THE TOWN OF EAST LONGMEADOW
HAZARD MITIGATION PLAN

Adopted by the East Longmeadow Board of Selectmen on _____

Prepared by:

The East Longmeadow Hazard Mitigation Committee

and

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TABLE OF CONTENTS

1: Planning Process 1
Introduction 1
Hazard Mitigation Planning Committee 1
Hazard Mitigation Committee Meetings 2
Participation by Stakeholders 3
Select Board Meeting 6
2: Local Profile 7
Community Setting 7
Development 8
Infrastructure 9
Natural Resources 12
3: Hazard Identification and Analysis 15
Natural Hazard Analysis Methodology 15
Flooding 19
Severe Snowstorms / Ice Storms 25
Hurricanes 29
Severe Thunderstorms / Wind / Tornadoes 34
Wildfires / Brushfires 39
Earthquakes 45
Dam Failure 51
Dam Failure 51
Drought 54
Impacts of Climate Change 58
Extreme Temperatures 64
Other Hazards 68
Summary of possible effects of Natural Hazards on East Longmeadow 68
4: Critical Facilities 70
Critical Facilities within Hazard Areas 70
Category 1 – Emergency Response Services 71
Category 2 – Non Emergency Response Facilities 71
Category 3 – Facilities/Populations to Protect 72
5: Mitigation Capabilities/Strategies 74
Capability Assessment Summary 74
Existing Mitigation Actions/Strategies & Potential New Mitigation Ideas 75
Prioritized Implementation Plan 86
Prioritization Methodology 86
Cost Estimates 87
Project Timeline 88
6: Plan review, evaluation, implementation, and adoption 92
Plan Adoption 92
Plan Implementation 92
Incorporation with Other Planning Documents 92

7: Appendices 94
Appendix A – Documentation of the Planning Process..... 95
Appendix B – List of Acronyms 101
Appendix C – Past and Potential Hazards / Critical Facilities Map..... 102

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Greg Moyer, Interim Town Administrator
Bob Peirent, Superintendent Department of Public Works
Brian Falk, Emergency Management Director (EMD)
Robyn Macdonald, Director of Planning, Zoning & Conservation
Paul Morrissette, Fire Chief
Daniel Hellyer, Building Inspector

The East Longmeadow Board of Selectmen offers thanks to the Massachusetts Emergency Management Agency (MEMA) for developing the Massachusetts Hazard Mitigation Plan which served as a model for this plan. 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.

Pioneer Valley Planning Commission

Catherine Ratté, Land Use/Environment Manager
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1: PLANNING PROCESS

Introduction

The Federal Emergency Management Agency (FEMA) and the Massachusetts Emergency Management Agency (MEMA) define 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, etc. Mitigation efforts undertaken by communities will help to minimize damages to buildings and infrastructure, such as water supplies, sewers, and utility transmission lines, as well as natural, cultural and historic resources.

Planning efforts, like the one undertaken by the Town of East Longmeadow and the Pioneer Valley Planning Commission, 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 a community.

Preparing a Local Natural Hazards Mitigation Plan before a disaster occurs 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, including the Hazard Mitigation Grant Program (HMGP), the Flood Mitigation Assistance Program (FMA), and the Pre-Disaster Mitigation Program (PDM).

Hazard Mitigation Planning Committee

In 2016, the Town of East Longmeadow completed their first Hazard Mitigation Plan in collaboration with the Pioneer Valley Planning Commission. Planning for hazard mitigation in East Longmeadow involved a six member workgroup:

- Greg Moyer, Interim Town Administrator
- Bob Peirent, Superintendent Department of Public Works
- Brian Falk, Emergency Management Director (EMD)
- Robyn Macdonald, Director of Planning, Zoning & Conservation
- Paul Morrissette, Fire Chief
- Daniel Hellyer, Building Inspector

The Hazard Mitigation planning process for the Town included the following tasks:

- Reviewing and incorporating existing plans and other information, including conducting a **Capability Assessment**, using FEMA Worksheet 4.1 from the 2013 Guidebook.

- Identifying the natural hazards that may impact the community.

- Conducting a Vulnerability/Risk Assessment to identify the infrastructure and other valuable resources at the highest risk for being damaged by the identified natural hazards, particularly flooding.

- Identifying and assessing the policies, programs, regulations, and other existing natural hazard mitigation capabilities the community already has in place and/or is currently implementing to mitigate both short and long term consequences of natural hazards.

- Identifying deficiencies in the current capabilities, including missing strategies and establishing a five year strategic action plan, including goals for updating, revising and/or adopting new strategies.

- Adopting and implementing the final Hazard Mitigation Plan.

The key product of this process was the development of an Action Plan with a Prioritized Implementation Schedule.

Hazard Mitigation Committee Meetings

Meetings of the Hazard Mitigation Planning Committee, all of which took place at East Longmeadow Town Hall, were held on the dates listed below. Agendas for each meeting are included in Appendix A. After review by MEMA, the Hazard Mitigation Committee met to review and incorporate MEMA feedback.

- Preliminary planning meeting-September 14, 2015, East Longmeadow Town Hall
- Committee Meeting #1 October 5, 2015
- Committee Meeting #2 November 2, 2105
- Committee Meeting #3 December 6, 2105
- Committee Meeting #4 January 11, 2016
- Committee Meeting #5

Agendas and sign-in sheets for each meeting can be found in Appendix A. While not all members of the Hazard Mitigation Committee were able to attend each meeting, all members collaborated on the plan and were updated on progress by fellow Committee members after

meetings occurred as necessary.

Participation by Stakeholders

A variety of stakeholders were provided with an opportunity to be involved in the development of the East Longmeadow Hazard Mitigation Plan. The different categories of stakeholders that were involved, and the engagement activities that occurred, are described below.

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 East Longmeadow as part of its regional planning efforts, which include the following:

- Developing Our Next Future: An Action Plan for Building A Smart, Sustainable and Resilient Pioneer Valley. “Our Next Future” was created to chart a course for a more vibrant, competitive, sustainable and equitable region. This is a regional plan, designed to achieve success through promoting collaboration of communities on a regional basis.

- Preparing, maintaining and working to implement 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.

- Preparing, maintaining and working to implement 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 both adaptation and 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.

- Preparing a Regional Climate Vulnerability Assessment-focusing on Infrastructure and Investment

The purpose of this regional infrastructure inventory and assessment is to provide a tool for anticipating climate-related impacts on transportation and water infrastructure in the 43 municipalities of the Pioneer Valley Planning Commission (PVPC) and the Pioneer Valley Metropolitan Planning Organization (PVMPO). Intended users of this tool include planners, municipal officials, state agencies, and the owners and operators of these assets.

This tool is designed to be a high-level assessment or screening tool to better understand which transportation and water infrastructure assets are likely to be vulnerable to the current and probable future impacts of climate change. This tool is now available in beta form as an online interactive GIS map to better allow evaluation of infrastructure assets at different scales (from regionwide to site specific). The beta version focuses on localized and riverine flooding. As such, this tool does not produce definite results regarding the vulnerability of any particular infrastructure asset or group of assets. Its intended function is to assist stakeholders in understanding which where resources for the additional evaluation of climate-related vulnerabilities can best be deployed.

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 East Longmeadow 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 staff attend all WRHSAC meetings and all WRHSAC members are aware of the fact that Granville was updating their Hazard Mitigation plan. 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 development of this Hazard Mitigation Plan, PVPC staff verbally informed WRHSAC members that they were working on the East Longmeadow plan as the Council's Planning sub-committee was deliberating about how to disseminate information about their work to sub-regions of the Pioneer Valley.

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 East Longmeadow’s Hazard Mitigation Plan update process and encouraged to comment.

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 East Longmeadow's hazard mitigation planning work.

Agencies that have the authority to regulate development

In East Longmeadow, the Planning Board and the Zoning Board of Appeals, staffed by Robyn MacDonald, are the entities that regulate development. Several town staff who participated in the East Longmeadow Hazard Mitigation Committee have direct connections to various municipal commissions, boards, and committees within East Longmeadow that have the authority to regulate development. These commissions and the Hazard Mitigation Committee members involved in each are as follows:

Planning Board/ZBA: Robyn Macdonald, Director
Department of Public Works: Robert Peirent, Superintendent
Board of Selectmen: Greg Moyer, Interim Town Administrator
Fire Department: Paul Morrissette, Chief
Building Department: Daniel Hellyer, Building Inspector—review all plans—roadways and drainage

Feedback from the stakeholder agencies listed above was ensured through the participation of the Hazard Mitigation Committee members, who were able to attend the Hazard Mitigation Committee meetings representing their respective groups.

In addition, the Pioneer Valley Planning Commission, as a regional planning authority, works with all agencies that regulate development in East Longmeadow, including the municipal entities listed above and state agencies, such as the Department of Environmental Protection, the Department of Housing and Community Development, the Department of Conservation and Recreation and MassDOT. This regular involvement ensured that during the development of the East Longmeadow Hazard Mitigation Plan, the operational policies and any mitigation strategies or identified hazards from these entities were incorporated into the Hazard Mitigation Plan.

Participation by the Public, Businesses, and Neighboring Communities

Two community meetings were held as part of the development of the East Longmeadow plan – on November 16, 2015 and January 25, 2016. The first meeting occurred early in the Hazard Mitigation planning process, but after the Hazard Mitigation Committee had provided input on hazards and mitigation strategies relevant to the community. The second meeting occurred toward the end of the planning process, after the committee had developed a list of proposed mitigation strategies. Notice of both public meetings were issued to area media outlets and via PVPC's social media outlets and posted at East Longmeadow Town Hall in compliance with the Commonwealth of Massachusetts' open meeting law. Public meeting agendas and notices can be found in Appendix A.

All comments received by the public were addressed either in the plan or in the planning process. add details if input is received

On January 15, 2016 the Pioneer Valley Planning Commission sent a press release to all area media outlets to inform the public that a draft of the East Longmeadow Hazard Mitigation Plan had been placed on PVPC's website. The release also indicated that hard copies were available at PVPC's offices and at East Longmeadow Town Hall, and that all residents of East Longmeadow were encouraged to comment on the plan by e-mailing or calling staff contacts at PVPC or the Town of East Longmeadow.

The press release and a screen shot of PVPC's website showing the link to the press release can be found in Appendix A.

A list of media organizations that were sent all press releases is included in Appendix A, which are the television stations, radio stations, and newspapers located in western Massachusetts, northern Connecticut, and southern Vermont.

The first press release generated a story in the weekly Reminder publication and a reporter attended the meeting. No members of the public attended. The story is included in Appendix A. The Hazard Mitigation Committee determined that the most effective outreach strategy for engaging with the public, businesses and neighboring communities was through the media, and so this was the outreach strategy employed for reaching out to all three groups of stakeholders. The press release indicated that residents of East Longmeadow were invited to attend the event, which was also intended to include representatives of businesses in East Longmeadow and residents of neighboring communities.

Businesses and neighboring communities were also provided with an opportunity to provide feedback through the Pioneer Valley Planning Commission. PVPC is regularly involved in land use, transportation, and environmental planning initiatives in East Longmeadow and surrounding communities. Regular feedback received from these other initiatives were incorporated into the hazard mitigation planning process.

Additional outreach to surrounding communities occurred through the regular quarterly newsletter that PVPC sends out to its member communities about its recent activities. In these articles, adjacent municipalities were encouraged to reach out to PVPC about hazard mitigation plans by e-mailing or calling staff contacts at PVPC. These notices are included in Appendix A. Any future input received from the public, as well as any other stakeholders, will be incorporated into the plan during future regular updates.

Select Board Meeting

In 2013, the Board of Selectmen agreed to begin the process of developing a Hazard Mitigation Plan. Once the plan was provisionally approved by FEMA, the Select Board included adoption of the plan as an agenda item on a scheduled meeting and voted to adopt the plan.

2: LOCAL PROFILE

Community Setting

Covering about 13.4 square miles, the Town of East Longmeadow is located in Hampden County south of the City of Springfield on the Connecticut border in western Massachusetts. East Longmeadow is situated due east of the Connecticut River in the Pioneer Valley. It is bordered by the towns of Wilbraham to the northeast, Hampden to the east, Enfield, Connecticut to the south and southwest, Springfield to the north and northwest, and Longmeadow to the west.

East Longmeadow was first settled in 1720 and was officially incorporated in 1894. The history of the Town of East Longmeadow is one of steady progression. Initially seen as little more than common pastureland during the colonial period, it slowly developed into a community of small farms until red and brown sandstone was found underneath the local soil. The red and brown sandstone became a widely used building material in the latter half of the nineteenth century, leading to its use in buildings and monuments across the United States, including the Smithsonian Institution in our nation's capital.

The formation of over fifty sandstone quarries lead to settlement and migration to the area of hundreds of Swedish, French Canadian and Italian stonemasons and stonecutters, a diverse group that enriched and transformed the town's social and cultural framework. The new lucrative industry created an imbalance between the area that now constitutes East Longmeadow (known at that time as the East Village) and that which constitutes Longmeadow (known at the time as The Street), where the East paid one third of the taxes but had two thirds of the population.

In 1894, upon a petition by The Street's residents, the State Legislature granted a partition granting a 13.4 square mile tract of former Longmeadow land to the new town of East Longmeadow. The new town relied on its quarrying industry to provide its economic backbone until the early 20th century, when the introduction of modern construction techniques such as steel framing and cement emerged, making sandstone, a highly durable fire resistant material, too expensive to use as widely as before. East Longmeadow shifted its dependence on industry to its role as a suburban community for the nearby City of Springfield.

In the twenty-first century, the Town of East Longmeadow has been able to maintain a mix of rural, suburban, industrial and urban elements which form a quilt of a vibrant community, which will continue to grow and evolve. East Longmeadow's location within 7 miles of the City of Springfield and within easy access to Interstate 91, has contributed to its development. The Town's estimated population in 2015 was 16,627 people, resulting in a population density of 1240 persons per square mile.

Today, the majority of East Longmeadow's 13.4 square miles (8339 acres) is residential housing (4067 acres or 49%). Forestlands encompass approximately 3235 acres. Vacant or Unused land (from all three zones) comprises 13% of the other half of land in the Town. Town land is 10%,

Agriculture land is 7%, and just 2% of land is commercial with 4% industrial. The remaining 'land' is water, utility right of way, etc.

The Planning Department reports the current use of land as:

Undeveloped land/also characterized by the Planning Dept as "forested"-approximately 3235 acres
Agricultural land-approximately 652 acres
Outdoor recreation land - 296 acres
Urban open/public land - 843 acres
Industrial uses - approximately 352 acres
commercial land use - approximately 201 acres

Development

During the past five years, East Longmeadow has seen two significant areas of development: 1) Completion of a new condominium development for persons over 55, and 2) a substantial subdivision with large homes for young families.

The Town of East Longmeadow is steadily growing. As the housing market has recovered and started to expand in the Pioneer Valley intensifying housing pressures, East Longmeadow and other towns are seeing an increase in new home development.

In addition to other factors, zoning and other land use regulations constitute East Longmeadow'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.

The East Longmeadow Zoning Bylaw establishes 12 zoning districts. The Zoning Bylaw also establishes a Special Permit Approval procedure for specific uses and structures within East Longmeadow. This review allows the Special Permit Granting Authority the ability to review development to ensure that the basic safety and welfare of the people of East Longmeadow are protected, and includes several specific evaluation criteria that are relevant to natural hazards.

Currently, development in East Longmeadow is slightly encouraged by existing zoning and other land use regulations to seek areas where the environmental conditions and existing public utilities support such development.

Median Residential Value: The town has 5692 properties coded as residential. Arraying the assessed values; the median residential assessment for FY16 is $219,100. This is inclusive of mixed used, congregate living facilities and elderly housing residential properties.

Properties Built Prior to 1975: All properties with buildings and improvements totals 6,050. There are 3,860 properties built in 1974 or earlier. This equates to 64%. The remaining 2,190 or 36% were built during 1975 or later. The actual number for the value of all property in town is $1,931,032,172.

Infrastructure

Roads and Highways

Major roadways through Town are Route 83 tending northwest from Springfield through East Longmeadow to Connecticut, and Routes 220 and 186 from the roundabout downtown. The most significant transportation route, Interstate 91, has an onramp in Springfield. Other major roadways are Route 5 in neighboring Longmeadow. Route 5 runs north to connect with Holyoke, Springfield, and Northampton, and south to Enfield, Connecticut.

Rail

There is no rail service in East Longmeadow. The nearest rail service is in the City of Springfield, MA and the Town of Enfield CT to the south.

Public Transportation

East Longmeadow runs a Two-Town Trolley each weekday, which services the towns of East Longmeadow and Hampden between the hours of 9:00 am and 2:00 pm for a cost of $1 each way.

The Pioneer Valley Transit Authority (PVTA) provides contracts through MV Transportation to offer paratransit in East Longmeadow, a door-to-door demand responsive van service on Tuesdays and Thursdays. Seats can be reserved up to two hours in advance for trips to the Senior Center, shopping, or medical appointments to the Allen and Cooley area at a cost of $1 each way.

Public Drinking Water Supply

In 2014, the Department supplied a total of 641 million gallons of water. The Town purchases its water from the Springfield Water and Sewer Commission. Drinking water produced by the Springfield Water and Sewer Commission originates from a surface water supply, the Cobble Mountain Reservoir, located in western Massachusetts. The Borden Brook Reservoir, a smaller surface water supply that feeds into Cobble Mountain Reservoir, contributes to the system's combined water supply capacity of 25 billion gallons.

The reservoirs and the land surrounding the reservoirs are collectively called the watershed. Watershed protection is the Commission's first defense in maintaining a pure water source. Within the Cobble Mountain watershed area the Commission owns approximately 13,000 acres of reservoir and land. Inside the watershed boundaries there is no commercial industry, the population density is low, and only limited farming and grazing is practiced. To further protect the water supply, boating, swimming, hunting and fishing is forbidden in and around the reservoir areas and watershed lands.

The reservoir water flows to the West Parish Filters Treatment Plant, located in Westfield, Massachusetts, where it is filtered through slow and rapid sand filtration, treated to inhibit corrosion of home plumbing, adjusted for pH, and disinfected before it flows to the 60 million gallon underground storage tanks at Provin Mountain Reservoir located in Agawam, Massachusetts. Clean drinking water is supplied, at an annual average rate of 35 million gallons per day to Springfield and the surrounding communities, Agawam, East Longmeadow, Longmeadow and Ludlow, through the 617 mile piping network of large sized transmission mains and smaller sized distribution mains.

The Town has four connections to the Springfield water supply system: Elm Street, Harkness Avenue, North Main Street and Dwight Road. The northwest quadrant of Town is serviced directly by these four connections.

The southern and eastern sides of the Town are serviced by what is referred to as a high-service system. Water delivered through the Town of Springfield is pumped at the Chestnut Street Pump Station into the high-service system. This water can go into our water storage tanks on

Prospect Street or directly to a home or business for consumption. Since this water may be stored in the tanks or pipelines for an undetermined amount of time, the Town of East Longmeadow Department of Public Works adds chlorine and ammonia at the Chestnut Street Pump Station as it pumps the water. This booster chlorination, as it is commonly referred to, helps to ensure that there are no bacteria in the system.

Sewer Service

The Sewer Division of the East Longmeadow Department of Public Works is responsible for the safe and efficient transmission of the raw sewage from its underground pipe network to the treatment plant located at Springfield's Bondi's Island.

Sewage flows in the pipes either by gravity or through forced pressure created by a network of pump stations throughout town. The Sewer Division is responsible for the maintenance of more than 114 miles of pipe and the upkeep of seventeen pump stations.

Schools

Public Schools in East Longmeadow include East Longmeadow High School, Birchland Park Middle School, and Mapleshade, Mountain View, and Meadow Brook Elementary Schools.

Natural Resources

East Longmeadow's terrain and landscape has played a key role in dictating its development as a community. The Town's natural resources led to its development as an agricultural village, reliant on farming and its quarries.

Forests

The forest resources and woodlands in East Longmeadow are abundant throughout the town. The town has large expanses of permanently and temporarily protected vegetated open space located within a North Central Hardwoods-Hemlock-White Pine zone. The extensive range of these forestlands encompasses approximately 3235 acres, which comprises 38.9% of the total land area in the Town. These areas are habitat for several tree and plant species as well as wildlife.

Water Resources

Rivers and Streams

There are three large and two small watersheds in East Longmeadow. All rivers and streams in town eventually drain to the Connecticut River.

Pecousic Brook

Pecousic Brook rises at Indian Spring between St. Joseph and Indian Spring Roads. It drains most of the north and west areas of the town before flowing into Springfield where it forms the lakes in Forest Park.

The major road crossings associated with Pecousic Brook that present possible flooding hazards and that threaten the brook from spills on the roads are on Porter Road at Mapleshade; Mapleshade Road at Mapleshade School; Elm Street; North Main Street at Rocky's; Westwood near North Main; and Vineland Avenue.

Watchaug Brook

Watchaug Brook has many tributaries in the south and east of the town and drains most of the eastern portion of the town. It flows southwards into Somers, CT, where it joins the Scantic River.

The major road crossings associated with Watchaug Brook that present possible flooding hazards and that threaten the brook from spills on the roads are on Porter Road; Meadowbrook Road; Somers Road (two crossings); Pease Road (two crossings); and Lee Street.

Freshwater and Jawbuck Brooks

Freshwater Brook and its tributary, Jawbuck Brook, drain the southwest corner of the town. They join in Connecticut and Freshwater Brook flows through Somers and Enfield, forming a number of lakes that have developed residential communities.

The major road crossings associated with Freshwater and Jawbuck Brooks that present possible flooding hazards and that threaten the brooks from spills on the roads are on Pease Road at Shaker Road; Shaker Road; Industrial Drive; and Denslow Road.

Mill River

The south branch of the Mill River drains a small area in the northeast corner of the town.

The major road crossing associated with the Mill River that presents possible flooding hazards and that threaten the river from spills on the roads is on Porter Road at Fenway Golf.

The Mill River abuts the closed landfill on Allen Street.

Scantic River

The Scantic River drains a very small area of mostly agricultural land in the southeast corner of the town. There are no road crossings in town associated with the Scantic River.

Wetlands

There are extensive wetlands throughout the town, many of them being bordering vegetated wetlands associated with the river systems identified above. There are only a few isolated lands subject to flooding.

Beaver Dams

There are no permanent beaver dams in town. While there is significant beaver activity, most dams are cleared as soon as they begin to create problems with flooding.

Dams

There are several dams that are relicts of agricultural activity in the town, including two on Freshwater Brook, north and south of Denslow Road; one on Jawbuck Brook in the Deer Park Industrial Park; and two on the Bluebird Estates property.

Aquifers

There is one significant aquifer along the western border of the town abutting Longmeadow and under the Industrial Park. However, all drinking water in town is purchased from the City of Springfield and the town does not rely on groundwater for a water supply.

3: HAZARD IDENTIFICATION AND ANALYSIS

The following section includes a summary of disasters that have affected or could affect East Longmeadow. 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
- Severe thunderstorms / wind / tornadoes
- Wildfires / brushfires
- Earthquakes
- Dam failure / levee breech
- Drought
- Extreme Temperatures

Natural Hazard Analysis Methodology

This chapter examines the hazards in the Massachusetts State Hazard Mitigation Plan which are identified as likely to affect East Longmeadow. 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 East Longmeadow are: floods, severe snowstorms/ice storms, hurricanes, severe thunderstorms / wind / tornadoes, wildfire/brushfire, earthquakes, dam failure / levee breech, 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:

Percentage of Town Impacted by Natural Hazard	
Land Area Affected by 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 people and property in the community, based on the assessment of extent described above. Impacts 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 through 5 as follows:

1 – Highest risk
2 – High risk
3 – Medium risk
4 – Low risk
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 East Longmeadow

Type of Hazard	Location of Occurrence	Probability of Future Events	Impact	Hazard Risk Index Rating
Flooding	Medium	Low	Minor	3
Severe Snowstorms / Ice Storms	Large	Very high	Limited	2
Severe Thunderstorms /	Small	Medium high	Minor	3
Winds /	Small	High	Minor	3
Tornadoes	Small	Very low	Limited	4
Hurricanes	Large	Low	Limited	3
Wildfire / Brushfire	Small	Very low	Minor	5
Earthquakes	Large	Very low	Critical/minor	5
Dam Failure	Small	Very low	Minor	5
Drought	Large	Very low	Minor	5
Extreme Temperatures	Large	Moderate	Limited	3

Source: Massachusetts Hazard Mitigation Plan

Flooding

Hazard Description

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

- 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.

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 small streams spill over their banks. 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).

Location

There are ___ locations in East Longmeadow that have been susceptible to 100-year floods in the past. At this time the Town of East Longmeadow has no repetitive loss properties as defined by FEMA's NFIP.

Extent

The average annual precipitation for East Longmeadow and surrounding areas in western Massachusetts has been 40 to 45 inches during the past several years.

Water levels in East Longmeadow's rivers, streams, and wetlands rise and fall seasonally and during high rainfall events. High water levels are typical in spring, due to snowmelt and ground thaw. This is the period when flood hazards are normally expected. Low water levels occur in summer due to high evaporation and plant uptake (transpiration). At any time, heavy rainfall may create conditions that raise water levels in rivers and streams above bank full stage, which then overflow adjacent lands.

Based on past records and the knowledge and experience of members of the East Longmeadow Hazard Mitigation committee and residents, the extent of the impact of localized flooding would be minor.

Previous Occurrences

In addition to the floodplains mapped by FEMA for the 100-year and 500-year flood, East Longmeadow often experiences minor flooding at isolated locations due to drainage problems, or problem culverts. On Dorsell Street, residents have alerted DPW to water in basement, and the Fire Department receives 3-4 calls/year on average to respond to flooding in basements. Elm Street has experienced localized flooding, but it has been years since the Fire Department had to respond to any emergency situations caused by flooding. Minor flooding in the road has occurred on North Main, on Mill Road near Meadow Brook, at the bottom of Pease Road near the pumping station, and at the south end of Somers Road (on the CT side).

There are a total of 2 problem culverts, one at Westwood at the old railroad crossing, and the second on Elm Street, that have been mapped on the Past and Potential

Hazards/Critical Facilities Map (Appendix D). Most of the flood hazard areas listed here were identified due to known past occurrence in the respective area. There are many areas with no record of previous flood incidents that could be affected in the future by heavy rain and runoff.

Probability of Future Events

Based upon previous data, there is low probability of localized flooding occurring in East Longmeadow in the next year.

Impact

The Town faces a minor impact, with less than 10% of total town area likely to be affected by a flooding event.

Minor Flooding is defined to have minimal or no property damage, but possibly some public threat. A Flood Advisory product is issued to advise the public of flood events that are expected not to exceed the minor flood category. Examples of conditions that would be considered minor flooding include:

- water over banks and in yards
- no building flooded, but some water may be under buildings built on stilts (elevated)
- personal property in low lying areas needs to be moved or it will get wet
- water overtopping roads, but not very deep or fast flowing
- water in campgrounds or on bike paths
- inconvenience or nuisance flooding
- small part of the airstrip flooded, and aircraft can still land
- one or two homes in the lowest parts of town may be cut off or get a little water in the crawl spaces or homes themselves if they are not elevated

Moderate Flooding is defined to have some inundation of structures and roads near the stream. Some evacuations of people and/or transfer of property to higher elevations may be necessary. A Flood Warning is issued if moderate flooding is expected during the event. Examples of conditions that would be considered moderate flooding include:

- several buildings flooded with minor or moderate damage
- various types of infrastructure rendered temporarily useless (i.e. fuel tanks cannot be reached due to high water, roads flooded that have no alternates, generator station flooded)
- elders and those living in the lowest parts of the village are evacuated to higher ground
- access to the airstrip is cut off or requires a boat
- water over the road is deep enough to make driving unsafe
- gravel roads likely eroded due to current moving over them
- widespread flooding, but not deep enough to float ice chunks through town
- water deep enough to make life difficult, normal life is disrupted and some hardship is endured

- airstrip closed
- travel is most likely restricted to boats

Major Flooding is defined to have extensive inundation of structures and roads. Significant evacuations of people and/or transfer of property to higher elevations are necessary. A Flood Warning is issued if major flooding is expected during the event. Examples of conditions that would be considered major flooding include:

- many buildings flooded, some with substantial damage or destruction
- infrastructure destroyed or rendered useless for an extended period of time
- multiple homes are flooded or moved off foundations
- everyone in threatened area is asked to evacuate
- National Guard units assist in evacuation efforts
- erosion problems are extreme
- the airstrip, fuel tanks, and the generator station are likely flooded
- loss of transportation access, communication, power and/or fuel spills are likely
- fuel tanks may float and spill and possibly float downstream
- ice chunks floating through town that could cause structural damage
- high damage estimates and high degree of danger to residents

Various critical facilities are at risk within East Longmeadow's floodplain:

<u>100-year floodplain</u>

- ___

<u>500-year floodplain</u>

- ___

Vulnerability

Based on the above analysis, East Longmeadow has a hazard index rating of 3 for flooding.

There are approximately ___ acres of land within the FEMA mapped 100-year floodplain and ___ acres of land within the 500-year floodplain within the Town of East Longmeadow. According to the Community Information System (CIS) of FEMA, there were ___ structures (all residential) located within the Special Flood Hazard Area (SFHA)

in East Longmeadow as of August 2005, the most current records in the CIS for the Town of East Longmeadow.

Utilizing the Town's median home value of $219,100 (Town Assessor-2015), combined with the total value of all property, $1,931,032,172, up to $_____ worth of damage could occur within the Special Flood Hazard Area. The damage estimate is a rough estimate and likely reflects a worst-case scenario. Computing more detailed damage assessments based on assessor's records is a labor-intensive task and beyond the scope of this project.

Severe Snowstorms / Ice Storms

Hazard Description

Severe winter storms can pose a significant risk to property and human life. Severe snowstorms and ice storms can involve rain, freezing rain, ice, snow, cold temperatures and wind.

Location

The entire Town of East Longmeadow is susceptible to severe snowstorms, which means the location of occurrence is "large." Because these storms occur regionally, they would impact the entire Town.

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

Previous Occurrences

Based on data available from the National Oceanic and Atmospheric Administration, there are 47 winter storms since 1958 that have registered on the NESIS scale. Of these, approximately 26 storms resulted in snow falls in the Pioneer Valley of at least 10 inches. These storms are listed in the table on the next page, in order of their NESIS severity.

Winter Storms Producing Over 10 inches of Snow in the region, 1958-2014			
Date	**NESIS Value**	**NESIS Category**	**NESIS Classification**
3/4/2013	3.05	2	Significant
2/7/2013	4.35	3	Major
10/29/2011	1.75	1	Notable
1/9/2011	5.31	3	Major
2/23/2010	5.46	3	Major
3/15/2007	2.54	2	Significant
1/21/2005	6.8	4	Crippling
2/15/2003	7.5	4	Crippling
3/31/1997	2.29	1	Notable
2/2/1995	1.43	1	Notable
2/8/1994	5.39	3	Major
3/12/1993	13.2	5	Extreme
1/25/1987	1.19	1	Notable
2/10/1983	6.25	4	Crippling
4/6/1982	3.35	2	Significant
2/5/1978	5.78	3	Major
1/19/1978	6.53	4	Crippling
2/18/1972	4.77	3	Major
12/25/1969	6.29	4	Crippling
2/22/1969	4.29	3	Major
2/8/1969	3.51	2	Significant
2/5/1967	3.5	2	Significant
2/2/1961	7.06	4	Crippling
1/18/1961	4.04	3	Major
12/11/1960	4.53	3	Major
3/2/1960	8.77	4	Crippling

2/14/1958	6.25	4	Crippling

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

Probability of Future Events

Based upon the availability of records for Hampden County, the likelihood that a severe snow storm will affect East Longmeadow is "very high" (greater than 70 percent in any given year).

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

The Town faces a "limited" impact or less than 10 percent of total property damaged, from snowstorms.

The weight from multiple snowfall events can test the load ratings of building roofs and potentially cause significant damage. Multiple freeze-thaw cycles can also create large amounts of ice and make for even heavier roof loads.

Other impacts from snowstorms and ice storms include:

- 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 medical emergencies or fires

Vulnerability

Based on the above assessment, East Longmeadow has a hazard index rating of "2 — high risk" from snowstorms and ice storms.

Utilizing the Town's median home value of $219,100 (Town Assessor-2015), combined with the total value of all property, $1,931,032,172, and an estimated 5 percent of damage to 10 percent of residential structures, approximately $ 9,655,161 worth of damage could occur from a severe snowstorm. This is a rough estimate and likely reflects a worst-case scenario. Computing more detailed damage assessments based on assessor's records is a labor-intensive task and beyond the scope of this project. The cost of repairing or replacing the roads, bridges, utilities, and contents of structures is not included in this estimate.

Hurricanes

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 East Longmeadow is at risk from hurricanes, meaning the location of occurrence is "large." Ridgetops are more susceptible to wind damage. Areas susceptible to flooding are also likely to be affected by heavy rainfall.

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 that have affected East Longmeadow are shown in the following table.

Major Hurricanes and Tropical Storms Affecting the region		
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

The Emergency Management Director (EMD) researched dollar amounts from damage received during the 1938 and 1955 Hurricanes. He found the following expenditures and narrative reports in the Town Report:

1938 – Town's Share of Gasoline Tax & Storm Damage Funds
Wages - $3,844.73 / Supplies & Other - $1,278.63
Storm Damage – (different listing) $5,129.06

At eight o'clock that night, with the wind abating, but rain still falling, the work of opening up the roads was begun. Every available person, and every available ax in the Town was was pressed into service. Under the direction of the Selectmen, the Tree Warden and Superintendent of Streets, nearly a hundred men worked until three o'clock the next morning cutting a path through the streets for the passage of

automobiles. For the next three days men worked feverishly to repair dangerous spots on roads and to remove trees from buildings.

A program of rehabilitation was outlined in cooperation with the federal government to repair dangerous spots on the roads & remove trees from buildings. It was a 3 month project with an approximate cost of $20,000.

1955 – Expenditures for Hurricane Diane – August 19, 1955
Noted as "Flood Emergency" – Labor - $3,689.32 / Materials $4,866.05

This tropical storm hit the Southern New England area on August 19, 1955 causing damage in the hundreds of millions to both public and private property. East Longmeadow came out of this disastrous flood with comparatively little damage especially in the light of what happened to some of our neighboring communities. However, from early Friday morning until Sunday night, all of our Town officials and employees, both regular and auxiliary, were taxed to the fullest. Once again we are indebted to the civic spirit of the people who answered our appeals for assistance. Perhaps the greatest lesson learned from this unhappy experience is the need for a well-organized and adequately manned Civil Defense organization. It is gratifying to note the enthusiastic response to the membership drive conducted by the Civil Defense Council early in December.

While Tropical Storm Sandy in late October of 2012 had severe impacts on much of the Northeastern United States, there was minimal damage that occurred due to the storm locally in East Longmeadow. No roads were flooded or washed out. No residents encountered long-term displacement due to the storm's impacts. In nearby areas of western Massachusetts, there were modest impacts, with localized flooding and downed power lines. Overall, western Massachusetts was able to send emergency response resources to other states where the storm had a larger impact. [1]

Probability of Future Events

East Longmeadow'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 (1 percent to 10 percent in any given year) of hurricanes in East Longmeadow. Climate change is projected to result in more severe weather, including increased occurrence of hurricanes and tropical storms. Because of this, the occurrence of hurricanes will increase in the future.

[1] "Western Massachusetts escapes Hurricane Sandy's wrath, but impact elsewhere still being felt." http://www.masslive.com/news/index.ssf/2012/10/western_massachusetts_escapes.html. October 30, 2012. Accessed March 6, 2015.

Impact

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

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+

The Town faces a "limited" impact from hurricanes, with _10_ percent or less of East Longmeadow affected.

Vulnerability

Based on the above analysis, East Longmeadow has a hazard index rating of "3 – medium risk" from hurricanes.

Utilizing the Town's median home value of $219,100 (Town Assessor-2015), combined with the total value of all property, $1,931,032,172, and an estimated 10 percent of damage to 5 percent of all structures, the estimated amount of wind damage from a hurricane is $9,655,161. Estimating that flooding would create 10 percent of damage to 20 percent of structures, the resulting damage would be $38,620,643. The cost of repairing or replacing the roads, bridges, utilities, and contents of structures is not included in this estimate.

Severe Thunderstorms / Wind / Tornadoes

Hazard Description

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.).

Location

As per the Massachusetts Hazard Mitigation Plan, the entire Town is at risk of high winds, severe thunderstorms, and tornadoes. The plan also identifies East Longmeadow and the surrounding communities as having a high frequency of tornados occurrence within Massachusetts. However, the actual area affected by thunderstorms, wind, or tornadoes is "small," with less than 10 percent of the Town affected.

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

Because thunderstorms and wind affect the town regularly on an annual basis, there are not significant records available for these events. As per the Massachusetts Hazard Mitigation Plan, there are approximately 10 to 30 days of thunderstorm activity in the state each year.

Between 1950 and 2015, 1 tornado has touched down in East Longmeadow in 1978. Since the 1950s, there have been over 15 tornadoes in Hampden County.

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 Hampden County to determine the Tornado Index Value as shown in the table below.

Tornado Index for Hampden County	
Hampden County	138.23
Massachusetts	87.60
United States	136.45

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

Based upon the available historical record, as well as East Longmeadow's location in a high-density cluster of state-wide tornado activity, there is a "very low" probability (less than 1 percent chance in any given year) of a tornado affecting the Town, and a a moderate probability of a severe thunderstorm and/or high winds.

As per the Massachusetts Hazard Mitigation Plan, there are approximately 10 to 30 days of thunderstorm activity in the state each year. Thus, there is a "moderate" probability (10 percent to 40 percent chance in any given year) of a severe thunderstorm or winds affecting the Town.

Impact

Overall, East Longmeadow faces a "minor" impact from severe thunderstorms, and a "limited" impact from severe winds, or thunderstorms, with 10 percent or less of the Town likely to be affected.

As indicated as part of the Enhanced Fujita Scale Levels for tornados, the following impacts can result from a tornado:

- EFO - Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages to sign boards.

- EF1 - 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 - Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.

- EF3 - Roof and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted.

- EF4 - Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.

Vulnerability

Based on the above assessment, East Longmeadow has a hazard index rating of "2-medium risk" from severe thunderstorms and winds, and a "4 – low risk" from tornadoes.

The potential for locally catastrophic damage is a factor in any tornado, severe thunderstorm, or wind event. In East Longmeadow, a tornado that hit the residential areas would leave much more damage than a tornado with a travel path that ran along the town's uplands, where less settlement has occurred. Most buildings in the town 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, and 64% percent (3,860 properties according to the Assessor's office), of the town's housing was constructed prior to this date.

Utilizing the Town's median home value of $219,100 (Town Assessor-2015), combined with the total value of all property, $1,931,032,172, and an estimated 10 percent of damage to 5 percent of all structures, the estimated amount of damage from a tornado

is $9,655,161. The cost of repairing or replacing the roads, bridges, utilities, and contents of structures is not included in this estimate.

Wildfires / Brushfires

Hazard Description

Wildfires 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. Typical causes of brushfires and wildfires are lightning strikes, human carelessness, and arson.

FEMA has classifications for 3 different classes of wildfires:

- Surface fires are the most common type of wildfire, with the surface burning 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

Hampden County has approximately 273,000 acres of forested land, which accounts for 67% of total land area. In East Longmeadow, an estimated 39% of the land is undeveloped, with much of it having trees on it, but it is not a significant sized "forest", and because of the suburban nature of the community, not considered to be a significant risk for forest fire. The total amount of town that could be affected by wildfire is categorized as “small,” or less than 10 percent of the total area.

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.

In East Longmeadow approximately 39% percent of the town’s total land area (about 3235 acres) is un-developed, with some trees, and is therefore at risk of fire, but this land area is scattered throughout the community, with development throughout. In drought conditions, a brushfire or wildfire would be a matter of concern. As noted in the next section describing previous occurrences of wildfire, there have not been any major wildfires recorded in East Longmeadow. Based on the experience of the Fire Chief, it is estimated that a wildfire might likely destroy around 10 to 50 acres of forested area.

The overall extent of wildfires is shown in the table below:

Extent of Wildfires

Rating	Basic Description	Detailed Description
CLASS 1: Low Danger (L) Color Code: Green	Fires not easily started	Fuels do not ignite readily from small firebrands. Fires in open or cured grassland may burn freely a few hours after rain, but wood fires spread slowly by creeping or smoldering and burn in irregular fingers. There is little danger of spotting.
CLASS 2: Moderate Danger (M) Color Code: Blue	Fires start easily and spread at a moderate rate	Fires can start from most accidental causes. Fires in open cured grassland will burn briskly and spread rapidly on windy days. Woods fires spread slowly to moderately fast. The average fire is of moderate intensity, although heavy concentrations of fuel – especially draped fuel -- may burn hot. Short-distance spotting may occur, but is not persistent. Fires are not likely to become serious and control is relatively easy.
CLASS 3: High Danger (H) Color Code: Yellow	Fires start easily and spread at a rapid rate	All fine dead fuels ignite readily and fires start easily from most causes. Unattended brush and campfires are likely to escape. Fires spread rapidly and short-distance spotting is common. High intensity burning may develop on slopes or in concentrations of fine fuel. Fires may become serious and their control difficult, unless they are hit hard and fast while small.
CLASS 4: Very High Danger (VH) Color Code: Orange	Fires start very easily and spread at a very fast rate	Fires start easily from all causes and immediately after ignition, spread rapidly and increase quickly in intensity. Spot fires are a constant danger. Fires burning in light fuels may quickly develop high-intensity characteristics - such as long-distance spotting - and fire whirlwinds, when they burn into heavier fuels. Direct attack at the head of such fires is rarely possible after they have been burning more than a few minutes.
CLASS 5: Extreme (E) Color Code: Red	Fire situation is explosive and can result in extensive property damage	Fires under extreme conditions start quickly, spread furiously and burn intensely. All fires are potentially serious. Development into high-intensity burning will usually be faster and occur from smaller fires than in the Very High Danger class (4). Direct attack is rarely possible and may be dangerous, except immediately after ignition. Fires that develop headway in heavy slash or in conifer stands may be unmanageable while the extreme burning condition lasts. Under these conditions, the only effective and safe control action is on the flanks, until the weather changes or the fuel

		supply lessens.

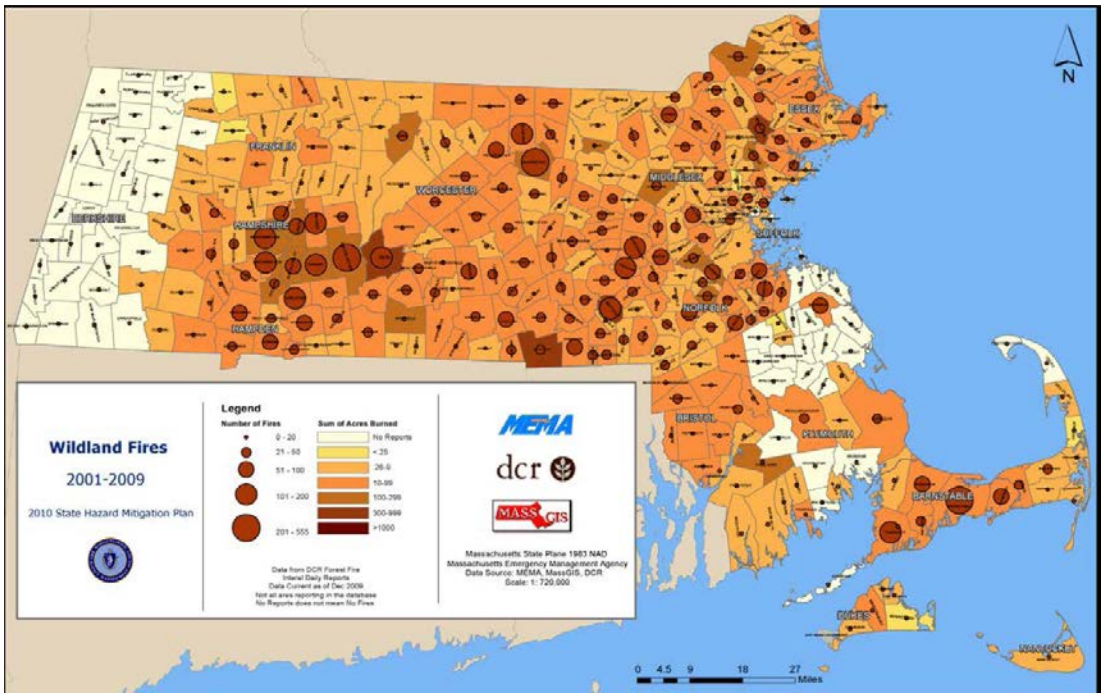
Previous Occurrences

East Longmeadow has a professional Fire Department, and there have not been any major forest fires in East Longmeadow. There have not been any brushfires other than for small backyard burning of brush, for which the Town issues permits.

During the past 100 years, there have not been many wildfires occurring in the Pioneer Valley. Several fires that burned 50-500 acres 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

Wildland Fires in Massachusetts, 2001-2009



Source: Massachusetts Hazard Mitigation Plan

Probability of Future Events

In accordance with the Massachusetts Hazard Mitigation Plan, the East Longmeadow Hazard Mitigation Committee found it is difficult to predict the likelihood of wildfires in a probabilistic manner because the number of variables involved. However, based on previous occurrences, the Committee determined the probability of future events to be "low" (1 percent to 10 percent probability in the next year).

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.

Climate change is also predicted to bring increased wind damage from major storms, as well as new types of pests to the region. Both increased wind and the introduction of new pests could potentially create more debris in wooded areas and result in a larger risk of fires.

Impact

While a large wildfire could damage much of the landmass of East Longmeadow, these areas are not populated by people, meaning that wildfire affected areas are not likely to cause damage to property. For this reason, the Town faces a "minor" impact from wildfires, with very few damages likely to occur.

Both wildfires and brushfires can consume homes, other buildings and/or agricultural resources. The impact of wildfires and brushfires are as follows:

- Impact to benefits that people receive from the environment, such as food/water and the regulation of floods and drought
- Impact on local heritage, through the destruction of natural features
- Impact to the economy, due to damage to property and income from land following a wildfire
- Impact through the destruction of people and property

Vulnerability

Based on the above assessment, East Longmeadow has a hazard risk index of "5 – lowest risk" from wildfires.

Utilizing the Town's median home value of $219,100 (Town Assessor-2015), combined with the total value of all property, $1,931,032,172, and an estimated 5 percent of damage to 1 percent of all structures, the estimated amount of damage from a forest fire is $965,516. The cost of repairing or replacing the roads, bridges, utilities, and contents of structures is not included in this estimate.

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 of East Longmeadow is susceptible to earthquakes. This makes the location of occurrence "large," or over 50 percent of the total area.

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 an earthquake that causes almost complete destruction.

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[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.*

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.

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

Source: US Federal Emergency Management Agency

Previous Occurrences

The most recent earthquakes to affect East Longmeadow are shown in the table below.

Largest Earthquakes Affecting the region, 1925 – 2015		
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 Hampden County to determine the Earthquake Index Value as shown in the table below.

Earthquake Index for Hampden County	
Hampden County	0.24
Massachusetts	0.70
United States	1.81

Source: USA.com

Based upon existing records, there is a “very low” frequency (less than 1 percent probability in any given year) of an earthquake in East Longmeadow.

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. Aside from residences, the majority of East Longmeadow’s buildings have been built after 1975. The seismic standards have also been upgraded with the 1997 revision of the State Building Code.

The Town faces a “minor” impact from an earthquake, with less than 10 percent of East Longmeadow affected.

While a significant earthquake, estimated to be approximately of magnitude 6.1 or higher, would cause the impact described above, a smaller earthquake would have "minor" impact, with only small damage to property. As shown in the table of the Richter Scale above, an earthquake of 6.0 or lower would result in at most slight damage to well-designed buildings, which are the vast majority of structures in East Longmeadow. Earthquakes between 3.5 and 5.4 would be felt but rarely cause damage, and earthquakes smaller than 3.5 would not be noticed.

Vulnerability

Based on the above analysis, East Longmeadow has a hazard index rating of "5- lowest risk" from earthquakes. Utilizing the Town's median home value of $219,100 (Town Assessor-2015), and the fact that an estimated 3,860 residential properties were built before 1975, whereas the majority of non-residential structures were built after 1975, and estimating 10 percent of damage to these homes ("minor" impact), the estimated amount of damage from an earthquake is $84,572,600. The cost of repairing or replacing the roads, bridges, utilities, and contents of structures is not included in this estimate.

Dam Failure

Hazard Description

Dams and their associated impoundments provide many benefits to a community, such as water supply, recreation, hydroelectric power generation, and flood control. However, they also pose a potential risk to lives and property. Dam 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 above overtop and erode the material components of the dam. Often dam breeches lead to catastrophic consequences as the water 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.

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 Office of Dam Safety is the agency responsible for regulating dams in the state (M.G.L. Chapter 253, Section 44 and the implementing regulations 302 CMR 10.00). To be regulated, these dams are in excess of 6 feet in height (regardless of storage capaTown) and have more than 15 acre feet of storage capaTown (regardless of height). Dam safety regulations enacted in 2005 transferred significant responsibilities for dams from the State of Massachusetts to dam owners, including the responsibility to conduct dam inspections.

Location

According to the State DCR, the Town of East Longmeadow has 5 dams on public and private land, and two are classified as low hazards. According to the East Longmeadow Hazard Mitigation Committee, the Blue Bird Acres Pond dam is not a dam anymore. The names and hazard levels of the individual structures are:

National Id Number	Dam Name	Primary Owner	Hazard Potential	Date of Most Recent Formal Phase I Inspection	Condition	Dam Purpose	Regulatory Authority
MA01886	Blue Bird Acres Pond Dam	No Record for Privately Owned Non-Jurisdictional Dam	N/A	Committee says not a dam anymore	n/a	n/a	Non-Jurisdictional
MA02368	Heritage Park Pond Dam	Town of E. Longmeadow, Board of Selectmen	N/A				Non-Jurisdictional
MA01884	Wetstone Pond #1 Dam	JSTW Limited Partnership	Low Hazard	12/28/2006	Fair		Office of Dam Safety
MA01885	Wetstone Pond #2 Dam	No Record for Privately Owned Non-Jurisdictional Dam	N/A				Non-Jurisdictional
MA00533	Wetstone Tobacco Co. #3	Town of E. Longmeadow, Board of Selectmen	Low Hazard	7/7/2010	Poor	Irrigation Pond	Office of Dam Safety

There are only two low hazard dams in East Longmeadow. The failure of a low hazard dam would not cause any personal injury and is not anticipated to affect a significant amount of the land area in East Longmeadow.

Extent

Often dam or levee 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 will likely 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

To date, there have been no catastrophic dam failures in East Longmeadow.

Probability of Future Events

Because East Longmeadow has only low hazard dams the frequency of dam failures is "very low" with a less than 1 percent chance of a dam bursting in any given year.

Impact

The Town faces a "very low" impact from failure of dams with, with significantly less than 10 percent of East Longmeadow likely to be affected.

The estimated property loss of failure of the low hazard dams in East Longmeadow is negligible.

Vulnerability

Based on this analysis, East Longmeadow has a hazard index rating of "5 – very low risk" from dam failure.

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, meaning the location of occurrence is "large" or over 50 percent of the Town affected.

Extent

The severity of a drought would determine the scale of the event. The vast majority of Town residents are served by the public water system, which received water from the Springfield Water and Sewer Commission, so a major regional drought would affect East Longmeadow.

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	Exceptional and widespread crop/pasture losses;

	Drought	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, but none have affected East Longmeadow.[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

East Longmeadow has not been impacted by any previous droughts in the state.

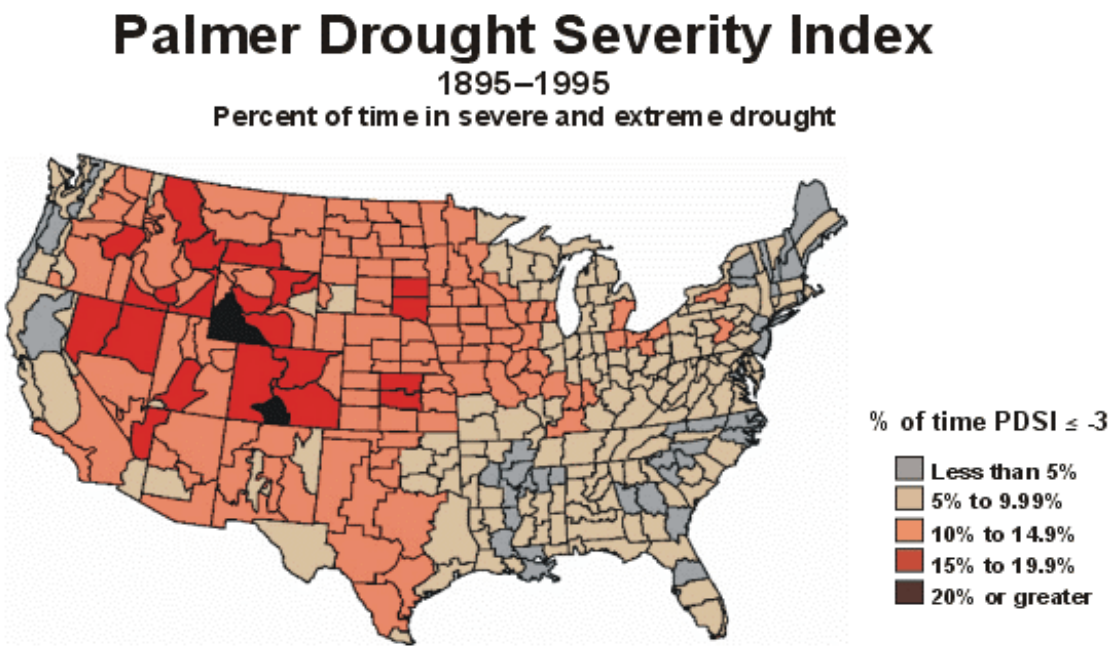
Probability of Future Events

In East Longmeadow, as in the rest of the state, drought occurs at a "very low" probability (1 to 10 percent in the next year). Based on past events and current criteria

[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.

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 and risk of drought.[5]

Due to the water richness of western Massachusetts, East Longmeadow 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.



Impact

The impact of droughts is categorized by the U.S. Drought Monitor include:

- Slowing or loss of crops and pastures

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

- Water shortages or restrictions
- Minor to significant damage to crops, pastures;
- Low water levels in streams, reservoirs, or wells

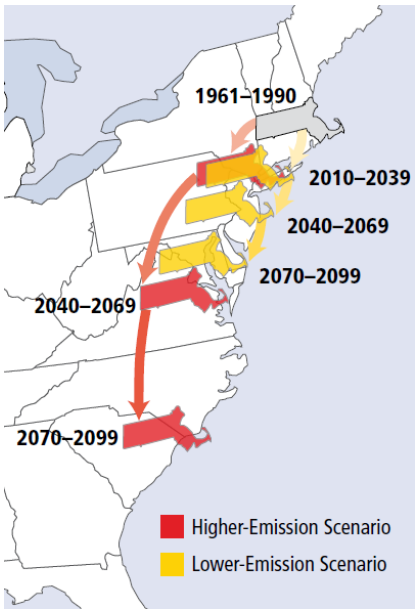
However, the Town's local aquifer supply would help to reduce the effects of widespread drought on the local water supply. The impact of a drought is thus "minor," with very few damages to people or property likely to occur.

Vulnerability

Based on the above assessment, East Longmeadow has a hazard index rating of "5 – very low risk" from drought. No loss of property, or damages to people or property is expected due to this hazard.

Impacts of Climate Change

Climate change is already causing natural hazards to have more of an impact on East Longmeadow, with hotter summers, wetter winters, more severe storms, and more frequent flooding. In the future, general climatic changes are projected to result in East Longmeadow experiencing higher temperatures and more precipitation. There will also be wider variability in weather extreme and more days of extreme heat above 90 degrees, more heat waves, more floods, more droughts, and more tornados, hurricanes and heavy storms.



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

This change in climate will expand the area of East Longmeadow that is within the 100-year and 500-year floodplain, affect critical resources and vulnerable populations, alter local food production, increase the risk of wildfires, and result in increased damage to people and property.

This section identifies the impacts that climate change will have to the various identified hazards affecting East Longmeadow. The information included is derived from several accepted sources:

- The 2007 report of the Northeast Climate Impacts Assessment (NECIA)
- The Pioneer Valley Planning Commission's *Our Next Future: An Action Plan for Building a Smart, Resilient Pioneer Valley*, which includes climate change projections
- The Massachusetts Climate Change Adaptation Report
- The Massachusetts Multi-Hazard Mitigation Plan

The mitigation strategies included in Chapter 5 also take into account the impacts of climate change and provide adaptation strategies where appropriate. While the exact extent is still uncertain, it is clear that climate change is occurring and will affect East Longmeadow in the coming decades

Increased Flooding

By the end of the 21st century, annual precipitation is expected to increase by 14 percent – however, this increase will be a result of more winter precipitation – an increase of 30 percent– while summer precipitation will actually slightly decrease.

Additionally, most of this winter precipitation is projected to be in the form of rain rather than snow. This will result in a continuation of the current trend of an overall decrease in total snowfall, as well as the number of days that have snow cover.
The increased amount of strong precipitation events and overall increase in rainfall will likely result in more flooding in the region.

Expected Climatic Variations 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

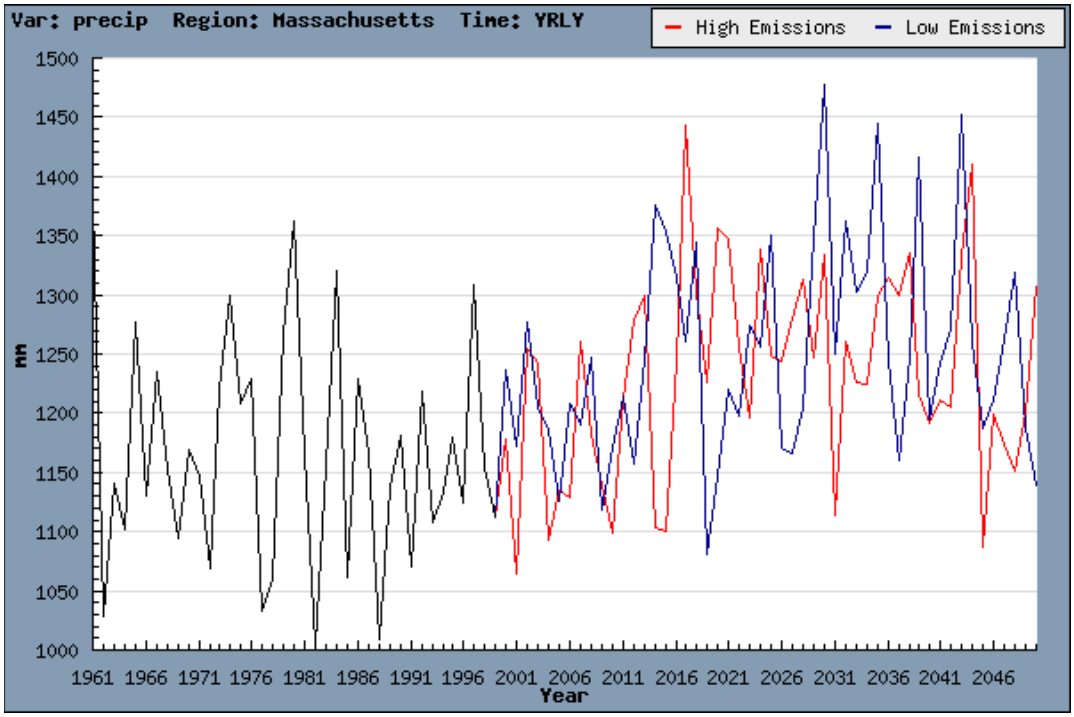
Sources: Massachusetts Climate Adaptation Report 2011, NECIA

Increased flooding will have the following projected impacts to people and property:

- Increased occurrences of localized flooding, in areas designated on the Hazard Identification map. The Town of East Longmeadow believes this to be a minor risk.

- Increased instances of standing water will lead to increased mosquito populations and greater risk of disease vectors.

Massachusetts Rainfall 1961-2050



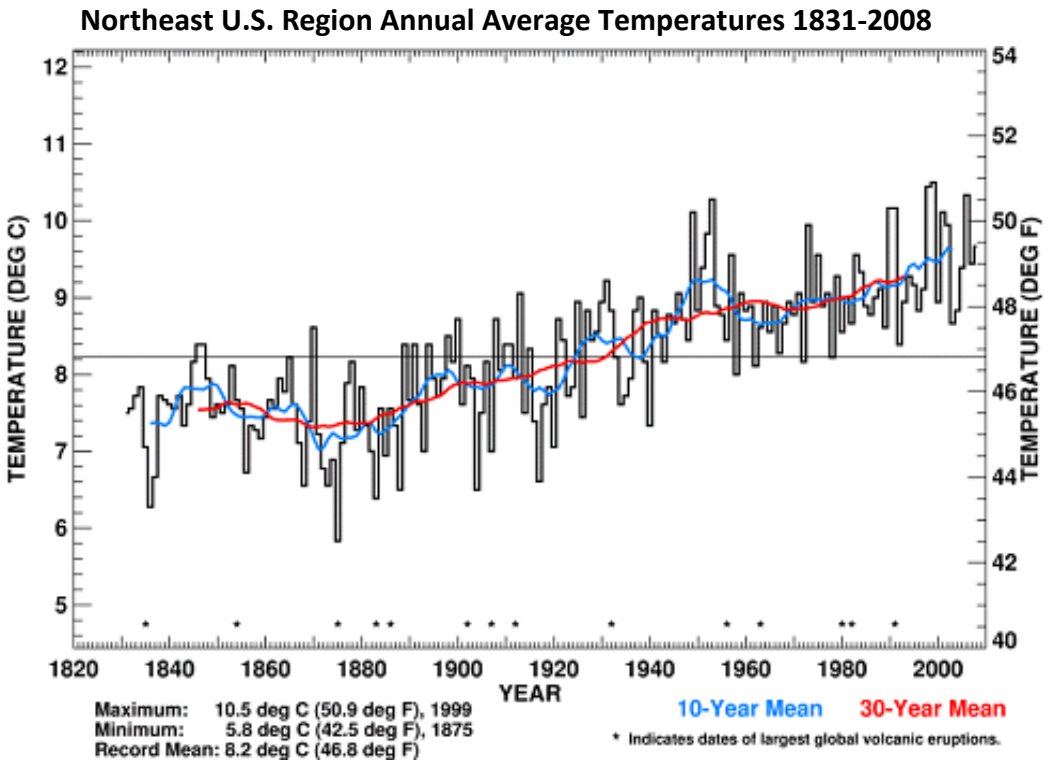
Rainfall has increased approximately 10% during the past 50 years, and is expected to continue to increase. *Source: NECIA*

Increased Temperatures

Average temperatures in the Pioneer Valley have been increasing over time in the Pioneer Valley due to climate change, and this trend is likely to continue in the future. Higher temperatures due to climate change will likely have an effect on future drought risk in East Longmeadow. The climate of the Pioneer Valley is strongly influenced by the weather patterns of the larger Northeast United States, a region ranging from Pennsylvania to Maine. Average temperatures in the Northeast have been increasing since the late 1800s. The overall average annual temperature increase in this area has been approximately .9 degrees C (1.5°F) since approximately 1900.

According to records of the United States Historical Climatology Network, most of this temperature increase has occurred recently, with an average increase of about 0.2 degrees C (0.5°F) per decade since 1970. These higher average temperatures have primarily been the result of warmer winters (December through March), during which there has been an increase of 1.3°F per decade since 1970. In addition to average temperature increases, the number of extremely hot and record heat days has also increased: the number of days with temperatures of 90°F and higher throughout the Northeast has doubled during the past 45 years. The northern portion of the Northeast

currently sees about 5 days per year with temperatures over 90°F and no days over 100°F, while the southern portion sees up to 20 days over 90°F and 2 days over 100°F.



From 1831 to 2008, there was a trend in temperatures steadily increasing at the National Weather Service's Blue Hill Observatory, the home of the oldest continuously recorded weather records in the U.S. *Source: Michael J. Iacono, Atmospheric and Environmental Research, Inc./ Blue Hill Observatory, MA. Plot includes temperature data for 1831–1884 from Milton and Canton that were adjusted to the Blue Hill summit location.*

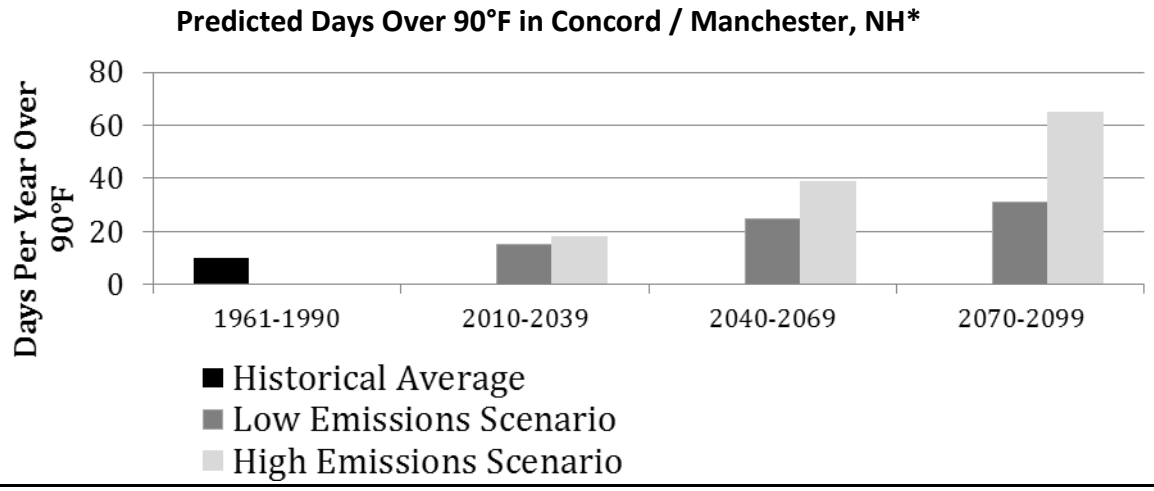
Increased temperatures will have the following projected impacts to people and property:

- Increased temperatures will put stress on current food production and require farming operations to adjust by planting new varieties of crops.

- Changes are also likely to introduce new insect species, pests, and invasive plant species to the region, which will result in further threats to food production and also adversely affect natural systems and biodiversity. Additional prominence of ticks may potentially also lead to more occurrence of Lyme disease.

- Increased energy usage in order to cool buildings in the summer and long-term electrical needs will increase.

- Greater stress on special populations, such as senior citizens, without access to air conditioning during heat waves.



(*used Concord because data projections were available)

Severe Weather

Temperature and precipitation changes in the region will lead to increased severe and extreme weather events, including:

- Slight decrease in summer precipitation that will result in an increase in the number of droughts. Short-term (1 to 3 month) droughts are likely to increase in their frequency in the Northeast to the level of once per year. According to the Connecticut Climate Adaptation Report, "Facing Our Future," the occurrence of drought in that state is already increasing, with shallower lakes drying up.[6]

- Decreased rainfalls will potentially create more occurrences of wildfires.

- Less dependable rainfall will also impact the Pioneer Valley's food systems, in the form of less dependable rainfall and require the region's farming operations to evolve.

- Increased occurrences of major snowstorms, especially during times previously considered unseasonably warm. Should storms occur when there are still leaves

[6] State of Connecticut Department of Environmental Protection. Facing Our Future: Adapting to Connecticut's Changing Climate. March 2009.

on trees, there could be great damage due to broken limbs, as happened during the snowstorm of 2011.

- Increased occurrences of severe thunderstorms and hurricanes, which will result in more wind damage from major storms and greater flooding.

Secondary Effects

- Disruption of communications services due to damage to cellular phone towers and other communications devices.

- Increased costs of home ownership due to higher flood insurance premiums, which will disproportionally affect low income residents.

- Higher difficulty in the ability of residents to obtain basic services that are heavily reliant on electricity after severe weather events, including gasoline and perishable food items.

Extreme Temperatures

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.

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

Wind (mph)	Temperature (°F)																	
Calm	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
45	26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98

Frostbite Times: 30 minutes, 10 minutes, 5 minutes

$$\text{Wind Chill (°F)} = 35.74 + 0.6215T - 35.75(V^{0.16}) + 0.4275T(V^{0.16})$$

Where, T= Air Temperature (°F) V= Wind Speed (mph)

Effective 11/01/01

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 F for 2 or more hours. The NWS issues an Excessive Heat Warning if the Heat Index is forecast to reach 105+ degrees F 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

Probability of Future Events

The probability of future extreme heat and extreme cold is considered to be "moderate," or between 10 and 40 percent in the next year.

Impact

The impact of extreme heat or cold in East Longmeadow is considered to be "limited," with no property damage and very limited effect on humans. However, because the community has a significant proportion of older adults, extreme temperatures are a concern for the local Hazard Mitigation committee.

Vulnerability

East Longmeadow's vulnerability from extreme heat and cold is considered to be, "4 - Low Risk."

Other Hazards

In addition to the hazards identified above, the Hazard Mitigation Committee 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.

Summary of possible effects of Natural Hazards on East Longmeadow

Flooding
A flood is the partial or complete inundation of normally dry land. The various types of flooding affecting East Longmeadow include riverine flooding and shallow flooding. 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 zoning ordinance, and subdivision regulations. Infrastructure like dams, pump stations and culverts are in place to manage the flow of water. Common impacts of flooding include damage to personal property, buildings, and infrastructure; bridge and road closures; service disruptions; and injuries or even fatalities.

Severe Snowstorms / 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 tools and strategies focus on preparedness, with many regulations and standards established based on safety during storm events and on assuring that branches, trees and debris will not come down in the event of heavy snow, causing power outages and/or damage to structures or people. 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.

Hurricanes / Severe Thunderstorms / Wind / Tornadoes
Hurricanes, severe thunderstorms, and tornadoes all generate high winds that can fell trees, down electrical wires, and generate hurtling debris. This common characteristic means that the same set of mitigation strategies applies equally to all four hazards. For example, current land development regulations, such as restrictions on the height of telecommunications towers, can help prevent wind damages from all four types of hazards. In addition to wind damage, hurricanes can generate significant flooding that damages buildings, infrastructure and threatens human lives. All of the existing mitigation measures listed in the Flooding section are also hurricane mitigation measures.

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.

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.

Dam Failures / Levee Breech
Dam or levee 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.

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.

4: CRITICAL FACILITIES

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 the community.
- Would create a secondary disaster if a hazard were to impact it.

Critical Facilities within Hazard Areas

The Critical Facilities List for the Town of East Longmeadow has been identified utilizing two sources, and the knowledge and expertise of the committee:

- East Longmeadow's Comprehensive Emergency Management Plan

- Critical infrastructure mapping undertaken by PVPC under contract with the Western Region Homeland Security Advisory Council, which is charged by the Executive Office of Public Safety and Security to administer and coordinate the State Homeland Security Grant for western Massachusetts.

East Longmeadow's Hazard Mitigation Committee has broken up this list of facilities into three categories:

- Facilities needed for Emergency Response in the event of a disaster.

- Non-Emergency Response Facilities that have been identified by the Committee as non-essential. These are not required in an emergency response event, but are considered essential for the everyday operation of East Longmeadow.

- Facilities/Populations that the Committee wishes to protect in the event of a disaster.

The Critical Facilities Map at the end of this Plan 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 (have back-up power)**
   Primary: East Longmeadow Fire Station – 150 Somers Rd.
   Secondary: Town Hall – 60 Center Square

2. **Fire Station**
   East Longmeadow Fire Department – 150 Somers Rd.

3. **Police Station**
   East Longmeadow Town Police Department – 160 Somers Rd.

4. **Highway Department**
   Town Hall -- 60 Center Square

5. **Water**
   Town Hall -- 60 Center Square

6. **Primary Evacuation Routes**
   Route 83
   Route 186
   Route 220

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 East Longmeadow.

1. **Water Supply**
   Pumping Station -- Chestnut Street & Harkness Ave
   Town Water Tanks -- Prospect Street

2. **Problem Culverts**
   2 problem culverts, one at Westwood at the old railroad crossing, and the second on Elm Street, that have been mapped on the Past and Potential Hazards/Critical Facilities Map (Appendix D).

Category 3 – Facilities/Populations to Protect

The third category contains people and facilities to protect in the event of a disaster.

1. **Special Needs Population/Elderly Housing/Assisted Living**
   Assisted Living Facilities: 50 Benton Drive-East Village Place; 741 Parker Street-Emeritus; 81 Quarry Street-McClarren House
   Elderly Housing (Private): 75 Pleasant Street-Brownstone I&II; 110 Somers Road-Brownstone III
   Elderly Housing (Public): 1-52 Inward Commons; 81 Quarry Hill; 1-40 Village Green
   Nursing Homes: 135 Benton Dr-Redstone Rehabilitation; 32 Chestnut Street-Wingate; 305 Maple Street-E.L. Skilled Nursing Center
   Independent Senior Living: 1 Apple Blossom Lane-Bluebird Estates
   Neighborhoods with language barriers -

2. **Public Buildings/Areas**
   60 Center Square-Town Hall/Library Complex

3. **Schools/Daycare** *(The EMD has a list of daycare facilities but they change very often and the Committee decided to not include the addresses in this plan)*
   77 Hampden Road-Mountainview School
   55 Hanward Hill-Birchland Middle School
   180 Maple Street-High School
   175 Mapleshade Avenue-Mapleshade School
   607 Parker Street-Meadowbrook School

4. **Churches**
   First Congregational Church, 7 Somers Rd
   First Baptist Church, 50 Parker St
   Greek Orthodox Church of St Luke, 400 Prospect St
   St. Mark's Episcopal Church, 1 Porter Rd
   St. Michael's Roman Catholic Church, 128 Maple St
   St. Paul Roman Catholic Church, 235 Dwight Rd
   St. Paul Evangelical Lutheran Church, 181 Elm St
   Grace & Glory Church, 93 Meadowbrook Rd
   Cornerstone Church, 15 Kibbe Rd
   East Longmeadow United Methodist Church, 215 Somers Rd
   New Life Baptists Church, 317 Westwood Ave

5. **Historic Buildings/Sites**
   East Longmeadow Historical Museum, 87 Maple Street

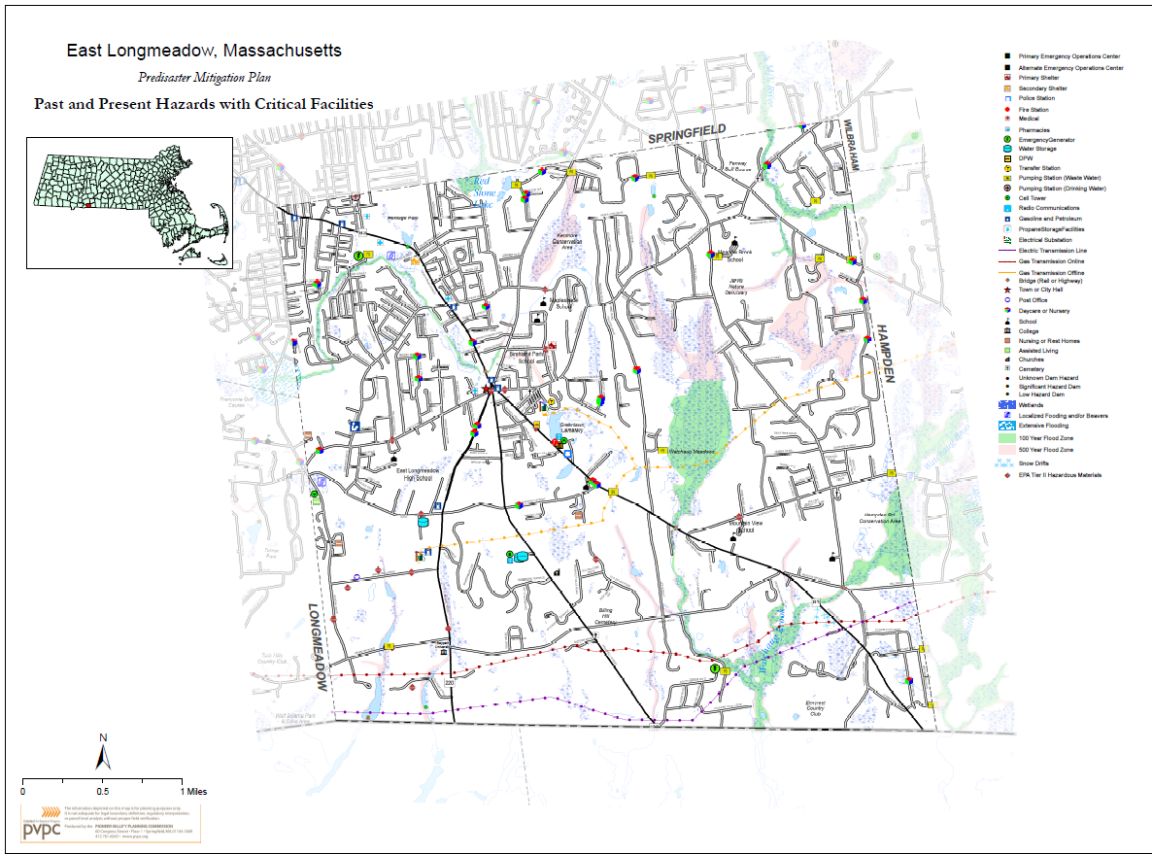
Quarryman Statue, Center Hill Park

6. Employment Centers

443 Shaker Rd-Hasbro/Milton Bradley
301 Chestnut Street-American Saw & Manufacturing
430 North Main Street-Heritage Mall
441 North Main Street-Big Y Supermarket/Ames Department Store Complex

There are no critical facilitates located along evacuation routes likely to be affected in the event of a natural disaster.

(Critical Facilities Map Located In Back of Plan)



5: MITIGATION CAPABILITIES/STRATEGIES

One of the steps of this Hazard Mitigation Plan was to evaluate all of the Town's existing policies and practices related to natural hazards and identify potential gaps in protection. The local Hazard Mitigation committee used the FEMA Capability Assessment worksheet to complete this assessment (included in Appendix and summarized here):

Capability Assessment Summary

The Town is making use of the vast majority of identified local means (plans, building code, land use regulations) to mitigate the consequences of natural hazards. The Town is not participating in any federal programs such as StormReady certification or Firewise communities certification, but does plan to research the utility of such programs as a result of this planning process.

After reviewing the community's existing plans, subdivision rules and regulations, land use zoning regulations, and adding to this research the knowledge of the municipal staff and community representatives serving on the local Hazard Mitigation committee, the Hazard Mitigation Committee developed a set of hazard mitigation strategies it will work to implement in the next five years. The committee also 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.

Existing Mitigation Actions/Strategies & Potential New Mitigation Ideas

The Town of East Longmeadow had some natural hazard mitigation capabilities/strategies/actions in place prior to the development of this Hazard Mitigation Plan in 2015. These strategies are explained in the following pages and have been evaluated in the "Effectiveness" column of the summary chart.

Existing Hazard Mitigation Measures/Evaluation Capability Assessment

Existing Action/Strategy	Description	Area/Hazard Covered	Effectiveness	Potential Changes New Mitigation Ideas
Subdivision Rules and Regulations Fire Department is involved in review of sub-division plans Definitive plans must include layout of water supply.	Adopted for the purpose of promoting public health and safety. These include design standards and definitive plan requirements. **Subdivision Review**: The procedures for the submission of preliminary and definitive subdivision plans require that the Fire Department be an active participant in the review of proposed subdivision plans. This involves verifying that proficient water supplies exist and that access routes to and from a given subdivision adequately meet public safety needs.	Community/all hazards	Very effective	None.

Existing Action/Strategy	Description	Area/Hazard Covered	Effectiveness	Potential Changes New Mitigation Ideas
Participation in the National Flood Insurance Program	As reported to PVPC in January 2016 by DCR staff, there were 16 homeowners with flood insurance policies through the NFIP; 6 claims have been made for a total of $30,134.	Areas identified by the FEMA maps/Flooding and flooding related to other hazards- severe thunderstorms, hurricanes	effective	The Town should consider becoming a part of FEMA's Community Rating System and continue to work with MEMA regarding flood mitigation requirements. Educate citizens living in the floodplain about the NFIP.

Existing Action/Strategy	Description	Area/Hazard Covered	Effectiveness	Potential Changes New Mitigation Ideas
Culvert Management/Replacement	The Town has a list of problem culverts and works steadily to secure funding and use available funds as needed, to replace top priorities on culvert replacement list. The DPW has identified 2 problem culverts to be addressed as priorities in this Plan's Action Strategy	Most of community/Flooding and flooding related to other hazards- severe thunderstorms, hurricanes	Somewhat effective, but the Town has identified a need for external financial support to assist with culvert replacement as a Mitigation Action, given the new extremes of weather and under-sized culverts.	Town has identified a need for external financial support to assist with culvert replacement as a Mitigation Action, given the new extremes of weather and under-sized culverts. The Town would like to undertake a GIS based mapping/inventory of culverts because as of the updated 2014 MA Wetlands Protection Act, municipalities are no longer allowed to replace culverts in-kind.

Existing Action/Strategy	Description	Area/Hazard Covered	Effectiveness	Potential Changes New Mitigation Ideas
Zoning Ordinance: The Floodplain ordinance has been updated per NFIP requirements. Floodplain District, section 4.1 of Town Zoning by-law available at: http://www.eastlongmeadowma.gov/do Includes-- Requiring an elevation certificate when building a new house if in the floodplain Zoning also sets grade limits on driveways that are included in Section Gradients, which, although not specified as weather hazard mitigation, can serve to minimize accident potential and power loss from severe winter storms. Zoning also requires that any dwelling be on permanent foundations which assists with Hurricane/Tornado/Severe wind mitigation. Mobile homes are an allowed use by special permit only.	Town has a Floodplain District that restricts development within the floodplains. The District includes all special flood hazard areas within the Town of East Longmeadow designated as Zone A or AE on the Hampden County Flood Insurance Rate Map (FIRM) issued by the Federal Emergency Management Agency (FEMA) for the administration of the National Flood Insurance Program. The map panels of the Hampden County FIRM that are wholly or partially within the Town of East Longmeadow are panel numbers 25013C0408E, 25013C0409E, 25013C0416E, 25013C0417E, 25013C0430E and 25013C0440E dated July 16, 2013. The exact boundaries of the District may be defined by the 100-year base flood elevations shown on the FIRM and further defined by the Hampden County Flood Insurance Study (FIS) report dated July 16, 2013. Between May 20, 2013 and July 16, 2013, the September 15, 1978 maps are to be used, after that date, the July 16, 2013 version shall apply (if completed). The FIRM and FIS report are incorporated herein by reference and are on file with the Town Clerk, Planning Board and Building Inspector	Community/All Hazards Flood plain district in particular-includes all special flood hazard areas within the Town of East Longmeadow designated as Zone A or AE on the Hampden County Flood Insurance Rate Map (FIRM)	Very effective	no

Existing Action/Strategy	Description	Area/Hazard Covered	Effectiveness	Potential Changes New Mitigation Ideas
Earth Removal Evaluations (Land Use Regulation/Zoning)	Town requires special permit for earth removal.	Community	Very effective	None
Stormwater Retention/Detention Requirements (Land Use Reg)	The Town adheres to state stormwater management guidelines which mitigate flooding	Community	Very Effective	Add stormwater retention/detention requirements to design standards in Subdivision Regulations.
Maintenance of detention basins in homeowner associations is required in management plans.	The Town requires each new development to create a home owners' association to manage stormwater	Community	Very effective	None
Small stormwater pump station at Center Pond	This was installed 7 years ago to reduce localized flooding and is very effective	Center Pond area	Very effective	None

Existing Action/Strategy	Description	Area/Hazard Covered	Effectiveness	Potential Changes New Mitigation Ideas
Comprehensive Emergency Management Plan	The Comprehensive Emergency Management (CEM) Plan for East Longmeadow lists the following measures: • Identify areas in the community that are flood prone and define methods to minimize the risk. Review National Flood Insurance Maps. • Disseminate emergency public information and instructions concerning flood preparedness and safety. • Community leaders should ensure that East Longmeadow continues to be enrolled in the National Flood Insurance Program. • Strict adherence should be paid to land use and building codes, (e.g. Wetlands Protection Act), and new construction should not be built in flood-prone areas. • Ensure that flood control works are in good operating condition at all times. • Natural water storage areas should be preserved. • Maintain plans for managing all flood emergency response activities including addressing potentially hazardous dams.	community	very	Passing and Enforcing an ordinance that regulates dumping in streams and ditches Establishing a green infrastructure program to link, manage, and expand existing parks, preserves, greenways, etc. Requiring a drainage study with new development

Existing Action/Strategy	Description	Area/Hazard Covered	Effectiveness	Potential Changes New Mitigation Ideas
Building code	The Town adheres to the State Building code which is updated every 3 years per International standards. For new or recently built structures, the primary protection against snow-related damage is construction according to the State Building Code, which addresses designing buildings to withstand snow loads. East Longmeadow has a part-time professional building inspector on staff. State and local building inspectors are guided by regulations put forth in the Massachusetts State Building Code. The first edition of the Massachusetts State Building Code went into effect on January 1, 1975 and included specific earthquake resistant design standards. These seismic requirements for new construction have been revised and updated over the years and are part of the current, 8th edition of the Massachusetts State Building Code. Given that most structures in Massachusetts were built before 1975, of many buildings and structures do not have specific earthquake resistant design features. In addition, built areas underlain by artificial fill, sandy or clay soils are particularly vulnerable to damage during an earthquake.	Community/All hazards	very	none
Back-up power	All shelters (EOC, COA and Birchland Middle School have back-up generators--2 trailer mounted also available and 3 portable.	Community/all hazards	very	Town wants to get 2 more back up generators for Senior Housing
Tree Management	Inventory of trees with branches near powerlines and regular tree trimming and maintenance in place with Town and National Grid Electric Company	Community/All Hazards	very	None

Existing Action/Strategy	Description	Area/Hazard Covered	Effectiveness	Potential Changes New Mitigation Ideas
Bury Utility lines	All new sub-divisions must bury their power lines.	New sub divisions/All Hazards	very	Seek funding and/or commitment from National Grid to bury power lines that need to be repaired repeatedly in the event of severe weather.
Snow removal requirements and restrictions	Property owners are required to clear sidewalks and driveways and are prohibited from shoveling snow into roadways	Community/Winter Storms	very	none
Burn Permits are required.	Town follows State DEP guidelines for burn permits. **Burn Permits***:* The Town of East Longmeadow does allow open burning under the guidelines of the Department of Environmental Protection. The Officer in Charge of the Fire Department will determine if burning will be allowed at the beginning of the shift and can suspend burning if weather conditions change.	Community/Fire	very	none
Fire Safety Public Education/Outreach:	The East Longmeadow Fire Department maintains a public outreach program that targets children and seniors with the intention of spreading information about fire safety within these two populations. Furthermore, the Town has a safety inspection program that works to ensure that fire safety standards are being met.	Community/Fire	Somewhat	None

Existing Action/Strategy	Description	Area/Hazard Covered	Effectiveness	Potential Changes New Mitigation Ideas
Permits Required for New Dam Construction	Massachusetts State Law (M.G.L. Chapter 253 Section 45) regulates the construction of new dams. A permit must be obtained from the Department of Conservation and Recreation (DCR) before construction can begin. One of the permit requirements is that all local approvals or permits must be obtained. All new dams must adhere to seismic requirements set forth in the 8th Edition of the Massachusetts State Building Code.	Flooding/Dam Safety/All Hazards related to flooding	Effective. Ensures dams are adequately designed.	None
Dam Inspections and Removal of Dams	The DCR requires that dams rated as Low Hazards are inspected every ten years and dams that are rated as Medium/Significant Hazards are inspected every five years. High Hazard dams must be inspected every two years.	Flooding/Dam Safety/All Hazards related to flooding	This is problematic because the responsibility for inspections is now on dam owners, who may not have sufficient funding to comply--however, in East Longmeadow, there are only 2 dams.	Considering raising issue with DCR

Existing Action/Strategy	Description	Area/Hazard Covered	Effectiveness	Potential Changes New Mitigation Ideas
The Town of East Longmeadow follows the state's Water Management Act. ,	The Act limits the amount of water consumption during a state-issued Water Emergency Declaration. For more information visit:www.mass.gov/eea/agencies/massdep/water/drinking/the-massachusetts-water-management-act-program.html.	Community/Drought	effective	None
DPW has authority to implement water use restrictions	As needed, although never implemented, the DPW can implement water use restrictions which could mitigate the effects of a drought.	Community/Drought	effective	None
Plant & maintain trees to reduce urban heat island effect	The Planning Board requires trees every 40 feet in new sub-divisions so the Town has applied that standard to public ways.	Community/Extreme Heat	somewhat	None
Council on Aging does wellness checks and assist vulnerable populations--focus on seniors	Ongoing outreach and education to Seniors about what to do in the event of extreme temperatures--cold and heat, as well as maintenance of an inventory of vulnerable elderly.	Community/Extreme Temperatures	effective	None
Integrating hazard mitigation into ongoing planning work	Now that East Longmeadow has developed its first local Hazard Mitigation plan, the Town is committed to integrating the information in this plan into other planning documents and planning processes.	Community/All Hazards	effective	Integrate the information in this plan into other planning documents and planning processes

Prioritized Implementation Plan

Several of the action items identified in the 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 Committee 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. Overall mitigation strategy priorities address all identified hazards through a combination of planning, public outreach, and infrastructure improvements.

Prioritization Methodology

The East Longmeadow Hazard Mitigation Planning Committee 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

Several hazard mitigation strategies identified in the previous Hazard Mitigation Plan have not yet been completed, but were changed in priority during the update of this plan by the Hazard Mitigation Committee. The Committee changed priorities by evaluating the entire list of mitigation strategies in a comprehensive manner according to the factors listed above. For strategies that have changed in priority, the previous priority is provided in parenthesis in the "Priority" column.

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.

Mitigation Strategies to be Implemented								
Mitigation Action	**Status**	**Action Type**	**Hazards Mitigated**	**Responsible Department/Board**	**Timeframe**	**Potential Funding Source(s)**	**Estimated Cost**	**Priority**
Culvert replacement	The town has a program in place to maintain culverts; however, 2 culverts have been identified as under-sized and in needed of replacement to mitigate the effects of anticipated increasingly unpredictable and severe weather events	Physical infrastructure	Flooding and all flooding related hazards--Severe thunderstorms tornadoes, hurricanes	DPW is lead	18 months for date of securing funding	HMGP with local match	Medium-High	high
Snow fence to prevent drifting onto roadways. This is an issue on Somers Rd (Rte 83) as identified on map	New initiative	Limited Physical infrastructure, although very lightweight and easy to remove if necessary	Snow, sever winter storms	DPW is lead	3 months to implement	Local funds	Low	low
Redundant connections for portable generators	New-the Town has been successful in placing back-up generators at all shelters, and has portable generators but needs the redundant connections to make use of the portable generators at all locations	Limited physical infrastructure	All hazards at it facilitates not losing power which can be caused by all hazards (except drought)	DPW is lead	3 months from start date, anticipated to be Jan 2017	Local funds	Low	Low
Identify and inventory all culverts to make a plan to update them to 2014 wetland protection regulations because replacement in-kind is no longer allowed.	new	Physical infrastructure	Flooding and all flooding related hazards--Severe thunderstorms tornadoes, hurricanes	DPW is lead	Multi-year effort over time, unless external funding if identified and secured	Local funds	Medium	low

Mitigation Strategies to be Implemented								
Mitigation Action	**Status**	**Action Type**	**Hazards Mitigated**	**Responsible Department/Board**	**Timeframe**	**Potential Funding Source(s)**	**Estimated Cost**	**Priority**
Address conflict between Conservation Commission and DPW because CC tells DPW they are not allowed to remove debris from waterways after storms and if debris is not removed, flooding is a risk.	new	policy	Flooding and all flooding related hazards--Severe thunderstorms tornadoes, hurricanes	DPW and Con Com, may require additional facilitation	1 year	Local funds	low	High
Install emergency generators to mitigate effects of a possible power outage at Senior Housing complex and for all municipal schools	new	Structure & Infrastructure	All Hazards	EMD, Sr Housing Director and School Dept Facilities person and Superintendent	5 years	HMGP with local match	low	High
Extreme Cold Weather education	new	Education & Outreach	Severe snow/ice storms	Sr Housing and COA with Fire Dept	2 years	COA	low	Medium
Monitor drought conditions--can provide early warning for policymakers and planners to make decisions through actions including: identifying local drought indicators, such as precipitation, temperature, surface water levels, soil moisture, etc and lead to establishing a regular schedule to monitor and report conditions	new	Local planning regulation	Drought	DPW	ongoing	local	low	low

Mitigation Strategies to be Implemented								
Mitigation Action	**Status**	**Action Type**	**Hazards Mitigated**	**Responsible Department/Board**	**Timeframe**	**Potential Funding Source(s)**	**Estimated Cost**	**Priority**
Research whether or not to join CRS	new	Programmatic	All hazards	DPW with EMD and Planning and Town Manager	1 year	local	low	low
Monitor the implementation of this local hazard mitigation plan to ensure that mitigation actions are being completed	new	Planning/management	All Hazards	EMD with committee	1 year and annually thereafter	local	low	High

6: PLAN REVIEW, EVALUATION, IMPLEMENTATION, AND ADOPTION

Plan Adoption

Upon completion of the draft Hazard Mitigation Plan, a public meeting was held on January 25, 2016 to receive comments. 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 East Longmeadow Board of Selectmen and adopted.

Plan Implementation

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

Incorporation with Other Planning Documents

Existing plans, studies, reports and municipal documents were incorporated throughout the planning process. This included a review and incorporation of significant information from the following key documents:

- ***East Longmeadow Zoning Ordinance*** - The Town's Zoning was used to gather identify those actions that the Town is already taking that are reducing the potential impacts of a natural hazard (i.e. floodplain regulations) to avoid duplicating existing successful efforts.

- ***Massachusetts' State Hazard Mitigation Plan*** - This plan was used to insure that the Town's HMP was consistent with the State's Plan.

During regular update meetings for the Hazard Mitigation Plan, the Hazard Mitigation Committee will review whether any of these plans are in the process of being updated. If so, the Hazard Mitigation Committee will provide copies of the Hazard Mitigation Plan to relevant Town staff and brief them on the content of the Hazard Mitigation Plan. The Hazard Mitigation Committee will also review current Town programs and policies to ensure that they are consistent with the mitigation strategies described in this plan.

Plan Monitoring and Evaluation

The measure of success of the East Longmeadow Hazard Mitigation Plan will be the number of identified mitigation strategies implemented. In order for the Town to become more disaster resilient, there must be a coordinated effort between elected officials, appointed bodies, Town employees, regional and state agencies involved in disaster mitigation, and the general public.

The East Longmeadow Hazard Mitigation Committee will meet on an annual basis or as needed (i.e., following a natural disaster) to monitor the progress of implementation, evaluate the success or failure of implemented recommendations, and brainstorm for strategies to remove obstacles to implementation. 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 plan every year, beginning in the Spring of 2017. The meetings of the committee will be organized and facilitated by the Emergency Management Director. Public participation will be a critical component of the Hazard Mitigation Plan maintenance process. The Hazard Mitigation Committee will hold all meetings in accordance with Massachusetts open meeting laws. Hard copies of the plan will be available in East Longmeadow Town Hall and on the Town's website. The Hazard Mitigation Committee will meet annually to discuss any needs and amendments. Any proposed amendments will be advertised and posted on the Town’s website. Any changes will be proceeded by a public hearing and solicitation of public comments.

7: APPENDICES

Appendix A – Documentation of the Planning Process

East Longmeadow Hazard Mitigation Committee
Meeting Agenda
Town Hall
October 5, 2015 1:00 pm

1. Introductions
2. Overview of Hazard Mitigation Planning Process
    a. Background on Hazard Mitigation Planning
    b. Planning process and requirements
        i. 3-5 committee meetings
        ii. 2 public meetings
        iii. SelectBoard approval/adoption
        iv. Public outreach
    c. Overview of draft East Longmeadow Hazard Mitigation Plan
3. Identification/Review of Critical Facilities
4. Discussion of Hazard Identification and Risk Assessment
5. Introduction to Documentation and Assessment of Existing Mitigation Strategies
6. Next Steps
    a. Proposed meeting schedule
    b. Next committee meeting agenda, time, date, and location
    c. First public meeting agenda, time, date, and location

East Longmeadow Hazard Mitigation Committee
Meeting Agenda
Town Hall
November 2 2015 1:00 pm

1. Assure Readiness for first public meeting
2. Edits to plan based on discussion from previous meeting
3. Review of Chapter 3: Hazard Identification and Analysis
4. Review of Chapter 4: Critical Infrastructure and map
5. Begin work on of Chapter 5: Mitigation Strategies--Generate list of existing mitigation strategies and start assessment, time permitting

East Longmeadow Hazard Mitigation Committee
Meeting Agenda #3
Town Hall
December 4 2015 1:00 pm

1. Continue work on Prioritized list of Mitigation Strategies, including finalizing list of existing mitigation measures
2. Proposed Mitigation Strategies
    a. Costs
    b. Prioritization
    c. Responsible entities
    d. Funding sources
3. Plan Review, Evaluation, Implementation, and Adoption/Approval process

East Longmeadow Hazard Mitigation Committee
Meeting Agenda #4 Jan 11, 2016

1. Plan for Public Meeting #2
2. Engage committee members in outreach and publicity
3. Complete work on Proposed Mitigation Strategies
    a. Costs
    b. Prioritization
    c. Responsible entities
    d. Funding sources
4. Plan Review, Evaluation, Implementation, and Adoption/Approval process

East Longmeadow Hazard Mitigation Committee
Meeting Agenda
Town Hall
_____, 2016 _:00 pm

1. Review Final plan and Prioritized list of Mitigation Strategies
2. Discuss and affirm understanding of Plan Adoption/Approval process and timeline

In addition to the above documentation of the East Longmeadow Hazard Mitigation Committee's work, we have also documented the public outreach that was part of this planning process below.

Two media releases of the planning process, inviting residents, businesses, surrounding communities and all interested parties to attend two public meetings describing the planning process and presenting the DRAFT plan were mailed to the following list of media outlets. The audience for these announcements covers all the surrounding communities and reaches businesses, and other key stakeholders.

Town of East Longmeadow Schedules Public Engagement Event for Hazard Mitigation Plan

09 Nov 2015

East Longmeadow residents are invited to provide comments on the development of the Town of East Longmeadow's Hazard Mitigation Plan on Monday, November 16 at 6:00 p.m. at the East Longmeadow Fire Department, 150 Somers Road. All members of the public are welcome to attend the event. Local businesses, residents of neighboring communities, and municipal officials of neighboring communities are also encouraged to attend and provide their feedback.

The meeting will include an introduction to the Hazard Mitigation planning process, a summary of existing mitigation initiatives, and an overview of past hazards in the Town. Municipal officials and PVPC staff will be available to answer questions and listen to comments.

The plan is being produced by the Town with assistance from the Pioneer Valley Planning Commission and is funded by the Federal Emergency Management Agency (FEMA) and the Massachusetts Emergency Management Agency (MEMA). This planning effort is being undertaken to help the Town of East Longmeadow assess the risks faced from natural hazards, identify action steps that can be taken to prevent damage to property and loss of life, and prioritize funding for mitigation efforts. A mitigation action is any action taken to reduce or eliminate the long-term risk to human life and property from hazards.

For more information, please contact PVPC's Catherine Ratté at cratte@pvpc.org or (413) 781-6045.

Media Organizations Sent Press Releases

Media Organization	Address	Town	State	Zip Code
African American Point of View	688 Boston Road	Springfield	MA	01119
Agawam Advertiser News	23 Southwick Street	Feeding Hills	MA	01030
Amherst Bulletin	115 Conz Street	East Longmeadow	MA	01060
Belchertown Sentinel	1 Main Street	Belchertown	MA	01007
Berkshire Eagle	75 South Church Street	Pittsfield	MA	01202
Brattleboro Reformer	62 Black Mountain Rd.	Brattleboro	VT	05301
CBS 3 Springfield	One Monarch Place	Springfield	MA	01144
Chicopee Register	380 Union Street	West Springfield	MA	01089
CommonWealth Magazine	18 Tremont Street	Boston	MA	02108
Country Journal	5 Main Street	Huntington	MA	01050
Daily Hampshire Gazette	115 Conz Street	East Longmeadow	MA	01060
El Sol Latino	P.O. Box 572	Amherst	MA	01004
Going Green	PO Box 1367	Greenfield	MA	01302
Hilltown Families	P.O. Box 98	West Chesterfield	MA	01084
Holyoke Sun	138 College Street	South Hadley	MA	01075
Journal Register	24 Water Street	Palmer	MA	01069
La Voz Hispana	133 Maple Street #201	Springfield	MA	01105
Ludlow Register	24 Water Street	Palmer	MA	01069
Massachusetts Municipal Association	One Winthrop Street	Boston	MA	02110
Quaboag Current	80 Main Street	Ware	MA	01082
Recorder	14 Hope Street	Greenfield	MA	01302
Reminder	280 N. Main Street	East Longmeadow	MA	01028
Southwick Suffield News	23 Southwick Street	Feeding Hills	MA	01030
State House News Service	State House	Boston	MA	02133
Tantasqua Town Common	80 Main Street	Ware	MA	01082
The Longmeadow News	62 School Street	Westfield	MA	01085
The Republican	1860 Main Street	Springfield	MA	01102
The Westfield News	62 School Street	Westfield	MA	01085
Town Reminder	138 College Street	South Hadley	MA	01075
Urban Compass	83 Girard Avenue	Hartford	CT	06105
Valley Advocate	115 Conz Street	East Longmeadow	MA	01061
Vocero Hispano	335 Chandler Street	Worcester	MA	01602
WAMC Northeast Public Radio	1215 Wilbraham Road	Springfield	MA	01119

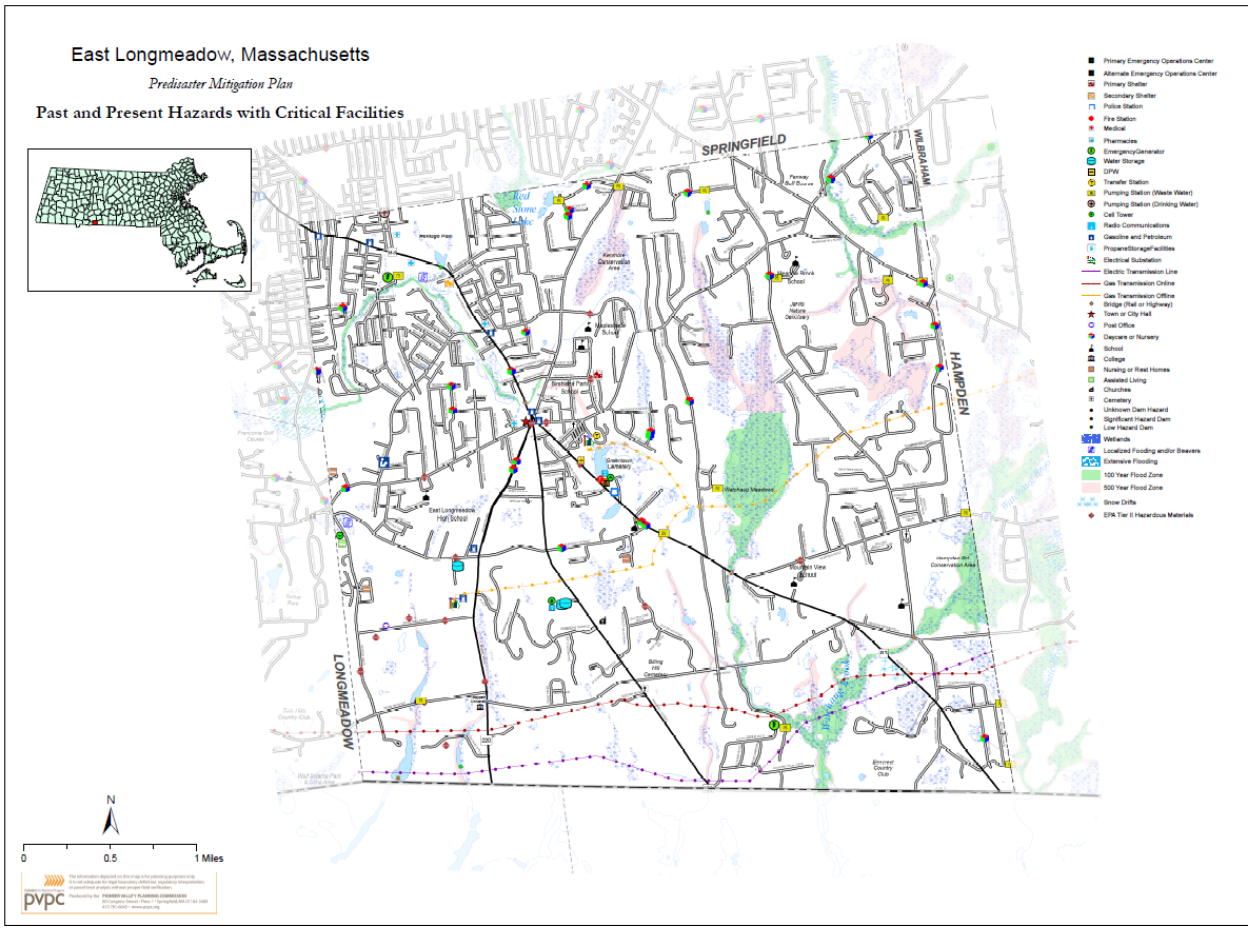
Ware River News	80 Main Street	Ware	MA	01082
West Springfield Record	P.O. Box 357	West Springfield	MA	01098
WFCR-Public Radio	131 County Circle	Amherst	MA	01003
WGBY-Public TV	44 Hampden Street	Springfield	MA	01103
WGGB ABC40/FOX 6 News	1300 Liberty Street	Springfield	MA	01104
WHMP-FM	15 Hampton Avenue	East Longmeadow	MA	01060
Wilbraham-Hampden Times	2341 Boston Road	Wilbraham	MA	01095
Worcester Telegram & Gazette	20 Franklin Street	Worcester	MA	01615
WRNX/WHYN/WPKR Radio	1331 Main Street	Springfield	MA	01103
WWLP-TV 22	PO Box 2210	Springfield	MA	01102

Capability Assessment Worksheet

Appendix B – 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 C – Past and Potential Hazards / Critical Facilities Map



CERTIFICATE OF ADOPTION

TOWN OF EAST LONGMEADOW, MASSACHUSETTS

BOARD OF SELECTMEN

A RESOLUTION ADOPTING THE EAST LONGMEADOW

HAZARD MITIGATION PLAN

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

WHEREAS, several public planning meetings were held between _____ and _____ regarding the development and review of the East Longmeadow Hazard Mitigation Plan; and

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

WHEREAS, a duly-noticed public hearing was held by the East Longmeadow Board of Selectmen on _____ to formally approve and adopt the East Longmeadow Hazard Mitigation Plan.

NOW, THEREFORE BE IT RESOLVED that the East Longmeadow Board of Selectmen adopts the East Longmeadow Hazard Mitigation Plan.

ADOPTED AND SIGNED this _____

_____

Board of Selectmen