manufactured Housing	$ 15,747,500	$ 157,475	$ 787,375
Commercial	$ 237,418,575	$ 2,374,186	$ 11,870,929
Tax Exempt	$ 102,604,700	$ 1,026,047	$ 5,130,235
Utilities	$ 75,389,400	$ 753,894	$ 3,769,470
Total	**$ 1,853,886,200**	**$ 18,538,862**	**$ 92,694,310**
Source: NH DRA 2015 MS-1			

CURRENT DEVELOPMENT TRENDS [1] [2]

Population, Housing Stock, and Growth Patterns

According to the NH Employment Security website, "Population change for Hampton totaled 9,694 over 54 years, from 5,379 in 1960 to 15,073 in 2014. The largest decennial percent change was a 49 percent increase between 1960 and 1970. The 2014 Census estimate for Hampton was 15,073 residents, which ranked 18th among New Hampshire's incorporated cities and towns."

Table 2.4: Hampton Population	
Year	**Population**
2014	15,073
2010	15,430
2000	14,973
1990	12,324
1980	10,943
1970	8,011
Source: http://www.nhes.nh.gov/elmi/products/cp/profiles-htm/Hampton.htm	

Table 2.5: New Residential Building Permits Issued			
Time Period	**Single-Family**	**Two-Family**	**3+ Units**
2012	13	0	3
2013	21	1	1
2014	26	1	2
2015	39	1	4

FUTURE DEVELOPMENT

Much of the new growth in Hampton is in the form of new residential units -- both single-family and multi-family. Many of the multi-family residential units are designed for condominium form of ownership, and several of the existing structures have been converted into condominiums in an effort to cater to the growing second home market. These trends can be expected to continue as the population in the Seacoast region increases.

The densely developed land within the Beach Precinct is expected to continue its conversion from seasonal cottages to year-round units and condominiums. In addition, the Town is working with the State to implement the Hampton Beach Area Master Plan (November 2001), a fifty-year vision of the beach. This includes new year-round services, larger attractions, and improvements to the existing, outdated infrastructure.

[1] 2010 US Census Data
[2] Town of Hampton Master Plan 2013

There are no immediate plans to provide sewer and water to the land West of Interstate 95, which may keep the larger developments out of this area for the immediate future. However, much of the undeveloped land in Hampton is concentrated in this area, and as other areas are developed, the Town may experience large growth in a short time in this area. In order to protect some of the open fields and farms, the Town is looking to purchase conservation easements. In 2004, the Town approved such a measure for protecting the Hurd Farm, the last working dairy farm in Hampton.

Businesses and commercial uses are expected to continue to be concentrated along Route 1 and the Beach area. Growth in these sectors will most likely tail-off, with redevelopment of existing sites as the primary source of new businesses.

The updated the Future Land Use Chapter (2005) of the Master Plan include a limited "build-out analysis" for the RAA and General zoning districts. "Because the greatest development demand is for residential units, and residential development greatly increases the demand for municipal services, the build-out focused on the potential for residential development. The results are useful in visualizing potential impacts from land development, and in identifying necessary regulatory amendments or actions to guide future development." The results are summarized in the following tables.

The committee recognizes the past growth trends and the potential for future growth. The committee believes existing regulations and plans manage and address these areas, so there were no changes in mitigation priorities. In future updates of this Plan the Town may want to consider mitigation priorities to reflect changes in development.

Table 2.6
RAA District: Single-Family Scenario

		# of units at build-out (includes existing development + future development and redevelopment)			
# of existing lots	Total # of lots at build-out	Multi-family units	Duplex units	Single-family units	Total # of units
236	379	0	0	363	363

Table 2.7
General District: Duplex Scenario

		# of units at build-out (includes existing development + future development and redevelopment)			
# of existing lots	Total # of lots at build-out	Multi-family units	Duplex units	Single-family units	Total # of units
392	555	426	598	174	1,198

Chapter 3
HAZARD IDENTIFICATION

COASTAL AND RIVERINE FLOODING

Probability: Frequent

Definition:
Flooding is the temporary overflow of water onto land that is not normally covered by water. Flooding results from the overflow of major rivers and tributaries, storm surges, and/or inadequate local drainage. Flooding events considered in this Plan include 100-year and 500-year floodplain events, rapid snow pack melt and ice jams.

Location:
Primary flood hazard areas are located within the 100-year floodplain and areas affected by wave action on the immediate coastal areas. According to the Master Plan, "Hampton has 3,416 acres of land within the 100-year floodplain, including 3,162 acres of riverine floodplain and 254 acres within coastal areas. 5517 acres of upland are located between the 100-year floodplain (Zone X) and 500-year floodplain, and 128 acres are within the 500-year floodplain (Zone X500)." Many homes and businesses are located in the flood prone areas. Appendix C includes the preliminary FEMA flood maps that delineate the 100-year and 500-year floodplains. In addition, the sea-level rise study in Appendix D includes maps of flooding based upon various projected sea-level rise extents.

Impact:
The extent of damage caused by any flood depends on the depth and duration of flooding, the topography of the area flooded, velocity of flow, rate of rise, and the amount and form of development in the floodplain. The flood hazard areas are highly susceptible to flooding from seasonal high tides, coastal storms and sea-level rise. When storms strike in connection with high tides, the waters can flow 3 feet deep or more, especially west of Ashworth Avenue where so many residences have been built on filled marshland. The impact to structures is reflected in in the number and amount of NFIP claims as described in the Chapter 2 of this plan.

Extent:
FEMA defines flood hazards by the 100-year and 500-year flood events. A 100-year flood event is defined as flood event having a 1% chance of being equaled or exceeded in any given year. The 500-year flood event is defined as flood event having a .2% chance of being equaled or exceeded in any given year. The Town of Hampton Flood Insurance Rate Maps (FIRM) identify both an A, AE, AO, V and X zones. A zones are subject to the 100-year flood, however because there have been no detailed hydraulic studies, there is no Base Flood Elevation (BFE) determined for these zones. The AE zones are subject to the 100-year flood and have BFEs delineated on the FIRM. X zones are areas outside the 1-percent annual chance floodplain and no Base Flood Elevations defined. V zones are Coastal areas with a 1% or greater chance of flooding and an additional hazard associated with storm waves. These areas have a 26% chance of flooding over the life of a 30-year mortgage.

Previous Occurrence:

October 29, 2015: An intensifying low pressure system passed well to the west of New England and into Canada during a period of extremely high astronomical tides. Ahead of this system, gale force southerly winds shifted to the southwest and diminished prior to high tide which led to only minor coastal flooding across the seacoast of New Hampshire. In Hampton, the astronomical tide of 10.7 feet was accompanied by a storm surge of 0.8 feet to lead to a 11.5 storm tide which was a half foot over the flood stage of 11.0 feet. Minor flooding occurred along Brown and Island avenues near the time of high tide.

September 30, 2015: Low pressure and gale force southeasterly winds combined with the highest astronomical tides of the month to produce coastal flooding across the southwest coast of Maine. Nearshore waves built to eight feet off the coast during high tide and led to splash-over in Rockingham County. Brown and Island Avenues were flooded with up to a half foot of water near the time of high tide.

April 20, 2015: Gale force easterly winds over the coastal waters allowed for nearshore waves to build to nearly 15 feet. High astronomical tides coincided with a storm surge of around a foot to produce coastal flooding and minor to moderate splash-over and beach erosion near the time of high tide. The tide was above flood stage for nearly an hour, causing minor flooding at the east end of High Street in Hampton.

February 15, 2015: An intense ocean storm producing storm force winds resulted in 20 foot waves along the Rockingham County coast. The Hampton tide gage reached it flood stage of eleven feet. This led to flooding of side streets in the Back Bay and Brown Ave area, causing minor water damage of local homes.

August 14, 2014: An early season Nor'easter developed and moved into the Gulf of Maine early on the 14th. This system produced a prolonged period of gale force winds and building seas. In addition, very high astronomical tides from a super moon combined with the low pressure system to produce minor coastal flooding on Island Path and Brown Street in Hampton.

July 12, 2014: Low pressure passing west of New England set up a modest southerly wind flow gradually increasing seas. The highest astronomical tides of the month combined with the increasing seas to produce minor coastal flooding on vulnerable Island Path and Brown Street.

January 3, 2014: A complex area of low pressure and gale force northerly winds combined with building nearshore waves up to 15 feet to produce splash-over and coastal flooding near the time of high tide. Winds switched to the north during the midday high tide on the 3rd. However, the highest astronomical tides of the month, combined with a modest storm surge to impact the coast from Portland south through the New Hampshire Seacoast. Many roads were closed due to moderate flooding in Hampton with a foot of water covering the roadways. Splash-over led to flooding of Ashworth Street.

May 25, 2013: The highest astronomical tides of the month combined with a weak, but developing, area of low pressure (1000 mb) near Cape Cod to produce coastal flooding in coastal Rockingham County during the late evening hours of May 25th. Fortunately, winds were relatively light, with relatively modest seas along the coast. Flooding occurred on several of the lower back roads in Hampton, including Brown Avenue.

December 27, 2012: Low pressure intensified as it slowly moved up the east coast on the 26th of December and into the Gulf of Maine on the 27th. The slow movement allowed for a two to three-foot storm surge on top of the normal astronomical tides. Seas rapidly built in the Gulf of Maine, reaching 25 feet during high tide. Strong northeasterly wind gusts approached hurricane force over the coastal waters. Splash-over occurred in Hampton, New Hampshire with moderate flooding closing down Brown, Island Path and Ashworth Streets.

December 18, 2012: Low pressure strengthened as it moved slowly across the southern New England coastline before reaching coastal Maine on the afternoon of the 18th. This slow movement allowed for heavy rains and a one to two-foot storm surge on top of high astronomical tides. Seas reached 11 to 15 feet at high tide on gusty easterly winds. Minor flooding occurred along side streets in the back bay area of Hampton.

June 2, 2012: A low and its nearly stationary moisture band triggered heavy rainfall across western Maine and eastern New Hampshire as tropical moisture was entrained into the system. It also produced moderate seas of 10 feet and storm surge of over a foot in persistent southeasterly winds which backed to the northeast and gusted to near gale force at times. Storm tides caused several

days of coastal flooding as tides were at an astronomical peak for the month. High astronomical tides combined with an unusually strong late spring storm to produce coastal flooding in Coastal Rockingham County.

October 29, 2011: A weak northeasterly flow set up across New England, which coincided with the highest astronomical tides of the year. There was very little wave action with this system which helped mitigate any problems. Nevertheless, the storm surge was sufficient enough along coastal New Hampshire to produce minor coastal flooding. Minor flooding occurred along low lying roads along Brown Avenue and Island Path, in Hampton New Hampshire.

September 29, 2011: A weak south to southeasterly flow across New England coincided with the highest astronomical tides of the month and caused minor coastal flooding. There was very little wave action with this system which helped mitigate any problems. Nevertheless, a storm surge of around a half foot (0.61 feet) occurred. Minor flooding occurred along low lying roads along Brown Avenue and Island Path in Hampton.

August 28, 2011 DR-4026 – Tropical Storm Irene – see hurricane section

January 21, 2011: Low pressure deepened to 985 mb in the Gulf of Maine during a period of high astronomical tides. This system produced north to northwest winds along the New Hampshire coast with very little wave action. Nevertheless, a storm surge of over a foot (1.58 feet) occurred. Minor flooding occurred on low lying roads including Brown Street and Ocean Boulevard in Hampton.

March 4, 2010: High astronomical tides combined with gale force winds to produce minor coastal flooding along the New Hampshire sea coast. This system produced 12 foot near-shore waves and a storm surge of over a foot on strong northeasterly gales. Flooding occurred along low lying roads in Hampton, specifically the High Street corridor. Many residences were flooded, and the town opened a local shelter at the Emergency Operations Center.

February 25, 2010: An intense storm was slowly weakening over southern New England on the morning of February 26th. Long period swells were slow to subside and some minor flooding occurred in Hampton at the time of high tide. Ahead of the low, east winds rapidly increased across New Hampshire with numerous gusts in excess of 60 mph being reported. A record number of homes and businesses lost power. Utilities reported 310,000 customers without power during the peak of the storm. This storm produced hurricane force winds with peak wind gusts of 91 mph at the Isles of Shoals. This resulted in near-shore waves as high as 32 feet. Significant splash-over occurred which produced flooding in low lying coastal areas. In Hampton, rocks and other debris as well as flooding closed down Brown avenue and other side streets.

January 11, 2009: An area of low pressure produced minor coastal flooding in Hampton, along Route 1 and the Taylor River. The Town evacuated Taylor River Estates due to extremely high flood levels.

April 16, 2007: High astronomical tides and strong northeast winds produced severe coastal flooding across most of New Hampshire. Ocean waves crossed the road along Route 1 in Hampton. Winds gusted from 60 to 80 mph. The damage from the wind was exacerbated due to soft, wet ground caused by spring thaw. Prolonged storm surge battered the coastline and caused extensive flooding and erosion (even channel markers with 20,00 pound blocks, went adrift causing problems for mariners). The Portland, Maine weather buoy reported 31 foot seas. Hampton experienced road washouts along North Beach, lost sea walls and nearly lost 6 houses along the ocean due to coastal erosion and flooding.

May 13, 2006: A slow moving, low pressure system rotated over New England from May 12, to May 15, 2006. Extremely heavy rainfall with rough seas and astronomical high tides produced localized flooding. Areas that flooded included Taylor River, Kings Highway area, Brown Ave area, and the area north of the RR into down town (a lot due to subsurface water). Taylor River Estates was one of the hardest hit areas during four days of torrential downpours, where roughly 10 homes on the street were damaged due to flooding from the Taylor River. The Town helped evacuate the citizens in the flooded areas.

May 25, 2005: A late season storm developed off the New England Coast. High astronomical tides, combined with strong northeast winds and large ocean waves to produce tidal flooding and beach erosion. Boulders the size of basketballs washed up on the road in Hampton and a portion of a seawall was damaged and basements were flooded.

March 2001 Nor'easter: Hampton received a total of 29" in snowfall amounts which resulted in an emergency declaration from FEMA.

Fall 2000 Tropical Storm Floyd caused flooding and minor wind damage which resulted in a Presidentially Declared Disaster from FEMA.
July 2, 1998: Heavy rains caused localized flooding.
1996/97: Sometime in this timeframe about 12 homes experienced flooding in their basements from a severe thunderstorm with flash flooding. The fire department received many calls for flooded basements within an hour's time.
October 1996: Heavy rains caused the Winnicunnet Bridge over Eel Ditch to wash out. The bridge was replaced at a cost of $250,000. This same event also washed out the culvert on Drakeside Road on a tidal tributary of the Taylor River, resulting in $38,000 in repair costs.
1993: Heavy rains in late winter caused localized flooding
Fall 1991: Perfect Storm caused flooding and minor wind damage
1978: A 70-year storm event caused damage to harbors, commercial development and residential development in the flood-prone coastal areas.
April 1973: A flood event in April of 1973 occurred when five to seven inches of rain fell along the seacoast of New Hampshire during a 36-hour period. This storm created high tides averaging 7 feet mean sea level (MSL) at the Seavey Island tide gage near Portsmouth, New Hampshire and reached over 8 feet msl, the highest recording since the gage was established in 1926. The aftermath of this storm was a 40-acre pond with a bog debris dam and a new 156-acre salt marsh. A ditch was dug through the debris and across a salt meadow to the Hampton River. The pond and ditch are now called Meadow Pond and Eel Ditch and the salt meadow is Little River Swamp.
February 1972: 10-year storm event caused damage to harbors, commercial development and residential development in the flood-prone coastal areas.
December 1959: 15-year storm event caused damage to harbors, commercial development and residential development in the flood-prone coastal areas.
September 21, 1938 Hurricane: Severe wind and flood damage
November 1919: Flooding caused the most serious beach loss since the fire in 1916
December 1909: 160-year storm event caused damage to harbors, commercial development and residential development in the flood-prone coastal areas.
July 1914: Flooding washed away several dwellings.
March 1723: On March 7, 1723 a storm hit the Hampton area that forced water 20 inches higher than had ever been witnessed before. The force of the storm breached the sand dune near the Hampton-North Hampton town line allowing the ocean to pour into the fresh meadows. The flood tide tore across a huge bog area known as Huckleberry Flats, picking up acres of bog and vegetation on its journey back to the sea.

WINTER WEATHER

Probability: Frequent

Definition:
Heavy Snow Storms: A winter storm can range from moderate snow to blizzard conditions. Blizzard conditions are considered blinding wind-driven snow over 35 mph that lasts several days. A severe winter storm deposits four or more inches of snow during a 12-hour period or six inches of snow during a 24-hour period. **Ice Storms**: An ice storm involves rain that freezes upon impact. Ice coating at least one-fourth inch in thickness is heavy enough to damage trees, overhead wires and similar objects. **Blizzard**: A blizzard is a violent snowstorm with winds blowing at a minimum speed of 35 miles (56 kilometers) per hour and visibility of less than one-quarter mile (400 meters) for three hours. **Nor'easter**: A Nor'easter is a large weather system traveling from south to north, passing along the coast. As the storm's intensity increases, the resulting counterclockwise winds impacted the coast and inland areas in a Northeasterly direction. Winds from a Nor'easter can meet or exceed hurricane force winds.

Location:
There is a town-wide vulnerability to severe winter weather. Nor'easters (wind), Ice Storms, Heavy Snow Accumulations and Severe Cold can occur at any place within the town and generally affect the entire town when it happens. The higher elevations are more likely to experience snow or ice before the lower terrain.

Impact:
Heavy snow accumulations (generally considered one that deposits six or more inches of snow in a 12-hour period) especially those associated with nor'easters can have a significant effect on the Town, including extended power outages, road closures, collapsed roofs and increased snow removal costs. During ice storms, ice forms on cold surfaces, such as trees and power lines, and may continue to form until the ice is quite deep, as much as several inches thick. Ice damage results in power outages, road closures and forest damage. Ice on the roads can be the most difficult for a rapid emergency response. Functional needs populations are at risk during prolonged power outages. Private roads are difficult for emergency response vehicles due to restricted access during winter.

Extent:
NOAA's National Climatic Data Center produced the Regional Snowfall Index (RSI) for significant snowstorms that impact the eastern two thirds of the U.S. The RSI ranks snowstorm impacts on a scale from 1 to 5, similar to the Fujita scale for tornadoes or the Saffir-Simpson scale for hurricanes. In addition, the National Weather Service developed and utilizes the Sperry-Piltz Ice Accumulation Index (SPIA) to forecast the impact of an ice storm. The index below ranges from an ice storm rated as "0" which has little impact, to an index rating of 5 that has catastrophic damage to exposed utility systems.

CATEGORY	RSI VALUE	DESCRIPTION
1	1-3	Notable
2	3-6	Significant
3	6-10	Major
4	10-18	Crippling
5	18.0+	Extreme

Previous Occurrence:
February 7, 2015: A series of low pressure areas moving along a stalled frontal boundary brought a moderate to heavy snowfall to the region over about a 60-hour period. Snowfall amounts generally ranged from 6 to 15 inches. The cumulative impact of the 1/27, 2/2 and 2/7 storms added to the snow drifts onto Hampton Beach.
February 2, 2015: Low pressure moving east from the Mississippi Valley on the 1st intensified off the New England coast on the 2nd before moving rapidly northeastward by the morning of the 3rd. The storm brought heavy snow to much of the State. Generally, 8 to 14 inches fell across southern areas.
January 27, 2015: An area of low pressure developed off the Delmarva peninsula on Monday, January 26th, and intensified rapidly as it moved slowly northward through the 27th. Snow spread northward across the region Monday night and became heavy on Tuesday, the 27th. Winds became strong during the day Tuesday leading to blizzard conditions at times along and inland from the coast. The snow persisted into Tuesday night in many areas with blowing and drifting snow. There were snow drifts up to 6' high along the beach and the State Park. Along the coast, large waves combined with a storm surge produced coastal flooding and splash over. In Hampton, the Tuesday morning tide was 1.43 feet above flood levels, inundating many streets on the bay side of town. Snowfall amounts ranged from 10 to more than 30 inches across much of the southeastern part of the state. The Town of Hampton spent over $300,000 on snow removal.

February 13, 2014: An area of low pressure brought heavy snow to the entire state with some mixed precipitation in the southeastern part of the state. Snowfall amounts generally ranged from 6 to 14 inches with a few areas getting more than 15 inches. The impact in Hampton was minimal.
March 8, 2013: A large area of low pressure moved off the Virginia coast on the morning of the 6th and then moved very slowly northeast during the next 60 hours. Snowfall amounts in Rockingham County ranged from 4 to 12 inches with the higher amounts in southern sections. The impact in Hampton was minimal.
February 8, 2013: An area of low pressure brought heavy snow, high winds, and blizzard conditions to the southeastern part of the state. Snowfall amounts were generally 18 inches or more in the southeast where blizzard conditions caused considerable blowing and drifting snow. In western and northern sections, snowfall amounts were in the 4 to 18-inch range. Southeastern New Hampshire had blizzard conditions for about 3 to 10 hours.
October 29, 2011: The storm brought a heavy, wet snow to southern and central New Hampshire. The snow was mixed with rain along the immediate coast. The combination of the heavy wet snow and leaves still on the trees caused numerous trees and branches to snap and fall, causing widespread power outages. About 315,000 customers lost power during the storm, mostly across the southeastern part of the state. Hampton had power outages for up to a week. The School batting cages were damaged and trick or treat events were cancelled.
February 2, 2011: The storm brought heavy snow to all of New Hampshire. Snowfall amounts generally ranged from 8 to 12 inches across the state. The storm followed on the heels of another storm on the 1st that deposited several inches of snow across the region. The impact to Hampton was minimal.
January 12, 2011: The storm brought heavy snow to the state with some mixed precipitation along the immediate coast. Snowfall amounts ranged from about 6 inches on the north side of the western mountains to 10 to 19 inches across much of the remainder of the area. Along the immediate coast, snowfall amounts ranged downward to about 6 inches due to the mixed precipitation. The impact to Hampton was minimal.
December 11, 2008: A major winter storm brought a mixture of snow, sleet, and freezing rain to New Hampshire from the morning of December 11th to the morning of December 12th. The greatest impact in the state was in southern and central New Hampshire where a significant ice storm occurred. Following the ice storm, recovery and restoration efforts were negatively impacted by additional winter weather events that passed through the state. Precipitation amounts across the southern and central part of the state ranged from 1 to 3 inches, ice accretion to trees and wires in these areas generally ranged from about a half inch to about an inch. The weight of the ice caused branches to snap, and trees to either snap or uproot, and brought down power lines and poles across the region. About 400 thousand utility customers lost power during the event, with some customers without power for two weeks. Property damage was estimated at over $5 million. Hampton had portions of town that were without power for up to 2 weeks. Shelters were opened in nearby Exeter and Portsmouth.
March 2001: Late winter snow storm
February 5-7, 1978 *(as shown in photo to right):* Events accumulations 33" along coastal New Hampshire. Hurricane-force winds and record-breaking snowfall made this storm one of the more intense to occur this century across parts of the northeastern United States.
January 20, 1978: 20-inch snowstorm leaving 20' high snowdrifts
February 22-28, 1969: Accumulations of 34" in coastal areas.

February 8-10, 1969: Event Accumulations up to 27" in southeastern New Hampshire
January of 1923: 4 storms within a week left over 30 inches of snow.

HURRICANE

Probability: Occasional

Definition:
A hurricane is a tropical cyclone in which winds reach speeds of 74 miles per hour or more and blow in a large spiral around a relatively calm center. The eye of the storm is usually 20-30 miles wide and the storm may extend over 400 miles. High winds are a primary cause of hurricane-inflicted loss of life and property damage. The Saffir-Simpson Hurricane Wind Scale is a 1 to 5 rating based on a hurricane's sustained wind speed. This scale estimates potential property damage. Hurricanes reaching Category 3 and higher are considered major hurricanes because of their potential for significant loss of life and damage. Category 1 and 2 storms are still dangerous, however, and require preventative measures.

Location:
When hurricane events occur in Hampton they affect the entire town. Certainly, the heavy rainfall associated with hurricanes will impact the 100-year floodplain but the high winds can have an impact on the whole town.

Impact:
New Hampshire's exposure to direct and indirect impacts from hurricanes is real, but modest, as compared to other states in the region. That being said, the probability of hurricanes occurring in Hampton is possible. The largest impact is on the floodplain areas due to heavy rains. High winds cause trees to fall down thereby causing power outages, structural damage to buildings, road closures and debris management issues.

Extent:
Wind speeds within hurricanes may reach 250 miles per hour in a Category 5 hurricane, as measured on the Saffir-Simpson Hurricane Scale. Tropical depressions are considered to be of hurricane force when winds reach 74 miles per hour. Damage resulting from winds of this force can be substantial, especially considering the duration of the event, which may last for many hours.

Category	Wind Speed (mph)	Damage at Landfall
1	74-95	Minimal
2	96-110	Moderate
3	111-130	Extensive
4	131-155	Extreme
5	> 155	Catastrophic

Previous Occurrence:
October 29-31, 2012 Hurricane Sandy DR-4095: On Monday, October 29th, a band of heavy rain and high winds associated with Sandy moved northward into New Hampshire. The high winds associated with this band of heavy rain downed numerous trees and caused widespread power outages. These strong and persistent winds combined with the powerful gusts to down numerous trees throughout the State and caused widespread power outages, especially across southern New Hampshire. The impact in Hampton was minimal.
August 28, 2011 DR-4026: Hurricane Irene made landfall across western Long Island, NY and was downgraded to a Tropical Storm as it moved into and through New England. The storm brought a prolonged period of strong and gusty winds and heavy rain to the state. The high winds snapped or uprooted numerous trees throughout the state causing more than 160,000 customers to lose electrical and/or communication services. The heavy rains caused rivers and streams throughout the state to flood causing damage to bridges, roads, and property. Observed maximum wind gusts in Portsmouth was 63 mph. Rainfall

amounts across the state ranged from 1.5 to 3 inches across southeastern New Hampshire with 3 to 6 inches across most of the remainder of the State. Hampton experienced minimal flooding, but power outages for several days. The local shelter was opened but no one showed up at the shelter.

October 2, 1985 – Hurricane Gloria: According to the Hampton Union, "Most of the hurricane's force had diminished by the time it reached town, but steady winds in excess of 50 miles per hour, with gusts of up to 80 miles per hour; were recorded at the beach fire station. Most of the damage was confined to downed trees and limbs and damage associated with power failures. Some Hampton residents were without power for more than 60 hours. According to an Exeter Hampton Electric Company spokesman, Hampton was one of the worst in the Seacoast to be hit with power outages."

September 2, 1954 – Hurricane Carol: According to the Hampton Union "The Seacoast Region was still adding up the staggering property loss today as a result of Tuesday's hurricane which lashed the coastal areas with winds up to 100 miles an hour, leaving in its path a wake of havoc and destruction. Stately elm trees were toppled, houses wrecked, boats lifted and smashed like match sticks as the full fury of Hurricane 'Carol" was felt by the towns in the seacoast region. The big blow, which started in Florida and was reported to be passing out to sea earlier in the day, suddenly veered and cut across the Connecticut - Thole Island shore line, swept across Cape Cod and on up the coastline to New Hampshire in much the same path as the 1938 hurricane. Property damage is considered to be higher than in 1938 with estimates running all the way to 500 million dollars, but the loss is so widespread that it would seem impossible to arrive at a figure anywhere near accurate."

September 22, 1938: According to the Hampton Union and Rockingham County Gazette, "The 88-Mile an hour hurricane, which at times was increased in velocity to 100 miles per hour, visited here on Wednesday night leaving disaster by floods and winds, with a toll of hundreds of lives lost throughout New England, swept through the town causing hundreds of dollars' worth of damage to property owners and to trees. So far as can be learned no one was injured by the storm, which in its path throughout the town and beach lifted roofs, buildings, trees, skylights and uprooted many valuable trees in the various sections. Electric power and lights with wires and poles down in many places, causing disruption of the telephone service to Exeter and the extinguishing of all lights even street lights, leaving the town in darkness and crippling business establishments; caused the closing of both Lamie's Tavern and Johnston's Restaurant in the center of town."

SEVERE WIND

Probability: Probable

Definition:

A tornado is a violent windstorm characterized by a twisting, funnel-shaped cloud. These events are spawned by thunderstorms and occasionally by hurricanes. They may also occur singularly or in multiples. A downburst is a severe, localized wind blasting down from a thunderstorm. These "straight line" winds are distinguishable from tornadic activity by the pattern of destruction and debris. Downbursts fall into two categories: Microburst which covers an area less than 2.5 miles in diameter; and Macroburst which covers an area at least 2.5 miles in diameter.

Location:
Severe wind events (downburst, tornadoes or high winds associated with thunderstorms) can occur anywhere in Hampton. Generally, the higher elevations are more susceptible as well as more vulnerable due to the fact that they are home to emergency response/mutual aid towers. Due to the sporadic nature of tornados and severe wind events, they could occur anywhere in the Town of Hampton.

Impact:
Depending on the size and location of these events, the destruction to property may be devastating. Several of the more significant and recent events within southern New Hampshire have caused several millions of dollars in damage and at least 5 fatalities. An F-2 Tornado, according to the Fujita scale, maintains wind speeds from 13-157 mph. A tornado occurring in Hampton would cause considerable damage. Roofs could be torn off frame houses; mobile homes demolished; large trees snapped or uprooted; and light object missiles would be generated as a result of an F-2 Tornado.

Extent:
According to the Enhanced Fujita scale, which rates tornado intensity, an EF-2 tornado maintains wind speeds from 111-135 mph and can cause considerable damage. Roofs could be torn off frame houses; mobile homes demolished; large trees snapped or uprooted; and light object missiles would be generated as a result of an EF-2 Tornado.

EF 0	65-85 mph
EF 1	86-110 mph
EF 2	111-135 mph
EF 3	136-165 mph
EF 4	166-200 mph
EF 5	Over 200 mph

Previous Occurrence:
July 15, 2014: A very warm and humid air mass was in place across the region on the afternoon of July 15th. Large hail, damaging winds and flash flooding were the main threats on this day. A severe thunderstorm downed trees in Hampton.
August 19, 2011: A severe thunderstorm produced 1 inch hail on Route 101 in Hampton.
February 26, 2010: High Winds caused by a low pressure developed off the mid Atlantic coast on the morning of the 25th and deepened as it moved north, reaching southern New England by evening. Ahead of the low, east winds rapidly increased across New Hampshire with numerous gusts in excess of 60 mph being reported. A record number of homes and businesses lost power. Utilities reported 310,000 customers without power during the peak of the storm.
May 21, 2006 (*shown in picture to right*): An F2 tornado with maximum winds of between 120 and 130 mph landed on Interstate 95 in Hampton. A pickup truck was picked up, flipped over and tossed about 50 feet. They were taken to Exeter Hospital, but were not seriously injured. The tornado snapped and uprooted trees, but caused no damage to homes or other structures.

Summer of 2002: Downburst flipped a porch from a house on to Ocean Blvd.

LIGHTNING

Probability: Frequent

Definition:
By definition, all thunderstorms contain lightning. Lightning is a giant spark of electricity that occurs within the atmosphere, or between the atmosphere and the ground. As lightning passes through the air, it heats the air to a temperature of 50,000 F, considerably hotter than the surface of the Sun.

Location:
The entire town. Including critical facilities, are at moderate risk to lightning hazard. The higher elevation areas, have an increased probability, such as cell towers, however lightning strikes can occur anywhere in the Town.

Impact:
Residents and visitors to the New Hampshire area are more vulnerable to being struck by lightning because of the activities with which they are involved, particularly on those warm summer days when lightning is most likely to occur. Often, many people are outside enjoying the variety of recreational activities that attract people to New England during the summer when the vulnerability to lightning strike is highest. More likely to be affected are structures and utilities, often resulting in structure fires and power outages.

Extent:
The National Oceanographic Atmospheric Administration (NOAA) defines the extent of lightning activity with a LAL scale as shown in the table below.

LAL 1	No Thunderstorms
LAL 2	Isolated thunderstorms. Light rain will occasionally reach the ground. Lightning is very infrequent. 1 to 5 cloud ground strikes in a 5 minute period.
LAL 3	Widely scattered thunderstorms. Light to moderate rain will reach the ground. Lightning is infrequent, 6 to 10 cloud to ground strikes in a 5 minute period.
LAL 4	Scattered thunderstorms. Moderate rain is commonly produced. Lightning is frequent, 11 to 15 cloud to ground strikes in a 5 minute period.
LAL 5	Numerous thunderstorms. Rainfall is moderate to heavy. Lightning is frequent and intense, greater than 15 cloud to ground strikes in a 5 minute period.
LAL 6	Dry lightning (same as LAL 3 but without rain). This type of lightning has the potential for extreme fire activity and is normally highlighted in fire weather forecasts with a Red Flag Warning.

Previous Occurrence:
July 6, 1999: Lightning struck a home in Hampton causing the structure to catch fire and causing considerable damage to the home. Severe damage to the electrical system was reported throughout the home, the blast blew the siding off the house, basement windows were blown out, and different areas in the house were left smoldering. In addition, a tree and an outbuilding were also damaged by the lightning strike.
July 18, 1988: A lifeguard, David Thomas age 23, was struck and killed by a bolt of lightning on Hampton Beach.

DROUGHT

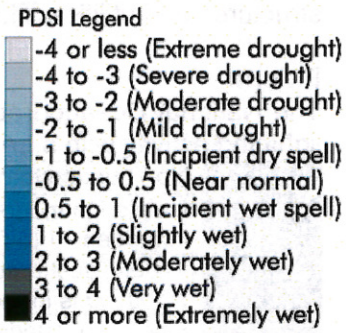
Probability: Occasional

Definition:
Drought is a deficiency in precipitation over an extended period, usually a season or more, resulting in a water shortage causing adverse impacts on vegetation, animals, and/or people.

Location:
Droughts are difficult to define geographically. Due to their widespread nature a drought would affect the entire Town. However, a drought can affect fire suppression in those areas that do not have access to water.

Impact:
A drought is defined as a long period of abnormally low precipitation, especially one that adversely affects growing or living conditions. Droughts are not as damaging to the Town as floods or winter weather. However a severe drought can affect public water supply, increase the probability of fires, and impede fire suppression. Those areas with minimal fire protection are at a higher risk as a result of a prolonged drought.

Extent:
The Palmer Drought Severity Index (PDSI) was devised in 1965, and was the first drought indicator to assess moisture status comprehensively. It uses temperature and precipitation data to calculate water supply and demand, incorporates soil moisture, and is considered most effective for un-irrigated cropland. It primarily reflects long-term drought and has been used extensively to initiate drought relief. It is more complex than the SPI and the Drought Monitor.



Previous Occurrence:
According to the State of New Hampshire Multi-Hazard Mitigation Plan Update 2013, the Seacoast area experienced droughts in 1957, 1964, 1965, 1971, 1974, 1978, 1993, 1995, 1997, 1999, 2002, 2010 and most recently in 2016.

WILDFIRE

Probability: Occasional

Definition:
Any free burning uncontainable wild land fire not prescribed for the area which consumes the natural fuels and spreads in response to its environment.

Location:
The Hampton Beach district contains many older wood-frame structures that are built very close to each other. Other conflagration risk areas include the downtown area of High Street, Lafayette Road, Exeter Road, Timber Swamp Road, Mill Road and Whites Lane. Lastly Phragmites are concentrated in the areas of North Beach, Kings Highway and Cusak Road.

Impact:
Fires in New Hampshire are predominantly human-caused, and roughly half of the total fire activity is in the most populous three southern counties. The proximity of many populated areas to the forested lands exposes these areas and their populations to the potential impact of wildfire. The estimated impact to structures could be derived from the information included in the critical facilities in Chapter 4.

Extent:
The extent of damage to structures and the general populations will vary depending on climate, warning, and the time of year. Even the time of day could affect the extent, as there is an increase of recreational hikers and tourists during the daytime. The National
Wildfire Coordinating Group (NWCG) classifies a wildfire into one of several ranges of fire, based upon the number of acres burned. The following list provides NWCG's scale for wildfire values:

Value	Description
A	Up to .25 acres
B	0.26 to 9.9 Acres
C	10.0 to 99.9 Acres
D	100 to 299 Acres
E	300 to 999 Acres
F	1000 to 4999 Acres
G	5000 to 9999 Acres
H	10000 to 49999 Acres
I	50000 to 99999 Acres
J	100000 to 499999 Acres
K	500000 to 999999 Acres
L	1000000 + Acres

Previous Occurrence:
February, 25, 2010: The A Street block had a conflagration of 5 buildings that were ultimately destroyed. There was $9 to 10 million in damages (private and town).
Fire of 1999: Old Salt Restaurant and several abutting businesses damaged
Late 1970s Phragmites Fire at the end of High Street
1950: Conflagration at the Hampton Beach District
1940s Downtown District Fires in (old town office burnt in 1949)
1921 Conflagration on the Hampton Beach District
1915 Conflagration on the Hampton Beach District

Old Town Office – 1949 Fire

DAM FAILURE

Probability: Occasional

Definition:
According to the NH Department of Environmental Services (DES), a dam is any artificial barrier which impounds or diverts water which: has a height of 6 feet or more; or is located at the outlet of a great pond, regardless of height or storage; or is an artificial barrier which impounds liquid Industrial or liquid commercial wastes, or septage or sewage, regardless of height or storage.

Location:
There are 7 non-menace dams (Car Barn Pond, Fire Pond, Signal Company Dam, Unitil Pond Dam, Foss Manufacturing Dam, Beaver Brook Mill Dam and Ice Pond dam) and 1 low hazard dam (Batchelder Dam on Drakes River) and 1 significant hazard dam (Old Mill Pond Dam) located in Hampton. There are no high hazard dams outside of Hampton that would pose a significant threat to the town.

Impact:
A dam failure or breech could occur due to extreme rainfall amounts and/or a human caused incident. A failure or breech would result in rapid loss of water that is normally held by the dam resulting in an inundation downstream. The map below shows the area of inundation as a result of a dam failure.

Extent:
NH Department of Environmental Services categorizes Dams into one of four classifications, which are differentiated by the degree of potential damages that a failure of the dam is expected to cause. The classifications are designated as non-menace, low hazard, significant hazard and high hazard. A Significant Hazard Dams is defined by the NH Department of Environmental Services as "a dam that has a significant hazard potential because it is in a location and of a size that failure or misoperation of the dam would result in any of the following: No probable loss of lives; Major economic loss to structures or property; Structural damage to a Class I or Class II road that could render the road impassable or otherwise interrupt public safety services; and Major environmental or public health losses. A Low Hazard Dam is as "a dam that has a low hazard potential because it is in a location and of a size that failure or misoperation of the dam would result in any of the following: no possible loss of life; low economic loss; structural damage to town road." A Non-Menace structure is a dam that is not a menace because it is in a location and of a size that failure or misoperation of the dam would not result in probable loss of life or loss to Property.

Previous Occurrence: There are no recorded dam failures.

OLD MILL POND DAM INUNDATION MAP

EARTHQUAKE

Probability: Remote

Definition:
An earthquake is a rapid shaking of the earth caused by the breaking and shifting of rock beneath the earth's surface. 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 magnitude and intensity of an earthquake is determined by the use of scales such as the Richter scale and Mercalli scale.

Location:
According to the State of New Hampshire Multi-Hazard Mitigation Plan Update 2013, New Hampshire is considered to lie in an area of "Moderate" seismic activity with respect to other areas of the United States and is bordered to the North and Southwest by areas of "Major" activity. Generally, the entire Town is at risk to earthquakes.

Impact:
Earthquakes can cause buildings and bridges to collapse, disrupt gas, electric and phone lines, and often cause landslides, flash floods, fires, and avalanches. It is assumed that all of the buildings in the Town have not been designed to withstand seismic activity. More specifically, the older historic buildings that are constructed of non-reinforced masonry are especially vulnerable to any moderate sized earthquake. In addition, utilities (water, gas, etc.) are susceptible to earthquake damage. For a more detailed review of the impact of earthquakes refer to the Hampton Essential Facilities Report, published in 2002 by Klotz Consultants Group. The report identifies, locates, collects and records the structural and general building data of the Essential Facilities and analyzes the functionality of these facilities based on various sized earthquakes. An executive summary of this report is included in Appendix F. Hampton has experienced the effect of small to moderate earthquakes that had minor to no effect on the town's infrastructure.

Extent:
Earthquakes with a magnitude of 2.0 to 4.9 on the Richter scale are considered minor to light, and those 5.0 to 6.9 are considered moderate to strong. However, if a large (6+ on the Richter Scale) occurred in or around the town, it is assumed that structural damage would be moderate to severe.

Richter Scale	Magnitude Earthquake Effects
2.5 or less	Usually not felt, but can be recorded by seismograph.
2.5 to 5.4	Often felt, but only causes minor damage.
5.5 to 6.0	Slight damage to buildings and other structures.
6.1 to 6.9	May cause a lot of damage in very populated areas.
7.0 to 7.9	Major earthquake. Serious damage.
8.0 or greater	Great earthquake. Can totally destroy communities near the epicenter.

Previous Occurrence:
The following table summarizes earthquakes of 2.5 magnitude or greater that have occurred in New Hampshire and New England:

Location	Date	Magnitude
Ossipee, NH	December 20, 1940	5.5
Ossipee, NH	December 24, 1940	5.5
Dover-Foxcroft, ME	December 28, 1947	4.5
Kingston, RI	June 10, 1951	4.6
Portland, ME	April 26, 1957	4.7
Middlebury, VT	April 10, 1962	4.2
Near NH Quebec Border, NH	June 15, 1973	4.8
West of Laconia, NH	Jan. 19, 1982	4.5
Ontario-Quebec Border	June 23, 2010	5.0
Boscawen, NH	September 26, 2010	3.1
Virginia	August 23, 2011	5.8
Southern Maine	October 16, 2012	4.0

HAIL

Probability: Occasional

Definition: Hail is defined as a showery precipitation in the form of irregular pellets or balls of ice more than 5 mm in diameter, falling from a cumulonimbus cloud.

Location:
Due to its widespread nature a hail event could affect any part of Town.

Impact:
Hail can damage communications and IT functions, and can damage agricultural crops. Due to the complexities and various factors involved in the formation of hail particle size and weight, the impact can vary tremendously.

Extent:
The bigger the diameter of the hailstone, the bigger the impact on agriculture, infrastructure and other objects.

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

Previous Occurrence:
The committee did not have any local knowledge of past significant hail events in Hampton.

EXTREME HEAT

Probability: Remote

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

Location:
Extreme heat events are difficult to define geographically. Due to their widespread nature, a period of extreme heat would affect the entire town.

Impact:
A heat wave is defined as 3 or more consecutive days of 90 degrees or higher. Extreme heat conditions may impact the health of residents and visitors. Facilities without generators and air-conditioners that house the elderly and disabled are very susceptible to human health issues. Utilities are also vulnerable as the demand for air-conditioning rises.

Extent:
According to OSHA, The risk of heat-related illness becomes greater as the weather gets hotter and more humid. This situation is particularly serious when hot weather arrives suddenly early in the season, before workers have had a chance to adapt to warm weather. This table provides guidelines for the risk related to extreme heat.

Heat Index	Risk Level	Protective Measures
Less than 91°F	Lower (Caution)	Basic heat safety and planning
91° to 103°F	Moderate	Implement precautions and heighten awareness
103° to 115°F	High	Additional precautions to protect workers
Greater than 115°F	Very High to Extreme	Triggers even more aggressive protective measures

Previous Occurrence:
The town has experienced frequent heat waves in any given 25-year period. However, the impact upon the town and its residents in minimal. The Committee had no specific dates or additional information of past extreme heat events.

AVALANCHE and LANDSLIDE

Due to no history or risk of avalanche or landslide within the Town of Hampton, the Committee chose not to recognize the risk of these hazards in this Plan.

Chapter 4
CRITICAL FACILITIES

The Critical Facilities List for the Town of Hampton has been identified for the Town by the Hampton Hazard Mitigation Planning Committee. The list is divided up into three sections: Facilities needed for Emergency Response, Facilities Not Necessary for Emergency response, and Populations and facilities to protect in the event of a disaster. The Inventory of Critical Facilities table assesses the value of these structures.

CATEGORY 1 (Facilities needed during an event)

1. Emergency Operations Center
   - Hampton Fire Station #1 / Headquarters
   - Hampton Police Station / Brown Ave

2. Police Station
   - Hampton Police Station / Brown Ave

3. Fire Station
   - Hampton Fire Station #1 / Winnacunnet Road
   - Hampton Fire Station #2 / Brown Ave

4. Emergency Medical Service (EMS)
   - Located at both fire stations above

5. Town Hall
   - Winnacunnet Road

6. Public Works Department
   - Highway Garage / Hardardt's Way

7. Hospitals
   - Portsmouth Hospital (Not located in town)
   - Exeter Hospital (Not located in town)

8. Emergency Shelters
   - Winnacunnet High School (partial backup power)

9. Transportation / Evacuation Routes
   - Interstate 95
   - Route 1
   - Route 101
   - Route 1a
   - Route 27
   - First Student Bus System
   - Community Action Program

Fire Station #1

Fire Station #2

Winnacunnet High School

10. Communications
    - 4 Telecommunication Facilities
    - Comcast Cable
    - 2 municipal cable channels
    - Fairpoint Communications
    - Police & Fire & DPW Transmitters/receivers
    - Sirens poles (Seabrook Evacuation)

11. Emergency Fuel
    - Hampton Highway Garage / Hardardt's Way
    - NH DOT Facility / I-95

12. Water Supply/Treatment
    - Aquarion Water Company Supply Wells
    - Water Storage Tanks (3)

13. Sewer Treatment
    - Wastewater Treatment Plant / Hardardt's Way

14. Public Utilities
    - Unitil Electric/Gas
    - Aquarion Water Company
    - Public Service of NH

CATEGORY 2 (Facilities NOT needed during an event)

1. Schools
    - Marston Elementary School / Marston Way
    - Centre Elementary School / Winnacunnet Ave.
    - Hampton Academy Jr. High / Academy Ave
    - Sacred Heart School / Lafayette Rd.

CATEGORY 3 (Populations & Places to Protect)

1. High Concentration Populations
    - Hampton Beach
    - Hampton Beach Casino / Ocean Blvd.
    - Religious Facilities
    - Hampton Public Schools
    - Inn of Hampton Conference Center –Lafayette Road
    - Ashworth Hotel / Ocean Blvd.
    - Downtown District
    - I-95 Toll Booths
    - Tuck Field & Eaton Park / Park Ave
    - Lane Memorial Library

2. Commercial / Industrial
   - Foss Manufacturing
   - Liberty Lane
   - Merrill Industrial Drive
   - Brazonics
   - NH Liquor Stores

Foss Manufacturing

3. Elderly Facilities
   - Atlantic Heights / High Street
   - Ross Colony / Winnacunnet Road
   - Dearborn Independent Living/ Dearborn Ave.
   - Partridge House / Lafayette Road
   - Seacoast Health Center / Tuck Road

Seacoast Health Center

4. Recreation Areas
   - Eaton Park / Park Ave
   - Tuck Field / Park Ave
   - Kids Kingdom / Park Ave
   - Five Corners Park / High St.-Little River Rd.-Locke Rd.
   - East End Schoolhouse Park / Locke Road
   - Joe Billy Brown Beach
   - Ruth Stimpson Beach
   - Bicentennial Park Beach
   - Skateboard Facility – Lou Brown Park / Hardart's Way
   - Seacoast United Soccer / Off Winnacunnet Road

5. Historic Buildings
   - James house / Towle Farm Road (national reg.)
   - Towle Farm Barn /Towle Farm Road (national register)
   - Grist Mill / High St.
   - Tuck Park / Park Ave
   - Fish Houses / Ocean Blvd
   - Blacksmith shop / Barbour Road

James House

6. Agricultural
   - Hurd Farm / Timber Swamp Road

ESSENTIAL FACILITIES REPORT

The Hampton Essential Facilities report, published in 2002 by Klotz Consultants Group, Inc., provides a detailed assessment of Hampton's eight essential facilities (see Appendix F). Those that absolutely must be functional immediately after a natural or man-made hazard event, consist of the Hampton Police Station, Hampton Beach Fire Station, Hampton Uptown Fire House, the four Elementary Schools and the Winnacunnet Cooperative School District Campus. The report identifies, locates, collects and records the structural and general building data of the Essential Facilities and analyzes the functionality of these facilities based on various sized earthquakes. The complete report is maintained on file at the Hampton Planning Office.

Inventory of Critical Facilities and Assets Hampton, NH							
Facility	**Name/Location**	**Owner**	**Category 1** ✓	**Category 2** ✓	**Category 3** ✓	**Hazard Vulnerability**	**Assessed Value**
Town Office	Hampton Town Office /Winnacunnet Rd.	Municipal	✓			Hurricane, Severe Wind, Winter Weather, Lightning, Earthquake, Human Caused	$1,484,900
EOC Primary Secondary	Fire Station # 1 / Winnacunnet Rd.	Municipal	✓			Drought, Hurricane, Severe Wind, Winter Weather, Lightning, Earthquake, Human Caused	$4,694,700
	Hampton Police / 100 Brown Ave.	Municipal	✓			Flood, Hurricane, Severe Wind, Winter Weather, Lightning, Human Caused	$9,171,000
Police Station	Hampton Police Station / 100 Brown Ave	Municipal	✓			Same as above	$9,171,000
Fire Station	Fire Station #1 / Winnacunnet Rd.	Municipal	✓			Flood, Hurricane, Severe Wind, Winter Weather, Lightning, Human Caused	$4,694,700
	Fire Station # 2 / Brown Ave	Municipal	✓			Drought, Hurricane, Severe Wind, Winter Weather, Lightning, Earthquake, Human Caused	3,683,700
EMS	Personnel at both locations. Ambulances at Winnacunnet	Municipal	✓			Hurricane, Severe Wind, Winter Weather, Lightning, Earthquake, Human Caused	n/a
Public Works	Highway Garage, transfer station, & wastewater treatment plant located at / Hardardt's Way	Municipal	✓			Flood, Hurricane, Severe Wind, Winter Weather, Lightning, Human Caused	$29,250,927
	13 sewage lift stations	Municipal	✓			Flood, Hurricane	$4,582,000
Hospital	Portsmouth Hospital	Private	✓			n/a	n/a
	Exeter Hospital	Private	✓			n/a	n/a
Shelters	Winnacunnet High School / Alumni Drive (ARC approved)	SAU 21	✓			Hurricane, Severe Wind, Winter Weather, Lightning, Earthquake, Human Caused	$42,133,000
	Hampton Academy / Academy Ave	SAU 90	✓			Hurricane, Severe Wind, Winter Weather, Lightning, Earthquake, Human Caused	$8,053,300

Inventory of Critical Facilities and Assets Hampton, NH							
Facility	**Name/Location**	**Owner**	**Category 1**	**Category 2**	**Category 3**	**Hazard Vulnerability**	**Assessed Value**
			✓	✓	✓		
Transportation Routes & Resources	Interstate 95 NH Route 1 NH Route 101 NH Route 1a NH Route 27	State & Federal	✓			Winter Weather, Severe Wind, Hurricane, Human Caused	n/a
	First Student / No. Hampton & Litchfield	Private	✓			Hurricane, Severe Wind, Winter Weather, Human Caused	n/a
	Town Dock (water travel)	Mixed	✓			Flood, Hurricane, Severe Wind, Winter Weather, Lightning, Human Caused	$227,000
Communica-tions	4 Telecommunication Facilities: Timber Swamp Road, Water tower on 101, Masonic Building on Tide Mill Rd. and 101 Ocean Blvd.	Private	✓			Hurricane, Severe Wind, Winter Weather, Lightning	Varies
	Comcast Cable	Private	✓			Hurricane, Severe Wind, Winter Weather, Lightning, Human Caused	Unknown
	Fairpoint Communications (switching stations at Winnacunnet and Mill Rd)	Private	✓			Hurricane, Severe Wind, Winter Weather, Lightning, Human Caused	$ 539,400
	Fire Department receivers on 3 siren poles and transmitter on Exeter Rd. tower.	Municipal	✓			Hurricane, Severe Wind, Winter Weather, Lightning, Human Caused	n/a
	Police transmitter on Mill Road Water Tower transmitter and receivers on 3 siren poles, high school and police station	Municipal	✓			Hurricane, Severe Wind, Winter Weather, Lightning, Human Caused	n/a
	All Siren Poles	Seabrook	✓			Hurricane, Severe Wind, Winter Weather, Lightning, Human Caused	n/a
	Microwave link between Town Hall, Fire and Police. Future expansion to all town facilities.	Municipal	✓			Hurricane, Severe Wind, Winter Weather, Lightning, Human Caused	$40,000
	DPW has transmitter on Mill Rd Tower and receiver on Hardarts Rd.	Municipal	✓			Hurricane, Severe Wind, Winter Weather, Lightning, Human Caused	n/a
	Ham Radio at EOC	Municipal	✓			Hurricane, Severe Wind, Winter Weather, Lightning, Human Caused	$2,000
	2 municipal cable channels	Municipal	✓			Hurricane, Severe Wind, Winter Weather, Lightning, Human Caused	$215,000
	State DOT has digital road signs.	State	✓			Hurricane, Severe Wind, Winter Weather, Lightning	n/a
	Hampton Police has 4 variable road signs.	Municipal	✓			Hurricane, Severe Wind, Winter Weather, Lightning	n/a
Public Utilities	Unitil (electric distribution & transmission) with a switching station at end of Timberswamp Road and by water tower on Church St.	Private	✓			Hurricane, Severe Wind, Winter Weather, Lightning	Part of value below

Inventory of Critical Facilities and Assets
Hampton, NH

Facility	Name/Location	Owner	Category 1 ✓	Category 2 ✓	Category 3 ✓	Hazard Vulnerability	Assessed Value
	Unitil (natural gas distribution lines throughout town)	Private	✓			Hurricane, Severe Wind, Winter Weather, Lightning	$12,699,800
	Aquarion Water Company (water supply)	Private	✓			Hurricane, Drought, Severe Wind, Winter Weather, Lightning	$19,192,500
	Eversource	Private	✓			Hurricane, Severe Wind, Winter Weather, Lightning	$11,369,100
Emergency Fuel	Hampton Highway Garage (1000 gal diesel tank w/ generator)	Municipal	✓			n/a	Included in value above
	NH-DOT has 2 fixed facilities with gas, diesel and generator at Liberty Lane near I-95 in the town of North Hampton.	State	✓			n/a	$ 3,047,000
	Atlantic Fuel in Rye (will deliver to town in emergency)	Private	✓			n/a	n/a
Water Supply	Aquarion Water Company supply wells and major aquifer in Hampton	Aquarion Water	✓			Drought, Human Caused	Part of Aquarion value above
	Water storage tanks near I-95 and Route101	Aquarion Water	✓			Earthquake, Human Caused	Part of Aquarion value above
	Water Storage Tank on Church St.	Aquarion Water	✓			Earthquake, Human Caused	Part of Aquarion value above
	Water Storage Tank on Mill Road	Aquarion Water	✓			Earthquake, Human Caused	Part of Aquarion value above
Sewer Treatment	Public Works Department (with backup power)	Municipal	✓			Winter Weather, Flooding, Earthquake, Hurricane, Human Caused	$ 4,366,000
Schools	Marston Elementary School / Marston Way	SAU 90		✓		Severe Wind, Winter Weather, Earthquake, Human Caused	$9,112,600
	Centre Elementary School / Winnacunnet Ave.	SAU 90		✓		Severe Wind, Winter Weather, Earthquake, Human Caused	$6,225,300
	Hampton Academy Jr. High / Academy Ave	SAU 90		✓		Severe Wind, Winter Weather, Earthquake, Human Caused	$ 8,053,300
	Sacred Heart School / Lafayette Rd.	Private		✓		Severe Wind, Winter Weather, Earthquake, Human Caused	$8,103,100
	Winnacunnet Cooperative High School / Alumni Drive	SAU 21		✓		Severe Wind, Winter Weather, Earthquake, Human Caused	$41,268,600
	Kids Stop II / 1 Merrill Ind. Drive (unit #113)	Private		✓		Severe Wind, Winter Weather, Earthquake, Human Caused	$ 110,000

Inventory of Critical Facilities and Assets Hampton, NH							
Facility	**Name/Location**	**Owner**	**Category 1**	**Category 2**	**Category 3**	**Hazard Vulnerability**	**Assessed Value**
			✓	✓	✓		
	My first school / 137 Winnacunnet	Private		✓		Severe Wind, Winter Weather, Earthquake, Human Caused	$ 327,900
	FUN After School / 27 Stickney Terrace	Private		✓		Severe Wind, Winter Weather, Earthquake, Human Caused	$ 491,600
Commercial/ Industrial	Foss Manufacturing	Private			✓	Severe Wind, Winter Weather, Lightning, Hurricane, Human Caused	$24,157,500
	Liberty Lane – Corporate Park	Mixed-Private			✓	Severe Wind, Winter Weather, Lightning, Hurricane, Human Caused	$30,621,000
	Merrill Industrial Drive	Mixed Private			✓	Severe Wind, Winter Weather, Lightning, Hurricane, Human Caused	$14,717,000
	Brazonics	Private			✓	Severe Wind, Winter Weather, Lightning, Hurricane, Human Caused	$1,741,600
	Smuttynose Brewery	Private			✓	Severe Wind, Winter Weather, Lightning, Hurricane, Human Caused	$7,078,300
	Liquor Stores on I-95 (2)	State			✓	Severe Wind, Winter Weather, Lightning, Hurricane, Human Caused	$5,401,600
High Population Areas / Entertainment Facilities	Hampton Beach	Mixed			✓	All Hazards	Varies
	Hampton Beach Casino / Ocean Blvd.	Private			✓	All Hazards	$ 9,423,700
	Religious Facilities (6 plus 2 seasonal)	Mixed			✓	All Hazards	$13,578,600
	Hampton Public Schools	SAU 21/90			✓	All Hazards	Varies - see above
	Inn of Hampton Conference Center – Lafayette Road	Private			✓	All Hazards	$ 3,409,500
	Ashworth Hotel & Function Room / Ocean Blvd.	Private			✓	All Hazards	$ 9,741,900
	Downtown District	Mixed			✓	All Hazards	Varies
	I-95 Toll Booths	State			✓	Human Caused	$ 808,500
	Lane Memorial Library	Municipal			✓	Hurricane, Severe Wind, Winter Weather, Lightning, Earthquake, Human Caused	$ 1,443,300
Elderly Facilities	Atlantic Heights 450 High Street	Private			✓	Extreme Heat, Winter Weather, Hurricane	Private
	Ross Colony / Winnacunnet Road	Private			✓	Extreme Heat, Winter Weather, Hurricane	Private
	Dearborn House Independent living/ Dearborn Ave.	Private			✓	Extreme Heat, Winter Weather, Hurricane	Private
	Partridge House / Lafayette Road	Private			✓	Extreme Heat, Winter Weather, Hurricane	Private
	Oceanside Health Center / Tuck Road	Private			✓	Extreme Heat, Winter Weather, Hurricane	Private
	Appleton Oaks / 241 Drakeside Rd. Oaks	Private			✓	Extreme Heat, Winter Weather, Hurricane	Private

Inventory of Critical Facilities and Assets Hampton, NH							
Facility	**Name/Location**	**Owner**	**Category 1** ✓	**Category 2** ✓	**Category 3** ✓	**Hazard Vulnerability**	**Assessed Value**
	Elderly Adult Day Care / 441 Rear Lafayette Rd.	Private			✓	Extreme Heat, Winter Weather, Hurricane	Private
	Blue Bay Terrace / Lafayette Rd.	Private			✓	Extreme Heat, Winter Weather, Hurricane	Private
	Village at Hampton Sq. / 373 Rear Lafayette Rd.	Private			✓	Extreme Heat, Winter Weather, Hurricane	Private
	Corner Stone Assisted Living / Exeter Road (To be built)	Private			✓	Extreme Heat, Winter Weather, Hurricane	Private
Recreation areas	Eaton Park / Park Ave	Municipal			✓	Severe Wind, Lightning, Human Caused	Land Only
	Tuck Field / Park Ave	Municipal			✓	Severe Wind, Lightning, Human Caused	Land Only
	Kids Kingdom / Park Ave	Municipal			✓	Severe Wind, Lightning, Human Caused	Land Only
	Five Corners Park	Municipal			✓	Severe Wind, Lightning, Human Caused	Land Only
	East End Schoolhouse Park / Locke Rd	Municipal			✓	Severe Wind, Lightning, Human Caused	Land Only
	Joe Billy Brown Beach	Municipal			✓	Severe Wind, Lightning, Human Caused	Land Only
	Ruth Stimpson Beach	Municipal			✓	Severe Wind, Lightning, Human Caused	Land Only
	Bicentennial Park Beach	Municipal			✓	Severe Wind, Lightning, Human Caused	Land Only
	Plaice Cove Beach	Municipal			✓	Severe Wind, Lightning, Human Caused	Land Only
	Skateboard Facility – Lou Brown Park / Hardart's Way	Municipal			✓	Severe Wind, Lightning, Human Caused	Land Only
	Seacoast United Soccer / Off Winnacunnet Road	Private			✓	Severe Wind, Lightning, Human Caused	Land Only
	Sun Valley / Hampton Thornton Ocean Dr.	Private			✓	Severe Wind, Lightning, Human Caused	n/a
	Hampton Beach State Park	Varies			✓	Severe Wind, Lightning, Human Caused	Varies
	Hampton Beach	Varies			✓	Severe Wind, Lightning, Human Caused	Varies
Historic Sites	James house / Towle Farm Road (on national reg.)	Private			✓	Hurricane, Severe Wind, Winter Weather, Lightning, Earthquake, Human Caused	184,762
	Towle Farm Barn /Towle Farm Road (on national register)	Private			✓	Hurricane, Severe Wind, Winter Weather, Lightning, Earthquake, Human Caused	n/a

Inventory of Critical Facilities and Assets Hampton, NH							
Facility	**Name/Location**	**Owner**	**Category 1**	**Category 2**	**Category 3**	**Hazard Vulnerability**	**Assessed Value**
			✓	✓	✓		
	Blacksmith shop / Barbour Road	Municipal			✓	Hurricane, Severe Wind, Winter Weather, Lightning, Earthquake, Human Caused	Land Only
	Grist Mill / High St.	Municipal			✓	Hurricane, Severe Wind, Winter Weather, Lightning, Earthquake, Human Caused	Private
	Tuck Park / Park Ave	Municipal			✓	Hurricane, Severe Wind, Winter Weather, Lightning, Earthquake, Human Caused	Private
	Fish Houses / Ocean Blvd.	Private			✓	Flood, Hurricane, Severe Wind, Winter Weather, Lightning, Earthquake, Human Caused	Private
Agriculture	Hurd Farm / Timberswamp Road	Private			✓	Hurricane, Severe Wind, Winter Weather, Lightning, Earthquake, Human Caused	Land Only

ESTIMATING POTENTIAL LOSSES TO CRITICAL FACILITIES

The Category 1 Critical Facilities identified in Hampton are estimated to be worth over $132,109,327. The Table above provides an estimate of the current monetary value for each of the Critical facilities in Hampton. These values can also be used to determine potential loss estimates in the event a natural or manmade hazard damages a portion of, or the entire facility. The estimates were generated by the town assessor and are based on property tax documentation.

Chapter 5
CAPABILITY ASSESSMENT

The following is a list of current policies and regulations adopted by the Town of Hampton that protect people and property from natural and man-made hazards. The Town reviewed and incorporated mitigation strategies into these policies and regulations, as appropriate. The table includes a description of the policy/regulation, the responsible agent, the policy's effectiveness and mitigation strategies to improve mitigation efforts.

Summary of Existing Policies and Programs

Emergency Operation Plan
Building Code
Floodplain Development Regulations
Special Flood Area
Elevation Certificates
Community Rating System
Emergency Warning System
Subdivision Regulations
Site Plan Regulations
Road Design Standards
Bridge Design Standards
Bridge Maintenance Program
Storm Drain/ Culvert Maintenance
State Dam Program
Aquifer Protection District
Shoreland Protection Program
Hazardous Materials Plan/Team
Public Education Programs
Tree Maintenance
Master Plan
Wetland Conservation District
Capital Improvement Program
Emergency Back-up Power
Mitigation Grants
Fire Ordinance

Integration of Mitigation Priorities into Planning and Regulatory Tools

The Town should conduct periodic review of these regulations and this Hazard Mitigation Plan. Reviewing these plans on a regular basis will ensure the integration of mitigation strategies. This review should continue to be a priority of the Hampton Selectmen and Planning Board, and will likely include yearly requests in the annual budget process. Moreover, as suggested in the onset of this document, this *Plan* is a planning tool to be used by the Town of Hampton, as well as other local, state, and federal governments, in the effort to reduce future losses from natural and/or man-made hazardous events before they occur. That being said, the Hampton Planning Board will incorporate this *Plan* in Chapter 7 of the Hampton Master Plan, under the authority of RSA 674:2. This integration will serve well for any future zoning updates that relate to hazard mitigation, and for the future implementation of the hazard mitigation priorities as defined in this *Plan*.

Under the Prioritized Mitigation Projects *Action Plan* (found in Chapter 6), all parties listed under the Responsibility/Oversight category shall also review this listing annually, and consider the listed (and updated) mitigation projects within their annual budget requests.

Hampton, NH
Existing Protection Matrix

Existing Protection	Description (Date/Area)	Responsible Agent	Effectiveness* (Poor/Avg/Good)	Recommended Changes
Emergency Operations Plan	2012	EMD	Good	Update in 2017
Building Code	State Building Code 2013	Building Inspector	Good	Continue periodic review and update of the Building Code to ensure compliance.
Floodplain Development Regulations Sec.11.6 Zoning Ordinance	2016 100-year floodplain only	Planning Board/Town Meeting	Good	Continue to work with State NFIP Coordinator to ensure compliance with State & Federal Regulations.
Special Flood Area Sec. 2.4 of Zoning Ordinance	2016 100-year floodplain only	Planning Board/Town Meeting	Good	Update Flood Insurance Rate Maps & define the Unnumbered A Zones.
Elevation Certificates Maintained	100-year floodplain only	Building Inspector	Good	Continue to require and issue EC for development in the floodplain.
Community Rating System	NFIP Policy Holders	Selectmen	N/A	Actively pursue joining CRS after adoption of Hazard Mitigation Plan.
Emergency Warning System	Seabrook Sirens, PA system, Cable, EAS, Code Red, Schools, Storm Ready, NOAA Radios, Town notification system	EMD	Avg.	Educate public about Code Red.

Existing Protection	Description (Date/Area)	Responsible Agent	Effectiveness* (Poor/Avg/Good)	Recommended Changes
Subdivision Regulations	July 2015 Town wide	Planning Board	Avg.	None
Site Plan Regulations	July 2016 Town wide	Planning Board	Avg.	None
Road Design Requirements	Contained in the July 2015 Subdivision Regs	Hampton Public Works & Planning Board & NH DOT	Good	Private roads meet town requirements.
	Town Roads Standards	Hampton Public Works & Planning Board	Good	New private roads meet town requirements.
Bridge Design Standards	State & Town Bridges	Hampton Public Works & NH DOT	Good	State inspects all bridges.
Bridge Maintenance Program	Review by NH DOT	Hampton Public Works & NH DOT	Avg.	Town relies on State Bridge Aid Program for bridge replacement.
Storm Drain / Culvert Maintenance	5-year maintenance cycle	Hampton Public Works	Avg.	None
State Dam Program	Statewide	NH DES	Good	Implement corrective action as identified in the studies.
Aquifer Protection District Sec.2.5 of Zoning Ordinance	2016 Regulates Public Water Supply	Planning Board & Town Meeting	Good	Real estate disclosure, create public awareness of aquifer
Shoreland Protection Program	Tidal & Coastal Areas	NH DES / Planning Board / Hampton Con Com	Good	RSA 483:B updated in July 2008.
Mosquito Control	Catch Basins and the marsh area	Mosquito Control Commission	Good	Continue mosquito control.

Existing Protection	Description	Responsible Agent	Effectiveness* (Poor/Avg/Good)	Recommended Changes
Hazardous Materials Plan / Team	Annex in EOP Team covers Town wide	Hampton Fire Department / EMD	Good	Add EPA www.rtk.com link to town's website.
Public Education Programs	Emerg. Prepared. Guide / Fire Prev. Week / Child Safety / DARE / School Resource Officer (SRO)	Fire Dept./ Police Dept.	Good	Continue education.
Tree Maintenance	Town Owned R.O.W & Private Utilities	Hampton Public Works, PSNH & Unitil	Good	Remove dead trees and growth throughout town: need $ to implement/ Control R.O.W. planting.
Master Plan	2009	Planning Board	Average	Continue to update Chapters in the Master Plan.
Wetlands Conservation District Sec. 2.3 of Zoning Ordinance	Contained in the 2009 Zoning Ordinance	Planning Board & Town Meeting	Good	Regulates Town defined wetlands & includes a 50' buffer.
Capital Improvement Program	Six Year Budget Cycle	Planning Board & CIP Committee	Average	Continue to develop and implement the CIP.
Emergency Back-up Power	High School has generator in food service area but not shelter area	Individual Departments	Average	Provide back-up power at the Transfer Station and Waste Water Treatment Plant
Fire Ordinance	Town wide Coverage	Fire Department	Poor	Needs a complete re-write in 2017.

*Effectiveness terms are defined as:

Poor: Outdated and/or ineffective and needs to be reviewed/updated.

Average: Meets minimum requirements and may require potential reviews/updates.

Good: Regulations meets all requirements and requires no reviews/updates.

Chapter 6
MITIGATION PROJECTS

Hazard Identification

The Committee utilized the *Hazard Identification Worksheet*, as shown in Appendix B, to identify potential hazards, the historical occurrence, locations, assets at risk and the probability of each hazard. The results of this process can be found in Chapter 3.

Problem Statements

From the Hazard Identification process the Committee developed a list of Problem Statements for each Hazard (see Appendix B). Based on the hazards and risks within the town, the Committee summarized the 'problems' associated for every hazard identified. These problem statements allowed the Committee to identify mitigation alternatives during the project identification step described below.

Goals Identified

During the 2016 update, the Committee reviewed the 2011 Hampton Hazard Mitigation Plan goals and made only minor revisions. The Goals were not modified for any substantial content, as there has not been any substantial change in development

Project Identification

Using the *Mitigation Project Identification Worksheet* (see Appendix B) as a guide, the Committee members identified mitigation projects for each problem Statement. Specific objectives included: Prevention, Property Protection, Public Education, Natural Resource Protection, Emergency Services and Structural Projects. In total, there were 24 projects identified.

This process resulted in the *Mitigation Project Identification Matrix*. For illustrative purposes the table below is an excerpt from the *Matrix* included in Appendix B. In this *Matrix*, the committee was able to determine a basic benefit/cost by using the STAPLEE method. For each project identified, the committee considered the STAPLEE Criteria (Social, Technical, Administrative, Political, Legal, Economic and Environmental) to guide their decision in prioritizing the projects. One component of STAPLEE is the Economic criteria which aided the committee in determining whether the benefits outweigh the costs.

Mitigation Project Identification Matrix

Hazard	Problem Statement	Projects *Prevention /Property Protection/ Public Educ./ Nat.Resources /Emerg.Serv / Structural*	Social	Technical	Administrate	Political	Legal	Economic	Environment
Flood	Heavy and prolonged rain events cause flood damage to roads and culverts and bridges and has the potential for residential flooding.	Continue enforcement of National Flood Insurance Program (NFIP) regulations and educate the public on the NFIP program.	+	+	+	+	+	+	+

Completed Projects since 2011

The Town of Hampton completed the latest version of this plan in 2011. Since that time the town has completed the projects listed below. These completed projects are not included in the 2016 edition of the Hazard Mitigation plan. In addition, the Committee deleted some projects and added new projects which are included in the Action Plan.

Completed Projects since 2011
1. Incorporate Hazard Mitigation Plan as part of Master Plan
2. Police Department Review site plans to make safety recommendations
3. Require Fire Suppression for new developments
4. Update Flood Insurance Rate Maps & define unnumbered A-zones
5. Eel Creek North & South of Winnacunnet Road crossing
6. Establish and Improve inter-operability communication between Police/Fire/Town Office/DPW/EMS
7. Construct new fire station that conforms to floodplain regulations
8. Upgrade EOC and re-evaluate relocating
9. Develop a Post-Disaster recovery plan for the Town of Hampton.
10. Construct the "Government Pier" – a pier for emergency services / response to the harbor
11. Upgrade alternate EOC at the precinct
12. Flood mitigation at the RR Track: west of Rt.1 & Marelli Square area
13. Flood mitigation at the Five Corners (off of Locke Road)
14. Flood mitigation at the Kershaw,Hackett & Moore Street
15. Flood mitigation at the Bourne Ave Properties
16. Flood mitigation at the Island Area (State Park, Epping Ave area, Boston Ave & Concord Ave area, River Ave.)
17. Generators for Junior High, Town Hall (needs assessment for other town owned property)
Deleted Projects Since 2011
1. "Require real estate disclosure (Aquifer & flood)" was deleted because it is not within the Town's legal authority.
2. "Minimize residential dumping in marshes" was deleted because it is an illegal violation and enforceable by police.
3. "Flood mitigation at Little River (Delany Motel area and Wild Rose Lane area)" was deleted because the roads in the area state, federal and privately owned.
4. "Flood mitigation Dam off of Towle Farm Road" was deleted because it is privately owned and not in the Town's authority to mitigate.
5. "Flood mitigation Rt. 1 Taylor River" was deleted because it is owned by the State and not in the Town's authority to mitigate.
6. Flood mitigation at Route 27 West, Towle Farm area, Edgewood and Winnacunnet, Bride Hill, Jenness Street and Sun Valley area were all deleted because there is no consistent or problematic flooding to mitigate. They were projects included in the original 2000 Flood Mitigation Plan, but are no longer an issue.
Continuing Projects since 2011 (These projects were either partially done or were not completed due to time and resources)
1. Update Emergency Operations Plan (Non-Mitigation)
2. Apply to the Community Rating System
3. Update Fire Ordinance in 2004 to include Haz Mat Permit Process (Non-Mitigation)
4. Education/Clarification of wetlands conservation ordinance

5. Conduct Risk Hazard Analysis of Haz Mat (Non-Mitigation)
6. Add a cumulative substantial improvement requirement to the floodplain ordinance.
7. Security fencing & lighting for recreation areas
8. Rep loss properties (very difficult: can't buy them out and most have basement apartments which makes retrofitting hard.)
9. Public Education on all hazards, to all populations (elderly, school, chamber of commerce, rotary clubs), i.e. Project Impact
10. Develop the town's website to incorporate all-hazard education
11. Promote Business Recovery Plan through the chamber of commerce (Non-Mitigation)
12. Continue public / private partnership w/ Aquarion to educate public on water conservation
13. Aquifer Recharge through stormwater/wastewater effluent reuse/direction/injection
14. Reduction and removal of Phragmites populations with the salt marsh restoration
15. Open space preservation in hazard areas
16. Establish and maintain databases and GIS mapping capability to enhance emergency response capability. (Non-Mitigation)
17. Security for the town hall (Non-Mitigation)
18. Train & equip first responders for terrorists and WMD incidents (Non-Mitigation)
19. Provide Incident Command System training for town personnel. (Non-Mitigation)
20. Business Recovery Plan for Town Hall (Non-Mitigation)
21. Maintain National Weather Service "Storm Ready" qualification
22. Flood mitigation Lower End of High Street
23. Flood mitigation Brown Ave Area (Church St/Diane Lane/Joanne Lane/Suzanne Lane/Nudd Ave/William St.Ave)
24. Flood mitigation Sun Valley Area
25. Meadow Pond Area (Gill St., Redman Lane, Gentian St., Greene St. & lower end of Winnacunnet Rd.)
26. Flood mitigation Ocean Blvd. Area (Kings Hwy, H Street, K Street, Surfside 30-493 Ocean Blvd.)
27. Flood mitigation Kings Highway Street Area
28. Flood mitigation Island Path / Glade Path Area
29. Flood mitigation Plaice Cove Area (Ocean Blvd., Beachplum Way, Ancient Hwy & Shaw Street)
30. Flood mitigation Great Boar's Head (Ocean Blvd.)
31. Flood mitigation Niles Brook Area (NW of Quinn Lane and North Shore Road)
32. Drainage improvement at Cogger, Mill, Barbour and Vanderpool Roads.
33. Whites Island drainage/sand improvement.
34. Campton, Portsmouth, Plymouth Ave – ocean discharge
35. Culvert Drainage maintenance equipment (Non-Mitigation)
36. Portable Pump & Generator (Non-Mitigation)
37. Evacuation signage (Non-Mitigation)

2016 Prioritized Mitigation Projects:

In 2016, each committee member reviewed the updated list of Mitigation Projects. After careful evaluation, the committee ranked the projects by each person voting for half of the projects. The project that received the most votes was ranked as the highest priority and the project receiving the least amount of votes received the lowest priority. (See Prioritized Mitigation Projects in Appendix B.) The committee was able to determine a basic benefit/cost by using the STAPLEE method. For each project identified, the committee considered the STAPLEE Criteria (Social, Technical, Administrative, Political, Legal, Economic and Environmental) to guide

their decision in prioritizing the projects. The prioritized projects are identified in the Mitigation Action Plan.

There have been no significant changes to mitigation priorities for the Town of Hampton. The Town has not experienced any changes in resources, new hazard impacts, or development patterns that merit changes to mitigation priorities. The Hazard Mitigation Committee identified new projects as described below. The committee then prioritized all of the projects, both new and continuing, as discussed above.

Incorporating Mitigation into Local Planning

In order for the requirements of this plan to be effective, it is essential that the Town of Hampton incorporate the strategies and actions into its planning process. Educating employees working within the Town Agencies along with members of the various Boards on the provisions of the plan is critical for ensuring that disaster preparedness and risk mitigation become part of their planning process when holding discussions, making decisions, and developing plans and Standard Operating Procedures (SOPs). As noted above, information outreach is a high priority action item that will impact more than just Town employees and Board members. Since interested citizens attend various Town meetings where decisions are made, having a community base that understands the importance of disaster mitigation planning will also assist in ensuring that future plans and actions integrate the requirements found in this plan.

The Board of Selectmen will instruct the Town Agency Heads to review their SOPs and ensure that where appropriate, the requirements of this plan are integrated into those procedures. They will also coordinate with both the Zoning Board and the Planning Board to ensure that risk mitigation planning continues to be a part of their recommendation/decision process in order to fulfill the goals and objectives outlined in this plan.

Since the last update of this Plan in 2011, the Town incorporated Hazard Mitigation Planning into the following documents:

- Master Plan – The Master Plan is updated every 5 to 10 years in accordance with RSA 674. The most recent edition was adopted in 2009 and included the 2011 Hazard Mitigation Plan as an Appendix. The Master Plan also includes a discussion of capital improvements within the Town.
- Hampton Emergency Operations Plan (EOP) – The EOP is designed to allow the Town to respond more effectively to disasters as well as mitigate the risk to people and property. The EOP was updated in 2012 and was reviewed to ensure that where appropriate, specific mitigation actions outlined in the HMP were also addressed in the EOP.

Mitigation Action Plan

The projects identified in 2011 included preparedness projects as well as mitigation projects. During the 2016 update, the committee prioritized only the FEMA defined mitigation projects. The Non-Mitigation Projects are listed below. The mitigation projects are compiled in the Mitigation Action Plan found on Page 6-4 which identifies Responsibility, Funding, Time frame, Hazards Addressed and the Priority for each mitigation project. The preparedness (NON-Mitigation) projects are identified on page 6-5.

NON-MITIGATION PROJECTS
1. Design, permit and re-construction of Old Mill Pond Dam and spillway to meet standards.
2. Install additional sources of fire protection water sources (i.e. cisterns)
3. Purchase a new forestry truck.
4. Promote Business Recovery Plan through the Chamber of Commerce
5. Install a generator at the transfer station to accommodate disposal of storm debris.
6. Install fencing and cameras at the Wastewater Treatment Facility.
7. Expand IT (cell phone booster, smartboards, electronics, etc.) at the EOC.
8. Purchase variable message boards.
9. Update the Emergency Operations Plan
10. Update Fire Ordinance in 2004 to include Haz Mat Permit Process
11. Conduct Risk Hazard Analysis of Haz Mat
12. Security fencing & lighting for recreation areas
13. Establish and maintain databases and GIS mapping capability to enhance emergency response capability.
14. Improve security for the town office
15. Train & equip first responders for terrorists and WMD incidents
16. Provide Incident Command System training for town personnel.
17. Develop a Business Recovery Plan for Town Hall
18. Purchase Culvert Drainage maintenance equipment
19. Purchase Portable Pump & Generator
20. Purchase Evacuation signage

MITIGATION ACTION PLAN

The following is the completed list of projects, recommended by the Committee. The following action plan identifies Responsibility, Funding and a Time frame for the mitigation projects for each objective. The actions will begin as soon as the plan is approved and the community is eligible for funding, unless otherwise stated, and will be completed as noted in the implementation date column in the table below.

Hampton, NH Mitigation Action Plan						
Project	**Responsibility/ Oversight**	**Funding/ Support**	**Timeframe**	**Hazard(s) Addressed**	**Estimated Cost**	**Priority** (High/Med/Low)
1. Update the town's website to incorporate all-hazard education.	IT / EMD	Town Budget & Grants	Short Term	All Hazards	$500	High
2. Improve drainage at Lower End of High Street	Department of Public Works (DPW)	Staff Time & contractor	Short Term	Flood, Hurricane	$100,000	High
3. Study for improved drainage at Meadow Pond Area (Gill St., Redman Lane, Gentian St., Greene St. & lower end of Winnacunnet Rd.)	DPW	Staff Time & contractor	Short Term	Flood, Hurricane	$100,000	High
4. Improve drainage at Kings Highway Street Area	DPW	Town Budget	Long Term	Flood, Hurricane	$1.5 million	High
5. Continue trimming of trees on town roadways.	DPW	Town Budget	Short Term	Hurricane, Severe Wind, Winter Weather	$50,000	High
6. Educate property owners on steps they can take reduce the impact of hazards on their home and business.	Public Safety Agencies	Town Budget & Grants	Short Term	All Hazards	$1,000	Medium
7. Continue enforcement of National Flood Insurance Program (NFIP) regulations and educate the public on the NFIP program.	Building & Code Enforcement	Staff Time	Short Term	Flood, Hurricane	$500	Medium
8. Add a cumulative substantial improvement requirement to the floodplain ordinance.	Town Planner	Staff Time & RPC & Grants	Short Term	Flood, Hurricane	$5,000	Medium
9. Improve drainage at Brown Ave Area (Church St/Diane Lane/Joanne Lane/Suzanne Lane/Nudd Ave/William St.Ave)	DPW	Staff time & contractor	Short Term	Flood, Hurricane	$100,000	Medium
10. Plan for emergency responders to respond to ocean flooding at Ocean Blvd. Area (Kings Hwy, H Street, K Street, Surfside 30-493 Ocean Blvd.) during high storm surge.	Public Safety Agencies	Staff Time	Short Term	Flood, Hurricane	$5,000 to $10,000	Medium
11. Reduce tidal flooding (through elevation of road) at Island Path / Glade Path Area	DPW	Town Budget	Long Term	Flood, Hurricane	$100,000	Medium

Hampton, NH Mitigation Action Plan						
Project	**Responsibility/ Oversight**	**Funding/ Support**	**Timeframe**	**Hazard(s) Addressed**	**Estimated Cost**	**Priority** (High/Med/Low)
12. Reduce tidal flooding (based upon current engineering practices) at Plaice Cove area (Ocean Blvd., Beachplum Way, Ancient Hwy & Shaw St.)	DPW	Town Budget	Short Term	Flood, Hurricane	$100,000	Medium
13. Apply to the Community Rating System	Town Planner & Con. Commission	Staff Time / RPC	Short / Medium	Flood, Hurricane	$20,000	Medium
14. Maintain "Storm Ready" qualification	Fire Dept. / EMD	Staff Time	Short Term	All Hazards	$500	Medium
15. Install lightning protection (internal and external) on critical facilities.	Department Heads	Town Budget	Medium Term	Lightning	$10,000 - $50,000	Medium
16. Continue to require underground utilities for new subdivisions.	Town Planner	Staff Time	Short Term	Hurricane, Severe Wind, Winter Weather	$100	Medium
17. Reduction and removal of Phragmites populations with the salt marsh restoration	Conservation Commission	Town Budget & Grants	Short Term	Drought, Wildfire, Human Caused	$10,000	Medium
18. Continue public / private partnership w/ Aquarion to educate public on water conservation.	Conservation Commission / Aquarion Water	Private Money / Staff Time	Short Term	Drought	$200	Low
19. Passive Aquifer Recharge of storm water/wastewater effluent reuse/direction.	Planning Board / DPW / Aquarion	Private Money / Staff Time	Short Term	Drought	$100	Low
20. Conduct seismic retrofit of critical facilities (i.e. securing loose objects, shatter proof film for windows, etc)	Department Heads	Town Budget & Grants	Short Term	Earthquake, Human Caused	$1,000 - $5,000	Low
21. Education/Clarification of wetlands conservation ordinance	Conservation Commission	Staff Time	Short Term	Flood, Hurricane	$250	Low
22. Assist repetitive loss properties (i.e. education, technical assistance, grants. Etc)	Planning / Building / Con. Commission	Staff Time & Grants	Short Term	Flood, Hurricane	$2,000	Low
23. Coordinate with NH DOT to improve drainage at Great Boar's Head (Ocean Blvd.)	DPW / NH DOT	State budget	Long Term	Flood, Hurricane	$300,000+	Low
24. Improve drainage at Nilas Brook Area (NW of Quinn Lane and North Shore Road)	DPW	Town Budget	Long Term	Flood, Hurricane	$50,000	Low
25. Drainage improvement at Cogger, Mill, Barbour and Vanderpool Roads.	DPW	Town Budget	Long Term	Flood, Hurricane	$50,000	Low

Hampton, NH Mitigation Action Plan						
Project	**Responsibility/ Oversight**	**Funding/ Support**	**Timeframe**	**Hazard(s) Addressed**	**Estimated Cost**	**Priority** (High/Med/Low)
26. Drainage/Sand Maintenance at Whites Island drainage improvement.	DPW	Town Budget	Long Term	Flood, Hurricane	$50,000	Low
27. Campton, Portsmouth, Plymouth Ave – ocean discharge	DPW	Town Budget	Long Term	Flood, Hurricane	$50,000	Low

***Timeframe:** Short Term: 1 year or less, or ongoing (will be completed on an ongoing basis throughout the life of the Plan)
Medium Term: 2-3 years
Long Term: 4-5 years

Chapter 7
ADOPTION, IMPLEMENTATION, MONITORING

Adoption

The Hampton Selectmen by majority vote officially adopted the *Hampton Hazard Mitigation Plan Update 2016* on _____ 2016. The formal Adoption is on page 7-3. The Planning Board adopted this Plan as Chapter 7 of the Hampton Master Plan on _____.

Implementation

There were 27 mitigation projects that were prioritized by the Committee. For each project the Committee identified who, when and how they would be implemented. Please refer to the "Action Plan" in Chapter 6 for a description of the timeframe and persons or departments responsible for implementation of the Prioritized Projects.

It will be the future responsibility of the Emergency Management Director to ensure implementation of these Prioritized Projects.

Monitoring & Updates

The *Hampton Hazard Mitigation Plan Update 2016* should be reviewed and evaluated annually; and formally updated every five years. The Emergency Management Director is responsible for initiating this review and needs to consult with members of the Hampton Hazard Mitigation Planning Committee, in order to track progress and update the Prioritized List in Chapter 6. The EMD will ensure the following:

- The Hazard Analysis will be evaluated for accuracy.
- Projects completed will be evaluated to determine if they met their objective.
- Projects not completed since the last update will be reviewed to determine feasibility of future implementation.
- Lastly, new projects will be identified and included in future updates as needed.
- The public, members of the Committee, surrounding communities, businesses, academia, State agencies and non-profit agencies, will continue to be invited and involved during this process. These groups can be notified through invitations, public notices, newspapers articles, brochures and/or other public outreach activities.
- In keeping with the process of adopting the Hampton Hazard Mitigation Plan Update 2016, a public hearing to receive public comment will be held. This will require the posting of two public notices.
- Updates to the *Plan* may be adopted subsequent to a public meeting or hearing by the Hampton Board of Selectmen.
- Once every five years, the EMD will submit an updated plan to FEMA for approval.

Annual Hazard Mitigation Plan Update, Monitor & Evaluate Schedule and Public Involvement			
Meeting Schedule	**Task**	**Town of Hampton Responsibilities**	**Public Involvement** (neighboring communities)
Annually or as needed	Assess current status of funding for mitigation projects. Discuss any new projects/plans that should be obtained for your community.	Dept. heads and Board of Selectmen to locate and apply for sources of funding and implement the proposed strategies and plans.	Residents, businesses, and neighboring / watershed communities.
Annually or as needed	Meet to discuss the Hazard Mitigation Plan content and any updates needed for the plan	Department Heads or other agencies.	Residents, businesses, and neighboring / watershed communities.
Annually or as needed	Discussion and evaluation of Training Programs and public outreach efforts. New public outreach methods discussed.	Department Heads or other agencies.	Residents, businesses, and neighboring / watershed communities.

CERTIFICATION OF ADOPTION

TOWN OF HAMPTON, NH
100 Winnacunnet Road, Hampton, NH 03842
DATE

A RESOLUTION ADOPTING THE TOWN OF HAMPTON, NH HAZARD MITIGATION PLAN UPDATE 2016

WHEREAS, the Town of Hampton, NH has historically experienced severe damage from natural hazards and it continues to be vulnerable to the effects of - only those natural hazards profiled in the plan (i.e. *flooding, thunderstorm, high wind, winter storms, earthquakes, and dam failure)*, resulting in loss of property and life, economic hardship, and threats to public health and safety; and

WHEREAS, the Town of Hampton, NH, has developed and received conditional approval from the Federal Emergency Management Agency (FEMA) for its Hazard Mitigation Plan Update 2016 under the requirements of 44 CFR 201.6; and

WHEREAS, public and committee meetings were held between April 2016 and July2016 regarding the development and review of the Hazard Mitigation Plan Update 2016; and

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

WHEREAS, the Plan recommends several hazard mitigation actions/projects that will provide mitigation for specific natural hazards that impact the Town of Hampton, NH, with the effect of protecting people and property from loss associated with those hazards; and

WHEREAS, adoption of this Plan will make the Town of Hampton, NH eligible for funding to alleviate the impacts of future hazards; now therefore be it

RESOLVED by the Board of Selectmen:
The Plan is hereby adopted as an official plan of the Town of Hampton, NH

1. The respective official identified in the mitigation strategy of the Plan are hereby directed to pursue implementation of the recommended actions assigned to them;
2. 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.
3. An annual report on the progress of the implementation elements of the Plan shall be presented to the Board of Selectmen by April 1st of each year.

Adopted, this _____ day of _____, 2016.

_____ Board of Selectmen, Chairman

_____ Board of Selectmen

_____ Board of Selectmen

_____ Board of Selectmen

_____ Board of Selectmen

_____ Authorizing Title

_____ Authorizing Signature

TOWN OF HAMPTON
MASTER PLAN
_____ AMENDMENT:

CHAPTER 7 – NATURAL HAZARDS
HAZARD MITIGATION PLAN

CERTIFICATE OF ADOPTION

The above listed chapter of the Town of Hampton's Master Plan was amended on _____ by a majority vote of the Hampton Planning Board, in accordance with Revised Statute Annotated 675:6, following a public hearing held on _____.

Certified by the Hampton Planning Board:

_____
Brendan McNamara, Chairman

_____
Fran McMahon, Vice-Chairman

_____
Ann Carnaby, Clerk

_____
Tracy Emerick

_____
Keith Lessard

_____
Mark Olson

_____
James Waddell, Selectmen Member

Date: _____

HAMPTON PLANNING BOARD
Brendan McNamara, Chairman
Fran McMahon, Vice-Chairman
Ann Carnaby, Clerk
Tracy Emerick
Keith Lessard

Anthony Ciolfi, Alternate
Thomas Higgins, Alternate
Steven Miller, Alternate
Rusty Bridle, Selectmen Alternate
James Waddell, Selectmen Member

Date of filing with the Office of the Town Clerk:
_____

Received by:
_____
(Town Clerk, Hampton)

ACRONYMNS

BMP – Best Management Practices
CDBG - Community Development Block Grant
CRS – Community Rating System
DES – Department of Environmental Services
DHS – Department of Homeland Security
DMA – Disaster Mitigation Act
DOT – Department of Transportation
EAP – Emergency Action Plan
EMD – Emergency Management Director
EMPG – Emergency Management Performance Grant
EMS – Emergency Medical Services
EOC – Emergency Operations Center
EOP – Emergency Operations Plan
FEMA – Federal Emergency Management Agency
FIRM – Flood Insurance Related Maps
FMA – Flood Mitigation Assistance Program
GIS – Geographic Information System
HAZMAT – Hazardous Material
HMGP – Hazard Mitigation Grant Program
HSEM – Homeland Security and Emergency Management
ICC – International Code Council
NFIP – National Flood Insurance Program
NH HSEM – NH Homeland Security and Emergency Management
PDM – Pre-Disaster Mitigation
OEP – Office of Energy Planning
RC&D – Resource Conservation and Development
USGS – United State Geological Survey

APPENDICES

Appendix A	Hazard Mitigation Resources
Appendix B	Documentation of Planning Process
Appendix C	Preliminary Floodplain Maps (2014)
Appendix D	Vulnerability Assessment of Projected Sea-Level Rise
Appendix E	Essential Facilities Report – Executive Summary
Appendix F	Approval Letter from FEMA

APPENDIX A

Hazard Mitigation Resources

♦ HAZARD MITIGATION GRANT PROGRAM - "Section 404 Mitigation"

The Hazard Mitigation Grant Program (HMGP) in New Hampshire is administered in accordance with the 404 HMGP Administration Plan which was derived under the authority of Section 404 of the Stafford Act in accordance with Subpart N. of 44 CFR.

The program receives its funding pursuant to a Notice of Interest submitted by the Governor's Authorized Representative (or GAR, i.e. the Director of NH HSEM) to the FEMA Regional Director within 60 days of the date of a Presidentially Declared Disaster.

The amount of funding that may be awarded to the State/Grantee under the HMGP may not exceed 15% of (over and above) the overall funds as are awarded to the State pursuant to the Disaster Recovery programs as are listed in 44 CFR Subpart N. Section 206.431 (d) (inclusive of all Public Assistance, Individual Assistance, etc.). Within 15 days of the Disaster Declaration, an Inter-Agency Hazard Mitigation Team is convened consisting of members of various Federal, State, County, Local and Private Agencies with an interest in Disaster Recovery and Mitigation. From this meeting, a Report is produced which evaluates the event and stipulates the State's desired Mitigation initiatives.

Upon the GAR's receipt of the notice of an award of funding by the Regional Director, the State Hazard Mitigation Officer (SHMO) publishes a Notice of Interest (NOI) to all NH communities and State Agencies announcing the availability of funding and solicits applications for grants. The 404 Administrative Plan calls for a State Hazard Mitigation Team to review all applications. The Team is comprised of individuals from various State Agencies.

Eligible Subgrantees include:

- State and Local governments,
- Certain Not for Profit Corporations
- Indian Tribes or authorized tribal organizations
- Alaskan corporations not privately owned.

Minimum Project Criteria

- Must conform with the State's "409" Plan
- Have a beneficial impact on the Declared area
- Must conform with:
  - NFIP Floodplain Regulations
  - Wetlands Protection Regulations
  - Environmental Regulations
  - Historical Protection Regulations
- Be cost effective and substantially reduce the risk of future damage
- Not cost more than the anticipated value of the reduction of both direct damages and subsequent negative impacts to the area if future disasters were to occur i.e., min 1:1 benefit/cost ratio
- Both costs and benefits are to be computed on a "net present value" basis
- Has been determined to be the most practical, effective and environmentally sound alternative after a consideration of a range of options
- Contributes to a long-term solution to the problem it is intended to address
- Considers long-term changes and has manageable future maintenance and modification requirements

Eligible Projects may be of any nature that will result in the protection to public or private property and include:

- Structural hazard control or protection projects
- Construction activities that will result in protection from hazards
- Retrofitting of facilities
- Certain property acquisitions or relocations
- Development of State and local mitigation standards
- Development of comprehensive hazard mitigation programs with implementation as an essential component
- Development or improvement of warning systems

♦ FLOOD MITIGATION ASSISTANCE (FMA) PROGRAM

New Hampshire has been a participant in the Flood Mitigation Assistance Program (FMA or FMAP) since 1996/97. In order to be eligible, a community must be a participant in the National Flood Insurance Program.

Flood Mitigation Assistance Program

- NFIP Funded by a % of Policy Premiums
- Planning Grants
- Technical Assistance Grants to States (10% of Project Grant)
- Project Grants to communities
- Communities must have FEMA approved Flood Mitigation Plan to receive Project Funds

In 1997, the State was awarded funds to assist communities with Flood Mitigation Planning and Projects. A Planning Grant from the 1996/97 fund was awarded to the City of Keene in 1998. In preparation for the development of the Flood Mitigation Plan, the Planning Department of the City of Keene created a digital data base of its floodplain including the digitizing of its tax assessing maps as well as its Special Flood Hazard Areas in GIS layers. The Plan Draft was submitted to FEMA for review and approval in March of 2000. The Plan includes a detailed inventory of projects and a "model" project prioritization approach.

In 1998, the FMAP Planning Grant was awarded to the Town of Salem. Given the complexity of the issues in the Spicket River watershed, the Town of Salem subcontracted a substantial portion of the development of its Flood Mitigation Planning to SFC Engineering Partnership of Manchester, NH, a private engineering firm. Salem submitted a Plan and proposed projects to the State and FEMA in May of 1999 which were approved by FEMA. This made Salem the first community in NH to have a FEMA/NFIP approved Flood Mitigation Plan.

Eligible Projects

(44 CFR Part 78)

- Elevation of NFIP insured residential structures
- Elevation and dry-proofing of NFIP insured non-residential structures
- Acquisition of NFIP insured structures and underlying real property
- Relocation of NFIP insured structures from acquired or restricted real property to sites not prone to flood hazards
- Demolition of NFIP insured structures on acquired or restricted real property
- Other activities that bring NFIP insured structures into compliance with statutorily authorized floodplain management requirements
- Beach nourishment activities that include planting native dune vegetation and/or the installation of sand-fencing.
- Minor physical mitigation projects that do not duplicate the flood prevention activities of other Federal agencies and lessen the frequency of flooding or severity of flooding and decrease the predicted flood damages in localized flood problem areas. These include: modification of existing culverts and bridges, installation or modification of flood gates, stabilization of stream banks, and creation of small debris or flood/storm water retention basins in small watersheds (not dikes, levees, seawalls etc.)

♦ PRE-DISASTER MITIGATION PROGRAM (PDM)

FEMA has long been promoting disaster resistant construction and retrofit of facilities that are vulnerable to hazards in order to reduce potential damages due to a hazard event. The goal is to reduce loss of life, human suffering, economic disruption, and disaster costs to the Federal taxpayer. This has been, and continues to be accomplished, through a variety of programs and grant funds.

Although the overall intent is to reduce vulnerability before the next disaster threatens, the bulk of the funding for such projects actually has been delivered through a "post-disaster" funding mechanism, the Hazard Mitigation Grant Program (HMGP). This program has successfully addressed the many hazard mitigation opportunities uniquely available following a disaster. However, funding of projects "pre-disaster" has been more difficult, particularly in states that have not experienced major disasters in the past decade. In an effort to address "pre-disaster mitigation", FEMA piloted a program from 1997-2001 entitled "Project Impact" that was community based and multi-hazard oriented.

Through the Disaster Mitigation Act of 2000, Congress approved creation of a national Pre-disaster Hazard Mitigation program to provide a funding mechanism that is not dependent on a Presidential disaster declaration. For FY2002, $25 million has been appropriated for the new grant program entitled the ***Pre-Disaster Mitigation Program (PDM)***. This new program builds on the experience gained from Project Impact, the HMGP, and other mitigation initiatives.

Eligible projects include:

- State and local hazard mitigation planning
- Technical assistance [e.g. risk assessments, project development]
- Mitigation Projects
  - Acquisition or relocation of vulnerable properties
  - Hazard retrofits
  - Minor structural hazard control or protection projects
- Community outreach and education [up to 10% of state allocation]

The funding is 75% Federal share, 25% non-Federal, except as noted below. The grant performance periods will be 18 months for planning grants, and 24 months for mitigation project grants. The PDM program is available to regional agencies and Indian tribes. Special accommodation will be made for "small and impoverished communities", who will be eligible for 90% Federal share, 10% non-Federal.

♦ COMMUNITY DEVELOPMENT BLOCK GRANT PROGRAM

These Federal funds are provided through the U.S. Department of Housing and Urban Development (HUD) and are administered by the CDBG Program of the New Hampshire Office of State Planning.

Some CDBG disaster related funding has been transferred to FEMA recently and the SHMO is scheduled to receive guidance as to which specific funds and, new program management criteria.

The specific CDBG funds designated for hazard mitigation purposes are made available to address "unmet needs" pursuant to a given Disaster Declaration to States which request them. For these funds, project selection guidance is provided by NH HSEM and NHOSP administers the grant.

Pursuant to Declaration DR-1144-NH, $557,000.00 was made available to the State and pursuant to DR-1199-NH, the grant award is targeted at $1,500,000.00.

In October of 1998, HUD announced the program guidelines for the expenditure of the DR-1144-NH related funding and the community of Salem applied for, and has received preliminary approval for funding to acquire a 19 unit trailer park in the Floodplain.

Community Development Block Grant

- ***U.S. Dept. of Housing and Urban Development***
- ***Funds for a Declared Disaster's "Unmet Needs"***
- ***Projects must meet one of three National Objectives***
- ***Provide a direct benefit to low and moderate income persons or households***
- ***Prevent or eliminate slums and blight***
- ***Eliminate conditions which seriously and immediately threaten the public health and welfare***

Additional conditions with respect to the expenditure of these funds includes the provision that at least 50% of the grant award must be expended in a manner which benefits individuals who earn 80% or less than the area's (county's) median income.

WEBSITES FOR MITIGATION RESOURCES	
American Planning Association	http://planning.org
Community Rating System	http://www.fema.gov/national-flood-insurance-program-community-rating-system
FEMA Mitigation Planning	http://www.fema.gov/multi-hazard-mitigation-planning
FEMA Public Assistance Program	https://www.fema.gov/public-assistance-local-state-tribal-and-non-profit
Flood Mitigation Assistance Program	http://www.fema.gov/flood-mitigation-assistance-program
Hazard Mitigation Grant Program	http://www.fema.gov/hazard-mitigation-grant-program
HAZUS and HAZUS–MH	https://www.fema.gov/hazus
Mitigation Success Stories	http://www.fema.gov/mitigation-best-practices-portfolio
National Flood Insurance Program	http://www.fema.gov/nfip
National Hurricane Program	http://www.fema.gov/hazards/hurricanes/nhp.shtm
NOAA Storm Events	http://www.ncdc.noaa.gov/stormevents/
NH Homeland Security & Emergency Management	http://www.nh.gov/safety/divisions/hsem/
Pre-Disaster Mitigation Program	https://www.fema.gov/pre-disaster-mitigation-grant-program
Small Business Administration	http://www.sba.gov/disaster
U.S. Army Corps of Engineers	http://www.usace.army.mil
U.S. Department of Agriculture (USDA)	http://www.usda.gov/da/disaster/nda.htm
USDA , Natural Resources Conservation Service	http://www.nrcs.usda.gov
U.S. Department of Housing and Urban Development	http://portal.hud.gov/hudportal/HUD

APPENDIX B

Documentation of Planning Process

Including:

Agendas
Attendance Sheets
Public Notices / Email Notices
Problem Statements
Mitigation Project Identification Matrix
Prioritized Mitigation Projects
Coordination with Outside Agencies

Hampton, NH
Hazard Mitigation Plan

April 14, 2016
Committee/Public Meeting
AGENDA

1. Introductions
2. Review/Update Goals
3. Review/Update Hazard History
4. Review/Update Risk Matrix
5. MISC:
   a. Any significant changes in development since fall of 2010, especially in hazard prone areas?
   b. Participation/activities in NFIP since 2010?
   c. Was the HMP incorporated into other planning mechanisms? If not, why?
6. Review for next meeting:
   Update Critical Facilities (Chap. 4)
   Update Capability Assessment (Chap.5)
   Distribute Sample Mitigation Projects

ATTENDEES

Name	Title/Affiliation
Chris Jacobs	Hampton Department of Public Works Director
David Hobbs	Hampton Police Department Deputy Chief
Fred Welch	Hampton Town Manager
Jason Bachand	Hampton Town Planner
Jen Hale	Hampton Department of Public Works, Deputy Director
Joseph Titone	Seabrook EMD
Karl Ingoldby	Winnicunnet High School Facilities Director
Kelly McDonald	Seabrook Fire / Emergency Management
Kristi Pulliam	Hampton Finance Director
Mark Gearreald	Hampton Town Attorney
Nathan Denio	Hampton Fire Department / EMS
Richard Sawyer	Hampton Police Chief / EMD
William Kennedy	Hampton Fire Department, Deputy Chief
Jane Hubbard	Hubbard Consulting LLC

Hampton, NH
Hazard Mitigation Plan

May 13, 2016

Committee/Public Meeting
AGENDA

1. Review Problem Statements
2. Review/Update Critical Facilities (Chap 4)
3. Review/Update Capabilities (Chap. 5)
4. Review for next meeting:
   Update Mitigation Projects (Chap. 6)

ATTENDEES

Name	Title/Affiliation
Chris Jacobs	Hampton Department of Public Works Director
David Hobbs	Hampton Police Department Deputy Chief
Jason Bachand	Hampton Town Planner
Jen Hale	Hampton Department of Public Works, Deputy Director
Mark Gearreald	Hampton Town Attorney
Richard Sawyer	Hampton Police Chief / EMD
Jane Hubbard	Hubbard Consulting LLC

Hampton, NH
Hazard Mitigation Plan

May 26, 2016

Committee/Public Meeting
AGENDA

1. Update Status of 2011 Projects

2. Identify NEW Mitigation Projects (if time)
    a. See Problem Statements to Projects worksheet

3. Review for next meeting:
    a. Vote and Prioritize Projects

ATTENDEES

Name	Title/Affiliation
Fred Welch	Hampton Town Manager
Jameson Ayotte	Hampton Fire Department, Chief
Jamie Sullivan	Hampton Assistant Town Manager
Jason Bachand	Hampton Town Planner
Jen Hale	Hampton Department of Public Works, Deputy Director
Kristi Pulliam	Hampton Finance Director
Mark Gearreald	Hampton Town Attorney
Richard Sawyer	Hampton Police Chief / EMD
Jane Hubbard	Hubbard Consulting LLC

Hampton, NH
Hazard Mitigation Plan

June 8, 2016

Committee/Public Meeting
AGENDA

1. Identify NEW Mitigation Projects (if time)
   a. See Problem Statements to Projects worksheet

2. Review for next meeting:
   a. Vote and Prioritize Projects

ATTENDEES

Name	Title/Affiliation
Chris Jacobs	Hampton Department of Public Works Director
David Hobbs	Hampton Police Department Deputy Chief
Fred Welch	Hampton Town Manager
Heidi Lawton	NH HSEM, Field Representative
Jamie Sullivan	Hampton Assistant Town Manager
Jason Bachand	Hampton Town Planner
Jen Hale	Hampton Department of Public Works, Deputy Director
Kristi Pulliam	Hampton Finance Director
Mark Gearreald	Hampton Town Attorney
Richard Sawyer	Hampton Police Chief / EMD
William Kennedy	Hampton Fire Department, Deputy Chief
Jane Hubbard	Hubbard Consulting LLC

Hampton, NH
Hazard Mitigation Plan

June 23, 2016

Committee/Public Meeting
AGENDA

1. Vote & Prioritize Mitigation Projects

2. Complete the Mitigation Action Plan

3. Review Draft

ATTENDEES

Name	Title/Affiliation
Chris Jacobs	Hampton Department of Public Works Director
Jameson Ayotte	Hampton Fire Department
Jamie Sullivan	Hampton Assistant Town Manager
Jason Bachand	Hampton Town Planner
Jen Hale	Hampton Department of Public Works, Deputy Director
Kristi Pulliam	Hampton Finance Director
Mark Gearreald	Hampton Town Attorney
Richard Sawyer	Hampton Police Chief / EMD
William Kennedy	Hampton Fire Department, Deputy Chief
Jane Hubbard	Hubbard Consulting LLC

Hampton, NH
Hazard Mitigation Plan

July 14, 2016

Committee/Public Meeting
AGENDA

1. Review Final Draft of Hazard Mitigation Plan Update 2016

ATTENDEES

Name	Title/Affiliation
Chris Jacobs	Hampton Department of Public Works Director
Fred Welch	Hampton Town Manager
Jameson Ayotte	Hampton Fire Department / EMS
Jason Bachand	Hampton Town Planner
Jen Hale	Hampton Department of Public Works, Deputy Director
Kristi Pulliam	Hampton Finance Director
Mark Gearreald	Hampton Town Attorney
Richard Sawyer	Hampton Police Chief / EMD
Jane Hubbard	Hubbard Consulting LLC

PUBLIC NOTICE TO THE RESIDENTS OF HAMPTON, NH

PUBLIC NOTICE

January 5, 2016 at 10:00am
Hampton Town Office
Hampton, NH

The Town of Hampton, with the Hazard Mitigation Planning Committee, is currently working to update Hampton's *Hazard Mitigation Plan.* The *Plan* identifies potential natural and man-made hazards throughout the town and various projects and/or strategies to mitigate their effects. The President signed into law, the Disaster Mitigation Act of 2000 (DMA), Section 322-Mitigation Planning. It requires all local governments to prepare and adopt jurisdiction-wide hazard mitigation plans as a condition of receiving Hazard Mitigation Grant Program (HMGP) and Pre-Disaster Mitigation (PDM) project grants.

All residents, neighboring communities, businesses, and interested parties are formally invited to review a draft of the Updated *Plan* and publicly comment on their concerns regarding the *Plan*.

For more information please contact Jane Hubbard, via email at jhubb_99@yahoo.com.

The above notice was posted at the Town Office, Hampton Police Department and the Town Website. In addition, email notices were sent to neighboring towns, chamber of commerce and the regional planning commission, as shown below.

The following was emailed on 4/13/16, 5/3/16, 5/24/16, 6/3/16, 6/15/16 and 7/11/16:

The Town of Hampton, NH is in the process of updating its Hazard Mitigation Plan. This Plan is a tool to be used by the Town, as well as other local, state and federal governments, to reduce the effects of natural and man-made hazards. Our communities and organizations share common hazards which do not respect governmental boundaries. Therefore, we are personally inviting you to participate in the planning process to update the Town's Hazard Mitigation Plan.

We encourage you to attend the Committee meeting on ----------, at 10:00am at the Hampton Town Office. If you are unable to attend this meeting, you may access a copy of the planning documents and/or comment on hazard mitigation issues by emailing Jane Hubbard with Hubbard Consulting LLC at jhubb_99@yahoo.com or at 603-848-8801.

For further information on mitigation planning, we are attaching a fact sheet. We look forward to hearing your ideas on how to mitigate future hazards for the community.

Thank you, on behalf of the Town of Hampton,
Jane Hubbard

Emailed to the following contacts:

Brian Comeau
Exeter EMD
bcomeau@exeternh.gov

Jay Lord
Hampton Falls EMD
chief@hffd.org

Brian Page
North Hampton EMD
bpage@northhampton-nh.gov

Joseph Titone
Seabrook EMD
jtitone@seabrooknh.org

David Emanuael
Stratham EMD
demanuel@emanuelengineering.com

Cliff Sinnott, Executive Director
Rockingham Regional Planning Commission
csinnott@rpc-nh.org

Hampton Area Chamber of Commerce
katie@hamptonchamber.com

Robert Sullivan, Superintendent
SAU #21
rsullivan@sau21.org

Parker Moore
Emergency Management Planning Specialist
Parker.moore@dos.nh.gov

Heidi Lawton
NH HSEM Field Rep
Heidi.Lawton@dos.nh.gov

Jennifer Gilbert, NFIP Coord.
Office of Energy & Planning
jennifer.gilbert@nh.gov

Hazard	Problem Statements	Projects ***BOLD are existing projects from last edition of plan***	Social	Technical	Administrative	Political	Legal	Economic	Environment
Dam Failure	There are 6 Non-Menace Dams, 1 low hazard and 1 significant hazard (Old Mill Pond Dam) dams located in Hampton.	Design, permit and re-construction of Old Mill Pond Dam and spillway to meet standards.	+	+	+	+	+	+	+
Drought	An extended drought increases the probability of fires and may hinder fire suppression in minimal fire protection areas.	Install additional sources of fire protection water sources (i.e. cisterns)	+	+	-	+	+	+	+
		Purchase a new forestry truck.	+	+	+	+	+	+	+
	Public and Private wells would be affected in an extended drought.	**Continue public / private partnership w/ Aquarion to educate public on water conservation.**	+	+	+	+	+	-	+
		Aquifer Recharge through storm water/wastewater effluent reuse/direction.	+	+	+	+	+	+	+
Earthquake	Critical facilities are susceptible to earthquake damage.	Conduct seismic retrofit of critical facilities (i.e. securing loose objects, shatter proof film for windows, etc)	-	+	+	-	+	-	+
Extreme Heat	Special populations (i.e. elderly, medical) would be at risk during an extended period of extreme heat.	**Educate property owners on steps they can take reduce the impact of hazards on their home and business.**	+	+	+	+	+	+	+
		Update the town's website to incorporate all-hazard education	+	+	+	+	+	+	+
	There are numerous high-population events and a daily influx of people that may be at risk during extreme heat.	None							
Flooding	Heavy and prolonged rain events cause flood damage to roads and culverts and bridges and structures, as well as search and rescue response.	**Continue enforcement of National Flood Insurance Program (NFIP) regulations and educate the public on the NFIP program.**	+	+	+	+	+	+	+
		Education/Clarification of wetlands conservation ordinance	+	+	+	+	+	+	+
		Add a cumulative substantial improvement requirement to the floodplain ordinance.	-	+	+	+	+	+	+
		Assist repetitive loss properties (i.e. education, technical assistance, grants. Etc)	+	+	+	+	+	+	+

Hazard	Problem Statements	Projects ***BOLD are existing projects from last edition of plan***	Social	Technical	Administrative	Political	Legal	Economic	Environment
Flooding Continued		**Improve drainage at Lower End of High Street**	+	+	+	+	+	+	+
		Improve drainage at Brown Ave Area (Church St/Diane Lane/Joanne Lane/Suzanne Lane/Nudd Ave/William St.Ave)	+	+	+	+	+	-	+
		Mitigate beach erosion at Sun Valley Area	+	+	+	+	+	-	+
		Improve drainage at Meadow Pond Area (Gill St., Redman Lane, Gentian St., Greene St. & lower end of Winnacunnet Rd.)	+	+	+	+	+	-	+
		Mitigate ocean flooding at Ocean Blvd. Area (Kings Hwy, H Street, K Street, Surfside 30-493 Ocean Blvd.)	+	+	+	+	+	-	+
		Improve drainage at Kings Highway Street Area	+	+	+	+	+	-	+
		Reduce tidal flooding (through elevation of road) at Island Path / Glade Path Area	+	-	+	+	+	-	+
		Reduce tidal flooding at Plaice Cove Area (Ocean Blvd., Beachplum Way, Ancient Hwy & Shaw Street)	+	-	+	+	+	-	+
		Coordinate with NH DOT to improve drainage at Great Boar's Head (Ocean Blvd.)	+	-	+	+	+	-	+
		Improve drainage at Nilas Brook Area (NW of Quinn Lane and North Shore Road)	+	+	+	+	+	+	+
		Drainage improvement at Cogger, Mill, Barbour and Vanderpool Roads.	+	-	+	+	+	-	+
		Whites Island drainage/sand improvement.	+	-	+	+	+	-	+
		Campton, Portsmouth, Plymouth Ave – ocean discharge	+	-	+	+	+	-	+
	Coastal flooding is a common occurrence and has the possibility of causing major damage to infrastructure, people and structures.	**Promote Business Recovery Plan through the Chamber of Commerce**	+	+	+	+	+	+	+
	Hampton has 40 Repetitive Loss Structures in the NFIP.	**Apply to the Community Rating System**	+	+	+	+	+	-	+

Hazard	Problem Statements	Projects *BOLD are existing projects from last edition of plan*	Social	Technical	Administrative	Political	Legal	Economic	Environment
Hail	There is minimal risk of hail to humans and infrastructure.	**Educate property owners on steps they can take reduce the impact of hazards on their home and business. (DUPLICATE)**	+	+	+	+	+	+	+
Hurricane	Hurricanes cause coastal flooding and erosion to the coastline.	'see flooding projects'							
	Power outages from downed utilities, minor to major structural damage, limited access and flooding can affect the town.	**Maintain "Storm Ready" qualification**	+	+	+	+	+	+	+
Lightning	Structural and forest fires can result from frequent lightning strikes.	Install lightning protection (internal and external) on critical facilities.	+	+	+	+	+	-	+
	Populations involved in outdoor activities are at risk from lightning strikes.	**Educate property owners on steps they can take reduce the impact of hazards on their home and business. (DUPLICATE)**	+	+	+	+	+	+	+
Severe Wind *(Tornado /Downburst)*	Wind damage can result in downed utilities causing power outages and limited access.	**Educate property owners on steps they can take reduce the impact of hazards on their home and business. (DUPLICATE)**	+	+	+	+	+	+	+
	Debris removal is an added burden to the Town's resources and budget.	Continue trimming of trees on town roadways.	+	+	+	+	+	-	+
		Install a generator at the transfer station to accommodate disposal of storm debris.	+	+	+	+	+	-	+
		Continue to require underground utilities for new subdivisions.	+	+	+	+	+	+	+
Wild/Forest Fire	High fuel load areas, including phragmites, are more susceptible to wildfires.	**Reduction and removal of Phragmites populations with the salt marsh restoration**	+	-	+	+	+	-	+
		See drought projects.							
Winter Weather	Extended power outages due to winter storms may require activation of a shelter.	**Educate property owners on steps they can take reduce the impact of hazards on their home and business. (DUPLICATE)**	+	+	+	+	+	+	+
	Severe cold and road conditions can impede emergency response.								

Hazard	Problem Statements	Projects ***BOLD are existing projects from last edition of plan***	Social	Technical	Administrative	Political	Legal	Economic	Environment
	Special populations (i.e. elderly, medical) would be at risk during an extended period of severe cold and winter weather.								
Human Caused Hazards	High Population, such as Hampton Beach, areas are at greater risk to human caused incidents.	None							
	Municipal buildings, including schools, are at risk to human caused hazards.	Install fencing and cameras at the Wastewater Treatment Facility.	+	+	+	+	+	+	+
		Expand IT (cell phone booster, smartboards, electronics, etc.) at the EOC.	+	+	+	+	+	+	+
	The town is at moderate to high risk for Hazardous Material incidents.	Purchase variable message boards.	+	+	+	+	+	+	+

For purposes of voting for the projects listed below, each committee member should place a checkmark **for half of the projects (12).** There are total of 24 projects. The projects will be prioritized based upon the total number of votes received for each project.

Description of Mitigation Strategy	Votes
1. Continue public / private partnership w/ Aquarion to educate public on water conservation.	2 low
2. Aquifer Recharge through storm water/wastewater effluent reuse/direction.	2 low
3. Conduct seismic retrofit of critical facilities (i.e. securing loose objects, shatter proof film for windows, etc)	0 low
4. Educate property owners on steps they can take reduce the impact of hazards on their home and business.	3 med
5. Update the town's website to incorporate all-hazard education.	6 high
6. Continue enforcement of National Flood Insurance Program (NFIP) regulations and educate the public on the NFIP program.	4 med
7. Education/Clarification of wetlands conservation ordinance	2 low
8. Add a cumulative substantial improvement requirement to the floodplain ordinance.	5 med
9. Assist repetitive loss properties (i.e. education, technical assistance, grants. Etc)	2 low
10. Improve drainage at Lower End of High Street	7 high
11. Improve drainage at Brown Ave Area (Church St/Diane Lane/Joanne Lane/Suzanne Lane/Nudd Ave/William St.Ave)	3 med
12. Improve drainage at Meadow Pond Area (Gill St., Redman Lane, Gentian St., Greene St. & lower end of Winnacunnet Rd.)	6 high
13. Mitigate ocean flooding at Ocean Blvd. Area (Kings Hwy, H St, K St, Surfside 30-493 Ocean Blvd.)	5 med
14. Improve drainage at Kings Highway Street Area	8 high
15. Reduce tidal flooding (through elevation of road) at Island Path / Glade Path Area	3 med
16. Reduce tidal flooding at Plaice Cove Area (Ocean Blvd., Beachplum Way, Ancient Hwy & Shaw St.)	3 med
17. Coordinate with NH DOT to improve drainage at Great Boar's Head (Ocean Blvd.)	1 low
18. Improve drainage at Nilas Brook Area (NW of Quinn Lane and North Shore Road)	2 low
19. Apply to the Community Rating System	4 med
20. Drainage improvement at Cogger, Mill, Barbour and Vanderpool Roads.	med
21. Whites Island drainage/sand improvement.	med
22. Campton, Portsmouth, Plymouth Ave – ocean discharge	med
23. Maintain "Storm Ready" qualification	4 med
24. Install lightning protection (internal and external) on critical facilities.	5 med
25. Continue trimming of trees on town roadways.	8 high
26. Continue to require underground utilities for new subdivisions.	5 med
27. Reduction and removal of Phragmites populations with the salt marsh restoration	4 med

VOTES: Low:0-2 Medium:3-5 High:6-8

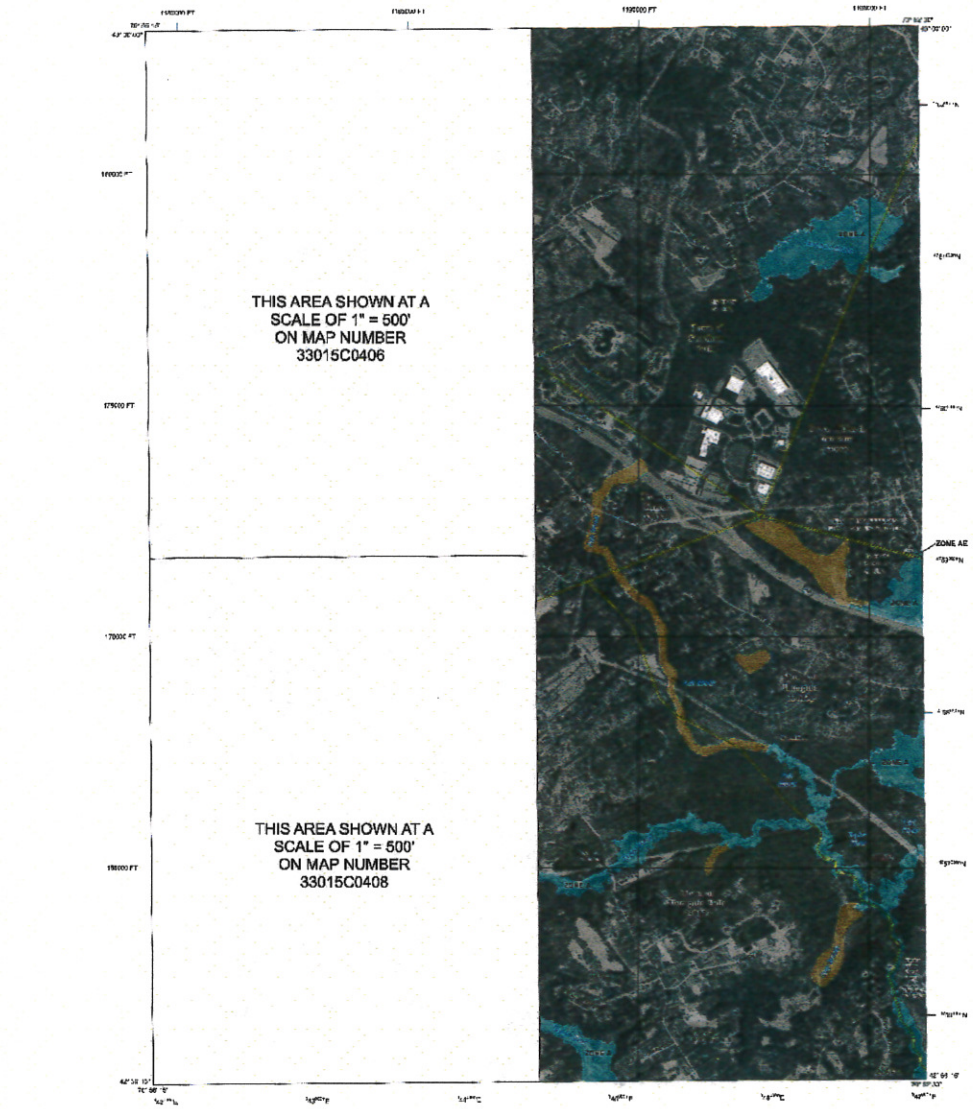
COORDINATION WITH OUTSIDE AGENCIES

Hubbard Consulting LLC coordinated with the following agencies during the planning process.

Date	Agency Contacted	Information Coordinated
April 5, 2016	NH Office of State Planning	Hubbard Consulting LLC contacted (via email) the State NFIP Coordinator, Jennifer Gilbert and Assistant Planner Kellie Walsh, to obtain information on NFIP policies and repetitive loss properties
June 16, 2016	Rockingham Planning Commission (RPC)	Hubbard Consulting LLC contacted Julie LaBranche (via telephone) to discuss the RPCs sea-level rise plan and how that data relates to the flood hazard in Hampton. In addition, Hubbard coordinated with the RPC on the CRS requirements for the Mitigation Plan.

APPENDIX C

Preliminary FEMA Floodplain Maps (2014)



FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR ZONE DESCRIPTIONS
THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT
HTTP://MSC.FEMA.GOV

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) Zone A, AO, With BFE or Depth Zone AE, AO, AH, VE, AR
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
- Future Conditions 1% Annual Chance Flood Hazard Zone X
- Area with Reduced Flood Risk due to Levee See Notes. Zone X

OTHER AREAS
- Areas Determined to be Outside the 0.2% Annual Chance Floodplain Zone X
- Area of Undetermined Flood Hazard Zone D

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Accredited or Provisionally Accredited Levee, Dike, or Floodwall
- Non-accredited Levee, Dike, or Floodwall
- 13.2 / 12.5 Cross Sections with 1% Annual Chance Water Surface Elevation (BFE)
- Coastal Transect
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature
- Base Flood Elevation Line (BFE)

OTHER FEATURES
- Limit of Study
- Jurisdiction Boundary

NOTES TO USERS

SCALE

1 inch = 1,000 feet 1:12,000
0 1,000 2,000 4,000 Feet
0 500 1,000 Meters

PANEL LOCATOR

FEMA National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP
ROCKINGHAM COUNTY, NEW HAMPSHIRE
PANEL 410 OF 691

COMMUNITY	NUMBER	PANEL	SUFFIX
HAMPTON (TOWN OF)	330135	0410	F
HAMPTON FALLS, TOWN OF	330136	0410	F

PRELIMINARY
4/9/2014

VERSION NUMBER 2.2.2.1
MAP NUMBER 33015C0410F
MAP REVISED

FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR ZONE DESCRIPTIONS

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT HTTP://MSC.FEMA.GOV

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) Zone A, A,AO,
- with BFE or Depth Zone AE, AO, AH, VE, AR
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
- Future Conditions 1% Annual Chance Flood Hazard Zone X
- Area with Reduced Flood Risk due to Levee See Notes. Zone X

OTHER AREAS
- Areas Determined to be Outside the 0.2% Annual Chance Floodplain Zone X
- Area of Undetermined Flood Hazard Zone D

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Accredited or Provisionally Accredited Levee, Dike, or Floodwall
- Non-Accredited Levee, Dike, or Floodwall
- 17.5 / 97.5 Cross Sections with 1% Annual Chance Water Surface Elevation (BFE)
- Coastal Transect
- Coastal Transect Baseline

OTHER FEATURES
- Profile Baseline
- Hydrographic Feature
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary

NOTES TO USERS

SCALE

1 inch = 500 feet 1:6,000

0 500 1,000 2,000 Feet

0 125 250 500 Meters

PANEL LOCATOR

FEMA National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

ROCKINGHAM COUNTY, NEW HAMPSHIRE

PANEL 428 OF 681

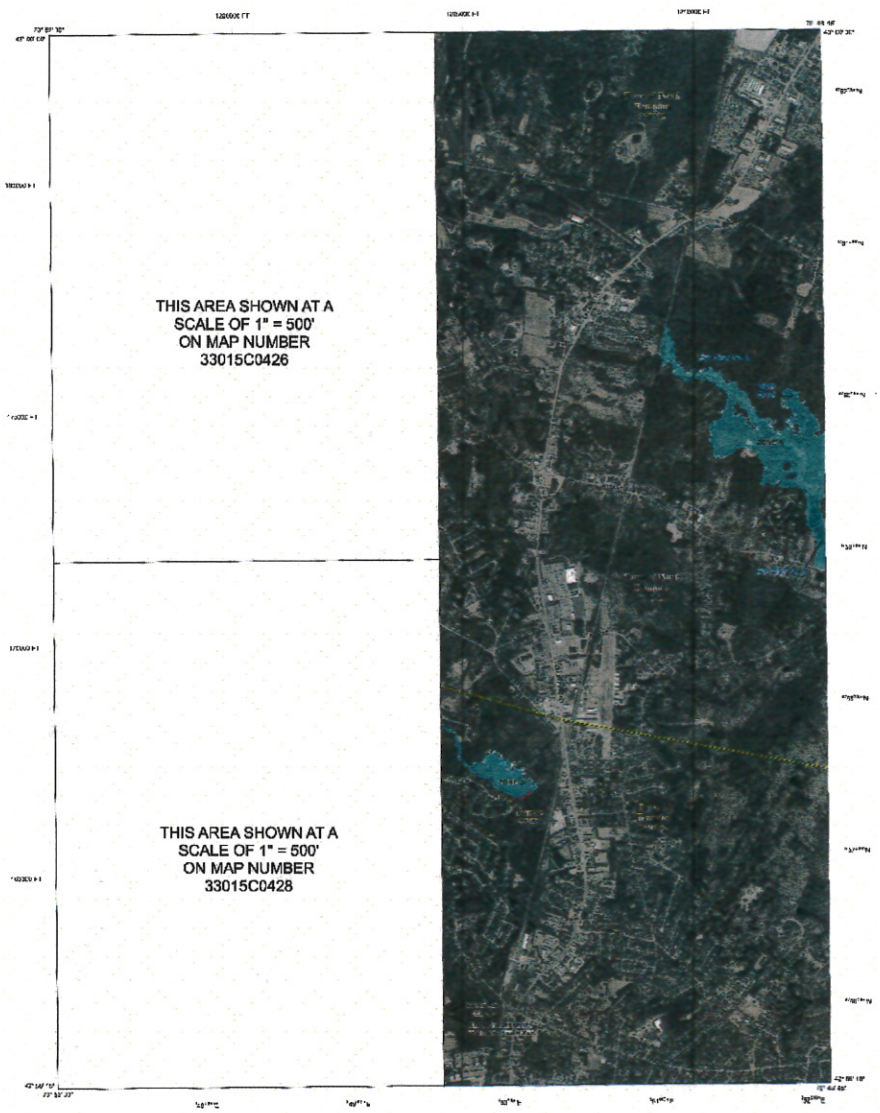
COMMUNITY	NUMBER	PANEL	SUFFIX
HAMPTON, TOWN OF	330135	0428	F
NORTH HAMPTON, TOWN OF	330139	0428	F

PRELIMINARY
4/9/2014

VERSION NUMBER
2.2.1.1

MAP NUMBER
33015C0428F

MAP REVISED



FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR ZONE DESCRIPTIONS
THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT
HTTP://MSC.FEMA.GOV

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE)
- With BFE or Depth
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile
- Future Conditions 1% Annual Chance Flood Hazard
- Area with Reduced Flood Risk due to Levee See Notes.

OTHER AREAS
- Areas Determined to be Outside the 0.2% Annual Chance Floodplain
- Area of Undetermined Flood Hazard

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Accredited or Provisionally Accredited Levee, Dike, or Floodwall
- Non-accredited Levee, Dike, or Floodwall
- Cross Sections with 1% Annual Chance Water Surface Elevation (BFE)
- Coastal Transect
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature
- Base Flood Elevation Line (BFE)

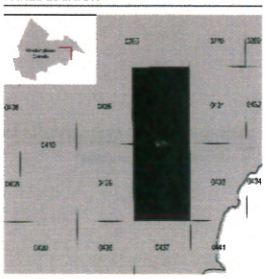
OTHER FEATURES
- Limit of Study
- Jurisdiction Boundary

NOTES TO USERS

SCALE

1 inch = 1,000 feet 1:12,000
0 1,000 2,000 4,000 Feet
0 255 510 1,020 Meters

PANEL LOCATOR



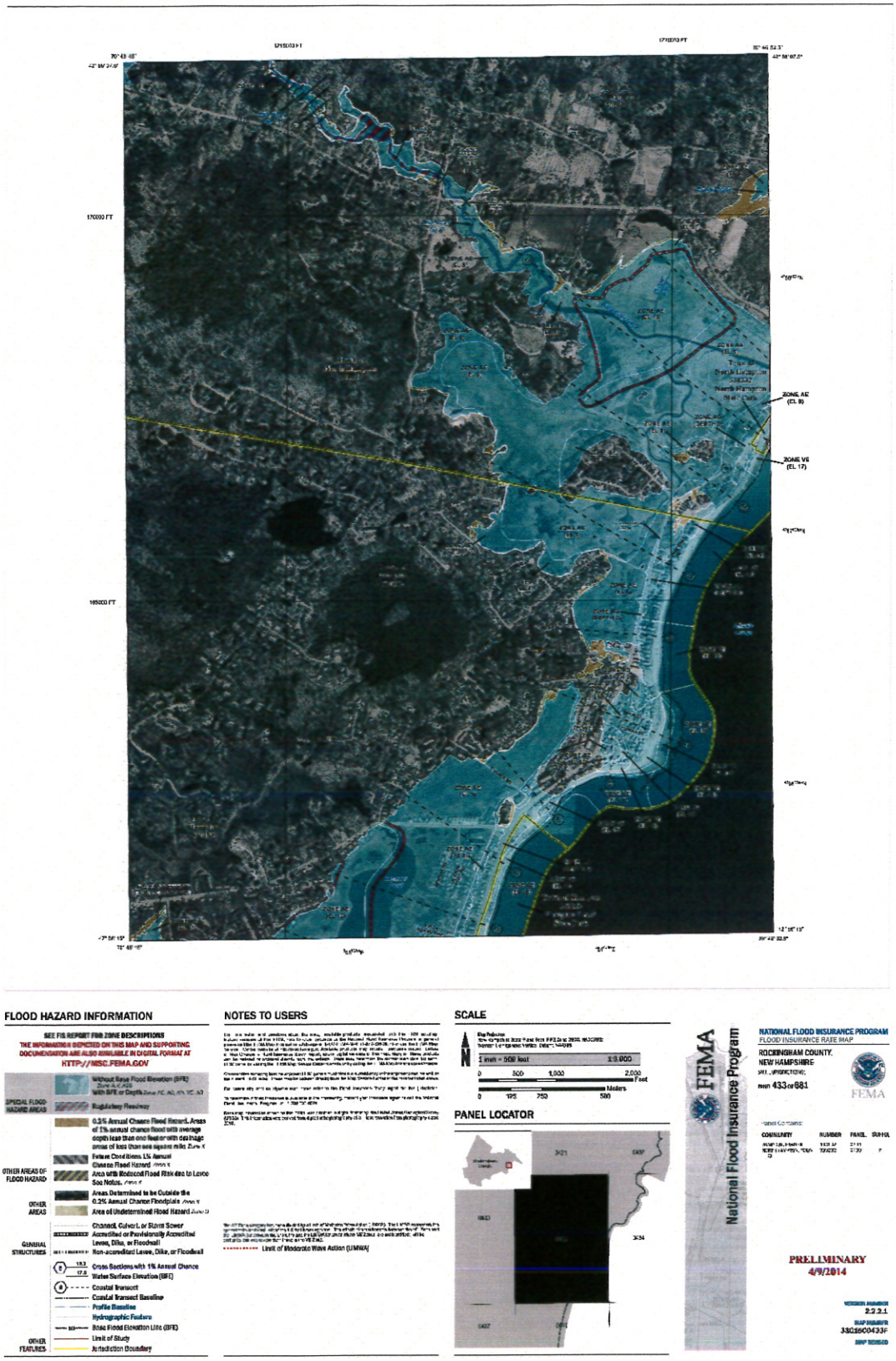
FEMA National Flood Insurance Program

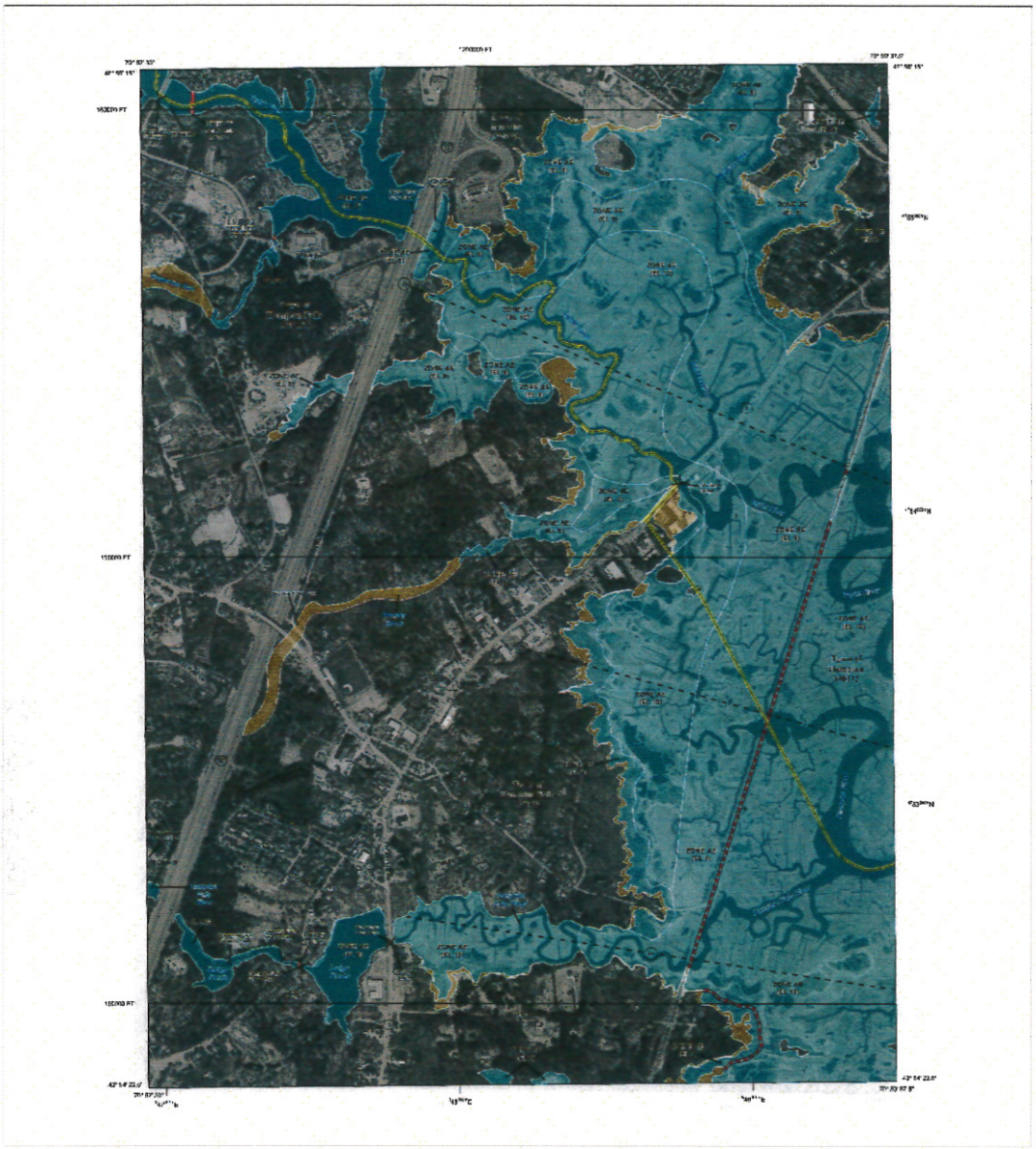
NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP
ROCKINGHAM COUNTY, NEW HAMPSHIRE
PANEL 430 OF 881

COMMUNITY	NUMBER	PANEL	SUFFIX

PRELIMINARY
4/9/2014

VERSION NUMBER 2.2.2.1
MAP NUMBER 33015C0430F
MAP REVISED


FLOOD HAZARD INFORMATION
SEE FIS REPORT FOR ZONE DESCRIPTIONS
THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT
HTTP://MSC.FEMA.GOV
SPECIAL FLOOD HAZARD AREAS
Without Base Flood Elevation (BFE)
With BFE or Depth
Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD
0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile
Future Conditions 1% Annual Chance Flood Hazard
Area with Reduced Flood Risk due to Levee
Areas Determined to be Outside the 0.2% Annual Chance Floodplain
OTHER AREAS
Area of Undetermined Flood Hazard
GENERAL STRUCTURES
Channel, Culvert, or Storm Sewer
Accredited or Provisionally Accredited Levee, Dike, or Floodwall
Non-accredited Levee, Dike, or Floodwall
Cross Sections with 1% Annual Chance Water Surface Elevation (BFE)
Coastal Transect
Coastal Transect Baseline
Profile Baseline
Hydrographic Feature
Base Flood Elevation Line (BFE)
OTHER FEATURES
Limit of Study
Jurisdiction Boundary
NOTES TO USERS
Limit of Moderate Wave Action (LiMWA)
SCALE
1 inch = 500 feet
1:6,000
0 500 1,000 2,000 Feet
0 125 250 500 Meters
PANEL LOCATOR
FEMA
National Flood Insurance Program
NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP
ROCKINGHAM COUNTY, NEW HAMPSHIRE
PANEL 433 OF 681
FEMA
COMMUNITY NUMBER PANEL SUFFIX
PRELIMINARY
4/9/2014
2.2.2.1
33015C0433F



FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR ZONE DESCRIPTIONS

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT HTTP://MSC.FEMA.GOV

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE)
- With BFE or Depth
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile
- Future Conditions 1% Annual Chance Flood Hazard
- Area with Reduced Flood Risk due to Levee

OTHER AREAS
- Area Determined to be Outside the 0.2% Annual Chance Floodplain
- Area of Undetermined Flood Hazard

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Accredited or Provisionally Accredited Levee, Dike, or Floodwall
- Non-accredited Levee, Dike, or Floodwall
- Cross Sections with 1% Annual Chance Water Surface Elevation (BFE)

OTHER FEATURES
- Coastal Transect
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary

NOTES TO USERS

Limit of Moderate Wave Action (LiMWA)

SCALE

1 inch = 500 feet 1:6,000

0 500 1,000 2,000 Feet

0 125 250 500 Meters

PANEL LOCATOR

FEMA National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

ROCKINGHAM COUNTY, NEW HAMPSHIRE
(All Jurisdictions)
PANEL 436 OF 681

FEMA

COMMUNITY	NUMBER	PANEL	SUFFIX
HAMPTON, TOWN OF	330136	0436	F

PRELIMINARY
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VERSION NUMBER
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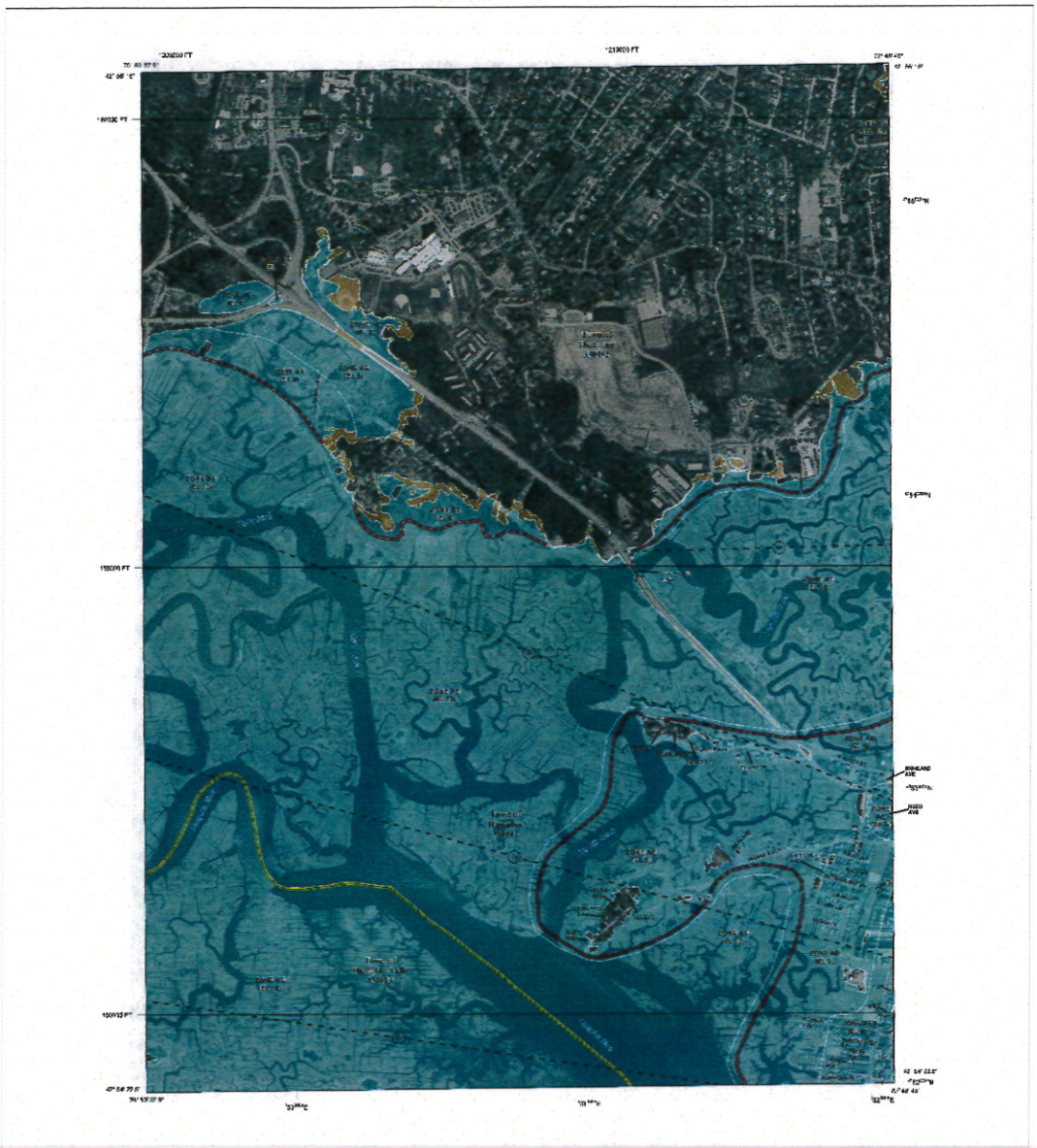

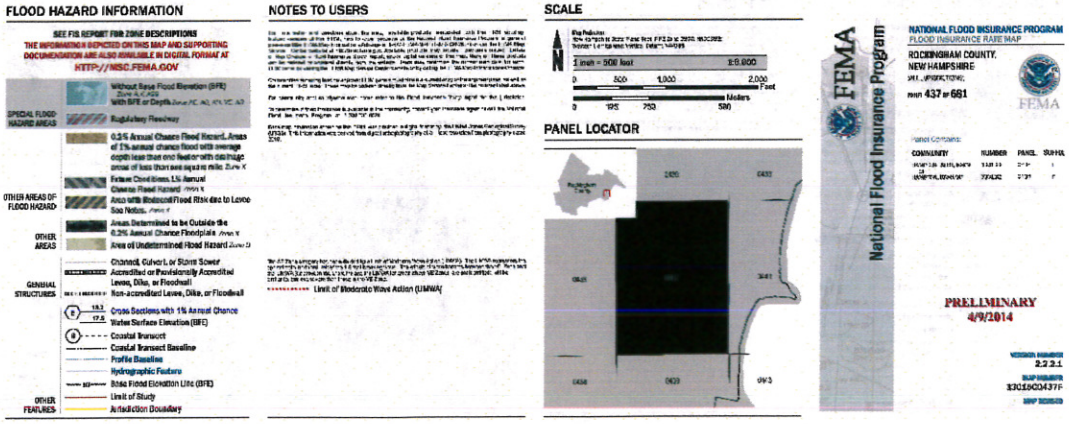
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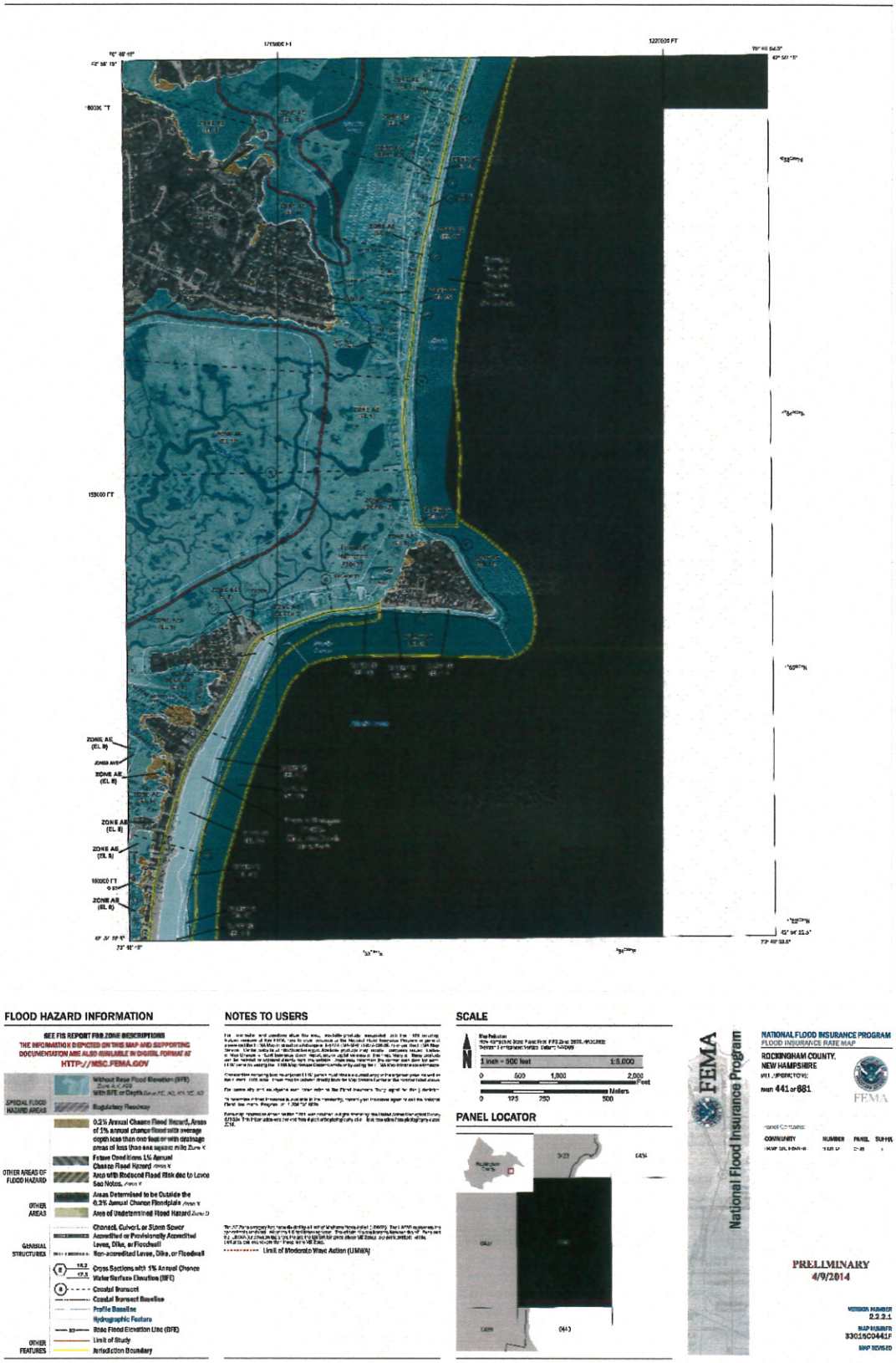
SPECIAL FLOOD HAZARD AREAS
OTHER AREAS OF FLOOD HAZARD
OTHER AREAS
GENERAL STRUCTURES
OTHER FEATURES
NOTES TO USERS
SCALE
1 inch = 500 feet
1:6,000
PANEL LOCATOR
NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP
ROCKINGHAM COUNTY, NEW HAMPSHIRE
PANEL 437 OF 661
FEMA
National Flood Insurance Program
PRELIMINARY
4/9/2014


FLOOD HAZARD INFORMATION
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HTTP://MSC.FEMA.GOV
SPECIAL FLOOD HAZARD AREAS
Without Base Flood Elevation (BFE)
With BFE or Depth
Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD
0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile
Future Conditions 1% Annual Chance Flood Hazard
Area with Reduced Flood Risk due to Levee See Notes.
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Areas Determined to be Outside the 0.2% Annual Chance Floodplain
Area of Undetermined Flood Hazard
GENERAL STRUCTURES
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Non-accredited Levee, Dike, or Floodwall
Cross Sections with 1% Annual Chance Water Surface Elevation (BFE)
Coastal Transect
Coastal Transect Baseline
Profile Baseline
Hydrographic Feature
Base Flood Elevation Line (BFE)
OTHER FEATURES
Limit of Study
Jurisdiction Boundary
NOTES TO USERS
Limit of Moderate Wave Action (LiMWA)
SCALE
1 inch = 500 feet
1:6,000
0 500 1,000 2,000 Feet
0 125 250 500 Meters
PANEL LOCATOR
FEMA
National Flood Insurance Program
NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP
ROCKINGHAM COUNTY, NEW HAMPSHIRE
PANEL 441 OF 681
FEMA
COMMUNITY NUMBER PANEL SUFFIX
PRELIMINARY
4/9/2014
VERSION NUMBER
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MAP NUMBER
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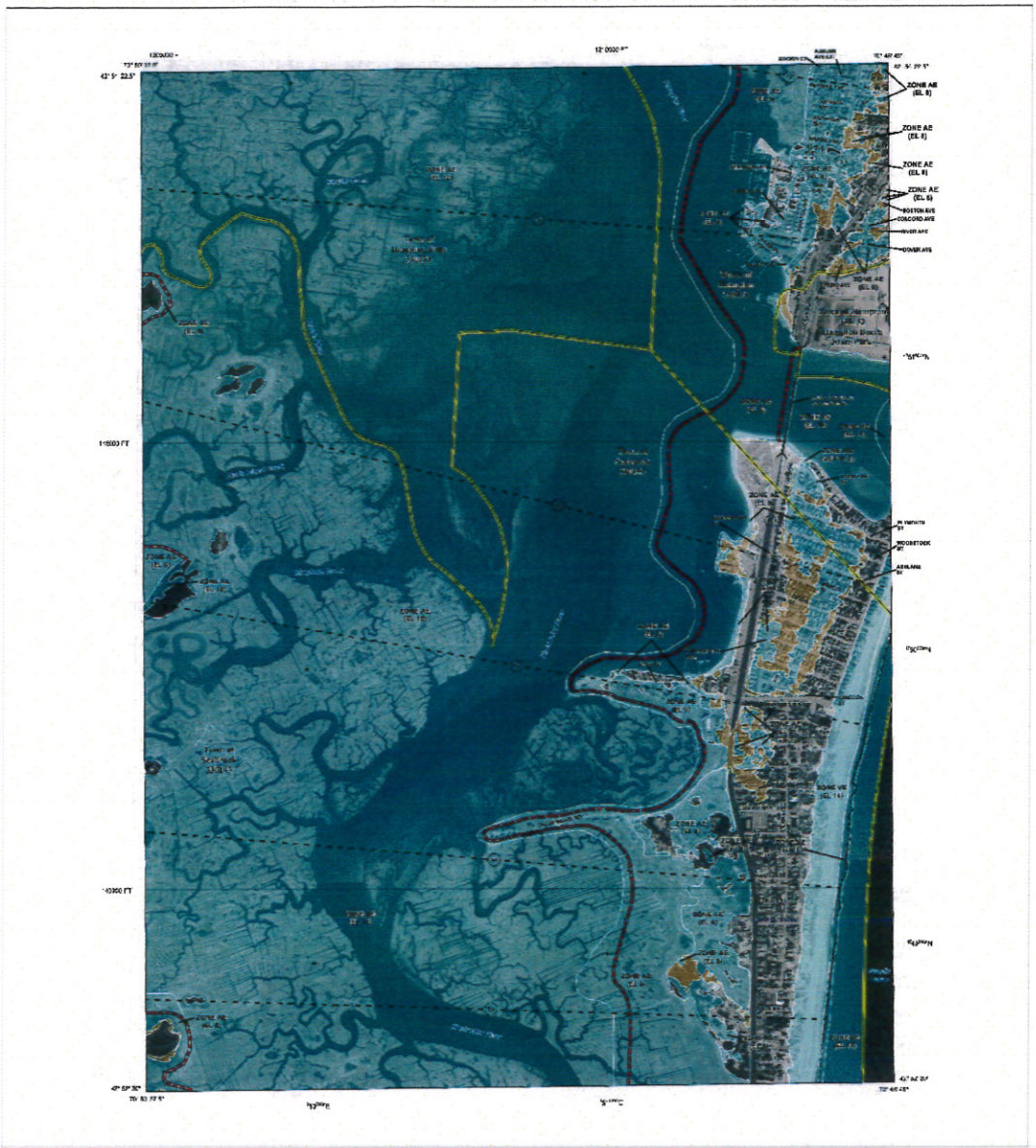
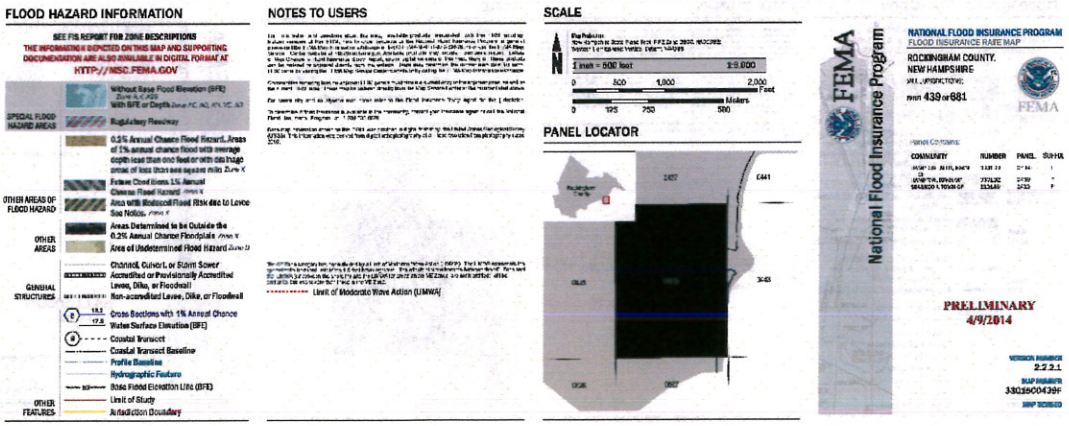
MAP REVISED




FLOOD HAZARD INFORMATION
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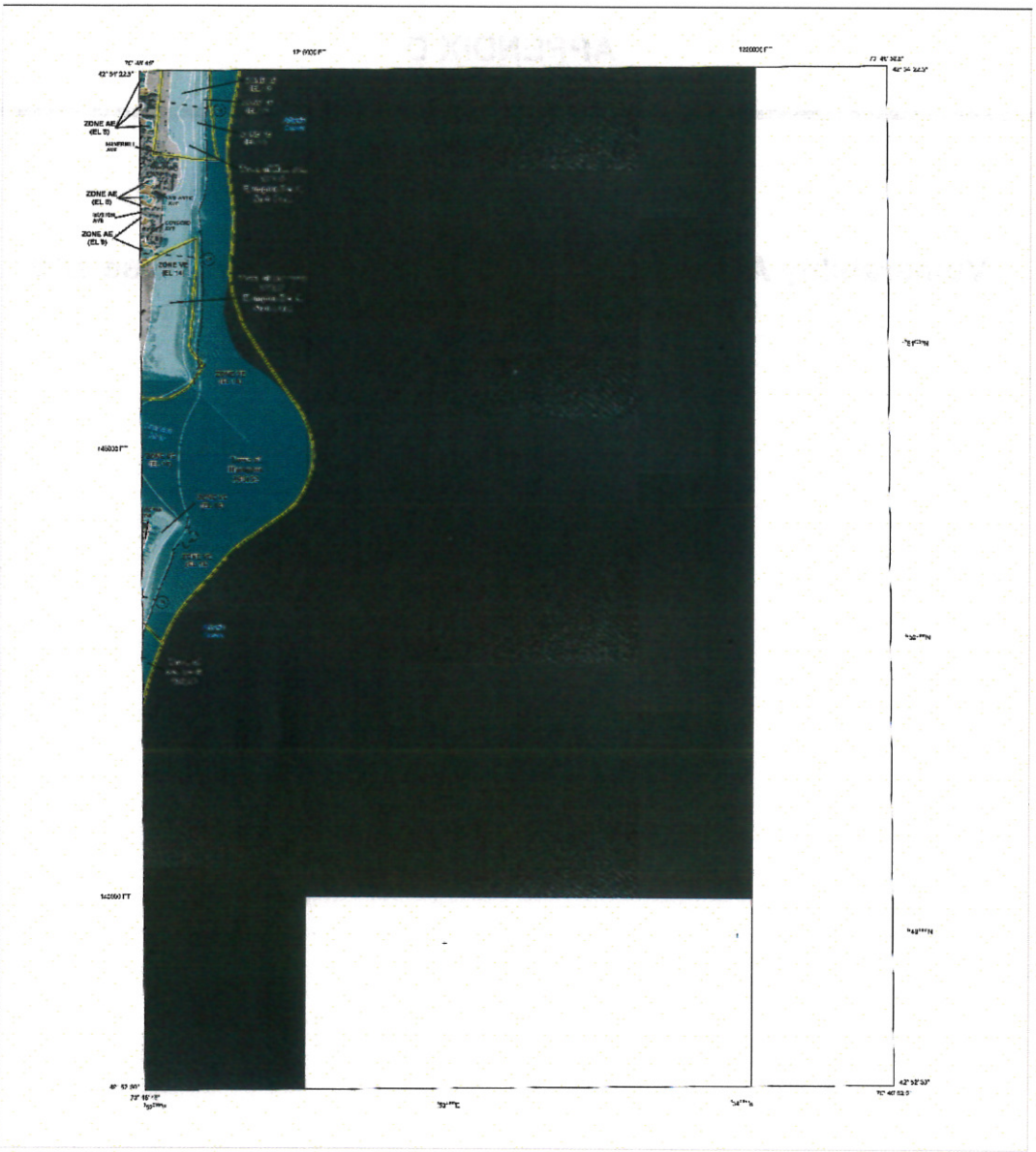
HTTP://MSC.FEMA.GOV
SPECIAL FLOOD HAZARD AREAS
OTHER AREAS OF FLOOD HAZARD
OTHER AREAS
GENERAL STRUCTURES
OTHER FEATURES
NOTES TO USERS
SCALE
1 inch = 500 feet
1:6,000
PANEL LOCATOR
NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP
ROCKINGHAM COUNTY, NEW HAMPSHIRE
PANEL 439 OF 681
National Flood Insurance Program
PRELIMINARY
4/9/2014



FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR ZONE DESCRIPTIONS
THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT
HTTP://MSC.FEMA.GOV

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) Zone A, V, A99
- With BFE or Depth Zone AE, AO, AH, VE, AR
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
- Future Conditions 1% Annual Chance Flood Hazard Zone X
- Area with Reduced Flood Risk due to Levee See Notes. Zone X
- Area Determined to be Outside the 0.2% Annual Chance Floodplain Zone X

OTHER AREAS
- Area of Undetermined Flood Hazard Zone D

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Accredited or Provisionally Accredited Levee, Dike, or Floodwall
- Non-accredited Levee, Dike, or Floodwall
- 15.2 / 17.1 Cross Sections with 1% Annual Chance Water Surface Elevation (BFE)
- Coastal Transect
- Coastal Transect Baseline

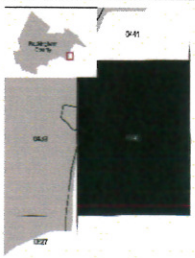
OTHER FEATURES
- Profile Baseline
- Hydrographic Feature
- 82 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary

NOTES TO USERS

SCALE

1 inch = 500 feet 1:6,000
0 500 1,000 2,000 Feet
0 175 350 500 Meters

PANEL LOCATOR



FEMA National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

ROCKINGHAM COUNTY, NEW HAMPSHIRE
(ALL JURISDICTIONS)
PANEL 443 OF 681

FEMA

COMMUNITY	NUMBER	PANEL	SUFFIX
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PRELIMINARY
4/9/2014

VERSION NUMBER
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MAP NUMBER
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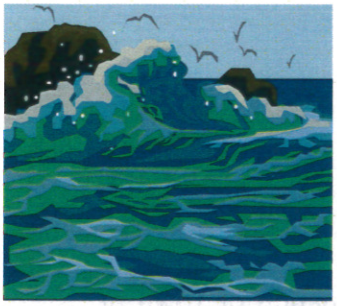
MAP REVISED

APPENDIX D

Vulnerability Assessment of Projected Sea-Level Rise and Coastal Storm Surge Flooding



TIDES TO STORMS

PREPARING FOR NEW HAMPSHIRE'S FUTURE COAST

Assessing Risk and Vulnerability of Coastal Communities to Sea Level Rise and Storm Surge

Seabrook - Hampton Falls – Hampton - North Hampton – Rye - New Castle - Portsmouth

TOWN OF HAMPTON, NEW HAMPSHIRE

Vulnerability Assessment

of projected sea-level rise and coastal storm surge flooding

Prepared by the
Rockingham Planning Commission

September 2015

ACKNOWLEDGEMENTS

The Rockingham Planning Commission gratefully acknowledges the participation of Town of Hampton staff, board and commission members:

Town Manager:
Fred Welch

Conservation Commission:
Jay Diener- Chair

Fire Department:
William Kennedy-Deputy Chief

Planning Department:
Jason Bachand-Planner and Rayann Dionne-Conservation Coordinator

Police Department:
Richard Sawyer-Chief

Department of Public Works:
Chris Jacobs-Director and Jennifer Hale-Deputy Director

Cover Photo Credit: Steve Miller

Notes on Use and Applicability of this Report and Results:
The purpose of this vulnerability assessment report is to provide a broad overview of the potential risk and vulnerability of state, municipal and public assets as a result of projected changes in sea-levels and coastal storm surge. This report should be used for preliminary and general planning purposes only, not for parcel level or site specific analyses. The vulnerability assessment performed was limited by several factors including the vertical accuracy of elevation data (derived from LiDAR) and the static analysis applied to map coastal areas subject to future flooding which does not consider wave action and other coastal dynamics. Also, the estimated flood impacts to buildings and infrastructure are based upon the elevations of the land surrounding them, not the elevation of any structure itself.

PLANNING TO REDUCE RISK AND VULNERABILITY

New Hampshire coastal municipalities are confronted by land use and hazard management concerns that include extreme weather events, storm surges, flooding and erosion. These issues are only intensified by recent increases in the frequency and intensity of extreme storm events and increases in sea level.

New Hampshire's economy and quality of life have historically been linked to its shores, its vast expanses of productive saltmarshes and sandy beaches. Increased flooding has the potential to place coastal populations at risk, threaten infrastructure, intensify coastal hazards and ultimately impact homes, businesses, public infrastructure, recreation areas, and natural resources. Accounting for changes in sea level and coastal storms will help lead to informed decisions for public and private investments by minimizing risk and vulnerability.

What is a Vulnerability Assessment?

A vulnerability assessment identifies and measures impacts of flooding from sea level rise and storm surge on built structures, human populations and natural environments. Factors that influence vulnerability include development patterns, natural features and topography. The assessment evaluates existing and future conditions such as:

- inland extent and depth of flooding
- impacts to natural and human systems
- changes in impacts between different flood levels

How can the vulnerability assessment be used?

Information from a vulnerability assessment can help guide common sense solutions, strategies and recommendations for local governments, businesses, and citizens to enable them to adopt programs, policies, business practices and make informed decisions.

Planning for the long-term effects of sea level rise may also help communities better prepare in the short-term for periodic flooding from severe coastal storms.

How will the vulnerability assessment benefit the community?

The Tides to Storms assessment is intended to assist coastal NH communities to take actions to prepare for increase flood risk, including:

- Enhance preparedness and raise community awareness of future flood risks.
- Identify cost-effective measures to protect and adapt to changing conditions.
- Improve resiliency of infrastructure, buildings and investments.
- Protect life, property and local economies
- Protect services that natural systems provide
- Preserve unique community character

Results from a vulnerability assessment can be incorporated into various municipal planning, regulatory and management documents such as:

Master Plan	Capital Improvement Plan	Land Conservation Plan
Zoning Ordinance	Site Plan Review Regulations	Subdivision Regulations
Roadway Management Plan	Stormwater Management Plan	Facilities Management Plan

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ROCKINGHAM PLANNING COMMISSION
156 Water Street
Exeter, NH 03833
Phone: (603) 778-0885

This project is funded by New Hampshire Homeland Security and Emergency Management (HSEM) through a Pre-Disaster Mitigation Grant from the Federal Emergency Management Agency (FEMA).

Additional funding for this project provided by the NH Department of Transportation through Federal Highways Administration.

MAPPING AND ASSESSMENT OVERVIEW

1. VULNERABILITY ASSESSMENT: SEA LEVEL RISE AND STORM SURGE SCENARIOS

The *Tides to Storms* coastal vulnerability assessment project produced maps and statistical data about the potential impacts to New Hampshire's seven coastal municipalities from sea-level rise and storm surge to infrastructure, critical facilities transportation systems, and natural resources. Three sea-level scenarios were evaluated accounting for a range from the intermediate-low to the highest projected sea-levels at the year 2100.

Figure 1. Sea-Level Rise and Storm Surge Scenarios

Sea-Level Rise (SLR) Scenarios	SLR 1.7 feet	SLR 4.0 feet	SLR 6.3 feet	SLR 1.7 feet + storm surge	SLR 4.0 feet + storm surge	SLR 6.3 feet + storm surge
Sea Level Rise	1.7 feet	4.0 feet	6.3 feet	--	--	--
Sea-level Rise + Storm Surge	--	--	--	1.7 feet + Storm Surge	4.0 feet + Storm Surge	6.3 feet + Storm Surge

Note: Storm surge is the area flooded by the 100-year/1% chance storm event.

Baseline: Flooding from the sea-level rise scenarios and sea-level rise plus storm surge scenarios evaluated in this study were mapped from Mean Higher High Water (MHHW) which is 4.4 feet in the coastal region of NH. ***Mean Higher High Water is the average of the higher high water height of each tidal day observed over the National Tidal Datum Epoch. The National Tidal Datum Epoch (NTDE) refers to the specific 19-year period adopted by the National Ocean Service as the official time segment over which tide observations are taken. The present NTDE is 1983 through 2001 and is considered for revision every 20-25 years (the next revision would be in the 2020-2025 timeframe).***[1]

Storm Surge: ***Storm surge is the rise of water level accompanying intense coastal storm events such a tropical storm, hurricane or Nor'easter, whose height is the difference between the observed level of the sea surface and the level that would have occurred in the absence of the storm event.***[2] Storm surge is mapped using the 100-year/1% chance flood events from the Preliminary Flood Insurance Rate Maps (FIRMs) released by FEMA in 2014. The preliminary FIRM's account for the limit of moderate wave action in coastal areas, however this assessment does not take into account additional flooding and impacts related to more severe wave action, wind action, erosion and other dynamic coastal processes.

Sea-Level Rise Scenarios

The sea-level rise projections used in this study are based on an earlier study completed in 2011 by Wake et al but are similar to a more recent report issued by the NH Coastal Risks and Hazards Commission's Science and Technical Advisory Panel in 2014. As shown in the graphics below, while slightly different than the scenarios cited in the 2014 report, the sea level rise scenarios used in the Tides to Storms assessment yield coverage estimates of flooding that are within the mapping margin of error for the scenarios in both the 2011 and 2014 reports.

[1] NOAA website at http://tidesandcurrents.noaa.gov/datum_options.html
[2] EPA website at http://epa.gov/climatechange/glossary.html

Figures 2 and 3 below document how the scenarios used in this report relate to 2011 by Wake et al but are similar to a more recent report issued by the NH Coastal Risks and Hazards Commission's Science and Technical Advisory Panel in 2014.

	Lower Emissions (B1)		Higher Emissions (A1fi)	
	2050	2100	2050	2100
Current Elevation of MHHW[a,b]	4.43	4.43	4.43	4.43
100-Year Flood Height	7.78	7.78	7.78	7.78
Subsidence	0.012	0.016	0.012	0.016
Eustatic SLR	1.0	2.5	1.7	6.3
Total Stillwater Elevation[a,c]	**13.2**	**14.7**	**13.9**	**18.5**

a - NAVD: North American Vertical Datum of 1988
b - MHHW: Mean Higher High Water at Fort Point, NH
c - Total Stillwater Elevation may not equal total of components due to rounding

Table 13. Preliminary estimates of future 100-year flood Stillwater elevations at the Fort Point Tide gauge under lower and higher emission scenarios (feet relative to NAVD[a]).

Figure 2. 2014 Sea-Level Rise Scenarios (based on greenhouse gas emissions)

Source: Wake CP, E Burakowski, E Kelsey, K Hayhoe, A Stoner, C Watson, E Douglas (2011) *Climate Change in the Piscataqua/Great Bay Region: Past, Present, and Future*. Carbon Solutions New England Report for the Great Bay (New Hampshire) Stewards.

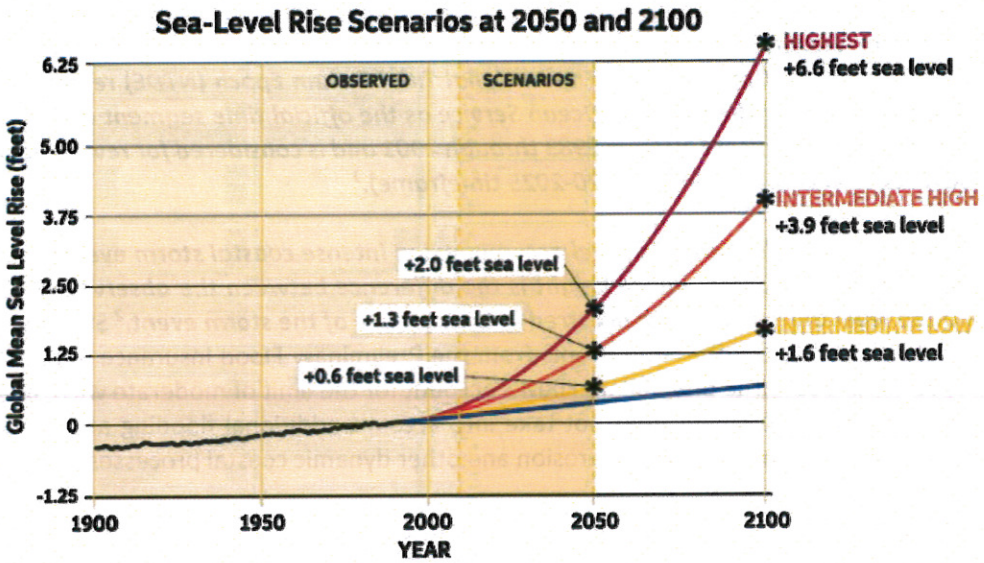


Figure 3. 2014 Sea-Level Rise Scenarios (based on greenhouse gas emissions)

Source: Wake CP, Kirshen P, Huber M, Knuuti K, and Stampone M (2014) *Sea-level Rise, Storm Surges, and Extreme Precipitation in Coastal New Hampshire: Analysis of Past and Projected Future Trends*, prepared by the Science and Technical Advisory Panel for the New Hampshire Coastal Risks and Hazards Commission.

2. ASSETS AND RESOURCES EVALUATED

Table 1 lists the three major categories and a detailed list of the assets and resources evaluated as part of the Tides to Storms vulnerability assessment. The assets and resources evaluated are listed in subsequent tables in this report only if they are affected by one or more of the sea-level rise and/or coastal storm surge scenarios.

TABLE 1. ASSETS AND RESOURCES EVALUATED FOR THE VULNERABILITY ASSESSMENT

CATEGORY	ASSETS AND RESOURCES
INFRASTRUCTURE AND CRITICAL FACILITIES	Municipal Critical Facilities (identified in Hazard Mitigation Plans) NHDOT Transportation Infrastructure State and Municipal Culverts Federal and State Historic Register Properties Other Assets: fire and police stations, graveyards, schools, dams, power stations and substations, public water supply wells, harbors, bridges NHDOT Ten-year and Long Range Plan Projects
ROADWAYS AND TRANSPORTATION ASSETS	State and Local Roadways Regional and Municipal Evacuation Routes Urban Compact Areas
NATURAL RESOURCES	Freshwater and Tidal Wetlands Aquifers and Wellhead Protection Areas Land Conservation Plan for NH's Coastal Watershed – Core Focus Areas Wildlife Action Plan – Tier 1 and Tier 2 habitats

3. MAP DESIGN AND ORGANIZATION

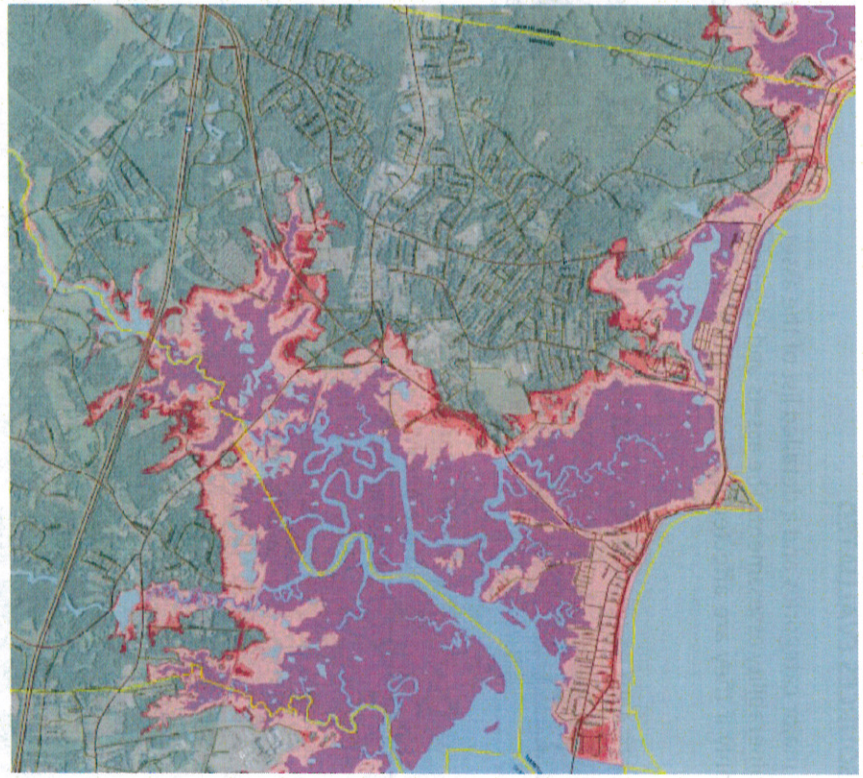
The Tides to Storms map set is comprised of two components: a map depicting the extent of projected flooding from the three sea-level rise scenarios in shades of green, and a map depicting the three sea-level rise plus storm surge scenarios in shades of pink. Each of the asset categorized evaluated are displayed on these two maps. Examples of the two scenario maps are shown on the following page.

Extent of Flooding from Sea-Level Rise and Storm Surge

The green and pink color schemes are arranged from lightest to darkest with increasing flood levels and extents.

Figure 4.
Sea–Level Rise Scenarios 1.7 feet, 4.0 feet and 6.3 feet

Figure 5.
Sea–Level Rise Scenarios 1.7 feet, 4.0 feet and 6.3 feet plus storm surge



Note: Storm surge = 100-year /1% chance flood.

TIDES TO STORMS

PREPARING FOR NEW HAMPSHIRE'S FUTURE COAST

Assessing Risk and Vulnerability of Coastal Communities to Sea Level Rise and Storm Surge

Seabrook - Hampton Falls – Hampton - North Hampton – Rye - New Castle - Portsmouth

TOWN OF HAMPTON, NEW HAMPSHIRE

OVERVIEW

The Town of Hampton is located along the south coastal area of New Hampshire comprising 5,762.9 acres of land and 3,309.9 acres of water and wetlands. With a population of 15,430 (2010), Hampton is the second most populated of the seven coastal municipalities. The coastal portion of Hampton is known for its seasonal recreation and tourism amenities including its beaches, harbors, marinas, parks and hospitality industry. These low lying areas are located within the coastal floodplain making them highly susceptible to flooding from seasonal high tides, coastal storms and sea-level rise.

In 2014, Hampton received a grant from the Piscataqua Region Estuaries Partnership to prepare an application to FEMA's National Flood Insurance Program's (NFIP) Community Rating System (CRS). CRS is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions meeting the three goals of the CRS:

1. Reduce flood damage to insurable property;
2. Strengthen and support the insurance aspects of the NFIP, and
3. Encourage a comprehensive approach to floodplain management.[3]

Vulnerability Assessment Results

Key findings for the Town of Hampton are reported in the table below based on evaluation of the 1.7 feet intermediate-low, 4.0 feet intermediate, and 6.3 feet highest sea-level rise projections at the year 2100 and these sea-level rise projections with the 100-year storm surge.

The data indicates that in Hampton state and local roadways, infrastructure, upland, and freshwater and tidal wetlands are most vulnerable to flooding from sea level rise and coastal storm surge. In Hampton, the 100-year floodplain is highly sensitive to flooding from sea-level rise: 75 percent at 1.7 feet sea-level rise, 86 percent at 4.0 feet sea-level rise, and 87 percent at 6.3 feet sea-level rise.

As shown on ***Maps 5 and 6***, certain segments of state roads Route 1A, Route 101 and Route 1, and the municipal roadway network are particularly sensitive to flooding at the 4.0 sea level rise scenario and current 100-year storm surge. Local roadways and lands behind Route 1A at Hampton Beach and North Beach are highly vulnerable to flooding at the 4.0 foot sea-level rise scenario. Observed flooding of the roadway network also impacts designated evacuation routes as segments of the network both within Hampton and adjacent towns become impacted.

[3] From FEMA's website at http://www.fema.gov/national-flood-insurance-program-community-rating-system

As shown on ***Maps 1 and 2***, low-lying upland areas behind Route 1A and interior fringe areas in the upper portions of the Hampton-Seabrook Estuary are susceptible to moderate flooding from the 1.7 foot sea-level rise scenario and a nearly doubling of acres flooded at the 4.0 foot sea-level rise scenario. *Maps 9 and 10* show the extent of flooding of estuarine and marine wetlands and adjacent freshwater wetlands. Increased daily tidal flooding of tidal marsh systems diminishes their flood storage capacity during storm events, although this may be partially offset by inundation of freshwater wetlands. Models indicate potential for migration of tidal marsh systems inland (see the Natural Resources section for key findings).

TABLE 2. SUMMARY OF ASSESSMENT DATA

Sea-Level Rise (SLR) Scenarios	SLR 1.7 feet	SLR 4.0 feet	SLR 6.3 feet	SLR 1.7 feet + storm surge	SLR 4.0 feet + storm surge	SLR 6.3 feet + storm surge
Infrastructure (# of sites)	18	43	71	76	87	107
Critical Facilities (# of sites)	0	2	2	2	2	2
Roadways (miles)	3.4	13.2	20.6	20.7	26.7	30.8
Upland (acres)	319.4	632.3	897.8	879.7	1,123.5	1,321.2
Freshwater Wetlands (acres)	56.8	79.8	102.7	97.6	121.4	135.5
Tidal Wetlands (acres)	181.7	202.9	223.8	235.6	236.9	237.3
Conserved and Public Lands (acres)	39.5	59.9	87.9	107.9	123.9	150.3
100-year floodplain (acres)	2,393.0	2,738.3	2,810.9	2,836.2	2,865.8	2,872.9
500-year floodplain (acres)	2,393.0	2,739.1	2,886.0	2,910.4	2,941.7	2,948.9

Note: Upland refers to land above mean higher high water (highest tidal extent). 500-year floodplain impacts were calculated based on flooding within the extent of the 500-year floodplain.

The complete detailed vulnerability assessment information and recommendations are provided in the following sections of this report.

SUMMARY OF VULNERABILITY ASSESSMENT RESULTS BY ASSET TYPE

INFRASTRUCTURE AND CRITICAL FACILITIES

Maps 3 and 4 Critical Facilities and Infrastructure shows state and municipal infrastructure types affected by sea-level rise and coastal storm surge flooding. Table 3 reports when specific infrastructure types are affected by each sea-level rise and coastal storm surge scenario.

Culverts are the most frequently impacted type of infrastructure from both projected sea-level rise and coastal storm surge flooding. Of particular concern are those culverts that currently function as freshwater conveyance systems that may be impacted by tidal flooding in the future. Freshwater culverts are not designed for bi-direction flow or to accommodate the volume of water resulting from tidal flooding.

TABLE 3. INFRASTRUCTURE

Sea-Level Rise (SLR) Scenarios	SLR 1.7 feet	SLR 4.0 feet	SLR 6.3 feet	SLR 1.7 feet + storm surge	SLR 4.0 feet + storm surge	SLR 6.3 feet + storm surge
State and Municipal Infrastructure (# of facilities)						
Culverts (state and municipal)	7	24	42	46	53	66
Dams	2	4	4	4	5	7
NH Historic Register	0	1	1	1	1	1
Power stations and Substations	0	1	1	1	1	1
Public Water Supply, Pump Houses, Wells	4	4	6	6	6	8
Bridges	3	3	5	5	6	7
Harbor/Marina	0	1	1	1	1	1
Signs, Lights, Signals, Beacons	0	2	8	7	10	11
Ten Year and Long Range Plan Projects	2	3	3	3	4	4
Total # of Sites	**18**	**43**	**71**	**76**	**87**	**107**

Dams. Dam locations indicted on the Tides to Storms maps are based on data maintained by NHDES Dam Bureau of all dams in the state and represent both active and inactive dams that require regular state inspections, and those dams that are in ruins or exempt from state inspections due to small size and hazard status (most of these dams impound stormwater detention ponds). Additional information in this data layer include the dam name, impounded waterbody, drainage area, impoundment acreage, dam height, dam construction type, ownership (state, municipal, or private), dam status (active, inactive, ruins, exempt), and hazard classification. Dam hazard classifications are a ranking of the potential for the loss of life of property damage if a dam were to fail; there are no dams within the focus area of this project ranks as high hazard dams. Additional information regarding dams can be found at http://des.nh.gov/organization/divisions/water/dam/index.htm.

Definition of a Bridge. Per RSA 234:2, a bridge defines a bridge as a structure, having a clear span of 10 feet or more measured along the center line of the roadway at the elevation of the bridge seats, spanning a watercourse or other opening or obstruction, on a public highway to carry the traffic across, including the substructure, superstructure and approaches to the bridge. This definition includes a combination of culverts constructed to provide drainage for a public highway with an overall combined span of 10 feet or more and a distance between culverts of half the diameter or less of the smallest culvert.

Bridges Evaluated. Bridges identified as "impacted" by sea-level rise and/or storm surge scenarios indicates that the bridge and its infrastructure are located within the extent of the scenario. There has been no analysis to determine if the bridge, or any part of its structure is impacted.

Municipal Critical Facilities

Maps 3 and 4 Critical Facilities and Infrastructure shows the municipal critical facilities affected by sea-level rise and coastal storm surge flooding. Table 4 reports when specific municipal critical facilities are affected by each sea-level rise and coastal storm surge scenario.

Hampton maintains flapper tide gates at the terminus of Tuttle Avenue, Mooring Avenue, Shaw Street, Brown Avenue at the police station, Ashworth Avenue parking lot, and Toppan Lane. The town also maintains a tide gate at Brown Avenue and Highland Avenue intersection. These tide gates are closed during storm events to prevent flooding of adjacent areas (residential areas, roads, a parking lot), stormwater management systems, and wetlands east of Brown Avenue.

The police station and fire station are located on Brown Avenue, an area that is low-lying and already impacted by tidal and storm related flooding. These facilities are impacted at sea-level rise of 4.0 feet and above and by coastal storm surge. The roads and parking areas surrounding these facilities are impacted today by seasonal flooding and storm events including freshwater and tidal flooding.

TABLE 4. MUNICIPAL CRITICAL FACILITIES (# of facilities)

Sea-Level Rise (SLR) Scenarios	SLR 1.7 feet	SLR 4.0 feet	SLR 6.3 feet	SLR 1.7 feet + storm surge	SLR 4.0 feet + storm surge	SLR 6.3 feet + storm surge
Fire Station	0	1	1	1	1	1
Police Station	0	1	1	1	1	1
Wastewater Treatment Plant (see notes below)	0	0	0	0	0	1
Total - Sites	**0**	**2**	**2**	**2**	**2**	**3**

Note: Municipal Critical Facilities as identified in the town's Hazard Mitigation Plan.

During discussions with municipal staff, the town's waste water treatment plant, high school, landfill and transfer station were recognized critical facilities that are impacted by flooding from sea-level rise and storm surge. The school's buildings are not directly impacted the supporting facilities including recreational fields and uplands are impacted. The main structures of the wastewater treatment plant are not impacted however the operations and management offices and contact chlorination tanks are impacted at the lowest sea-level rise scenario of 1.7 feet. Although the landfill is capped and no longer an active facility, there are concerns about potential impacts on water quality from saturation at the base of the landfill from rising groundwater levels as sea-levels rise. The access road of the transfer station, an active municipal facility, is susceptible to flooding at the highest 6.3 foot sea-level rise scenario.

TRANSPORTATION

Maps 5 and 6 Road and Transportation Assets show the state and municipal roadways affected by sea-level rise and coastal storm surge flooding. Table 5 reports the miles of state and local roadways affected by each flood scenario.

TABLE 5. STATE AND MUNICIPAL ROADWAYS AND INFRASTRUCTURE (miles)

Sea-Level Rise (SLR) Scenarios	SLR 1.7 feet	SLR 4.0 feet	SLR 6.3 feet	SLR 1.7 feet + storm surge	SLR 4.0 feet + storm surge	SLR 6.3 feet + storm surge
Roadway Type						
Local	2.8	10.1	14.8	13.9	17.2	19.9
State	0.6	2.8	5.1	6.2	8.5	9.7
US Route	0.0	0.3	0.7	0.6	1.0	1.2
Total Road Miles	**3.4**	**13.2**	**20.6**	**20.7**	**26.7**	**30.8**
Culverts (state and local)	**7**	**24**	**42**	**46**	**53**	**66**
Guardrail	0.2	0.5	0.7	1.6	1.9	2.2
Bike Routes	0.4	1.5	2.9	4.1	5.3	6.2
Evacuation Routes	0.6	2.1	3.4	3.2	4.0	4.8

The municipal roadway network is particularly sensitive to sea-level rise and coastal storm flooding, with impacts increasing sharply at 4.0 feet of sea-level rise flooding. Map ___ shows that most of the local roadway network landward of Route 1A at Hampton Beach, North Beach and the near the North Hampton border and Route 1 south of the Route 101 interchange is impacted at 6.3 feet of sea-level rise.

Culverts are supporting infrastructure for the roadway network that are also highly susceptible to flooding impacts. As sea levels rise in the future, some tidal culverts may become submerged by flooding even at low tide and freshwater culverts will be influenced by tidal flooding, creating hydrologic conditions these drainage systems were not designed for.

NATURAL RESOURCES

Maps 7 and 8 Conservation Areas and ***Map 9 and 10 Wetlands, Aquifers, Wellhead Protection Areas*** show natural resources affected by sea-level rise and coastal storm surge flooding. Table 6 reports the number of acres for each natural resource affected by each sea-level rise and coastal storm surge scenario.

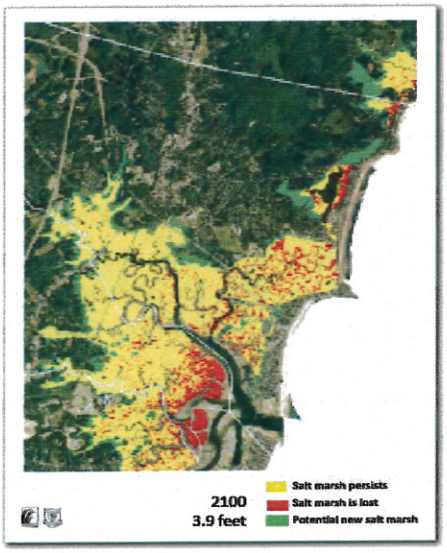
TABLE 6. NATURAL RESOURCES (acres)

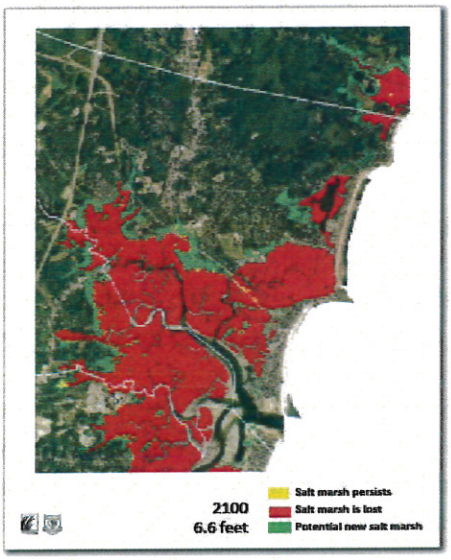
Sea-Level Rise (SLR) Scenarios	SLR 1.7 feet	SLR 4.0 feet	SLR 6.3 feet	SLR 1.7 feet + storm surge	SLR 4.0 feet + storm surge	SLR 6.3 feet + storm surge
Surface Water		32.6	33.7	33.0	34.5	35.0
Stratified Drift Aquifers	6.9	20.0	49.4	42.2	77.0	108.0
Freshwater Wetlands	56.8	79.8	102.7	97.6	121.4	135.5
Tidal Wetlands	181.7	202.9	223.8	235.6	236.9	237.3
Wildlife Action Plan – Tier 1 and Tier 2 habitat	795.3	916.3	995.1	995.6	1,064.3	1,109.1
Coastal Conservation Plan Focus Areas	179.0	281.6	349.1	340.7	391.2	417.9
Conserved and Public Lands	39.5	59.9	87.9	107.9	123.9	150.3
Ag Soils (All Types)	26.0	83.3	153.3	135.4	214.3	286.3

SEA LEVEL AFFECTING MARSHES MODEL (SLAMM): HAMPTON

From: A Natural Choice: Conservation and Restoration Options to Enhance Coastal Resiliency in New Hampshire (NH Fish & Game, DRAFT September 2015)

Currently, 1,497 acres of salt marsh lie within Hampton. At the 3.9 feet sea level rise by 2100 scenario there is potential for 310 acres of new marsh to form and at the 6.6 feet scenario there is potential for 344 acres.





Hampton currently has the most salt marsh in New Hampshire and is the community with the second greatest potential area of new salt marsh. Protecting land where salt marsh can potentially migrate is a good strategy to enhance coastal resiliency. Of the opportunities available, the areas circled above are some of the priority areas for conservation as they are particularly large, currently mainly undeveloped, and are robust as they remain under the highest sea level rise scenario modeled.

There are several opportunites to remove or modify barriers to tidal flow, although not all will be logistically feasible. Potential opportunites are show in blue in the figure above. The Taylor River is one of two large tidal connection restorations in the state

that are particularly robust in terms of likely duration.

Salt marsh, sand dunes and sand beaches provide natural protection against floods and storm surge. Maps 9 and 10 indicate that tidal wetland systems and freshwater wetlands will be heavily impacted by flooding from sea-level rise. Changes in the daily tidal condition and seasonal high tides will affect the stability of these systems and their ability to sustain surface elevations that keep pace with rising water levels.

LAND USE

Maps 1 and 2 Extent of Flooding show upland affected by sea-level rise and coastal storm surge flooding above mean higher high water. Table 7 reports the number of acres of upland affected by each flood scenario.

Low-lying upland areas behind Route 1A and in interior fringe areas of the Hampton-Seabrook Estuary are highly susceptible to flooding even at the lowest 1.7 foot sea-level rise scenario. Much of these uplands are the result of filling tidal marshes decades ago to create developable land. Over time, the underlying marsh sediments and material continue to subside lowering the land elevation. Residents in these low-lying residential neighborhoods behind Ashworth Avenue have expressed interest in the construction of berms to alleviate current nuisance flooding at highest tides and prevent flooding during coastal storms, however no further discussion has taken place about the extent of structures needed and their construction cost.

TABLE 7. UPLAND (acres)

Sea-Level Rise (SLR) Scenarios	SLR 1.7 feet	SLR 4.0 feet	SLR 6.3 feet	SLR 1.7 feet + storm surge	SLR 4.0 feet + storm surge	SLR 6.3 feet + storm surge
Acres	319.4	632.3	897.8	879.7	1,123.5	1,321.2
% Upland	3.9	7.7	10.9	10.7	13.6	16.0

Total Upland in Hampton = 8,257.7 acres. Upland refers to land above mean higher high water (highest tidal extent).

Land Use/Land Cover

Map 14 Regional Land Use shows land use/land cover types affected by sea-level rise and coastal storm surge flooding. Table 8 reports the number of acres for each land use/land cover type affected by each flood scenario.

The land use types most impacted by both sea-level rise and coastal storm surge flooding are residential development and wetland systems. The majority of development at North Beach and Hampton and in interior fringe areas of the Hampton-Seabrook Estuary are residential structures, both permanent owner-occupied dwellings and seasonal rental units. Although less severely impacted, commercial development at North Beach and Hampton Beach are susceptible to flooding from the 4.0 foot sea-level rise scenario and by coastal storms. Forested areas are mainly impacted in the interior fringe areas of the Hampton-Seabrook Estuary at the 4.0 foot sea-level rise scenario and by coastal storms. Town residents have

observed impacts to trees in the areas as seasonal tidal flooding reaches into upland areas and freshwater wetlands.

TABLE 8. LAND USE/LAND COVER (acres)

Sea-Level Rise (SLR) Scenarios	SLR 1.7 feet	SLR 4.0 feet	SLR 6.3 feet	SLR 1.7 feet + storm surge	SLR 4.0 feet + storm surge	SLR 6.3 feet + storm surge
Active Agricultural	0.6	2.9	6.3	5.6	8.8	10.3
Aux Transportation	0.6	5.9	8.7	13.9	17.3	21.8
Farmsteads	0.0	0.0	0.0	0.0	0.0	0.0
Forested	13.5	54.8	97.9	89.2	135.6	176.1
Industrial/Commercial	5.3	29.9	49.5	46.0	63.3	79.4
Mixed Urban	0.0	0.6	1.6	1.5	2.6	2.8
Other/Idle	11.4	32.1	64.5	79.6	94.9	104.0
Playing fields / Recreation	10.6	19.4	26.7	27.2	32.6	49.5
Railroad	0.0	0.0	0.3	0.1	0.5	0.7
Residential	50.9	179.6	287.1	269.8	365.3	431.6
Transportation	6.0	34.7	57.9	62.2	81.5	97.5
Utilities	2.0	6.2	14.1	12.0	20.8	27.2
Water	1.6	33.4	34.7	33.7	35.5	35.7
Fresh/Tidal Wetlands	233.4	280.9	309.1	303.1	330.7	351.5

Note: Auxiliary Transportation refers to small pieces of land adjacent to transportation assets.

Zoning

Map 13 Regional Zoning shows local zoning districts affected by sea-level rise and coastal storm surge flooding. Table 9 reports the acres within each zoning district affected by each flood scenario. Zoning districts are superimposed over land use and land cover.

Zoning districts are superimposed over land use and land cover reported in Table 8. Flood impacts in existing zoning districts follows a similar pattern to land use impacts by category with single-family and high-density residential and commercial development showing sensitivity at the lowest 1.7 foot sea-level rise scenario and all storm surge scenarios.

TABLE 9. ZONING DISTRICTS (acres)

Sea-Level Rise (SLR) Scenarios	SLR 1.7 feet	SLR 4.0 feet	SLR 6.3 feet	SLR 1.7 feet + storm surge	SLR 4.0 feet + storm surge	SLR 6.3 feet + storm surge
Commercial	43.4	123.5	186.5	197.0	232.0	245.5
General/Single Zone	83.7	172.9	226.0	215.9	268.2	331.3
Industrial	5.3	11.4	29.2	24.2	54.1	88.9
Residential - High Density	202.8	367.1	510.9	500.9	628.5	715.5
Residential - Med Density	0.3	4.5	4.7	4.6	4.9	5.1

Parcels and Assessed Value

Table 10 reports the number of parcels affected by for each of the six scenarios evaluated and the aggregated assessed value of these parcels. The degree to which the parcel and any development on the parcel is affected by sea-level rise or storm related flooding was not analyzed. Affected parcels were identified based on their location either partially or fully within the extent of the scenarios evaluated. The data may include a number of high value parcels under state and municipal ownership.

For Hampton, the largest increase in the number of affected parcels is the extent of flooding from 1.7 feet of sea-level rise to 4.0 feet of sea-level rise. There is a 76.5 percent increase in the number of affected parcels and nearly a $288 million increase in assessed value from the 1.7 feet to the 4.0 feet sea-level rise scenarios. There is a 31 percent increase in the number of affected parcels and approximately a $300 million increase in assessed value from the 4.0 feet to the 6.3 feet sea-level rise scenarios

TABLE 10. PARCELS AND ASSESSED VALUE BY SCENARIO

Sea-Level Rise (SLR) Scenarios	Number of Parcels Affected by scenario	Aggregate Value of Affected Parcels
1.7 feet SLR	1,149	$414,879,900
4.0 feet SLR	2,028	$703,144,400
6.3 feet SLR	2,664	$1,005,790,500
1.7 feet SLR + storm surge	2,607	$1,003,687,600
4.0 feet SLR + storm surge	2,898	$1,116,615,500
6.3 feet SLR + storm surge	3,065	$1,188,484,400

FEMA Flood Hazard Areas

Maps 23 and 24 Preliminary FEMA Flood Hazard Areas show areas within the 100-year and 500-year floodplain affected by sea-level rise and coastal storm surge flooding. Table 11 reports the acreage within the current 100-year and 500-year floodplains affected by each flood scenario.

The three sea-level rise scenarios generally fall within the current 100-year floodplain, extending beyond into the 500-year floodplain in certain areas. From a floodplain management perspective, creating more resilient development within the current 100-year floodplain will provide protection against flood impacts from long term sea level rise.

In Hampton, the 100-year floodplain is highly sensitive to flooding from sea-level rise: 75 percent at 1.7 feet sea-level rise, 86 percent at 4.0 feet sea-level rise, and 87 percent at 6.3 feet sea-level rise.

TABLE 11. FEMA FLOOD HAZARD AREAS (acres)

Sea-Level Rise (SLR) Scenarios	SLR 1.7 feet	SLR 4.0 feet	SLR 6.3 feet	SLR 1.7 feet + storm surge	SLR 4.0 feet + storm surge	SLR 6.3 feet + storm surge
100-year floodplain	**2,393.0**	**2,738.3**	**2,810.9**	**2,836.2**	**2,865.8**	**2,872.9**
100-year floodplain - Coastal Region	8,179.5	9,361.1	9,593.2	9,639.0	9,765.8	9,818.0
500-year floodplain	**2,393.0**	**2,739.1**	**2,886.0**	**2,910.4**	**2,941.7**	**2,948.9**
100-year floodplain - Coastal Region	8,180.6	9,368.4	9,837.6	9,879.8	10,015.3	10,069.5

Area of the 100-year floodplain = 3,168.0 acres. Area of the 500-year floodplain = 3,301.0 acres.
Floodplain assessment based on Preliminary Flood Insurance Rate Maps (FIRMs) released by FEMA in 2014.

ISSUES AND CONSIDERATIONS

The following issues and considerations were identified during project meetings with municipal staff and land use board and commission members.

- Improvements to the state roadway network (elevating, enlarging culvert and bridges) may affect local connector roads, driveway access points and connecting infrastructure and utilities.

- Although roadways, buildings and infrastructure can be protected by raising them above projected sea-level rise elevations, supporting land and land based uses may be impacted by daily tidal flooding from projected sea-level rise.

- Planning for long term sea-level rise can be integrated with existing regulatory and management frameworks for the current 100-year floodplain.

- Ownership of transportation infrastructure and assets by multiple state agencies (roadways, culverts, state parks, parking areas) and town responsibility for management of assets (sidewalks, roads in urban compact areas) creates complexity in comprehensively managing these systems and implementing climate adaptation strategies.

- Flooding from sea-level rise and coastal storm surge impacting the state and local roadway network adjacent to the Route 1A and Route 1 south of the Route 101 interchange disrupt the designated evacuation network in Hampton and connections to evacuation routes in adjacent towns.

- Providing information about potential flood hazards to businesses and residents, and early notification of flood risk during a coastal storm event would enhance public safety and preparedness.

- Meadow Pond lacks storage capacity to accommodate tidal flooding and stormwater drainage during most storm events.

- Long term infrastructure management would benefit from an analysis of the costs necessary to improve roads and drainage infrastructure to withstand projected sea-level rise elevations at 2050 and 2100.

RECOMMENDATIONS

The following recommendations are short-term climate adaptation actions that can be included in the town's Natural Hazards Mitigation Plans, Master Plan and other planning and policy documents. These actions are focused on strengthening land use development standards, resource protection, municipal policy and plans, and public support to create more resilient development, infrastructure and natural systems. *Refer to Appendix B for an expanded list of climate adaptation strategies.*

REGULATORY

R1 - Elevate Structures 2 feet Above Base Flood Elevation. Adopt standards in floodplain zoning and/or Site Plan Review and Subdivision Regulations that require all new development and redevelopment to be elevated 2 feet above the base flood elevation. Two feet of additional elevation will ensure that structures are protected from flooding based on the highest sea-level rise projection of 2 feet by 2050.

R2 - Coastal Flood Hazard Overlay District. Adopt in the town's zoning ordinance a Coastal Flood Hazard Overlay District that includes performance based standards that protect against flood impacts from sea-level rise and coastal storm surge. Establish the overlay district boundaries based on current flood hazard areas on FEMA Flood Insurance Rate Maps and projected future high risk flood areas mapped by the Tides to Storms Vulnerability Assessment. (Also see similar recommendation in the Community Outreach and Engagement section below.)

R3 - Coastal Buffers and Tidal Marshes. Adopt buffers and setbacks that adequately separate development and infrastructure from tidal wetlands, freshwater wetlands and surface waters to sustain flood storage capacity, and allow for inland migration of tidal marsh systems and conversion of freshwater systems to tidal systems to accommodate projected changes in sea-levels.

PLANNING AND POLICY

P1 - Natural Hazards Mitigation Plan. Incorporate the vulnerability assessment information and recommendations from the Tides to Storms Hampton profile report in the town's 2015/2016 Natural Hazards Mitigation Plan update. Continue revising and updating the assessment information and climate adaptation recommendations in future updates of the Plan.

P2 - Master Plan Coastal Hazards Chapter. Adopt a Coastal Hazards Chapter in the town's Master Plan that incorporates information and recommendations from the Tides to Storms Vulnerability Assessment Profile for Hampton.

P3 - FEMA Community Rating System. Support implementation of climate adaptation actions that will qualify the town for FEMA's Community Rating System (CRS) program or increase its rating in the CRS program. Climate adaptation implementation includes planning and policy, regulatory, non-regulatory, and community outreach and engagement activities.

P4 - Capital Infrastructure and Investments. Incorporate consideration of impacts from sea-level rise and coastal storm surge flooding in current and future capital infrastructure projects. Incorporate the Tides to Storms vulnerability assessment information into infrastructure management plans and capital

improvement plans. Evaluate the extent of sea-level rise and storm surge flooding on individual facilities (e.g. wastewater treatment plant, transfer station, high school).

P5 - Land Conservation. Land conservation offers the greatest opportunities to provide for adaptation to the effects of sea-level rise and coastal storm flooding and climate change impacts.

- Adopt a targeted scoring framework or incorporate new scoring criteria into existing land conservation prioritization efforts that consider climate adaptation benefits when evaluating land for conservation purposes.
- Increase funding and resources for land conservation, land management programs, and land stewardship activities. (Note: Land conservation scores very high as an activity in the FEMA Community Rating System program.)
- Support retreat from high risk areas by buying properties and restoring them to a natural condition.

P6 - Wetlands Mitigation Site Inventory. Identify and inventory lands where protection of tidal and freshwater wetlands would provide tangible benefits to protect against flooding, and restoration opportunities to remove barriers to tidal function and marsh and migration. This inventory will allow the town to pre-identify and prioritize sites that can be permanently preserved as a mitigation strategy for wetland impacts from development in high risk coastal areas.

P7 - Evacuation Planning. Prepare evacuation plans and coordinate these plans with towns in the coastal region to implement timely and comprehensive planning and notification for coastal storm events. Mark evacuation routes with signage and communicate these routes to the public with information on the town's website and printed maps.

COMMUNITY OUTREACH AND ENGAGEMENT

O1 - Seabrook-Hamptons Estuaries Alliance. The Seabrook-Hamptons Estuaries Alliance (SHEA) is a voluntary collaborative advocacy group consisting of members from Hampton, Hampton Falls and Seabrook. The group's focus is to: 1) pursue activities that improve the resilience of natural systems, infrastructure and development to the impacts of climate change; and 2) facilitate communication and cooperation among the three towns, especially in regard to research, programs and other efforts designed to help preserve, protect, and strengthen the Estuary. SHEA can assist the town with outreach, planning and regulatory activities involving climate adaptation implementation.

- Continue participating in and supporting the Seabrook-Hamptons Estuaries Alliance.
- Continue SHEA's and the town's partnership with NH Coastal Adaptation Workgroup in climate adaptation activities that facilitate, coordinate, provide technical information, and convene public outreach events for the Estuary towns.

O2 - Implement FEMA's High Water Mark Initiative. Communities implement the High Water Mark Initiative by providing information on past floods, such as documenting high water marks in public places, and posting maps and photographs of past floods on their websites. High water marks can be displayed on public buildings or on permanently installed markers.

O3 - Coastal Flood Hazard Overlay District. Use the Coastal Flood Hazard Overlay District as a tool to inform property owners of existing and future risks and hazards based on projected sea-level rise and coastal storm surge flooding.

O4 - Living Shorelines and Landscaping. Maintaining natural shorelines is an effective way to preserve the functions of shoreline systems (marshes, dunes, estuaries) in providing valuable services including flood storage, recreational areas, and commercial harvesting of fish and shellfish.

- Provide information to property owners about living shorelines and the importance of retaining the functions of natural shorelines, and implementing landscaping best practices.
- Implement living shorelines projects on town lands to demonstrate best practices, and the benefits and effectiveness of living shorelines approaches.

Refer to Hampton's Natural Hazards Mitigation Plan for additional recommendations for outreach and engagement activities.

APPENDIX A – MAP SET

Map 1 Extent of Projected Tidal Flooding - SLR 1.7', 4.0' and 6.3'
Map 2 Extent of Projected Tidal Flooding - SLR + Storm Surge
Map 3 Critical Facilities and Infrastructure - SLR 1.7', 4.0' and 6.3'
Map 4 Critical Facilities and Infrastructure - SLR + Storm Surge
Map 5 Roads and Transportation Assets - SLR 1.7', 4.0' and 6.3'
Map 6 Roads and Transportation Assets - SLR + Storm Surge
Map 7 Existing and Recommended Conservation Areas - SLR 1.7', 4.0' and 6.3'
Map 8 Existing and Recommended Conservation Areas - SLR + Storm Surge
Map 9 Wetlands, Aquifers, Wellhead Protection Area - SLR 1.7', 4.0' and 6.3'
Map 10 Wetlands, Aquifers, Wellhead Protection Area - SLR + Storm Surge
Break in map numbering.
Map 13 Zoning Districts - SLR 1.7', 4.0' and 6.3'
Map 14 Land Use/Land Cover - SLR 1.7', 4.0' and 6.3'
Break in map numbering.
Map 17 Depth of Flooding - Sea-Level Rise 1.7'
Map 18 Depth of Flooding – Sea-Level Rise 4.0'
Map 19 Depth of Flooding – Sea-Level Rise 6.3'
Map 20 Depth of Flooding – Sea-Level Rise 1.7' + Storm Surge
Map 21 Depth of Flooding - Sea-Level Rise 4.0' + Storm Surge
Map 22 Depth of Flooding – Sea-Level Rise 6.3' + Storm Surge
Map 23 Preliminary FEMA Flood Hazard Areas - SLR 1.7', 4.0' and 6.3'
Map 224 Preliminary FEMA Flood Hazard Areas - SLR + Storm Surge

APPENDIX E
Essential Facilities Report
(Dr. Klotz 2002)
Executive Summary

Hampton's eight essential facilities, those that absolutely must be functional immediately after a natural or man-made hazard event, consist of the Hampton Police Station, Hampton Beach Fire Station, Hampton Uptown Fire House, the four Elementary Schools and the Winnacunnet Cooperative School District Campus. Many other facilities and infrastructure are "critical" for its residents and the operation of a municipality, but "essential" meets the very first, basic needs of populations for emergency services, protection, care and shelter immediately after a disaster event. Chapter 1 describes the objectives, scope, and process that was followed for this study.

Each of Hampton's essential facilities was visited and the building's physical data collected and correct geographic location determined because existing, generally available, databases of such data is non-existent, inaccurate or has missing data elements. Chapter 2 contains descriptions and digital photographs of the buildings and comments on observed conditions. All digital photographs taken during visits to the essential facilities are available on the Hampton Report CD. The information collected was then entered into the computer program HAZUS99-SR1 (Hazards US), the Federal Emergency Management Agency (FEMA) sponsored facility evaluation program. This program provides probabilities of various damage states and estimates of their functionality following a natural hazard event. The program is currently limited to evaluating the effects of earthquakes, but HAZUS is in the process of being extended to the natural hazards of wind and flood. The initial versions of these extensions are expected to be available in early 2003 and the data collected for Hampton's essential facilities should make it possible to rerun the analyses considering these events at that time.

For the present study, four earthquake scenarios were developed that are based on historical earthquakes in the New England/New Hampshire region. A fifth, much smaller, very commonly occurring earthquake was developed that also simulates a small explosion. All of these earthquake scenarios, except for the earthquake located over the New Hampshire border in Canada, will result in some damage to the essential facilities in Hampton. However, the estimated functionalities of Hampton's essential facilities are not acceptable if the Northfield, NH earthquake of 1638 or if the Cape Ann, MA earthquakes of 1765 should reoccur. Of these two scenarios, the Cape Ann earthquake resulted in the most damage and reduced functionality of the essential facilities.

For this scenario, emergency facilities ranged from 83% to 99% functionality despite a 24% to 60% estimate of at least slight, 10% to 38% at least moderate and 2% to 12% at least extensive structural damage. Non-structural damage

estimates were similar. The results ranged from 28 to 61% of at least slight, 5 to 23% at least moderate and 0 to 4% at least extensive for acceleration sensitive components, whereas drift sensitive components were estimated at 21 to 56% of at least slight, 7 to 30% of at least moderate and 0 to 5% extensive.

The school facilities, however, did not fair well at all. Functionality ranged from 52% to a high of 58%. They are not really functional. Structural damage estimates ranged from 19 to 44% of at least slight, from 9 to 26% of at least moderate and from 0 to 7% of at least extensive damage. The wide range of structural building types resulted in a wide spread of estimated damage values. In general, the light steel frame of the Technology Building and the Mobile Classrooms on the Winnacunnet Campus had the largest estimated damages. The functionality was also heavily impacted by the results of the non-structural damage estimates. The acceleration sensitive components damage estimates ranged from 16 to 29% of at least slight and 2 to 6% of at least moderate damage. The drift sensitive components showed a wider range of damage estimates; from 15 to 36% of at least slight, 5 to 15% of at least moderate and 0 to 1% of at least extensive. Again, higher probabilities of non-structural damage were estimated for the Technology and Mobile Classroom buildings on the Winnacunnet Campus

The study of the effects of a magnitude 5.0 occurring about 4 miles from the schools (approximately equivalent to a magnitude 3.4 occurring at the schools that in turn simulates the shaking from about ¾ of a ton of TNT) drove the estimated functionality of the Schools down to an estimated 16 to17% after the event. In other words, the schools would not be useable! The other essential facilities were minimally effected because of the distance from the event. However, because the exact location of such an event is unknown, the results of the school facilities can be considered to also apply to those facilities.

In this case, structural damage is estimated to range from 9 to 25% for at least slight damage to 1 to 10% at least moderate damage, with the Technology Building experiencing 2% extensive damage. It is, however, the non-structural damage estimates for acceleration sensitive components which are seriously impacting the functionality of the schools. Acceleration sensitive components are expected to experience 37 to 54% slight damage, 8 to 22% moderate and 1 to 2% extensive damage. Drift sensitive components show lesser probabilities. For this class of non-structural components, the range is from 7 to 20% at least slight damage and 2 to 6% for moderate damage. This again shows that school functionality can be improved by mitigation of non-structural components although it will likely take structural mitigation actions to improve the overall functionality estimates.

Given some of the observed internal nonstructural and contents conditions at the essential facilities it is questioned if the functionality will be as high as the estimates developed by HAZUS. In most of the essential facilities any flat surface served to hold books, papers, magazines, files, computers, monitors, desktop equipment, ornamental objects, etc. in random stacking one upon another and/or without any

restraints. Add to that unrestrained overhead lights, ceiling tiles, piping, ductwork, etc. and there is a nonstructural disaster waiting to happen with any shaking event. The net result is that the essential facilities could be part of the problem, requiring assistance from a shaking event, rather then being part of the solution.

Discussions of damage states and their descriptions are provided in Chapter 4 and information on running the HAZUS analyses scenarios on the Hampton Report CD-ROM is in Chapter 5.

Estimates of the cost of damages, resulting from reoccurrence of the 1765 Cape Ann earthquake or from a magnitude 3.4 near the schools, are discussed in Chapter 6. Based on 1994 dollars, it is estimated there would be over half a million dollars in structural, nonstructural, and contents losses for the essential facilities from reoccurrence of a 1765 Cape Ann earthquake. The magnitude 5.0 event, which simulates the ¾ ton blast located near the schools, would cause major nonstructural and contents losses in all essential facilities because of the rapid shaking that would occur. In this case, the estimated losses, in 1994 dollars, for just the nonstructural and contents for the schools is $949,000 and $133,000 for the police and fire stations.

There are major opportunities to correct, mitigate, the observed problems. Consideration of mitigation measures is discussed in Chapter 8, illustrated in Appendix J, and further concluded and recommended in Chapter 9. The bottom line leading to mitigation is in the hands of facility owners. Mitigation, as discussed in Chapter 9, starts if ordered and supported by owners and then proceeds if the facility mangers take the lead for action by building and maintenance staff. Mitigation is best accomplished when supported by all the building stakeholders, including office staff and maintenance personnel. A major message of Chapters 8 and 9 is that mitigation does not have to be an all or nothing process. As discussed in these chapters, mitigation should be part of the normal maintenance and capital improvement process. The incorporation of mitigation into the maintenance planning process, as well as in any capital expenditure planning, over a relatively short few years, can accomplish major improvements in facility behavior and estimated functionality.

The early, written, records of earthquakes in New England were made by local ministers and it is a fascinating exercise to read them. It is also thought provoking. In considering mitigation, to quote the Reverend John Cotton's sermon in Newton, MA on November 13, 1727, following the magnitude 5.6 earthquake on November 9, 1727 in Newbury, MA, we must not be, "... Tho' too remarkably backward and slothful in duty before.", to prepare for coming seismic or other shaking events.

APPENDIX F

Approval Letter from FEMA