THE TOWN OF HATFIELD

LOCAL NATURAL HAZARDS MITIGATION PLAN

Adopted by the Hatfield Board of Selectmen on _____

Prepared by:
The Hatfield Natural Hazards Mitigation Planning Committee

and

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1 - INTRODUCTION

Hazard Mitigation

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 Hatfield 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. For example, the Hazard Mitigation Grant Program (HMGP), the Flood Mitigation Assistance Program (FMA), and the Pre-Disaster Mitigation Program are programs with this requirement.

Planning Process

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

- Identifying the natural hazards that may impact the community.
- Conducting a Vulnerability/Risk Assessment to identify the infrastructure (i.e., critical facilities, public buildings, roads, homes, businesses, etc.) at the highest risk for being damaged by the identified natural hazards, particularly flooding.
- Identifying and assessing the policies, programs, and regulations a community is currently implementing to protect against future disaster damages. Examples of such strategies include:
    - Preventing or limiting development in natural hazard areas like floodplains;
    - Implementing recommendations in existing planning documents including Stormwater Management Plans, Master Plans, Open Space and Recreation Plans, and Emergency/Evacuation Plans that address the impacts of natural hazards; and
    - Requiring or encouraging the use of specific structural requirements for new buildings such as buried utilities, flood-proofed structures, and lightening grounding systems.
- Identifying deficiencies in the current strategies and establish goals for updating, revising or adopting new strategies.
- Adopting and implementing the final Local Natural Hazards Mitigation Plan.

During the planning process, the Town's Local Natural Hazard Planning Committee identified Action Plan items and specific time frames. The actions were selected from a list of local strategies which were compiled during several brainstorming sessions (see Regional Natural Hazard Mitigation Plan Risk Assessment Matrix – Section 3: Risk Assessment) and others identified by the Town during their review of existing programs, policies, and regulations. From this list, specific Action Items were prioritized by the Town's Local Natural Hazards Planning Committee based on the following criteria:

- Select Action Items which have the ability to significantly mitigate the negative impact of natural hazards on people and property;
- Select Action items which the Town has the ability to implement given the financial and staff resources available;
- Select Action Items which will have the greatest influence on achieving Local Goals & Objectives;
- Select a diverse set of Action Items which will address different Natural Hazards that present a high or moderate risk to the region; and
- Select Action items which will address those mitigation measures identified as deficient or in need of attention to ensure that the Town is in the best possible position to address natural hazards which impact property and residents.

For example, updating or adopting a local floodplain bylaw would be a relatively low cost action item, which could have a significant impact on mitigating hazards caused by flooding. If adopted by the Town, this bylaw would discourage development in floodplain areas and prevent harm to people and damage to property. Another action item was to review and maintain shelters for victims of natural hazards within the Town and to conduct outreach to residents so that they are aware of the availability of those shelters.

First, however, the Town must identify what services are available at the different shelters (e.g. food preparation, potable water, back-up electrical power, heat, showers, etc.) and whether the location of different shelters will be impacted by different hazards (i.e. whether flooding will make the shelter inaccessible to some residents). This action item, review and maintain shelters, also addressed a number of different natural hazards and would help ensure that suitable shelters are available for different types of natural hazards. The action items selected were all considered to have a low to moderate cost to implement. In some cases grant funding would be sought for implementation given the limited resources available in the Town.

The local action items represent a multi-faceted approach to addressing natural hazards in the Town and will be undertaken as resources become available and will be integrated into ongoing planning activities. As part of the review and adoption process, the Committee approved the action items that were in keeping with the goals and criteria established by the Town and assigned appropriate bodies within the Town to implement them within a five-year framework.

Public Committee Meetings

October 3, 2006 4:00 - 5:30 p.m.: Public informational and organizational meeting, held at Hatfield Town Hall.
November 14, 2006 4:00 – 5:30 p.m.: Working committee meeting held at Hatfield Town Hall.
December 12, 2006 4:00 - 5:30 p.m.: Working committee meeting held at Hatfield Town Hall.
February 6, 2007, 4:00 - 5:30 p.m.: Working committee meeting held at Hatfield Town Hall.
March 23, 2007, 4:00 - 5:30 p.m.: Working committee meeting held at Hatfield Town Hall.
May 7, 2007, 4:00 - 5:30 p.m.: Working committee and draft plan review meeting held at Hatfield Town Hall.

Public Meetings with the Board of Selectmen

[DATES HERE]

During the above dates the Selectmen held a public meeting on Hatfield's Hazard Mitigation Plan, which was adopted on [DATE HERE].

Public Involvement in the Planning Process

On September 13, 2007 the Pioneer Valley Planning Commission sent a press release to all area media outlets to inform the general public that drafts of the region's Hazard Mitigation plans were complete and available for public comment and review on the Commission's website (www.pvpc.org). This press release (Appendix D) resulted in a series of news articles (Appendix D) that further enhanced awareness of the Hazard Mitigation Planning Process. This action was undertaken to fulfill the requirement that a Hazard Mitigation Plan be developed in a format that is open to the public for comments.

Involving neighboring Jurisdictions

In the initial stages of the planning process for this mitigation plan, the Pioneer Valley Planning Commission conducted a series of outreach efforts to make the public aware of the regional mitigation process. In October of 2005, the Planning Commission notified all Select Boards and Chief Elected Officials that their community could participate in the region's mitigation planning process. Again, on April 4, 2006, the Planning Commission mailed a notice of planning activities to all Chief Elected

Officials and Select Board in the Pioneer Valley. Both mailings explained the purpose of mitigation planning and invited communities to participate in either Round I or Round II of the region's mitigation planning process.

On November 20th, 2007 the Pioneer Valley Planning Commission Presented the planning process that led to the creation of the *Hatfield Local Natural Hazards Mitigation Plan*. The Western Regional Homeland Security Council is the planning entity responsible for orchestrating the homeland security planning activities of Berkshire, Franklin, Hampden and Hampshire Counties. Collectively, this body is responsible for 101 communities.

Additionally, the Hampshire Regional Emergency Planning Committee was presented with the findings of this plan during its November15, 2007 meeting. Prior to this briefing, the HREPC was provided with updates of the Hazard Mitigation Planning Process on April 20, 2007 and again on December 21, 2006.

Managing and Updating the Plan

The Hatfield Local Emergency Planning Committee will manage this plan, update the plan's action steps, update the plan every five years and support funding applications for implementing the plan's action steps.

2 – LOCAL PROFILE[1]

Community Setting

The Town of Hatfield is an historic agricultural river town on the west bank of the Connecticut River. Large land grants were made to Governor Bradstreet and Major General Dennison in 1659, and the town's early Colonial settlement in 1660 was compatible with Indian life. The Nonatucks reserved their right to erect wigwams on the common, plant, hunt and fish. In 1662, Thomas Meekins operated a grist mill on the Mill River and in 1669 he added a sawmill. This single area in the town remained an industrial
locus for over 200 years.

The first linseed oil mill was patented and established in 1737, and cider mills were opened. Residents raised sheep and cattle and the town was described as a "prosperous town on a strong agricultural base." Hatfield became one of the primary suppliers of beef and of soldiers to the Continental Army. In 1776, 127 men of a population of 582 were serving in the army. In 1786 the town was the site of a 50-community meeting of the rebels involved in Shay's rebellion, who were angered by the hardships and foreclosures brought on by a cash-poor economy. When they weren't fighting or rebelling, residents of Hatfield grew corn and made brooms, which became a major industry in the town. Irish, German and French Canadian immigrants, drawn to work in building the railroads in the state, finished the track and set up as farmers in Hatfield, as did later arrivals from Poland, Austria and Czechoslovakia. These newcomers created the largest immigrant population in the county at 39.6%. The farmers raised wheat and by 1905 were the leading tobacco and onion producers in the state. There are still over 120 tobacco barns in Hatfield.

Benefactors in the town shared their prosperity with their neighbors. Sophia Smith, an heiress to one of the largest fortunes in Hatfield, used her money to create Smith College, while Caleb Cooley Dickinson founded Dickinson Hospital in Northampton.

Main Street in Hatfield retains a remarkable historic character, with a dense concentration of well preserved 18th and 19th century family homes.

[1] This information was taken from the Department of Housing and Community Development's narrative profile of Hatfield, which is available at http://www.mass.gov/dhcd/iprofile/127.pdf.

According to the 1999 MacConnell Land use data, the total land area of Hatfield is approximately 10,771 acres with roughly 15 percent of those acres as developed land. The remaining land is classified as undeveloped with forest as the largest category (44% of all land in town) with 4,739 acres. Cropland is the second largest category of undeveloped land with 3,339 acres compared to Water and Wetlands, which represent individually, the third and fourth largest amount of undeveloped land in the town with 486 and 204 acres, respectively. Because the Connecticut River is such a prominent feature in town, it should be noted that Hatfield's maximum elevation (MassGIS) is 840 feet.

Infrastructure

Hatfield's geography has been a major factor in the development of its infrastructure. The broad, alluvial plains of the Connecticut River attracted farms and farmer, and settlement patterns grew around the fertile soils. In recent years, Interstate 91 cannot be ignored, as it serves a major conduit for goods and people and has two exits within Hatfield's borders. This has spurred industrial, commercial and residential growth. The town has water and sewer utilities, and the boundaries and capacities of these crucial services will shape and direct growth in the future.

Roads and Highways

The major artery running through town is Interstate 91, which connects Hatfield with Northampton and Springfield to the south and with towns to the north including Greenfield, Northfield and finally communities in Vermont such as Brattleboro. Hatfield residents can travel both north and south via Route 5 & 10. Because of the river, there is not an east-to-west route available within Hatfield, but residents can travel to Route 9 to access Hadley, Amherst and points east as well as points west.

Rail

Pan Am Railways operates the freight line that runs north-south through Hatfield along the old Guilford train corridor.

Public Transportation

The Franklin Regional Transit Authority (FRTA) provides limited bus service along routes 5/10 four times a day. This service is designed to serve

employees of C&S Wholesale grocers. The town is not a member of the Pioneer Valley Transit Authority (PVTA).

Public Drinking Water Supply

The Town of Hatfield has a water distribution system with about 37 miles of water mains ranging from 2" to 16" in diameter. Town water sources include two wells, West Hatfield and the Omasta Well, and the Hatfield Reservoir located in West Hatfield. The City of Northampton has a reservoir located partially within the western portion Hatfield, but this source supplies Hatfield residents with no drinking water. Water distribution sources are located throughout Hatfield.

Sewer Service

Approximately one-third of Hatfield is tied into the town's sewer system. Sanitary sewer service is provided to homes and businesses only on Elm Street, Main Street, North Street, the Pleasant View Drive, Primrose Pole Subdivision, School Street, and portions of Prospect Street, Bridge Street, Grove Street, King Street, Plantation Road, Elm Court, Old Farms Road, Maynard Avenue Dwight Street, Church Street, North Hatfield Road and West Street.

Schools

Hatfield has an elementary school, Hatfield Elementary, and a High School, Smith Academy.

Natural Resources

People who live in Hatfield talk about the community's "rural character." This term encompasses agricultural lands, natural resources, open space and recreational properties and historic buildings. One cannot underestimate the strong role Hatfield's farming heritage plays in the town's rural character. According to *National Geographic*, Hatfield has the seventh best agricultural land in the world. The community strongly identifies with its agricultural heritage.

The second and third components involved in preserving Hatfield's rural character are natural resources and open space. Adopting zoning regulations to safeguard floodplains, rivers, wetlands, watersheds and wildlife habitats will not only sustain Hatfield's ecological richness but will

also reduce the long-term risks associated with flooding and damage to the town's water supply.

Forested areas are greatest in the section of town west of Interstate 91, with high elevations reaching in the Horse and Chestnut Mountains and along the rocky ledges of The Rocks. In this densely wooded terrain, outcroppings of bedrock alternated with pockets of wetlands, most of which flow into Running Gutter Brook, the primary stream draining Hatfield's western hills. East of the Interstate are the fertile Connecticut Valley lowlands, where the terrain hardly has any slope and the town is only 110 feet above sea level.

Water Resources

Hatfield's public water supply comes from three sources: the town reservoir (capacity of 500,000 gallons per day); the West Hatfield Well (capacity of 350,000 gallons per day); and the Omasta Well (capacity of 150,000 gallons per day). Water supplies are drawn primarily from the reservoir as the per gallon cost to operate the wells is higher than that of the reservoir, even taking into consideration the treatment requirements for the town's surface water supply.

Rivers and Streams

Hatfield is a town whose land is heavily influenced by watercourses. There are approximately 35 miles of stream and river channel within the town boundaries. About 7.5 miles of the Connecticut River forms the eastern and part of the southern boundaries. The two primary streams in Hatfield and their tributaries form most of the remainder of Hatfield's stream channels. Three major watersheds drain the town's 10,771 acres. Running Gutter Brook in West Hatfield drains one of the town's major watersheds. The Hatfield Reservoir is within this watershed region. Two other minor watersheds in West Hatfield drain into Northampton. IN one of these watersheds is Mountain Reservoir, a 25 acre water body, only about 1/3rd of which is actually in Hatfield.

The second major watershed drains through the Mill River, a primary tributary of the Connecticut River with its headwaters in the Town of Conway. This mature river is joined by flow from Running Gutter Brook. The dam at Prospect Street, the site of former industry, causes the water course to run deep upstream of the dam with wide meanders and broad marshes which are important wildlife habitats.

The third major watershed is within the north-east corner of Hatfield. The remnant of an old Connecticut River meander remains in this portion of Hatfield and receives the drainage from this watershed before eventually draining to the Connecticut River. This area was originally an oxbow lake which, over the years, has aged due to sedimentation and eutrophication, and the oxbow is now a series of ponds and marshes. It remains a significant wildlife habitat and storage area for the Connecticut River when it floods.

Wetlands

Combined, there are more than 3,000 acres of wetland, floodplain and open water (most of which is the Connecticut River) in Hatfield, which accounts for about 30% of the town's total area. These wetlands include the open water of streams and ponds, shrub swamps, forested swamps, wet meadows, bogs, marshes, and land within the flood water elevation of the 100-year storm, not all of which is currently considered true vegetated wetland under the Massachusetts Wetlands Protection Act, Chapter 131, Section 40 of the General Laws of the Commonwealth.

Most of the wetlands are in the eastern and northern sections of Hatfield in areas that border the Connecticut River, the Mill River, and the old oxbow meander in the northeast section of Hatfield. The wetlands in West Hatfield are primarily narrow wetlands bordering Running Gutter Brook and its tributaries. However, several small isolated wetlands exist in this area as well which also help to provide important wetland wildlife habitat.

The limits of the 100-year storm flood zone are primarily located within the eastern and northern portions of Hatfield along the Connecticut River and Mill River, and coincident with the majority of Hatfield's wetlands. However, some of the 100-year flood zone exists along Running Gutter Brook in West Hatfield. Under current law, development is sharply curtailed within both the 100-year storm flood elevation and wetlands that have been defined under the Wetlands Protection Act. Therefore, with diligent application of the applicable Federal and State laws, these areas represent open space buffers to development.

Beaver Dams

Beaver activity has been increasing over the past decade. Several wetland areas have been flooded by beaver dam construction. As a result, their vegetation has changed from forested wetland to marshy habitat. Sometimes beaver activity is detrimental to property, causing problems for local land owners (e.g., flooding of wells, septic systems, lawns, out-buildings, and roadways). Affected individuals must contact

the Board of Health and Conservation Commission for advice and permission to alleviate the beaver problem.

The Great Pond

A Connecticut River oxbow, the Great Pond is the largest natural freshwater body in town. It has approximately 200 acres of open water, wooded swamp and marshes, all of which serve as rare species habitat and refugia for migrating waterfowl.

Aquifers

The Town's groundwater supply is feed by the three watersheds listed above. The town relies on the two wells located over Hatfield's aquifer in emergency and periods of peak demand, such as the warmest months of summer.

Floodways

Water levels in Hatfield'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.

Floodways include the watercourses (rivers and streams) and adjacent relatively low-lying areas subject to periodic flooding (the 100-year flood zone and 500-year flood zone). These adjoining lands are flood hazard zones and they vary in their predicted flood frequency. The 100-year flood zone has a one in 100 statistical probability (or one percent chance) of being flooded in a single year or is predicted to be flooded one year out of a 100-year period; while the 500-year flood zone is based on a 500-year period. Hatfield's gently sloping terrain, especially in the eastern section of town, permits the formation of broad floodplains.

The National Flood Insurance Program has produced maps that identify floodways across America. The following areas have been designated as floodways in Hatfield:

(1) Running Gutter—From Rocks Road down to the Mill River;
(2) The Mill River from the Hatfield's northernmost town line south down Brad Street Depot Road, continuing down to West Hatfield Cemetery, continuing down with a broad flood plain to the Connecticut River;
(3) Cow Bridge Brook from Great Pond into the Connecticut River;
(4) Great pond and its tributary streams;

The Town Hall, Town Fire Station, Town Library and Town Police Station are all located within the Connecticut River's 500 year floodplain.

Flood Control Structures

The existing flood control earthen levee, Hatfield Dike, was built in 1938 along the bank of the Connecticut River. As of 2006, natural erosion of the banks of the Connecticut River had brought the river to within 15 feet of the toe of the dike.

Forests

Forty-four percent, or 4,721 acres, of Hatfield's total area is forested land. Different forest types offer differing values to the wood products industry, for wildlife habitat, and for recreation, which is the reason for differentiating between them. There are approximately 135 species of trees and woody shrubs naturally occurring in Hatfield. Several species have an economic importance to the lumber industry and are used locally, as well as exported out of the region to other states and markets. Eastern white pine and northern red oak head the list of commercially valuable species. Pine is used widely in the construction and the paper industry. Red oak is in demand for veneer for paneling, flooring, trim detail in homes and buildings and furniture.

Because pine and oak are so valuable, they have been selected as the standard to measure a forests' potential productivity. In Hatfield 1,000 $\pm$ acres is classified as prime, while 500 $\pm$ is of state and local importance.

3 – HAZARD IDENTIFICATION & ANALYSIS

Natural Hazard Identification

Historical research, conversations with local officials and emergency management personnel, available hazard mapping and other weather-related databases were used to identify the natural hazards which are most likely to have an impact on the Town of Hatfield.

Floods

The average annual precipitation for Hatfield and surrounding areas in the central Connecticut River Valley in Massachusetts is 42.5 inches. There are three major types of storms that bring precipitation to Hatfield. Continental storms that originate from the west continually move across the region. These storms are typically low-pressure systems that may be slow-moving frontal systems or more intense, fast-moving storms. Precipitation from coastal storms, also known as nor'easters, that travel into New England from the south constitute the second major storm type. In the late summer or early fall, the most severe type of these coastal storms, hurricanes, may reach Massachusetts and result in significant amounts of rainfall. The third type of storm is the result of local convective action. Thunderstorms that form on warm, humid summer days can cause locally significant rainfall.

Floods can be classified as either *flash floods*, which are the product of heavy, localized precipitation in a short time period over a given location or *general floods*, which are caused by precipitation over a longer time period in a particular river basin. There are several local factors that determine the severity of a flooding event, including: stream and river basin topography, precipitation and weather patterns, recent soil moisture conditions, amount of impervious surface area, and the degree of vegetative clearing. Floods occur more frequently and are one of the most costly natural hazards in the United States.

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).

In contrast, *general flooding* events may last for several days. 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).

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.

Severe Snowstorms/Ice Storms

Severe winter storms can pose a significant risk to property and human life because the rain, freezing rain, ice, snow, cold temperatures and wind associated with these storms can disrupt utility service, phone service and make roadways extremely hazardous. Severe winter storms can be deceptive killers. The types of deaths that can occur as a result of a severe winter storm include: traffic accidents on icy or snow-covered roads, heart attacks while shoveling snow, and hypothermia from prolonged exposure to cold temperatures. Infrastructure and other property are also at risk from severe winter storms and the associated flooding that can occur following heavy snow melt. Power and telephone lines, trees, and telecommunications structures can be damaged by ice, wind, snow, and falling trees and tree limbs. Icy road conditions or roads blocked by fallen trees may make it difficult to respond promptly to medical emergencies or fires. Prolonged, extremely cold temperatures can also cause inadequately insulated potable water lines and fire sprinkler pipes to rupture and disrupt the delivery of drinking water and cause extensive property damage.

Hurricanes

Hurricanes are violent rainstorms with strong winds that can reach speeds of up to 200 miles per hour. Hurricanes generally occur between June and November and can result in flooding and wind damage to structures and above-ground utilities. In Massachusetts, major hurricanes occurred in 1904, 1938, 1954, 1955, 1960 and 1976.

Tornadoes

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 Franklin County. There have been two tornadoes that have touched down in Hatfield, since 1950. Both were ranked F2 (Strong Tornado) on the Fujita Scale of Tornado Intensity. 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.). Since the 1950s, there have been close to twenty-four tornadoes in Hampshire and Hampden Counties.

Of additional concern are microbursts, which often do tornado-like damage and can be mistaken for tornadoes. In contrast to the upward rush of air in a tornado, air blasts rapidly downward from thunderstorms to create microbursts.[2] In a meeting with the Committee, the recurrence of microbursts in the Chestnut Street area.

Wildland Fires/Brushfires

According to FEMA, there are three different classes of wildland fires: *surface fires*, *ground fires* and *crown fires*.[3] The most common type of wild land fire is a surface fire that burns slowly along the floor of a forest, killing or damaging trees. A ground fire burns on or below the forest floor and is 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. While wild land fires have not been a significant problem in

[2] *http://www.fema.gov/regions/vii/2003/03r7n06a.shtm*
[3] FEMA, "Fact Sheet: Wildland Fires," September 1993.

Hatfield, there is always a possibility that changing land use patterns and weather conditions will increase a community's vulnerability. For example, drought conditions can make forests and other open, vegetated areas more vulnerable to ignition. Once the fire starts, it will burn hotter and be harder to extinguish. Soils and root systems starved for moisture are also vulnerable to fire. Residential growth in rural, forested areas increases the total area that is vulnerable to fire and places homes and neighborhoods closer to areas where wildfires are more likely to occur.

There were four brushfires reported in Hatfield in 2004[4]. As a point of comparison, the Hatfield Department issues approximately 200 burn permits a year.

Earthquakes

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.[5] 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.[6]

Table 3-1
New England Earthquakes with a Magnitude of 4.2 or more 1924 - 2002

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

[4] *Annual Report of the Massachusetts Fire Incident Reporting System, 2004*.
[5] Northeast States Emergency Consortium Web site: *www.nesec.org/hazards/earthquakes.cfm.*
[6] Federal Emergency Management Agency Web site: *www.fema.gov/hazards/earthquakes/quake.shtm.*

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

Source: Northeast States Emergency Consortium Web site: *www.nesec.org/hazards/earthquakes.cfm*

Table 3-2
New England States Record of Historic Earthquakes

State	Years of Record	Number Of Earthquakes
Connecticut	1568 - 1989	137
Maine	1766 - 1989	391
Massachusetts	1627 - 1989	316
New Hampshire	1728 - 1989	270
Rhode Island	1766 - 1989	32
Vermont	1843 - 1989	69
New York	1737 - 1985	24
Total Number of Earthquakes within the New England states between 1568 and 1989 = 1,239.		

Source: Northeast States Emergency Consortium Web site: *www.nesec.org/hazards/earthquakes.cfm*

Massachusetts introduced earthquake design requirements into their building code in 1975. 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 1975 may not have been designed to withstand the forces of an earthquake. The seismic standards have also been upgraded with the 1997 revision of the State Building Code.

Dam Failure

Although dams and their associated impoundments provide many benefits to a community, such as water supply, recreation, hydroelectric power generation, and flood control, 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. Most earthen dam failures occur when floodwaters above overtop and erode the material components of the dam. Often dam breaches lead to catastrophic consequences as the water ultimately rushes in a torrent downstream flooding an area engineers refer to as an "inundation area." The number of casualties and the amount of property damage will depend upon the timing of the warning provided to downstream residents, the number of people living or working in the inundation area, and the number of structures in the inundation area.

Many dams in Massachusetts were built in the 19th century without the benefit of modern engineering design and construction oversight. Dams can fail because of structural problems due to age and/or lack of proper maintenance. Dam failure can also be the result of structural damage caused by an earthquake or flooding brought on by severe storm events.

The Massachusetts Department of Conservation and Recreation (MA DCR) 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). Until 2002, DCR was also responsible for conducting dam inspections but then state law was changed to place the responsibility and cost for inspections on the owners of the dams. In 2005, the state issued new regulations, and now dam owners are responsible for the maintenance and inspection of their property. For this reason, the town should be proactive in seeking out dam owners to make sure they are aware of, and have a plan for, meeting their obligations.

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.

The inspection schedule for dams is as follows:

- Low Hazard dams – 10 years
- Significant Hazard dams – 5 years
- High Hazard dams – 2 years

The time intervals represent the maximum time between inspections. More frequent inspections may be performed at the discretion of the state. Dams and reservoirs licensed and subject to inspection by the Federal Energy Regulatory Commission (FERC) are excluded from the provisions of the state regulations provided that all FERC-approved periodic inspection reports are provided to the DCR. All other dams are subject to the regulations unless exempted in writing by DCR.

The Massachusetts Emergency Management Agency (MEMA) identifies two dams, all of which are identified as having a *Low Hazard*: D.F. Riley Grist Mill Dam and the Hatfield Reservoir Dam.

The 100-year floodplain covers about 26 percent, or approximately 2,779 acres of the town, including an estimated 100 acres of developed residential land.

Drought

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.[6]

In Massachusetts, six major droughts have occurred statewide since 1930[7]. 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.

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.

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

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

Natural Hazard Analysis Methodology

In order to review the likelihood of a specific hazard occurring, to identify the location of occurrence, and to assess the impacts of the hazard event, a *Hazard Identification and Analysis Matrix* was prepared to organize the information that was gathered for this project. The matrix is organized into the following sections: Type of Hazard, Frequency of Occurrence, Severity of Impacts and Hazard Index. The Hazard Index was completed to rank the hazards according to the frequency of occurrence and the amount of potential damage likely to occur. The Hazard Index forms the basis for concentrating the future mitigation efforts outlined in this plan. A description of each of the matrix categories is provided below. The completed Matrix is shown on Table 3-6.

Type of Hazard

The natural hazards identified for Hatfield include floods, severe snowstorms/ice storms, hurricanes, tornadoes, wildfires/brushfires, dam failure and earthquakes. Many of these hazards result in similar impacts to a community. For example, hurricanes, tornadoes and severe snowstorms may cause wind-related damage. A more detailed description of each type of hazard is included in the earlier section of this chapter.

Frequency of Occurrence

The frequency or likelihood of occurrence for each natural hazard was classified according to the following scale:

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

Table 3-3
Frequency of Occurrence and Annual Probability of Given Natural Hazard

Frequency of Occurrence	Annual Probability
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

Source: information adapted from Hyde County, North Carolina Multi-Hazard Mitigation Plan, September 2002.

Location of Occurrence

The classifications are based on the area of the Town of Hatfield that would potentially be affected by the hazard. The following scale was used:

Table 3-4
Location of Occurrence and Percentage of Town Impacted of Given Natural Hazard

Location of Occurrence	Percentage of Town Impacted
Large	More than 50% of the town affected
Medium	10 to 50% of the town affected
Small	Less than 10% of the town affected

Source: information adapted from Hyde County, North Carolina Multi-Hazard Mitigation Plan, September 2002.

Severity of Impacts

The severity of direct impacts an affected area could potentially suffer were classified according to the following scale:

Table 3-5
Severity of Impacts and Magnitude of Multiple Impacts of Given Natural Hazard

Severity 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.

Source: information adapted from Hyde County, North Carolina Multi-Hazard Mitigation Plan, September 2002.

Hazard Index

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

Table 3-6
Hazard Identification and Analysis Worksheet for Hatfield

TYPE OF HAZARD	FREQUENCY OF OCCURRENCE	LOCATION OF OCCURRENCE	IMPACT	HAZARD RISK INDEX RATING
Flooding	**High**	**Medium**	**Limited**	**1**
Severe Snowstorms/Ice Storms	**High**	**Large**	**Limited**	**1**
Severe Thunderstorms (microbursts) which cause wind damage	**High**	**Medium**	**Limited**	**2**
Hurricanes	**Low**	**Large**	**Critical**	**2**
Tornadoes	**Low**	**Small**	**Critical**	**3**
Wildfire/Brushfire	**Low**	**Small**	**Minor**	**4**
Earthquakes	**Very Low**	**Large**	**Critical**	**3**
Dam Failures	**Very Low**	**Medium**	**Critical**	**3**
Drought	**Low**	**Large**	**Limited**	**4**
Man-made Hazards: Hazardous Materials	**Low**	**Medium**	**Critical**	**2**

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

Detailed Hazard Profile for Hatfield

Flooding

Location: The 100-year flood zone covers mostly narrow bands of level floodplain land along the Connecticut River and the Mill River. The 500-year flood zone tracks along the same boundaries with a wider swath.

Extent
There are approximately 1,228 acres of land within the FEMA mapped 100-year floodplain and 246 acres of land within the 500-year floodplain within the Town of Hatfield. There are 269 structures located within the Special Flood Hazard Area (SFHA) in Hatfield as of August 9, 2005 the most current records in the CIS for the Town of Hatfield. The estimated number of people living in the floodplain is 616.

Previous Occurrences

Based upon existing records for flood damage, there have been five events that have caused damage in Hatfield since 1978 with a total damage amount of $25,834 (NFIP-Flood Loss Statistics). No specific events were identified for Hatfield in the National Climatic Data Center, but 27 flooding events have occurred in Hampshire County with a total damage value of 10.38 million dollars.

In addition to this, Hatfield's PDM Committee identified the October 9, 2005 flooding event as an event. No damage was recorded for this event.

Probability of Future Events

Based upon previous data, it seems likely that there is a greater than ten percent chance of minor flooding occurring every year in Hatfield. This is partly a function of the presence of the Mill River and Connecticut River both of which contain floodplain acreage in Hatfield. The area within the 100-year flood plain still has a one (1) percent chance of a severe flood in any given year.

Snowstorms and Severe Winter Weather

Location: The entire Town of Hatfield is susceptible to snowstorms.

Extent: The Massachusetts State Hazard Mitigation Plan has identified Hatfield as a community that is among the state's highest locations for

snow fall events. The most severe snow Hatfield can expect is between 36 and 48 inches. At worst, the constraints this places on the town highway department could result in a significant portion of the town being without transportation options, depending on the severity of the storm, as staff fatigue results in an accumulation of snow.

Previous Occurrences

Available records, dating back to 1950, indicate that 86 severe winter storms have occurred in Hampshire County. There were no specific records for Hatfield, but the committee has agreed to keep records on future severe winter storm events.[9]

Probability of Future Events

Based upon the availability of records for Hampshire County, the likelihood that a severe snow storm will hit Hatfield in any given year is greater than ten percent.

Hurricanes

Location: Massachusetts is susceptible to hurricanes and tropical storms. Between 1851 and 2004, approximately 32 tropical storms; five Category 1 hurricanes, two Category 2 hurricanes and three Category 3 hurricanes have made landfall. To date, the Commonwealth has not experienced a Category 4 or 5 hurricane. Aside from direct hits from hurricanes and tropical storms, the Commonwealth is often affected by their extra tropical remnants as these storms move up the coast and out into the Atlantic Ocean. Since the destructive hurricane of 1938, four other major hurricanes have struck the Massachusetts coast in 1954, 1955, 1960, 1985, and 1991. The last hurricane to make landfall in New England was Hurricane Bob, a weak category 2 hurricane, in August 1991. Therefore, it is forecasted that, Massachusetts, and the rest of New England, is long overdue for a major hurricane to make landfall. Based on past hurricane and tropical storm landfalls, the frequency of tropical systems to hit the Massachusetts coastline is an average of once out of every six years.

Hatfield's greatest risk is the increase in flooding along the Connecticut River that might accompany an inland hurricane.

Extent

[9] **National Environmental Satellite, Data, and Information Service (NESDIS)**

In the event of a tropical storm or hurricane, the greatest risk to Hatfield will be flooding of the Connecticut River. Wind damage will be limited, but widely spread, perhaps including downed power and communications lines, but flooding damage will be more severe and focused on population centers and croplands; the town's transportation infrastructure and evacuation routes could also be impacted, as the Connecticut River could isolate sections of the town center.

Previous Occurrences

While several hurricanes and tropical storms have passed through the Pioneer Valley Region since records have been kept, only one tropical storm has passed through Hatfield. This does not mean that Hatfield has not suffered from wind and storm damage, as several neighboring communities have had hurricanes and tropical storms pass through them, and the effects of a hurricane are hardly localized.

Probability of Future Events

Based upon the past reporting of one tropical depression within Hatfield over a period of 150+ years, it is reasonable to say that there is a low frequency of hurricane and tropical storm occurrence in Hatfield (once every fifty years is less than a one percent chance of any such storm occurring in a given year).

Tornados/Microbursts

Location

The hazard area for tornadoes in Hatfield varies according to the intensity and size of the tornado. There have not been enough tornadoes in Hatfield to accurately predict sections of town that are more likely to experience a tornado. However, the Massachusetts State Hazard Mitigation Plan (2004) identifies eastern Hatfield and the surrounding communities as having a high frequency of tornado occurrence within Massachusetts. For this reason, Hatfield's highest-population areas are at the greatest risk of experiencing damage from a tornado.

Extent

The area of damage would vary according to the F-Scale rating and a given Tornado's location. A tornado in Hatfield's center, where the

population and commercial activity are concentrated, would have a greater impact than a tornado that ravaged Hatfield's uplands.

Previous Occurrences

There have been two F2 tornados in Hatfield since 1950.

Probability of Future Events

Based upon the available historical record, as well as Hatfield's location in a high-density cluster of state-wide tornado activity, it is reasonable to estimate that there is a medium frequency of tornado occurrence in Hatfield (a 1 % - 5% chance in any given year).

Wildfires/Brushfires

Location: Hatfield still contains several thousand acres of largely undeveloped space. The rural-urban interface is most pronounced in those sections of town that are experiencing development; most notably the community's forested uplands.

Extent

Forested areas in Hatfield cover a large portion of the town's surface area; forested areas can be remote and difficult for emergency crews to access. In Hatfield 44 percent of the town's total land area is in forest, or about 4,720 acres, and is therefore at risk of fire. A significant portion of the town is still in cropland; 3,331 acres, or 31%, of Hatfield is still a working agricultural landscape. A large wildfire could damage 77 percent of the town's land mass, including vital watershed lends, in a short period of time. However, Massachusetts receives more than 40 inches of rain per year, which makes wildfires uncommon in Massachusetts. Nevertheless, in drought conditions, a brushfire or wildfire would be a matter of concern.

Previous Occurrences

There are no records of wildfires or burned acreage available for Hatfield, but the 2005 Massachusetts *Fire Incident Reporting System* recorded 4 "other" fires, a category that includes any fire that does not occur in a building. The fire department is committed to collecting data on and acreage statistics on wildfires in Hatfield.

Probability of Future Events

Based upon the availability of data, there is a low frequency of wildfires in Hatfield.

Earthquakes

Location The last major earthquake to strike Massachusetts did so more than 200 years ago in 1755 when an estimated 5.75 strength earthquake struck off of Cape Anne, which is North of Boston. Damage from this event stretched from Northern Massachusetts to Boston, and is thought to have occurred because of compression and buckling along the North American Plate, which stretches from California to the middle of the Atlantic Ocean. Unlike California, where earthquakes occur along fault lines, there is no predictable pattern for where an earthquake will emerge in New England. However, the forces that initiate buckling in New England include the downward weight of mountains and the upward stress relief that resulted from the retreat of the glaciers. These factors, when combined with the geography of New England and the historical record, indicate that Cape Ann and Eastern Massachusetts are the sections of the Commonwealth that are most likely to experience an earthquake. However, seismologists have concluded that earthquakes in New England can occur anywhere in the region and that there is no way to specify where the greatest risk lies.

Extent: In the event of an earthquake, all of Hatfield would be affected with some portions more impacted than others, depending on the magnitude of the earthquake and the underlying population density.

Previous Occurrences

In the past 150 years, one earthquake has been documented in Hatfield, but nine have been documented throughout the Pioneer Valley.

Probability of Future Events

Based upon existing records, there is a low frequency of earthquakes in Hatfield with less than a 1% chance of an earthquake occurring in any given year.

Dam Failures

Location

Hatfield has two dams located within its boundaries. Please refer to the Hatfield Hazard Map (appendix E) for the location and distribution of these dams; they have both been classified as low-hazard dams:

Name	Hazard	Owner
D.F. Riley Grist Mill Dam	L	Mill River Development
Hatfield Reservoir Dam(NJ)	L	Town of Hatfield

Extent

Dams in Massachusetts are assessed according to their risk to life and property. Dams with a *Low Hazard* rating may cause minimal property with no expected loss of life.

Previous Occurrences

To date, there have been no dam failures in Hatfield.

Probability of Future Events

As Hatfield's dams age, and if improvements are deferred, the likelihood of a dam failing will increase, but, currently the frequency of dam failures is very low with a less than one percent chance of a dam failing in any given year.

<u>Drought</u>

Location: A drought would impact all of Hatfield, most specifically water-dependent activities, like agricultural businesses.

Extent

A drought in Hatfield would leave widespread damage to plant life. Hatfield's public water is supplied mostly by Running Gutter Brook Reservoir on Horse Mountain, which has safe yield of .5 MGD. West Hatfield Well, which has a 200 gpm safe yield, is one of two wells. The other, Omasta Well, can pump 275 GPM but is only used intermittently (1 1/2 hours on and 1 hour off). If drought conditions depleted surface water supplies, damage from a drought could be widespread, as the groundwater supplies are only permitted for a maximum withdrawal of 180 days without groundwater recharge.

Previous Occurrences

In Massachusetts, six major droughts have occurred statewide since 1930. 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.

Probability of Future Events

In Hatfield, as in the rest of the state, drought occurs at a medium frequency, with a range of a 1% or a 10% chance of drought occurring in a single given year. However, due to Hatfield' smaller population and the water richness of Western Massachusetts, communities like Hatfield would not be as severely impacted as some communities in Eastern Massachusetts.

Man-Made Hazards

Location: Hatfield has several facilities in town that could produce damage from man-made chemical explosions, leaks or spills. Please refer to Hatfield's Natural Hazard map to see where these uses are distributed. Otherwise, these are:

Company	**Location**
Hatfield Water Treatment Plant	Reservoir Road
Brockway-Smith Company	Chestnut Street, Box
Hatfield Wastewater Treatment Plant	Main Street
C&S Wholesale Grocers	North Hatfield Rd
C&S Wholesale Grocers	Elm St.
Helena Chemical Company	Elm Street
Helena Chemical Company	Elm Street
Verizon Hatfield Dial Office	Chestnut Street
Verizon Hatfield Garage	North Hatfield Rd
Turfcare	Dwight Street
E. Osterman Propane	
Brockway Smith	Chestnut Street
Kieras Oil Co.	N. Hatfield Rd.

Extent

There is no reliable indicator of the extent of a man-made hazard in Hatfield that can be performed as part of this work. Pictometry is a modeling program that enables incident commanders to perform hazard modeling scenarios; Hatfield could identify the greatest threats and build scenarios for them based upon available data in a future project. The threat of a man-made hazard depends on the substance, the concentration of the substance, air flow, water flow, human demographics and geography.

Previous Occurrences

An ammonia leak occurred in Hatfield in May of 2007 at the C&S Wholesale Grocery complex. According to the Hampshire Gazette, work at the 337,000-square-foot facility halted for eight hours as firefighters and health and safety officials tested the building for ammonia levels and determine the source of the strong odor. No fatalities were reported

Probability of Future Events

One event has occurred, which placed this at a low frequency with a less than 1% of a spill occurring in a single given year.

Development

As the town grows, development could result in future areas becoming more risky for residents. In Hatfield, growth is modest, but the trend has been towards more houses in town. For example: Excluding forest land, the total lot of farmland in the town between 1971 and 1997 was about 220 acres, or 5.7 percent. Continuing pressure in the real estate market for larger lot home sites close to I-91, along with the educational, cultural and economic amenities of communities like Amherst and Northampton, could easily tip the balance against Hatfield's working farm landscapes.

The Natural Hazards Map (Appendix E) shows where development has been predicted. This was developed through the efforts of the committee.

Vulnerability Assessment

The following is a list of natural and manmade disasters, and the areas affected by them, that have or could affect the Town of Hatfield. The Past and Potential Hazards Map at the end of this Plan reflects the contents of this list.

In order to determine estimated losses due to natural and man made hazards in Hatfield, each hazard area was analyzed with results shown below. Human losses are not calculated during this exercise, but could be expected to occur depending on the type and severity of the hazard. Most of these figures exclude both the land value and contents of the structure. The value of all structures in the Town of Hatfield, including exempt structures such as schools and churches, is $408,437,908 as of 2005. The median value of a home in Hatfield in 2005 was $250,000 according to the Warren Group. The data below was calculated using FEMA's Understanding Your Risks: Identifying Hazards and Estimating Losses, August 2001. In addition, the Committee completed the Vulnerability Assessment Worksheets which provided more data to estimate the potential losses.

Past and Potential Hazards

Flooding (100-year base flood): High Risk

In this section, a preliminary vulnerability assessment was prepared to evaluate the potential impact that flooding could have on the portions of Hatfield located within the 100-year floodplain. Flooding was chosen for this evaluation because it is a natural hazard likely to impact the community and the location of the impact can be determined by mapping of areas inundated during severe flooding events. Flooding can be caused by severe storms, such as hurricanes, nor'easters, and microbursts, as well as ice dams and snow melt. To determine the vulnerability of the town, the property within the floodplain with the highest likelihood of damage was identified and preliminary damage assessments were then generated for classes of residential properties. The damage estimates presented in the following table are rough estimates and likely reflect 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.

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There are approximately 2,304 acres of land within the FEMA mapped 100-year floodplain and 1,462 acres of land within the 500-year floodplain within the Town of Hatfield. According to the Community Information System (CIS) of FEMA, there were 194 1-4 family structures and 75 "other" structures located within the Special Flood Hazard Area (SFHA) in Hatfield August 9, 2005, the most current records in the CIS for the Town of Hatfield. Utilizing the Town's median home value of $250,000, a preliminary damage assessment was generated. For the estimated number of people living in the floodplain, an average household size of 2.29[10] people was used.

A total of 269 structures are located within the SFHA in Hatfield, totaling approximately $67,250,000 of damage, and 616 people impacted. 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.

Summary of October 9, 2005 Connecticut River Flood[11]

General flooding occurred along the Connecticut River during this high rainfall event. Farm fields in Hatfield's lowlands received most of the floodwaters. The FEMA levee system has sufficiently contained floodwaters since its construction, but erosion is wearing down to the toe of the dyke, and repairs could be done on this structure.

Localized Flooding: Medium-High Risk

There is potential for annual flood incidents in Hatfield due to the community's location next to the Connecticut River as well as its topography. Most of the flood hazard areas listed here were identified

[10] Figure courtesy of 2000 U.S. Census.

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 from surrounding slopes.

Chestnut Street

- The Mill River crossing un Chestnut Street was submerged in the October, 2005 floods. However, there are no residential structures in this area, so no damage to property was reported. However, the inconvenience and safety risks that accompanied losing this east-west route would place a serious strain on emergency service personnel if it were to continue for a longer duration during a more drastic event.

South Street and Valley Street

- These streets experience frequent flooding in high rain events.

King Street

- There is a damaged culvert on King Street, and this damage causes blockages in high rain events. Replacing this culvert would reduce localized flooding.

Severe Snowstorms/Ice Storms: High Risk

Three types of winter events are heavy snow, ice storms and extreme cold which cause concern. Occasionally heavy snow years will collapse buildings. Ice storms have disrupted power and communication services. Timberland has been severely damaged. Extreme cold affects the elderly. Hatfield's recent history has not recorded any loss of life due to the extreme winter weather. These random events are difficult to set a cost to repair or replace any of the structures or utilities affected.

- Area has been subject to extremely heavy snow falls, records of early 1900s and into the 1950s and 1960s indicate this.
- Moderate risk town wide due to snow, ice and extreme cold.
- Elderly are affected by extreme weather.

The Rocks and Horse Hill

Reduced access in severe incidents

- Areas of higher elevation particularly affected by snow and wind.
- No known damage to structures.

Severe Wind/Downburst: Medium-High Risk

- Area between Linseed Road and Route 5 & 10 has had frequent recurrence of micro bursts.

- Structural damage potential.
- Such events cause small blocks of downed timber.

Area between Linseed Road and Route 5 & 10
The Town experienced a severe wind incident in 2003. There were no structures affected by the incident. Cost for repairing or replacing any power lines, telephone lines, and contents of structures are not included.

- Trees were uprooted; fallen utility lines – roads were blocked by debris.
- Equipment shed roof damaged.

Hurricanes: Medium-High Risk

Hatfield's location in the Connecticut River Valley reduces the risk of extremely high winds that are associated with hurricanes. The Town has experienced small blocks of downed timber and uprooting of trees onto structures. Hurricanes can and do create flooding. Estimated wind damage 5% of the structures with 10% damage $2,042,189. Estimated flood damage 10% of the structures with 20% damage $8,168,758. Cost of repairing or replacing the roads, bridges, utilities, and contents of structures is not included.

- Connecticut River corridor at risk.
- 1938 hurricane was a major event - wind damage and flooding statewide.
- Power and phone lines - disruptions of services.
- Flooding/washing of evacuation routes.

Tornadoes: Medium Risk

Risk of tornadoes is considered to be high in Hampden County. Tornadoes are unpredictable in this part of the country; therefore, assessing damages is difficult. Buildings have not been built to Zone 2, Design Wind Speed Codes. Estimated damages to 10% of structures with 20% damages $8,168,758. Estimated cost does not include building contents, land values or damages to utilities.

- Two F2 tornadoes have occurred in Hatfield in the past.
- River corridors and hill tops susceptible.
- 9 incidents of tornado activity (F1 or greater) occurred in Hampden County between 1959 – 1991.

Connecticut River
Hurricane in 1938 was a major statewide incident. Cost for repairing or replacing any power lines, telephone lines, and contents of structures are

not included.

- Increased risk for Connecticut River corridor.
- Flooding/washing of evacuation routes.

Wildfires/Brush Fires: Low Risk

As timber harvesting is reduced, wood roads close, debris builds up on the ground, potential for wildfire increases town-wide. Entire town - minimal forest fire protection (dependent on on-call firefighters and problems with accessibility)

Horse Mountain

Moderate risk exists for potential wildfire incidents in this portion of town. There are approximately 25 structures in this area that could be affected by a wildfire incident. 100% damage to 100% of the structures, estimated cost of repairing or replacing to be $6,250,000. Cost for repairing or replacing any power lines, telephone lines, and contents of structures are not included.

- Forested areas with high fuel content have more potential to burn.
- Risk increases for wooded areas with higher elevation.
- Limited access for reaching some areas if a wildfire occurs in this area.
- Potential impact on watershed lands.

The Rocks

There are 15 structures in this area. One hundred percent damage to 100% of the structures would result in estimated cost of $3,750,000 Cost for repairing or replacing any power lines, telephone lines, and contents of structures are not included.

- Forested areas with high fuel content have more potential to burn.
- Risk increases for wooded areas with higher elevation.
- Limited access for reaching a wildfire in this area.

Earthquakes: Medium Risk

Moderate potential for serious damage in village portion of town and along Connecticut River shoreline. Structures are mostly of wood frame construction estimated loss 20% of town assessed structural valuation $81,687,582. Costs of repairing or replacing roads, bridges, power lines, telephone lines, or the contents of the structures are not included.

- No significant damage from previous earthquakes.

Drought: Low Risk

Hatfield has had limited experience with severe drought conditions. Drought will increase the risk of wildfire, especially in areas of high recreational use and as more timberland is set aside as non-harvested timberland, the potential for the risk of wildfire will increase. Because the town's water supply is relatively limited, the town drilled two emergency water wells to supplement its surface water supply.

- Forested areas with high fuel content have more potential to burn.
- Severe drought conditions existed in New England from 1960 to 1969.
- Drought conditions currently do not exist in Massachusetts.

Man-Made Hazards - Hazardous Materials: High Risk

Hatfield relies on the support of DEP and MEMA's emergency response teams, as well as local mutual aid in responding to hazardous chemical incidents. Public transportation of chemicals and bio-hazardous materials by rail Hatfield and by vehicle transport on I-91, are a concern. Several areas of hazardous materials storage increase the potential for future incidents.

C & S Wholesale Grocers North and South Campus
These locations are certified Tier II facilities because of diesel and battery storage.

Railroad Tracks on Route 5 & 10

Hazardous chemicals are transported along this corridor.

Railroad Tracks along I-91
Past derailings indicate the potential for chemical spills.

Interstate 91

Hazardous chemicals are transported along this corridor.

Brockway Smith Manufacturing Company
Storage of chemicals for industrial wood processing and finishing. Structures could be damaged in the event of an incident.

Turf Care
Storage of thousands of gallons fertilizers and herbicides. No record of

past incidents. Structures could be damaged in the event of an incident. Evacuation of residences and businesses could be required.

There 12 EPA Tier II facilities documented in Hatfield. Some of these locations receive attention above, but all locations are listed in their entirety below:

1. Brockway-Smith Company	Chestnut Street, Box
2. Hatfield Wastewater Treatment Plant	Main Street
3. C&S Wholesale Grocers Hat	North Hatfield Rd
4. C&S Wholesale Grocers	Elm St.
5. Helena Chemical Company	Elm St.
6. Helena Chemical Company	Elm St.
7. Verizon Hatfield Dial Ofc	Chestnut St
8. Verizon Hatfield Dial Garage	No Hatfield Rd
9. Turfcare	Dwight St
10. E. Osterman Propane	
11. Kieras Oil Co.	N. Hatfield Rd.
12. Hatfield Water Treatment Plant	Reservoir Rd.

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

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

Hazards identified in this plan are regional risks and, as such, all critical facilities fall into the hazard area. The exception to this is flooding. There are several critical facilities that fall within the 100-year floodplain as shown in the table at the end of this section.

The Critical Facilities List for the Town of Hatfield has been identified utilizing a Critical Facilities List provided by the State Hazard Mitigation Officer. Hatfield's Hazard Mitigation Committee has broken up this list of facilities into three categories. The first category contains facilities needed for Emergency Response in the event of a disaster. The second category contains Non-Emergency Response Facilities that have been identified by the Committee as non-essential. These are not required in an emergency response event, but are considered essential for the everyday operation of Hatfield. The third category contains Facilities/Populations that the Committee wishes to protect in the event of a disaster. The fourth category contains Potential Resources, which can provide services or supplies in the event of a disaster. 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

Town Hall – Main Street
Hatfield Fire Station- School Street

2. **Fire Station**
   Hatfield Fire Station- School Street

3. **Police Station**
   Hatfield Police Department – Main Street

4. **Highway Garage**
   Located at Hatfield Transfer Station – Straits Road

5. **Water Department**
   Hatfield Water Treatment Plant – Reservoir Road

6. **Emergency Fuel Stations**
   2,000 gallons of Diesel at the DPW
   2,000 gallons of unleaded at the DPW

7. **Emergency Electrical Power Facility**
   Hatfield Water Treatment Plant – Reservoir Road
   Hatfield Waste Water Treatment Plant – Main Street
   Hatfield Elementary School – School Street
   Hatfield DPW, 2 Generators – Main Street

8. **Emergency Shelters (not Red Cross Approved)**
   Smith Academy – School Street
   Hatfield Elementary School – Main Street

9. **Hydrants - Fire Ponds - Water Sources**
   Numerous locations in Hatfield

10. **Transfer Station**
    Hatfield Transfer Station – Straits Road

11. **Utilities**
    Hatfield Sewer Department serves half of the Town

12. **Helicopter Landing Sites**
    Rear section of 33 Main Street

    Brockway Smith Company – Chestnut Street

Omasta Well – Norton Street

13. **Communications**
    Cell Towers – One Located at Brockway Smith
    Telephone Crossboxes:
    Central Switching Office – Verizon Building Located on Chestnut Street

14. **Primary Evacuation Routes**
    Elm Street/Maple Street
    Chestnut Street
    North Hatfield Road
    Depot Road

15. **Bridges Located on Evacuation Routes**
    Maple Street Bridge
    Chestnut Street Bridge—subject to seasonal flooding.

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 Hatfield.

1. **Water Supply**
   Running Gutter Brook Reservoir – Horse Mountain
   West Hatfield Well, back up
   Omasta Well, back up
2. **Sewer Infrastructure (Pump Stations)**
   Hatfield Waste Water Treatment Plant – Main Street

3. **Problem Culverts**
   Culvert on King Street

Category 3 – Facilities/Populations to Protect

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

1. **Special Needs Population**
   Group Home on Route 5 &10 in North Hatfield

2. **Elderly Housing/Assisted Living**
   Capawonk Housing Authority – School Street

3. **Recreation Areas**
   Hatfield Reservoir and Watershed – Horse Mountain
   State Boat Ramp – Kellogg Hill Road
   Hatfield Elementary School Grounds – Main Street
   Smith Academy Fields – School Street
   Town Park – School / Main Street
   Center School Playing Fields

4. **Schools**
   Hatfield Elementary School – Main Street
   Smith Academy – School Street

5. **Churches**
   1st Congregational Church – Main Street

   Holy Trinity – Main Street
   St. Joseph's – School Street

6. **Historic Buildings/Sites**
   Hatfield Public Library – Main Street
   Mary Lou and Robert J. Cutter Hatfield Farm Museum – Main Street

7. **Apartment Complexes**
   Kenwood – West Street

   La Mirage – West Street

8. **Employment Centers**
   C&S Wholesale Grocers – Elm Street

9. **Mobile Home Parks**
   West Street/Pantry Road – 40-plus units

Critical Facilities and Evacuation Routes Potentially Affected by Hazard Areas

Hazard Type	Hazard Area	Critical Facilities Affected	Evacuation Routes Affected
Flooding (100-year Flood)	Farm fields in East Hatfield, Mill River below dam, Main Street Historical District	Schools, Sewage Pump Station, Hatfield Dikes Along the Connecticut River affected by erosion	Chestnut Street, Depot Road
Microburst	Chestnut Street West Street, falling debris	None	Route 5
Drought	Entire Town of Hatfield	Minor impact on all services	None
Tornadoes	Variable	Localized damage, depending on extent of storm	Location determines impact
Wildfires/Brushfires	West Hatfield – 3,800 acres	Town Public Water Supply	Old Stage Road, Linseed Road
Man-Made: Hazardous Materials	EPA Tier II Facilities in Hatfield and Route 91 Corridor, Pan Am Railroad bed	Airborne particulate matter would affect all points west of any location.	Northbound / Southbound traffic on Interstate 91 and Route 5

(Critical Facilities Map Located In Back of Plan)

5 – CURRENT MITIGATION STRATEGIES

Flooding

The 100-year flood zone is the area that will be covered by water as a result of a flood that has a one percent chance of occurring in any given year. The 100-year flood zone covers mostly bands of level floodplain land along Elm Street, Maple Street, Bridge Lane, Main Street, Chestnut Street and areas along the Mill River and Running Gutter Brook. In several areas, the flood zone widens out to encompass farmland, some residential land, and industrial lands.

The major floods recorded in Hatfield during the 20th century have been the result of rainfall alone or rainfall combined with snowmelt. One of the goals of this Natural Hazards Mitigation Plan is to evaluate all of the town's existing policies and practices related to natural hazards and identify potential gaps in protection.

Management Plans

The Comprehensive Emergency Management (CEM) Plan for Hatfield lists the following generic mitigation measures for flood planning:

- 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 Hatfield is 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.

The Comprehensive Emergency Management (CEM) Plan for Hatfield lists the following generic preparedness and response measures for floods:

- Place EOC personnel on standby during stage of flood 'watch' and monitor NWS/New England River Forecast Center reports.

- Ensure that public warning systems are working properly and broadcast
  any information that is needed at this time.

- Review mutual aid agreements.

- Monitor levels of local bodies of water.

- Arrange for all evacuation and sheltering procedures to be ready for activation when needed.

- Carry out, or assist in carrying out needed flood-proofing measures such as sand bag placement, etc.

- Regulate operation of flood control works such as floodgates.

- Notify all Emergency Management related groups that will assist with flood response activities to be ready in case flood 'warning'.

Evacuation Options

The majority of lands subject to a 100-year flood are located along Elm Street, Maple Street, Bridge Lane, Main Street, Chestnut Street and areas along the Mill River and Running Gutter Brook. These lands consist of forest, abandoned pasture, pasture or cropland, but there are areas of residential uses within the area as well. According to the Hatfield CEM Plan, local officials have stated that there are local shelters available for flooding victims. In that case, the shelter is Smith Academy. Approximately 100 people would be expected to be impacted by a 100-yr. flood. Emergency management personnel should assess existing floodplain and dam failure data to determine an appropriate evacuation plan.

In addition, Hatfield has 4 bridges situated either in or near the 100-year floodplain, which could make evacuation efforts as a result of dam failure

more difficult. Some of the roads that residents would most likely take to reach safety travel through flood-affected areas.

Flood Control Structures

The Connecticut River Dike system was built after the flood of 1938 to prevent flood damage from occurring along the Connecticut River Floodplain.

Land Use Regulations that Mitigate Impacts from Flooding[12]

The Town of Hatfield has adopted several land use regulations that serve to limit or regulate development in floodplains, to manage stormwater runoff, and to protect groundwater and wetland resources, the latter of which often provide important flood storage capacity. These regulations are summarized below and their effectiveness evaluated in Table 4-1.

Subdivision Rules and Regulations

Hatfield's most recent draft of its Subdivision Rules and Regulations (November 13, 1996) which govern the subdivision of land were adopted for the purpose of "protecting the safety, convenience, and welfare of the inhabitants of the inhabitants of [Hatfield]…by regulating the laying out and construction of ways in subdivision providing access to the several lots therein, but which have not become public ways, and ensuring sanitary conditions in subdivision and in proper cases parks and open areas. The powers of a planning board and of a board of appeal under the subdivision control law shall be exercised with due regard for the provision of adequate access to all of the lots in a subdivision by ways that will be safe and convenient for travel; for lessening congestion in such ways and in the adjacent public ways; for reducing the danger to life and limb in the operation of motor vehicles; for securing safety in case of a fire, flood, panic, and other emergencies; for insuring compliance with the applicable zoning ordinances or by-laws; for securing adequate provision for water, sewerage, drainage, and other requirements where necessary in a subdivision; and for co-coordinating the ways in a subdivision with each other and with the public ways in the city or town in which it is located and with the ways in neighboring subdivisions." The Subdivision Rules and Regulations contain several provisions that mitigate the potential for, and impact of, flooding, including:

[12] All bulleted items and direct quotes in the Hatfield Local Natural Hazards Mitigation Plan are taken from the Town of Hatfield's zoning bylaw and subdivision regulations. Other references to those documents contained herein are paraphrases of the same.

- Section III. Procedure for the Submission and Approval of Plans

    - A. Preliminary Plan 2. Contents (5) The proposed system of drainage, including adjacent existing natural waterways, and all water bodies and wetlands, including those within 200' of the subdivision.
    - A. Preliminary Plan 2. Contents (8) The topography of the land in a general manner. Major site features, such as existing stone walls, fences, buildings, large trees, rock ridges, ledges, swamps, historic features and wooded areas

- Section III. B. Definitive Plan
    - 2. Contents, j. On a separate sheet, a street layout plan at a horizontal scale of 1"= 40', for each street in the subdivision showing exterior lines, roadway lines, partial lot lines, curb lines, intersection angles, points of tangency, and radii of curves. Also included on the street layout plan shall be location, size, type of construction, elevations and invert, whenever applicable, of all pipes and conduits of the:
        b. Storm drainage system, including piping, manholes, pumps, community septic tanks, and appurtenant equipment;
    - 2. Contents k.1. the profile plan shall show location of existing and proposed water, drainage and sanitary sewer lines, slopes and types (material and class) of all storm and sanitary sewer lines, invert, rim elevation and station of each manhole or catch basin.

- Section V. Design Standards
    - A. 3. Grade
        a. Grades of streets shall be not less than 0.5% Grades shall not be
        more than six (6%) percent for collector streets nor more than ten (10 %) percent for local streets.]

    - D. Protection of Natural Features. All natural and cultural features, such as large trees, historic plots, barns, and similar community assets shall be preserved, if, in the opinion of the Planning Board, they will add attractiveness to the value of the subdivision. Existing vegetation shall be minimally disturbed. Except where necessary to conform to road design, driveways, safety, and drainage, major earth grading shall be avoided. At least two trees per lot shall be preserved

or planted within the right-of-way or within 10 feet of the right-of-way. All non-paved areas of the public way shall be appropriately replanted and reseeded. The top six (6) inches of all non-paved areas of the public way shall consist of good quality loam.

- H. Underground Utility Systems. All utility distribution systems, public or private, shall be placed underground.

- Section VI. Required Improvements for an Approved Subdivision
  - C. Utilities/Storm Water/Sewer/Water
    2. Adequate disposal of surface water shall be provided. Catch basins shall be built in conformity with specifications of the Department of Public Works on both sides of the roadway on continuous grades at intervals of not more than three hundred feet (300) feet, at low points and sags in the roadway and near the corners of the roadway at intersecting streets.

- Appendix A: Development Impact Statement [The impact of the proposed subdivision is to be described according to the following criteria…]:

  Section III Support Systems

  c. Storm Drainage – Discuss the storm drainage system including the projected flow from a 50 year storm, name of the receptor stream, and any flow constrictions between the site and the receptor stream.

Hatfield Zoning By-Laws

The Town of Hatfield has established a set of bylaws designed in part to "The purpose of this zoning By-Law is to promote and regulate the use of land, buildings and structures to the full extent of the independent constitutional powers of cities and towns and to protect the health, safety and general welfare of Hatfield's present and future inhabitants..." The Zoning By-Laws include several provisions that mitigate the potential for flooding, including:

- Erosion Control Measures Contained in Hatfield's Zoning Bylaw

Section 6.3 Commercial Development & Environmental Conditions

Sub-Section 6.3.7.2 Erosion Control:

a. Erosion of soil and sedimentation of streams, water bodies, and wetlands shall be minimized by using the following erosion control practices:

(1) An erosion control. plan shall be filed with Planning Board at the time of site plan review. No work shall begin until the Planning Board has approved the erosion control plan.

(2) Areas that are exposed or disturbed due to stripping vegetation, soil removal, or re-grading shall be permanently stabilized before issuance of an Occupancy Permit

(3) During construction, temporary vegetation and/or mulching shall be used to protect exposed areas from erosion. Until a disturbed area is permanently stabilized, sediment in runoff shall be trapped by using sedimentation traps such as siltation fencing, staked hay bales, or stone check dams.

(4) Permanent erosion control and vegetation measures shall be in accordance with the management practices recommended by the Natural Resources Conservation Service.

(5) All slopes exceeding twenty percent (20%), resulting from site development or disturbance, shall be covered with four (4) inches of topsoil and planted with a vegetative cover sufficient to prevent erosion, or stabilized by a retaining wall.

(6) Dust control shall be used during non-agricultural grading operations if the grading is to occur within 200 feet of an occupied residence or place of business. Dust control methods may consist of dampening the ground with water prior to beginning work or grading fine soils only at times of low wind velocity.

Section 5.4 Special Permits with Site Plan Approval provides, in part, for:

5.4.4.C. Required Contents of Site Plans for Approval

6. A plan for the control of erosion, dust and silt, both during and after construction, temporary and permanent erosion control, and protection of water bodies is required.

5.4.7 Site Plan Approval Decisions and Criteria

4. The proposed development, to the extent feasible:

a. is integrated into the existing landscape and protects abutting properties;

b. .minimizes adverse environmental impacts on such features as wetlands, floodplains, and aquifer recharge areas;

6. The proposed development is served with adequate water supply and waste disposal systems and will not place excessive demands on Town services and infrastructure.

- **Section 2.4 Floodplain Overlay District**

Section 2.4.1. Purpose. The purposes of the Flood Hazard Overlay District are, [in part], to:

1) Protect life, public safety and property from flooding hazards;

2) Preserve the natural flood control and flood storage characteristics of the floodplain;

3) Eliminate costs associated with the response and clean-up of flooding conditions;

4) Reduce damage to public and private property resulting from flooding waters;

6) Ensure the Town of Hatfield- qualifies for participation in the National Flood Insurance Program.

2.4.2 District Delineation

a. The Floodplain Overlay District is herein established as an overlay district and includes all special flood hazard areas designated as Zones A, A1-30 on the Hatfield Flood Insurance Rate Maps (FIRM), on file with the Town Clerk, and hereby made a part of this ordinance.

b. Where the boundaries of this district may be in dispute, the Town of Hatfield or a landowner may engage a registered land surveyor to

provide more detailed or more accurate delineation, based on cross-sectional elevations.

2.4.3 Development Regulations

a. All development, including structural and non-structural activities, whether permitted as a right or by special permit must be in compliance with the Hatfield Wetlands Bylaw, the Mass. Wetlands Protection Act, Chapter 131, Section 40 of the Massachusetts General Laws and with the requirements of the Massachusetts State Building Code 780 CMR 744.0 pertaining to construction in the floodplain, with the Mass. Rivers Protection Act, with the State Environmental Code (Title V). and must comply in all respects to the provisions of the underlying district except where the Floodplain Overlay Zoning imposes additional regulations such regulations shall prevail.

2.4.4 Permitted Uses

a. The following uses of low flood-damage potential and causing no obstruction to flood flows shall be permitted in the Floodplain Overlay District provided they do not require new structures or fill or storage of material or equipment.

(1) Agricultural uses such as farming, grazing and horticulture.

(2) Forestry and nursery uses.

(3) Outdoor recreational uses, including fishing, boating, play areas and foot, bicycle or horse paths.

(4) Conservation of water, plants and wildlife.

(5) Wildlife management areas.

(6) Structures existing prior to the adoption of these provisions which conform with the provisions on the bylaws regulating underlying districts, including maintenance and repair usual for continuance of such an existing structure and improvements to such structures provided that the footprint increase of those improvements does not exceed 25% of the overall footprint of the structure. In the event such structure is destroyed, said structure may be rebuilt on the same location but no larger than the original overall footprint.

2.4.5 Prohibited Uses

a. The following uses shall be prohibited within the Floodplain Overlay Districts:

(1) Mobile homes;

(2) Storage of floatable materials, such as lumber;

(3) Industrial uses;

(4) Junkyards, solid waste landfills, auto salvage and recycling, dumps;

(5) Business and industrial uses, not agricultural, which manufacture, use process, store or dispose of hazardous materials or wastes as a principal activity, including but not limited to metal plating, chemical manufacturing, wood preserving, furniture stripping, dry cleaning and auto body repair.

(6) The outdoor storage of salt, other de-icing chemicals, pesticides or herbicides, flammable, explosive or toxic materials.

(7) Commercial sand and gravel removal operations, or excavation or disposal of soil or mineral substances, except as permitted in Section 2.4.6 or as necessary for construction of foundations, utilities, roads, or agricultural uses.

2.4.6 Special Permit

(1) Developed recreation facilities except buildings;

(2) Utility lines and facilities;

(3) Minor buildings incidental to permitted flood control, recreation, or agricultural, uses, ground coverage, if constructed so as to not obstruct natural hydrological features and provided the requirements of Section 2.4.7 relative to the elevation of the base flood are met;

(4) Single-family residences;

(5) Residential accessory uses, including garages, driveways, and onsite wastewater disposal systems;

(6) Reconstruction or substantial improvements, which increase the existing building footprint by more than 25% and which conform to the provisions of underlying districts;

(7) Business uses which are in compliance with the provisions of the underlying districts;

(8) Maintenance of the river, including stabilization or repair of eroded riverbanks or removal of flood debris, under requirements M.G.L., Chapter 131, Section 40, and any other applicable laws, bylaws and regulations. Riverbanks repairs shall be undertaken utilizing only natural materials (i.e., rock) and not with man-made materials (i.e. tires).

- **Section 2.6 Riverfront Protection District**

2.6.1 Purposes

b. The purposes of the Riverfront Overlay District (RO) are to:

(1) Protect the sensitive natural resources and rural character of the lands adjacent to the Connecticut River in Hatfield;

(2) Promote the preservation of agricultural lands along the Connecticut River; and

(3) Preserve the natural flood control and flood storage characteristics of the

2.6.2 District Delineation

c. The Riverfront Overlay District (RO) is herein established as an overlay district and includes all those geographic areas designated on the map entitled, "Hatfield Riverfront Overlay District - March 17, 2003" on file with the Town Clerk, and hereby made a part of this ordinance.

d. This overlay district shall be superimposed on other districts established by these zoning bylaws. Restrictions and prohibitions of land use in the underlying district(s) shall remain in full force and shall not be modified by the conditions of the RO District unless superseded by the restrictions and prohibitions of the RO District. Floodplain areas in the Riverfront Overlay District.

2.6.4 Prohibited Uses

c. The following uses shall be prohibited within the Riverfront Overlay District:

(9) All those uses prohibited in the Floodplain Overlay District Section 2.4.5 a. (1) through 2.4.5 a. (7); and,

(10) Seasonal lodging or camps in permanent or semi-permanent structures.

- **2.5 Water Supply Protection District**

2.5.1 Purpose of District

To promote the health, safety and welfare of the community by protecting and preserving the surface and groundwater resources of the Town and the region from any use of land or buildings which may reduce the quality of its water resources.

2.5.3 Scope of Authority

The Water Supply Protection District is an overlay district and shall be superimposed on the other districts established by this bylaw. All regulations of the Town of Hatfield Zoning Bylaw applicable to such underlying districts shall remain in effect, except that where the Water Supply Protection District imposes additional regulations, such regulations shall prevail.

2.5.4 District Delineation

1. The Water Supply Protection District is herein established to include all lands within the Town of Hatfield lying within the primary and secondary recharge areas of groundwater aquifers and the watershed areas of the Town (Running Gutter Brook) Reservoir and the Mountain Street Reservoir, which now or may in the future provide public water supply. The map entitled "Zoning Map, Town of Hatfield, Hampshire County, Massachusetts", dated October 2002, on file with Town Clerk, delineates the boundaries of the district.

2. Where the bounds delineated are in doubt or in dispute, the burden of proof shall be upon the owner(s) of the land in question to show where they should properly be located. At the request of the owner(s), the Town may engage a professional hydrogeologist to determine more accurately the location and extent of an aquifer or primary recharge area, and may charge the owner(s) for all or part of the cost of the investigation.

2.5.5. Prohibited Uses

The following uses are prohibited within the entire Water Supply Protection District unless otherwise noted.

1. Business and industrial uses, not agricultural, which manufacture, use, process, store, or dispose of hazardous materials or wastes subject to MGL 21C and 310 CMR 30.000 as amended as a principal activity, including but not limited to metal plating, chemical manufacturing, wood preserving, furniture stripping, dry cleaning, and auto body repair, or which involve on-site disposal of process waste waters, except for the following:

(a) very small quantity generators of hazardous waste; as defined by 310 CMR 30.00 as amended;

(b) treatment works approved by the Massachusetts Department of Environmental Protection designed in accordance with 314 CMR 5.00 for the treatment of contaminated ground or surface waters.

2. Trucking terminals, bus terminals, car washes, commercial outdoor washing of vehicles, motor vehicle gasoline sales, automotive service and repair shops.

3. Solid waste landfills, landfills receiving only wastewater residuals and/or septage, dumps, auto recycling, auto graveyards, junk and salvage yards.

6. Dumping or disposal on the ground, in water bodies, in residential septic systems or in. other drainage systems of any toxic chemical, including but not limited to septic system cleaners which contain toxic chemicals such as methylene chloride and 1-1-1 trichlorethane, and other household hazardous wastes. (See list of prohibited chemicals available from the Hatfield Town Clerk's office).

1. commercial fuel oil storage and sales;

8. petroleum, fuel oil and heating oil bulk stations and terminals, including, but not limited to, those listed under Standard Industrial Classification (SIC) Codes 5171 and 5983. SIC Codes are established by the U.S. Office of Management and Budget and may be determined by referring to the publication, Standard Industrial Classification Manual and any subsequent amendments thereto;

9. storage of sludge and septage, as defined in 310 CMR 32.05, unless such storage is in compliance with 310 CMR 32.30 and 310 CMR 32.31;

10. treatment or disposal works subject to 314 CMR 5.00 for wastewater other than sanitary sewage. This prohibition includes, but is not limited to, treatment or disposal works related to activities under the Standard. Industrial Classification (SIC) Codes set forth in 310 CMR 15.004(6) (Title 5), except the following:

(a) the replacement or repair of an existing system(s) that will not result in a design capacity greater than the design capacity of the existing system(s); and

(b) treatment works approved by the Massachusetts Department of Environmental Protection designed for the treatment of contaminated ground or surface waters and operated in compliance with 314 CMR 5.05(3) or 5.05 (13); and

(c) publicly owned treatment works, or POTWs.

12. Treatment or disposal works subject to 314 CMR 3.00 and 5.00 within the Zone A and Zone II of the Water Supply Protection District, except the following:

(a) The replacement or repair of an existing treatment or disposal works that will not result in a design capacity greater than the design capacity of the existing treatment or disposal works;

(b) Treatment or disposal works for sanitary sewage if necessary to treat existing sanitary sewage discharges in non-compliance with Title 5, 310 CMR 15.00, provided the facility owner demonstrates to the Massachusetts Department of Environmental Protection's satisfaction that there are no feasible siting locations outside of the Zone A. Any such facility shall be permitted in accordance with 314 CMR 5.00 and shall be required to disinfect the effluent. The Department of Environmental Protection may also require the facility to provide a higher level of treatment prior to discharge.

(c) Treatment works approved by the Massachusetts Department of Environmental Protection designed for the treatment of contaminated ground or surface waters and operated in compliance with 314 CUR' 5.05(3) or 5.05(13).

(d) Discharge by public water system of water incidental to water treatment processes.

13. In the Zone A of the Water Supply Protection District, facilities, that through their acts or processes, generate, treat, store or dispose of hazardous wastes that are subject to M.G.L. c. 21C and 310 CMR 30.000, except for the following:

(a) very small quantity generators of hazardous waste, as defined by 310 CMR 30.00 as amended;

(b) treatment works approved by the Massachusetts Department of Environmental Protection designed in accordance with 314 CMR 5.00 for the treatment of contaminated ground or surface waters;

14. cemeteries (human and animal) and mausoleums within the Zone A and Zone II of the Water Supply Protection District;

15. solid waste combustion facilities or handling facilities as defined at 310 CMR 16.00 within the Zone A and Zone II of the Water Supply Protection District;

16. Sand and gravel operations within the Zone A and Zone II of the Water Supply Protection District.

17. In the Zone A of the Water Supply Protection District, the rendering impervious of more than 15% of any lot, or more than 20% with artificial recharge or 2,500 square feet of any lot, whichever is greater.

18. No stabling, hitching, standing, feeding or grazing of livestock or other domestic animals shall be located, constructed, or maintained within 100 feet of the bank of a surface water source or tributary thereto.

2.5.6 Restricted Uses

1. Outside of Zone A and Zone II, excavation for removal of earth, sand, gravel and other soils is permitted, but shall not extend closer than five (5) feet above the historic high groundwater table (as determined from monitoring wells and historical water table fluctuation data prepared by the United Stated Geological Survey). A monitoring well shall be installed by the property owner to verify groundwater elevations. This section shall not apply to excavations incidental to permitted uses, including but not limited to providing for the installation

or maintenance of structural foundations, freshwater ponds, utility conduits or on-site sewage disposal or wetland restoration work conducted in accordance with a valid Order of Conditions issued pursuant to M.G.L. c. 131 § 40.

a. Access road(s) to extractive operation sites shall include a gate or other secure mechanism to restrict public access to the site.

b. Upon completion of earth removal operations, all altered areas shall be restored with topsoil and vegetative plantings. All fine materials, such as clays and silts, removed as part of the earth removal operation and leftover as by-products, shall be disposed of off site to prevent damage to aquifer recharge characteristics.

5. Above-ground storage of liquid hazardous material as defined in M.G.L.c.21E, or liquid propane or liquid petroleum products, except for the following:

(a) The storage is incidental to:

1. normal household use, outdoor maintenance, or the heating of a structure;

2. use of emergency generators;

3. a response action conducted or performed in accordance with M.G.L.c.21E and 310 CMR 40.000 and which is exempt from a groundwater discharge permit pursuant to 314 CMR 5.05(14); and

(b.) The storage is within container(s) or above-ground tank(s) within a building, or outdoors in covered container(s).or above-ground tank(s) in an area that has a containment system designed and operated to hold either 10% of the total possible storage capacity of all containers, or 110% of the largest container's storage capacity, whichever is greater. However, these storage requirements do not. apply to the replacement of existing tanks or systems for the keeping, dispensing or storing of gasoline provided the replacement is performed in accordance with applicable state and local requirements;

6. On-site sewage disposal systems shall not be installed in areas where soil percolation rates are faster than two minutes per inch without additional measures imposed by the Board of Health. (See Board of Health Regulations). All on-site subsurface sewage disposal systems, as

defined in 310 CMR 15.000 (Title 5), shall be in compliance with the requirements of 310 CMR 15.000.

2.5.7 Drainage

1. For commercial and industrial uses, to the extent feasible, run-off from impervious surfaces shall be recharged on the site by being diverted toward areas covered with vegetation for surface infiltration. Dry wells shall be preceded by oil, grease, and sediment traps to facilitate removal of contamination. All recharge areas shall be permanently maintained in full working order by the owner(s).

- **Section 7.0 Stormwater Management**

Section 7.1.1 Purpose and authority states, in part, that:

A. The proper management of stormwater runoff will meet the following objectives:

1. Reduce the adverse water quality impacts of stormwater discharges to surface water bodies, including rivers, lakes, reservoirs and streams in order to attain or maintain state and federal water quality standards.
2. Prevent the discharge of pollutants, including hazardous chemicals, into stormwater runoff.
3. Minimize the volume and rate of stormwater which is discharged to surface water bodies, including rivers, streams, reservoirs, and lakes.
4. Prevent erosion and sedimentation from improper land development, and reduce erosion caused by increased runoff.
5. Provide for the recharge of groundwater aquifers and maintain the base flow of streams.
6. Provide stormwater facilities that are attractive, maintain the natural integrity of the environment, and are designed to protect public safety.
7. Maintain or reduce predevelopment runoff characteristics after development to the extent feasible.
8. Minimize damage to public and private property from flooding and erosion.

Section 7.1.2 Applicability states that prior to the issuance of any development permit for any proposed development listed below, a stormwater management plan, or a waiver of the requirement for a stormwater management plan, must be approved by the planning board. No person shall, on or after the effective date of the bylaw, initiate any land clearing, land grading, earth moving or development

activities without first complying with this bylaw. The following uses shall be required to submit drainage reports, plans, construction drawings, specifications and as-built information in conformance with the requirements of this bylaw:

A. Any development that creates 10,000 sf or more of new impervious surfaces

B. Any project that results in the disturbance of five (5) acres or more of soil, except for existing agricultural uses

7.1.6 Inspections. No plan will be approved without adequate provision for inspection of property before development activity commences. The applicant shall arrange with the Zoning Enforcement Officer for scheduling the following inspections:

A. Initial inspection: Prior to approval of any plan.

B. Erosion control inspection: To ensure erosion control practices are in accord with the plan.

C. Construction inspection: Prior to backfilling of any underground drainage or stormwater conveyance structures.

D. Final inspection: When all work including construction of stormwater management facilities has been completed.

The Zoning Enforcement Officer shall inspect the work and either approve it or notify the applicant in writing in what respects there has been a failure to comply with the requirements of the approved plan. Any portion of the work which does not comply shall be promptly corrected by the applicant or the applicant will be subject to the bonding provisions of Section 7.2.1 or the enforcement provisions of Section 7.2.2. The town may conduct random inspections to ensure effective control of erosion and sedimentation during all phases of construction. Laboratory tests may be required at the owner's expense to verify adequacy of material and/or compaction.

7.1.8 Stormwater Management Performance Standards

A. Minimum control requirements. The minimum stormwater control requirements are that all developments provide design and management measures necessary to maintain the post development peak discharges for a 24-hour, two-year and ten-year frequency storm

events at a level that is equal to or less than the respective, pre-development peak. surcharge rates. When the proposed discharge may have an impact upon a sensitive receptor, including streams, storm drains, combined sewers, roads, and/or buildings, the planning board may require an increase in these minimum requirements.

Section 7.1.9 Specific design criteria states, in part, that:

A. Infiltration systems:

8. Provisions shall be made for safe overflow passage in the event of a storm which exceeds the capacity of an infiltration system.

B. Retention and detention ponds shall be designed for flow volumes calculated in accordance with the criteria of the Rational Method, or Natural Resource Conservation Service's "Urban Hydrology for Small Watersheds," Technical Release No. 55 or "Computer Program for Project Formulation Hydrology," Technical Release No. 20, whichever is most appropriate for the project unless otherwise approved by the planning board.

C. The applicant shall give consideration in any plan to incorporating the use of natural topography and land cover such as natural swales, and depressions as they exist prior to development to the degrees that they can accommodate the additional flow of water.

D. The planning board shall give preference to the use of swales in place of the traditional use of curbs and gutters based on a case by case review of stormwater plans and department of public works.

Section 6.2.1 Open Space Development Allowed By Right

Open Space Development in accordance with this bylaw shall be allowed by right in the Rural Residential District (RR), Outlying Residential District (OR), Town Center District (TC), and Agricultural District (AG), not including those lands in Hatfield's Floodplain District (FP). Open Space development shall mean a residential development in which single family residences are clustered together, adjacent to permanently preserved open space.

Section 6.2.2 Purposes The purposes of Open Space development are to:

1. allow for greater flexibility and creativity in the design of residential subdivisions, provided that the overall density of the development is no greater than what is normally allowed in the district;
2. encourage the permanent preservation of open space, agricultural lands, forest lands and other natural resources and encourage a less sprawling form of development that consumes less open land;
3. maintain the traditional New England rural character and land use pattern in which small villages contrast with open space and farmlands;
4. facilitate the construction of streets, utilities and public services in a more economical and efficient manner;
5. ensure that residential developments respect the natural features of the land, including wetlands, watercourses, forests, prime agricultural land, steep slopes, plants, wildlife, historic sites, scenic areas, and rural character;
6. encourage development out of view from the road, and promote alternatives to strip residential development lining roadsides in the town.
7. provide wildlife corridors connecting open spaces, needed by wildlife to ensure their survival.

6.2.7 Site Design Standards

1. Each structure shall be integrated into the existing landscape on the property so as to minimize its visual impact through use of vegetative and structural screening, landscaping, grading, and placement on or into the surface of the lot.

2. Lots shall be laid out and designed, to the greatest extent feasible, to preserve and protect historic and archaeological sites, farmland, wooded stream corridors, forested areas and large trees, scenic views particularly as seen from public roads, ridgelines and hilltops.

3. All buildings, roads and driveways shall be located away from soils which are most suitable for agriculture (based on U.S. Soil Conservation Service classifications for prime farmland soils and soils of state and local importance) to the maximum practical extent. This provision does not apply to the location of on-site septic disposal facilities which must be placed in soils meeting the Massachusetts Environmental Code.

6.2.9 Common Open Space

1. Common Open Space Requirements

a. A minimum of 40% of the total development parcel must be permanently protected as common open space. At least 70% of the common open space shall be retained in contiguous areas, unless approved by the Planning Board.

b. Watercourses, lakes, ponds, wetlands and steep slopes over 25% may not be included in common open space calculations.

c. The Planning Board may permit up to three (3) percent of the open space area to be paved or built upon for structures accessory to the dedicated use of open space (i.e. pedestrian walks, bicycle paths, playgrounds, farm related structures).

6.2.11 Stormwater Management

The Planning Board shall encourage the use of non-structural stormwater management techniques and other drainage systems that reduce impervious surfaces and enable infiltration where appropriate.

1. Stormwater management systems serving the Open Space subdivision may be located within the required common open space. Surface systems, such as retention and detention ponds, shall not qualify towards the minimum open space requirement.

Section 2.6, Riverfront Overlay District, protects the citizens of Hatfield with the following pertinent measures:

Section 2.6.1 Purposes

b. The purposes of the Riverfront Overlay District (RO) are to:

(7) Protect the sensitive natural resources and rural character of the lands adjacent to the Connecticut River in Hatfield;

(8) Promote the preservation of agricultural lands along the Connecticut River; and

(9) Preserve the natural flood control and flood storage characteristics of the floodplain areas in the Riverfront Overlay District.

Section 2.6.2 District Delineation

c. The Riverfront Overlay District (RO) is herein established as an overlay district and includes all those geographic areas designated on the map entitled, "Hatfield Riverfront Overlay District - March 17, 2003" on file with the Town Clerk, and hereby made a part of this ordinance.

d. This overlay district shall be superimposed on other districts established by these zoning bylaws. Restrictions and prohibitions of land use in the underlying district(s) shall remain in full force and shall not be modified by the conditions of the RO District unless superseded by the restrictions and prohibitions of the RO District.

2.6.3 Development Regulations

b. All development, including structural and non-structural activities, whether permitted as a right or by special permit must be in compliance with the Hatfield Wetlands Bylaw, the Mass. Wetlands Protection Act, Chapter 131, Section 40 of the Massachusetts General Laws and with the requirements of the Massachusetts State Building Code 780 CMR 744.0 pertaining to construction in the floodplain (where applicable), with the Mass. Rivers Protection Act (where applicable), with the State Environmental Code (Title V) and must comply in all respects to the provisions of the underlying districts and other overlay districts, except where the Riverfront Overlay Zoning imposes additional regulations such regulations shall prevail.

2.6.4 Prohibited Uses

c. The following uses shall be prohibited within the Riverfront Overlay District:

(9) All those uses prohibited in the Floodplain Overlay District Section 2.4.5 a. (1) through 2.4.5 a. (7); and,

(10) Seasonal lodging or camps in permanent or semi-permanent structures.

- **<u>Section 6.1 Transfer of Development Rights. Transferring Development Rights can reduce density in those areas subject to flooding:</u>**

  6.1.1 Purposes

  A. The purposes of this ordinance are:

  1. to protect farmland and open space in Hatfield;

  2. to protect property values and provide a fair economic return to property owners ;

  3. to foster compact development in areas served by public services and infrastructure.

  4. to preserve the remaining rural, historic, and agricultural character of the community by directing new commercial & industrial development to appropriate locations.

  Section 6.1.2 Transfer of Development Rights [Applicability]

  Transfer of Development Rights provides for increased density of commercial and industrial development in the designated Receiving Area, when suitable open space land in the Sending Area, is permanently preserved from development. The transfer of development rights is accomplished by the execution of an Agricultural Preservation Restriction or Conservation Restriction, and the increased density is permitted by the issuance of a Special Permit, both as hereinafter provided.

  Section 6.1.4 Establishment of Sending Area and Receiving Area

  A. The following districts are hereby established:

  1. a Sending Area, which shall consist of all land within the Agricultural (AG), Outlying Residential (OR), and Rural Residential (RR) Zoning Districts. The Sending Area is established so as to designate lands eligible for Agricultural Preservation and Conservation Restriction funding under the Hatfield TDR program

  2. a Receiving Area, which shall consist of all land, which is served with Town water and sewer, within the Business (B), Industrial (I), and Light Industrial (LI) Zoning Districts.

Wetlands Protection

The Town of Hatfield follows the standards established by the Wetlands Protection Act, which protects water bodies and wetlands through the town Conservation Commission. The Town also has instituted its Stream and Lake Protection District, an overlay district that provides restrictions on the location of septic tanks and leach fields, as well as on the impacting of the flood storage capacity of the land.

Hatfield Open Space and Recreation Plan

Recent efforts by the Town of Hatfield Conservation Commission and others have resulted in the creation of municipal plans that are useful for flood hazard mitigation purposes. Hatfield recently completed its Open Space and Recreation Plan, and it is current until 2008; the town should have plans in place to fund this update. The intent of the document is not to address hazard mitigation or flood control in a direct or comprehensive way; however, it inventories the natural features and environments in the town, many of which, such as wetlands, aquifer recharge areas, farms, rivers, streams, and brooks, contain floodplain, dam failure inundation or localized flooding areas.

The plan highlights the importance of balancing future development with the preservation of the community's natural and scenic resources. The preservation of open space and farmland will provide flood storage capacity, which reduces the amount of impervious surfaces in an area, as well as other benefits not directly related to natural hazard mitigation.

National Flood Insurance Program

The Town of Hatfield participates in the National Flood Insurance Program. As of 2006, there were 39 policies in effect in Hatfield for a total of $6,714,900 worth of insurance. The town is not a member of the Community Rating System, which entitles policyholders to a discount on flood insurance premiums. The CRS ranking is based on the steps that a town has taken to control flood losses.

The Community Rating System reduces flood insurance premiums to reflect what a community does above and beyond the National Flood Insurance Program's (NFIP) minimum standards for floodplain regulation. The objective of the CRS is to reward communities for what they are doing, as well as to provide an incentive for new flood protection activities. To participate in the CRS, a community must fill out an

application and submit documentation that shows what it is doing and that its activities deserve at least 500 points. More information including instructions and applications is available at *http://training.fema.gov/EMIWeb/CRS/m3s1main.htm*

Table 5-1
Existing Flood Hazard Mitigation Measures

Type of Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
Subdivision Rules and Regulations	Requires a Preliminary and Definitive Plan for new subdivisions, including location of all wetlands, cultural properties, natural lands, and proposed storm drainage of land. Hatfield's Development Impact Statement (DIS) requires a storm drainage system that is designed to handle a 50 year storm.	Entire town.	Somewhat effective for mitigating or preventing localized flooding of roads and other infrastructure. Somewhat effective for controlling impacts from stormwater runoff.	**Consider adding Flood Prevention and Mitigation to purpose section of the Subdivision Rules and Regulations.** **DIS should identify impacts of the development on the potential for flooding, and include mitigation measures, if deemed necessary by the Planning Board.** **Consider implementing standards to require temporary and permanent erosion control measures for streams and surface water bodies.**

Type of Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
Zoning Bylaws:				
Erosion Control	Requires that the site design, materials, and construction processes be designed to avoid erosion damage, sedimentation or uncontrolled surface water runoff and regulates slope and vegetative cover.	Entire town.	Somewhat effective for controlling surface runoff and erosion problems.	**None.**
Site Plan Review	Requires that plans show storm drainage. Requires that the development process minimize the impact on wetlands, floodplain lands, aquifer recharge areas and town infrastructure.		Somewhat effective for controlling surface runoff and erosion problems.	**None.**
Floodplain Overlay District	Purpose includes to preserve natural flood control characteristics and flood storage capacity of the flood plain and to preserve and maintain the ground water table and water recharge areas within the flood plain.	Areas delineated by the Hatfield Flood Insurance Rate Map	Somewhat effective for minimizing impacts of development on flood levels within flood plain.	**None.**

Type of Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
Open Space Development Allowed by Right	Allows development of land in a subdivision pattern, but preserves open space by requiring that 40% of the land be set aside and protected with either a Conservation Restriction or Agricultural Preservation Restriction.	Entire Town	Effective method of preserving a portion of the Town's flood storage lands.	**None.**
Special Permits	Prior to issuing of a Special Permit, the Planning Board or Zoning Board will consider potential impacts on the natural environment and on neighborhood character and social structures.	Entire town.	Somewhat effective for ensuring that permitted projects do not increase flooding potential.	**Consider adding more specific impacts to address including topographic change, removal of cover vegetation, risk of erosion or siltation and increased storm water runoff.**
Town of Hatfield Open Space and Recreation Plan	Inventories natural features and promotes natural resource preservation in the town, including areas in the floodplain; such as wetlands, aquifer recharge areas, farms and open space, rivers, streams and brooks.	Entire town.	Effective in identifying sensitive resource areas, including floodplains. Encourages forestland and farmland	**Consider implementing the Five-Year Action Plan strategies, particularly those dealing with protection of forests, farmland and floodplain forests.**

Type of Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
			protection, which will help conserve the town's flood storage capacity.	
Participation in the National Flood Insurance Program	As of 2006, there were 39 policies in effect in Hatfield for a total of $6,714,900	Areas identified by the FEMA maps.	Somewhat effective, provided that the town remains enrolled in the National Flood Insurance Program.	**The town should evaluate whether to become a part of FEMA's Community Rating System.**
Beaver Management Strategy	Removing beaver dams, when necessary, can protect the property and lives of Hatfield residents.	Areas within the 100-Year Floodplain.	Would be effective in controlling the negative impacts of flooding caused by beaver activity.	**Develop a Beaver Management Strategy in cooperation with the Hatfield Board of Health**
Water Supply Protection District	Restrict Development in primary and secondary recharge areas of groundwater aquifers and the watershed areas of the Town (Running Gutter Brook) Reservoir and the Mountain Street Reservoir	Municipal Drinking Water Supply	Effective tool for preventing development along sensitive lands and floodplains.	**N/A**
Riverfront Overlay District	Restricts development and land use types along Hatfield's riverfront parcels; regulations same as Floodplain Overlay, but also excludes seasonal camps.	Hatfield Riverfront Overlay District – March 17, 2003	Somewhat effective for minimizing impacts of development on flood levels within flood plain.	**N/A**

Type of Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
Transfer of Development Rights	Allows developers to buy development credits and transfer them to areas that have been selected for their ability to handle greater levels of development. This mechanism protects open space and directs development to existing centers.	Entire Town	Effective tool for preventing the loss of critical flood storage lands.	**N/A**

Severe Snowstorms/Ice Storms

Winter storms can be especially challenging for emergency management personnel even though the storm has been forecast. The Massachusetts Emergency Management Agency (MEMA) serves as the primary coordinating entity in the statewide management of all types of winter storms and monitors National Weather Service (NWS) alerting systems when winter storms are expected.[13]

Management Plans

The CEM Plan for Hatfield lists the following generic mitigation measures for severe winter storms:

- Develop and disseminate emergency public information concerning winter storms, especially material which instructs individuals and families how to stock their homes, prepare their vehicles, and take care of themselves during a severe winter storm.

- Local governments should assume that winter will occur annually and budget fiscal resources with snow management in mind

- Maintain plans for managing all winter storm emergency response activities.

To the extent that some of the damages from a winter storm can be caused by flooding, all of the flood protection mitigation measures described in Table 4-1 can also be considered as mitigation measures for severe snowstorms/ice storms.

The CEM Plan for Hatfield lists the following generic preparedness and response measures for severe winter storms:

- Ensure that warning/notification, and communications systems are in readiness.

- Ensure that appropriate equipment and supplies, (especially snow removal equipment), are in place and in good working order.

[13] Comprehensive Emergency Management Plan for the Town of Hatfield, 2001.

- Review mutual aid agreements.

- Designate suitable shelters throughout the community and make their locations known to the public.

- Implement public information procedures during storm 'warning' stage.

- Prepare for possible evacuation and sheltering of some populations impacted by the storm (especially the elderly and special needs).

Restrictions on Development

There are no restrictions on development that are directly related to severe winter storms.
The Town of Hatfield Subdivision Rules and Regulations set grade limits on streets as part of its Section 4000 Required Improvements, and restrictions on utility placement (Section III. Procedure for the Submission and Approval of Plans, Sub-Section V, Design Standards), which, although not specified as weather hazard mitigation, can serve to minimize accident potential and power loss from severe winter storms:

Other Mitigation Measures

The Hatfield Elementary School, which is designated as an emergency shelter, has a backup power generator to cope with power outages.

State Building Code

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. The Town of Hatfield has measures in place for building inspections.

Table 5-2
Existing Severe Snowstorms/Ice Storms Hazard Mitigation Measures

Type of Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
Subdivision Regulations – Design Standards for Roads	Standards include street grade regulations (.05 to 6 percent maximum).	Entire town.	Effective.	**None.**
Subdivision Regulations – Utilities (electric and telephone)	The town requires all utilities for new subdivisions to be underground.	Entire town.	Somewhat effective for ensuring that utility service is uninterrupted by severe storms in new areas of residential development.	**Work with utility companies to underground existing utility lines in locations where repetitive outages occur.**
State Building Code	The Town of Hatfield has adopted the Massachusetts State Building Code.	Entire town.	Effective.	**None.**

Hurricanes

Of all the natural disasters that could potentially impact Hatfield, hurricanes provide the most lead warning time because of the relative ease in predicting the storm's track and potential landfall. MEMA assumes "standby status" when a hurricane's location is 35 degrees North Latitude (Cape Hatteras) and "alert status" when the storm reaches 40 degrees north Latitude (Long Island).[14] One tropical depression has hit Hatfield; eight tropical storms have passed through the region; three Category 1 hurricanes have struck the region; and two Category 2 hurricanes have struck the region. The flooding associated with hurricanes can be a major source of damage to buildings, infrastructure and a potential threat to human lives. Therefore, all of the flood protection mitigation measures described in Table 4-1 can also be considered hurricane mitigation measures. High winds that oftentimes accompany hurricanes can also damage buildings and infrastructure. The following areas are the most vulnerable to the hazards associated with hurricanes: Town Center.

Town of Hatfield telecommunications facilities bylaw, restrictions on development, and mobile home and State Building Code regulations, as listed below, are equally applicable to wind events such as hurricanes and tornadoes.

Management Plans

The CEM Plan for Hatfield includes the following generic mitigation measures for hurricane planning and response:

- Develop and disseminate emergency public information and instructions concerning hurricane preparedness and safety.

- Community leaders should ensure that Hatfield is enrolled in the National Flood Insurance Program.

- Develop and enforce local building codes to enhance structural resistance to high winds and flooding. Build new construction in areas that are not vulnerable to direct hurricane effects.

- Maintain plans for managing all hurricane emergency response activities.

[14] Comprehensive Emergency Management Plan for the Town of Hatfield

The CEM Plan for Hatfield includes the following generic preparedness and response measures for hurricanes:

- Ensure that warning/notification systems and equipment is ready for use at the 'hurricane warning' stage.
- Review mutual aid agreements.
- Designate suitable wind and flood resistant shelters in the community and make their locations known to the public.
- Prepare for coordination of evacuation from potentially impacted areas including alternate transportation systems and locations of special needs facilities.

Evacuation Options

All shelters in Hatfield are designed to accommodate victims of all hazards.

Zoning

- **5.4 SPECIAL PERMITS WITH SITE PLAN APPROVAL**
- Section 5.4.7 Site Plan Approval Decisions and Criteria
- 5.4.7.9 Electric lines, telecommunications lines and other such utilities shall be underground

Restrictions on Development

The only restrictions on development that are wind-related are the provisions in the zoning bylaw related to the burying of utilities when a special permit requires site plan review.

Mobile Homes

According to the Town of Hatfield's Zoning Bylaws, mobile homes are not allowed in Hatfield. However, a pre-existing trailer park is located in town and future planning efforts should take into consideration any potential impacts of a natural hazard on residents of this trailer park.

State Building Code

For new or recently built structures, the primary protection against wind-related damage is construction that adheres to the State Building Code, which, when followed, results in buildings that withstand high winds. The Town of Hatfield has measures in place to guarantee building inspection services are provided.

Tornadoes

Worcester County and areas just to its west, including portions of Hampshire County, have been dubbed the "tornado alley" of the state because the majority of significant tornadoes in Massachusetts's weather history have occurred in that region.[15] According to the *Institute for Business and Home Safety,* the wind speeds in most tornadoes are at or below design speeds that are used in current building codes.[16] Like earthquakes, the location and extent of potential damaging impacts of a tornado are completely unpredictable. Most damage from tornadoes comes from high winds that can fell trees and electrical wires, generate hurtling debris and, possibly, hail.

Management Plans

The CEM Plan for Hatfield includes the following generic mitigation measures for tornado planning and response:

- Develop and disseminate emergency public information and instructions concerning tornado safety, especially guidance regarding in-home protection and evacuation procedures, and locations of public shelters.

- Strict adherence should be paid to building code regulations for all new construction.

- Maintain plans for managing tornado response activities. Refer to the non-institutionalized, special needs and transportation resources listed in the Resource Manual.

The CEM Plan for Hatfield includes the following generic preparedness and response measures for tornadoes:

[15] Comprehensive Emergency Management Plan for the Town of Hatfield, 2006
[16] *www.ibhs.org.*

- Designate appropriate shelter space in the community that could potentially withstand tornado impact.

- Periodically test and exercise tornado response plans.

- Put Emergency Management on standby at tornado 'watch' stage.

Evacuation Plans

All shelters in Hatfield are designed to accommodate victims of all hazards.

Table 5-3
Existing Hurricane & Tornado Hazard Mitigation Measures
(Wind-related)

Type of Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
Zoning regulations for Tele-communications Facilities	Should the Town of Hatfield adopt a zoning bylaw that applied to wireless communications facilities, the Town can regulate the amount of space such a structure must have should it fail.	Entire town.	Effective.	**Consider adopting a wireless communications facilities bylaw.**
Subdivision Regulations – Utilities (electric and telephone)	The town requires all utilities for new subdivisions to be underground.	Entire town.	Somewhat effective for ensuring that utility service is uninterrupted by severe storms in new areas of residential development.	**Work with utility companies to underground new utility lines in general and existing utility lines in locations where repetitive outages occur.**

Type of Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
Zoning Regulations regarding new mobile homes	Mobile homes are an allowed use in all districts.	Entire town.	Does not address the potential for wind-related damage to mobile homes.	**None.**
State Building Code	The Town of Hatfield has adopted the Massachusetts State Building Code.	Entire town.	Effective.	**None.**
Debris Management Plan	A debris management plan could be developed.[17]	Entire town.	Effective.	**Consider participation in the creation of a Regional Debris Management Plan.**
Shelters	All shelters in Hatfield are designed to accommodate victims of all hazards.	Entire town.	Somewhat effective.	**None.**

[26] Natural disasters can precipitate a variety of debris, including trees, construction and demolition materials and personal property. After a natural disaster, potential threats to the health, safety and welfare of impacted citizens can be minimized through the implementation of a debris management plan. Such a plan can be critical to recovery efforts after a disaster, including facilitating the receipt of FEMA funds for debris clearance, removal and disposal. Additional information is available at *http://www.fema.gov/rrr/pa/dmgbroch.shtm.*

Wildfires/Brushfires

Hampshire County and Hampden Counties have approximately 469,587 acres of forested land, which accounts for 63 percent of the total land area. Forest fires are therefore a potentially significant issue. In Hatfield approximately 48 percent of the town's total land area is in forest, or about 5,140 acres, and is therefore at risk of fire. In 2005 here were only four fires reported in Hatfield according to the *2004 Report of the Massachusetts Annual Fire Incident Reporting System*.

Massachusetts has approximately 350,000 acres of state owned forested wildlands. An additional 2.7 million acres are privately owned. Each year an average of 6,000 fires burn up to 9,000 acres. The threat from wildfire is particularly serious where residential, and commercial development, major transportation routes, power/gas lines, and other infrastructure intersect. Thus, a fire that once might have been allowed to burn itself out with a minimum of fire fighting or containment must now be fought to prevent not only fire damage to surrounding homes and commercial areas, but also to prevent smoke threats to health and safety in these areas.

Despite Massachusetts' extensive regulations governing fire prevention, control, and suppression, there are still specific areas which are especially vulnerable to fire hazards. These include rural areas where personnel and specialized equipment are scarce, as well as the wild land/urban interface areas.

Management Plans

A. Mitigation

- Promote fire safety measures such as fire-safe landscaping and construction practices to the public and business communities.

B. Preparedness

- Restrict outside burning etc. based on moisture levels, fuel supply conditions such as drought.
- Identify high vulnerability or problem areas.

Regulatory Measures

Burn Permits: The Hatfield Fire Department issues burn permits to town residents with the following stipulations: the burn permit must be issued on the day that the burn has been scheduled, the forecast cannot call for a windy day, and a burn permit will not be issued of the season has been particularly dry.

Subdivision Review: The following measures are required in Hatfield's Land Use Regulations for the Development Impact Statement for a subdivision and/or a special permit application:

- Appendix A: Development Impact Statement [The impact of the proposed subdivision is to be described according to the following criteria…]:

  Section III Support Systems

  f. Fire Protection – Discuss the type and capacity of fuel storage facilities, location of storage areas for hazardous substances, special requirements, and distance to fire station.

Section 5.3.5 Procedures for Review and Referral of SPA

C. Referral to Town Departments

1. The Planning Board shall within ten (10) days of receiving a Special Permit/Site Plan Approval/Site Plan Review application, transmit one copy each to: the Building Inspector, Board of Health, Conservation Commission, Industrial Development Commission, Fire Department, Police Department, and Board of Selectmen, who shall review the application and submit their recommendations and comments to the Planning Board concerning:

a. the adequacy of the data and methodology used by the applicant to determine the impacts of the proposed developments;

b. the impacts of the proposed development, and;

c. recommended conditions or remedial measures to accommodate or mitigate the expected impacts of the proposed development

Public Education/Outreach

The Hatfield Fire Department has an active outreach program that includes Safety Fairs, Senior Citizen fire awareness and fire prevention education within the Hatfield school system.

Table 5-4
Existing Wildfire/Brushfire Hazard Mitigation Measures

Type of Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
Burn Permits	Residents obtain burn permits on the day of the proposed burn, and permits can be approved or denied according to the local weather conditions.	Entire town.	Effective.	**None.**
Subdivision Review:	The Fire Department is involved in the review of subdivision plans.	Entire town.	Effective.	**None.**
Fire Safety	The Town of Hatfield has enough water capacity to meet the needs of its residents with its surface water sources; however, the Town's water mains are small and the Fire	Entire town.	Effective.	**None.**

	Department pulls from 4" water mains, which limits water pressure.			
Public Education/Outreach	Hatfield's Fire Department has an outreach program for its residents. The Fire Department conducts a safety fair and works closely with the Town's schools.	Entire town.	Effective.	**None.**

Earthquakes

Although there are five mapped seismological faults in Massachusetts and two in Hampshire and Hampden Counties, there is no discernable 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 to plan for. Most buildings and structures in the state were constructed without specific earthquake resistant design features.

Earthquakes can involve several potentially devastating secondary effects including:

- The collapse of buildings, bridges, roads, dams, and other vital structures;
- Rupture of utility pipelines;
- Flooding caused by dam failure;
- Landslides;
- Major transportation accidents, (railroad, chain highway crashes, aircraft, and marine);
- Extended power outage;
- Fire and/or explosion;
- HAZMAT accident; and,
- Water contamination.

Management Plans

The Hatfield CEM Plan lists the following generic mitigation measures for earthquakes:

- Community leaders in cooperation with Emergency Management Personnel should obtain local geological information and identify and assess structures and land areas that are especially vulnerable to earthquake impact and define methods to minimize the risk.

- Strict adherence should be paid to land use and earthquake resistant building codes for all new construction.

- Periodic evaluation, repair, and/or improvement should be made to older public structures.

- Emergency earthquake public information and instructions should be developed and disseminated.

- Earthquake drills should be held in schools, businesses, special care facilities, and other public gathering places.

The Hatfield CEM Plan lists the following generic preparedness measures for earthquakes:

- Earthquake response plans should be maintained and ready for immediate use.

- All equipment, supplies and facilities that would be needed for management of an earthquake occurrence should be maintained for readiness.

- Emergency Management personnel should receive periodic training in earthquake response.

- If the designated Emergency Operations Center (EOC) is in a building that would probably not withstand earthquake impact, another building should be chosen for an earthquake EOC.

- Mass Care shelters for earthquake victims should be pre-designated in structures that would be most likely to withstand earthquake impact.

- It is assumed that all special needs facilities could be affected to some extent by earthquake effects there fore preparedness measures should be in place to address the needs of all facilities listed in the *Resource Manual* (Vulnerable populations and Areas).

- Most likely the entire population of the community will be affected by a seismic event. Estimate the maximum peak population affected, considering peak tourism, special event populations, and work hours.

Evacuation Options

All shelters in Hatfield are designed to accommodate victims of all emergencies.

The maximum peak population affected by an earthquake is estimated at 4,400 people.

State Building Code

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, 6th 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. According to the 2000 U.S. Census, 65 percent of the housing in Hatfield was built before 1970. In addition, built areas underlain by artificial fill, sandy or clay soils are particularly vulnerable to damage during an earthquake.

Restrictions on Development

There are no seismic-related restrictions on development.

Table 5-5
Existing Earthquake Hazard Mitigation Measures

Type of Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
State Building Code	The Town of Hatfield has adopted the 6th Edition of the State Building Code.	Entire town but applies to new construction only.	Effective for new buildings only.	**Evaluate older structures to be used as shelters and the Elementary School to determine if they are earthquake resistant.**
Debris Management Plan	A debris management plan could be developed.	Entire town.	Effective.	**Consider participation in the creation of a Regional Debris Management Plan.**
Shelters	Hatfield's shelters are designated as emergency shelters for all occasions.	Entire town.	Effective.	**Consider designating a specific shelter for this hazard.**

Dam Failures

Dam failure is a highly infrequent occurrence, but a sever incident could prove deadly. Since 1984, three dams have failed in or very near Massachusetts, and two have come very close t failing. One of these dam failures resulted in death.

There are over 2,500 dams in Massachusetts, two of which are in Hatfield. Statewide, the Army Corps of Engineers in conjunction with the Department of Environmental Management has classified over 50 of the state's dams as being "structurally unsafe". Three hundred dams, including over 40 of the "unsafe" dams, are designated as 'high hazard' dams. High hazard dams are those located upstream of an area which would probably suffer property damage and fatalities if the dam were to fail. Many of the dams in the state were built in the 19th Century during the early Industrial Revolution; some are even older and date back to the late 18th Century.

The Hatfield CEM Plan states that there are three categories of dam failure or overspill and that action should be taken according to hazard rating:

Type 1: Slowly developing condition

- Activate EOC

- Activate all communication networks
    - Establish communications with Command Post
    - On a 24-hour basis.

- Release public information

- Notify
    - MEMA Region Headquarters
    - American Red Cross
    - Downstream communities

- Review Plans for evacuation and sheltering
    - Evacuation
        - Routes
        - Notification
    - Sheltering
        - Availability and capacity
        - Food, supplies and equipment

        - Shelter owners and managers
        - Other communities (if out of town sheltering is required)

- Require "Stand By" status of designated emergency response forces.

Type 2: Rapidly developing condition

- Establish a 24-hour communications from dam site to EOC.
- Assemble, brief and assign specific responsibilities to emergency response forces.
- Release public information.
- Obtain and prepare required vehicles/equipment for movement.
- Prepare to issue warning.

Type 3: Practically instantaneous failure

- Issue warning
- Commence immediate evacuation.
- Commit required resources to support evacuation.
- Activate shelters or coordinate activation of shelters located outside the community.
- Notify:
    - MEMA Region Headquarters
    - Red Cross
- Initiate other measures as required to protect lives and property.

Management Plans and Regulatory Measures

The Hatfield CEM Plan contains the following generic mitigation measures for dam failure:

- Develop and conduct public education programs concerning dam hazards.

- Maintain up-to-date plans to deal with threat and actual occurrence of dam over-spill or failure.

- Emergency Management and other local government agencies should familiarize themselves with technical data and other information pertinent to the dams, which impact Hatfield. This should include determining the probable extent and seriousness of the effect to downstream areas.

- Dams should be inspected periodically and monitored regularly.

- Repairs should be attended to promptly.

- As much as is possible burdens on faulty dams should be lessened through stream re-channeling.

- Identify dam owners.

- Determine minimum notification time for down stream areas.

The Hatfield CEM Plan contains the following generic preparedness measures for dam failure:

- Pre-place adequate warning/notification systems in areas potentially vulnerable to dam failure impact.

- Develop procedures for monitoring dam site conditions at first sign of any irregularity that could precipitate dam failure.

- Identify special needs populations, evacuations routes, and shelters for dam failure response.

- Have sandbags, sand, and other items to reinforce dam structure or flood proof flood prone areas.

Evacuation Options

The Hatfield CEM Plan identifies the D.F. Riley Gristmill Dam as the one dam in town with the potential to have an adverse impact on life and property. The Town estimates that up to 350 individuals live downstream of

the dam. The Hatfield CEM Plan does not note any potential for dam hazards emanating from dams upstream of the town.

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.

Dam Inspections

The DCR requires that dams rated as Low Hazards are inspected every ten (10) years and dams that are rated as Medium/Significant Hazards are inspected every five (5) years. High Hazard dams must be inspected every two (2) years. IN 2005, DCR's rules and regulations shifted the onus for dam inspections over to the state's dam owners. For this reason, it is crucial for the town to know whether or not the owner's have Hatfield's two dams have the resources and will to inspect their property.

Zoning

There is no mention made regarding the construction of new dams in the Town of Hatfield zoning or subdivision regulations.

Restrictions on Development

There are no town restrictions on dam locations. The DCR issues permits for new dams and does have the authority to deny a permit if it is determined that the design and/or location of the dam is not acceptable.

Table 5-6
Existing Dam Failure Hazard Mitigation Measures

Type of Existing or Proposed Protection	Description	Area Covered	Effectiveness	Potential Changes
Permits required for new dam construction	State law requires a permit for the construction of any dam.	Entire town.	Effective. Ensures dams are adequately designed.	**None.**
Dam Inspections	DCR has an inspection schedule that is based on the hazard rating of the dam (low, medium, high hazard).	Entire town.	Low. The DCR does not have adequate staff and resources to inspect dams according to the required schedule.	**Develop a plan for contacting dam owners and informing them of their obligations and designate a staff coordinator.** **Identify sources of funding for dam safety inspections.** **Incorporate dam safety into development review process.**
Evacuation Plans	Comprehensive evacuation plans would ensure the safety of the citizens in the event of dam failure.	Inundation areas in town.	None.	**None.**

Drought

Drought is a normal part of virtually every climate on the planet, even rainy ones. The severity of a drought depends not only on its duration, intensity and geographic extent, but also on the regional water supply demands made by human activities and vegetation. The multi-dimensional nature of this hazard makes it difficult to define a drought and to perform a comprehensive risk assessment. The impacts of drought hit hardest when people place too high a demand on the water supply. Unrealistic expectations often contribute to overestimating the water supply. Drought can be mitigated by carefully balancing domain with supply.

Severe droughts in Massachusetts, which coincided with periods of extreme heat, occurred in 1961-1967, 1980-1981 and 1987-1989. The 1987-89 droughts cost $39 billion in estimated damages to agricultural crops, wildlife, livestock, land values, water quality and the economy in the Central and Eastern United States.

Management Plans

The Hatfield CEM Plan lists the following generic mitigation measures for drought the town can commit to:

- Seek to balance demand on water supply through land use, zoning and other tools.
- Encourage water conservation and water control measures to ease demand on water supply.
- Improve efficiency and capacity of the water supply system, including lead detection and repair.

The Hatfield CEM Plan lists the following generic preparedness measures for drought:

- Identify potential emergency water sources, such as a purchase from adjoining communities if available.
- Keep abreast of drought forecasts issued by the State Drought Task Force

- Encourage businesses and other bulk users to develop water conservation and shortage plans.

Options

Hatfield has implemented a series of policies that can lessen the town's overall demand on its water supply at both peak and normal periods of demand. Customer metering has been applied to 95 percent of the Hatfield Water Department's coverage area, which can allow residents to gauge their water usage.

Te Town has an active Drought and Emergency Plan, which contains policies and measures for how to cope with water shortages. To prevent water shortages, the town adopted aquifer protection regulations in 1990, which will help to limit development around the town's surface water supply, the town's main source of water; and followed suit in 2002 with wellhead protection regulations for the West Hatfield Well and the Omasta Well.

State Permitting

The Water Management Act (M.G.L. c 21G) was passed in 1986 to protect surface and groundwater supplies. Any source that pumps 100,000 gallons per day, 36.5 million gallons per year, or uses nine million gallons in a three month period must have a WMA permit. Operators of existing sources were given until 1988 to register their source at the withdrawal levels that were in existence at the time the WMA passed and, since then, any new source or increase in an exiting registered/permitted source must have a WMA permit before it can begin to operate.

The Department of Environmental Protection is responsible for enforcing the rules and regulations of the Water Management Act, and this makes DEP the permitting authority for new sources as well as the regulatory agency for all existing sources. If the Town wishes to have any new sources, it must first conduct a pump test to determine the safe yield for a proposed source. Based upon the safe yield, DEP caps the withdrawal limit from that source and it is up to the town to measure the rate of withdrawal and file this data in an Annual Statistics Report

Restrictions on Development

Floodplain and watershed protection overlays limit development within areas that contribute to aquifer recharge zones and surface water

supplies. Furthermore, Title V regulations limit the placement of houses in lands that are unsuitable for water and septic infrastructure.

6 – INCORPORATION

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

- *Hatfield Comprehensive Emergency Management Plan* (particularly the Critical Infrastructure Section) – the Critical Infrastructure section was used to identify those infrastructure components in Hatfield that have been identified as crucial to the function of the Town; also, this resource was used to identify special needs populations as well as potential emergency shortcomings.

- *The Hatfield Open Space and Recreation Plan* – this Plan was used to identify the natural context within which the Town mitigation planning would take place. This proved useful insofar as it identified water bodies, rivers, streams, infrastructure components (i.e. water and sewer, or the lack thereof), as well as population trends. This was incorporated to ensure that the Town's mitigation efforts would be sensitive to the surrounding environment. During the OSRP update, the Town can use the work of the PDM Plan to incorporate identified hazard areas into open space and recreation planning. This could either take the form of acquiring parcels of land that are currently un-developed, but situated within an identified hazard area, as permanent open space, thereby minimizing the likelihood that critical infrastructure components will be constructed in an area prone to damage from natural hazards.

- *The Hatfield Community Development Plan*—this Plan was used to identify any action items that might prove successful, based on previous planning efforts.

- *Hatfield's Zoning Bylaw* - The Town's Zoning Bylaw 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.

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

6 – FUTURE MITIGATION STRATEGIES

Goal Statements and Action Items

As part of the natural hazards mitigation planning process that was undertaken by the Hatfield Hazard Mitigation Planning Committee, existing gaps in protection and possible deficiencies were identified and discussed. The Committee then developed general Goal Statements and Action Items that, when implemented, will help to reduce risks and future damages from natural hazards. The Goal Statements, Action Items, Town department(s) responsible for implementation, and the proposed timeframe for implementation for each category of natural hazard are described below.

Several of the Action Items have multiple benefits because, if implemented, these Action Items will mitigate or prevent damages from more than one type of natural hazard. For example, updating the Subdivision Regulations to require new utility lines be placed underground will prevent property damage and loss of service in the event of high winds (tornado or hurricane) or severe snow and ice storms.

General Mitigation Action Items

Goal Statement: To mobilize Hatfield's municipal resources for the purpose of reducing the likelihood of damage to life and property from all natural hazards that Hatfield might experience.

Action Item: Maintain an Emergency Management Planning Committee.

Responsible Department/Board: Emergency Management Director, Board of Selectmen

Proposed Completion Date: On-going

Action Item: Inventory supplies at existing shelters and develop a needs list and storage requirements. Establish arrangements with local or neighboring vendors for

supplying shelters with food and first aid supplies in the event of a long-term natural disaster. Distribute an informational pamphlet that informs citizens that they must bring three-day supply of food and water with them.

Responsible Department/Board: Emergency Management Planning Committee, Hatfield Elementary Principal, Smith Academy Principal

Proposed Completion Date*:* 2008

Action Item: Fund notification system that includes Reverse 911.[18]

Responsible Department/Board: Board of Selectmen, Police & Fire Departments, Hampshire Regional Emergency Planning Committee

Proposed Completion Date: 2007

Action Item: Expand Emergency Preparedness Booklet to include all households, and use CTY system as notification outlet.

Responsible Department/Board: Emergency Management Director, Police and Fire Departments, Council on Aging.

Proposed Completion Date: 2007

Flooding

Overall, the Town of Hatfield's existing land use regulations regulate development in the floodplain or reduce localized flooding events. Long-range planning documents such as the Town's Open Space and Recreation Plan also addresses flood prevention and mitigation either directly or indirectly in the goals and objectives listed in these documents. However, the Town is not yet NPDES Phase II compliant.

[18] In essence, Reverse 911 is a Windows compatible software program, which uses GIS and database technology to create call lists of phone numbers within a specified geographical area and provide prerecorded messages to the residents at those numbers. Call lists can be created ahead of time or as emergency or other situations arise. The system is voluntary and it is a simple matter to remove those residents who do not wish to participate. Cost of the system varies depending on a number of factors. The Town of Green Tree, Pennsylvania was able to subsidize their purchase of a Reverse 911 system through a $10,000 Community Development Block Grant.

Goal Statement: To take actions that are designed to lessen the impact of a flood in Hatfield and implement mitigation actions that will reduce the loss of life, damage to property, and the disruption of governmental services and general business activities due to flooding.

Action Item: Add Flood prevention and mitigation to the purpose section of the Subdivision Rules and Regulations.

Responsible Department/Board: Planning Board

Proposed Completion Date: 2007

Action Item: Add requirements to identify impacts that a proposed development could have on the potential for flooding, and include mitigation measures, if deemed necessary by the Planning Board to the Environmental Impact Statement.

Responsible Department/Board: Planning Board

Proposed Completion Date: 2007

Action Item: Revise all necessary general and zoning bylaws to make the Town of Hatfield NPDES Phase II compliant on time.

Responsible Department/Board: Planning Board, Conservation Commission, Board of Selectmen, Department of Public Works

Proposed Completion Date: 2008

Action Item: In regards to the Hatfield Open Space and Recreation Plan, implement the Five-Year Action Plan strategies, particularly those dealing with protection of forests and farmland.

Responsible Department/Board: Conservation Commission, Planning Board, and the Board of Selectmen

Proposed Completion Date: Ongoing

Action Item: Become a part of FEMA's Community Rating System.

Responsible Department/Board: Board of Selectmen, Emergency Management Director

Proposed Completion Date: 2009

Action Item: Develop a Beaver Management Strategy.

Responsible Department/Board: Board of Health, Fire Department, Highway Department, Police Department, Conservation Commission.

Proposed Completion Date: 2009

Action Item: Receive Hazard Mitigation Grant funding to restore the toe of the Hatfield Dike.

Responsible Department/Board: Board of Selectmen, DPW, and Emergency Management Director

Proposed Completion Date: 2012

Action Item: Identify all Pre-FIRM structures throughout Town that need to be elevated above the base-flood elevation.

Responsible Department/Board: Building Inspector, Fire Department

Proposed Completion Date: 2010

Action Item: Establish a program to identify and clean-up properties within flood zones with junk and hazardous materials.

Responsible Department/Board: Building Inspector, Board of Health

Proposed Completion Date: 2010

Action Item: Build structures/measures to prevent flooding of the South Street and Valley Street areas.

Responsible Department/Board: Highway Department, Board of Selectmen

Proposed Completion Date: 2011

Action Item: Seek funding through the Hazard Mitigation Grant Program (HMGP) for the replacement of damaged culverts throughout Town, especially those on King Street.

Responsible Department/Board: Board of Selectmen, Highway Department

Proposed Completion Date: 2008

Severe Snowstorms/Ice Storms

Goal Statement: Take actions that reduce the impact of Sever Snow and Ice Storms on Hatfield. Hatfield's location in New England makes severe winter storms frequent, but the Town will implement mitigation actions that minimize the loss of life, damage to property, damage to infrastructure, and the disruption of governmental services and general business activities from severe snow and ice storms.

Action Item: Fund CTY to direct residents, including special needs populations, to water, information, shelter, and food stores in Town in the event of a severe winter storm.

Responsible Department/Board: Emergency Management Committee, Board of Selectmen

Proposed Completion Date: 2008

Hurricanes, Microbursts and Tornadoes

The Action Items listed above, under flooding, address the flooding that can result from a hurricane.

Goal Statement: To mitigate the impacts of high-wind events in Hatfield through adopting policies and measures that will lessen loss of life, damage to property, damage to infrastructure, and the disruption of governmental services and general business activities that would accompany the high winds associated with hurricanes and tornadoes/Microbursts.

Action Item: Fund notification system that includes Reverse 911.[19]

Responsible Department/Board: Board of Selectmen, Police & Fire Departments, Hampshire Regional Emergency Planning Committee

Proposed Completion Date: 2007

Wildfires/Brushfires

Goal Statement: To mitigate the impacts of large wildfires on Hatfield through minimizing the urban-rural interface with the goal of minimizing the loss of life, damage to property, damage to infrastructure, and the disruption of governmental services and general business activities due to wildfires/brushfires.

Action Items: Develop and distribute an educational pamphlet on fire safety and prevention.

Responsible Department/Board: Fire Department

Proposed Completion Date: On-going

Earthquakes

Goal Statement: To make structural and policy changes prior to a large earthquake to mitigate the impacts of an earthquake on the Town of Hatfield with the intent of minimizing loss of life, property damage, damage to infrastructure, and the disruption of governmental services and general business activities due to earthquakes.

Action Item: Evaluate all Mass Care Shelters and Reception Centers to determine if they are earthquake resistant.

Responsible Department/Board: Building Inspector, Emergency Management Director

[19] In essence, Reverse 911 is a Windows compatible software program, which uses GIS and database technology to create call lists of phone numbers within a specified geographical area and provide prerecorded messages to the residents at those numbers. Call lists can be created ahead of time or as emergency or other situations arise. The system is voluntary and it is a simple matter to remove those residents who do not wish to participate. Cost of the system varies depending on a number of factors. The Town of Green Tree, Pennsylvania was able to subsidize their purchase of a Reverse 911 system through a $10,000 Community Development Block Grant.

Proposed Completion Date: 2007

Action Item: Ensure that all identified shelters have sufficient back-up utility service and potable water in the event of primary power failure.

Responsible Department/Board: Building Inspector, Emergency Management Director

Proposed Completion Date: 2007

Drought

Goal Statement: To minimize the loss of life, damage to property, and the disruption of governmental services and general business activities due to drought.

Action Item: Update a Water Conservation Plan for the Town.

Responsible Department/Board: Board of Selectmen, Conservation Commission

Proposed Completion Date: 2011

Man-Made Hazards/Hazardous Materials

Goal Statement: To minimize the loss of life, damage to property, and the disruption of governmental services and general business activities due to man-made hazards/hazardous materials.

Action Item: Establish an Action Plan that addresses toxic releases at EPA Tier II locations.

Responsible Department/Board: Hampshire Regional Emergency Planning Committee

Proposed Completion Date: 2009

Action Item: Establish an Action Plan that addresses toxic releases along transportation routes.

Responsible Department/Board: Emergency Management Director, Emergency Planning Committee

Proposed Completion Date: 2009

Prioritized Implementation Schedule

Summary of Critical Evaluation
The Hatfield Hazard Mitigation Planning Committee reviewed each of the actions identified above, as well as existing mitigation strategies using the following factors to prioritize mitigation projects:

- Ability to reduce disaster damage
- Social acceptability
- Ability to complete or be combined w/other actions
- Technical feasibility / potential success
- Impact on the environment
- Administrative workability
- Ability to meet regulations
- Political acceptability
- Ability to save or protect historic structures
- Legal implementation
- Ability to meet other community objectives
- Economic impact
- The duration of its implementation period
- Environmental compatibility

Project Prioritization

The Hatfield Hazard Mitigation Planning Committee created the following prioritized schedule for implementation of prioritized items. The table lists items in order of priority.

Note: As additional information becomes available regarding project leadership, timeline, funding sources, and/or cost estimates, the Plan will be reviewed and amended accordingly.

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PRIORITIZED IMPLEMENTATION SCHEDULE
(ACTION PLAN)
IMPLEMENTATION STRATEGY FOR PRIORITY MITIGATION ACTIONS

The Hatfield Hazard Mitigation Planning Committee created the following prioritized schedule for implementation:

MITIGATION ACTION	RESPONSIBLE DEPARTMENT/BOARD	PROPOSED COMPLETION DATE	POTENTIAL FUNDING SOURCE(S)	ESTIMATED COST	PRIORITY
Allocate funding for a Reverse 911 call system.	Board of Selectmen, Police and Fire Departments, Emergency Planning Committee	2007	Town Staff/Revenue	$16,000	High
Evaluate all Mass Care Shelters and Reception Centers to see if they are earthquake resistant	Building Inspector, Emergency Management Director	2007	Town Staff	N/A	Medium
Add flood impact analysis to the Environmental Impact Statement	Planning Board	2007	Town Staff/Volunteers	N/A	Low
Extend emergency preparedness booklet to all households, use CTY as outlet	EMD, Police and Fire Departments, Council on Aging	2007	Town Staff/Volunteers	N/A	Low
Add flood prevention and mitigation to purpose statement for subdivision rules and regulations	Planning Board	2007	Town Staff/Volunteers	N/A	Low
Ensure shelters have back-up power and water	Building Inspector, EMD	2007	Town Staff	To be Determined	High
Inventory supplies at existing shelters and obtain written Memoranda of Agreements with local businesses for food and medical supplies	Emergency Planning Committee, Hatfield Elementary Principal, Smith Academy Principal	2008	Town Staff/Volunteers	N/A	High
Make Hatfield NPDES Phase II compliant on time.	Conservation Commission, Planning Board, Board of Selectmen, Department of Public Works	2008	Town Staff/Volunteers	To be Determined	Very High

Replacement of Undersized Culverts throughout Town	Board of Selectmen, Highway Department	2008	HMGP	To be Determined	Very High
Become a part of FEMA's Community Rating System	Board of Selectmen, EMD	2009	Town Staff	N/A	High
Develop a Beaver Management Strategy	Board of Health, Fire Department, Highway Department, Police Department, Conservation Commission.	2009	Town Staff/Volunteers	N/A	High
Develop an action plan for toxic chemical releases along transit routes	EMD, LEPC	2009	Town Staff	N/A	High
Establish and Action Plan that Addresses Chlorine Releases at EPA Tier II Locations	Hampshire Regional Emergency Planning Committee	2010	Town Staff/Volunteers	N/A	High
Identify all Pre-FIRM structures throughout Town that need to be elevated above the base-flood elevation	Building Inspector, Fire Department	2010	Town Staff Volunteers	N/A	High
Establish a program to identify and clean-up properties within flood zones	Building Inspector, Board of Health	2011	Town Staff	N/A	Medium
Repair toe of Hatfield Dike	EMD, DPW, Board of Selectmen	2012	Town Staff, HMGP, Army Corps, Capital Budget	$200,000	High
Maintain Emergency Management Planning Committee	Board of Selectmen, EMD	On-going	Town Staff/Volunteers	N/A	High
Implement Open Space and Recreation Plan	Conservation Commission, Planning Board, Board of Selectmen	On-going	Town Staff/Volunteers	To Be Determined	High
Develop and distribute an educational pamphlet on fire safety and prevention.	Fire Department	On-going	Town Staff/Volunteers	N/A	Medium

7 – PLAN ADOPTION & IMPLEMENTATION

Plan Adoption

Upon completion, copies of the Draft Local Hazards Mitigation Plan for the Town of Hatfield were distributed to the town boards for their review and comment. A public meeting was held by the Hatfield Select Board to present the draft copy of the Hatfield Local Natural Hazards Mitigation Plan to town officials and residents and to request comments from this committee and the general public. The Natural Hazards Mitigation Plan was formally approved by the Select Board and forwarded to the Massachusetts Emergency Management Agency (MEMA) and the Federal Emergency Management Agency (FEMA) for their approval.

Plan Implementation

The implementation of the Hatfield Local Natural Hazards Mitigation Plan will begin following its formal adoption by the Hatfield Select Board and approval by MEMA and FEMA. Specific town departments and boards will be responsible for ensuring the development of policies, bylaw revisions, and programs as described in Sections 5 and 6 of this plan. The Hatfield Natural Hazards Planning Committee will oversee the implementation of the plan.

Plan Monitoring and Evaluation

The measure of success of the Hatfield Local Natural Hazards Mitigation Plan will be the number of identified mitigation strategies implemented. In order for the town to become more disaster resilient and better equipped to respond to natural disasters, 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 Hatfield Natural Hazards Planning 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. All meetings will be publicized and open to the public. 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. At a minimum, the

committee will review and update the plan every five years, beginning in the fall of 2012. The meetings of the committee will be organized and facilitated by the Emergency Management Director or the Hatfield Select Board.

CERTIFICATE OF ADOPTION

TOWN OF HATFIELD, MAASSACHUSETTS

BOARD OF SELECTMEN

A RESOLUTION ADOPTING THE HATFIELD

HAZARD MITIGATION PLAN

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

WHEREAS, several public planning meetings were held between October 2006 and May 2007 regarding the development and review of the Hatfield Hazard Mitigation Plan; and

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

WHEREAS, a duly-noticed public hearing was held by the Hatfield Board of Selectmen on _____, 2007 to formally approve and adopt the Hatfield Hazard Mitigation Plan.

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

ADOPTED AND SIGNED this [DATE]

_____

Darryl Williams, Hatfield Board of Selectmen

_____

Patrick Gaughan, Hatfield Board of Selectmen

_____

Jan Adamski, Hatfield Board of Selectmen

ATTEST

APPENDICES

Appendix A

TECHNICAL RESOURCES

1) Agencies

Massachusetts Emergency Management Agency (MEMA).....508/820-2000
Hazard Mitigation Section 617/626-1356
Federal Emergency Management Agency (FEMA) 617/223-4175
MA Regional Planning Commissions:
Berkshire Regional Planning Commission (BRPC)……..413/442-1521
Cape Cod Commission (CCC)……...508/362-3828
Central Massachusetts Regional Planning Commission (CMRPC)……...508/693-3453
Franklin Regional Council of Governments (FRCOG)……..413/774-3167
Martha's Vineyard Commission (MVC)……508/693-3453
Merrimack Valley Planning Commission (MVPC)……...978/374-0519
Metropolitan Area Planning Council (MAPC)……...617/451-2770
Montachusett Regional Planning Commission (MRPC)……978/345-7376
Nantucket Planning and Economic Development Commission (NP&EDC)…….508/228-7236
Northern Middlesex Council of Governments (NMCOG)……978/454-8021
Old Colony Planning Council (OCPC)……..508/583-1833
Pioneer Valley Planning Commission (PVPC)……..413/781-6045
Southeastern Regional Planning and Economic Development District (SRPEDD)……..508/823-1803
MA Board of Building Regulations & Standards (BBRS)……617/227-1754
MA Coastal Zone Management (CZM)……617/626-1200
DCR Water Supply Protection……..617/626-1379
DCR Waterways……617/626-1371
DCR Office of Dam Safety……...508/792-7716
DFW Riverways……617/626-1540
MA Dept. of Housing & Community Development…….617/573-1100
Woods Hole Oceanographic Institute……508/457-2180
UMass-Amherst Cooperative Extension…….413/545-4800
National Fire Protection Association (NFPA)……...617/770-3000
New England Disaster Recovery Information X-Change (NEDRIX – an association of private companies & industries involved in disaster recovery planning)……..781/485-0279
MA Board of Library Commissioners……...617/725-1860
MA Highway Dept, District 2……413/582-0599
MA Division of Marine Fisheries……..617/626-1520
MA Division of Capital & Asset Management (DCAM)…….617/727-4050
Massachusetts Association of Regional Planning Agencies (MARPA)……...413/781-6045
University of Massachusetts/Amherst……...413/545-0111
Natural Resources Conservation Services (NRCS)……...413/253-4350
MA Historical Commission……...617/727-8470
U.S. Army Corps of Engineers……..978/318-8502
Northeast States Emergency Consortium, Inc. (NESEC).....781/224-9876
US Department of Commerce: National Oceanic and Atmospheric Administration: National Weather Service; Tauton, Massachusetts 508/824-5116
US Department of the Interior: US Fish and Wildlife Service 413/253-8200
US Geological Survey 508/490-5000

2) Mitigation Funding Resources

404 Hazard Mitigation Grant Program (HMGP) .....Massachusetts Emergency Management Agency
406 Public Assistance and Hazard Mitigation .....Massachusetts Emergency Management Agency
Community Development Block Grant (CDBG)…….....DHCD, also refer to RPC
Dam Safety Program.....MA Division of Conservation and Recreation
Disaster Preparedness Improvement Grant (DPIG) .....Massachusetts Emergency Management Agency

Emergency Generators Program by NESEC[‡] ....Massachusetts Emergency Management Agency
Emergency Watershed Protection (EWP) Program.....USDA, Natural Resources Conservation Service
Flood Mitigation Assistance Program (FMAP) ..... Massachusetts Emergency Management Agency
Flood Plain Management Services (FPMS).....US Army Corps of Engineers
Mitigation Assistance Planning (MAP)..... Massachusetts Emergency Management Agency
Mutual Aid for Public Works.....Western Massachusetts Regional Homeland Security Advisory Council
National Flood Insurance Program (NFIP) [†] ..... Massachusetts Emergency Management Agency
Power of Prevention Grant by NESEC[‡].....Massachusetts Emergency Management Agency
Roadway Repair & Maintenance Program(s).....Massachusetts Highway Department
Section 14 Emergency Stream Bank Erosion & Shoreline Protection ……....US Army Corps of Engineers
Section 103 Beach Erosion……...US Army Corps of Engineers
Section 205 Flood Damage Reduction……US Army Corps of Engineers
Section 208 Snagging and Clearing ....US Army Corps of Engineers
Shoreline Protection Program……MA Department of Conservation and Recreation
Various Forest and Lands Program(s).....MA Department of Environmental Protection
Wetlands Programs ..... .MA Department of Environmental Protection

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

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

3) Websites

Sponsor	Internet Address	Summary of Contents
Natural Hazards Research Center, U. of Colorado	http://www.colorado.edu/litbase/ha zards/	Searchable database of references and links to many disaster-related websites.
Atlantic Hurricane Tracking Data by Year	http://wxp.eas.purdue.edu/hurricane	Hurricane track maps for each year, 1886 – 1996
National Emergency Management Association	http://nemaweb.org	Association of state emergency management directors; list of mitigation projects.
NASA – Goddard Space Flight Center "Disaster Finder:	http://www.gsfc.nasa.gov/ndrd/dis aster/	Searchable database of sites that encompass a wide range of natural disasters.
NASA Natural Disaster Reference Database	http://ltpwww.gsfc.nasa.gov/ndrd/main/html	Searchable database of worldwide natural disasters.
U.S. State & Local Gateway	http://www.statelocal.gov/	General information through the federal-state partnership.
National Weather Service	http://nws.noaa.gov/	Central page for National Weather Warnings, updated every 60 seconds.
USGS Real Time Hydrologic Data	http://h20.usgs.gov/public/realtime.html	Provisional hydrological data
Dartmouth Flood Observatory	http://www.dartmouth.edu/artsci/g eog/floods/	Observations of flooding situations.
FEMA, National Flood Insurance Program, Community Status Book	http://www.fema.gov/fema/csb.html	Searchable site for access of Community Status Books
Florida State University Atlantic Hurricane Site	http://www.met.fsu.edu/explores/tropical.html	Tracking and NWS warnings for Atlantic Hurricanes and other links
National Lightning Safety Institute	http://lightningsafety.com/	Information and listing of appropriate publications regarding lightning safety.
NASA Optical Transient Detector	http://www.ghcc.msfc.nasa.gov/ot d.html	Space-based sensor of lightning strikes
LLNL Geologic & Atmospheric Hazards	http://wwwep.es.llnl.gov/wwwep/g hp.html	General hazard information developed for the Dept. of Energy.
The Tornado Project Online	http://www.tornadoroject.com/	Information on tornadoes, including details of recent impacts.
National Severe Storms Laboratory	http://www.nssl.uoknor.edu/	Information about and tracking of severe storms.
Independent Insurance Agents of America IIAA Natural Disaster Risk Map	http://www.iiaa.iix.com/ndcmap.html	A multi-disaster risk map.
Earth Satellite Corporation	http://www.earthsat.com/	Flood risk maps searchable by state.
USDA Forest Service Web	http://www.fs.fed.us/land	Information on forest fires and land management.

Appendix B

Documentation of the Planning Process

Hatfield Hazard Mitigation Planning Committee

Meeting #1

AGENDA

October 3, 2006
4:00 p.m.
Hatfield Town Hall

1) Introduction

2) Purpose of Committee

- Why selected to serve on Committee
- What we are doing and why

3) What is Hazard Mitigation Planning?

- PowerPoint Presentation on Hazard Mitigation

4) Step 1: Organize Hazard Mitigation Team

- Establish a chairperson/point of contact

5) What must we do to prepare a Hazard Mitigation Plan?

- Explain/set milestones (4-5 committee meetings)
- Agree on next committee meeting date

6) Question and Answer Period

Hatfield Hazard Mitigation Planning Committee

Meeting #2

AGENDA

November 14, 2006
4:00 p.m.
Hatfield Town Hall

1) Identify Hazards (past and potential) on Base Map

- What are the hazards?
- What is at risk from those hazards?

2) Develop Base Map with Critical Facilities

• Identify Critical Facilities on Base Map. The following list contains items that should be clearly identified on the map, as they apply to your community:

- Emergency Operations Center
- Emergency Fuel Facilities
- Town/City Hall
- Police Station
- Fire Station
- Public Works Garages
- Water Treatment Facilities
- Sewage Treatment Plants
- Water Tower/Supply Pumps
- Power Plants
- Electrical Power Substations
- Schools
- Major Highways and Roadways
- Bridges
- Dams
- Nursing Homes
- Elderly Housing
- Day-Care Facilities
- Correctional Facilities
- Other Congregate Care Facilities
- Shelters
- Special Needs Populations
- Hazardous Materials Facilities
- Access Roads to Critical Facilities
- Evacuation Routes
- Unique or Historic Resources
- Commercial Economic Impact Areas
- Socio-Economic Impact Areas
- Areas with Second Language Needs
- Hospitals

3) Question and Answer Period

4) Set Goals for Next Meeting

Hatfield Hazard Mitigation Planning Committee
Meeting #3

AGENDA
December 12, 2006
4:00 p.m.
Hatfield Town Hall

1) Review Identification of Hazards
- Past and Potential
- Critical Facilities

2) Analyze Development Trends
- Looking at Community Change
- Map out Development Patterns

3) Existing Protection Measures
- Review of Draft Existing Protection Measures

4) Question and Answer Period

5) Set Goals for Next Meeting

Hatfield Hazard Mitigation Planning Committee
Meeting #4

AGENDA
February 6, 2007
4:00 p.m.
Hatfield Town Hall

1) Identify What's in Place & Identify gaps in the current protection
- Review Draft Existing Protection Measures
- Identify gaps in existing protection

2) Review of Draft Goal Statements

3) Brainstorm Mitigation Actions
- What actions can be taken?
- Evaluating Action Feasibility

4) Prioritize Final List of Actions
- Select Actions which Best Suit Community's Needs
- Include actions that can be implemented quickly

5) Question and Answer Period

6) Set Goals for Next Meeting

Hatfield Hazard Mitigation Planning Committee

Meeting #5

AGENDA

March 23, 2007
4:00 p.m.
Hatfield Town Hall

1) Develop Strategy to Implement Selected Prioritized Actions

- Who will be responsible for implementing each prioritized action;
- When will these actions be implemented?
- How will the community fund the projects?

2) Develop Process for Adoption and Monitoring of the Plan

3) Review & Revise as Necessary Final Draft of the *Hatfield Hazard Mitigation Plan*

4) Discuss Next Steps for the *Hatfield Hazard Mitigation Plan* including FEMA/MEMA Review and Adoption by the Board of Selectmen.

5) Question and Answer Period

Hatfield Hazard Mitigation Planning Committee

Meeting #6

AGENDA

May 7, 2007
4:00 p.m.
Hatfield Town Hall

1) **Develop Process for Adoption and Monitoring of the Plan**

2) **Review & Revise as Necessary Final Draft of the *Hatfield Hazard Mitigation Plan***

3) **Discuss Next Steps for the *Hatfield Hazard Mitigation Plan* including FEMA/MEMA Review and Adoption by the Board of Selectmen.**

4) **Question and Answer Period**

HATFIELD

Agenda

November 28, 2007

Pre-Disaster Mitigation Plan Review

4:00 p.m.

Hatfield Town Hall

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1) Committee Sign-in

2) Pre-Disaster Mitigation Planning Process Update

3) Remaining Tasks for PVPC to Complete

    a. Detailed profiling of hazards ☑
    b. Incorporation of PDM Plan with other documents ☑

4) Remaining Tasks for PDM Committee to complete with PVPC
    a. Public notices for public comment session ☑
    b. Public comment session ☑
    c. Section on identifying future parties to involve ☒
    d. Discussion of development and risks posed from ALL hazards, not just floods ☒
    e. Specific goal statements for each hazard ☑
    f. Elimination of actions that are not mitigation actions, (i.e. disaster kits, which are response oriented) ☑
    g. Actions that are mitigation actions and not response ☒
    h. Section on "Plan Monitoring" with clearly designated responsibilities among town officials for tracking success with action steps ☒

5) Incorporate public comment period, and develop action steps at that meeting

Appendix C

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 D

Documentation of Public Comment Notices

PRESS RELEASE

CONTACT: Andrew Smith, Pioneer Valley Planning Commission, (413) 781-6045

FOR IMMEDIATE RELEASE
September 12, 2007

Public Input Sought on Pre-Disaster Mitigation Plans

The Pioneer Valley Planning Commission has completed final working drafts of pre-disaster mitigation plans for thirteen communities in the region: Agawam, Chester, Chesterfield, Easthampton, Hadley, Hampden, Hatfield, Holland, Holyoke, Ludlow, Monson, Northampton, and South Hadley.

This planning effort is being undertaken to help communities assess the risks they face 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.

The draft plans are posted for public review and comment on PVPC's website at www.pvpc.org. Please submit comments to PVPC's Andrew Smith at (413) 781-6045 or asmith@pvpc.org no later than November 30, 2007. Communities with approved plans will be eligible for Hazard Mitigation Grant Program funding from the Massachusetts Emergency Management Agency.

These pre-disaster mitigation plans are being developed with assistance from the Pioneer Valley Planning Commission with funding provided by the Massachusetts Emergency Management Agency.

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The Republican.

'Predisaster plans' readied for grants

Sunday, September 23, 2007

By NANCY H. GONTER
ngonter@repub.com

It's the public's turn to weigh in on plans prepared by local communities to keep the damage from natural disasters to a minimum. Sixteen "predisaster mitigation plans," developed by the Pioneer Valley Planning Commission working with local officials from each community, are part of an effort to secure grant money from the Massachusetts Emergency Management Agency, said Catherine M. Miller, principal planner with the commission.

"This comes from an effort by the Federal Emergency Management Agency that while we are aware you can't prevent natural disasters from happening, you can prevent the long term consequences," Miller said.

The plans, which average more than 100 pages each, can be viewed on the agency's Web site at www.pvpc.org Plans for Agawam, Chester, Chesterfield, Easthampton, Hadley, Hampden, Hatfield, Holland, Holyoke, Ludlow, Monson, Northampton, South Hadley, Southwick, Ware and Wilbraham are available, she said.

"This is largely an education exercise so people know local government is looking into these things and thinking about what the consequences of natural disasters would be. It's reassuring to know local governments are looking at this kind of thing especially after all the awareness following (hurricane) Katrina," Miller said.

Comments may be made by calling Andrew Smith at the Commission at (413) 781-6045 or by e-mailing him at asmith@pvpc.org by Nov. 30.

The plans were developed with a state grant of $224,962 which was supplemented by local communities for total cost of just under $300,000, she said.

Each plan looks at the risks communities may face from natural disasters such as flooding, tornadoes, drought and earthquakes, and what can be done to prevent damage to property and loss of life. They also prioritize projects for funding for mitigation efforts, Miller said.
An example of a mitigation project is Greenfield's purchase of the Wedgewood Gardens mobile home park which was badly flooded by the Green River in 2005 and had previously been flooded, although that was not part of this program, Miller said.

The commission is working with 32 communities in this area and a second round of 16 more communities will soon be started. They are Amherst, Belchertown, Brimfield, Chicopee, Cummington, Goshen, Granby, Huntington, Palmer, Southampton, Springfield, Westfield, West Springfield, Westhampton, Williamsburg and Worthington.

After that, a plan for the entire region will be prepared, Miller said.

Northampton Deputy Fire Chief Dana Cheverette, a member of the local committee that worked with the commission on the city's plan, said going through the process of preparing the plan was helpful.

"You identify the flood plans and you identify the area where you need to put your resources. In 1988 when the Oxbow area flooded, a lot of people got isolated. Now we know where the people could get isolated," Cheverette said.

Sunday's news briefs

Posted by The Republican Newsroom September 30, 2007 12:04PM

Predisaster plan drafts
The Pioneer Valley Planning Commission has completed final working drafts of predisaster mitigation plans for 13 communities in the region. The draft plans are posted for public review and comment on the commission's Web site at www.pvpc.org. The deadline for comments is Nov. 30.

This planning effort is being undertaken to help communities assess the risks they face 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. Communities with approved plans will be eligible for Hazard Mitigation Grant Program funding from the Massachusetts Emergency Management Agency.

Affected are Agawam, Chester, Chesterfield, Easthampton, Hadley, Hampden, Hatfield, Holland, Holyoke, Ludlow, Monson, Northampton and South Hadley.

Appendix E

Map of Local Hazards for Hatfield