Town of Westhampton

Natural Hazards Mitigation Plan Update

Adopted by the Westhampton Select Board on January 9, 2017

Prepared by:
Westhampton Hazard Mitigation Planning Committee
and
The Pioneer Valley Planning Commission
60 Congress Street First Floor
Springfield MA 01104
(413) 781-6045
www.pvpc.org

This project was funded by a grant received from the Massachusetts Emergency Management Agency (MEMA) and the Massachusetts Department of Conservation Services (formerly the Department of Environmental Management)

Acknowledgements

Westhampton Hazard Mitigation Committee

Thank you to the members of the Westhampton Hazard Mitigation Committee who reviewed and updated this plan:

Chris Norris, Fire Chief and Emergency Management Director

David Blakesley, Highway Superintendent and Board of Health

Ginny Curtis, Triad Senior Council "Safety"

Thank you also to the Massachusetts Emergency Management Agency (MEMA) for developing the Commonwealth of Massachusetts Natural Hazards Mitigation Plan (www.state.ma.us/dem/programs/mitigate/index.htm) which served as a model for this update. In addition, special thanks are extended to the staff of the Pioneer Valley Planning Commission for professional services, process facilitation and preparation of this document.

The Pioneer Valley Planning Commission

Patty Gambarini, Senior Environmental Planner

Catherine Ratté, Principal Planner

Jake Dolinger, Planner and GIS Specialist

Cover photo: David Majercik

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1: PLANNING PROCESS

1.1 Introduction

The Federal Emergency Management Agency (FEMA) and the Massachusetts Emergency Management Agency (MEMA) define natural hazard mitigation as any sustained action taken to reduce or eliminate long-term risk to people and property from natural hazards such as flooding, storms, high winds, hurricanes, wildfires, earthquakes, and similar occurrences. Mitigation efforts undertaken by communities help minimize damages to public buildings and infrastructure, such as water supplies, sewers and utility transmission lines, as well as private property and natural, cultural and historic resources.

Planning efforts, like the one undertaken by the Town of Westhampton in collaboration with the Pioneer Valley Planning Commission (PVPC), make mitigation a proactive process. Pre-disaster planning emphasizes actions that can be taken before a natural disaster occurs. Future property damage and loss of life can be reduced or prevented by a mitigation program that addresses the unique geography, demography, economy, and land use of a community within the context of each of the specific potential natural hazards that may threaten it.

Preparing and updating every five years, a local natural hazard mitigation plan before a disaster happens can save the community money and will facilitate post-disaster funding. Costly repairs or replacement of buildings and infrastructure, as well as the high cost of providing emergency services and rescue/recovery operations, can be avoided or significantly lessened if a community implements the mitigation measures detailed in the Plan.

FEMA requires that a community adopt a pre-disaster mitigation plan as a condition for mitigation funding. For example, the Hazard Mitigation Grant Program (HMGP), the Flood Mitigation Assistance Program (FMA), and the Pre-Disaster Mitigation Program are programs with this requirement.

This plan is an update to the approved 2009 plan. As there have not been any major development changes in Westhampton since the time of the earlier plan, this current plan primarily serves to update and affirm the work of Town staff, volunteers, and residents to implement the prioritized mitigation strategies.

1.2 Hazard Mitigation Committee

Updating of the Town of Westhampton's Hazard Mitigation Plan involved a three-member committee:

David Blakesley, Highway Superintendent and Board of Health

Ginny Curtis, TRIAD Senior Council “Safety”

Chris Norris, Fire Chief and Emergency Management Director

The hazard mitigation planning process for the Town included the following tasks:

- Reviewing and incorporating existing local plans and other information.
- Identifying the natural hazards that may impact the community.
- Conducting a Vulnerability/Risk Assessment to identify the infrastructure at the highest risk for being damaged by the identified natural hazards, particularly flooding.
- Identifying and assessing the policies, programs, and regulations the community is currently implementing to protect against future disaster damages.
- Identifying deficiencies in the current strategies and establishing goals for updating, revising or adopting new strategies.
- Adopting and implementing the final Natural Hazards Mitigation Plan.

The key product of this process was the development of a list of prioritized new mitigation strategies to be implemented during the next five years.

Meetings

Meetings of the Hazard Mitigation Planning Committee were held on the dates and at the locations listed below. Agendas and sign in sheets for each meeting are included in Appendix C.

Committee Meeting 1: January 26, 2016 at 9 a.m.
Overview of hazard mitigation planning, identification and organizing of the committee members, meeting schedule, discussion of hazard identification and risk assessment.

Committee Meeting 2: February 2, 2016 at 9:30 a.m.
Continued discussion of hazard identification and risk assessment; identification of critical facilities.

Committee Meeting 3: February 24, 2016 at 9 a.m.
Review critical facilities, and discussion of potential mitigation strategies to be implemented.

Committee Meeting 4: March 7, 2016 at 6:30 p.m.
Review mitigation strategies and implementation strategies.

Committee Meeting 5: March 16, 2016 at 7:30
Review and finalize priority of implementation strategies; discuss plan adoption process and procedures for ongoing maintenance of the plan.

1.3 Participation by Stakeholders

The public and surrounding communities had the opportunity to participate in the Town of Westhampton's natural hazards planning process via a variety of means.

Local and regional agencies involved in hazard mitigation activities and surrounding community engagement and input

The Pioneer Valley Planning Commission is a regional planning agency for 43 towns and cities in Massachusetts' Hampden and Hampshire Counties. PVPC regularly engages with the Town of Westhampton as part of its regional planning efforts, which include the following:

- Developing the Pioneer Valley Regional Land Use Plan, Valley Vision 2, which advocates for sustainable land use throughout the region and consideration for the impact of flooding and other natural hazards on development.

- Developing the Pioneer Valley Climate Action and Clean Energy Plan, which assesses the impact that climate change will have on the region and recommends strategies for mitigation that can be implemented by local municipalities and businesses.

- Collaborating with state agencies, such as the Department of Conservation and Recreation, to maintain inventories of critical infrastructure throughout the region.

All of these PVPC initiatives considered the impact of natural hazards on the region and strategies for reducing their impact to people and property through hazard mitigation activities. The facilitation of the Westhampton Hazard Mitigation Plan by PVPC ensured that the information from these plans was incorporated into the Hazard Mitigation Planning process.

In addition, the Pioneer Valley Planning Commission is actively involved in the Western Region Homeland Security Advisory Council (WRHSAC). WHRSAC, which includes representatives from Western Massachusetts municipalities, Fire Departments, Public Works Departments, Police Departments, area hospitals and regional transit from throughout the four counties of western Massachusetts, is responsible for allocating emergency preparedness funding from the US Department of Homeland Security. The representatives of these disciplines who serve on the WRHSAC are charged with sharing the information discussed at meetings with their colleagues at their regular meetings. PVPC attends all WRHSAC meetings and all WRHSAC members are aware of the fact that Westhampton was updating its Hazard Mitigation plan and that there were opportunities to provide input during the planning process. Meetings of WRHSAC regularly involve discussion about how to improve emergency preparedness in western Massachusetts, and hazard mitigation activities are included in this discussion.

For the update of this Hazard Mitigation Plan, PVPC provided feedback from WRHSAC on regional mitigation activities and natural hazards pertaining to Westhampton. This was the method through which WRHSAC was engaged in the planning process.

In addition, PVPC staff regularly present to their Executive Committee and Commission (representatives from the 43 cities and towns that comprise the Pioneer Valley, when new projects are launched and when funding opportunities are available). As result, all the communities in the region were informed of Westhampton's Hazard Mitigation Plan update process and encouraged to comment. Additionally, surrounding communities were further notified as described below.

PVPC staff included a summary article on the status of Hazard Mitigation planning in the region in the quarterly Regional Reporter that is mailed to area Chambers of Commerce, all member municipalities, area colleges and universities and other key stakeholders in the region. In this way, businesses, educational institutions and other key stakeholders were educated about and informed of Westhampton's hazard mitigation planning work.

To ensure that local councils and boards in town were aware and involved in the Hazard Mitigation planning process, the Hazard Mitigation Planning Committee notified the following boards of the plan update and the public meetings: Westhampton Open Space Committee, Triad Senior Citizen Safety Council, Westhampton Council on Aging, Westhampton Zoning Board of Appeals, Westhampton Selectboard via Phil Dowling, Westhampton Fire Department, Westhampton Police Department, the town Building Inspector and the town Highway Superintendent.

Participation by the Public, Businesses, and Neighboring Communities

The PVPC has worked with all its member cities and towns since 2005 to prepare and update Hazard Mitigation plans. The PVPC is governed by a Commission of representatives from the 43 cities and towns that comprise the Pioneer Valley, including Westhampton. PVPC staff secured approval from the Executive Committee of the Commission before launching any new funded initiatives, and notes from these meetings are shared with the Commission. As a result, neighboring communities of Westhampton have been kept up to date throughout the process to update Westhampton Hazard Mitigation plan. Furthermore, press releases invited participation by neighboring communities and the Town of Westhampton directly e-mailed Hampshire County Fire Chiefs and Hampshire County Board of Selectmen members to invite comments on the final draft plan. These groups included representatives from the surrounding towns of Chesterfield, Williamsburg, Northampton, Easthampton, Southampton and Huntington. (See copy of these e-mail in Appendix C) PVPC staff and members of the Westhampton Natural Hazards Mitigation Committee did not receive any comments or input from neighboring communities during the Hazard Mitigation plan update process.

The public in Westhampton was informed of the Town's plans to update their Hazard Mitigation plan through official town postings, articles in the local paper, and on social media.

- In August 2015, PVPC sent a media release to all area media outlets announcing the Commission's application to FEMA to secure funding to update existing and prepare new Hazard Mitigation plans for ten communities, including Westhampton.

- On January 28, 2016, the Town of Westhampton sent a press release to key area media outlets, including The Country Journal, announcing that the hazard mitigation planning process in Westhampton was underway. The release also announced the two public planning sessions as part of plan development to be held on: February 2 and March 16, 2016. The press release announcing the two public meetings was also include in the Belltower, the town news publication, which is mailed to all houses in town. PVPC also posted this press release on its website and social media pages.

- Notice of both public meetings was also posted at Town Hall in compliance with the Commonwealth of Massachusetts' open meeting law. Appendix C includes documentation of the press releases and any resulting coverage and posted notices.

- Furthermore, the Town issued a press release on March 9, 2016 to key area media outlets promoting attendance at the final public meeting and notifying the public that a draft of the Westhampton Hazard Mitigation Plan had had been placed on the Town website. The release also noted the availability of hard copies of the draft plan at Town Hall. It encouraged all residents, businesses and other concerned parties of

Westhampton to comment on the plan by e-mailing or calling the Town Emergency Management Director or the staff contacts at PVPC listed in the press releases.

- The press release and a screen shot of Westhampton's website showing the link to the press release can be found in Appendix C. A list of organizations, including media outlets, town officials, and local businesses, that were sent the two press releases is also provided in Appendix C.

Approximately three community members attended the two public meetings. Their comments were minimal, but they were interested in learning about the process and how the town intended to move forward.

Public participation will be a critical component of the Hazard Mitigation Plan maintenance process, as discussed in Chapter 6: Plan Review, Evaluation, Implementation, and Adoption.

1.4 Local Adoption

In 2014, the Westhampton Board of Selectmen agreed to collaborate with the PVPC to seek funds from FEMA (via MEMA) to update Westhampton 's Hazard Mitigation plan. PVPC was awarded funding in 2015. Updating Westhampton 's plan was part of a multi-community plan update funding award. Work on Westhampton 's plan update began in January 2016. After the plan was provisionally approved by FEMA, the Board of Selectmen adopted the updated plan on January 9, 2017.

2: LOCAL PROFILE

2.1 Community Setting

Geography

Westhampton is a small, rural town set amid rocky hillsides and valleys with numerous rivers and streams. It is located in Hampshire County within the Pioneer Valley region. The Town is bordered by Chesterfield and Williamsburg to the north, Huntington to the west, Southampton to the south, and Easthampton and Northampton to the east. Westhampton is closest to the urbanized area of Northampton and is approximately 20 miles northwest of Springfield, the region's largest city. It consists of 17,523 acres or 27.38 miles.

Population

Westhampton has evolved into a mainly residential community of relatively affluent families who work in nearby urban and academic areas. There are 1,607 Westhampton residents and a total of 623 housing units based on the 2010 US Census. The population forecast for 2025 is 1,725, and so can be expected to remain relatively steady in coming years and decades (UMass Donahue Institute Population projections).

The median household income is $79,583 with 5.2 percent of residents below the poverty line (American Community Survey 5-year Estimates 2010-2014).

Character

Westhampton maintains a quiet, rural character highlighted by a forested landscape and historic villages. Despite the waning influence of agriculture on the landscape, Westhampton remains largely undeveloped and fundamentally rural in nature. Dense forests, several rivers, and abundant farmland and open fields highlight the landscape in town. The overall quality of life and rural character make Westhampton a desirable place to live, and the Town has seen steady growth in recent years.

Economy

Early industries in Westhampton included charcoal making, maple syrup production, lumbering, sheep raising, blacksmithing, tanning, cider making, and saw mills. In the southern portion of town, where the land is relatively flat, farms were established. Farms have been in decline through the years, however, due to the challenges of terrain, difficulty in finding affordable labor, and the increased cost of land. Only one dairy farm continues to operate full-time. Other small farming operations currently include fruits and vegetables, beef cattle, horses, and maple sugaring. Wood products and lumber are still important industries. There are only three retail stores in town: Outlook Farm Barn and Eatery, North Country Garden Center, and Hanging Mountains Farms Straw Bale Café. Otherwise the local business community consists of home-based or other small operations. They include: maple producers, horse farms, used auto dealer, pottery studios, small equipment repair, hair dresser, dog training and kennel, KOA campground, financial services, travel agency, and real estate brokerages.

Climate

Westhampton is located in Hampshire County, where annual rainfall averages 44 inches and is distributed throughout the year. In addition to rain, snowfall averages 40 inches per season. Prevailing winds from the south (and from the north/northwest to a lesser extent) reach their highest average speed during the month of April.

In the past few decades, Westhampton and all of New England have seen an increase in the number of extreme precipitation events, usually defined as large amounts of rain in a short period of time (an inch or more in a 24-hour period). In Massachusetts, the increase in these types of events since 1948 has been 81% (Environment America Research & Policy Center, 2012). Notable among these in terms of impact in Westhampton were Tropical Storm Irene in late August 2011, and the "Snow-tober" snow and ice storm of October 30, 2011.

Extreme rainfall produces flooding, which is a major concern of this plan. In the last five years, there has also been an increased occurrence of tornadoes and large storms that generate strong wind gusts in the region.

Notable History

Incorporated in 1778 with about 300 residents, Westhampton's history is well-preserved. One of its most famous citizens was Revolutionary War patriot Ethan Allen; in addition, Reverend Enoch Hale, brother of Nathan Hale, was the first minister of the town. The Westhampton Blacksmith Shop Museum houses a vast collection of memorabilia donated by residents and continues to preserve the history of the town.

2.2 Infrastructure

Westhampton's geographical features have shaped the town's historical development patterns. The chain of hills that ring the western section of town—Dry Hill, Spruce Hill. Cub Hill, Fisher Hill, Red Oak Hill—have channeled development into the lowlands of the eastern side of town. These slowly-sloping bottom lands contain the prime agricultural soils and wide open pastureland that have made Westhampton a rural, agricultural community for centuries. The location of agricultural soils, flat land and the availability of groundwater sources in the eastern section of town made this the first, and most densely, settled part of town. Recently, those interested in moving to Westhampton for its scenic qualities have been drawn to the town's gentle hills.

Roads and Highways

The major artery running through town is Route 66, which connects Westhampton with Northampton to the east and with Huntington to the west, where Route 66 connects with Route 112, which runs north-to-south and links up with Route 20 on its southern terminus and runs north to the Vermont border. Westhampton residents can travel east along Route 66 through Northampton to Interstate 91, which travels north-to-south and provides access to all of western New England. Southampton Road is another heavily traveled route as it is the way to get to the Mass Turnpike via Westfield. North Road, Montague Road, and Chesterfield Road are all used as alternate routes to Northampton.

Public Transportation

No public transportation system is available in Westhampton. Most residents work outside of town and use private vehicles to commute to work destinations. Route 66 is the major thoroughfare, being a main route from Northampton to Westhampton and the outlying hill towns. Southampton Road is another heavily used road, as it is the way to get to the Mass. Turnpike via Westfield.

Public Drinking Water Supply

Residential water needs in Westhampton are now met through private wells. However it wasn't always this way. Back around 1860, the Westhampton Water Company was formed when a group of people dammed a small river above Tob Road. It provided water to 56 homes and public buildings around the center of town until about 1990 when it went out of business. The owners of the Water Company gave their approximately 200 acres to the town.

There are also seven wells in Westhampton that fall into the state classification of public water supplies. Each well is marked as an interim wellhead protection area. These include wells at the:

- Westhampton Elementary School
- KOA Campground
- Outlook Farm
- StrawBale Café at the Aloisi farm
- Hampshire Regional High School

The well at the Hampshire Regional High School can pump 100,000 gallons per day and supplies the school as well as the Town Hall, Town Hall Annex, library, public safety facility and the local church. The water is distributed to the various buildings through the pipeline that was laid by the former Westhampton Water Company. Upgrades to the older pipe in this system involved installing a PVC insert as approved by MassDEP. A new water line was installed to connect the Hampshire Regional High School system to the existing water lines. The old well at the high school yields approximately 100 gallons per minute and is now primarily used for irrigating the athletic fields.

Water and Sewer

Westhampton decommissioned its municipal water supply service in 1990. All residents are on private well water. All parts of the town are served by private septic systems.

Schools

The Hampshire Regional High School, which serves the towns of Westhampton, Williamsburg, Southampton, Chesterfield and Goshen, is located in the center of Westhampton. The town also has one elementary school, Westhampton Elementary School.

2.3 Natural Resources

Westhampton most significant natural resource is the large blocks of un-fragmented forest and open land, coupled with several pristine water bodies. In addition to providing habitat and clean air and water, the rural, undeveloped nature of the town contributes to its appeal for tourism and recreation.

Forests and Fields

Westhampton is almost entirely covered by forest, which provides an abundance of timber, opportunities for recreation, wildlife habitat, the benefits of climate moderation, and the protection of water quality. The forest and intermixed agricultural land also provide a visually pleasant landscape for residents and visitors too. The town's forests are mainly closed-canopied and middle-aged, having a great diversity of species, but no diversity of horizontal or vertical structural. Interestingly, the town is 85% forested, and many of these lands have some form of permanent protection.

Large blocks of contiguous forestland such as those in Westhampton are important resources for several reasons. First they represent an area with a low degree of fragmentation. Wildlife species that require a certain amount of deep forest cover separate from people's daily activities tend to migrate out of fragmenting landscapes. New frontage lots and subdivisions can often result in a widening of human activity, an increase in the populations of plants and animals that thrive alongside humans (i.e. raccoons and squirrels) and a reduction in the species that have larger home ranges and unique habitat needs. Large blocks of forest provide clean water, air, and healthy wildlife populations.

Contributing to Westhampton's forested landscape is the 1847 acres owned by the City of Holyoke Water Department to protect drinking water supplies at Tighe Carmody and White reservoirs. Note that the dam at White Reservoir is no longer functional so the reservoir no longer exists as a drinking water supply.

Water Resources

Westhampton is divided into three main watersheds:

- to the east, a small portion of the town drains into the Mill River
- the northwest corner drains via the Dead Branch into the Westfield River; and
- the majority of the town flows into the Manhan River

All three of these watersheds are part of the much larger Connecticut River watershed. The Mill River enters the Connecticut River in Northampton, the Manhan enters in Easthampton, and the Westfield enters 25 miles south on the West Springfield/Agawam border.

<u>Lakes and Ponds</u>

No large ponds (greater than 5 acres) exist in town, except for Pine Island Lake, a privately held impoundment in the upper watershed of the North Branch of the Manhan River. Hanging Mountain Pond is a small natural pond near the intersection of North and Montague Roads.

Rivers and Streams

Aside from the two larger rivers mentioned above, the Mill River and the Manhan River, there are several cold and rocky perennial streams:

- Brewer Brook and Roberts Meadow Brook (Mill River),
- the Dead Branch (Westfield River) and
- Turkey Brook, Sodom Brook, North Branch and South Branch of the Manhan River.

Wetlands

Wetlands are particularly important to absorbing storm flows and reducing downstream flooding. This benefit of wetlands became especially apparent in Middlebury, Vermont, during Tropical Storm Irene. The absorption of peak storm flows by the Otter Creek Swamp Wetlands Complex, located upstream of Middlebury, is heralded with protecting the Town from the devastating flows that damaged so many other communities throughout Vermont.

Where the Dead Branch merges with the East Branch of the Westfield River it flows through more than 2,000 acres of Army Corps of Engineers Flood Control land. Of special note, the upper reaches of the Dead Branch provide suitable habitat for two common species of freshwater mussel: the Eastern Papershell (Pyganodon cataracta) and the Eastern Elliptic (Elliptio complanata). The wetlands occur throughout town, and comprise approximately 6 percent of the town's land area. This is a lower percentage than in many other Massachusetts communities and reflects the town's rugged topography. Nevertheless, the wetlands provide several important functions: protection of public and private water supplies, protection of groundwater supplies, storm-damage control, flood prevention, pollution prevention, protection of fisheries, and protection of wildlife habitat. They are also areas that offer recreation opportunities (fishing, hunting, nature study, research) and aesthetic qualities.

The Mineral Hills/Turkey Hill area, composed of hidden wetlands, steep cliffs, narrow ravines, and a wide variety of habitats, starts at the ends of Turkey Hill and Hooker Roads and heads east into Northampton. There are over 400 acres of contiguous, permanently-protected open space in Westhampton and Northampton. The hills provide beautiful views across the region and the shallow soils are home to a half dozen of the hardiest, most drought tolerant plants in our area. The area provides valuable habitat for an array of wildlife species, including bear, bobcat, fisher, mink, porcupine, coyote, turkey and a variety of other wetland and upland species.

Vernal pools, a special wetland type, are not common in Westhampton and are widely scattered. Although none is presently certified, several are known to support healthy populations of spotted salamanders, wood frogs and fairy shrimp. A few are known to support Jefferson's salamanders.

Groundwater - Water Supply

There is no identified aquifer in Westhampton, thus no recorded aquifer recharge area. The nearest aquifer is in Southampton, and Westhampton’s possible recharge regions can only be speculated at this time. The most likely recharge area is south of Tob Hill Road and Spruce Hill Road.

Floodways

Floodways include the watercourses (rivers and streams) and adjacent relatively low-lying areas subject to periodic flooding (the 100-year flood zone and 500-year flood zone). These adjoining lands are flood hazard zones and they vary in their predicted flood frequency. The 100-year flood zone has a one in 100 statistical probability (or one percent chance) of being flooded in a single year or is predicted to be flooded one year out of a 100-year period; while the 500-year flood zone is based on a 500-year period.

2.4 Development

Several factors have played, and will continue to play, an important role in the development of Westhampton. These include: the existing development pattern and availability of land for future development; the present road network; physical factors such as steep slopes, soil conditions, land set aside for conservation, the Connecticut River, its tributaries and floodplains; and the availability of utilities such as public water and sanitary sewers. These factors have an impact, both individually and cumulatively, on where and how development occurs.

Zoning and other land use regulations constitute a town's "blueprint" for its future. Land use patterns over time will continue to look more and more like the town's zoning map until the Town is finally "built out"—that is, there is no more developable land left. Therefore, in looking forward over time, it is critical that the Town focus not on the current use and physical build-out today, but on the potential future uses and build-out that are allowed under the Town's zoning map and zoning bylaws. Zoning is the primary land use tool that the Town may use to manage development and direct growth to suitable and desired areas while also protecting critical resources and ensuring that development is in keeping with the Town's character.

Zoning

Westhampton has one zoning district, Agricultural-Residential AR, as displayed on the Zoning Map below. No commercial areas are designated, but some commercial use is allowed by special permit. Building lots require 250 feet of frontage on a public road and 50,000 square feet of land (slightly more than 1 acre). The zoning bylaw was last amended in 2003. What is Town thinking in terms of update?

Overlay districts:

- Floodplain Overlay District - The purpose of this overlay district is to promote the protection of life, public safety, and property from flooding hazards by preserving the natural flood control and flood storage characteristics of the floodplain; promote the preservation of agricultural lands within the floodplain by preventing alterations to the natural flow of rivers, streams, or brooks within the floodplain; protect fisheries and wildlife habitat; control and prevent pollution caused by erosion, sedimentation, nutrient and pesticide run-off; enhance and preserve the existing scenic or environmentally sensitive areas along the shoreline through the conservation of shore cover and encouragement of well-designed developments.

- Water Supply Protection District - The purpose of this overlay district is to promote the health, safety and welfare of the community by protecting and preserving the surface and groundwater resources of the Town and the region from any use of land or buildings which may reduce the quality and quantity of its water resources.

Subdivision Regulations

Subdivision regulations guide the private development of new roads. They control layout and construction, specifying municipal requirements for location, width, and grades of proposed ways.

Within subdivision regulations, best practices can be addressed in the early stages of the planning process itself, and within requirements for the following:

- location and length of roadways
- right of ways
- paved roadway width
- curbs
- drainage
- sidewalks
- utilities
- landscaping
- cul de sacs

Westhampton's subdivision regulations were last updated in January of 1990. There are many improvements that could be made to reduce hazard risks based on roadway layouts and drainage recommendations. Possible updates include reduced roadwidths (currently roadway excavation of 34 feet wide is required) and promotion of low impact development stormwater practices (currently drains must be piped to an existing brook, stream, or river).

To date, one subdivision development has been approved in Westhampton. Located on Blueberry Hill, also known as Fisher Hill, 9 lots were approved for construction. To date the road has been constructed, some lots cleared, and one house built.

Current Development Trends

There have been no significant changes in development in Westhampton since the first Hazard Mitigation plan was approved in 2009 that have affected vulnerability to natural hazards.

Today, the vast majority of Westhampton's 27.38 square miles is undeveloped land. Topography and the lack of major waterways have made it impractical up until now to provide municipal water and sewer services to residents.

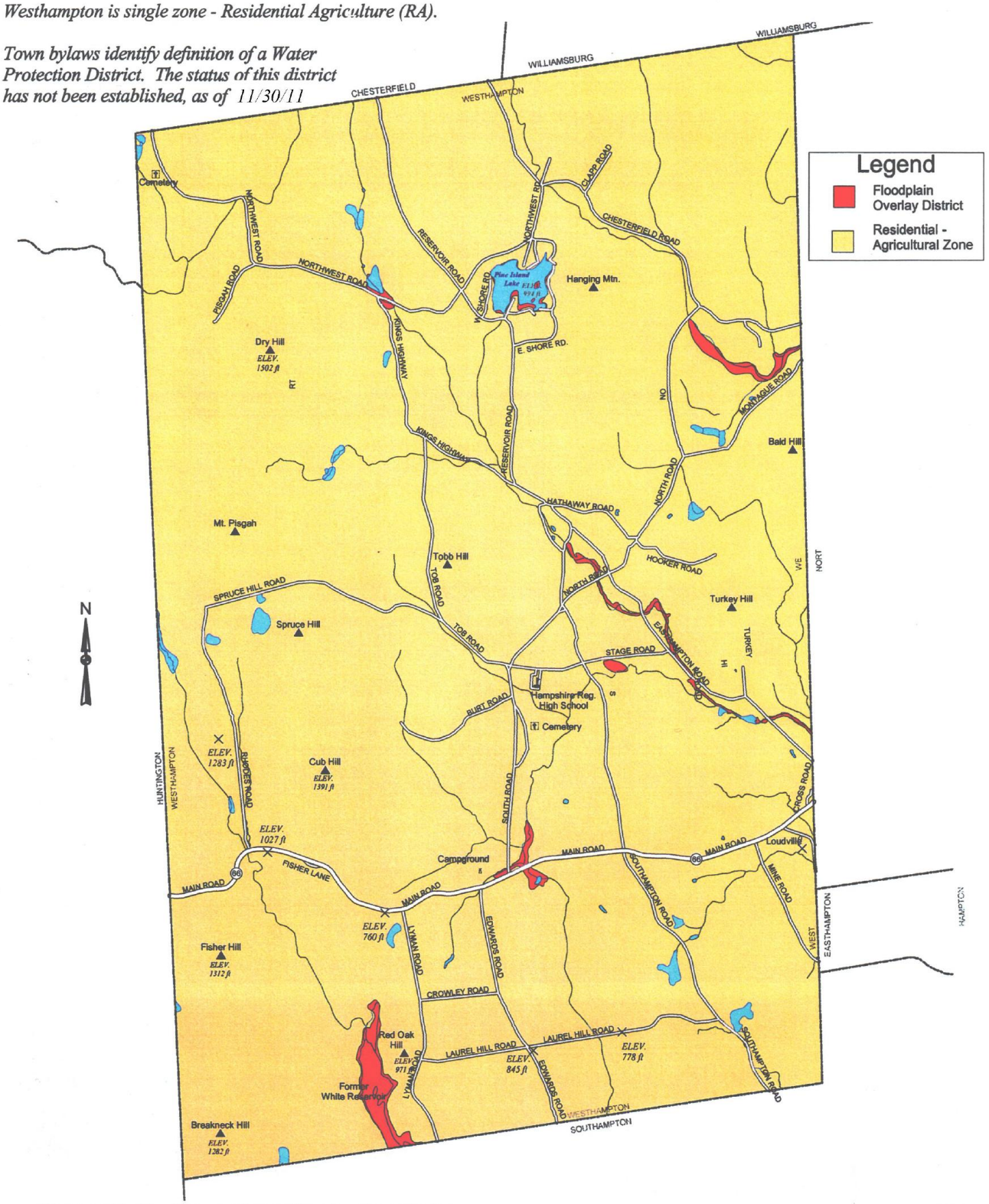
Because of its terrain, the town has been able to maintain a quiet, country character. Most current development consists of single-family homes; the remainder of land in Westhampton is hilly and forested, with scattered open and agricultural fields. The town's population has nearly doubled in the last 30 years, growing to 1,607 residents.

With many housing developments occurring in surrounding communities of Northampton, Easthampton and Southampton, however, the rising cost and diminishing availability of building lots in these communities is leading to growing development interest in Westhampton. The Town has approved a new 9 unit subdivision for Blueberry Hill, and multiple single new homes thoughout Town. Committee members feel that to date these projects provide no increase in vulnerabilities to natural hazards.

Westhampton, Massachusetts
Zoning Map

**Note:*
Westhampton is single zone - Residential Agriculture (RA).

Town bylaws identify definition of a Water Protection District. The status of this district has not been established, as of 11/30/11



Map provided by Pioneer Valley Planning Commission
Updated 2011 Westhampton Open Space Committee

Currently, agricultural land is the second most prolific land use, at approximately 980 acres, followed closely by residential land at approximately 940 acres. Industrial land constitutes about 174 acres, but commercial land constitutes a relatively small 13 acres. There are 35 acres of outdoor recreational land in Town, and land characterized as urban open/public land constitutes another 57 acres. (*Source: Mass GIS Land Use Data 2005*)

Today, the threat of development exists as single-family homes continue to replace agricultural fields and forested land. Zoning laws are minimal and serve to space houses out along the roads but nevertheless lead to strip development. However, Westhampton does have some land use regulations to encourage development where most appropriate, and the necessity of private septic systems also acts as a constraint on development.

National Flood Insurance Program (NFIP)

Westhampton is a participating member of the National Flood Insurance Program, and had the following NFIP policy and claim statistics as of January 2016:

- Food Insurance Maps (FIRMs) are used for flood insurance purposes and are on file with the Westhampton Planning Board.
- FIRMs have been effective since July 2, 1981 with the current map in effect since July 16, 2013.
- Westhampton has 3 in-force policies in effect for a total of $652,200 worth of insurance.
- There have been no NFIP claims or claims paid since 1978.
- As of January 2016, there have been no Repetitive Loss Properties in Westhampton.
- The Town will maintain compliance with the NFIP throughout the next 5-year Hazard Mitigation Planning cycle by monitoring its Flood Plain Overlay District and ensuring that the district accurately reflects the 100-year flood plain and FEMA Flood Insurance Rate Map (FIRM).

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3: HAZARD IDENTIFICATION & ANALYSIS

The following section includes a summary of disasters that have affected or could affect Westhampton. Historical research, conversations with local officials and emergency management personnel, available hazard mapping and other weather-related databases were used to develop this list. Identified hazards are the following:

- Floods
- Severe snowstorms / ice storms
- Hurricanes / tropical storms
- Severe thunderstorms / winds / tornadoes / microbursts
- Wildfires / brushfires
- Earthquakes
- Dam failures
- Drought
- Extreme temperatures

Natural Hazard Analysis Methodology

This chapter examines all hazards identified by the Massachusetts State Hazard Mitigation Plan. The analysis is organized into the following sections: Hazard Description, Location, Extent, Previous Occurrences, Probability of Future Events, Impact, and Vulnerability. A description of each of these analysis categories is provided below.

Hazard Description

The natural hazards identified for Westhampton are: floods, severe snowstorms/ice storms, hurricanes, severe thunderstorms / wind / tornadoes, wildfire/brushfire, earthquakes, dam failure, and drought. Many of these hazards result in similar impacts to a community. For example, hurricanes, tornadoes and severe snowstorms may cause wind-related damage.

Location

Location refers to the geographic areas within the planning area that are affected by the hazard. Some hazards affect the entire planning area universally, while others apply to a specific portion, such as a floodplain or area that is susceptible to wild fires. Classifications are based on the area that would potentially be affected by the hazard, on the following scale:

Location of Occurrence, Percentage of Town Impacted by Given Natural Hazard	
Location of Occurrence	**Percentage of Town Impacted**
Large	More than 50% of the town affected
Medium	10 to 50% of the town affected
Small	Less than 10% of the town affected

Extent

Extent describes the strength or magnitude of a hazard. Where appropriate, extent is described using an established scientific scale or measurement system. Other descriptions of extent include water depth, wind speed, and duration.

Previous Occurrences

Previous hazard events that have occurred are described. Depending on the nature of the hazard, events listed may have occurred on a local, state-wide, or regional level.

Probability of Future Events

The likelihood of a future event for each natural hazard was classified according to the following scale:

Frequency of Occurrence and Annual Probability of Given Natural Hazard	
Frequency of Occurrence	**Probability of Future Events**
Very High	70-100% probability in the next year
High	40-70% probability in the next year
Moderate	10-40% probability in the next year
Low	1-10% probability in the next year
Very Low	Less than 1% probability in the next year

Impact

Impact refers to the effect that a hazard may have on the community and its assets. Assets are determined by the community and include people, strucutures, facilities, systems, capabilities, and/or activities that have value to the community. Impacts are based on the assessment of extent described above and are classified according to the following scale:

Extent of Impacts, Magnitude of Multiple Impacts of Given Natural Hazard	
Extent of Impacts	**Magnitude of Multiple Impacts**
Catastrophic	Multiple deaths and injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of facilities for 30 days or more.
Critical	Multiple injuries possible. More than 25% of property in affected area damaged or destroyed. Complete shutdown of facilities for more than 1 week.
Limited	Minor injuries only. More than 10% of property in affected area damaged or destroyed. Complete shutdown of facilities for more than 1 day.
Minor	Very few injuries, if any. Only minor property damage and minimal disruption on quality of life. Temporary shutdown of facilities.

Vulnerability

Based on the above metrics, a hazard index rating was determined for each hazard. The hazard index ratings are based on a scale of 1 (highest risk) through 5 (lowest risk). The ranking is qualitative and is based, in part, on local knowledge of past experiences with each type of hazard. The size and impacts of a natural hazard can be unpredictable. However; many of the mitigation strategies currently in place and many of those proposed for implementation can be applied to the expected natural hazards, regardless of their unpredictability.

Hazard Identification and Analysis Worksheet for Westhampton				
Type of Hazard	**Location of Occurrence** *Geographic area of Town affected by hazard*	**Probability of Future Events** *In the next year*	**Impact** *Effect on people and property based on strength or magnitude of hazard*	**Vulnerability** *Qualitative ranking based on past experience*
Floods	Small *<10%*	High *40 to 70% probability*	Limited	2 – High Risk
Severe Snow / Ice Storms	Large *>50%*	High	Limited	3 – Medium Risk
Hurricanes / Tropical Storms	Large	Low *1 to 10% probability*	Limited	4 – Low Risk
Severe Thunderstorms / Winds	Large	High	Limited	3 – Medium Risk
Tornadoes / Microburst	Small	Low		4 – Low Risk
Wildfires / Brushfires	Medium *10 to 50%*	Moderate *10 to 40% probability*	Minor	4 – Low Risk
Earthquakes	Large	Low	Critical	4 – Low Risk
Dam Failures	Small	Very low *(Less than 1% probability*	Medium	4 – Low Risk
Drought	Large	Low	Minor	4 – Low Risk
Extreme Temperatures	Large	High	Minor	4 – Low Risk

Source: Information adapted from Town of Holden Beach North Carolina Community-Based Hazard Mitigation Plan, July 15, 2003 and the Massachusetts Emergency Management Agency (MEMA)

3.1 Floods

Hazard Description

There are three major types of storms that can generate flooding in Westhampton:

- Continental storms are typically low-pressure systems that can be either slow or fast moving. These storms originate from the west and occur throughout the year.

- Coastal storms, also known as nor'easters, usually occur in late summer or early fall and originate from the south. The most severe coastal storms, hurricanes, occasionally reach Massachusetts and generate very large amounts of rainfall.

- Thunderstorms form on warm, humid summer days and cause locally significant rainfall, usually over the course of several hours. These storms can form quickly and are more difficult to predict than continental and coastal storms.

A floodplain is the relatively flat, lowland area adjacent to a river, lake or stream. Floodplains serve an important function, acting like large "sponges" to absorb and slowly release floodwaters back to surface waters and groundwater. Over time, sediments that are deposited in floodplains develop into fertile, productive farmland like that found in the Connecticut River valley. In the past, floodplain areas were also often seen as prime locations for development. Industries were located on the banks of rivers for access to hydropower. Residential and commercial development occurred in floodplains because of their scenic qualities and proximity to the water. Although periodic flooding of a floodplain area is a natural occurrence, past and current development and alteration of these areas will result in flooding that is a costly and frequent hazard.

Other areas can help absorb stormwater, preventing it from reaching rivers so quickly and reducing peak flooding. Surfaces such as open space, fields, forests, wetlands have important values in helping to reduce the risk of floods.

Location

According to NFIP, the following areas have been designated as Special Flood Hazard Areas (SFHA) in Westhampton:

- Roberts Meadow Brook south of North Road and north of Montague Road;
- The intersection of the Manhan River and Northwest Road (attributed to beaver activity);
- The Manhan River beginning at the Inersection of Perry Hill and Kings Highway and running down to the Northampton City Boundary;
- The west branch of the Manhan River along the shores of the White Reservoir.

Additionally, these areas in town have been identified as prone to flooding:

Stage Road and Easthampton Road

The North Branch of the Manhan River crosses beneath Stage Road and then Easthampton Road on its journey downstream in a low area where its waters pool. The pooling during large storms washes up on the roads and causes flooding. With the arrival of more frequent larger storms and the potential for increased flooding, this is threatening structural damage to 4 homes. With 100% damage to 100% of the structures, the estimated cost of repairing or replacing would be $1,318,000. Cost for repairing or replacing any power lines, telephone lines, and contents of structures are not included.

Northwest Road at beaver pond

This portion of Northwest Road is within the 100-year floodplain. The culvert carrying water out of the pond is undersized for large storms and clogs causing flooding onto the road. During the past 20-years, the road at this location has flooded less than a dozen times. During the heavy rains in April of 2007, the flooding undermined the road and caused a large sink hole just as a tractor trailer was traveling by. Approximately 75' of the road needed to be rebuilt at a cost of $3,000 in material and labor for the Town. In addition, there are approximately 2 residential structures in this area that could be affected by a flood incident. With 100% damage to 100% of the structures, the estimated cost of repairing or replacing would be $659,000. Cost for repairing or replacing any power lines, telephone lines, and contents of structures are not included.

Chesterfield Road to the Chesterfield Town Line

For approximately ½ mile from the Chesterfield town line, the road collects water running off the mountain. During the April 2007 flood, which was caused by a storm that brought 6 inches of snow followed by 2 days of rainfall, the road was closed down to one lane. MassHighway Department brought in directional signs for traffic. One residential driveway was also washed out. The Town repaved the road and one driveway to mitigate the damage. The Highway Department has not maintained exact cost estimates for repairs for this specific event. In addition, there are approximately 2 residential structures in this area that could be affected by a flood incident. With 100% damage to 100% of the structures, the estimated cost of repairing or replacing would be $659,000. Cost for repairing or replacing any power lines, telephone lines, and contents of structures are not included.

Laurel Hill Road

A 36" culvert on Laurel Hill Road is undersized and clogs during large storm events, causing flooding onto this dirt road. During the April 2007 floods, the road washed out requiring the Town to rebuild the road. During Superstorm Sandy in 2012, problems repeated with the need to close the road down to one lane. The Highway Department has not maintained exact cost estimates for repairs for this specific event. In addition, there are approximately 2 residential structures in this area that could be affected by a flood incident. With 100% damage to 100% of the structures, the estimated cost of repairing or replacing would be $659,000. Cost for repairing or replacing any power lines, telephone lines, and contents of structures are not included.

Kings Highway

During the April 2007 floods, runoff from the hillside on Reservoir Road caused sever erosion of Kings Highway. There is an approximate 100' grade change between the elevation of the Manhan River and Kings Highway in this location. Runoff from the mountain crossed the road in its rush to the Manhan. Both the extreme volume and velocity of the runoff eroded the bank and undercut the road. This road provides access to approximately 15 houses, none of which incurred any damages directly. The Town recently initiated a contract for permanent repair of the bank and realignment of the road in the amount of $32,400.

Tob Road

This unpaved road suffered washout during the April 2007 floods. Runoff from the adjacent hillside over flowed the roadside ditches severely damaging the road. No residential structures were affected.

South Road at crossing with Rice Brook

Water flowing down Rice Brook comes from a high gradient area, rushing quickly to pass under South Road and then slow suddenly upon reaching a wetlands. This sudden slowing causes pooling and backflow of Rice Brook onto South Road each spring. The Highway Department must close the road during this time.

There is another problem location along Rice Brook just slightly north, involving a culvert on private property. Water behind this private culvert pools and floods South Road.

Stage Road east of Southampton Road

In this location 4 homes sit in a low area. During Tropical Storm Irene in 2011, basements flooded and had to be pumped out. This is a low lying swampy area that floods due to flows from an unnamed stream.

In addition, beaver activity has led to localized flooding issues in a few locations. The Town has retained Integrated Wildlife Control to address such problems when needed. The placement of two "beaver deceivers" at Northwest Road has discouraged beaver activity there; and trapping of beavers near Kings Highway, Lyman Road, and Route 66, has addressed problems at those locations.

Given these flood-prone areas, the location of occurrence is "small."

Extent

Floods can be classified as one of two types: flash floods and general floods.

- **Flash floods** are the product of heavy, localized precipitation in a short time period over a given location. Flash flooding events typically occur within minutes or hours after a period of heavy precipitation, after a dam or levee failure, or from a sudden release of water from an ice jam. Most often, flash flooding is the result of a slow-moving

thunderstorm or the heavy rains from a hurricane. In rural areas, flash flooding often occurs when the waters of small streams race from high gradient areas. However, in urbanized areas, flash flooding is often the result of clogged storm drains (leaves and other debris) and the higher amount of impervious surface area (roadways, parking lots, roof tops).

- **General floods** may last for several days or weeks and are caused by precipitation over a longer time period in a particular river basin. Excessive precipitation within a watershed of a stream or river can result in flooding particularly when development in the floodplain has obstructed the natural flow of the water and/or decreased the natural ability of the groundcover to absorb and retain surface water runoff (e.g., the loss of wetlands and the higher amounts of impervious surface area in urban areas).

The average annual precipitation for Westhampton and surrounding areas in western Massachusetts is 46 inches.

Previous Occurrences

The Hazard Mitigation Workgroup identified the locations listed under the "location" section as where previous occurrences of localized flash flooding have occurred. Westhampton has experienced many small flooding events over the last decade. Generally, these small floods have had "minor" impacts, temporarily impacting roads.

Probability of Future Events

The area within the 100-year flood plain still has a 1 percent chance of a severe flood in any given year. Since 1948, incidents of extreme rainfall events (large amounts of rain in a short period of time) in the U.S. have increased 30 percent. But New England states have experienced a far greater increase than the national average. In Massachusetts, the increase is 81 percent; upstream on the Connecticut River, New Hampshire is up 115 percent and Vermont is up 84 percent. (*Source: Environment America Research & Policy Center, 2012*). Extreme rainfall is a cause of flooding, which is a major concern of this plan.

The chances of localized flooding are over 50 percent, and thus classified as "high."

Impact

The impact of a flood event is classified as "limited." The value of all residential structures in the Town of Westhampton is $234,274,500 as of 2014[1]. The median value of a home in Westhampton in 2014 is approximately $329,500, the average household size is 2.58 people, and there are 711 residential units in town.

[1] Figure calculated using U.S. Census Bureau 2010 Decennial Census Data, 2008-2012 ACS Data.

There are approximately 150 acres of land within the FEMA mapped 100-year floodplain and 34 acres of land within the 500-year floodplain within the Town of Westhampton. According to the Community Information System (CIS) of FEMA, there were 5 residential structures located within the Special Flood Hazard Area (SFHA), or 100-year floodplain, in Westhampton as of January 2016, the most current records in the CIS for the Town of Westhampton. Therefore, a vulnerability assessment for a 100-year flood equals approximately $1.3 million of damage to residential structures, with approximately 12 people impacted.

The data below was calculated using FEMA's Understanding Your Risks: Identifying Hazards and Estimating Losses, August 2001. In addition, the Committee completed the Vulnerability Assessment Worksheets which provided more data to estimate the potential losses.

Vulnerability

Based on the above analysis, Westhampton faces a hazard index rating of "2 - high risk" of flooding.

3.2 Severe Snow / Ice Storms

Hazard Description

Severe winter storms can pose a significant risk to property and human life. The rain, freezing rain, ice, snow, cold temperatures and wind associated with these storms can cause the following hazards:

- Disrupted power and phone service
- Unsafe roadways and increased traffic accidents
- Infrastructure and other property are also at risk from severe winter storms and the associated flooding that can occur following heavy snow melt.
- Tree damage and fallen branches that cause utility line damage and roadway blockages
- Damage to telecommunications structures
- Reduced ability of emergency officials to respond promptly to any emergencies throughout the community.

Location

The entire Town of Westhampton is susceptible to severe snowstorms. Because these storms occur regionally, they would impact the entire town. Consequentially, the location of occurrence for these storms is classified as “large.”

The Town has had problems with snow drifts on the following roadways:

- South Road north of intersection with Route 66
- 185 Main Road (Route 66) at open fields on corner
- North Road at intersection with Montague Road

Extent

The Northeast Snowfall Impact Scale (NESIS) developed by Paul Kocin of The Weather Channel and Louis Uccellini of the National Weather Service (Kocin and Uccellini, 2004) characterizes and ranks high-impact Northeast snowstorms. These storms have large areas of 10-inch snowfall accumulations and greater. NESIS has five categories: Extreme, Crippling, Major, Significant, and Notable. The index differs from other meteorological indices in that it uses population information in addition to meteorological measurements. Thus NESIS gives an indication of a storm's societal impacts.

NESIS scores are a function of the area affected by the snowstorm, the amount of snow, and the number of people living in the path of the storm. The aerial distribution of snowfall and population information are combined in an equation that calculates a NESIS score which varies from around one for smaller storms to over ten for extreme storms. The raw score is then

converted into one of the five NESIS categories. The largest NESIS values result from storms producing heavy snowfall over large areas that include major metropolitan centers.

Northeast Snowfall Impact Scale Categories		
Category	**NESIS Value**	**Description**
1	1—2.499	Notable
2	2.5—3.99	Significant
3	4—5.99	Major
4	6—9.99	Crippling
5	10.0+	Extreme

Source: http://www.ncdc.noaa.gov/snow-and-ice/rsi/nesis

The Sperry-Piltz Ice Accumulation (SPIA) Index (below) is a prediction tool (algorithm) that can be used in conjunction with National Weather Service data to predict the impact of winter weather in terms of ice damage. It was not used for the October 2008 ice storm, but is currently being tested by the National Weather Service and FEMA in several regions with potential implementation in the future. In the meantime, the index provides an outline of the potential damage impacts of ice storms based on accumulation and wind.

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

ICE DAMAGE INDEX	* AVERAGE NWS ICE AMOUNT (in inches) *Revised-October, 2011	WIND (mph)	DAMAGE AND IMPACT DESCRIPTIONS
0	< 0.25	< 15	Minimal risk of damage to exposed utility systems; no alerts or advisories needed for crews, few outages.
1	0.10 – 0.25	15 - 25	Some isolated or localized utility interruptions are possible, typically lasting only a few hours. Roads and bridges may become slick and hazardous.
	0.25 – 0.50	> 15	
2	0.10 – 0.25	25 - 35	Scattered utility interruptions expected, typically lasting 12 to 24 hours. Roads and travel conditions may be extremely hazardous due to ice accumulation.
	0.25 – 0.50	15 - 25	
	0.50 – 0.75	< 15	
3	0.10 – 0.25	> = 35	Numerous utility interruptions with some damage to main feeder lines and equipment expected. Tree limb damage is excessive. Outages lasting 1 – 5 days.
	0.25 – 0.50	25 - 35	
	0.50 – 0.75	15 - 25	
	0.75 – 1.00	< 15	
4	0.25 – 0.50	> = 35	Prolonged & widespread utility interruptions with extensive damage to main distribution feeder lines & some high voltage transmission lines/structures. Outages lasting 5 – 10 days.
	0.50 – 0.75	25 - 35	
	0.75 – 1.00	15 - 25	
	1.00 – 1.50	< 15	
5	0.50 – 0.75	> = 35	Catastrophic damage to entire exposed utility systems, including both distribution and transmission networks. Outages could last several weeks in some areas. Shelters needed.
	0.75 – 1.00	> = 25	
	1.00 – 1.50	> = 15	
	> 1.50	Any	

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

Previous Occurrences

New England generally experiences at least one or two severe winter storms each year with varying degrees of severity. Severe winter storms typically occur during January and February; however, they can occur from late September through late April.

Based on data available from the National Oceanic and Atmospheric Administration, there are 48 winter storms since 1958 resulted in snow falls in the Pioneer Valley of at least 10 inches. These storms are listed in the table on the next page. Note that during the last 10 years (since 2006), there have been 20 storms that merited a "notable" rating or greater. This represents nearly a doubling of such rated storms compared to preceding decades shown in the table.

In Westhampton, an ice storm in December 2008 caused significant damage and disruption for a full week. One inch of ice and high winds fell numerous trees, leaving many roads impassable, and caused widespread loss of power.

The October 2011 snowstorm which left less than 12 inches of snow while many leaves were still on the trees, led to a week-long power outage in Westhampton, particularly in the lower elevations. The Fire Department Brush Truck transported water to help flush toilets, but there was no way for the Town to provide potable water where private wells had relied on electric pumps.

Winter Storms Producing Over 10 inches of Snow in the Pioneer Valley, 1958-2015

Date	NESIS Value	NASIS Category	NESIS Classification
1958-02-14	6.25	4	Crippling
1958-03-18	3.51	2	Significant
1960-03-02	8.77	4	Crippling
1960-12-11	4.53	3	Major
1961-01-18	4.04	3	Major
1961-02-02	7.06	4	Crippling
1964-01-11	6.91	4	Crippling
1966-01-29	5.93	3	Major
1966-12-23	3.81	2	Significant
1967-02-05	3.50	2	Significant
1969-02-08	3.51	2	Significant
1969-02-22	4.29	3	Major
1969-12-25	6.29	4	Crippling
1972-02-18	4.77	3	Major
1978-01-19	6.53	4	Crippling
1978-02-05	5.78	3	Major
1982-04-06	3.35	2	Significant
1983-02-10	6.25	4	Crippling
1987-01-21	5.40	3	Major
1993-03-12	13.20	5	Extreme
1994-02-08	5.39	3	Major
1995-02-02	1.43	1	Notable
1996-01-06	11.78	5	Extreme

1997-03-31	2.29	1	Notable
2000-01-24	2.52	2	Significant
2000-12-30	2.37	1	Notable
2003-02-15	7.50	4	Crippling
2005-01-21	6.80	4	Crippling
2006-02-12	4.10	3	Major
2007-02-12	5.63	3	Major
2007-03-15	2.54	2	Significant
2009-03-01	1.59	1	Notable
2010-02-23	5.46	3	Major
2010-12-24	4.92	3	Major
2011-01-09	5.31	3	Major
2011-01-26	2.17	1	Notable
2011-02-01	5.30	3	Major
2011-10-29	1.75	1	Notable
2013-02-07	4.35	3	Major
2013-03-04	3.05	2	Significant
2013-12-13	2.95	2	Significant
2013-12-30	3.31	2	Significant
2014-02-11	5.28	3	Major
2014-11-26	1.56	1	Notable
2014-12-09	1.49	1	Notable
2015-01-25	2.62	2	Significant
2015-01-29	5.42	3	Major
2015-02-08	1.32	1	Notable

Source: http://www.ncdc.noaa.gov/snow-and-ice/rsi/nesis

Probability of Future Events

Based upon the availability of records for Hampshire County, the likelihood that a severe snow storm will hit Westhampton in any given year is greater than 50 percent, or "high."

Research on climate change indicates that there is great potential for stronger, more frequent storms as the global temperature increases. More information about the effect of Climate Change can be found in the Pioneer Valley Planning Commission's Climate Action Plan, available at www.sustainableknowledgecorridor.org.

The Massachusetts State Climate Change Adaptation Report has additional information about the impact of climate change and can be accessed at www.mass.gov/eea/air-water-climate-change/climate-change/climate-change-adaptation-report.html.

Impact

Westhampton faces a "limited" impact from a severe snow or ice storm. To approximate the potential impact to property and people that could be affected by this hazard, the total value of all residential property in town, $234,274,500, is used. An estimated 20 percent of damage would occur to 10 percent of structures, resulting in a total of $4,685,490 worth of damage. The

cost of repairing or replacing the roads, bridges, utilities, and contents of structures is not included in this estimate.

Vulnerability

Based on the above assessment, Westhampton faces a hazard index rating of “3 – medium risk” from severe snow and ice storms.

3.3 Hurricanes / Tropical Storms

Hazard Description

Hurricanes are classified as cyclones and defined as any closed circulation developing around a low-pressure center in which the winds rotate counter-clockwise in the Northern Hemisphere (or clockwise in the Southern Hemisphere) and whose diameter averages 10 to 30 miles across. The primary damaging forces associated with these storms are high-level sustained winds and heavy precipitation. Hurricanes are violent rainstorms with strong winds that can reach speeds of up to 200 miles per hour and which generate large amounts of precipitation. Hurricanes generally occur between June and November and can result in flooding and wind damage to structures and above-ground utilities.

Location

Because of the hazard's regional nature, all of Westhampton is at risk from hurricanes, and the location of occurrence is deemed to be "large." The following locations have been identified as potentially more susceptible to damage due to flooding, with water traveling from high gradient areas at high velocity:

- State Road and Easthampton Road
- Stage Road east of Southampton Road
- Northwest Road at beaver pond
- Chesterfield Road to the Chesterfield town line
- Laurel Hill Road
- Kings Highway
- Tob Road

Extent

As an incipient hurricane develops, barometric pressure (measured in millibars or inches) at its center falls and winds increase. If the atmospheric and oceanic conditions are favorable, it can intensify into a tropical depression. When maximum sustained winds reach or exceed 39 miles per hour, the system is designated a tropical storm, given a name, and is closely monitored by the National Hurricane Center in Miami, Florida. When sustained winds reach or exceed 74 miles per hour the storm is deemed a hurricane. Hurricane intensity is further classified by the Saffir-Simpson Hurricane Wind Scale, which rates hurricane wind intensity on a scale of 1 to 5, with 5 being the most intense.

Saffir-Simpson Scale	
Category	**Maximum Sustained Wind Speed (MPH)**
1	74–95
2	96–110
3	111–129
4	130–156
5	157 +

Source: National Hurricane Center, 2012

Previous Occurrences

Hurricanes and tropical storms affecting the Pioneer Valley and Westhampton are show in the following table.

Major Hurricanes and Storms Affecting Westhampton		
Hurricane/Storm Name	**Year**	**Saffir/Simpson Category (when reached MA)**
Great Hurricane of 1938	1938	3
Great Atlantic Hurricane	1944	1
Carol	1954	3
Edna	1954	1
Diane	1955	Tropical Storm
Donna	1960	Unclear, 1 or 2
Groundhog Day Gale	1976	Not Applicable
Gloria	1985	1
Bob	1991	2
Floyd	1999	Tropical Storm
Irene	2011	Tropical Storm
Sandy	2012	Super Storm

Source: National Weather Service

During Irene, Westhampton had roadway damage at a number of locations, including:

- Lyman Road
- Laurel Hill
- Tob Road
- Cemetery Road
- Burt Road
- Perry Hill Road
- Kings Highway

At Mine Road a falling tree damaged a guardrail, which had to be replaced.

Probability of Future Events

Westhampton's location in Western Massachusetts reduces the risk of extremely high winds that are associated with hurricanes, although it can experience some high wind events. Based upon past occurrences, it is reasonable to say that there is a "low" probability of hurricanes in Westhampton in any given year.

Impact

A description of the damages that could occur due to a hurricane is described by the Saffir-Simpson scale, as shown below.

The 1938 and 1985 hurricanes were major events and caused wind damage and flooding statewide. There is potential for disruption of power and phone line services, structural damage to buildings, and flooding of evacuation routes.

Using a total a value of all structures in town of $234,274,500 and an estimated wind damage of 5 percent of all structures with 10 percent damage to each structure, an estimated $1,171,373 of damage would occur. Estimated flood damage to 10 percent of the structures with 20 percent damage to each structure would result in $4,685,490 of damage. The cost of repairing or replacing the roads, bridges, utilities, and contents of structures is not included in this estimate. As a result, the impact a hurricane may incur on Westhampton is deemed to be "limited."

Vulnerability

Based on the above analysis, Westhampton faces a hazard index rating of "4 - low risk" from hurricanes.

Hurricane Damage Classifications			
Storm Category	**Damage Level**	**Description of Damages**	**Wind Speed (MPH)**
1	MINIMAL Very dangerous winds will produce some damage	No real damage to building structures. Damage primarily to unanchored mobile homes, shrubbery, and trees. Also, some coastal flooding and minor pier damage. An example of a Category 1 hurricane is Hurricane Dolly (2008).	74-95
2	MODERATE Extremely dangerous winds will cause extensive damage	Some roofing material, door, and window damage. Considerable damage to vegetation, mobile homes, etc. Flooding damages piers and small craft in unprotected moorings may break their moorings. An example of a Category 2 hurricane is Hurricane Francis in 2004.	96-110
3	EXTENSIVE Devastating damage will occur	Some structural damage to small residences and utility buildings, with a minor amount of curtain wall failures. Mobile homes are destroyed. Flooding near the coast destroys smaller structures, with larger structures damaged by floating debris. Terrain may be flooded well inland. An example of a Category 3 hurricane is Hurricane Ivan (2004).	111-129
4	EXTREME Catastrophic damage will occur	More extensive curtain wall failures with some complete roof structure failure on small residences. Major erosion of beach areas. Terrain may be flooded well inland. An example of a Category 4 hurricane is Hurricane Charley (2004).	130-156
5	CATASTROPHIC Catastrophic damage will occur	Complete roof failure on many residences and industrial buildings. Some complete building failures with small utility buildings blown over or away. Flooding causes major damage to lower floors of all structures near the shoreline. Massive evacuation of residential areas may be required. An example of a Category 5 hurricane is Hurricane Andrew (1992).	157+

3.4 Severe Thunderstorms / Winds / Tornadoes/ Microbursts

A thunderstorm is a storm with lightning and thunder produced by a cumulonimbus cloud, usually producing gusty winds, heavy rain, and sometimes hail. Effective January 5, 2010, the NWS modified the hail size criterion to classify a thunderstorm as 'severe' when it produces damaging wind gusts in excess of 58 mph (50 knots), hail that is 1 inch in diameter or larger (quarter size), or a tornado (NWS, 2013).

Wind is air in motion relative to surface of the earth. For non-tropical events over land, the NWS issues a Wind Advisory (sustained winds of 31 to 39 mph for at least 1 hour or any gusts 46 to 57 mph) or a High Wind Warning (sustained winds 40+ mph or any gusts 58+ mph). For non-tropical events over water, the NWS issues a small craft advisory (sustained winds 25-33 knots), a gale warning (sustained winds 34-47 knots), a storm warning (sustained winds 48 to 63 knots), or a hurricane force wind warning (sustained winds 64+ knots). For tropical systems, the NWS issues a tropical storm warning for any areas (inland or coastal) that are expecting sustained winds from 39 to 73 mph. A hurricane warning is issued for any areas (inland or coastal) that are expecting sustained winds of 74 mph. Effects from high winds can include downed trees and/or power lines and damage to roofs, windows, etc. High winds can cause scattered power outages. High winds are also a hazard for the boating, shipping, and aviation industry sectors.

Tornadoes are swirling columns of air that typically form in the spring and summer during severe thunderstorm events. In a relatively short period of time and with little or no advance warning, a tornado can attain rotational wind speeds in excess of 250 miles per hour and can cause severe devastation along a path that ranges from a few dozen yards to over a mile in width. The path of a tornado may be hard to predict because they can stall or change direction abruptly. Within Massachusetts, tornadoes have occurred most frequently in Worcester County and in communities west of Worcester, including towns in eastern Hampshire County. High wind speeds, hail, and debris generated by tornadoes can result in loss of life, downed trees and power lines, and damage to structures and other personal property (cars, etc.).

Microbursts are localized columns of sinking air (downdrafts) within a thunderstorm. Wind speeds in microbursts can reach up to 100 mph, or even higher, which is equivalent to an EF-1 tornado. They can can cause extensive damage at the surface, and in some instances, can be life-threatening. Microbursts occur when the large core of rain/hail held up in the thunderstorm through an updraft suddenly plummets to the ground. As it hits the ground it spreads in all directions, but the location where the microburst first hits the ground experiences the highest winds and greatest damage.

Location

As per the Massachusetts Hazard Mitigation Plan, the entire town is at risk of high winds and severe thunderstorms. Consequentially, the location of occurrence for severe thunderstorms and wind is considered to be "large." Microbursts and tornadoes threaten much more limited parts of town, the location of occurrence considered to be "small."

Extent

An average thunderstorm is 15 miles across and lasts 30 minutes; severe thunderstorms can be much larger and longer. Southern New England typically experiences 10 to 15 days per year with severe thunderstorms. Thunderstorms can cause hail, wind, and flooding.

Tornadoes are measured using the enhanced F-Scale, shown with the following categories and corresponding descriptions of damage:

Enhanced Fujita Scale Levels and Descriptions of Damage			
EF-Scale Number	**Intensity Phrase**	**3-Second Gust (MPH)**	**Type of Damage Done**
EF0	Gale	65–85	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages to sign boards.
EF1	Moderate	86–110	The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.
EF2	Significant	111–135	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
EF3	Severe	136–165	Roof and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted.
EF4	Devastating	166–200	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.

Previous Occurrences

Westhampton experiences numerous lightening strikes throughout the summer months with approximately 3 strikes per year hitting houses. A recent lightening strike on South Road, took out power, including pumps at several residences in that area. Residences on Lyman Road, Easthampton, Road, and Tipping Rock Road have also been particularly susceptible to strikes.

There are no documented incidences of tornados or microbursts occurring in Westhampton. However, two severe wind events have occurred in the past thirty years based on the recollection of the project advisory committee:

- In the mid-1980s, it is believed that a tornado touched down at about the Chesterfield town line causing a lot of tree and property damage along East Street.

- In the early summer in the mid-1990s, a severe wind came through out of the northwest and traveling to the southeast. The event caused the largest widespread power outage

in recent history. The town landfill was reopened to allow people to dispose of rotten food. Damage estimates for both events were not available.

In Western Massachusetts, the majority of sighted tornadoes have occurred in a swath from Southwick to New Salem, and Westhampton sits directly within this "tornado alley." The June 1, 2011 tornado that touched down in West Springfield and Springfield had been tracked for possible impacts to Westhampton and Huntington in its movement eastward.

Probability of Future Events

One measure of tornado activity is the tornado index value. It is calculated based on historical tornado events data using USA.com algorithms. It is an indicator of the tornado level in a region. A higher tornado index value means a higher chance of tornado events. Data was used for Hampshire County to determine the Tornado Index Value as shown in the table below.

Tornado Index for Hampshire County	
Hampshire County	125.73
Massachusetts	87.60
United States	136.45

Source: USA.com
http://www.usa.com/hampshire-county-ma-natural-disasters-extremes.htm

Based upon the available historical record, as well as Westhampton's location in a high-density cluster of state-wide tornado activity, it is reasonable to estimate that there is a "low" frequency of tornado occurrence in Westhampton in any given year.

As per the Massachusetts Hazard Mitigation Plan, there are approximately 10 to 30 days of thunderstorm activity in the state each year. Probability is thus "high."

Impact

The potential for locally catastrophic damage is a factor in any tornado, severe thunderstorm, or wind event. In Westhampton, a tornado that hit the residential areas would leave much more damage than a tornado with a travel path that ran along the agricultural areas. Most buildings in the Town of Westhampton have not been built to Zone 1, Design Wind Speed Codes. The first edition of the Massachusetts State Building Code went into effect on January 1, 1975, with most of the Town's housing built before this date.

To approximate the potential impact to property and people that could be affected by this hazard, the total value of all property in town, $234,274,500 is used. An estimated 100 percent of damage would occur to 1 percent of structures, resulting in a total of $2,342,745 worth of

damage and 18 people affected. The cost of repairing or replacing the roads, bridges, utilities, and contents of structures is not included in this estimate. Because of the town's rural setting and sparse development, a severe thunderstorm / winds / microbursts / tornadoes would have a "limited" impact.

Vulnerability

Based on the above assessment, Westhampton has a hazard index rating of "3- medium" for severe thunderstorms and winds and a "4 –low" for tornadoes

3.5 Wildfires / Brushfires

Hazard Description

Wildland fires are typically larger fires, involving full-sized trees as well as meadows and scrublands. Brushfires are uncontrolled fires that occur in meadows and scrublands, but do not involve full-sized trees. Both wildland fires and brushfires can consume homes, other buildings and/or agricultural resources. Typical causes of brushfires and wildfires are lightning strikes, human carelessness, and arson.

FEMA has classifications for 3 different classes of wildland fires:

- Surface fires – the most common type of wildland fire, surface fires burn slowly along the floor of a forest, killing or damaging trees.
- Ground fires burn on or below the forest floor and are usually started by lightening
- Crown fires move quickly by jumping along the tops of trees. A crown fire may spread rapidly, especially under windy conditions.

Location

Hampshire County has approximately 252,000 acres of forested land, which accounts for 72% of total land area. Forest fires are therefore a potentially significant issue, with a "medium" location of occurrence. In Westhampton, approximately 85% of the town's total land area is in forest, or about 14,937 acres, and is therefore at risk of fire. A large wildfire in Westhampton could cause serious damage to the town's land mass in a short period of time. However, Massachusetts receives more than 40 inches of rain per year and much of the landscape is fragmented, and together these two traits make wildfires uncommon in Massachusetts. Nevertheless, in drought conditions, a brushfire or wildfire would be a matter of concern.

The western side of Westhampton poses a greater risk of wildfire due to the large protected forested tracts that attract kids and ATV use. Fortunately, there have been no significant wildfires to date.

Extent

Wildfires can cause widespread damage to the areas that they affect. They can spread very rapidly, depending on local wind speeds and be very difficult to get under control. Fires can last for several hours up to several days. Approximately 85% of Westhampton is forested, increasing the extent of a potential fire.

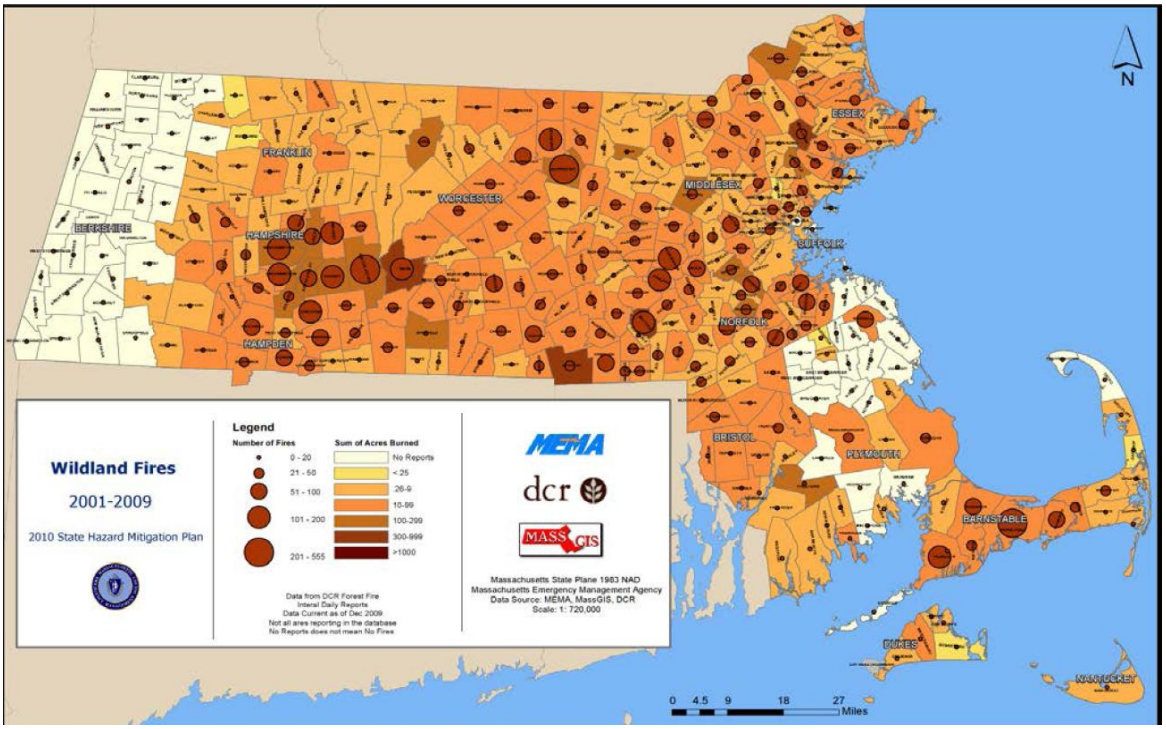
Previous Occurrences

During the past 100 years, there have not been many wildfires occurring in the Pioneer Valley. However, several have occurred during the past 20 years, as shown in the list below:

- 1995 – Russell, 500 acres burned on Mt. Tekoa
- 2000 – South Hadley, 310 acres burned over 14 days in the Litihia Springs Watershed
- 2001 – Ware, 400 acres burned
- 2010 – Russell, 320 acres burned on Mt. Tekoa
- 2012 – Eastern Hampden County, dry conditions and wind gusts created a brush fire in Brimfield, and burned 50 acres

Westhampton usually has about 6 to 10 brush fires per year. These have not involved more than 1 acre of land typically. According to the Westhampton Fire Department, 300 burn permits are typically issued in the course of the state designated open burning season, January 15 to May 1. During the open burning season, Westhampton contains risk by allowing burning only on Saturdays and Sundays when the volunteer fire department is most able to respond to problems.

Wildland Fires in Massachusetts, 2001-2009



Source: Massachusetts Hazard Mitigation Plan

Probability of Future Events

In accordance with the Massachusetts Hazard Mitigation Plan, the Town Hazard Mitigation Committee found it is difficult to predict the likelihood of wildfires in a probabilistic manner because the number of variables involved. However, given the proximity of previous wildfires and the build up of "fuel" with more brush in the forest over the years, the likelihood of a future wildfire is determined to be "moderate".

Climate scenarios project summer temperature increases between 2ºC and 5ºC and precipitation decreases of up to 15 percent. Such conditions would exacerbate summer drought and further promote high-elevation wildfires, releasing stores of carbon and further contributing to the buildup of greenhouse gases. Forest response to increased atmospheric carbon dioxide—the so-called "fertilization effect"—could also contribute to more tree growth and thus more fuel for fires, but the effects of carbon dioxide on mature forests are still largely unknown.

Impact

The impact a wildfire would incur on Westhampton is classified as "minor" as there are no homes in the areas of highest risk in town. To approximate the potential impact to property and people that could be affected by this hazard, the total value of all property in town, $234,274,500, is used.

An estimated 100 percent of damage would occur to 1 percent of structures, resulting in a total of $2,342,745 worth of damage and 18 people affected. The cost of repairing or replacing the roads, bridges, utilities, and contents of structures is not included in this estimate.

Vulnerability

Based on the above assessment, Westhampton faces a hazard index rating of "4 - low risk" from wildfires.

3.6 Earthquakes

Hazard Description

An earthquake is a sudden, rapid shaking of the ground that is caused by the breaking and shifting of rock beneath the Earth's surface. Earthquakes can occur suddenly, without warning, at any time of the year. New England experiences an average of 30 to 40 earthquakes each year although most are not noticed by people.[2] Ground shaking from earthquakes can rupture gas mains and disrupt other utility service, damage buildings, bridges and roads, and trigger other hazardous events such as avalanches, flash floods (dam failure) and fires. Un-reinforced masonry buildings, buildings with foundations that rest on filled land or unconsolidated, unstable soil, and mobile homes not tied to their foundations are at risk during an earthquake.[3]

Location

Because of the regional nature of the hazard, the entire town is equally susceptible to earthquakes. Thus, the location of occurrence is "large."

Extent

The magnitude of an earthquake is measured using the Richter Scale, which measures the energy of an earthquake by determining the size of the greatest vibrations recorded on the seismogram. On this scale, one step up in magnitude (from 5.0 to 6.0, for example) increases the energy more than 30 times. The intensity of an earthquake is measured using the Modified Mercalli Scale. This scale quantifies the effects of an earthquake on the Earth's surface, humans, objects of nature, and man-made structures on a scale of I through XII, with I denoting a weak earthquake and XII denoting a earthquake that causes almost complete destruction.

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

Source: US Federal Emergency Management Agency

[2] Northeast States Emergency Consortium Web site: *www.nesec.org/hazards/earthquakes.cfm.*
[3] Federal Emergency Management Agency Web site: *www.fema.gov/hazards/earthquakes/quake.shtm.*

Modified Mercalli Intensity Scale for and Effects			
Scale	**Intensity**	**Description Of Effects**	**Corresponding Richter Scale Magnitude**
I	Instrumental	Detected only on seismographs.	
II	Feeble	Some people feel it.	< 4.2
III	Slight	Felt by people resting; like a truck rumbling by.	
IV	Moderate	Felt by people walking.	
V	Slightly Strong	Sleepers awake; church bells ring.	< 4.8
VI	Strong	Trees sway; suspended objects swing, objects fall off shelves.	< 5.4
VII	Very Strong	Mild alarm; walls crack; plaster falls.	< 6.1
VIII	Destructive	Moving cars uncontrollable; masonry fractures, poorly constructed buildings damaged.	
IX	Ruinous	Some houses collapse; ground cracks; pipes break open.	< 6.9
X	Disastrous	Ground cracks profusely; many buildings destroyed; liquefaction and landslides widespread.	< 7.3
XI	Very Disastrous	Most buildings and bridges collapse; roads, railways, pipes and cables destroyed; general triggering of other hazards.	< 8.1
XII	Catastrophic	Total destruction; trees fall; ground rises and falls in waves.	> 8.1

Previous Occurrences

The most recent earthquakes to affect New England are shown in the table below.

Largest Northeast Earthquakes Since 1924		
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
Plattsburg, NY	April 20, 2002	5.1
Bar Harbor, NH	October 3, 2006	4.2
Hollis Center, ME	October 16, 2012	4.6

Source: Northeast States Emergency Consortium website, www.nesec.org/hazards/earthquakes.cfm

New England States Record of Historic Earthquakes		
State	**Years of Record**	**Number Of Earthquakes**
Connecticut	1668 - 2007	137
Maine	1766 - 2007	544
Massachusetts	1668 - 2007	355
New Hampshire	1638 - 2007	360
Rhode Island	1776 - 2007	38
Vermont	1843 - 2007	73
New York	1840 - 2007	755
Total Number of Earthquakes within the New England states between 1638 and 1989 is 2262.		

Source: Northeast States Emergency Consortium website, www.nesec.org/hazards/earthquakes.cfm

Probability of Future Events

One measure of earthquake activity is the Earthquake Index Value. It is calculated based on historical earthquake events data using USA.com algorithms. It is an indicator of the earthquake activity level in a region. A higher earthquake index value means a higher chance of earthquake

events. Data was used for Hampshire County to determine the Earthquake Index Value as shown in the table below.

Earthquake Index for Hampshire County	
Hampshire County	0.17
Massachusetts	0.70
United States	1.81

Based upon existing records, there is a "low" frequency of earthquakes in Westhampton with between a 1 percent and 2 percent chance of an earthquake occurring in any given year.

Impact

Massachusetts introduced earthquake design requirements into their building code in 1975 and improved building code for seismic reasons in the 1980s. However, these specifications apply only to new buildings or to extensively-modified existing buildings. Buildings, bridges, water supply lines, electrical power lines and facilities built before the 1980s may not have been designed to withstand the forces of an earthquake. The seismic standards have also been upgraded with the 1997 revision of the State Building Code.

The impact an earthquake could incur on Westhampton is deemed to be "critical." To approximate the potential impact to property and people that could be affected by this hazard, the total value of all property in town, $234,274,500 is used.

An estimated 100 percent of damage would occur to 20 percent of structures, resulting in a total of $46,845,900 worth of damage and 367 people affected. The cost of repairing or replacing the roads, bridges, utilities, and contents of structures is not included in this estimate.

Vulnerability

Based on this analysis, Westhampton faces a "4- low risk" from earthquakes.

3.7 Dam Failures

Hazard Description

Dams, levees, and their associated impoundments can provide important benefits to a community, including water supply, recreation, hydroelectric power generation, and flood control. However, they also pose a potential risk to lives and property. Dam or levee failure is not a common occurrence, but dams do represent a potentially disastrous hazard. When a dam fails, the potential energy of the stored water behind the dam is released rapidly. Most dam failures occur when floodwaters overtop and erode the material components of the dam.

Many dams in Massachusetts were built during the 19th century without the benefit of modern engineering design and construction oversight. Dams of this age can fail because of structural problems due to age and/or lack of proper maintenance, as well as from structural damage caused by an earthquake or flooding.

The Massachusetts Department of Conservation and Recreation's Office of Dam Safety is responsible for regulating dams in the state (M.G.L. Chapter 253, Section 44 and the implementing regulations 302 CMR 10.00). Dams regulated by the Office of Dam Safety must be in excess of 6 feet in height (regardless of storage capacity) and have more than 15 acre feet of storage capacity (regardless of height). Dams that fall below these parameters are known as non-jurisdictional dams. Hydropower dams, such as the West Springfield Dam/Strathmore Paper Co. Dam, are typically regulated through licensing they obtain through the Federal Energy Regulatory Commission.

Dam safety regulations enacted in 2005 transferred significant responsibilities for dams from the State of Massachusetts to dam owners. The financial burden associated with these responsibilities can vary greatly, depending on the number of dams for which an owner is responsible, and the dam's condition and hazard index rating. A hazard index rating (see description of this rating in "Extent" section below) brings with it different requirements related to frequency of inspections by engineers and the need for development of emergency action plans. With these inspections, a dam determined to be in poor or unsafe condition can involve very costly repairs.

In January 2013, the Governor signed into law additional provisions to promote greater dam safety by:

1. extending the requirement of emergency action plans to significant hazard dams (in addition to high hazard dams);
2. strengthening the authority of the Office of Dam Safety by increasing fines for non compliance; and
3. establishing the Dam and Sea Wall Repair and Removal Fund, an annual grant and loan program available to dam owners.

As of March 2015, it is noted on the Office of Dam Safety website, "Prior to implementation of the legislated changes, regulations must be drafted, reviewed and promulgated. Draft regulations will be made available for public comment as part of the promulgation process.

Location

The Massachusetts Office of Dam Safety identifies two regulated dams and one regulated dike in Westhampton. One of these is categorized as High Hazard, one is Significant Hazard, and one is Low Hazard. (These categories are described below under Extent section.) Failure of Westhampton's high hazard dam, the Pine Island Lake Dam, would result in the most significant loss, potentially destroying 8 downstream bridges in Westhampton. A dam failure would have a "small" location of occurrence.

Dams in Westhampton				
ID#	**Dam**	**Hazard Index Rating**	**Condition**	**Emergency Action Plan**
MA02711	Lyman Pond Dam	Low Hazard	Unsafe, but currently breached	NA
MA00595	Pine Island Lake Dam	High Hazard	Satisfactory	10/1/14
MA00596	Pine Island Lake Dike	Significant Hazard	Satisfactory	Will likely be required with new regulations

Source: Based on updates to PVPC dams data base from Massachusetts Office of Dam Safety, October 2015

Extent

Often dam breaches lead to catastrophic consequences as the water ultimately rushes in a torrent downstream flooding an area engineers refer to as an "inundation area." The number of casualties and the amount of property damage will depend upon the timing of the warning provided to downstream residents, the number of people living or working in the inundation area, and the number of structures in the inundation area.

Dams in Massachusetts are assessed according to their risk to life and property. The state has three hazard classifications for dams:

- *High Hazard*: Dams located where failure or improper operation is likely to cause loss of life and serious damage to homes, industrial or commercial facilities, important public utilities, main highways, or railroads.

- *Significant Hazard*: Dams located where failure or improper operation may cause loss of life and damage to homes, industrial or commercial facilities, secondary highways or railroads or cause interruption of use or service of relatively important facilities.

- *Low Hazard*: Dams located where failure or improper operation may cause minimal property damage to others. Loss of life is not expected.

Previous Occurrences

The Lyman Pond Dam failed during the flood of 1955 taking out the bridge on Route 66. Since then the bridge has been rebuilt twice, once in 1955 and again in 1989 (or the early 1990s). This dam is currently breached and advisory committee members are not sure what new owner is planning with regards to the dam.

Flood waters in the 1955 flood also overtopped the Pine Island Lake Dam. Downstream damage was minimal. Work was performed on this dam in the mid-1990s.

Probability of Future Events

As Westhampton's dams age, and if maintenance is deferred, the likelihood of a dam failure will increase, but, currently the frequency of dam failures is "very low" with a less than 1 percent chance of a dam failing in any given year.

As described in the Massachusetts Hazard Mitigation Plan, dams are designed partly based on assumptions about a river's flow behavior, expressed as hydrographs. Changes in weather patterns can have significant effects on the hydrograph used for the design of a dam. If the hydrograph changes, it is conceivable that the dam can lose some or all of its designed margin of safety, also known as freeboard. If freeboard is reduced, dam operators may be forced to release increased volumes earlier in a storm cycle in order to maintain the required margins of safety. Such early releases of increased volumes can increase flood potential downstream. Throughout the west, communities downstream of dams are already seeing increases in stream flows from earlier releases from dams. Dams are constructed with safety features known as "spillways." Spillways are put in place on dams as a safety measure in the event of the reservoir filling too quickly. Spillway overflow events, often referred to as "design failures," result in increased discharges downstream and increased flooding potential. Although climate change will not likely increase the probability of catastrophic dam failure, it may increase the probability of design failures.

Impact

The impact a dam failure could incur on Westhampton is considered "medium." To approximate the potential impact to property and people that could be affected by this hazard, the total value of all property in town, $234,274,500 is used.

An estimated 100 percent of damage would occur to 20 percent of structures, resulting in a total of $46,854,900 worth of damage and 367 people affected. The cost of repairing or replacing the roads, bridges, utilities, and contents of structures is not included in this estimate.

Vulnerability

Based on this analysis, Westhampton faces a hazard index rating of "4-low risk" from dam failure.

3.8 Drought

Hazard Description

Drought is a normal, recurrent feature of climate. It occurs almost everywhere, although its features vary from region to region. In the most general sense, drought originates from a deficiency of precipitation over an extended period of time, resulting in a water shortage for some activity, group, or environmental sector. Reduced crop, rangeland, and forest productivity; increased fire hazard; reduced water levels; increased livestock and wildlife mortality rates; and damage to wildlife and fish habitat are a few examples of the direct impacts of drought. Of course, these impacts can have far-reaching effects throughout the region and even the country.

Location

Because of this hazard's regional nature, a drought would impact the entire town, making the location of occurrence "large."

Extent

The severity of a drought would determine the scale of the event and would vary among town residents depending on whether the residents' water supply is derived from a private well or the public water system.

The U.S. Drought Monitor also records information on historical drought occurrence. Unfortunately, data could only be found at the state level. The U.S. Drought Monitor categorizes drought on a D0-D4 scale as shown below.

U.S. Drought Monitor		
Classification	**Category**	**Description**
D0	Abnormally Dry	Going into drought: short-term dryness slowing planting, growth of crops or pastures. Coming out of drought: some lingering water deficits; pastures or crops not fully recovered
D1	Moderate Drought	Some damage to crops, pastures; streams, reservoirs, or wells low, some water shortages developing or imminent; voluntary water-use restrictions requested
D2	Severe Drought	Crop or pasture losses likely; water shortages common; water restrictions imposed
D3	Extreme Drought	Major crop/pasture losses; widespread water shortages or restrictions
D4	Exceptional Drought	Exceptional and widespread crop/pasture losses; shortages of water in reservoirs, streams, and wells creating water emergencies

Source: US Drought Monitor, http://droughtmonitor.unl.edu/classify.htm

Previous Occurrences

In Massachusetts, six major droughts have occurred statewide since 1930.[4] They range in severity and length, from three to eight years. In many of these droughts, water-supply systems were found to be inadequate. Water was piped in to urban areas, and water-supply systems were modified to permit withdrawals at lower water levels. The following table indicates previous occurrences of drought since 2000, based on the US Drought Monitor:

Annual Drought Status	
Year	**Maximum Severity**
2000	No drought
2001	D2 conditions in 21% of the state
2002	D2 conditions in 99% of the state
2003	No drought
2004	D0 conditions in 44% of the state
2005	D1 conditions in 7% of the state
2006	D0 conditions in 98% of the state
2007	D1 conditions in 71% of the state
2008	D0 conditions in 57% of the state
2009	D0 conditions in 44% of the state
2010	D1 conditions in 27% of the state
2011	D0 conditions in 0.01% of the state
2012	D2 conditions in 51% of the state

Source: US Drought Monitor

Westhampton has not been previously affected by any droughts in the state.

Probability of Future Events

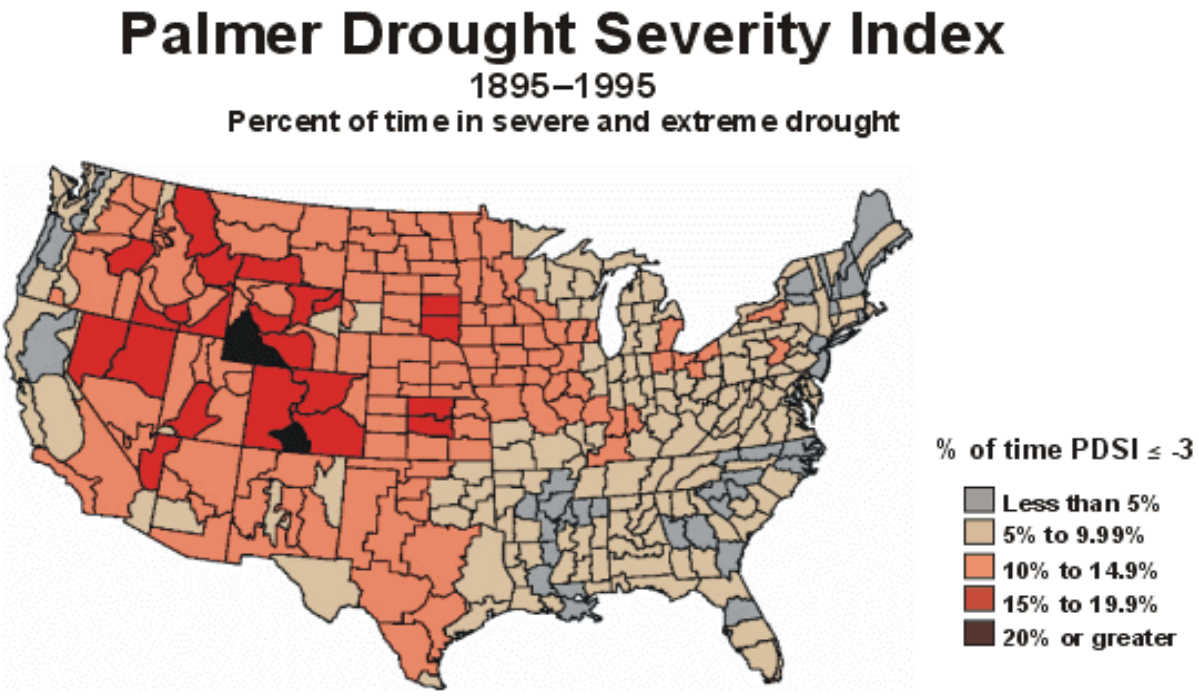
In Westhampton, as in the rest of the state, drought occurs at a rate of between 1 percent and 10 percent in a single given year, or "low."

Based on past events and current criteria outlined in the Massachusetts Drought Management Plan, it appears that western Massachusetts may be more vulnerable than eastern Massachusetts to severe drought conditions. However, many factors, such as water supply sources, population, economic factors (i.e., agriculture based economy), and infrastructure, may affect the severity and length of a drought event.

When evaluating the region's risk for drought on a national level, utilizing a measure called the Palmer Drought Severity Index, Massachusetts is historically in the lowest percentile for severity

[4] US Geological Survey Water-Supply Paper 2375. "National Water Summary 1989 – Floods and Droughts: Massachusetts." Prepared by S. William Wandle, Jr., US Geological Survey.

and risk of drought.[5] However, global warming and climate change may have an effect on drought risk in the region. With the projected temperature increases, some scientists think that the global hydrological cycle will also intensify. This would cause, among other effects, the potential for more severe, longer-lasting droughts.



Impact

Due to the water richness of Western Massachusetts, Westhampton is unlikely to be adversely affected by anything other than a major, extended drought. While such a drought would require water saving measures to be implemented, there would be no foreseeable damage to structures or loss of life resulting from the hazard. The impact a drought would have on Westhampton would be "minor."

Vulnerability

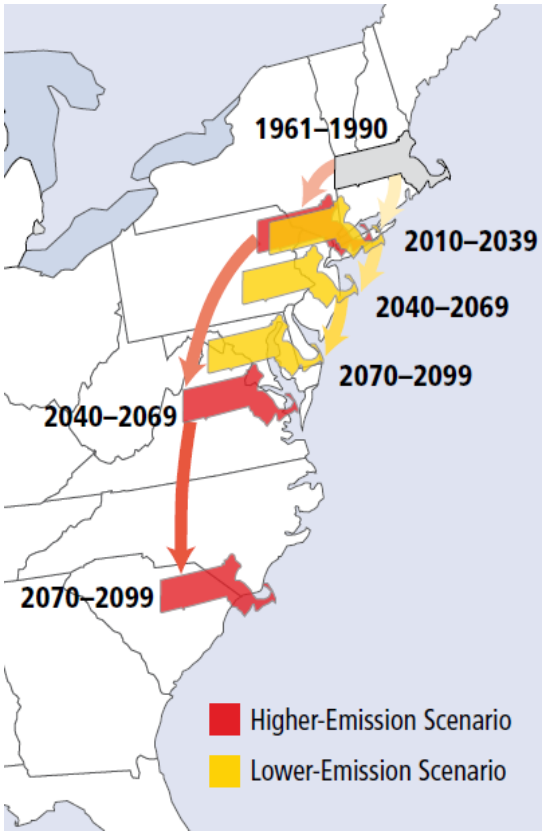
Based on the above assessment, Westhampton faces a hazard index rating of "4 - low risk" of drought.

[5] National Drought Mitigation Center – http://drought.unl.edu

3.9 Extreme Temperatures

Hazard Description

Greater variation and extremes in local atmospheric temperatures due to global changes in climate are now among the natural hazards that this plan anticipates. Westhampton is likely to experience more instances of extreme and sustained heat and cold. And, because warmer air holds more moisture, higher temperatures will also bring wetter winters, more severe storms, and more frequent flooding. Locally, there will also be more single-day records highs, and more total days with highs above 90 degrees, and more heat waves with 3 or more days above 90 degrees. More extreme temperatures throughout Western Massachusetts and New England mean that there will be more floods, droughts, and tornados. There will also be more Atlantic hurricanes and nor'easters. Anticipated increases in extreme local temperatures is directly related to many of the previously described vulnerabilities, as well as increasing the risk of heat-related disease and injury, especially among senior citizens and residents unable to afford air conditioning.



At current rates of greenhouse gas accumulation and temperature increases, the climate of Massachusetts will become similar to those of present-day New Jersey or Virginia by 2040-2069, depending on future GHG emissions.
Source: NECIA 2006

Anticipated Climatic Variation

In Western Massachusetts, annual precipitation is expected to increase by 14% by the end of the 21st century. However, most of this precipitation increase will come during the winter months – as much as 30% more than today – while summertime precipitation will actually decrease slightly. Also, most of the added winter precipitation is expected to be in the form of rain, rather than snow. This will mean a continuation of the current regional trend of a decreasing snowfall totals, as well as the number of days with snow cover on the ground, but more precipitation overall. The increased amount of strong precipitation events and overall increase in rainfall, combined with the aging stormwater infrastructure in the region, will likely result in more flooding in the region.

Anticipated Climatic Variations for Massachusetts Due to Climate Change

Category	Current (1961-1990 avg.)	Predicted Change 2040-2069	Predicted Change 2070-2099
Average Annual Temperature (°F)	46°	50°to 51°	51° to 56°
Average Winter Temperature (°F)	23°	25.5° to 27°	31° to 35°
Average Summer Temperature (°F)	68°	69.5° to 71.5°	74° to 82°
Days over 90 °F	5 to 20 days	-	30 to 60 days
Days over 100 °F	0 to 2 days	-	3 to 28 days
Annual Precipitation	41 inches	43 to 44 inches	44 to 47 inches
Winter Precipitation	8 inches	8.5 to 9 inches	9 to 10.4 inches
Summer Precipitation	11 inches	10.9 to 10.7 inches	10.9 to 11 inches

Source: Massachusetts Climate Adaptation Report 2011, NECIA

As per the Massachusetts Hazard Mitigation Plan, extreme cold is a dangerous situation that can result in health emergencies for susceptible people, such as those without shelter or who are stranded or who live in homes that are poorly insulated or without heat. There is no universal definition for extreme temperatures, with the term relative to local weather conditions. For Massachusetts, extreme temperatures can be defined as those that are far outside the normal ranges. The average temperatures for Massachusetts are:

Winter (Dec-Feb) Average = 27.51ºF
Summer (Jun-Aug) Average = 68.15ºF

Criteria for issuing alerts for Massachusetts are provided on National Weather Service web pages: http://www.erh.noaa.gov/box/warningcriteria.shtml.

Location

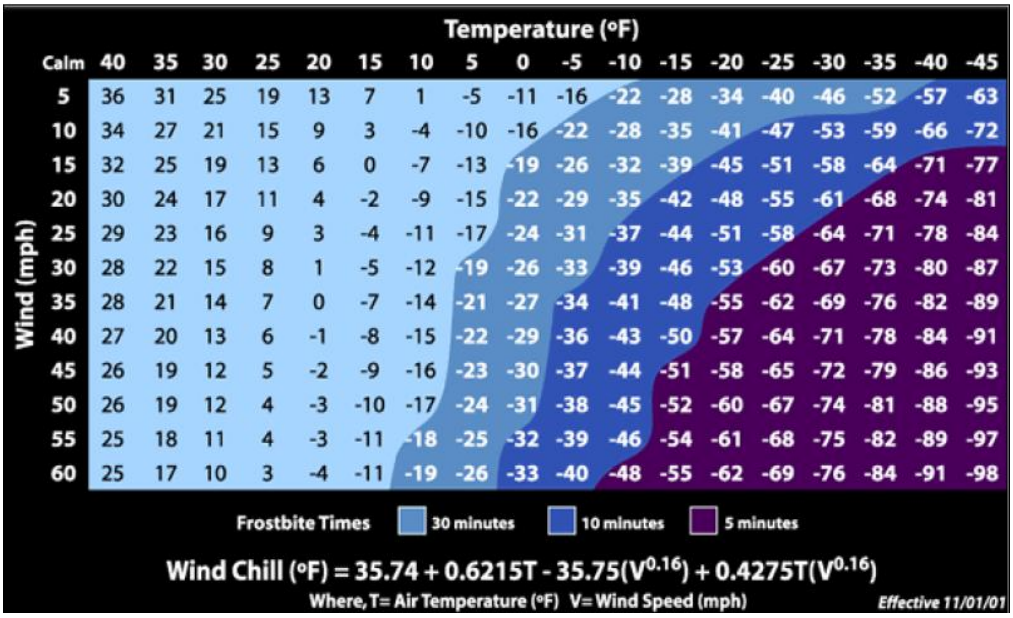
Any instances of extreme temperatures that have occurred in the past occurred throughout Westhampton and therefore have a "large" location of occurence. Extreme cold or heat does not usually require the opening of comfort stations, though plans are in place if they are needed.

Extent

As per the Massachusetts Hazard Mitigation Plan, the extent (severity or magnitude) of extreme cold temperatures are generally measured through the Wind Chill Temperature Index. Wind Chill Temperature is the temperature that people and animals feel when outside and it is based on the rate of heat loss from exposed skin by the effects of wind and cold. The chart shows three shaded areas of frostbite danger. Each shaded area shows how long a person can be exposed before frostbite develops. In Massachusetts, a wind chill warning is issued by the NWS Taunton Forecast Office when the Wind Chill Temperature Index, based on sustained wind, is –25ºF or lower for at least three hours.

Extreme temperatures would affect the whole community.

Wind Chills



For extremely hot temperatures, the heat index scale is used, which combines relative humidity with actual air temperature to determine the risk to humans. The NWS issues a Heat Advisory when the Heat Index is forecast to reach 100-104 degrees Fahrenheit for 2 or more hours. The NWS issues an Excessive Heat Warning if the Heat Index is forecast to reach 105+ degrees Fahrenheit for 2 or more hours. The following chart indicates the relationship between heat index and relative humidity:

Heat Index

Relative Humidity (%)	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	128	136					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

Category	Heat Index	Health Hazards
Extreme Danger	130 °F – Higher	Heat Stroke or Sunstroke is likely with continued exposure.
Danger	105 °F – 129 °F	Sunstroke, muscle cramps, and/or heat exhaustion possible with prolonged exposure and/or physical activity.
Extreme Caution	90 °F – 105 °F	Sunstroke, muscle cramps, and/or heat exhaustions possible with prolonged exposure and/or physical activity.
Caution	80 °F – 90 °F	Fatigue possible with prolonged exposure and/or physical activity.

Previous Occurrences

The following are some of the lowest temperatures recorded in parts of Massachusetts for the period from 1895 to present (Source: NOAA, www.ncdc.noaa.gov.):

Blue Hills, MA – -21°F
Boston, MA – -12°F
Worcester, MA – -19°F

The following are some of the highest temperatures recorded for the period from 1895 to present (Source: NOAA, www.ncdc.noaa.gov.):

Blue Hills, MA – 101°F
Boston, MA – 102°F
Worcester, MA – 96°F

Extreme heat usually requires the opening of shelters on a few occasions per year. In the winters of 2014 and 2015, warming centers were opened for extremely cold temperatures due to the "polar vortex."

Probability of Future Events

The probability of future extreme heat and extreme cold is considered to be "high," or between 40 and 70 percent in any given year.

Impact

The impact of extreme heat or cold in Westhampton is considered to be "minor," with no property damage and very limited affect on humans.

Vulnerability

Westhampton’s vulnerability from extreme heat and cold is considered to be, "4 - Low Risk."

3.10 Other Hazards

In addition to the hazards identified above, the Hazard Mitigation Team reviewed the full list of hazards listed in the Massachusetts Hazard Mitigation Plan. Due to the location and context of the Town, coastal erosion, landslides, and tsunamis, were determined to not be a threat.

4: CRITICAL FACILITIES

Facility Classification

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

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

The Critical Facilities List for the Town of Westhampton has been identified utilizing a Critical Facilities List provided by the State Hazard Mitigation Officer. Westhampton's Hazard Mitigation Workgroup has broken up this list of facilities into three categories:

- Facilities needed for emergency response in the event of a hazard event.

- Facilities identified as non-essential and not required in an emergency response event, but which are considered essential for the everyday operation of the Town.

- Facilities or institutions that include special populations which would need additional attention in the event of a hazard event.

The critical facilities and evacuation routes potentially affected by hazard areas are identified following this list. The Past and Potential Hazards/Critical Facilities Map (Appendix D) also identifies these facilities.

Category 1 – Emergency Response Services

The Town has identified the Emergency Response Facilities and Services as the highest priority in regards to protection from natural and man-made hazards.

1) Emergency Operations Center
   Primary: Westhampton Fire Department, 48 Stage Road
   Secondary: Westhampton Highway Department, 58 Hathaway Road

2) Fire Station
   Westhampton Fire Department, 48 Stage Road

3) Police Station
   Westhampton Police Department, 48 Stage Road

4) Highway Department
   Westhampton Highway Department, 58 Hathaway Road

5) Potable Water
   Westhampton Elementary School, 37 Kings Highway
   Hampshire Regional High School, 19 Stage Road
   Westhampton Congregational Church, 1 Tob Road
   Westhampton Public Library, 1 North Road
   Town Hall and Town Hall Annex, 1 South Road
   Highway Department, 58 Hathaway Road

6) Emergency Fuel Stations
   Public Safety Complex, 48 Stage Road

7) Facilities with Emergency Generators
   Public Safety Complex, 48 Stage Road
   Highway Department, 58 Hathaway Road
   Westhampton Woods, 13 Main Road, Unit F
   Westhampton Elementary School, 37 Kings Highway
   Hampshire Regional High School, 19 Stage Road

8) Regional Emergency Shelter
   Smith Vocational and Agricultural High School, 80 Locust Street, Northampton (Red Cross approved and pet friendly)

9) Warming and Cooling Centers
   Primary: Westhampton Elementary School, 37 Kings Highway (no air conditioner currently)
   Secondary: Westhampton Public Library, 1 North Road (no generator currently)

10) Portable Generators
   3 medium-sized portable generators (2 stored at Highway Department and 1 stored at Public Safety Complex)
   4 small-sized portable generators stored at Public Safety Complex

11) Transfer Station
   Westhampton Transfer Station, 52 Hathaway Road

12) Helicopter Landing Sites
   Hampshire Regional High School parking lot, 19 Stage Road
   Westhampton Elementary School, 37 Kings Highway

13) Communications
   Route 66 – 2 cell towers
   Southampton Road – 1 cell tower

14) Primary Evacuation Routes
   Route 66
   Chesterfield Road
   Northwest Road

Southampton Road
Loudville Road

15) Bridges/Culverts Located on Evacuation Routes
Route 66 – two Sodom Brook crossings; 1 Manhan River crossing
Chesterfield Road – 2 Roberts Meadow Brook crossings
Northwest Road – 1 at Manhan River crossings; 1 at Roberts Meadow Brook
Southampton Road – 1 Sodom Brook crossing
Loudville Road – 1 culvert to unnamed brook

Category 2 – Non Emergency Response Facilities

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

1) River Crossings, Including Bridges and Culverts
Laurel Hill Road at Lyman Brook (*note: culvert here is undersized*)
Northwest Road at Manhan River (*note: culvert here is undersized*)
Chesterfield Road near Roberts Meadow Brook (*note: requires weight limit due to condition*)
Kings Highway at Manhan River (*note: requires weight limit due to condition*)
Tob Road near small tributary to Manahan River (*note: requires weight limit due to condition*)

2) Pumping Stations
Hampshire Regional High School – 100,000 gallon cistern with diesel pump; 2 wells one of which is for fire protection and the other for drinking water

3) Main Electrical Service Lines
Loudville Road
Route 66
South Road

Category 3 – Facilities/Populations to Protect

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

1) Special Needs Population
Massachusetts Department of Health and Human Services Home, 100 North Road

2) Elderly Housing/Assisted Living
Westhampton Woods, 13 Main Road, Unit F

3) Public Buildings/Areas
Town Hall and basement of Town Hall Annex, 1 South Road

4) Schools
   Westhampton Elementary School, 37 Kings Highway
   Hampshire Regional High School, 19 Stage Road

5) Churches
   Westhampton Congregational Church, 1 Tob Road

6) Historic Buildings/Sites
   Cemetery Road
   Blacksmith Shop, 5 Stage Road
   Town Hall and Town Hall Annex, 1 South Road
   Westhampton Congregational Church, 1 Tob Road
   Westhampton Public Library, 1 North Road

7) Apartment Complexes
   None

8) Employment Centers
   None

9) Other
   Hathaway Construction, 128 North Road - has >10,000 gallons of diesel fuel
   Meehan Construction, 19 Perry Hill Road - has >10,000 gallons of diesel fuel
   Windy Acres KOA Campground, 139 South Road

Category 4 – Potential Resources

Contains facilities that provide potential resources for services or supplies.

1) Food/Water
   Outlook Farm, 136 Main Road

2) Hospitals/Medical Supplies
   Easthampton Fire Department (Mutual Aid Ambulance Partners)
   Southampton Fire Department American Medical Response (Mutual Aid Ambulance Partners)
   Northampton Fire Department (Mutual Aid Ambulance Partners)
   Pioneer Valley Ambulance
   Cooley Dickinson Hospital, Northampton

3) Gasoline
   Public Safety Complex

4) Building Materials Suppliers
   Fleury Lumber, Easthampton

5) Heavy & Small Equipment Suppliers
   Todd Alexander, 202 Reservoir Road
   David Loven, 230 Reservoir Road
   Hathaway Construction, 128 North Road
   Meehan Construction, 19 Perry Hill Road

6) Gravel Pits
   Chesterfield Road
   North Road
   South Road
   Reservoir Road

7) Transportation
   Cosmic Cab, 78 Conz Street, Northampton
   Go Green Cab, 2 Conz Street, Northampton
   Northampton Cab, 68 Bradford Street, Northampton
   Paradise Taxi, 16C North Maple Street, Northampton

   Durham Transportation (Buses), 77 Ferry Street, Easthampton
   Lecrenski Brothers (Buses), 169 College Highway, Southampton
   Strong Corporation (Buses), 40 O'Neil Street, Easthampton

Critical Facilities and Evacuation Routes Potentially Affected by Hazard Areas			
Hazard Type	**Hazard Area**	**Critical Facilities Affected**	**Evacuation Routes Affected**
Flooding	• Stage and Easthampton roads • Stage and Southampton roads • Northwest Road • Laurel Hill Road • Kings Highway • Tob Road • Chesterfield Road • South Road	None None None None None None None None	None Southampton Road Northwest Road None Kings Highway None Chesterfield Road None
Severe snow / ice storms	Loudville Road Route 66, and South Road 185 Main Road North Road	Electrical Distribution _____ None None	None _____ Route 66 (Main Road) None
Hurricanes	Entire Town	None	None
Severe thunderstorms / wind / tornadoes	Entire Town	None	None
Wildfires / brushfires	Entire Town	None	None
Earthquakes	Entire Town	None	None
Dam Failure	Lyman Pond Dam/ Pine Island Lake Dam	Hathaway Construction maintenance facility; and Meehan Construction storage tank for >10,000 gallons of diesel fuel	Route 66 (Main Road)
Drought	Entire Town	None	None

(Past and Potential Hazards / Critical Facilities Map Located In Back of Plan)

5: MITIGATION CAPABILITIES AND STRATEGIES

One of the steps of this Hazard Mitigation Plan update is to evaluate all of the Town's existing policies and practices related to natural hazards and identify potential gaps in protection. Westhampton's local Hazard Mitigation Committee worked with PVPC to complete the FEMA Capability Assessment worksheet, included in Appendix.

Westhampton has many no cost or low cost hazard mitigation strategies and capabilities in place. These are deployed for hazard mitigation as appropriate. Land use zoning, subdivision regulations and an array of specific policies and regulations that include hazard mitigation best practices, such as limitations on development in floodplains, stormwater management, tree maintenance, etc.

Westhampton also has appropriate staff dedicated to hazard mitigation-related work for a community of its size, including an Emergency Management Director, a professionally run Highway Department, a Building Inspector, and a Tree Warden. Also important to mention is the Town Treasurer who manages payroll and the Administrative Assistant to the Selectboard who coordinates all departments in terms of finances, including materials and hours.

The Town also has paid department staff and numerous volunteer committees and boards. Committees that support natural hazard mitigation capabilities include the Westfield Wild & Scenic Committee, which focuses on land protection related to the the Emergency Planning Committee, which focuses on disaster planning and response coordination; the Conservation Commission; and the Capital Improvement Planning Committee, which prepares the immediate and 5-year Capital Improvement Budget. The Town's ability to expand upon and improve the above capabilities is limited by volunteer availability and the Town's budget, but includes the potential to increase collaboration with state and federal landowners in Town as mitigation issues warrant.

The Town collaborates closely with surrounding communities and is party to Mutual Aid agreements through the MEMA. Westhampton is also an active member community of the Hampshire Council of Governments and the Pioneer Valley Planning Commission (PVPC). Westhampton can take advantage of no cost local technical assistance provided by the professional planning staff at the PVPC as needed for certain mitigation planning activities.

Westhampton's most obvious hazard mitigation need is for federal funds to implement prioritized actions. While Westhampton is a well-managed fiscally sound Town, it is not a wealthy community and with state constraints on municipalities raising their own funds, Westhampton has very limited financial resources to invest in costly hazard mitigation measures. Westhampton is, however, committed to locally matching all HMGP grants received.

The Town of Westhampton has developed the following goal to serve as a framework for mitigation of the hazards identified in this plan.

Goal Statement

To minimize the loss of life, damage to property, and the disruption of governmental services and general business activities due to the following hazards: flooding, severe snowstorms/ice storms, severe thunderstorms, hurricanes, tornadoes, wildfires/brushfires, earthquakes, dam failures, and drought.

For the extent of this analysis, the Workgroup reviewed the following Town documents:

- Zoning Bylaws
- Subdivision Rules and Regulations
- Comprehensive Emergency Management Plan
- Town Open Space and Recreation Plan

Current Mitigation Capabilities and Strategies by Hazard

An overview of existing mitigation strategies and capabilities for each of the hazards identified in this plan follows.

Floods

The key factors in flooding are the water capacity of water bodies and waterways, the regulation of waterways by flood control structures, and the preservation of flood storage areas and wetlands. As more land is developed, more flood storage is demanded of the town's water bodies and waterways. The Town currently addresses this problem with a variety of mitigation tools and strategies. Flood-related regulations and strategies are included in the Town's general bylaws, zoning by-law, and subdivision regulations. Infrastructure such as culverts are in place to direct the flow of water.

Existing Hazard Mitigation Capabilities and Strategies for Floods			
Strategy/Capability	**Description**	**Effectiveness**	**Potential Changes**
Zoning regulations	Floodplain overlay district protects areas delineated as part of the 100-year flood plain by regulating uses and special permit requirements.	Very effective for preventing incompatible development within flood prone areas.	Will need to update overlay district if FEMA provides new maps (currently maps for Town date to 1979)
	Water supply protection district protects groundwater resources by regulating certain uses, drainage, and other requirements within recharge area of aquifer.	Very effective for preventing groundwater contamination and managing infiltration.	Revise Water Supply Protection District using MassDEP model, with a focus on clarifying definitions
	Any project or operation that involves more than 100 cubic yards of earth is regulated, including setbacks and erosion control measures.	Effective for preventing sedimentation and erosion.	None
	Special permit/site plan approval With just one zoning district in town, many uses require special permit approval, which includes regulations for drainage, groundwater, etc.	Somewhat effective for preventing incompatible development.	Review to ensure that standards support mitigation of hazards to the maximum extent practicable.
Subdivision regulations	Definitive plans must include proposed drainage	Somewhat effective	Make regulations consistent with drainage requirements in zoning bylaw and include requirement that stormwater BMPS must be used where applicable
	Board of Health must determine suitability of land for drainage.	Effective	None
	Design standards provide protection of natural features – developers encouraged to consider significant features in site layout.	Somewhat effective	Restrict altering natural features rather than just encouraging protection
	Floodplain district – properties within the floodplain have additional safety requirements	Effective	None
National Flood Insurance Program	As of 2006, there were 3 homeowners with flood insurance	Somewhat effective provided	Evaluate whether to become a part of

participation	policies.	that town remains enrolled in the NFIP	FEMA's Community Rating System Educate citizens living in the floodplain about NFIP
Culvert replacement and drainage improvements	Replace culverts/improve drainage systems on: Northwest Road, Tob Road, Chesterfield Road, Laurel Hill Road	Very effective for managing flood control needs.	Seek funding from HMGP for top priority projects

What is the NFIP's Community Rating System?

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

Severe Snow and Ice Storms

Winter storms can be especially challenging for emergency management personnel. The Massachusetts Emergency Management Agency (MEMA) serves as the primary coordinating entity in the statewide management of all types of winter storms and monitors the National Weather Service (NWS) alerting systems during periods when winter storms are expected. Even though the storm has usually been forecast, there is no certain way for predicting its length, size or severity. Therefore, mitigation strategies must focus on preparedness prior to a severe snow/ice storm.

The Town's current mitigation focuses on preparedness, with many regulations and standards established based on safety during storm events. To the extent that some of the damages from a winter storm can be caused by flooding, flood protection mitigation measures also assist with severe snowstorms and ice storms.

Existing Hazard Mitigation Strategies and Capabilities for Severe Snow and Ice Storms			
Strategy/Capability	**Description**	**Effectiveness**	**Potential Changes**
Subdivision regulations	Design standards limit street grades to 6% for primary streets and 12% for secondary streets	Effective	None
	Utilities must be placed underground at time of construction	Effective for preventing power loss	None
Snow removal general bylaw	Prohibits residents from plowing snow into the road	Effective	None
Tree management	List of dangerous trees created annually for EverSource	Very effective	None
State building code	Town has adopted the 2008 MA state building code	Effective	Adopt new MA state building code expected July 2016
Bylaw to regulate height of telecommunications facilities	Draft bylaw to deal with telecommunications facilities	Effective	Needs to be drafted
Regional Debris Management Plan	Participate in the creation of a Regional Debris Management Plan	Effective	Needs to be developed
Properly equip warming centers	There are 2 warming centers designated in town: the Elementary School and Library	Effective	Configure generator at Elementary School to ensure that drinking water can be supplied during outages Install back-up generator at Library

What is a Regional Debris Management Plan?

Natural disasters can precipitate a variety of debris, including trees, construction and demolition materials and personal property. After a natural disaster, potential threats to the health, safety and welfare of impacted citizens can be minimized through the implementation of a debris management plan. Such a plan can be critical to recovery efforts after a disaster, including facilitating the receipt of FEMA funds for debris clearance, removal and disposal.

Hurricanes and Tropical Storms

Hurricanes and tropical storms provide the most lead warning time of all identified hazards, because of the relative ease in predicting the storm's track and potential landfall. MEMA assumes "standby status" when a hurricane's location is 35 degrees North Latitude (Cape Hatteras) and "alert status" when the storm reaches 40 degrees North Latitude (Long Island). Even with significant warning, hurricanes can do significant damage – both due to flooding and severe wind.

The flooding associated with hurricanes and tropical storms can be a major source of damage to buildings, infrastructure and a potential threat to human lives. Therefore all of the flood mitigation strategies and capabilities can also be considered hurricane mitigation measures. The high winds that often accompany hurricanes can also damage buildings and infrastructure, similar to tornadoes and other strong wind events. Therefore the strategies and capabilities associated with severe winds is coupled with this hazard.

Severe Thunderstorms / Winds / Tornadoes / Microbursts

Most damage from severe thunderstorms, tornadoes, and microbursts come from high winds that can fell trees and electrical wires, generate hurtling debris and, possibly, hail. According to the Institute for Business and Home Safety, the wind speeds in most tornadoes are at or below design speeds that are used in current building codes, making strict adherence to building codes a primary mitigation strategy. In addition, current land development regulations, such as restrictions on the height of telecommunications towers, can also help prevent wind damages.

Existing Hazard Mitigation Strategies and Capabilities for Severe Thunderstorms / Winds / Tornadoes / Microbursts			
Strategy/Capability	**Description**	**Effectiveness**	**Potential Changes**
Zoning regulations	Mobile home/trailers are permitted with some additional regulations; can be used as temporary residence based on MA state building code	Not effective for preventing damage to susceptible structures	None
Subdivision regulations	Required improvements include that utilities must be placed underground at time of construction	Effective for preventing power loss	None
Tree management	List of dangerous trees created annually for EverSource	Very effective	None
Culvert replacement and drainage improvements	Replace culverts/improve drainage systems: Northwest Road, Tob Road, Chesterfield Road, Laurel Hill Road	Very effective for managing flood control needs.	Seek funding from HMGP for top priority projects
Regional Debris Management Plan	Participate in the creation of a Regional Debris Management Plan	Effective	Needs to be developed
State building code	Town has adopted the 2008 MA	Effective	Adopt new MA state

	state building code		building code expected out July 2016
Bylaw to regulate height of telecommunications facilities	Draft and adopt bylaw to address height of telecommunications facilities	Effective	Needs to be drafted

Wildfires / Brushfires

Wildfire and brushfire mitigation strategies involve educating people about how to prevent fires from starting, as well as controlling burns within the town through the issuance of permits.

Existing Hazard Mitigation Strategies and Capabilities for Wildfires / Brushfires			
Strategy/Capability	**Description**	**Effectiveness**	**Potential Changes**
Zoning regulations	Fire Chief must inspect all construction plans (principal use regulations)	Effective	None
	Campground must be inspected for fire access prior to special permit approval (special use regulations)	Effective	None
	Site plan must be approved by Fire Department	Effective	None
Burn permits	Residents must obtain burn permits and personnel provide information on safe burn practices	Effective	None
Public education/outreach	Fire Department has an ongoing educational program in the schools and mailer to all residents	Effective	None
Mutual aid agreements	The Town has mutual aid relationships to fight fires with surrounding communities and several state agencies. State police can provide reconnaissance and Mass DCR helicopter has capacity to carry 500 gallons of water for fire suppression	Effective	None

Earthquakes

Although there are five mapped seismological faults in Massachusetts, there is no discernible pattern of previous earthquakes along these faults nor is there a reliable way to predict future earthquakes along these faults or in any other areas of the state. Consequently, earthquakes are arguably the most difficult natural hazard for which to plan.

Most buildings and structures in the state were constructed without specific earthquake resistant design features. In addition, earthquakes precipitate several potential devastating secondary effects such as building collapse, utility pipeline rupture, water contamination, and extended power outages. Therefore, many of the mitigation efforts for other natural hazards identified in this plan may be applicable during the Town's recovery from an earthquake.

Existing Hazard Mitigation Strategies and Capabilities for Earthquakes			
Strategy/Capability	**Description**	**Effectiveness**	**Potential Changes**
State building code	Town has adopted the 2008 MA state building code	Effective for new buildings only	Adopt new MA state building code expected out July 2016
Subdivision regulations	Design standards require that utilities must be placed underground	Effective for preventing power loss	None
Regional debris management plan	Participate in creation of regional debris management plan	Effective	Needs to be developed

Dam Failure

Dam failure is a highly infrequent occurrence, but a severe incident could prove catastrophic. In addition, dam failure most often coincides with flooding, so its impacts can be multiplied, as the additional water has nowhere to flow. The only mitigation measures currently in place are the state regulations governing the construction, inspection, and maintenance of dams. This is managed through the Office of Dam Safety at the Department of Conservation and Recreation.

Existing Hazard Mitigation Strategies and Capabilities for Dam Failure			
Strategy/Capability	**Description**	**Effectiveness**	**Potential Changes**
Construction permits	State law requires a permit for the construction of any dam	Effective. Ensures dams are adequately designed.	None
Office of Dam Safety regulations	Mass DCR Office of Dam Safety has an inspection schedule based on a dam's hazard index rating (low, medium, high); also new regulations require Emergency Action Plans at both high and significant hazard dams now.	With greater enforcement comes greater effectiveness. Increased fines recently enacted.	None
Emergency Action Plans	Owners of existing High Hazard dams must have completed Emergency Action Plan. Most owners of significant hazard structures will be required to have EAP going forward.	Effective	Obtain copy from dam owner or Office of Dam Safety and review contents of plan, perhaps share with Easthampton, which is downstream.

Drought

Although Massachusetts does not face extreme droughts like many other places in the country, it is susceptible to dry spells and drought. Drought can most likely be effectively mitigated in regions like the Pioneer Valley if measures are put into place, such as ensuring that groundwater is recharged.

Existing Hazard Mitigation Strategies and Capabilities for Drought			
Strategy/Capability	**Description**	**Effectiveness**	**Potential Changes**
Zoning bylaw	Water Supply Protection District protects groundwater resources by regulating certain uses, drainage, and other requirements with the recharge are of the aquifer.	Very effective for preventing groundwater contamination and increasing infiltration.	Revise Water Supply Protection District using MassDEP model, with a focus on clarifying definitions
	Any project or operation that involves earth removal of more than 100 cubic yards is regulated, including setbacks and erosion control measures.	Effective for preventing sedimentation and erosion.	None
Subdivision regulations	Definitive plan must include proposed storm drainage, sewer, water supply, and major site features, including natural features	Effective for ensuring adequate water supply and preventing drainage problems	None
	Board of Health must assess the suitability of land, especially regarding septic	Effective for protecting groundwater	None

Extreme Temperatures

Extreme temperatures are likely to become more common due to climate change. The impacts of extreme temperatures are often emergency response-related, such as the provision of heating or cooling centers during extreme temperature events. Other mitigation measures include increasing awareness of extreme temperature risk to health and properties and assisting vulnerable populations in extreme temperature events.

Existing Hazard Mitigation Strategies and Capabilities for Extreme Temperatures			
Strategy/Capability	**Description**	**Effectiveness**	**Potential Changes**
Cooling centers	There are 2 cooling centers designated in town: the Elementary School and Library	Effective	Configure generator at Elementary School to ensure that drinking water can be supplied during outages Install air conditioning at Elementary School Install back-up generator at Library
Identify vulnerable populations	TRIAD and Council on Aging are working to develop buddy system among the Town's most vulnerable populations so that can be in regular touch and report on any problems	Effective	In process of development now

Completed and Deleted Mitigation Strategies

The Town has implemented several mitigation strategies that were identified in the previous version of this plan. In addition, the Town has decided not to pursue several mitigation strategies identified in the previous version of its Hazard Mitigation Plan. These completed and deleted strategies are described below.

Completed and Deleted Mitigation Strategies					
Action Name	**Status**	**Description**	**Hazards Mitigated**	**Responsible Agency**	**Notes**
Emergency notification system	Completed	Code Red notification system instituted in 2014	All		Residents receive phone calls and text messages
Culvert replacement and drainage improvements	Completed	Culverts and drainage improvements on Kings Highway completed	Floods; Hurricanes/Tropical Storms	Highway Department	
Burn permits	Completed	Consider increasing enforcement of burning regulations, perhaps invoke penalties for offenders	Wildfire/Brushfire	Fire Dept.	Revised regulations to limit burning to Saturdays and Sundays only
Form Local Emergency Planning Committee (LEPC)	Completed	Form Local Emergency Planning Committee (LEPC)	All	EMD, Police, Fire, BOS	

Completed and Deleted Mitigation Strategies					
Action Name	**Status**	**Description**	**Hazards Mitigated**	**Responsible Agency**	**Notes**
Beaver Management	Completed	Develop a strategy to effectively manage beavers	All	Highway Dept., BOS	Very effective - now have standing contract with Integrated Wildlife Control for assistance
Generator - Highway Department	Completed	Install generator at Highway Dept.	All	Highway Dept., BOS	
Back up electrical power	Refined to be more accurate	Shelters have back up power, three mobile generators	Severe Snow / Ice Storms; Hurricanes / Tropical Storms; Severe Thunderstorms / Winds / Tornadoes / Microbursts; Earthquakes		Westhampton does not have any formalized emergency shelter; rather it has warming and cooling shelters
Water conservation guidelines	Deleted	Create water conservation guidelines to inform and educate town residents	Drought		This strategy does not make sense in Westhampton where nearly all properties are on private wells

Completed and Deleted Mitigation Strategies					
Action Name	**Status**	**Description**	**Hazards Mitigated**	**Responsible Agency**	**Notes**
Flood control structures	Deleted	Three dams	Floods		These are run of the river dams and therefore do not provide storage during flooding.
Getting new and repetitive outage utility lines underground	Deleted	Work with electric company (formerly WMECO now Ever Source) to put underground existing lines where repetitive outages occur	Severe Snow / Ice Storms; Hurricanes / Tropical Storms	Electric company	Financial constraints with local utility make this infeasible
Dams	Deleted	Ensure dam owners realize their responsibility to inspect dams regularly	Dam failures	MassDCR, Office of Dam Safety	This is enforced state wide
Inventory supplies at existing shelters	Deleted	Establish system to inventory supplies at existing shelter and develop a needs list and storage requirements. Establish arrangements with local or neighboring vendors for supplying shelters with food and first aid supplies in the event of a natural disaster.	Severe Snow / Ice Storms; Hurricanes / Tropical Storms; Earthquakes		Westhampton has agreement with regional Emergency Shelter at Smith Vocational and Agricultural School in Northampton and does not have its own shelter

Previously Identified and New Strategies

Several of the action items previously identified in the 2007 Hazard Mitigation Plan are currently continuing, either because they require more time to secure funding or their construction process is ongoing. In addition, the Hazard Mitigation Workgroup identified several new strategies that are also being pursued. These new strategies are based on experience with currently implemented strategies, as well as the hazard identification and risk assessment in this plan.

Prioritization Methodology

The Westhampton Hazard Mitigation Planning Workgroup reviewed and prioritized a list of previously identified and new mitigation strategies using the following criteria:

Application to multiple hazards – Strategies are given a higher priority if they assist in the mitigation of several natural hazards.

Time required for completion – Projects that are faster to implement, either due to the nature of the permitting process or other regulatory procedures, or because of the time it takes to secure funding, are given higher priority.

Estimated benefit – Strategies which would provide the highest degree of reduction in loss of property and life are given a higher priority. This estimate is based on the Hazard Identification and Analysis Chapter, particularly with regard to how much of each hazard's impact would be mitigated.

Cost effectiveness – in order to maximize the effect of mitigation efforts using limited funds, priority is given to low-cost strategies. For example, regular tree maintenance is a relatively low-cost operational strategy that can significantly reduce the length of time of power outages during a winter storm. Strategies that have identified potential funding streams, such as the Hazard Mitigation Grant Program, are also given higher priority.

Eligibility Under Hazard Mitigation Grant Program – The Hazard Mitigation Grant Program (HMGP) provides grants to states and local governments to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the HMGP is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster. Funding is made available through FEMA by the Massachusetts Emergency Management Agency. Municipalities apply for grants to fund specific mitigation projects under MEMA requirements

The following categories are used to define the priority of each mitigation strategy:

Low – Strategies that would not have a significant benefit to property or people, address only one or two hazards, or would require funding and time resources that are impractical

Medium – Strategies that would have some benefit to people and property and are somewhat cost effective at reducing damage to property and people

High – Strategies that provide mitigation of several hazards and have a large benefit that warrants their cost and time to complete

Very High – extremely beneficial projects that will greatly contribute to mitigation of multiple hazards and the protection of people and property. These projects are also given a numeric ranking within the category.

Cost Estimates

Each of the following implementation strategies is provided with a cost estimate. Projects that already have secured funding are noted as such. Where precise financial estimates are not currently available, categories were used with the following assigned dollar ranges:

- **Low** – cost less than $50,000
- **Medium** – cost between $50,000 – $100,000
- **High** – cost over $100,000

Cost estimates take into account the following resources:

- Town staff time for grant application and administration (at a rate of $25 per hour)
- Consultant design and construction cost (based on estimates for projects obtained from town and general knowledge of previous work in town)
- Town staff time for construction, maintenance, and operation activities (at a rate of $25 per hour)

Project Timeline

Each strategy is provided with an estimated length of time it will take for implementation. Where funding has been secured for the project, a specific future date is provided for when completion will occur. However, some projects do not currently have funding and thus it is difficult to know exactly when they will be completed. For these projects, an estimate is provided for the amount of time it will take to complete the project once funding becomes available.

New and Continuing Mitigation Strategies to be Implemented in Westhampton									
Status	**Action Name**	**Action Type**	**Description**	**Hazards Addressed**	**Responsibility/ Oversight**	**Priority**	**Estimated Cost**	**Funding Source**	**Time frame**
New	Properly equip warming and cooling centers	Capital construction	Configure generator at Elementary School to ensure that drinking water can be supplied during outages Install air conditioning at Elementary School Install back-up generator at Library	All	BOS; EMD; Highway Dept.	Very High	Medium	MA State Emergency Mgmt grants	Will apply when announced and anticipate 6 months to secure funding, procure, install
New	Set up system to document impacts (damages, costs) of undersized culverts throughout town	Operational strategy	Maintain list of undersized culverts and carefully document all related issues	Floods; Hurricanes / Tropical Storms; Severe Thunderstorms	Highway Dept.	Very High	Staff time	Town	Start in Oct 2016 and complete by Feb 2017

New and Continuing Mitigation Strategies to be Implemented in Westhampton									
Status	**Action Name**	**Action Type**	**Description**	**Hazards Addressed**	**Responsibility/ Oversight**	**Priority**	**Estimated Cost**	**Funding Source**	**Time frame**
Continuing	Secure funding for top priority culvert replacement	Capital Construction	Replace culverts / improve drainage systems: Northwest Road, Tob Road, Chesterfield Road, Laurel Hill Road Seek funding from HMGP for top-priority projects	Floods; Hurricanes / Tropical Storms; Severe Thunderstorms	BOS, Planning Board, Highway Dept.	Very High	High	Town Funds, HMGP	Will apply when eligible and anticipate 15 months to secure funds & implement project
New	Obtain Emergency Action Plan	Operational	Get Emergency Action Plan for Pine Island Lake Dam	Dam Failures	EMD	High	Low	Town staff/Town funds	Start in Oct 2016 and complete by Dec 2016
Continuing	MA State Building Code 2016	Operational strategy	Use new MA state building code expected July 2016	Severe Snow/Ice Storms; Severe Thunderstorms /Winds/ Tornadoes/ Microbursts; Earthquakes	BOS	High	Low	Town staff/Town funds	Start in July 2016 with new code
Continuing	Modify design standards to consider hazard mitigation	Subdivision regulation	Restrict altering natural features rather than just encouraging protection	Floods	Planning Board	Medium	Low	PVPC/DLTA	Seek funding in Jan 2017 and implement by Dec 2017

New and Continuing Mitigation Strategies to be Implemented in Westhampton									
Status	**Action Name**	**Action Type**	**Description**	**Hazards Addressed**	**Responsibility/ Oversight**	**Priority**	**Estimated Cost**	**Funding Source**	**Time frame**
Continuing	Emergency Information – Home Survival Kit	Operational Strategy	Periodically update and disseminate information on emergency information, what to include in a 'home survival kit', how to prepare homes and other structures to withstand flooding and high winds, and the proper evacuation procedures to follow during a natural disaster. Use town website, Facebook, local print outlets.	All	BOS, EMD, Police and Fire Dept	Medium	Low	Town staff/Town funds	Plan to launch in September 2016-Natl Preparedness Month
Continuing	Modify Special Permit / Site Plan Approval as needed to integrate Hazard Mitigation	Zoning Bylaws	Review to ensure that standards support mitigation of hazards to the maximum extent practicable.	Floods; Severe Snowstorms / Ice Storms / Severe Thunderstorms	Planning Board	Low	Low	PVPC LTA or DLTA	Apply for funds in Jan 2018 and complete by Dec 2018

New and Continuing Mitigation Strategies to be Implemented in Westhampton									
Status	**Action Name**	**Action Type**	**Description**	**Hazards Addressed**	**Responsibility/ Oversight**	**Priority**	**Estimated Cost**	**Funding Source**	**Time frame**
Continuing	Modify Definitive Plan to integrate Hazard Mitigation	Subdivision Regulations	Make regulations consistent with drainage requirements in zoning bylaw and include requirement that stormwater BMPS must be used where applicable	Floods	Planning Board	Low	Low	PVPC LTA or DLTA	Seek funding in Jan 2019 and complete by Dec 2019
Continuing	Debris Management Plan	Planning Document	Participate in the creation of a Regional Debris Management Plan	Severe Thunderstorms /Winds/ Tornados/ Microbursts; Earthquakes	BOS, Planning Board, Police and Fire Dept, EMD	Low	Medium	Homeland Sec $$ to State	Anticipate Hampshire REPC will be ready in 2018 and will take 1 year
Continuing	Revise Water Supply Protection District Revisions to integrate Hazard Mitigation	Zoning Bylaws	Revise Water Supply Protection District, utilizing the state model from DEP, with a focus on clarifying definitions	Floods; Drought	Planning Board,	Low	Low	PVPC LTA/DLTA	Seek funding in Jan 2020 and implement by Dec 2020

New and Continuing Mitigation Strategies to be Implemented in Westhampton									
Status	**Action Name**	**Action Type**	**Description**	**Hazards Addressed**	**Responsibility/ Oversight**	**Priority**	**Estimated Cost**	**Funding Source**	**Time frame**
Continuing	Revise Tele communication Facilities regulations to integrate hazard mitigation	Zoning Bylaws	Draft and adopt bylaw to deal with height of telecommunications facilities	Hurricanes / Tropical Storms; Severe Thunderstorms / Winds/ Tornados / Microbursts; Earthquakes	Planning Board, Building Inspector	Low	Low	PVPC LTA/DLTA	Seek funding in Jan 2021 and implement by Dec 2021
Continuing	National Flood Insurance Program Participation	Operational Strategy	Evaluate whether to become a part of FEMA's Community Rating System (CRS) Educate citizens living in the floodplain about NFIP	Floods	BOS	Low	Low	Town staff/Town funds	Start research in July 2017 and complete by Dec 2017

6: PLAN REVIEW, EVALUATION, IMPLEMENTATION, AND ADOPTION

Plan Adoption

Upon completion of the draft Hazard Mitigation Plan update, a public meeting was held by the town staff and the Pioneer Valley Planning Commission to present and request comments from town officials, residents, and neighboring communities. The Hazard Mitigation Plan was then submitted to the Massachusetts Emergency Management Agency (MEMA) and the Federal Emergency Management Agency for their review. Upon receiving conditional approval of the plan by FEMA, the plan was presented to the Town's Select Board and adopted.

Plan Implementation

The implementation of this plan began upon its formal adoption by the Town Select Board and approval by MEMA and FEMA. Those town departments and boards responsible for ensuring the development of policies, bylaw revisions, and programs as described in Sections 5 and 6 of this plan will be notified of their responsibilities immediately following approval. The Town's Hazard Mitigation Committee will oversee the implementation of the plan.

Plan Monitoring and Evaluation

The Town's Emergency Management Director will call meetings of all responsible parties to review plan progress an annual basis in each of the following years: 2017, 2018, 2019, 2020, 2021 and as needed (*i.e.*, following a natural disaster). The public will be notified of these meetings in advance through a posting of the agenda at Town Hall. Responsible parties identified for specific mitigation actions will be asked to submit their reports in advance of the meeting. Meetings will entail the following actions:

- Review events of the year to discuss and evaluate major issues, effectiveness of current mitigation, and possible mitigation for future events.
- Assess how the mitigation strategies of the plan can be integrated with other Town plans and operational procedures, including the Zoning Bylaw and Emergency Management Plan.
- Review and evaluate progress toward implementation of the current mitigation plan based on reports from responsible parties.
- Amend current plan to improve mitigation practices.

Following these discussions, it is anticipated that the committee may decide to reassign the roles and responsibilities for implementing mitigation strategies to different town departments and/or revise the goals and objectives contained in the plan. The committee will review and update the Hazard Mitigation Plan every five years. The next updated plan will be submitted to MEMA and FEMA six months before plan expiration.

7: APPENDICES

Appendix A – Technical Resources

1) Agencies

Massachusetts Emergency Management Agency (MEMA)..... .....508/820-2000
Hazard Mitigation Section 617/626-1356
Federal Emergency Management Agency (FEMA) 617/223-4175
MA Regional Planning Commissions:
Berkshire Regional Planning Commission (BRPC).....413/442-1521
Cape Cod Commission (CCC).....508/362-3828
Central Massachusetts Regional Planning Commission (CMRPC)..... 508/693-3453
Franklin Regional Council of Governments (FRCOG).....413/774-3167
Martha's Vineyard Commission (MVC).....508/693-3453
Merrimack Valley Planning Commission (MVPC).....978/374-0519
Metropolitan Area Planning Council (MAPC).....617/451-2770
Montachusett Regional Planning Commission (MRPC).....978/345-7376
Nantucket Planning and Economic Development Commission (NP&EDC).....508/228-7236
Northern Middlesex Council of Governments (NMCOG).....978/454-8021
Old Colony Planning Council (OCPC).....508/583-1833
Pioneer Valley Planning Commission (PVPC).....413/781-6045
Southeastern Regional Planning and Economic Development District (SRPED.....508/823-1803
MA Board of Building Regulations & Standards (BBRS).....617/227-1754
MA Coastal Zone Management (CZM).....617/626-1200
DCR Water Supply Protection.....617/626-1379
DCR Waterways.....617/626-1371
DCR Office of Dam Safety.....508/792-7716
DFW Riverways.....617/626-1540
MA Dept. of Housing & Community Development.....617/573-1100
Woods Hole Oceanographic Institute.....508/457-2180
UMass-Amherst Cooperative Extension.....413/545-4800
National Fire Protection Association (NFPA).....617/770-3000
New England Disaster Recovery Information X-Change (NEDRIX –
an association of private companies & industries involved in disaster recovery
planning).....781/485-0279
MA Board of Library Commissioners.....617/725-1860
MA Highway Dept, District 2.....413/582-0599
MA Division of Marine Fisheries.....617/626-1520
MA Division of Capital & Asset Management (DCAM).....617/727-4050
University of Massachusetts/Amherst.....413/545-0111
Natural Resources Conservation Services (NRCS).....413/253-4350
MA Historical Commission.....617/727-8470
U.S. Army Corps of Engineers.....978/318-8502
Northeast States Emergency Consortium, Inc. (NESEC).....781/224-9876
National Oceanic and Atmospheric Administration: National Weather Service.....508/824-5116

US Department of the Interior: US Fish and Wildlife Service 413/253-8200
US Geological Survey.....508/490-5000

2) Mitigation Funding Resources

404 Hazard Mitigation Grant Program (HMGP) .....MA Emergency Management Agency
406 Public Assistance and Hazard Mitigation .....MA Emergency Management Agency
Community Development Block Grant (CDBG).....DHCD, also refer to RPC
Dam Safety Program.....MA Division of Conservation and Recreation
Disaster Preparedness Improvement Grant (DPIG) .....MA Emergency Management Agency
Emergency Generators Program by NESEC‡ .....MA Emergency Management Agency
Emergency Watershed Protection (EWP) Program.....USDA, Natural Resources Conservation Service Flood Mitigation Assistance Program (FMAP).....MA Emergency Management Agency
Flood Plain Management Services (FPMS).....US Army Corps of Engineers
Mitigation Assistance Planning (MAP).....MA Emergency Management Agency
Mutual Aid for Public Work.....Western Massachusetts Regional Homeland Security Advisory Council
National Flood Insurance Program (NFIP) † .....MA Emergency Management Agency
Power of Prevention Grant by NESEC‡ .....MA Emergency Management Agency
Roadway Repair & Maintenance Program(s).....Massachusetts Highway Department
Section 14 Emergency Stream Bank Erosion & Shoreline Protection .....US Army Corps of Engineers
Section 103 Beach Erosion..... ..US Army Corps of Engineers
Section 205 Flood Damage Reduction.....US Army Corps of Engineers
Section 208 Snagging and Clearing .....US Army Corps of Engineers
Shoreline Protection Program.....MA Department of Conservation and Recreation
Various Forest and Lands Program(s).....MA Department of Environmental Protection
Wetlands Programs .....MA Department of Environmental Protection

‡NESEC – Northeast States Emergency Consortium, Inc. is a 501(c)(3), not-for-profit natural disaster, multi-hazard mitigation and emergency management organization located in Wakefield, Massachusetts. Please, contact NESEC for more information.

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

3) Internet Resources

Sponsor	Internet Address	Summary of Contents
Natural Hazards Research Center, U. of Colorado	http://www.colorado.edu/litbase/hazards/	Searchable database of references and links to many disaster-related websites.
Atlantic Hurricane Tracking Data by Year	http://wxp.eas.purdue.edu/hurricane	Hurricane track maps for each year, 1886 – 1996
National Emergency Management Association	http://nemaweb.org	Association of state emergency management directors; list of mitigation projects.
NASA – Goddard Space Flight Center "Disaster Finder:	http://www.gsfc.nasa.gov/ndrd/dis aster/	Searchable database of sites that encompass a wide range of natural disasters.
NASA Natural Disaster Reference Database	http://ltpwww.gsfc.nasa.gov/ndrd/main/html	Searchable database of worldwide natural disasters.
U.S. State & Local Gateway	http://www.statelocal.gov/	General information through the federal-state partnership.
National Weather Service	http://nws.noaa.gov/	Central page for National Weather Warnings, updated every 60 seconds.
USGS Real Time Hydrologic Data	http://h20.usgs.gov/public/realtime.html	Provisional hydrological data
Dartmouth Flood Observatory	http://www.dartmouth.edu/artsci/g eog/floods/	Observations of flooding situations.
FEMA, National Flood Insurance Program,	http://www.fema.gov/fema/csb.html	Searchable site for access of Community

Sponsor	Internet Address	Summary of Contents
Community Status Book		Status Books
Florida State University Atlantic Hurricane Site	http://www.met.fsu.edu/explores/tropical.html	Tracking and NWS warnings for Atlantic Hurricanes and other links
The Tornado Project Online	http://www.tornadoroject.com/	Information on tornadoes, including details of recent impacts.
National Severe Storms Laboratory	http://www.nssl.uoknor.edu/	Information about and tracking of severe storms.
Independent Insurance Agents of America IIAA Natural Disaster Risk Map	http://www.iiaa.iix.com/ndcmap.html	A multi-disaster risk map.
Earth Satellite Corporation	http://www.earthsat.com/	Flood risk maps searchable by state.
USDA Forest Service Web	http://www.fs.fed.us/land	Information on forest fires and land management.

Appendix B – Capability Assessment Worksheet

sent as separate PDF

Appendix C – Documentation of the Planning Process

1. Meeting Schedule

2. Outreach and Publicity

3. Public Meeting Agendas, Sign in Sheets, and Agendas

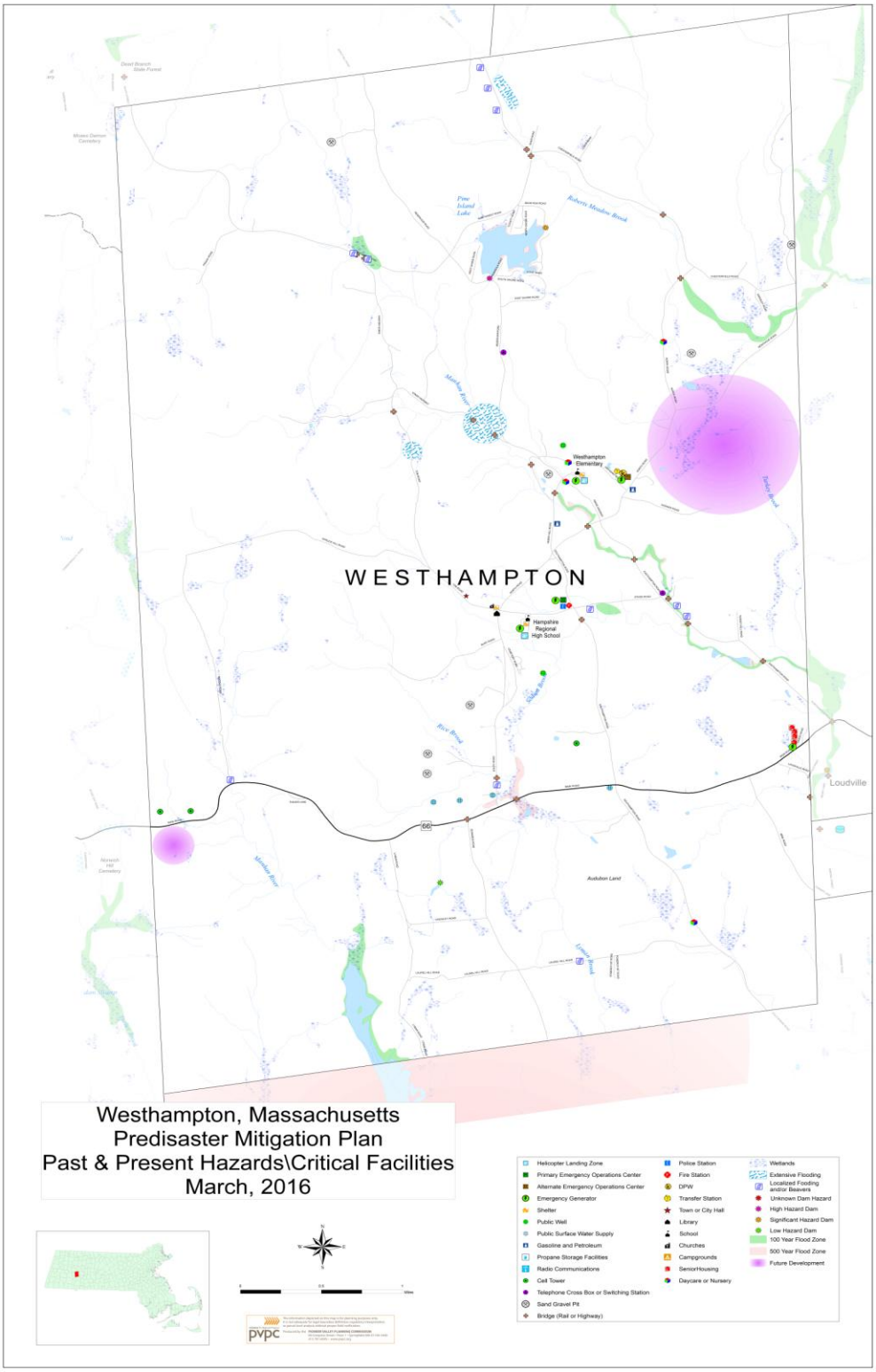
4. Hazard Mitigation Planning Committee Agendas and Sign in Sheets

sent as separate PDF

Appendix D – List of Acronyms

FEMA	Federal Emergency Management Agency
MEMA	Massachusetts Emergency Management Agency
PVPC	Pioneer Valley Planning Commission
EPA	Environmental Protection Agency
DEP	Massachusetts' Department of Environmental Protection
NWS	National Weather Service
HMGP	Hazard Mitigation Grant Program
FMA	Flood Mitigation Assistance Program
SFHA	Special Flood Hazard Area
CIS	Community Information System
DCR	Massachusetts Department of Conservation and Recreation
FERC	Federal Energy Regulatory Commission
TRI	Toxics Release Inventory
FIRM	Flood Insurance Rate Map
NFIP	National Flood Insurance Program
CRS	Community Rating System
BOS	Board of Selectmen
DPW	Department of Public Works
LEPC	Local Emergency Planning Committee
EMD	Emergency Management Director
Con Com	Conservation Commission
Ag Com	Agricultural Commission
EOC	Emergency Operations Center
CEM Plan	Comprehensive Emergency Management Plan
EMA	Emergency Management Agency
RACES	Radio Amateur Civil Emergency Service
WMECO	Western Massachusetts Electric Company
HAZMAT	Hazardous Materials

Appendix E – Past and Potential Hazards/Critical Facilities Map



SELECTBOARD
TOWN OF WESTHAMPTON
TOWN HALL
WESTHAMPTON, MASSACHUSETTS 01027

CERTIFICATE OF ADOPTION

Town of Westhampton, MASSACHUSETTS

BOARD OF SELECTMEN

A RESOLUTION ADOPTING THE TOWN OF WESTHAMPTON HAZARD MITIGATION PLAN

WHEREAS, the Town of Westhampton established a Committee to prepare the Hazard Mitigation plan; and

WHEREAS, the Town of Westhampton participated in the development of the Town of Westhampton Hazard Mitigation Plan;

and WHEREAS, the Town of Westhampton Hazard Mitigation Plan contains several potential future projects to mitigate potential impacts from natural hazards in the Town of Westhampton, and

WHEREAS, a duly-noticed public meeting was held by the Board of Selectmen on January 9, 2017 for the public and municipality to review prior to consideration of this resolution; and

WHEREAS, the Town of Westhampton authorizes responsible departments and/or agencies to execute their responsibilities demonstrated in the plan, and

NOW, THEREFORE BE IT RESOLVED that the Town of Westhampton Board of Selectmen formally approves and adopts the Town of Westhampton Hazard Mitigation Plan, in accordance with M.G.L. c. 40.

ADOPTED AND SIGNED this Monday, January 9, 2017

Philip Dawley, chair

ATTEST