TOWN OF MOUNT PLEASANT
COUNTY OF WESTCHESTER,
NEW YORK

LOCAL MULTI-HAZARD MITIGATION PLAN (HMP)

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ACKNOWLEDGEMENTS

The Town of Mount Pleasant Multi-Hazard Mitigation Plan officially commenced with the kick-off meeting on March 24th, 2014. The concluding Planning Team Meeting finalizing the Plan to be distributed to the Town Board was held on September 3rd, 2015.

PLANNING TEAM

Carl Fulgenzi – Town Supervisor
Paul Oliva – Police Chief
Robert Guena – Superintendent of Water/Sewer
Sal Pennelle – Building Inspector
Kellie Rizzi – Superintendent of Recreation
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STAKEHOLDER INVOLVEMENT

Thornwood Fire Department
Hawthorne Fire Company
Valhalla Fire Department
Pleasantville Fire Department
Pocantico Hills Fire Department
BMFD Scarborough Engine Company
Chappaqua Fire Department
Valhalla Ambulance Corps, Inc.
Pleasantville Volunteer Ambulance Corps.
Hawthorne Ambulance
Sleepy Hollow Ambulance Corp.
TransCare
Westchester Medical Center
Phelps Hospital
Blythedale Children's Hospital
Rosary Hill Home
Crestview Manor
New York Medical College
Pace University
Mount Pleasant Central School District
Valhalla UFSD District Office
Pleasantville UFSD District Office
Pocantico Hills Central School District
EF International Academy
Hawthorne Cedar Knolls UFSD
JCCA Cottage School
Con Edison
Cablevision
Verizon Corporate Office Headquarters
Lightpath
AT&T Corporate Office Headquarters
Sullivan Data

MTA Metro-North Railroad
Bee-Line Bus
PepsiCo. Inc.
FujiFilm USA
New York Life Insurance Company
Carl Zeiss, Inc.
Regeneron
Girls Scouts of America, USA
Community Emergency Response Team (CERT)
American Red Cross
Village of Pleasantville
Village of Briarcliff Manor
Village of Sleepy Hollow
Town of Greenburgh
Town of North Castle
Town of New Castle
Town of Ossining
Westchester County Department of Planning
Westchester Department of Emergency Services
Westchester County Department of Public Works/ Transportation
Westchester County Police Department
Westchester County Department of Environmental Facilities
NYS Div. of Homeland Sec. & Emergency Services
New York State Department of Environmental Conservation (NYSDEC)
New York State Department of Conservation (NYSDEC)
New York City Department of Environmental Protection
New York State Department of Transportation
NYSDEC - Floodplain Management Section
Federal Emergency Management Agency (FEMA)
US Army Corps of Engineers
Environmental Protection Agency-Region 2
National Flood Insurance Program (NFIP)

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EXECUTIVE SUMMARY

The Town of Mount Pleasant, in Westchester County, New York presents the Multi Hazard Mitigation Plan (MHMP) in effort to reduce or eliminate the long-term risks to people and their properties from potential naturally occurring and man caused hazards.

SECTION 1. INTRODUCTION

1.1. Overview

States, locals and tribes are subjected to unsuspected natural and manmade disasters such as storms, hurricanes, tornadoes, earthquakes, fires, collapses, explosions etc. Over the years many communities as well as property owners have suffered the consequences of natural hazards. Although changes can be made to avoid the damage occurring from natural and manmade disasters, it is physically impossible to prevent all disaster scenarios.

History shows that the physical, financial and emotional losses caused by disasters can be reduced significantly through mitigation planning. The Federal Emergency Management Agency (FEMA) provides assistance to local governments who develop and update the Hazard Mitigation Plan (HMP) to meet the requirements of Title 44 of the Code of Federal Regulations (CFR) § 201.6. The HMP is used as a tool to help protect lives and properties from natural disasters.

The HMP entails: identifying planning area and resources, building a planning team, creating an outreach strategy, reviewing community capabilities, conducting a risk assessment, developing a mitigation strategy, and reviewing and adopting the plan. The goal of the plan, which will need to be kept current (updated), is to create a safe and resilient community.

The Mitigation Plan addresses various natural disasters and focuses attention and resources on solving a particular problem such as reducing repetitive flood losses and thereby produces successive benefits over a period of time. Statistics show that $1.1 billion dollars in flood damages are prevented annually through the implementation of local floodplain ordinances. Mitigation includes a broad range of activities designed to protect homes, schools, public buildings and critical facilities.

1.2. Purpose

Under the Disaster Mitigation Act of 2000 (Public Law 106-390), State, local and Tribal governments are required to develop a hazard mitigation plan as a condition for receiving certain types of non-emergency disaster assistance and FEMA grants to implement mitigation projects. The purpose of the Town of Mount Pleasant's Multi Hazard Mitigation Plan (MHMP) is to develop a plan according to the Disaster Mitigation Act (DMA) 2000 requirements.

The primary purpose of hazard mitigation planning is to identify community policies, actions, and tools for implementation over the long term that will result in a reduction in risk and potential for future losses community-wide. This will be accomplished by using a systematic process of learning about the hazards that can affect the Town (the Town Profile can be found in section 2), setting clear goals, identifying appropriate actions, following through with an effective mitigation strategy, and keeping the plan current.

The secondary purpose of the HMP following the planning and development process is to be eligible for receiving project grants under hazard mitigation assistance programs such as: Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation (PDM), Flood Mitigation Assistance (FMA), and Severe Repetitive Loss (SRL). The hazard mitigation assistance programs are authorized by Section 404 of the Stafford Act to provide grants to state, local, and tribal governments (up to 15% of the FEMA disaster funds they receive) to implement long-term hazard mitigation measures after a major disaster declaration.

1.3. Background and Scope of Work

Municipalities over the years had suffered losses and damages from natural and/or man-made hazards. Emergency Management is an ongoing process by which the communities and individuals attempt to manage hazards in an effort to avoid or reduce the impact of disasters. A FEMA approved MHMP is required by a local municipality to be eligible to receive any federal or state funding for emergency management or mitigation. The process of developing an approved HMP is to identify policies, capabilities, activities, and tools necessary to implement successful and sustainable mitigation actions.

1.4. Benefits of Multi-Hazard Mitigation Plan

The Hazard Mitigation is the action taken to reduce or eliminate long-term risk to people and their property from hazards and the process which state, tribal, and local governments use to identify risks and vulnerabilities associated with natural disasters, and to develop long-term strategies for protecting people and their property from future hazard event. The HMP strategies can be long-term or short-term goals; Mitigation is a comprehensive evaluation of cost-effective methods to reduce and/or prevent the potential for injury, loss of life and property. The activities taken towards constructing a HMP should be within the physical and financial limitations of the Town of Mount Pleasant.

1.5. Regulatory Compliance

1.5.1. Code of Federal Regulation (CFR) § 201.6

"(a) Plan requirements. (1) A local government must have a mitigation plan approved pursuant to this section in order to receive HMGP project grants. The Administrator may, at his discretion, require a local mitigation plan for the Repetitive Flood Claims Program. A local government must have a mitigation plan approved pursuant to this section in order to apply for and receive mitigation project grants under all other mitigation grant programs."

1.5.2. FEMA Review Criteria

Application Eligibility

- Cost-effectiveness
- Feasibility and effectiveness
- EHP compliance

Application review:

"FEMA will review all applications and sub applications for eligibility and completeness. Applications and subapplications that do not satisfy the eligibility and completeness requirement will not be funded."

Cost-effectiveness Review

"FEMA will review the documentation provided in support of the subapplication cost-effectiveness to validate the accuracy and credibility of data and ensure the appropriate use of the cost-effectiveness methodologies. Only subapplications meeting HMA cost-effectiveness requirements will be considered eligible."

SECTION 2. TOWN PROFILE

2.1. Overview

Town of Mount Pleasant is located in central Westchester County of the State of New York. **Figure 2-1: Location – Westchester County**, shows location of Westchester County within the State of New York. Westchester County is located in the southeastern portion of the State of New York. Lower Westchester County is part of the Piedmont Zone, which is a transition between the Atlantic Coastal Plain to the southeast and the Hudson Highlands to the northwest.

The Town is approximately 32.7 square miles of which 5.0 square miles is under water and lies approximately thirty miles north of New York City. Within its boundaries lie the incorporated village of Sleepy Hollow (2.58 square miles in size), Pleasantville (1.82 square miles in area) and a small portion of Briarcliff Manor. The remaining area of the Town is unincorporated, which is approximately 24.25 square miles in size, and includes the hamlets of Hawthorne, Thornwood, Valhalla and Pocantico Hills. This Plan only covers the unincorporated area. The Town's latitude and longitude are: 41°6'26" N, -73°48'30" W (N 41.10732, W -73.80819).

Figure 2-1 Location – Westchester County

The climate is one of long summers and short winters. The average annual temperature is approximately 50 degrees Fahrenheit (°F), with extremes varying from -34°F to 106°F. The average annual rainfall for the county is approximately 45 inches. The annual distribution of precipitation throughout the year is fairly uniform, with slightly higher amounts during the summer (U.S. Department of Commerce, June 1972). The average annual snowfall within the County is 45-50 inches.

2.2. History

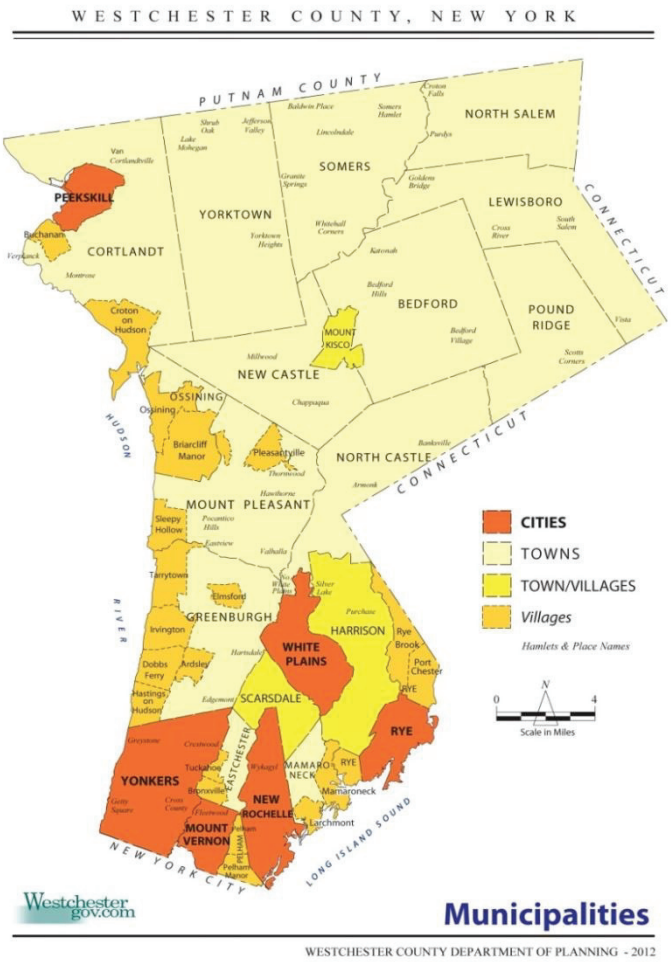
According to the land records, the Town of Mt. Pleasant became incorporated in 1788. The older tax maps disclose that farmlands and estates were the predominate occupants of the unincorporated Town. The rolling hills and sparsely settled Hamlets of Kensico, later named Valhalla in 1902, with Hawthorne, Thornwood and Pocantico Hills combined to comprise a calculated 28 square miles of the unincorporated area of the Town of Mount Pleasant. Except for an area occupied by Phelps Memorial Hospital, which was conveyed to the then Village of North Tarrytown by the Town which is currently Village of Sleepy Hollow, the area remains essentially the same today in 2014.

In 1885, New York City decided that the proximity, geographic basin and resources within Kensico and the contiguous area of North White Plains, which also comprised part of the Kensico community, were conducive to constructing a water reservoir. The original and much smaller version of the Kensico Dam was constructed. Twenty-eight years later, New York City decided to expand the reservoir to meet the water resource needs of an escalating Metropolitan population constantly influenced by the immigrant migration from Ellis Island. The Kensico Dam Construction ranges from 1913 to 1917. The expanded and current version of the Kensico Dam construction attracted a variety of employees that resulted in a local population explosion. Housing and inhousing medical facilities were built to accommodate the needs of laborers and their families, while markets and social businesses developed simultaneously to accommodate the needs of the increased population.

2.3. Geography and Topography

The Town is bordered on the north by the Towns of North Castle and Ossining; on the east by the Kensico Reservoir and the Town of New Castle; on the south by Town of Greenburgh; and on the west by the Hudson River. **Figure 2-2: Location Map – Town of Mount Pleasant**, shows location of the Town of Mount Pleasant and the surrounding municipalities.

Figure 2-2 Location Map – Town of Mount Pleasant (Source: Westchester County GIS)



The topography of the Town is one of gently rolling hills with large areas of open land including State, County and local parks, watershed protection lands and several cemeteries. The Pocantico River and Pocantico Lake traverse the Town from north to south where they empty into the Hudson River at Kingsland Point Park in Sleepy Hollow. The Town's largest body of water is the Kensico Reservoir which

is located in the eastern portion of the town and forms the boundary between Mount Pleasant on the west and North Castle on the east.

Figure 2-3 Environmental Features shows the major environmental features within the Town courtesy the Westchester County GIS Maps, including major slopes, designated water fresh lands, and hydraulic soil wet lands.

2.4. Demographics

As reported in the 2010 U.S. Census, the entire Town had a population of 43,724 with a population density of 1,337 per square mile, as compared to the 949,113 population for the whole of Westchester County. This is a 1.16% increase in population over the 43,221 for the Town as reported in the 2000 Census, as compared to the 2.78% for Westchester County (see Figure 2-4).

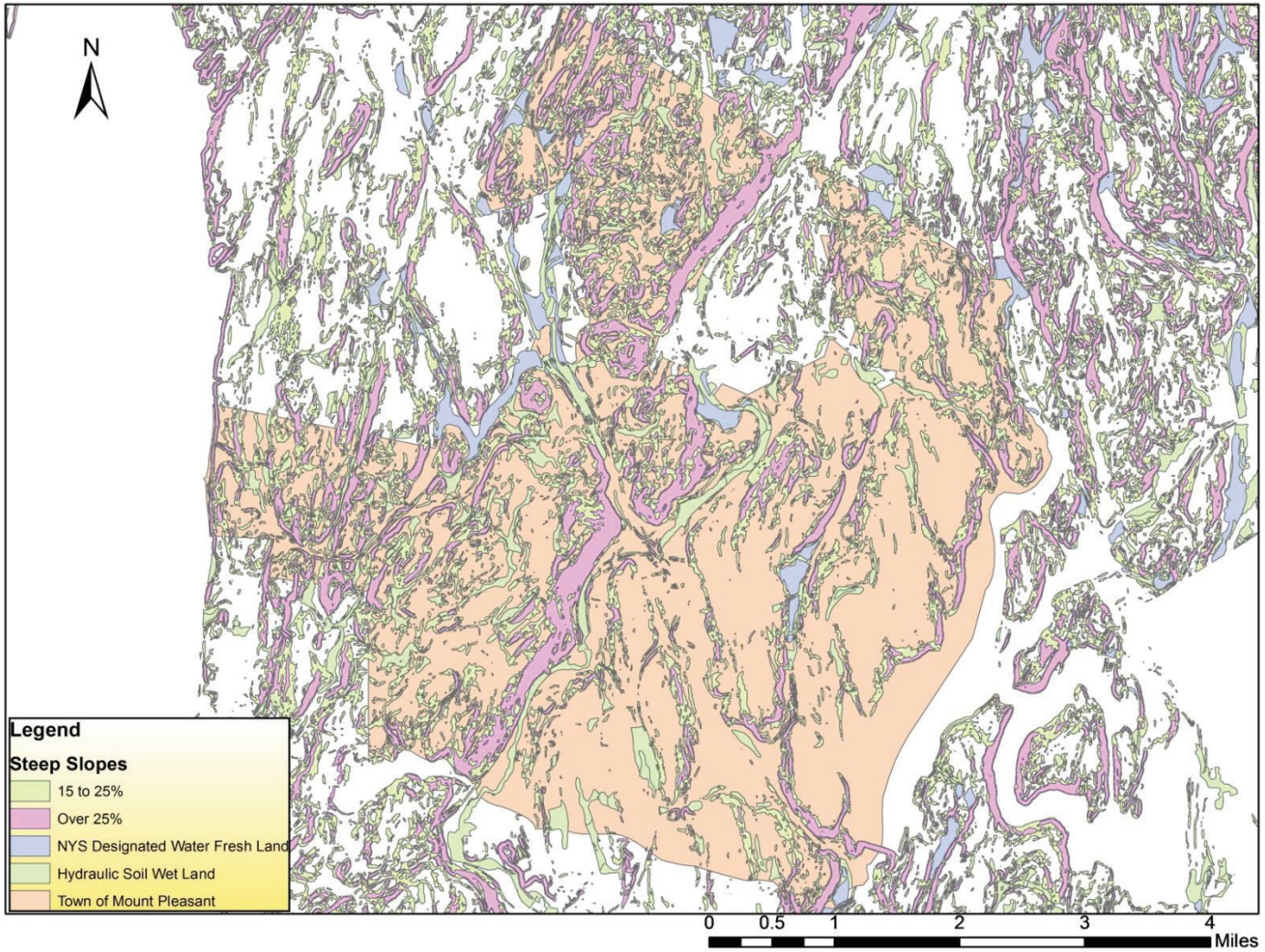
The Town's population is more affluent and educated than the average for Westchester County. According to the Census Tract 2010, the Town's median family income and age were $106,380 and 37.8, respectively. In comparison, the median family income and age for Westchester County were $81,093 and 40.1, respectively. Approximately 89.8% of the Town's residents graduated from a high school or higher with 50.0% of residents having a college degree, while 87.4% of the County's residents graduated from high school and 44.8% have a college degree. For all Town residents 16 years of age and older, 59.1% were employed as of 2010.

Table 2-1 – Town Population, tabulates the 2010 population of the entire Town, as well as the incorporated Villages of Pleasantville and Sleepy Hollow, and the unincorporated portion of the Town.

Table 2-1 Town Population (ref. 2010 Census Bureau)

Total Population	Village of Sleepy Hollow	Village of Pleasantville	Town of Mount Pleasant (Unincorporated)
43,724	9,870	7,019	26,835

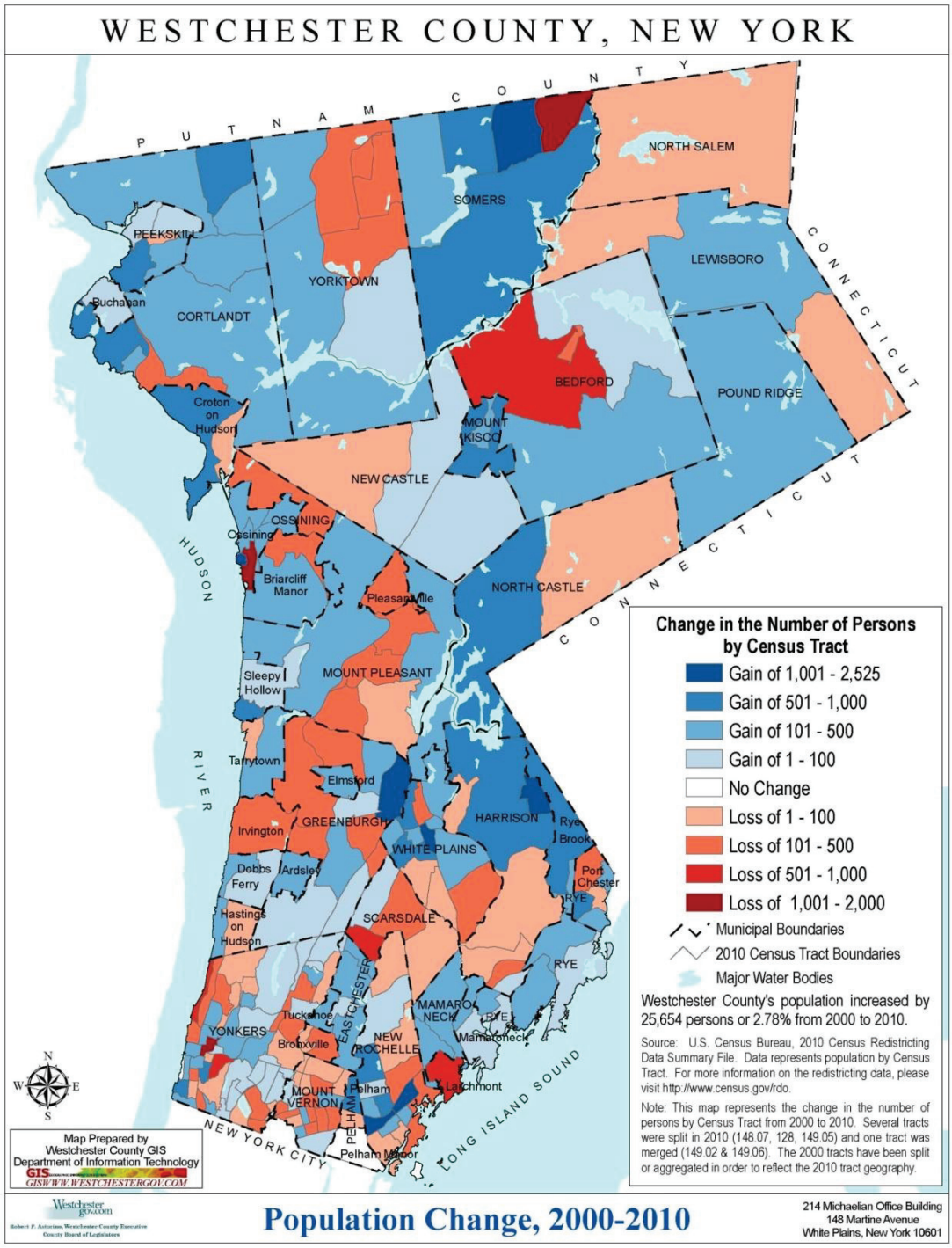
Figure 2-3 Environmental Features (Source: Westchester County GIS**)**



For the purpose of the Hazard Mitigation Plan (HMP), the Town used FEMA's HAZUS-MH risk assessment software program, which is based on 2010 census data. In HAZUS, the study region is the geographic unit for which data are aggregated, the hazard defined and the analysis carried out. The study region can be any combination of states, counties, census tracts or census blocks. In many cases, the region may follow the political boundaries such as City or County limits. The region is always defined by a combination of census tract boundaries, within which population, demographics, and general building stock values are aggregated.

The unincorporated portion of the Town contains six census tracts; while the Village of Sleepy Hollow contains two census tracts and Pleasantville contains one census tract. For the HMP, only the unincorporated portion of the Town is considered, hereafter called the Town of Mount Pleasant. It is observed that the census tracts do not exactly coincide with the Mount Pleasant municipal boundary, especially the boundary between the unincorporated Town and incorporated Village of Sleepy Hollow. However, for hazard analysis purposes, the region comprising the six census tracts was assumed to represent the unincorporated Town of Mount Pleasant.

Figure 2-4 Westchester County Population Change, 2000-2010



2.5. Land Use and Growth Trend Zoning

The Town is essentially a residential area consisting of single-family homes, apartments and estates. Most residents work throughout the County or commute to New York City. The Town also consists of commercial, industrial, agriculture, religion, government, and education buildings. Table 2-2: Building Count by Occupancy shows the number of buildings in the Town by occupancy types. Table 2-3: Building Count by Type shows the number of buildings in the Town by building types.

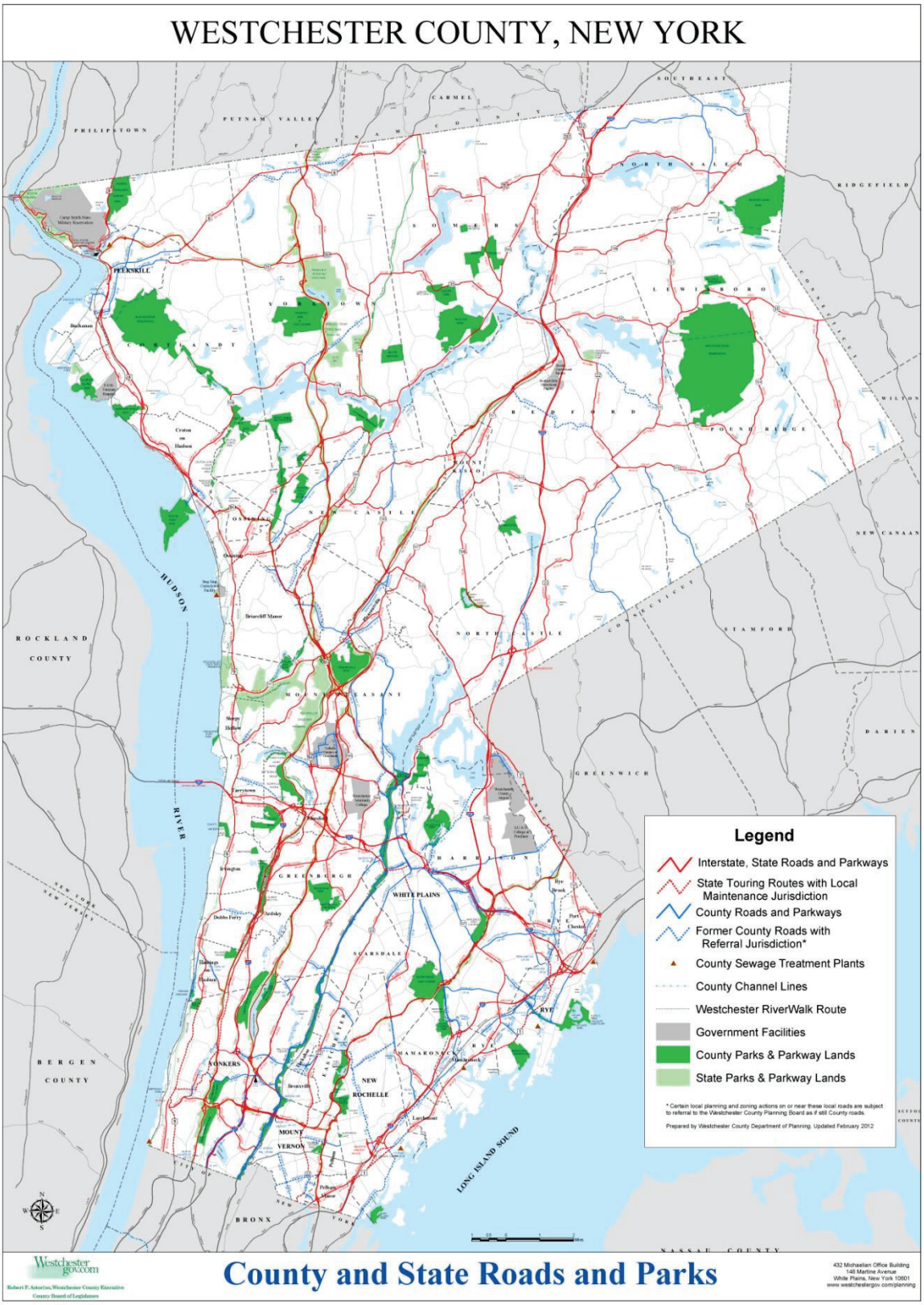
Table 2-2 Building Count by Occupancy

Building Type	Building Count
Residential	8,268
Commercial	743
Industrial	262
Agricultural	50
Religious	46
Government	16
Education	32
Total	**9,417**

Table 2-3 Building Count By Type

Building Type	Building Count
Wood	6.955
Steel	556
Masonry	1,658
Concrete	239
Mobile Home	8
Total	**9,416**

Figure 2-5 County and State Roads and Parks (source Westchester County GIS)



2.6. Critical and Emergency Facilities

Industrial development in the Town includes several large office parks: New York Life Insurance Company, PepsiCo Inc., and Fuji Photo Film U.S.A., Inc.; and Estate holdings of the Rockefeller family. In addition, educational developments in the Town include nineteen (19) school buildings (see figure 2-6)

There are two major medical facilities, the Westchester Medical Center in Valhalla and Phelps Hospital in Sleepy Hollow (see figure 2-7). The New York Medical College is located at the Westchester Medical Center and Pace University's Pleasantville campus is located on Bedford Road.

2.7. Transportation Systems

Within the Town are major state parkways, the Saw Mill River Parkway, Sprain Brook Parkway, and the Taconic State Parkway. Bedford Road, Manville Road, Route 117 and Route 9 are also major traffic routes for the Town. Aside from automotive traffic, there are major train lines within the Town, including the Metro-North railway, which is a prominent travel route to New York City. These routes have large volume traffic for daily commuters, and are the most prominent travel routes through the Town (see figure 2-8).

Due to the hilly and rough landscape of the Town and the variety of major road intersections, there are a number of bridges within the Town to traverse the landscape by both road and railway. There are two (2) major railway bridges to accommodate the Metro-North railway, and forty-nine (49) highway bridges according to the HAZUS-MH inventory.

2.8. Critical Infrastructure

Other vital facilities are organized within the Town, including: nearby town halls; the water department along with major pump stations; three volunteer ambulance corps; two communications facilities; two train stations; and a variety of recreation centers, shelters, and nursing homes that require special attention during an emergency (see Figure 2-9).

Figure 2-6 Town of Mount Pleasant Schools (Source HAZUS-MH)

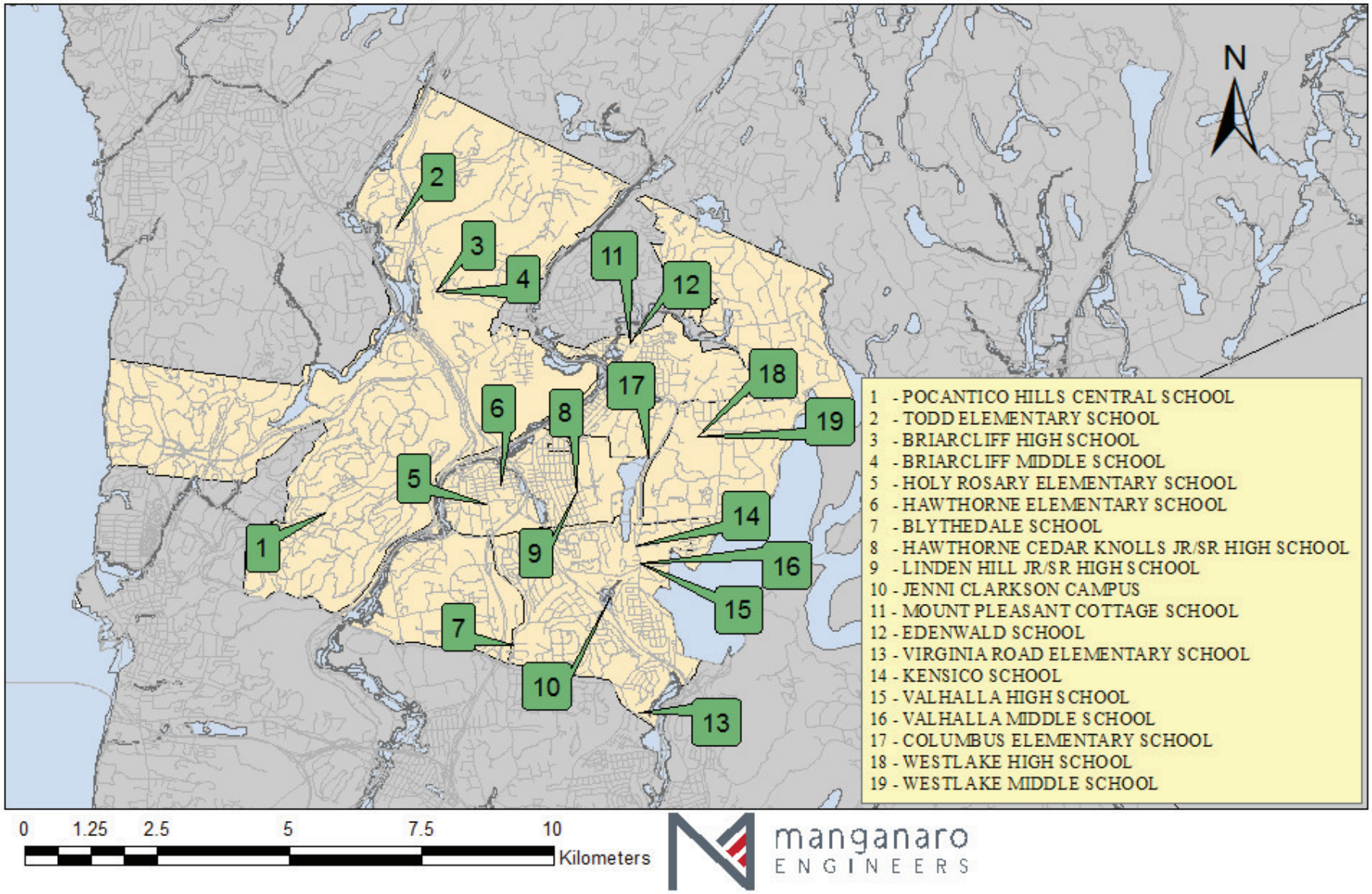


Figure 2-7 Emergency and Critical Care Facilities (source HAZUS-MH)

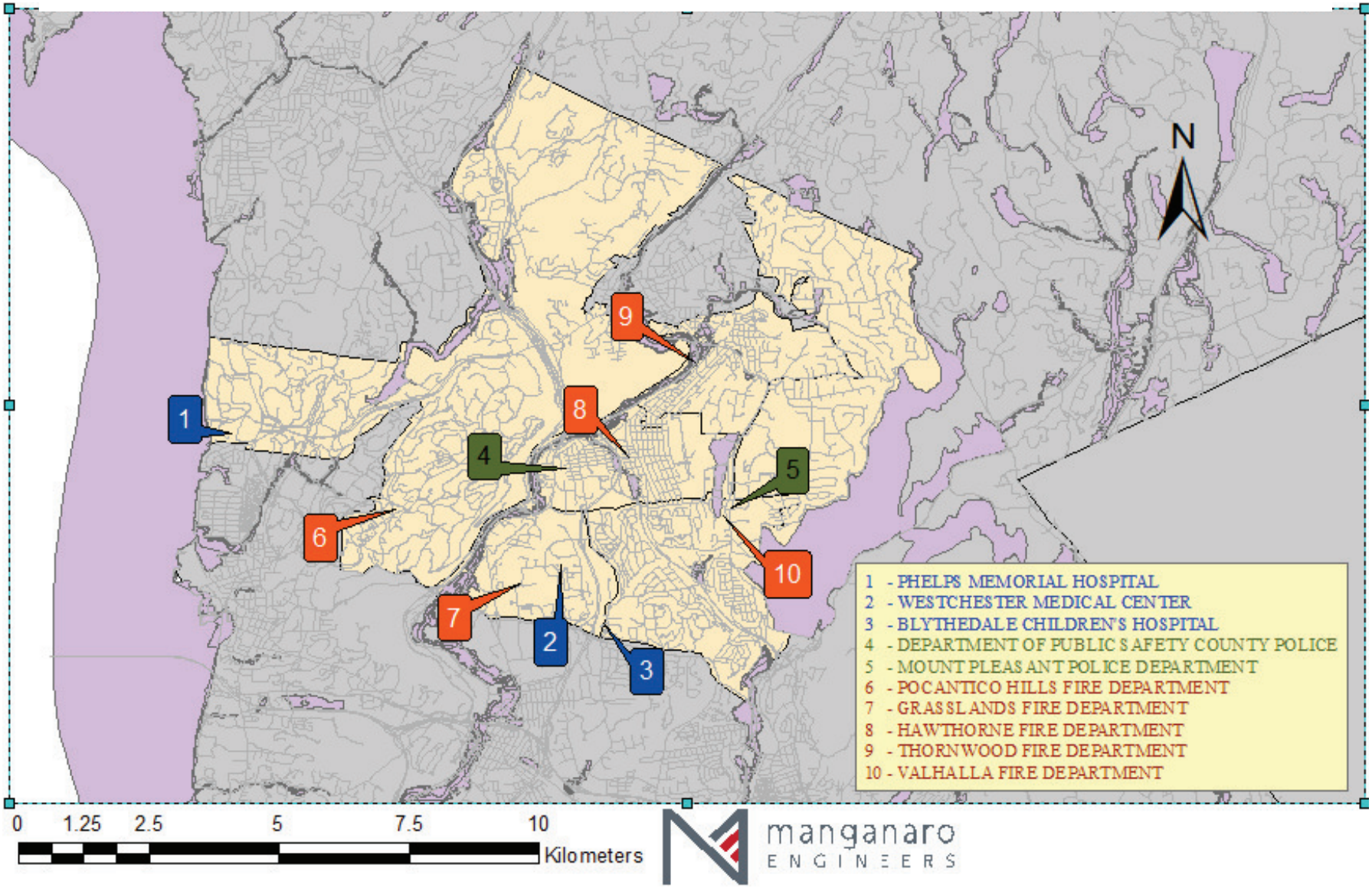


Figure 2-8 Transportation Systems (source HAZUS-MH)

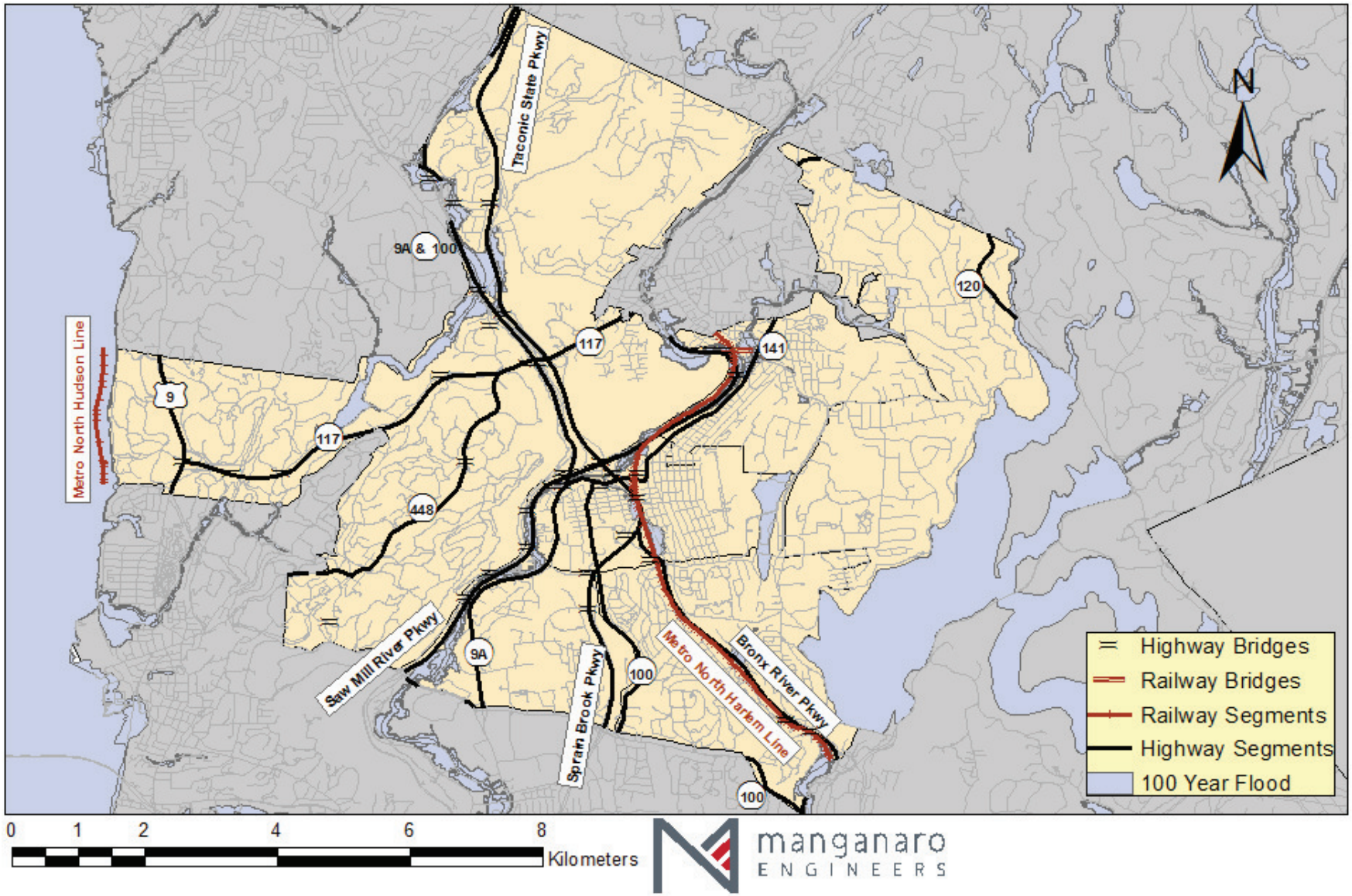
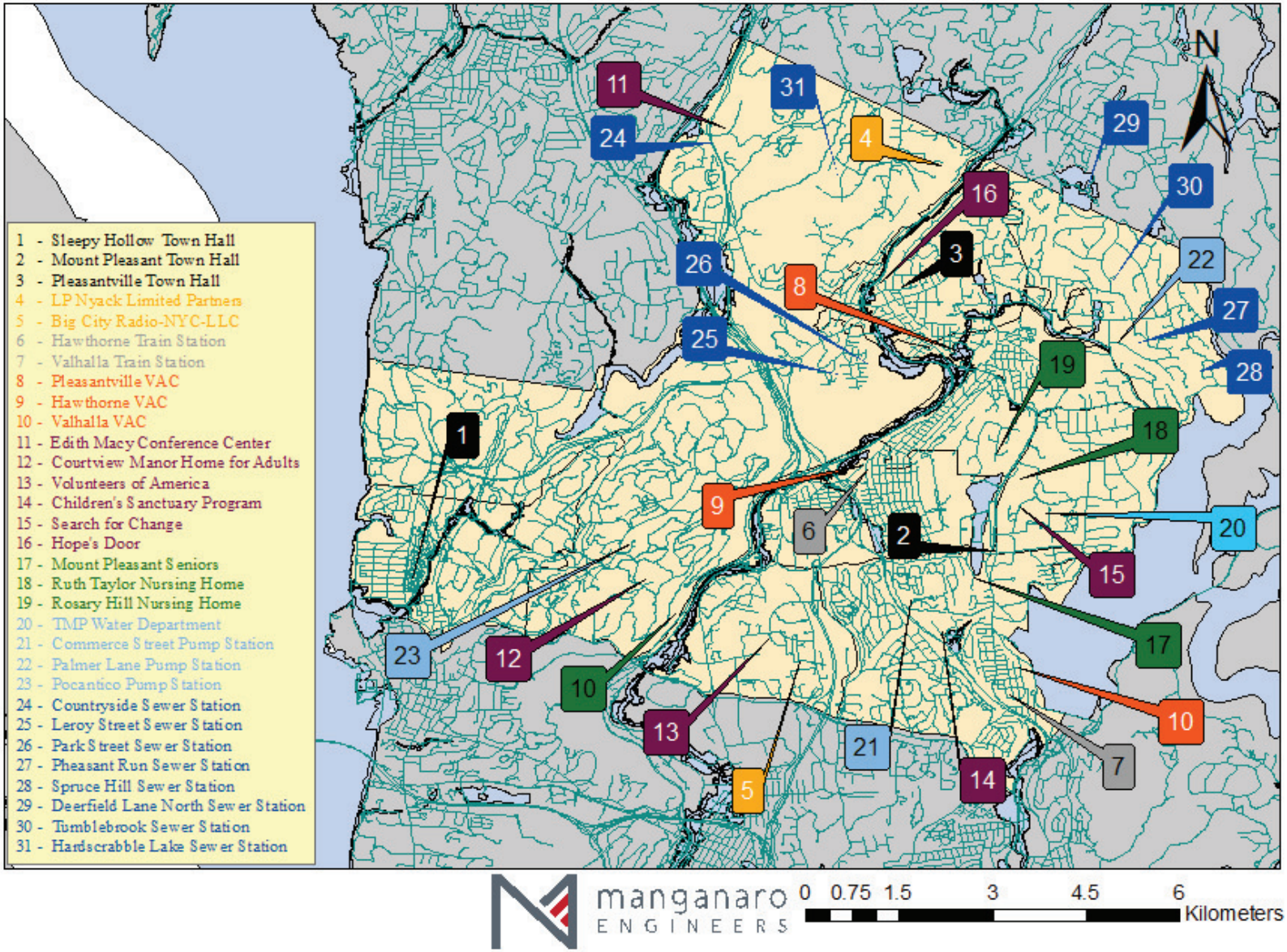


Figure 2-9 Town of Mount Pleasant Critical Facilities



2.9. Town Government

The Town was established as a municipal government by the State of New York in 1788 and is vested with the powers and responsibilities inherent in the operation of a municipal government including the authority to tax real property and incur debt.

The Town Board is the legislative, appropriating, governing and policy determining body of the Town and consists of four board members, elected at large to serve a four year term, plus the Supervisor. Town Board members may serve an unlimited number of terms. The Town Board enacts, by resolution, all legislation including ordinances and local laws, approves the annual operating budgets for the Town; and authorizes modifications and transfers between budgetary appropriations on the recommendation of the supervisor. The original issuance of all Town indebtedness is subject to approval by the Town Board.

The Supervisor is the chief executive officer and chief fiscal officer of the Town and is elected for a two-year term of office with the right to self-succeed. The Supervisor is a full member of and the presiding officer of the Town Board. Duties of the supervisor include: the administration of the Town's daily functions, budget preparation and control, treasury management and the renewal of notes evidencing short-term indebtedness. The Supervisor is assisted with financial duties by the Town Comptroller. The Town Clerk acts as the custodian of the Town's records and the clerk to the Town Board. At the initiation of the HMP, the Supervisor was Joan A. Maybury, and the Town Board members were Carl Fulgenzi, Mark Rubeo, Laurie Smiley, and Denis McCarthy.

In addition to the Town Board, there are several other boards and committees that make decisions and provide oversight, input, regulation and advice for various Town functions.

2.10. Town Services

2.10.1. Emergency Services

The Town has separate services for Police Department, Fire Department and Ambulance Corps.

a. Police Department

The Mount Pleasant Police Department is responsible for maintaining order in the Town. It is also responsible for traffic and safety including street lighting, signs, and animal control (see Figure 2-7). The department is run by a Chief and is comprised of two (2) Lieutenants, nine (9) Sergeants, four (4) Detectives, twenty four (24) Patrol Officers, one (1) Animal Control / Parking Enforcement Officer, two (2) full-time Police Dispatchers, one (1) full time Secretary, and three (3) Traffic Safety Division.

b. Fire and Rescue Services

The Town of Mount Pleasant is protected by an all-volunteer Fire Department that operates out of four fire districts serving the Town of Mount Pleasant (see Figure 2-7): The Hawthorne Fire District, The Pleasantville Fire District, Thornwood Fire District and Valhalla Fire District. The four member companies each have their own set of line officers.

The Hawthorne Fire District has been serving the residents of Hawthorne since 1911 and has an active roster of 67 professional members. The Pleasantville Fire Department serves part of the Town of Mount Pleasant. The Thornwood Fire Company is comprised of approximately 75 volunteer firefighters who are instrumental in protecting the 2,500 homes and businesses in the 5 square mile community, nearly 6,000 residents and many more visitors each day. The Valhalla Fire District is comprised of approximately 70 volunteer firefighters.

c. Ambulance Corps

The Town is serviced by several ambulance corps units: The Valhalla Ambulance Corps, Pleasantville Ambulance, Hawthorne Ambulance, Sleepy Hollow Ambulance Corps, and TransCare. They are staffed by volunteers, trained drivers, Emergency Medical Technicians (EMTs), and administrative staff.

SECTION 3. PLAN DEVELOPMENT

The collaborative planning process to develop both short-term and long-term risk reduction involved Town officials such as: Town Supervisor, Councilmen/Councilwomen, Police Chief, Highway Superintendent, Fire Marshall / Building Inspector, Superintendent of Recreation, Town Engineer, Town Junior Engineer, and Town Consultant, Charles A. Manganaro Consulting Engineers, P.C. Participating citizens, Westchester County Department of Emergency Services and the New York State Office of Emergency Management (NYSOEM) were additional resources. Participants were required to attend all meetings and secure a level of commitment in order to develop a successful plan to reduce the Town's vulnerability to any potential hazard.

3.1. Assess Community Support

Much of mitigation planning involves cycles of learning about the community and then acting on what is discovered. The more we understand the issues, important concerns, and capabilities in our community, the more we can develop a planning process that reflects community values and thereby generate support for projects and outcomes.

Among the first steps in the planning process is measuring the level and source of community support for planning, and working on securing any needed support where gaps are identified.

The process to Assess Community Support includes the following steps:

- **Planning Area**: Town of Mount Pleasant is located in central Westchester County of the State of New York. The Town's incorporated area is 27.7 square miles. (See Section 1 for more details).
- **Determine if the Community is ready to Begin the Planning Process**: Determining the level of understanding in the community was crucial to the MHMP. Knowledge, support, and resources of the community are key elements for a successful planning

process. In Mount Pleasant, the HMP was undertaken as a result of FEMA authorization of funding for preparation of the Multi-Hazard management Plan, which would enable the Town to be eligible for receiving projects grants under hazard mitigation assistance. The draft MHMP was broadcasted on a FTP server for public access to invite public comments based on their previous disaster experiences.

- **Determine Local Government Participation**: Local government and public officials are conversant on hazards and risks in the Town based on their previous experiences in TMP as well as neighboring towns and villages. They were involved in order to have a clear understanding on hazards and risks in the Town and their knowledge was crucial to the MHMP planning process (see Section 5). They along with the Town consultant (CAMCE) compiled the planning activities to assist in risk reduction before, during and after a disaster.
- **Remove Roadblocks:** The smooth Mitigation planning was ensured due to involvement of public officials, educating public officials, and stressing to the public of the need of an approved plan to be eligible for post-disaster mitigation funding.

3.2. Planning Process

This plan addresses both the past and potential future hazards and develops action items that the Town can implement to protect its citizens' businesses, and their properties. The plan is divided into the following steps in accordance with FEMA process that addresses each phase in the planning process. The process is in accordance with the latest FEMA guidance and example plans.

3.2.1. Planning Steps

The planning steps are as follows:

Step 1: Organizing the Town Resources

Step 2: Public Involvement and Outreach

Step 3: Coordination with Other Agencies

Step 4: Assessing Hazards and Risks

Step 5: Assessing the Impacts

Step 6: Setting Goals and Objectives

Step 7: Reviewing Mitigation Activities

Step 8: Drafting Action Plan

Step 9: Implementing, Maintaining, Evaluating, and Revising Plan

Step 10: Adoption of the Plan

3.2.2. Plan Organization

The plan is divided into eleven sections, each of which addresses a phase in the planning process based on FEMA's guidance and example plans dated March 2003. The first seven sections represent the Multi-Hazard Mitigation Plan Development. The next two sections, Plan Maintenance and Plan Adoption, are the action items for the Town to implement after the plan is approved by FEMA following its adoption by the Town Board.

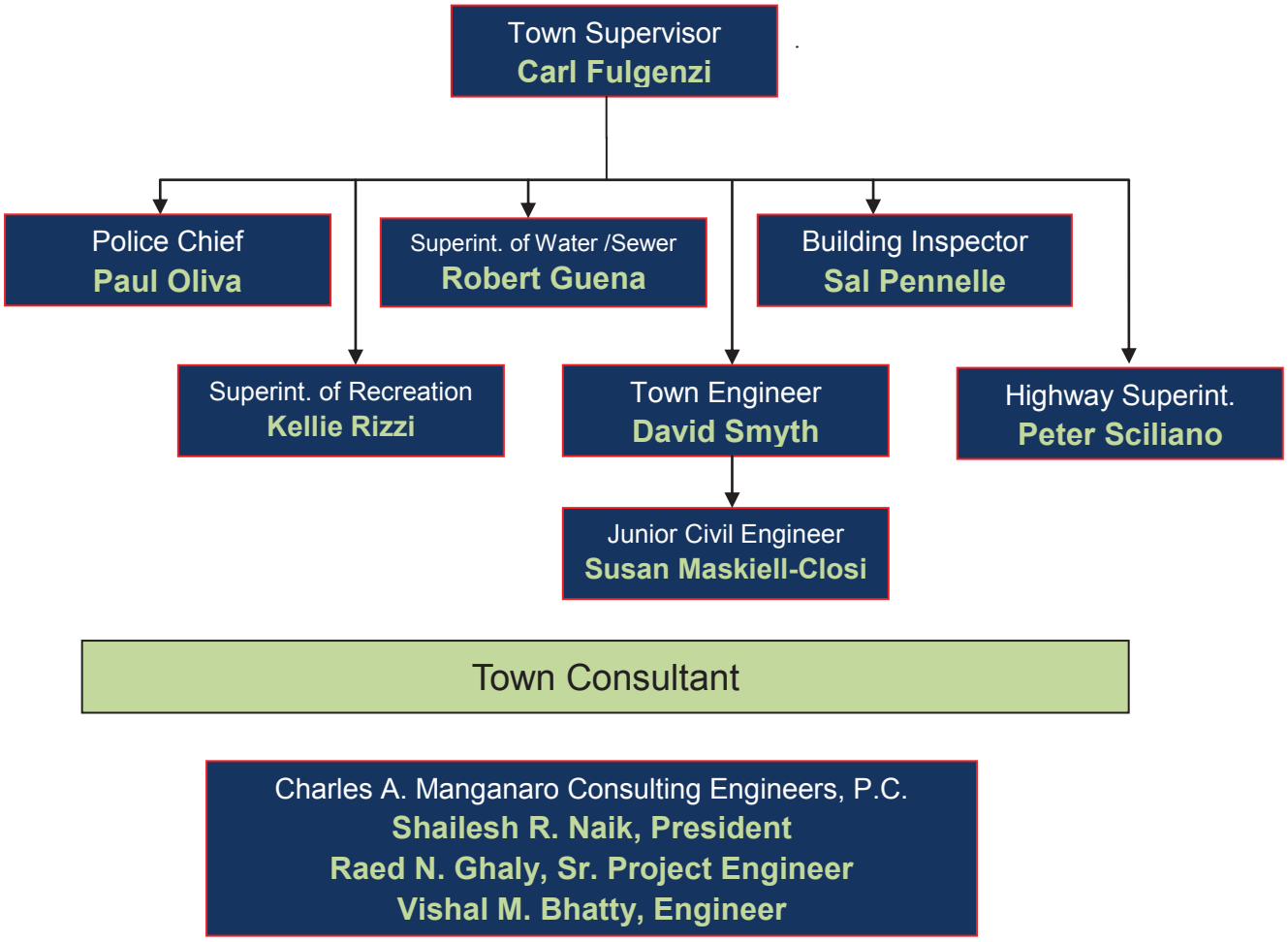
Section 1. ***Introduction***	This section includes the plan overview, purpose, background and scope of work, plan benefits and regulatory compliance.
Section 2. ***Town Profile***	This section provides the municipal profile which includes an overview; history; geography and topography; demographics; land use and growth trend zoning; a description and location of town's critical and emergency facilities; transportation systems; town government; and town services.
Section 3. ***Plan Development***	This section describes the detailed description of the planning team, summary of the referenced documents and the planning process.
Section 4. ***Public Involvement and Outreach***	This section describes the public involvement and outreach; public meetings; public information and actions; and the public input.
Section 5. ***Coordination with Other Agencies***	This section describes coordination with other agencies and organizations; government agencies and participating stakeholders; and Agencies and organization representatives contact.
Section 6. ***Risk Assessment***	This section provides a summary of identification of hazards that impact the Town, profiling of hazard events and vulnerability analyses for each of the hazard event.

Section 7. ***Mitigation Strategies***	This section describes how the Town of Mount Pleasant will accomplish the overall purpose or mission of the planning process to reduce, control or limit the potential losses of life and property, human suffering, economic disruption, and disaster assistance costs resulting from natural and human-caused hazards identified
Section 8. ***Plan Maintenance***	This section describes monitoring, evaluating and updating the plan; implementation on strategies and annual review; incorporation into existing mitigation mechanism; and public involvement.
Section 9. ***Plan Adoption***	This section outlines the process by which this plan will be formally adopted by the local governing body.
Section 10. ***Acronyms and Glossary***	This section outlines the acronyms and glossary of key terms used throughout the Mitigation Plan.
Section 11. ***References***	This section outlines the listing of source material used throughout the Mitigation Plan.

3.2.3. Organizing the Town Resources

This is a first step in the planning process. During the development of the plan, the collaborative planning process involved Town officials such as: Town Supervisor, Town Board Members, Police Chief, Highway Superintendent, Fire Marshall/Building Inspector, Superintendent of Recreation, Town Engineer, Town Junior Engineer, and the Town Consultant, Charles A. Manganaro Consulting Engineers, P.C. (see Figure 3-1: Hazard Mitigation Planning Team). The Town Engineer and the Town Junior Engineer were active in coordinating resources and public involvement and providing information for the development of the Plan.

Figure 3-1 Hazard Mitigation Planning Team



The Town officials and staff along with their planning consultant were crucial to the organization of the Multi-Hazard Mitigation Planning Committee. The Town officials, the Planning team and community participants reviewed and commented on this plan. Using a standard review process, FEMA staff will then evaluate and comment on the Draft Plan and identify issues to be resolved prior to approval. Post the initial Draft Plan process, the plan is revised into the Draft Final Plan prior to approval. The Draft Final Plan is then presented to the Town Board for approval and acceptance, and then forwarded by NYSOEM to FEMA for their final review and approval.

The Geographic Information System (GIS) maps were used where applicable to identify hazard locations, critical facilities, and vulnerabilities. An appendix with the supporting documents and articles and hazard analyses details are included in the HMP.

The planning process involves the identification of potential hazards in the Town that could have a fatal effect on people's lives and damage buildings and/or structures. The hazard analyses assessment includes a profile of each hazard, ranked based on the hazard severity. The rating and ranking of scores were developed using the Hazard Identification and Risk Assessment – New York (HIRA-NY) program results. The hazard analysis assessment is based on the rating/severity, area of impact, frequency, warning, duration, recovery, impact, and cascading effect (See Section 6.1).

Based on the Risk Assessment Analysis prepared for each hazard, only the most significant hazards were analyzed further for a detailed impact analysis, proposed mitigation measures and a cost/benefit evaluation. Priorities were then established for mitigation activities based on these analyses and the goal and objectives set for the community.

The Multi-Hazard Mitigation Plan consists of information obtained from various Federal, State, and local sources (See Section 5). Flood information shown on the maps is based on existing shape files from Westchester County GIS, current Flood Insurance Rate Maps (FIRM) and Flood Insurance Studies (FIS). Information on these maps is regarded as acceptable for planning purposes. This MHMP will be updated and modified by the Town as shown in Section 8. Updates will include the success of implementing the Plan's activities, availability of funds, availability of new information and changes in priorities.

SECTION 4. PUBLIC INVOLVEMENT AND OUTREACH

4.1. Public Involvement and Outreach

The Multi-Hazard Mitigation Plan developing process included involving the community in the Town of Mount Pleasant through invitations in the Town newsletter and website notice. The members of the public were invited to the town meetings to provide their comments on the MHMP via letters and email (see Appendix D). During the Planning Process and post initial Draft Plan completion, the Plan was made available to the public on the Town Website, at the Town Hall, and Town Library. The Draft Plan was also uploaded on a FTP server (ftp://mail.camengineers.com/report/) for the stakeholders and Planning Team to comment electronically.

4.2. Public Meetings

The public meetings of this plan are listed in the table below. Public meetings were held in the Town Hall Conference Room. A notice of the first public meeting was issued on June 24th, announcing the first meeting to be held on July 15th, 2015. The purpose of the first meeting was to provide an overall view of the MHMP to the community, future planning activities including goals and objectives, and the plan developing process. Members of the community were encouraged to provide comments. All questions and comments were noted by the Town Consultants. A second meeting was held on September 15, 2015 to present and summarize the Draft Plan for the community review and comments. The public comments and input were obtained and the next steps in the planning and approval process were presented.

Table 4-1 Public Meeting Dates

Date	Meeting
July 15th, 2015	1st Public Meeting
September 15, 2015	2nd Public Meeting

4.3. Public Information and Actions

Community members were encouraged to attend public meeting at the Town Hall, and were given the opportunity to address on notable hazard issues in the Town. A summary of the public meetings was also put on the Town's website (see website at www.mtpleasantny.com).

The Town of Mount Pleasant along with their Consultant provided several methods of public outreach to facilitate coordination and communication between the MHMP Committee and the members of the Community. The following steps have been implemented in an effort to receive public input in the preparation and review of this plan:

a) The Town has created a page on its website devoted to the MHMP to inform residents about the project and allow for direct input.

b) The Town Consultant has created a FTP server for the Planning Team and Stakeholders to have access to the Draft Plan online for electronic questions and comments.

c) Notified the community about the public meeting on July 15th, 2015 by publishing in the Journal News on June 24th, 2015.

d) A summary of the first public meeting was posted to the Town of Mount Pleasant Website.

e) A Draft Plan was posted to the Town of Mount Pleasant Website (www.mtpleasantny.com).

f) A second notification was published in the News for the second public meeting on September 22, 2015.

g) A formal opportunity for public comment will be provided for the Draft Plan that will be submitted to NYSOEM and FEMA. A 30 day review period for the Plan will be provided for the public comment.

Public comments are noted in Appendix D.

4.4. Public Input

In preparation for any disaster that could impact the community, the Town officials and Planning Committee sought the community's input on the plan. The public was invited to attend public meetings and assist in the Draft Plan developing process by providing information by letter or e-mail. The public were notified that this plan would qualify the Town of Mount Pleasant for grant money to assist in mitigating the potential hazards evaluated in the plan.

Prior to the first Public Meeting, the consultant developed a rough Draft Plan to ease the Public understanding of the MHMP developing process. The Town then was seeking input from residents about potential hazards they faced in the past and actions the local government can provide to help residents and Town officials prepare for and recover from disasters.

Upon the completion of the Draft Plan, a Final Draft Plan is submitted to NYSOEM for review and comments by FEMA. The public was welcomed for any feedback during and after the 30-day comment period by either submitting a letter or emailing to either the Town Engineer or the Town's Jr. Civil Engineer. Through public outreach the Town will get ideas from the residents who have been impacted by these hazards.

SECTION 5. COORDINATION WITH GOVERNMENT AGENCIES & STAKEHOLDERS

5.1. Community Stakeholders and Other Partnering Agencies

The Hazard Mitigation Plan Committee determined several government agencies and private organization which have stakeholder interest in the development and implementation of the Town of Mount Pleasant MHMP. The purpose of coordination with other agencies and organizations is to develop a resourceful and organized Hazard Mitigation Plan by using relevant information useful to the Town needs. Some of these agencies may fund programs, oversee regulatory requirements or provide technical input or review. The various agencies were divided into Neighboring Communities, County Departments, New York State and City Offices, Federal Agencies, Fire Departments, Ambulance, School Districts, Medical Facilities, Utility Companies, IT (Computer/Data), Major Employers and Businesses, Mass Transit and others as shown in tables below:

Table 5-1 Government Agencies and Stakeholders

Entity	Personnel
Neighboring Communities	
Village of Pleasantville	Patricia Dwyer, Village Administrator
Village of Briarcliff Manor	Philip E. Zegarelli, Village Manager
Village of Sleepy Hollow	Anthony Giaccio, Village Administrator
Town of Greenburgh	Paul Feiner, Town Supervisor
Town of North Castle	Michael J. Schiliro, Town Supervisor
Town of New Castle	Robert J. Greenstein, Town Supervisor
Town of Ossining	Susanne Donnelly, Town Supervisor

Entity	Personnel
County Departments	
Westchester County Department of Planning	Edward Buroughs, Planning Commissioner
Westchester Department of Emergency Services	John M. Cullen, Commissioner
Westchester County Department of Public Works/ Transportation	Jay T. Pisco, Commissioner
Westchester County Police Department	Sheriff George N. Longworth, Public Safety Commissioner
Westchester County Department of Environmental Facilities	Thomas Lauro, Commissioner
New York State and City Offices	
NYS Div. of Homeland Sec. & Emergency Services	Mr. Richard Lord, Chief of Mitigation Programs
New York State Department of Environmental Conservation (NYSDEC)	Mr. Martin Brand, Regional Director
New York State Department of Conservation (NYSDEC)	Dam Safety Official
New York City Department of Environmental Protection	Paul Bennett, Chief of Emergency Planning
New York State Department of Transportation	William Gorton, PE, Acting Regional Director
NYSDEC - Floodplain Management Section	William Nechamen, Chief
Federal Agencies	
Federal Emergency Management Agency (FEMA)	Jerome Hatfield, Regional Administrator
US Army Corps of Engineers	
Environmental Protection Agency-Region 2	Walter Mugdan, Director
National Flood Insurance Program (NFIP)	

Entity	Personnel
Fire Departments	
Thornwood Fire Department	Herbert Doerr, Chief
Hawthorne Fire Company	Henry Oswald Jr., Chief
Valhalla Fire Department	Daniel Lester, Chief
Pleasantville Fire Department	Ray Johnson
Pocantico Hills Fire Department	
BMFD Scarborough Engine Company	Robert O;Hanlon Jr.
Chappaqua Fire Department	Russel Maitland, Chief
Ambulance	
Valhalla Ambulance Corps, Inc.	Captain Steven Marello
Pleasantville Volunteer Ambulance Corps. Ambulance	Captain Krista Kolodzinski
Hawthorne Ambulance	
Sleepy Hollow Ambulance Corp.	Richard D'Alessandro, Chief of EMS
TransCare	Jeff Pitonza, Director of Operations
Medical Facilities	
Westchester Medical Center	Michael D. Israel, President and CEO
Phelps Hospital	Keith F. Safian, FACHE, President and CEO
Blythedale Children's Hospital	Maureen Desimone, COO
Rosary Hill Home	Sister Mary Edwin
Crestview Manor	

Entity	Personnel
School District	
New York Medical College	Alan Kadish, M.D, President
Pace University	Stephen J. Friedman, President
Mount Pleasant Central School District	Susan Guiney, School Superintendent
Valhalla UFSD District Office	Dr. Brenda Myers, Superintendent
Pleasantville UFSD District Office	Mary Fox-Alter, Superintendent
Pocantico Hills Central School District	Dr. Valencia F. Douglas, Superintendent
EF International Academy	Brian Mahoney, Headmaster
Hawthorne Cedar Knolls UFSD	Mark K. Silverstein, Superintendent
JCCA Cottage School	Richard Altman, CEO
Utility Company	
Con Edison	Jane Skolnick, Operations Emergency Management
Cablevision	
Verizon Corporate Office Headquarters	
Lightpath	
AT&T Corporate Office Headquarters	Larry Bamberger
IT (Computer/Data)	
Sullivan Data	Glen Sullivan, Director
Mass Transit	
MTA Metro-North Railroad	Joseph Giuletti, President
Bee-Line Bus	Department of Public Works and Transportation

Entity	Personnel
Major Employers and Businesses	
PepsiCo. Inc.	Adrienne Scivolette, Manager Ev. Health & Safety
FujiFilm USA	
New York Life Insurance Company	Doug Rodgers
Carl Zeiss, Inc.	
Regeneron	Leonard S Schleifer, M.D., PhD., President
Girls Scouts of America, USA	David Vogt, Edith Macy Conference Center General Manager
Others	
Community Emergency Response Team (CERT)	Ryan Rodgers
American Red Cross	Kevin Stewart

The table above illustrates all the Government Agencies and private organizations invited to participate in the planning process of the MHMP. Interested agencies' and organizations' roles in the planning process include providing information and source of data relevant to the Town of Mount Pleasant, regulatory oversight, review and input to the MHMP of specific mitigation action plans prior to their implementation, and funding of projects. Stakeholders as well as the public were invited to review and comment on the Plan uploaded online (FTP server). Each agency, organization and group participating role in the Draft Plan preparation is as follows:

5.1.1. Federal Agencies

- **Federal Emergency Management Agency (FEMA) –** the plan guidance, regulatory requirements, funds, and program review for preparation and implementation of the MHMP was provided by FEMA. FEMA approval of this plan is required in order to receive funds.

- **U.S. Army Corp of Engineers (USACE) -** Permits and regulatory approvals from USACE are needed to implement any proposed projects relating to aqueous features within the Town. This includes dam repairs and dredging.
- **Environmental Protection Agency - Region 2 –** Provides information for Region 2, which contains the Town of Mount Pleasant. This office also controls regulations for emergency environmental impact.
- **National Flood Insurance Program (NFIP) –** Holds records and information on flood hazard insurance. Flood mitigation and insurance activities require the NFIP to be notified

5.1.2. New York State and City Offices

The following state agencies were contacted for permits and review:

- New York State Department of Conservation – Involved with the specific mitigation actions having potential environmental impacts. It oversees the State Environmental Quality Review Act (SEQRA) requirements, pollution discharge permits, regulation of HAZMAT releases, protection of habitats, wetlands, and protected species that are related to the implementation of the Plan.
- New York State Department of Transportation – Handles matters relating to highways and other transportation. They will be informed of any project relating to Traffic Management issues relating to hazard impacts.
- New York State Division of Homeland Security & Emergency Services – Oversees emergency response planning.
- State Floodplain Manager – Provides information on floodplain regions and insurance. Reviews mitigation plans relating to flood hazards.

- Department of Environmental Protection – Manages the water supply to the City of New York. It regulates impacts to the environment in City owned land. It also manages forest inventory in the City's watershed and debris management from any hazard impact.

5.1.3. County and Town Departments

- Westchester County Dept. of Public Works – Involves design and construction of all infrastructure systems, capital projects, and non-recurring repairs and replacement projects for the County.
- Westchester County Dept. of Public Works/ Transportation – Regulates public works for the whole of the County. Invited to review the Plan and comment on County-wide impacts of hazards.
- Westchester County Department of Public Safety – Reviews projects that would impact personal safety of the residents and visitors to the County, and regulates key facilities within the County.
- Westchester County Department of Environmental Facilities – They will review projects that impact facilities such as waste, hazardous waste, water, and wastewater facilities.
- Fire Departments within the Town will review projects that impact paths and capabilities for emergency rescue and fire containment:
    - Thornwood Fire Department
    - Valhalla Fire District
    - Chappaqua Fire Department
    - Pleasantville Fire Department
    - Pocantico Hills Fire Department
    - BMFD Scarborough Engine Company
    - Hawthorne Fire Department

- Ambulance Corps. within the Town will review projects that impact capabilities for emergency transport and lifelines:
  - Valhalla Ambulance Corps, Inc.
  - Pleasantville Ambulance
  - Hawthorne Ambulance
  - Sleepy Hollow Ambulance Corp.
  - TransCare

5.1.4. Neighboring Communities

The following are towns and villages within the immediate area, which may be impacted by projects implemented under the Hazard Mitigation Plan:

- Village of Pleasantville
- Village of Briarcliff Manor
- Village of Sleepy Hollow
- Town of Greenburgh
- Town of North Castle
- Town of New Castle
- Town of Ossining

5.1.5. Hospitals and School Districts

There are several medical facilities and schools which were contacted for Plan meetings. Hospitals and schools both will assess their capabilities to respond or evacuate due to hazard impact. These organizations and facilities are impacted by hazard response efforts:

- Westchester Medical Center
- Phelps Memorial Hospital

- Mount Pleasant Central School District
- Pocantico Hills Central School District
- Hawthorne Cedar Knolls U.F.S.D.
- Pace University
- New York Medical College
- Valhalla U.F.S.D.
- Pleasantville U.F.S.D.
- EF International Academy
- J.C.C.A. Cottage School
- Blythedale Children's Hospital

5.1.6. Other Organizations and Utilities

Other private companies which have economic or other interests within the Town of Mount Pleasant were also invited for input and comment on the Hazard Mitigation Plan.

- Consolidated Edison – Reviews and comments on mitigation actions that will impact power lines and buried cables. Also assesses resistance of power grid to hazard impacts.
- Verizon, AT&T, LightPath, and Cablevision – Provides review on hazard impacts and mitigation projects that may impact communication structures or cables. Also prepares communication lines in preparation for hazard impacts.
- MTA Metro-North Railroad – Provides commuter rail services to the Town of Mount Pleasant. MTA will review projects that have an impact on the railway services and review railway traffic effects.
- Bee-Line Bus – Provides review on hazard impacts and mitigation projects that may impact bus routes and related traffic impacts.

- Citizens Emergency Response Team (CERT) – Provides feedback on emergency response capabilities and aid able to be offered.
- Sullivan Data – Provides IT services for the Town of Mount Pleasant, and provides review on impacts of mitigation actions to those services.
- Rosary Hill Home – A home for the elderly, it will provide input on quick response and evacuation protocols representing its residents.
- Private enterprises with business and organizational interests within the Town of Mount Pleasant:
    - PepsiCo. Inc.
    - Girl Scouts of America, USA
    - FujiFilm, USA
    - New York Life Insurance Company
    - Carl Zeiss, Inc.
    - Regeneron

5.2. Participation by Community Stakeholders and Other Partnering Agencies

The General Stakeholders were invited through letters sent on October 21, 2014, for a meeting to be held on November 12, 2014, at the Town Library at 125 Lozza Drive, Valhalla, New York, to ensure participation by all the community stakeholders and other partnering agencies. The draft plan was uploaded on the FTP server for review by the community stakeholders and other partnering agencies, prior to the actual meeting. A graphic presentation of the draft plan was offered to the meeting attendees.

Questionnaires were distributed to the stakeholders for receiving their comments. The stakeholders' comments from review of the Plan are documented in Appendix D. Other individual meetings were held with the New York City Department of Environmental Protection and Consolidated Edison Company, on December 4, 2014 and February 3, 2015, respectively

5.3. Draft Action Plan Review

The Draft Plan was uploaded on the Towns Website www.mtpleasantny.com and also on a FTP server for questions and comments. Each agency representative was contacted to discuss hazards and mitigation measures relevant to the Town of Mount Pleasant. The Draft Plan underwent comprehensive review and comment by the Town's Planning Committee, the Town's Consultant, interested Stakeholders, and the public (public comment period was 30 days). The Draft Plan then was sent to NYSOEM project manager for FEMA's review and comment. Comments by FEMA were resolved and incorporated into the Plan. The Planning Team Committee of the Town recommended a group of organizations to review and comment on the Final Plan. The recommended agencies were:

- Town of Mount Pleasant (boundaries shown in Figure 5-1)
- Mount Pleasant School District
- Westchester County Planning Department.

Existing documents were obtained from some of the agencies mentioned in section 5.2. A variety of information was obtained from several participating agencies as well as various websites. A full listing of used documents and citations are given in Section 11: References.

Figure 5-1 Town of Mount Pleasant Boundaries, Roads, Reservoirs, Lakes, Ponds, and Water District

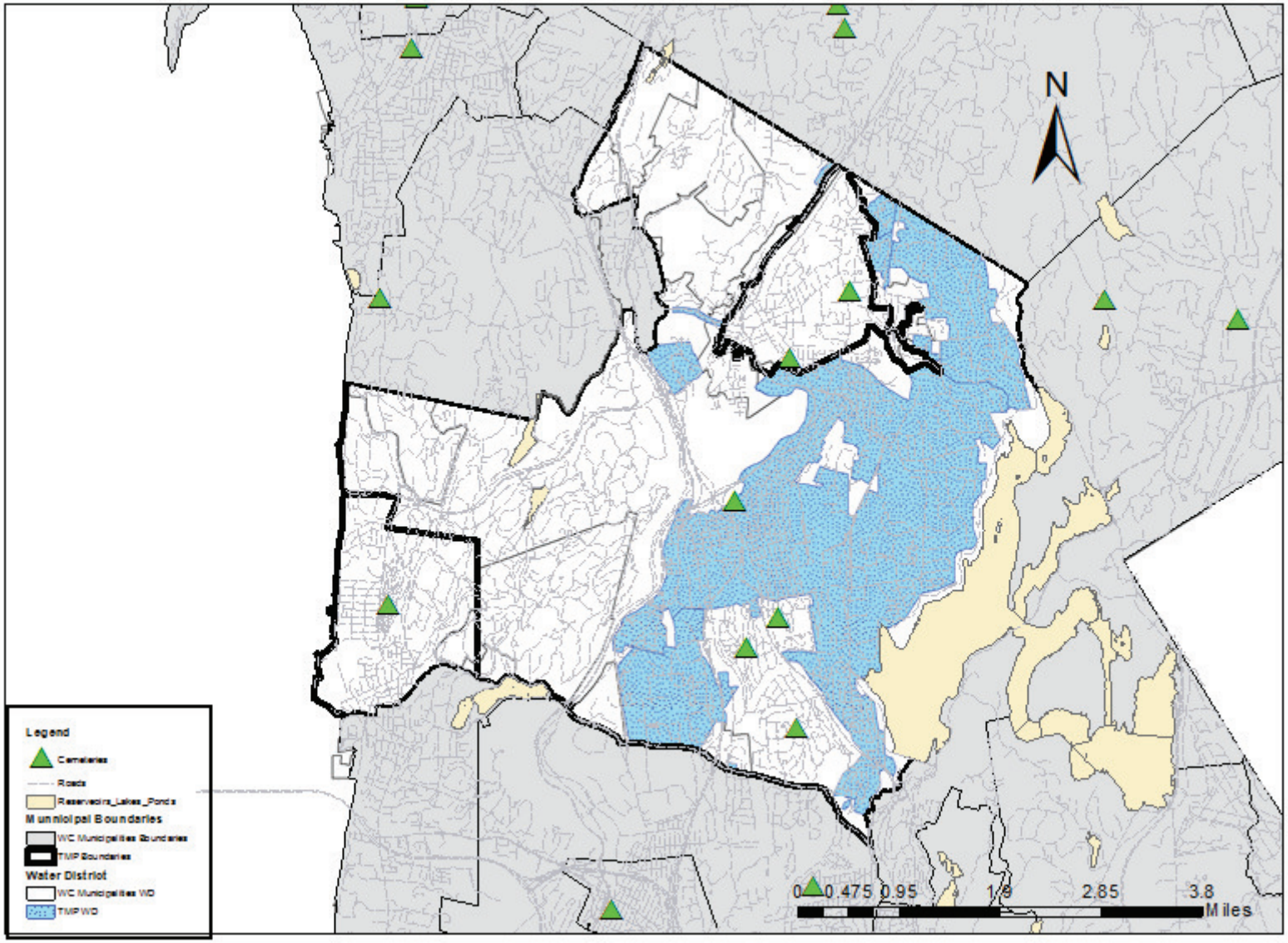


Figure 1.1.2 - Town of Mount Pleasant Boundaries, Roads, Reserveoirs, Lakes, Ponds and Water District

SECTION 6. RISK ASSESSMENT

Risk is the potential for damage, loss or other impacts created by the interaction of natural hazards with community assets. A natural hazard is a source of harm or difficulty created by a meteorological, environmental or geological event. The exposure of people, property, and other community assets to natural hazards can result in disasters depending on the impacts, which are the consequences or effects of the hazard on the community and its assets. The type and severity of impacts are based on the extent of the hazard and the vulnerability of the asset, as well as the community's capabilities to mitigate, prepare for, respond to and recover from events.

This section describes how the Town of Mount Pleasant conducted a risk assessment to determine the potential impacts of hazards to the people, economy and built and natural environments of the community, which is the foundation for the rest of the mitigation planning process.

The risk assessment was developed consistent with the FEMA State and Local Mitigation and Planning Guide 386-2: **Identifying Hazards and Estimating Losses**. The risk assessment was also based on the Town's Comprehensive Emergency Management Plan, found in Appendix A.

The Risk Assessment section includes the following steps:

Step 1: Identify Hazards.

Step 2: Profile Hazard Events.

Step 3: Assess Vulnerability

- Inventory Assets
- Estimate Losses
- Analyze Development Trends

The plan satisfies the following requirements of the Code of Federal Regulations:

CFR 201.6(c)(2): *The risk assessment shall include:*

- ***(i)*** *A description of the type, location, and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.*
- ***(ii)*** *A description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community. All plans approved after October 1, 2008 must also address NFIP insured structures that have been repetitively damaged by floods. The plan should describe vulnerability in terms of:*
  - *A. The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas;*
  - *B. An estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(ii)(A) of this section and a description of the methodology used to prepare the estimate;*
  - *C. Providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.*
- ***(iii)*** *For multi-jurisdictional plans, the risk assessment section must assess each jurisdiction's risks where they vary from the risks facing the entire planning area.*

6.1. Identify Hazards

Identifying all the natural hazards that might affect your community and narrowing down to the hazards that are most likely to affect the community are the first steps in doing a risk assessment. In this step, as required by **§201.6(c)(2)(i)** mentioned above, all the natural hazards that may occur in the Town were listed by using the following means: researching newspapers and other historical records; reviewing all existing plans and reports; communication with the community and state; and gathering research from the web.

In April 2011, the Town of Mount Pleasant conducted a hazard analysis using the automated program, Hazards Identification and Risk Assessment New York (HIRA-NY), developed by the American Red Cross and New York State office of Emergency Management (NYSOEM).

The potential hazards that can impact the Town were ranked using the program, which entailed entering the information into preformatted Microsoft Excel spreadsheets. HIRA-NY evaluated five factors that are the cornerstones of the hazard analysis process by developing the risk assessment components of the all-hazard mitigation planning process, as outlined in 44 CFR Part 201, under which the hazard mitigation plan was developed. The risk assessment process identified all hazards that can impact the Town and profiled the most prevalent hazards. Profiling involved consideration of: location or geographic areas affected; extent or magnitude/severity of each hazard; records of previous occurrences; and probability of future occurrences.

The five factors are:

1. Scope

   This factor looks at two aspects:

   - What area or areas in your jurisdiction could be impacted by the hazard?
   - What are the chances of the hazard triggering another hazard causing a cascading effect?

2. Onset

   The onset factor is related to the amount of time between the initial recognition of an approaching hazard and when the hazard begins to impact the community. This is a very important factor because for some hazards, ample warning time is available (e.g. Drought), so that if plans and procedures have not been developed, there is still time to accomplish such. On the other hand, an earthquake could occur at any time without a warning and cause severe damage.

3. Impact

   The factor involves the analysis of a hazard's impact on the community's infrastructure, private properties and people.

4. Duration

This factor is concerned with three durations:

- How long does the hazard remain active?
- How long do emergency operations continue after the hazard event has ended?
- How long does the recovery process take?

5. Frequency (of past occurrences)

This factor indicates how often a hazard has resulted in an emergency or disaster, or it can be a prediction of how often a hazard may occur in the future. Frequency is established by recording historical events and determining time intervals between each occurrence.

Table 6-1 Frequency Terms

Event	**Frequency**
Rare	Occurs less than once every 50 years.
Infrequent	Occurs between once every 8 years and once every 50 years (inclusive)
Regular	Occurs between once a year and once every 7 years (inclusive)
Frequent	Occurs more than once a year

The selected hazards were assigned a numerical score in HIRA-NY program. Table 6-2 tabulates the hazards, ranked based on their severity, and also includes the other risk assessment characteristics for each hazard. Table 6-3 highlights the relevant and responding agencies for each hazard.

From the initial review of the hazards, it was determined that some of the natural, human-caused, and technological hazards included in the HIRA-NY program were not applicable to the Town. Hence, the most prevalent hazards in the Town from among the list were selected for further analysis.

Table 6-2 HIRA-NY Multi-Hazard Risk Assessment

HAZARDS	TMP HAZARDS ANALYSIS REPORT (HIRA-NY)							
	Rating/ Severity	Area of Impact	Frequency	Warning	Duration	Recovery	Impact	Cascading Effects
Moderately High Hazards								
Flood	296 Moderately High Hazard	Large Region	A Frequent Event	No Warning	1-3 Days	1-2 Days	• Serious injury or death is unlikely. • Moderate damage to private property. • Moderate structural damage to public facilities	Highly Likely; Explosion; Fire; Food Shortage; Fuel Shortage; Hazmat (Fixed Site); Hazmat (In Transit); Landslide; Oil Spill; Structural Collapse; Trans Accident; Utility Failure; Water Supply Contamination.
Winter Storm (Severe Snow/Ice)	263 Moderately High Hazard	Large Region	A Frequent Event	1 Day Warning	2-3 Days	1-2 Days	• Serious injury or death is likely (not large number). • Moderate damage to private property. • Moderate structural damage to public facilities.	Some Potential; Fire; Food Shortage; Fuel Shortage; Hazmat (Fixed Site); Hazmat (In Transit); Oil Spill; Structural Collapse; Trans Accident; Utility Failure; Water Supply Contamination.
Moderately Low Hazards								
Dam Failure	241 Moderately Low Hazard	Single Location	A Rare Event	No Warning	1 Day	More than 2 Weeks	• Serious injury or death to extremely large number. • Severe damage to private property. • Severe structural damage to public facilities.	Highly Likely; Explosion; Fire; Food Shortage; Fuel Shortage; Hazmat (Fixed Site); Hazmat (In Transit); Landslide; Oil Spill; Structural Collapse; Trans Accident; Utility Failure; Water Supply Contamination.
Severe Storm	238 Moderately Low Hazard	Large Region	A Frequent Event	Serveral Hour Warning	Less Than 1 Day	Less Than 1 Day	• Serious injury or death is likely • Little or no damage to private property. • Little or no structural damage to public facilities.	Highly Likely; Fire; Flood; HAZMAT (Fixed Site); HAZMAT (In Transite); Oil Spill; Structural Collapse; Trans Accident; Utility Failure; Water Supply Contamination.

HAZARDS	TMP HAZARDS ANALYSIS REPORT (HIRA-NY)							
	Rating/ Severity	Area of Impact	Frequency	Warning	Duration	Recovery	Impact	Cascading Effects
Ice Storm	231	Large Region	A Regular Event	Serveral Hours Warning	2-3 Days	1-2 Days	• Serious injury or death is unlikely. • Little or no damage to private property. • Moderate structural damage to facilities.	Highly Likely; Fire; Flood; HAZMAT (Fixed Site); HAZMAT (In Transite); Oil Spill; Structural Collapse; Trans Accident; Utility Failure; Water Supply Contamination.
Fire	230	Single Location	A Frequent Event	No Warning	Less Than 1 Day	Less Than 1 Day	• Serious injury or death is likely (not in large numbers) • Little or no damage to private property. • Little or no structural damage to facilities.	Some Potential; Explosion; Fire; Hazmat (Fixed Site); Structural Collapse; Utility Failure; Water Supply Contamination; Wildfire.
Extreme Temperature	218	Large Region	A Regular Event	1 Day Warning	4-7 Days	Less Than 1 Day	• Serious injury or death is likely (not in large numbers) • Little or no damage to private property. • Moderate structural damage to facilities	Some Potential; Explosion; Fire; Hazmat (Fixed Site); Structural Collapse; Oil Spill; Utility Failure; Water Supply Contamination.
Terrorism	211	Large Region	A Rare Event	No Warning	2-3 Days	3-7 Days	• Serious injury or death is likely (large numbers) • Little or no damage to private property. • Moderate structural damage to facilities.	Highly Likely; Civil Unrest; Dam Failure; Epidemic; Explosion; Food Shortage; Fuel Shortage; HAZMAT (Fixed Site); HAZMAT (In Transit); Oil Spill; structural Collapse; Utility Failure; Water Supply Contamination.
Tornados	210	Small Region	An Infrequent Event	No Warning	Less Than 1 Day	3-7 Days	• Serious injury or death is likely (not in large numbers) • Little or no damage to private property. • Little or no structural damage to facilities.	Highly Likely; Explosion; Fire; Food Shortage; Fuel Shortage; Landslide; Oil Spill; Structural Collapse; Trans Accident; Utility Failure; Water Supply Contamination.

HAZARDS	TMP HAZARDS ANALYSIS REPORT (HIRA-NY)							
	Rating/ Severity	Area of Impact	Frequency	Warning	Duration	Recovery	Impact	Cascading Effects
Utility Failure	195	Large Region	An Infrequent Event	No Warning	2-3 Days	Less Than 1 Day	• Serious injury or death is unlikely • Little or no damage to private property. • Little or no structural damage to facilities.	Some Potential; Civil Unrest; Fire; Food Shortage; Fuel Shortage; Trans Accident; Water Supply Contamination.
Earthquakes	195	Large Region	A Rare Event	No Warning	1 Day	3-7 Days	• Serious injury or death is likely (not in large numbers) • Moderate damage to private property. • Moderate structural damage to facilities.	Highly Likely; Explosion; Fire; Food Shortage; Fuel Shortage; Hazmat (Fixed Site); Hazmat (In Transit); Landslide; Oil Spill; Structural Collapse; Trans Accident; Utility Failure; Water Supply Contamination.
Explosion	195	Single Location	A Regular Event	No Warning	Less Than 1 Day	Less Than 1 Day	• Serious injury or death is likely (not in large numbers) • Moderate damage to private property. • Moderate structural damage to facilities.	Some Potential; Explosion; Fire; Flood; Hazmat (Fixed Site); HAZMAT (In Transite); Structural Collapse; Oil Spill; Utility Failure; Transportation Accident; Water Supply Contamination.
Transportation Accidents	187	Single Location	An Infrequent Event	No Warning	1 Day	1-2 Days	• Serious injury or death is likely (not in large numbers) • Moderate damage to private property. • Moderate structural damage to facilities.	Some Potential; Explosion; Fire; HAZMAT (In Transit); Structural Collapse; Oil Spill; Utility Failure; Water Supply Contamination.
HAZMAT (Fixed Site)	186	Single Location	A Regular Event	No Warning	Less Than 1 Day	Less Than 1 Day	• Serious injury or death is unlikely • Little or no damage to private property. • Little or no structural damage to facilities.	Some Potential; Oil Spill; Water Supply Contamination.

HAZARDS	TMP HAZARDS ANALYSIS REPORT (HIRA-NY)							
	Rating/ Severity	Area of Impact	Frequency	Warning	Duration	Recovery	Impact	Cascading Effects
HAZMAT (In Transit)	158	Single Location	An Infrequent Event	No Warning	Less Than 1 Day	Less Than 1 Day	• Serious injury or death is likely (not in large numbers) • Little or no damage to private property. • Little or no structural damage to facilities.	Some Potential; Explosion; Fire; Transporation Accident; Oil Spill; Water Supply Contamination.
Oil Spill	186	Single Location	A Regular Event	No Warning	Less Than 1 Day	Less Than 1 Day	• Serious injury or death unlikely • Little or no damage to private property. • Little or no structural damage to facilities.	Some Potential; Explosion; Fire; Trans Accident; Water Supply Contamination.
Water Supply Contamination	185	Large Region	An Infrequent Event	Several Hours Warning	More than 1 Week	1-2 Days	• Serious injury or death unlikely • Little or no damage to private property. • Little or no structural damage to facilities.	Highly Unlikely
Drought	180	Large Region	A Regular Event	More Than 1 Week Warning	More than 1 Week	Less Than 1 Day	• Serious injury or death is unlikely • Little or no damage to private property. • Little or no structural damage to facilities.	Some Potential; Extreme Temp; Fire; Utility Failure; Water Supply Contamination.
Hurricane	180	Large Region	An Infrequent Event	Several days Warning	1 Day	3-7 Days	• Serious injury or death is likely (not in large numbers) • Little or no damage to private property. • Little or no structural damage to facilities.	Highly Likely; Explosion; Fire; Hazmat (Fixed Site); Hazmat (In Transit); Structural Collapse; Trans Accident; Utility Failure; Water Supply Contamination.

HAZARDS	TMP HAZARDS ANALYSIS REPORT (HIRA-NY)							
	Rating/ Severity	Area of Impact	Frequency	Warning	Duration	Recovery	Impact	Cascading Effects
Radiological (Fixed Site)	176	Single Location	A Rare Event	No Warning	More Than 1 Week	More than 2 Weeks	• Serious injury or death is unlikely • Little or no damage to private property. • Little or no structural damage to public facilities.	Some Potential; Civil Unrest; Hazmat (In Transit); Oil Spill; Fire; Trans Accident.
Radiological (In transit)	136	Single Location	A Rare Event	No Warning	Less Than 1 Day	1 Day	• Serious injury or death is unlikely • Moderate damage to private property. • Little or no structural damage to public facilities.	Some Potential; Extreme Temp; Fire; Trans Accident; Utility Failure.
Epidemic	166	Large Region	An Infrequent Event	Several Days Warning	More than 1 Week	1-2 Days	• Serious injury or death is likely (not in large numbers) • Little or no damage to private property. • Little or no structural damage to public facilities.	Highly Unlikely
Low Hazards								
Wildfire	156	Single Location	An Infrequent Event	No Warning	1 Day	Less Than 1 Day	• Serious injury or death is unlikely • Little or no damage to private property. • Little or no structural damage to public facilities.	Some Potential; Utility Failure.
Civil Unrest	153	Several Location	An Infrequent Event	Several Hours Warning	1 Day	Less Than 1 Day	• Serious injury or death likely (not in large numbers) • Moderate damage to private property. • Little or no structural damage to public facilities.	Some Potential; Civil Unrest; Hazmat (In Transit); Oil Spill; Fire; Trans Accident.

Table 6-3 Hazards Related Agencies

HAZARDS	Town Supervisor	Engineering Department	Police Department	Highway Department	Water and Sewer Department	Recreation & Park Department	Fire Service	Building Deparment	Emergency Medical Service	Con Edison/Other Utilities	Emergency Shelter Operation Protocols	EOC	Controller/Finance
Flood	X	X	X	X	X	X	X	X	X	X	X		
Winter Storm (Severe Snow/Ice)	X		X	X	X	X	X		X			X	
Dam Failure	X	X	X	X	X	X	X	X	X	X	X	X	
Severe Storm	X		X	X	X								
Ice Storm	X		X	X		X				X	X	X	X
Fire	X		X	X		X	X	X		X	X		
Extreme Temperature	X		X	X	X	X			X	X	X		
Terrorism	X		X	X	X		X	X	X				
Tornados	X	X	X	X	X	X	X	X	X	X	X	X	X
Utility Failure	X		X	X	X		X	X	X	X	X	X	
Earthquakes	X	X	X	X	X	X	X	X	X	X	X	X	X
Explosion	X	X	X	X	X		X	X	X	X		X	X
Transportation Accidents	X		X	X	X		X	X	X	X			
HAZMAT (Fixed Site)	X		X	X	X	X	X		X		X	X	
HAZMAT (In Transit)	X		X	X	X	X	X		X		X	X	
Oil Spill	X		X	X	X		X						
Water Supply Contamination	X	X	X		X			X					
Drought	X		X	X	X		X						
Hurricane	X	X	X	X	X	X	X	X	X	X	X	X	X
Radiological (Fixed Site)	X		X	X	X	X	X		X		X	X	
Radiological (In transite)	X		X	X	X	X	X		X		X	X	
Epidemic	X		X	X	X				X		X		
Wildfire	X			X	X	X	X		X				
Civil Unrest	X		X	X			X		X				

The selected hazards were categorized as follows:

Table 6-4 HIRA-NY Hazard Classifications

Rating	Category
321 - 400	High Hazard
241 - 320	Moderately High Hazard
161 - 240	Moderately Low Hazard
44 - 160	Low Hazard

Town of Mount Pleasant Hazards Analysis Report (HIRA-NY) is attached in the Appendix A and lists all the natural hazards that may occur in the Town. The hazards with a higher magnitude or severity of impact to the Town were further analyzed and are as follows:

- Flood
- Winter Storm (Severe Snow/Ice)
- Dam Failure
- Severe Storm
- Ice Storm
- Fire
- Extreme Temperature
- Terrorism
- Earthquakes
- Hurricane

Other hazards considered less severe or low magnitude are described in less detail and maybe re-evaluated in later updates to this plan.

6.2. Profile Hazard Events

Each hazard type has unique characteristics that can impact a community. Also any given hazard can produce different effects on a community depending upon its magnitude, duration or intensity. It can also affect different communities in different ways based on geography, development, population distribution, age of buildings etc. A hazard event is a specific occurrence of a particular type of hazard.

Profiling of a hazard event is the next step in risk assessment which reflects these different characteristics. For the planning purposes, some hazards were profiled by mapping the geographic extents of identifiable hazards because they occur in the predictable areas of the Town and then determining the vulnerable portions of the community together with the elements that can be damaged. The others which can occur anywhere were profiled simply by recording the maximum intensity.

The basic steps in profiling of hazard events are:

A. Create a base map showing the areas that are subject to various hazards. The map should be current, to scale and should have distinguishable buildings, roads, rivers, coastlines, place names, north arrow etc.

B. Obtain hazard event profile information. HAZUS was considered the primary source of data in this step.

C. Record the hazard event profile information.

Hazard Profiles

The risk profiles for each of the hazards identified in Section 6.1 are summarized below: Each hazard profile addressed the following elements:

- Description of Hazard
- Sources of Information

- Location and Spatial Extent of Area of Hazard (if applicable)
- Hazard Impact
- Past Occurrences
- Probability of Future Events
- Vulnerability Assessment Profile Maps (if applicable)

6.2.1 Flood - 296

Description:

Floods are the most prevalent hazards in the United States, as can be seen from Figure 6-1 which illustrates the past Presidential declarations for flood events. A flood is a natural event for rivers and streams. Excess water from snowmelt, rainfall, or storm surge accumulates and overflows onto the banks and adjacent floodplains.

Floodplain: The area adjoining a watercourse that may be covered by floodwater during a flood. Storm runoff and flood events may cause alterations in the floodplain.

Floodway: The channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the Base Flood can be carried without substantial increases in flood height

100-Year Flood (or Base Flood): A flood event that statistically has a one percent chance of being equaled or exceeded in any given year. The base flood is the national standard used by the National Flood Insurance Program (NFIP) and all Federal agencies for the purposes of requiring the purchase of flood insurance and regulating new development. Base Flood Elevations (BFEs) are typically shown on Flood Insurance Rate Maps (FIRMs).

500-Year Flood: A flood event that statistically has a 0.2 percent chance of being equaled or exceeded in any given year.

Base Flood Elevation (BFE): The computed elevation to which floodwater is anticipated to rise during the base flood, usually in feet, in relation to National Geodetic Vertical Datum of 1929, the North American Vertical Datum of 1988, or other datum referenced in the Flood Insurance Study Report. Base Flood Elevations (BFEs) are shown on Flood Insurance Rate Maps (FIRMs) and on the flood profiles. The BFE is the regulatory requirement for the elevation or floodproofing of structures. The relationship between the BFE and a structure's elevation determines the flood insurance premium.

Most floods fall into one of the three major categories:

1. Riverine flooding: A watershed, basin, or catchment is an area bounded by a ridge or divide that drains into a lake, stream or other body of water. Channels are defined features on the ground that carry water through and out of a watershed. They may be called rivers, creeks, streams or ditches. Water from rain and snowmelt are collected by the smaller channels (tributaries) which send the water to larger ones and eventually to the lowest body of water in the watershed. When a channel receives too much water, the excess flows over its banks and into the adjacent floodplain. Flooding that occurs along a channel is called riverine flooding. Among the common type of riverine flooding are:

   - Overbank Flooding: Over bank flooding is the most common type of flooding in the United States. It occurs when downstream channels receive more rain or snowmelt from their watershed than normal, or a channel is blocked by an ice jam or debris. The excess water overloads the channels and flows out onto the floodplain. It varies with the watershed's size and terrain and is measured by the velocity of the moving water. In hilly areas the velocity poses a serious hazard, while in flat areas, the flood may move slower and velocity may pose a lower threat. Terrain may affect how much warning people have that a flood is building. Conditions on a river that drains a large watershed may warn of a pending flood hours or even days before actual flooding. On the other hand, streams in hilly areas may give no warning that a flash flood is about to strike. Flood depths vary, as do flood durations. Generally, the larger the river, the deeper the flood and the longer it will last. However, in hilly or mountainous areas with narrow valleys, flooding can be very deep in small watersheds. Depending on the size of the river and terrain of its floodplain, flooding can last for days and cover wide areas.
   - Flash Flood: Flash flood is a rapid and extreme flow of high water into a normally dry area, or a rapid rise in a stream or creek above a predetermined flood level beginning within six hours (actual time threshold may vary) of the causative event. A severe storm

that drops much rainfall in a short time, dam failure, the release of ice jam flooding or collapse of debris dams can generate a flash flood. All flash floods strike quickly and end swiftly. Areas with steep slopes and narrow stream valleys are particularly vulnerable, as are the banks of small tributary streams. In hilly areas, the high-velocity flows and short warning time make flash floods hazardous and very destructive. In urban areas, flash flooding can occur where impervious surfaces, gutters and storm sewers speed runoff.

2. Coastal Flooding: Coastal flooding occurs along the coasts and large lakes by several paths, such as overflowing a barrier, coastal erosion, direct inundation and/or breaching of a barrier. These can be caused by coastal storms such as hurricanes and severe storms, tsunamis and storm surges.

3. Shallow Flooding: Shallow flooding occurs in flat areas where water cannot drain away easily. Shallow flood problems fall into three categories: sheet flow, ponding and urban drainage.

- Sheet flow: Sheet flows occur after an intense or prolonged rainfall during which the rain cannot soak into the ground, and the floodwaters move downhill and cover a wide area.
- Ponding: Runoff collects in depressions and cannot drain out, creating temporary ponds until the water infiltrates into the soil, evaporates or is pumped out.
- Urban Drainage: An urban drainage system comprises the ditches, storm sewers, retention ponds, swales etc. constructed to store runoff or carry it to a receiving stream, lake or the ocean. Due to conversion of open natural spaces to impervious spaces such as buildings, parking lots and roads, which increases the runoff and also due to design of storm sewer systems in the past to handle smaller storms, larger storms overload them, and the resulting backed-up sewers and overloaded ditches producing shallow flooding. These are usually more a nuisance than a hazard.

Sources of Information:

Conversation with local Town Residents, documents and engineering reports furnished by the Town, NOAA website, FEMA website, and Westchester County Flood Insurance Study.

Profile Details:

As per HIRA-NY flooding is ranked first with a score of 296 which is a moderately high hazard. The area of impact is fairly large. The community is crossed by a number of streams brooks, rivers, lakes and ponds, thus making it fairly susceptible to flooding from a variety of sources. The flood events that caused major damage were from tropical storms Floyd, Ernesto, Nor'Easter of 2007, Irene in August, 2011 and Sandy in October, 2012. Flooding is a frequent event, and is caused in large part by the Saw Mill River, Nanny Hagen Brook, Pocantico Lake and associated lakes and ponds. Within the Town of Mount Pleasant, there are Saw Mill River and Nanny Hagen Brook that travel across the town; ponds; lakes; and the Kensico Reservoir. These areas are at high risk for personal safety, property damage, and infrastructure damage such as roads, sewer lines, and utilities. Flooding may also back up sanitary sewers and add sewage to floodwater.

Floods are costly and cause extensive damage. According to FEMA, $1,164,582 was paid out in insurance claims for flood damage in the Town of Mount Pleasant between January 1, 1970 and November 29, 2014.

Flood Location and Extent:

The Westchester County GIS database provides the 100-year and 500-year floodplains (see Figure 6-2 and Figure 6-3). These maps show the major hazard areas related to flooding within the Town. The hilly nature of the Town and its low, narrow river basins creates zones with frequent flooding and poor drainage. Floods usually last one (1) to three (3) days, and the expected recovery time is (1) to two (2) days.

According to FEMA's HAZUS-MH and the Westchester County GIS maps, the high flood risk areas are located along the Kensico Reservoir, the Saw Mill River, Nanny Hagen Brook, Pocantico Lake and associated lakes and ponds.

HAZUS-MH estimates, in 2006 dollars, that the total economic losses from a 100-year flood will cost $80.43 million; of which $79.34 million are from building losses and $1.08 million are from business interruptions. Residential structure repairs make up $15.21 million, roughly 18.91% of the total losses, and 273 households will be displaced. For the 500-year flood estimates, total economic losses add up to $86.78 million; of which $85.83 million are from building losses and $0.95 million are from business interruptions. Residential damage accounts for 20.73% of these losses and 287 households will be displaced.

The Pleasantville Volunteer Ambulance Corps. building on 30 Gramercy Place, Thornwood is the only critical facility located within the Town's 500-year floodplain. The facility is evacuated prior to large storm events because the street on which it is located is within the 100-year floodplain, which blocks evacuation routes.

Flood Impact:

The following flood impacts have been identified for the Town of Mount Pleasant:

1. Storm water exceeding the drainage capacity.
2. Flooded basements due to groundwater level rise.
3. Failure to drain floodwater due to clogged or ineffective storm and sanitary sewers.
4. Significant insurance claims based on repetitive damage to structures in floodplains.
5. Falling trees due to weakened structural strength of soil

It is unlikely that serious injury or death will occur due to flood events. However, moderate structural damage to public facilities and moderate damage to private property is to be expected. Floods have a high likelihood to cause consequential effects including: explosions; fires; fuel shortages; HAZMAT

exposures, from transit and fixed-site scenarios; landslides; oil spills; structural collapses; transportation accidents; utility failures; and water supply contaminations.

Past Occurrences*:*

1. Along Brady Avenue, between Main Street and Cliff Street in Hawthorne, has consistent flooding originating from a Saw Mill River tributary and runoff from adjacent streets. This affects streets and building basements in the area, with portions of flood waters reaching Elwood Avenue. This occurs approximately three times annually, and results in a maximum five (5) feet of standing water that can last one (1) to two (2) days at most. Flooding affects fourteen (14) residential properties and nine (9) commercial properties.
2. Thornwood's Water District, a low-lying area within the town park, has flooding within areas that include Garrigan Avenue, Grammercy Place, and Claremont Avenue, and lies across the Thornwood Shopping Center. This area is part of the 100-year and 500-year floodplains. Backwater from the Saw Mill River and surging from Nanny Hagen Brook can cause flood elevations to reach up to nine (9) feet within the town park, and can last for five (5) to twelve (12) hours. This area has experienced repetitive flooding occurring nine to ten times in the past decade for a 5-year or greater storm.

Water District Flooding, Town Park, Thornwood, Aug. 28, 2011 (Hurricane Irene)

3. In Hawthorne, flooding occurs at the intersection of Broadway, the Sprain Brook Parkway entrance, and Route 141. Floodwater originates from a tributary of the Saw Mill River and runoff from adjacent properties and streets. The area is within the 100-year floodplain, and flooding occurred nine to ten times in the past decade. Flood elevation reaches eight (8) to twelve (12) inches and lasts twelve (12) to (24) hours, on average.

4. At the Marble Avenue entrance ramp to the Saw Mill River Parkway in Thornwood, flooding occurs repetitively. The area is partly within both the 100-year and 500-year floodplains, and occurred nine to ten times in the past decade for a 5-year or greater storm. Floodwaters originate from the Saw Mill River, Nanny Hagen Brook, and runoff from adjacent streets. Flooding affects streets, driveways, and commercial properties in the area. Flood depths average six (6) to twenty-four (24) inches, and can last six (6) to eighteen (18) hours. Extensive flooding has occurred during Hurricane Irene and Tropical Storm Lee in 2011.

5. In Thornwood, at the Four Corners intersection of Marble Avenue, Kensico Road, Commerce Street, and Route 141, floods occur frequently, originating from the Saw Mill River, surges from Nanny Hagen Brook, and runoff from adjacent streets and properties. The flooding affects streets, residential areas, and commercial properties, and has occurred nine to ten times in the past decade for a 10-year or greater storm. Flooding causes standing water with an average depth of six (6) to twelve (12) inches, lasting for an average five (5) to twelve (12) hours.

6. Flooding occurs from Davis Brook along Park Avenue between Brook Street and the Taconic Parkway Extension in Valhalla. The flooding impacts multiple family residences and a condominium residence. The area has experienced flooding multiple times over the past decade, and affects streets and building basements in the area.

Four Corners Flooding, Subway Restaurant at Marble Ave and Broadway, Thornwood

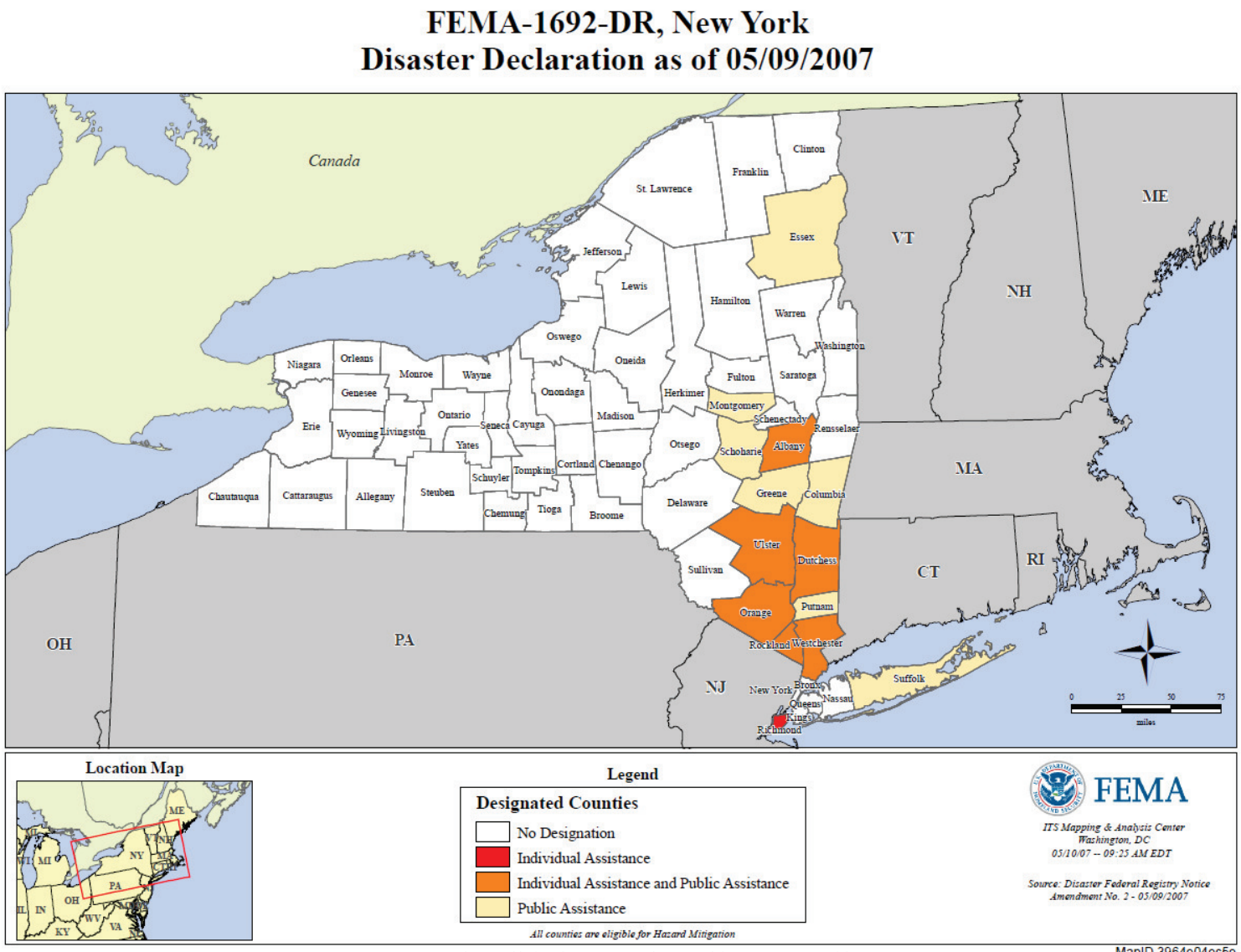
Aug. 28, 2011 (Hurricane Irene)

7. On Stevens Avenue, between Columbus Avenue and Clovebrook Road in Valhalla, flooding from Clove Brook and runoff from nearby properties affect streets and driveways in the area. This section of road is located in the 100-year and 500-year floodplains. Flooding affects streets, driveways, and two residential properties in the area. Flooding here has an average depth of six (6) to twenty-four (24) inches, lasting one (1) to three (3) hours, occurring one to two times in the past decade for a 25-year or greater storm.

Probability of Future Events:

Flooding will continue to be a frequent event in the Town as a result of proximity to the Saw Mill River.

Figure 6-1 FEMA Flood Disaster Declarations DR-1692 April 2007 (ref. FEMA website)



Source: http://gis.fema.gov/maps/dec_1692.pdf

Figure 6-2 100 Year Flood (ref. Westchester County GIS)

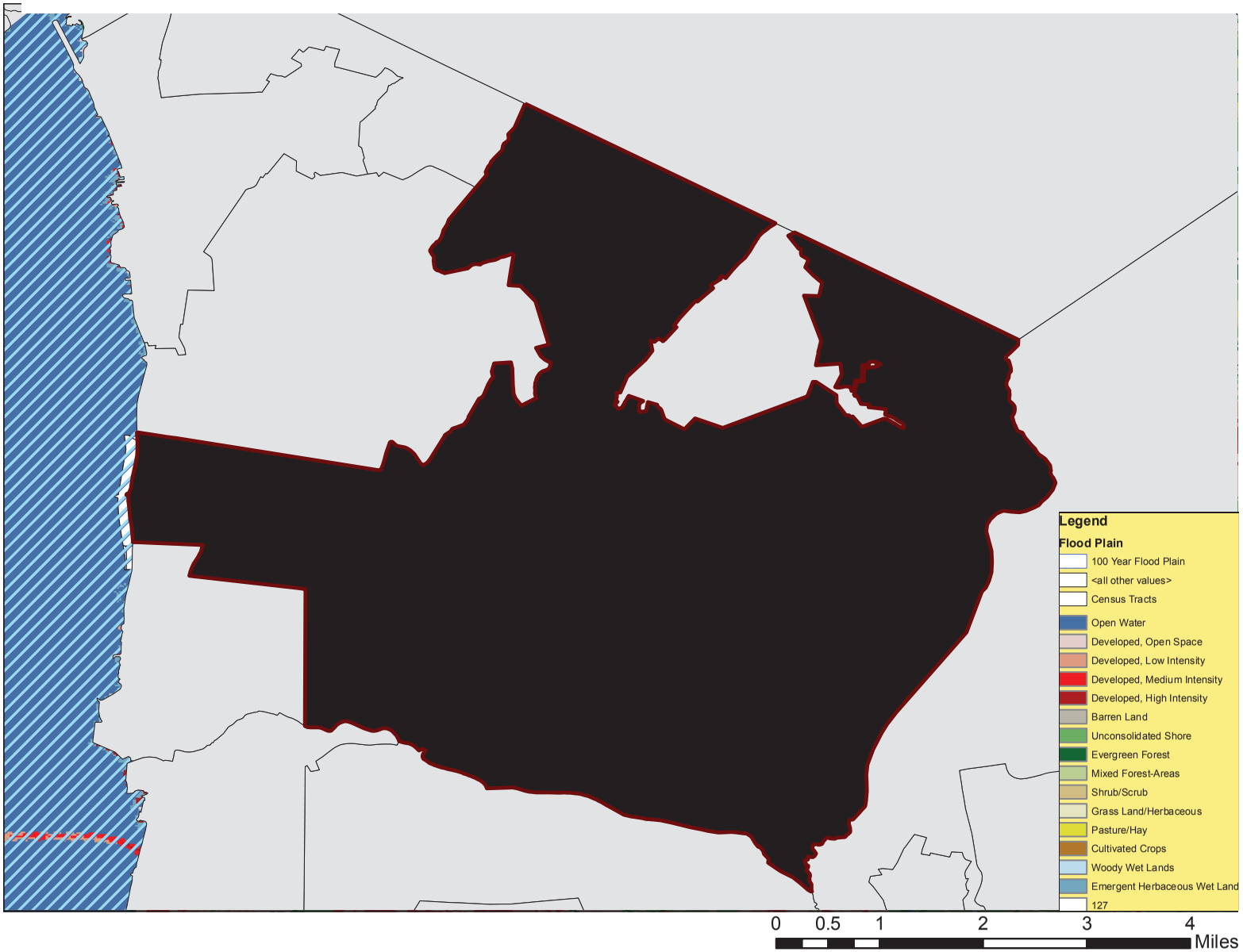


Figure 6-3 500 Year Flood (ref. Westchester County GIS)

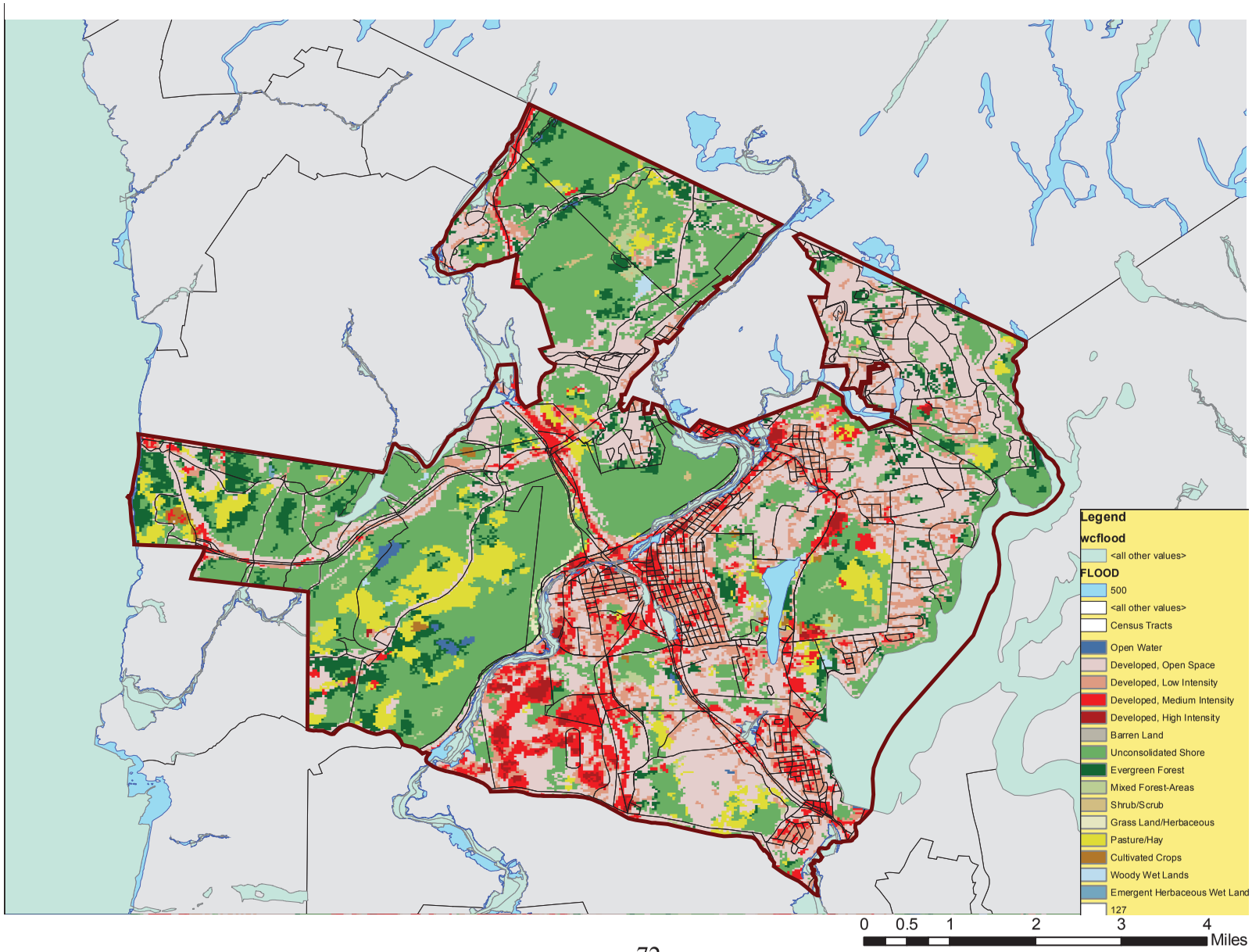
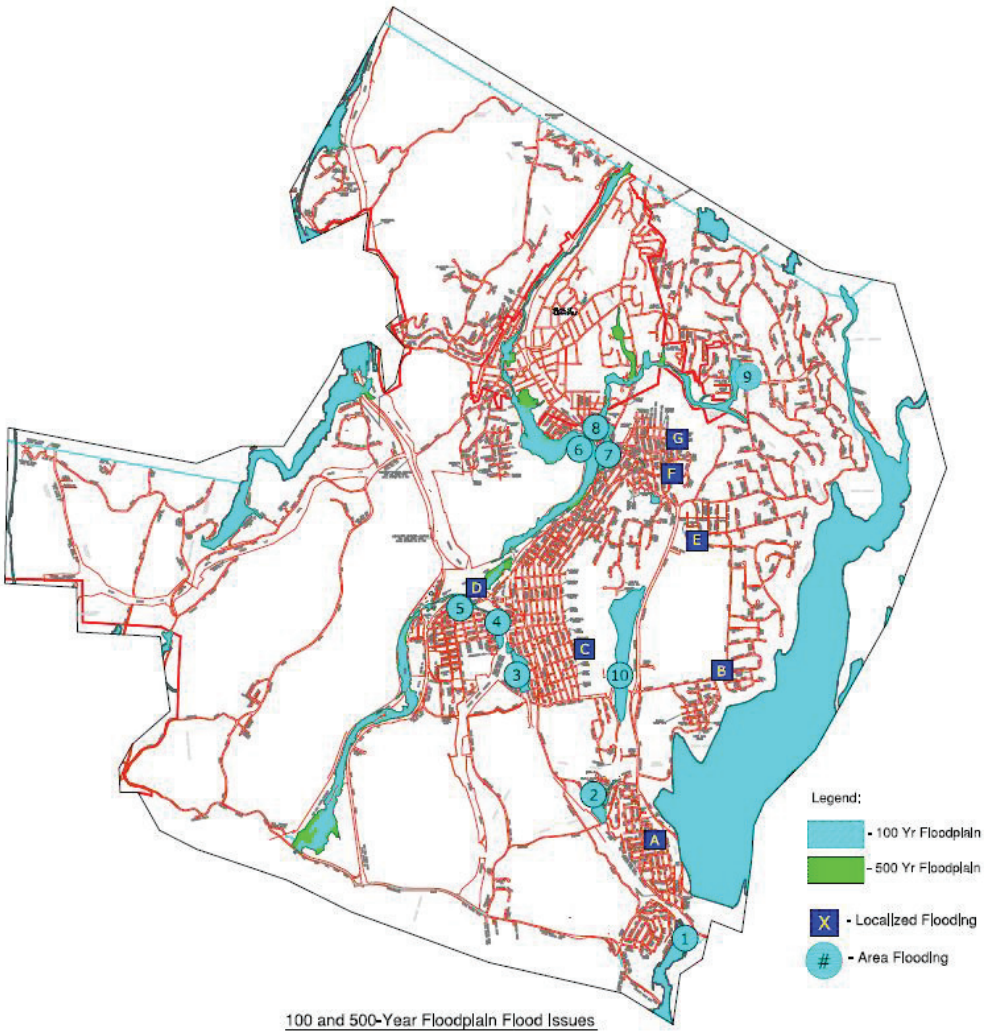


Figure 6-4 100 and 500-year Floodplain Issues (ref. Town of Mount Pleasant)



Flood Insurance Map Known Issues

No.	LOCATION	AREA
1	CLEVELAND AVENUE	TSP CONNECTOR, VALHALLA COMMUTER LOT & CLEVELAND AVE.
2	LAKEVIEW AREA	WALL STREET & BRONX RIVER EXTENSION
3	BRADY AVENUE	MAIN STREET & CLIFF STREET
4	LIVINGSTON AVENUE	LIVINGSTON AVE. BETWEEN NEWMAN AVE. & WEED AVE.
5	BROADWAY & BRADHURST	BROADWAY, BRADHURST & SPRAIN BROOK PARKWAY.
6	MARBLE AVENUE	MARBLE AVENUE AT ENTRANCE RAMP TO SAW MILL RIVER PARKWAY
7	COMMERCE ST. & MARBLE AVE.	MARBLE AVENUE, COMMERCE STREET AND KENSICO ROAD.
8	WATER DISTRICT FIELD	GARRIGAN AVENUE, GRAMMERCY PLACE & CLAREMONT AVENUE
9	BEAR RIDGE ROAD	WOODBROOK ROAD TO BROOK LANE
10	STEVENS AVENUE	BETWEEN COLUMBUS AVENUE AND CLOVEBROOK AVENUE

Localized Flooding Known Issues

No.	LOCATION	AREA
A	CYPRESS AREA	BEECH,ELM,CYPRESS,CLINTON,CAIMBRIDGE,MADISON & JEFFERON
B	WEST LAKE DRIVE	ON WEST LAKE DRIVE BETWEEN SALEM & BRICHBROOK
C	LINDA AVENUE	BETWEEN BRADFORD & FRANKFORD
D	BROADWAY	LUTHERIAN CHURCH PROPERTY, NORTH OF RT. 141
E	SWANSON DRAIN	SWANSON & FOXWOOD DISCHARGE TO ROSEHILL S.C.
F	WHITTIER DRIVE	WHITTIER DRIVE FROM POE ROAD TO WESTCHESTER AVENUE
G	PRITCHARD AVENUE	STORMDRAIN OVERFLOWS FROM JEFFERSON AND COTTAGE SCHOOL

Un-Incorporated Town of Mount Pleasant
Multi-Hazard Mitigation Plan

0 55.9375 111.875 223.75 Feet
1:16000

6.2.2. Winter Storm (Severe Snow/Ice) – (263)

Description:

Winter storms derive their energy from the clash of two air masses of different temperatures and moisture levels. A winter storm is an event in which the varieties of precipitation are formed that only occur at low temperatures, such as snow, sleet, or rain storm where ground temperatures are low enough to allow ice to form (i.e. freezing rain). The Town has experienced winter storms in the past and it is considered a moderately high hazard.

The Winter Storms can range from a moderate snow over a few hours to a blizzard with blinding, wind-driven snow that lasts for several days. Many winter storms are accompanied by dangerously low temperatures and sometimes by strong winds, icing, sleet and freezing rain. Heavy snowfall and extreme cold can immobilize an entire region. The Winter Storms has a high probability of occurring every year with a high likelihood of damage.

Sources of Information:

Sources of information were acquired through discussion with the Town of Mount Pleasant, and resources from the National Weather Service and National Oceanic and Atmospheric Administration.

Profile Details:

As per HIRA-NY winter storms are ranked second with a score of 263 which is a moderately high hazard. The area of impact is fairly large. Winter storm events occur frequently with up to one day's warning. Winter storms can last for 1-3 days, and it can take 1-2 days to recover utilities, remove debris, and clear transportation routes of snow. The Town is susceptible to winter storms during winter season, due to its location and climate. Residences and utilities are susceptible to falling tree branches, so forested areas are vulnerable. Power lines throughout the Town are also susceptible to damage from snows and ice. In addition, due to heavy mix of rain and snow from some Nor'easters, flooding has a high chance of occurrence from both the initial storm and snowmelt runoff.

Winter Storm Impact:

The following winter storm impacts have been identified for the Town of Mount Pleasant:

1. Utility failure due to freezing
2. Snow accumulation causing disturbance to critical transportation and facilities.
3. Falling of massive tree branches and power lines due to snow load.
4. Icing of roads, causing dangerous conditions for traveling vehicles and pedestrians
5. Loss of heat, power, and communication.
6. Collapsing of roof and structures due to heavy snow load
7. Roadway damage.
8. Resource depletion and operation expenses.

It is likely that winter storms will cause serious injury or death, although not in large numbers. Moderate damage to private property and moderate structural damage to public facilities are expected. There is also some potential for cascading effects to occur, including: fires; food shortages; fuel shortages; HAZMAT exposures, both on-site and in-transit; oil spills; structural collapses; transportation accidents; utility failures; and water supply contamination. Since damages from winter storms are isolated incidents, a quantitative analysis for winter will not be addressed further.

Past Occurrences:

The following snowstorms and ice storms occurred within New York State since 1970 according to the National Weather Service database:

- November 24-25, 1971
- February 6-7, 1978
- January 15-16, 1983
- October 4, 1987
- December 12, 1992
- March 13-14, 1993
- December 25-26, 2002
- January 3-4, 2003

- February 2003
- December 6-7, 2003
- February 12, 2006
- January 14-15, 2007 (Ice Storm)
- February 14, 2007
- December 11-12 2008 (Ice Storm)
- February 23-27, 2010
- December 26-27, 2010
- October 29-30, 2011
- February 13-14, 2014

Probability of Future Events:

Winter storms are prevalent throughout the Northern United States. The town is susceptible to Nor'easters, which are severe winter storms that travel up the Atlantic Coast on a seasonal basis and bring both heavy rain and snow from October to April.

6.2.3. Dam Failure - (241)

Description:

Dam Failures are collapses or failures in impoundments that cause heavy and high-velocity downstream flooding. These can be caused both by terrorism or weakening of the structure. Dam failures are comparatively rare, but can cause catastrophic damage and loss of life and/or property when they occur. The Pocantico Hills Dams, Pocantico Lake Dam and Kensico Dam all have inundation regions in the Town. Although dam failures are rare, the impacts are massive, and creating mitigations actions to remove or protect people and structures from the path of destruction is necessary in order to minimize impact from such failure.

There is an Emergency Action Plan in place for the Pocantico Hills Dams. The Town is responsible for maintaining and inspecting these Dams to ensure the integrity of the structures and surrounding area. New York City and Westchester County are responsible for maintenance and security of the Kensico Dam and Pocantico Lake Dam respectively.

Sources of Information:

Information was provided by the New York State Dam Safety Officials website, the New York State Hazard Mitigation Plan, the Westchester County GIS maps, the NYSDEP, and Hydraulic Analysis of Town of Mount Pleasant Water District Dams conducted by CAMCE.

Profile Details:

Dam Failures are ranked third as per HIRA-NY with a score of 241, which is a moderately low hazard. The Town has not experienced any dam failure in the past and this event is considered a moderately low hazard. Dam failures can cause rapid and heavy damage to specific areas. These locations include floodplains and adjacent areas surrounding the Kensico Dam, the Pocantico Hills Dam, and the Pocantico Lake Dam. A dam failure would result in impacts to large, individual locations depending on the dam breached. Dam failures can occur with no warning. The resulting flood would last for one day, but

recovery can take more than two weeks. There are no historical cases within the Town of Mount Pleasant. However, there are historical cases of dam failures with extremely high losses recorded throughout the United States.

Dam Failure Location and Extent:

The Kensico Dam is a Class C dam that contains the Kensico Reservoir, which acts as a collecting basin for multiple reservoirs that feed New York City's water supply. The Kensico Reservoir is located along the south half of the eastern border of the Town, occupying over 2,140 acres and holding a capacity of over 93,000 acre-feet of water. The inundation area in the event of a failure at the Kensico Dam is shown in Figure 6-5.

The Pocantico Hills Dams are a series of four dams that hold the four Town Lakes, identified as Water District Dam #1, Water District Dam #2, Water District Dam #3, and the Ferguson Lake Dam. These lakes are located southeast of Route 448 in the Rockefeller Preserve, and West of the Saw Mill River Parkway and Hawthorne. These lakes have a total capacity of 200 acre-feet of water, and the inundation area is shown in Figure 6-6.

The Pocantico Lake Dam contains the Pocantico Lake, which lies just north of State Highway 117, about three-quarters of a mile east from the Town's western border. Figure 6-7 shows the inundation area and 500-year floodplains for the Town.

Dam Failure Impacts:

The following dam failure impacts have been identified for the Town of Mount Pleasant:

1. Facilities shut down for 30 days or more
2. Properties destroyed or damaged
3. Loss of water supply
4. Heavy flooding and increased floodplain risk
5. Large number of casualties

Dam failures are accompanied with serious injuries and deaths to an extremely large number of people. It also comes with severe damage to private properties and severe damage to public facilities. Cascading effects are highly likely, and include: explosions; fires; food shortages; fuel shortages; HAZMAT exposures, for both on-site and in-transit; oil spills, landslides; structural collapses; transportation accidents; utility failures; and water supply contaminations and loss.

Past Occurrences:

No past examples of Dam Failure were recorded within the Town. Dam failures are rare and extremely potent events, and have only occurred infrequently in the history of the United States. Below is a non-comprehensive list of some of the worst US historical levee and dam failures:

- 1874, Mill River Dam in Williamsburg, MA, resulting in 139 casualties and 740 homes damaged
- 1889, South Fork in Johnstown, PA, resulting in 2209 casualties, $17 million in damages, 1600 homes and 280 businesses destroyed.
- 1903, Willow Creek in Heppner, OR, resulting in over 250 casualties.
- 1928, St. Francis in CA, resulting in over 600 casualties, over $5.5million in damages, 1,240 homes destroyed along with 23,500 acres of farmland destroyed.
- 1948, Columbia River dike in Vanport, OR, levee failure resulted in destroyed city and damages over $100 million.
- 1972, Buffalo Creek in Logan County, WV, resulting in 125 casualties and $400 million in damages
- 1972, Canyon Lake Dam in Rapid City, SD, resulting in 237 casualties, over 3,000 injured, and $60-$164 million in damages
- 2005, levee breaks in New Orleans, LA, from Hurricane Katrina resulted in over 1,000 casualties.

Probability of Future Events:

Dam failures are rare events that occur with no warning.

NYC Dept. of Environmental Protection – Emergency Action Plan Kensico Dam (Class C – High Hazard):

The purpose of an Emergency Action Plan (EAP) for the Kensico Dam is to identify and describe the actions that NYCDEP should take to minimize property damage during an unusual or emergency event. These actions include preparedness (training, inundation mapping, plan maintenance), problem identification, notification, and mitigation. A copy of the EAP is located at the Mount Pleasant Police Dept., located at 1 Town Hall Plaza, Valhalla, NY. The EAP is updated regularly by the NYCDEP with the last revision date of December 2014.

The EAP addresses:

- Detection and evaluation of conditions that, if observed, may warrant activation of this EAP;
- Preplanned actions the NYCDEP should follow to minimize property damage and loss of life in the event of a dam emergency;
- Recommended actions the NYCDEP to moderate or alleviate the problems at the dam;
- Responsibilities of the NYCDEP and utilization of the Incident Commend System;
- Notification procedures and information to assist the NYCDEP in issuing emergency warning to responsible downstream emergency management and public safety authorities;
- Inundation maps to show emergency response organizations critical areas for action;
- Information on Plan updating, distribution, and training and related exercises.

Figure 6-5 Kensico Reservoir Inundation Area

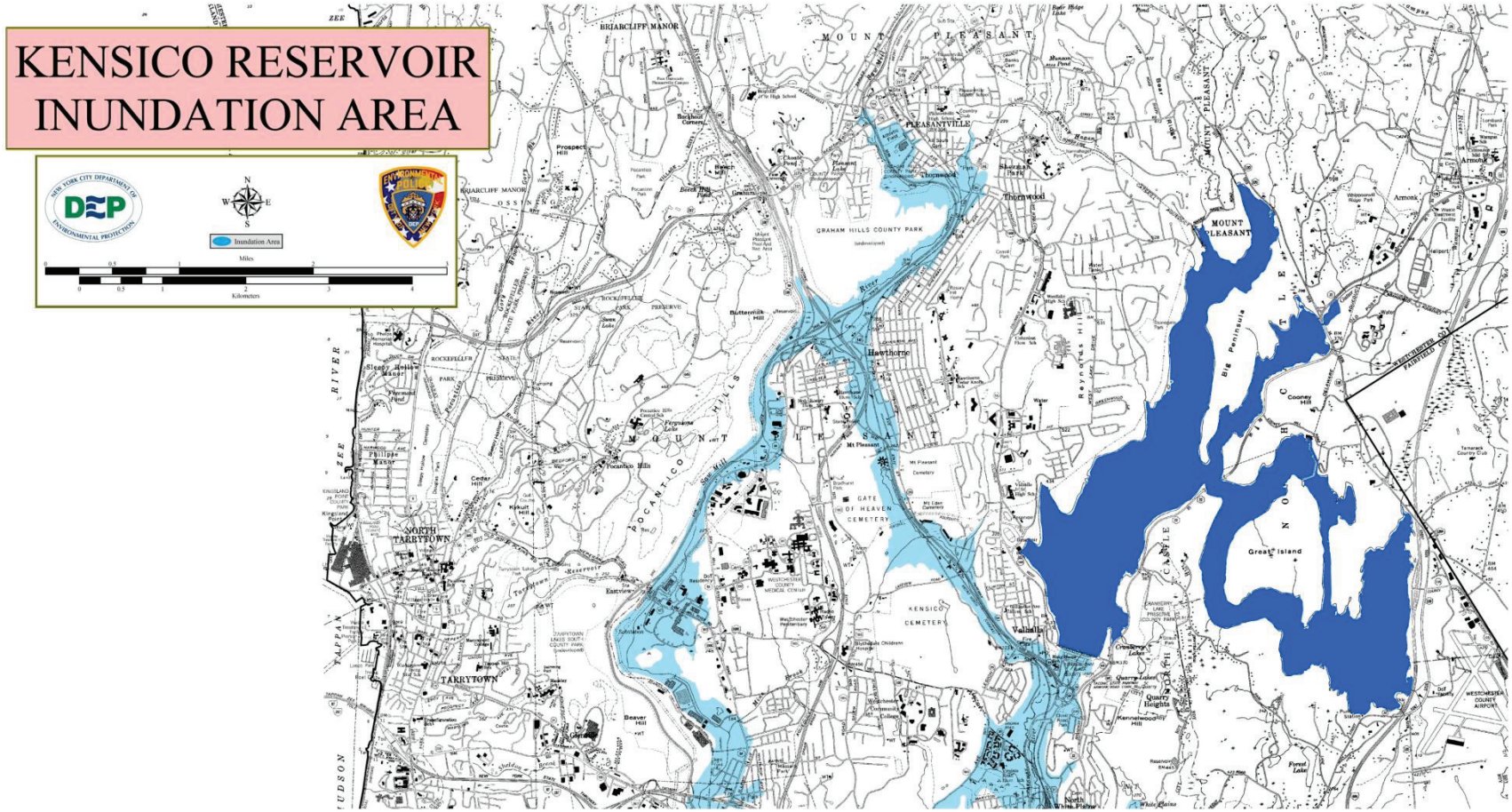


Figure 6-6 Pocantico Hills Water District Dam #1 Inundation Area

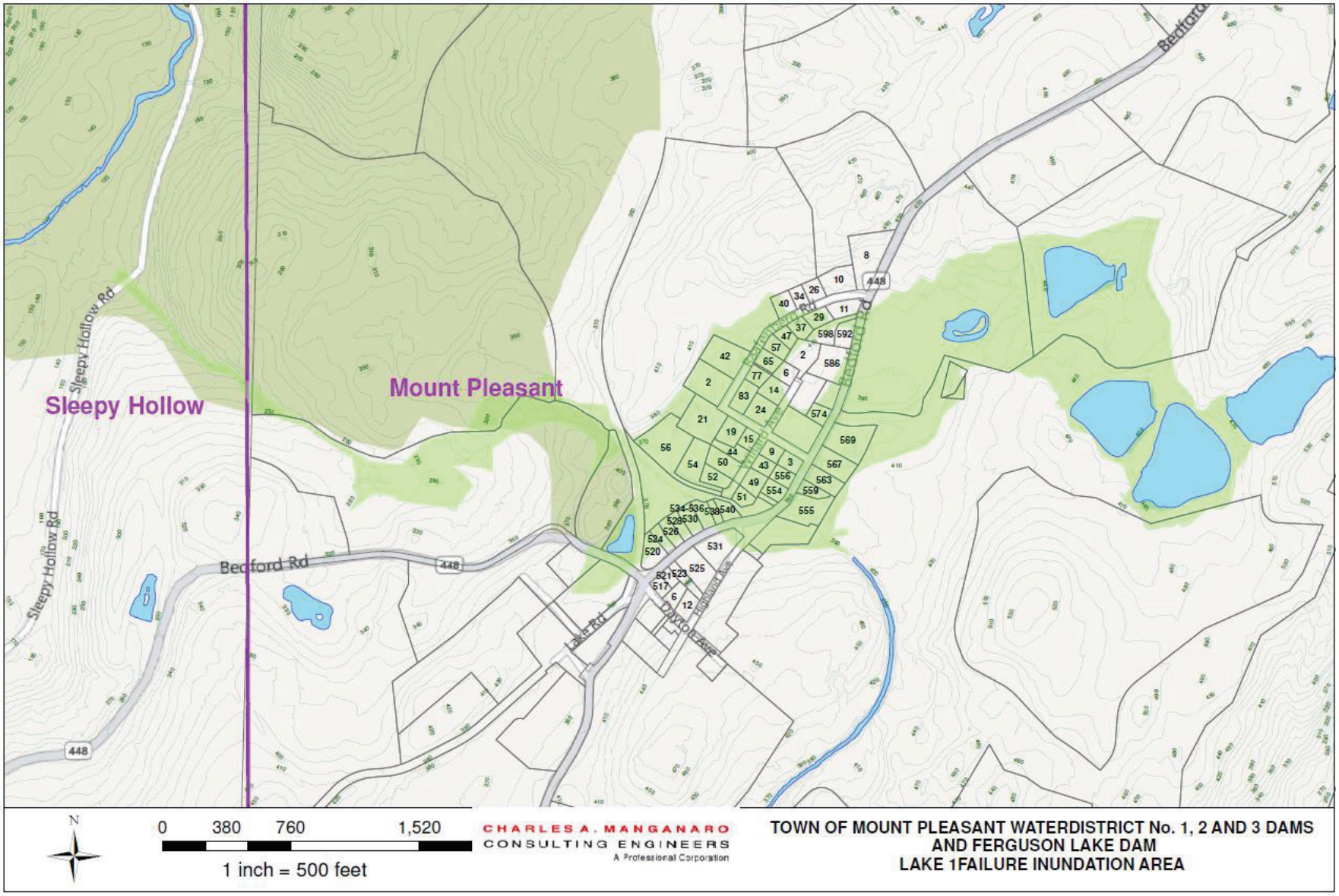
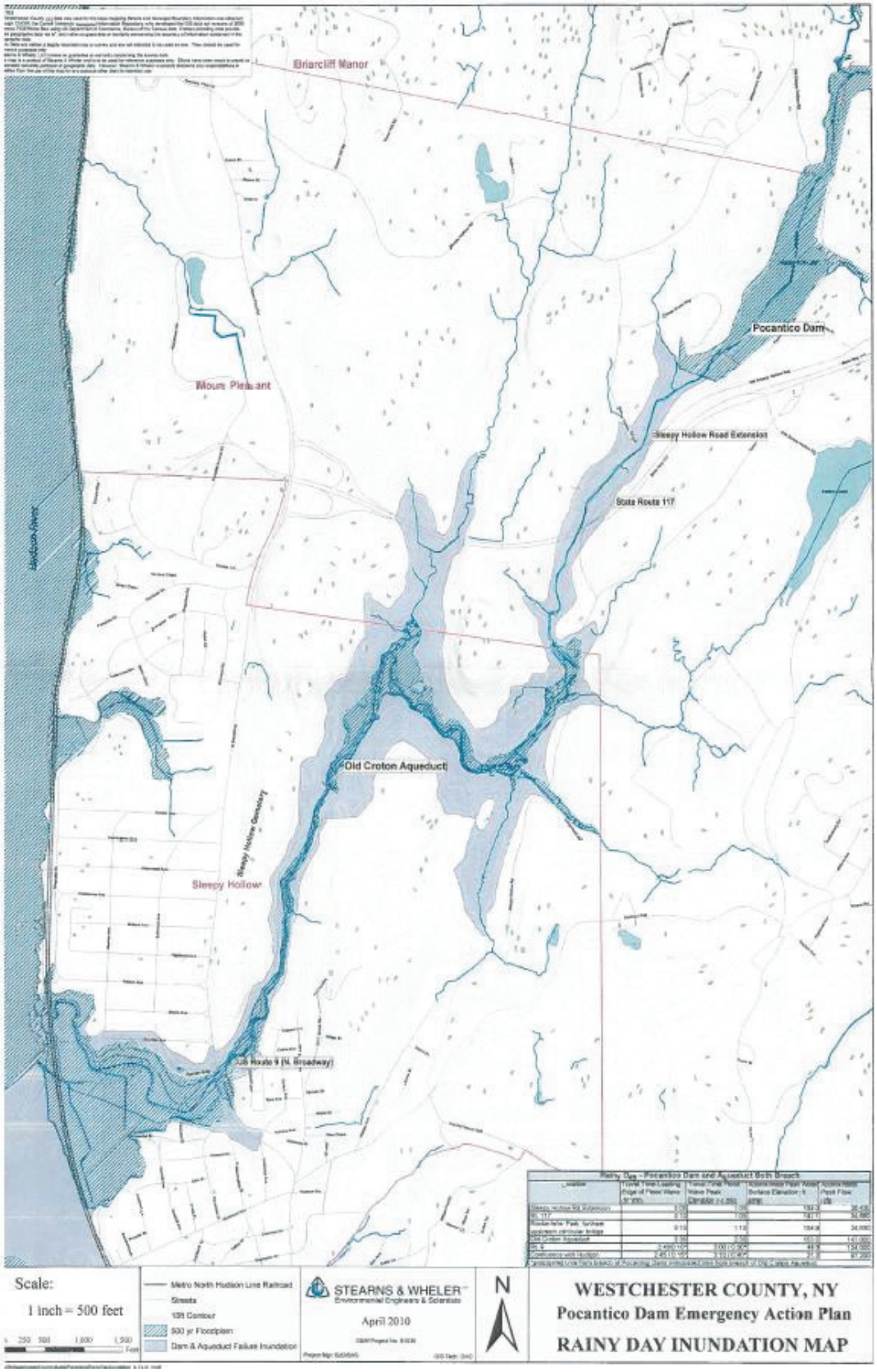


Figure 6-7 Pocantico Lake Dam Rainy Day Inundation Map



6.2.4. Severe Storm - (238)

Description:

Severe storms refer to any dangerous meteorological phenomena with the potential to cause damage, serious damage, serious social disruption, or loss of human life. Severe Weather depends on the latitude, altitude, topography, and atmospheric conditions. These are usually accompanied by strong winds and flooding. The Town had experienced severe storms in the past and as such, it is considered a moderately low hazard. Severe Storms can cause flooding, and may be accompanied by tornadoes, lightning, snow, icing, and/or microbursts.

It is a frequent event and damage caused by the Severe Storms in the Town could be significant to properties as well as the impact on safety of people such as heavy flood-inducing rains, power line and injuries associated with lightning strikes, damage and debris associated with high winds and possible tornadoes, severe snow and icing in winter storm scenarios, transportation system blockages, and resulting utility failures.

Sources of Information:

Information was acquired through discussion with the Town of Mount Pleasant staff, and research data provided by Consolidated Edison, the National Weather Service, National Oceanic and Atmospheric Association, and FEMA.

Profile Details:

According to HIRA-NY, severe storms have a score of 238 and pose a moderately low hazard. They impact a large region, and can occur frequently. The risks and damages are associated with those of flooding and heavy winds. The Saw Mill River, Nanny Hagen Brook, and Pocantico Lake floodplains have been known to overflow and cause flooding during heavy rains and storms (see Flood hazard assessment). Wind damage also causes damage to trees and power lines, prevalent throughout the Town. Severe storms last less than one (1) day, and recovery also lasts less than one (1) day on average.

Severe Storm Impacts:

Severe storms in the Town could be significant to the safety of people and properties such as:

1. Structural damage due to high winds
2. Falling trees due to high speed winds
3. Flooding and associated risks
4. Utility failure from debris striking phone and power lines

Severe storms last less than a day, and recovery and removal of debris also lasts less than one day. Serious injury or death is likely, though in small numbers. There is also little to no damage expected in the Town to private properties, and little to no structural damage to public facilities. Cascading effects are highly likely, and include: fires; floods; HAZMAT exposure, for fixed-site and in-transit; oil spills; structural collapses; transportation accidents; utility failures; and water supply contamination.

Past Occurrences:

Severe storms are frequent events, and can result from hurricanes, Nor'easters, severe winter storms, tropical and coastal storms. Hurricanes, severe wind storms at their worst and Severe Wind Storms, which are considered here under Severe Storms, are evaluated separately under Sections 6.2.2 (Winter Storm) and 6.2.18 (Hurricane). Since severe storms are associated with flooding as well, most of the flooding examples are also accompanied by severe storms (see Flood hazard).

Occasionally, a severe storm will be recorded solely for the amount of rain it produces. A slow moving storm system dropped 13.57" of rain on Islip, NY over a 24-hr period on August 12-13, 2014. This set a new state 24-hour precipitation record for NY. Microbursts have also occurred, which were noted by Consolidated Edison to have knocked out power lines. In July 2006, one microburst electrical storm, accompanied by 60-70 mph winds, knocked out power to 35,000 households in Westchester County. It was followed days later by another storm that knocked out power to an additional 6,000 households.

Probability of Future Events:

Severe Storms are frequent events that occur sporadically with several hours of prior warning. Due to their broad classification that includes winter storms, hurricanes, etc., various factors play into future probabilities of severe storm occurrences.

Global climate change, for example, impacts many of these factors and will likely cause an increased risk in the future. One such factor is the volatility of the polar vortex—a global air current that brings cold air from the Arctic region, which affects frequency and strength of winter storms. Rising sea levels and increased ocean temperature will increase warm air currents, making violent wind storms such as hurricanes also more likely.

6.2.5. Ice Storm - (231)

Description:

An ice storm is a type of winter storm characterized by freezing rain. It is defined by the National Weather Service as a storm that accumulates one-quarter of an inch of ice, in the form of hail or freezing rain, on exposed surfaces. These are associated with winter storms, blizzards, and nor'easters. The Town had experienced Ice Storms in the past, which are moderately low hazard events.

Ice storms are considered subsets of both Severe Storms and Winter Storms (see Severe Storm and Winter Storm hazard assessments).

Sources of Information:

Sources of information were acquired through discussion with the Town of Mount Pleasant, and resources from the National Weather Service and National Oceanic and Atmospheric Administration.

Profile Details:

According to HIRA-NY, ice storms score 231 and are moderately low hazard. Ice storms are large storms that affect large areas. They are regular events that occur with several hours warning. These storms last one (1) to three (3) days, and recovery and cleanup last one (1) to two (2) days.

Ice Storm Impacts:

Serious injury or death is unlikely during an ice storm. Private properties experience little to no property damages, but public facilities experience moderate structural damage. Ice storms are likely to cause structural collapses, transportation accidents, and utility failures. They also increase the chance of fires, due to heating demands increased, and floods from ice runoff. Since damages from ice storms are isolated incidents, quantitative damage analyses will not be conducted.

Past Occurrences:

See Winter Storm Profile.

Probability of Future Events:

See Winter Storm Profile.

6.2.6. Fire - (230)

Description:

Structural fires or brush fires are experienced within the town occasionally. Fire code enforcement and active volunteer fire departments assist in reducing the number of fires and the spread of fire.

Fires are frequent events and can affect residential, commercial and governmental structures. There is no warning for fire scenarios and densely developed residential areas are likely to be at risk. Each year, more than 4,000 Americans die and more than 25,000 are injured in fires, many of which could be prevented. Direct property loss due to fires is estimated at $8.6 billion annually nationwide. Severity and frequency are expected to increase due to climate change causing increases in droughts and temperatures.

Sources of Information:

Profile Details:

According to HIRA-NY, fires score 230, presenting a moderately low hazard. Fires impact single individual locations. These are frequent events that occur with no warning; they last for less than one (1) day and recovery also lasts less than one (1) day.

Fire Impacts:

The Town has identified the following impacts for fire events: personal and structural damage through burning, and loss of properties. Serious injury or death is likely, although not in large numbers. Fires are expected to cause little to no damage to private property in the Town, and little to no structural damage to public facilities. There is some potential for cascading effects, including: explosions; fires; HAZMAT exposure on fixed-sites; structural collapses; utility failures; water supply contaminations; and wildfires.

Past Occurrences:

In Valhalla private dwelling fire was caused by floor cleaning chemicals. In Thornwood, a resident's cottage had an electrical fire. In Heritage Court, Pleasantville, a private dwelling fire was caused by

malfunctioned heating system. In Chappaqua, a private dwelling had a chimney fire. In Pleasantville-private dwelling- structure fire. In Thornwood-private dwelling caught fire due to a malfunctioned heater.

Probability of Future Events:

Structural fires are sporadic and unpredictable events and are usually caused from other hazards, including Explosions, Wildfires, Oil spills, Utility Failures, etc. They are frequent events, even though they are too unpredictable to make a future forecast on their occurrence. However, from future climate predictions, droughts will be considered a more likely hazard in the future, which impacts the water supply. This may have an effect on the future ability to fight fires, and water supply considerations will need to be undertaken by the Town's fire departments in future updates to the Plan.

6.2.7. Extreme Temperature- (218)

Description:

Extreme heat is defined as temperatures which hover 10 degrees or more above the average high temperature for a region and can last for several weeks. Though the event may not be as notable as other hazards which affect New York State, its effects can have devastating consequences to personal health. The Town had experienced Extreme Temperature in the past. It is considered moderately low hazard.

Extreme heat mainly affects the demand of power on the feeder cables within the Town. Feeder cables can overheat and cause power disruption particularly with reported aging power grid infrastructure. Power supply output cans be lowered or brown out conditions can be instituted throughout the Town.

Sources of Information:

Information was provided based on discussion with the Town of Mount Pleasant staff, along with online resources such as the National Climate Data Center, National Oceanic and Atmospheric Administration, the National Weather Service, and FEMA advisories.

Profile Details:

According to HIRA-NY, extreme temperature events score 218 and present a moderately low hazard. Since these come in large meteorological effects, they affect large regions. These are regular events that occur with about one (1) day warnings. Temperature spikes can last four (4) to seven (7) days, and recovery lasts less than one (1) day.

Extreme Temperature Impacts:

The following impacts of extreme temperature have been identified:

1. Sunburn causing skin redness and pain, possible swelling blisters, fever, headaches.
2. Heat cramps causing painful spasms.

3. Heat exhaustion causing weak pulse, fainting, dizziness, nausea, vomiting, exhaustion, and headaches are possible.
4. Heat stroke causing severe medical emergencies.
5. Power failures due to increased demand and overheating of feeder cables

Serious injury or death is likely, although not in large numbers.

Past Occurrences:

In July, 1999 the temperature reached a peak of 110 °F. In July 2000, Long Island Sound shore communities experienced power outages due extreme heat for several days.

Westchester County issues public heat advisory statements when conditions merit it.

Probability of Future Events:

Extreme Temperatures are considered regular events, however the frequency and severity of such events is expected to increase in the future; NOAA studies have shown an increase in the average annual temperature by 1.5 degrees Fahrenheit from 1970. Energy capabilities should be monitored and discussed with Con Edison regularly. Fatalities have been recorded in the Northeast region during extreme temperature scenarios.

6.2.8. Terrorism- (211)

Description:

Terrorism activities are illegal activities that involve the use of force and intend to intimidate or coerce. Terrorism is used to frighten the people in an area as a way of trying to achieve a personal or political goal. Terrorist hazards include: biological threats, chemical threats, cyber-attacks, explosions, nuclear blast, and other forms of sabotage.

The Town did not experience any Terrorism attack in the past, considers it as a moderately low hazard. However, since September 11, 2001, key facilities that present potential targets for terrorist activities have been put under increased security and surveillance. Recent incidents around the globe have increased the threat and risk of attacks within the United States.

Sources of Information:

Information was acquired through discussion with the Town of Mount Pleasant staff and Police Department.

Profile Details:

According to HIRA-NY, Terrorism scores 211, presenting a moderately low hazard for the Town that can potentially impact a large region with no warning. The duration of terrorism impacts can last two (2) to three (3) days, and recovery from public panic and other effects can take three (3) to seven (7) days.

Terrorism Extent:

Critical facilities and structures in the TMP key targets include:

- The Kensico Dam
- Pocantico Hills Dams
- Pocantico Lake Dam
- Town Hall Building and Facilities
- NYCDEP Facilities
- Commerce Street Pump Station

- Community Water Supply Tanks
- Hospitals
- Indian Point Power Plant
- Colleges

Terrorism Impact:

The Town has identified several impacts for a terrorist attack:

- Personal injury or death on a large scale
- Moderate to Severe structural damage
- Resulting explosions, utility failure

Serious injury or death is likely in large numbers in the event of a terrorist attack. There is little to no damage expected in the Town to private property, and moderate structural damage to public facilities. Cascading effects are highly likely to occur, and include: civil unrest; dam failures; epidemics; explosions; food shortages; fuel shortages; HAZMAT exposure for fixed-site and in-transit; oil spills; structural collapses; utility failures; and water supply contamination. Since terrorism and sabotage are isolated events, quantitative analyses on effects for the Town will not be made.

Past Occurrences:

No past examples of terrorism have occurred within the Town, however since the terrorist attacks on the World Trade Center on September 11, 2001 and the following declaration of war on terror, terror alerts have heightened. Other notable recent terror attacks within the United States include the San Bernardino attacks in December 2, 2015, the Boston Marathon Bombings in April 15, 2013 and the Oklahoma City Bombing on April 19, 1995.

Probability of Future Events:

Terrorism is a rare event and has no historical events in the Town. Evacuations and response to such threats are under the jurisdiction of the Police Department. Due to being a man-made threat, terrorism is considered a sporadic and unpredictable event.

6.2.9. Tornadoes- (210)

Description:

A tornado is a violently rotating column of air that is in contact with both the surface of the earth and a cumulonimbus cloud or, in rare cases, the base of a cumulus cloud. They are often referred to as twisters or cyclones. The Town had experience a Tornado event in the past and as such, it is considered a moderately low hazard.

According to the National Oceanic and Atmospheric Administration (NOAA), tornadoes come in all shapes and sizes and can occur anywhere in the U.S. at any time of the year. The tornado wind speed is classified using the Fujita Tornado Scale:

Table 6-5 Tornado Classification

Classification	Wind Speed (mph)
F0	40-72
F1	73-112
F2	113-157
F3	158-206
F4	207-260
F5	261-318

In the southern states, peak tornado season is March through May, while peak months in the northern states are June and July. Tornadoes can strike with little or no warning, and are associated with severe storms and hurricanes. If you live in an area where tornadoes occur, prepare ahead of time.

Sources of Information:

Information was acquired through discussion with the Town of Mount Pleasant staff, as well as records from National Oceanic and Atmospheric Association, the National Weather Service, and FEMA.

Profile Details:

According to HIRA-NY, tornadoes score 210 and are a moderately low hazard. Tornado winds directly impact a small region, although they are associated with severe storms and hurricanes that impact larger regions (see Severe Storm and Hurricane risk assessments).

Tornado Impacts:

The Town has identified several impacts of tornadoes:

1. Damage to power lines, gas lines, or electrical systems
2. Risk of fire electrocution and or explosion
3. Physical harm
4. Structure damage
5. Falling objects, rolling heavy objects, damage caused by debris

Serious injury or death from a tornado is likely, although not in large numbers. There is little or no damage expected in the Town to private property, and little to no structural damage to public facilities. Tornadoes are highly likely to cascade into other hazards, including: explosions; fires; food shortages; fuel shortages; landslides; oil spills; structural collapses; transportation accidents; utility failures; and water supply contamination. Quantitative analyses will not be made, due to isolated and sporadic damages from tornadoes.

Past Occurrences:

An F1 tornado in July of 2006 affected some residential properties, a couple of local businesses and vehicles along its path. It uprooted and downed numerous trees in the Pocantico Hills, Hawthorne and Valhalla areas, roughly 4.7 miles away from the Town center. There were no fatalities as a result of this event. Six people were injured, and $12 million in damages were caused to the Town. Prior to this, the most recent tornado within Westchester County was recorded in 1904.

California Closets Warehouse Tornado Damage

Probability of Future Events:

Tornadoes are infrequent events that occur with no warning. Historically, the impact of tornadoes within the County has been low; with no tornadoes above an F2 classification and only occurring every several decades. This would at most bring down power lines or trees, and only impact structures with close contact with the tornado. However, with rising ocean temperatures due to climate change, storm systems are projected to become more likely and energetic, thus increasing the chance of tornadoes.

6.2.10. Utility Failure- (195)

Description:

Utility failures are mainly caused by accidents, weather conditions, and service age of infrastructures. It is commonly a cascading effect of other hazard events. If power lines are overhead, there is a greater chance of problems. Overloads occur when the demand for electricity exceeds the capacity of the distribution system to supply it. Falling debris, heavy winds, and snow and icing may also physically damage power lines, which can cause loss of power to connected areas. Domestic systems failures usually do not endanger people but can cause extensive damage to buildings and equipment.

Utility failures are infrequent events and damage caused by the utility failure in the Town could be significant to properties as well as the impact on safety of people such as loss of communications and water line failures.

Sources of Information:

Information was acquired through discussion with the Town of Mount Pleasant staff and communications with Consolidated Edison representatives.

Profile Details:

Consolidated Edison provides the main supply of electricity and gas to the Town. The Town Water Department is responsible for operating and maintaining the potable water treatment and the pumping and distribution facilities in the Town's operated water districts. The Town Sewer Department is responsible for operating and maintaining the sanitary sewer collection and pumping systems in the Town's operated sewer districts. Other utilities include technology utilities such as cable television, telephone lines, and internet connection.

According to HIRA-NY Hazard scoring, utility failures score 195 and are a moderately low hazard. They can affect a large region, depending on the scope of failure. These are infrequent events that can occur

with no warning. Failures can last for two (2) to three (3) days, although recovery can last less than one (1) day.

Utility Failure Impacts:

Utility Failures are known to cause loss of power and communications for Town facilities, as well as pump failures for water and sanitary lines. Utility Failures are unlikely to cause serious injuries or death, and little to no damage is expected to occur to private property or public facilities. Utility failure has some potential to cascade into other hazard events, including: civil unrest; fires; food shortages; fuel shortages; transportation accidents; and water supply contamination.

Past Occurrences:

In 2006, several power outages occurred in succession that impacted Westchester County. In January, a severe wind and rain storm uprooted trees and caused a loss of power to over 60,000 customers. In July, several severe storm and heat wave events in short succession caused continuous and cascading power losses for tens of thousands of customers throughout the County for ten days. In September, Tropical Storm Ernesto and resulting severe storms caused an additional 80,000 households to lose power.

Consolidated Edison has allocated $1.2 billion to storm protection for its power lines in response to successive power outages. Some mitigation activities include steel wires to guard power lines from falling debris and tree maintenance near transformers and power lines.

There are currently eight (8) sanitary sewer pump stations in the Town of Mount Pleasant. The Town has experienced a pump station failure at the Pheasant Run Pump Station in January 2012. This failure required electrical pumps and a standby diesel generator until the repair was completed in July 2014.

Throughout the year, water main breaks do occur on the aging water main infrastructure. Once in a while damages occur to private residences and/or businesses, for which files will be claimed with the Town for damages.

Probability of Future Events:

Utility failures occur as sporadic events, usually as a result of another hazard including, but not limited to, extreme heat, severe storms, winter storms, and tornadoes. Thus, the likelihood of utility failure occurrence is related to the probabilities of each of the preceding hazards occurring.

Utility failures are also caused by demands on the utility systems; therefore, increases in population would increase demands of power and similar services. For the Town, the population has not been increasing at a significant rate, however population increases must be considered during future Plan revisions along with their impacts on the utility systems.

6.2.11. Earthquakes- (194)

Description:

One of the most frightening and destructive phenomena of nature is a severe earthquake. An earthquake is the sudden, rapid shaking of the earth, caused by the breaking and shifting of subterranean rock as it releases strain that has accumulated over a long time.

For hundreds of millions of years, the forces of plate tectonics have shaped the earth, as the huge plates that form the earth's surface slowly move over, under, and past each other. Sometimes, the movement is gradual. At other times, the plates are locked together, unable to release accumulated energy. When the accumulated energy grows strong enough, the plates break free. If the earthquake occurs in a populated area, it may cause many deaths and injuries and extensive property damage. On occasion, earthquakes may also cause dam and levee failures. Also, the Indian Point nuclear power plant is less than one mile south of the Ramapo fault and is at risk of damage in the event of an earthquake.

All 50 states and 5 U.S. territories are at some risk for earthquakes. While earthquakes are more common along tectonic plate boundaries, earthquakes can occur at points of stress anywhere within the plate as well. Earthquakes can happen at any time of the year. The Town experienced earthquakes in the past at various levels, and as such, it is considered moderately low hazard.

There are several parameters to consider when measuring an earthquake's power: regional Lg-wave magnitude (LG), duration magnitude (MD), and local magnitude (ML).

Sources of Information:

Information was acquired through online resources that include the US Geological Survey, NYS Hazard Mitigation Plan, and FEMA, "HAZUS 99 Estimated Annualized Earthquake Losses for the United States".

Profile Details:

According to HIRA-NY hazard scoring, earthquakes score 195 and are considered a moderately low hazard. While occasional tremors are felt within the Town, they are not considered major events. Seismic waves can affect large regions, with varying intensity depending on the distance from the epicenter, and distant earthquakes can sometimes cause notable tremors. On August 23, 2011, an earthquake registered a 5.8 on the Richter scale in northern Virginia, while its seismic waves reached the Town.

Earthquake Location and Extent:

Earthquakes can happen year-round and impact large regions. Figure 6-8 depicts the peak ground acceleration (PGA) in factors of *g* for the United States, where Westchester is shown to have a 14-20%*g* with a 2% chance within 50 years to exceed this value. This means that there is a moderately low risk to the Town for an earthquake to exceed 20%*g*.

Earthquake Impacts:

Earthquakes can cause severe structural damage to a large region. It is a rare event and occurs with little to no warning. Earthquakes are short, impactful events that last less than on (1) day, but clean-up of debris can take three (3) to seven (7) days. Moderate damage to private and public property is expected, since earthquakes can damage and disable transportation systems, critical infrastructure, and buildings of all sizes. Casualties are expected in earthquake events, although not in very high numbers.

Past Occurrences:

- On 8/26/2003 at 18:24:18, a magnitude 3.8 (3.8 LG, 3.5 ML, Depth: 1.9 mi, Class: Light, Intensity: II - III) earthquake occurred 76.8 miles away from the Mount Pleasant center.
- On 10/28/1991 at 20:58:26, a magnitude 3.0 (3.0 LG, Depth: 6.2 mi) earthquake occurred 11.8 miles away from Mount Pleasant center.
- On 6/16/2000 at 04:02:53, a magnitude 3.3 (3.3 LG, Depth: 6.1 mi) earthquake occurred 85.1 miles away from Mount Pleasant center.

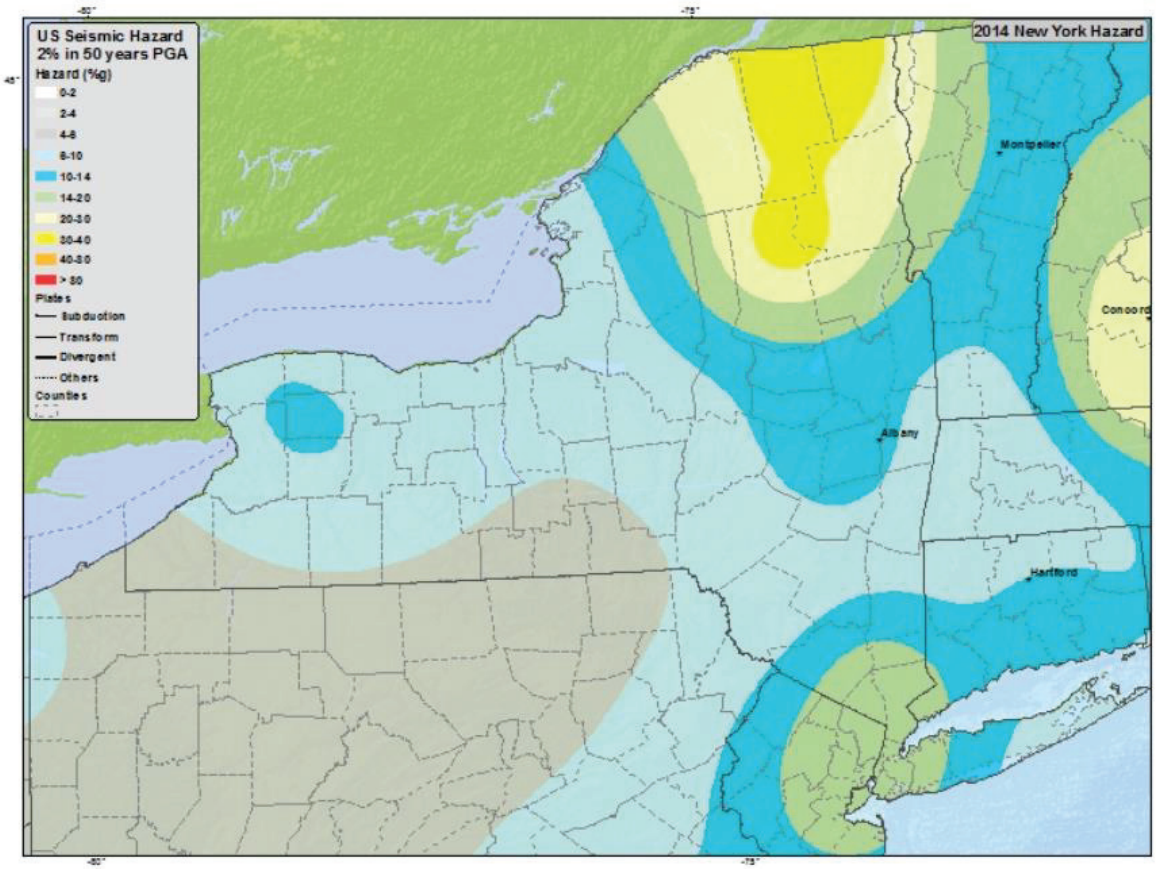
- On 1/9/1992 at 08:50:45, a magnitude 3.1 (3.0 LG, 3.1 MD, Depth: 4.9 mi) earthquake occurred 59.0 miles away from Mount Pleasant center.

Severe global earthquakes are also of concern to the Town. In 2005, the Kashmir earthquake (LG 7.6) caused severe damage to most of the Indian Ocean rim. While it is unlikely, strong earthquakes may cause notable damage, even at a significant distance from the earthquake epicenter.

Probability of Future Events:

The discovery of the Ramapo fault in the 1970s has led to an increase in assessed earthquake risks to the Town. However, even including this, the probability of earthquakes is still low and is not expected to change drastically in the near future. Future impacts of earthquakes are also expected to remain similar in relation to the Town's inventories.

Figure 6-8 Peak Ground Acceleration with 2% Exceedance (ref. 2014 USGS)



6.2.12. Explosion- (194)

Description:

An explosion is a rapid increase in volume of gases and release of energy in an extreme manner, usually with the generation of high temperatures. Destruction caused by explosions can vary based on the source. Chemical changes, such as rapid oxidation, deflagration, detonation, and other chemical reactions can cause explosions. Physical changes, such as damage to pressurized or sealed containers, can also cause explosions. These can also be caused due to gas main leaks and damages. Terrorists may also use explosive devices. The Town had experienced explosions in the past, and as such, it is considered a moderately low hazard. Damage caused by explosions in the Town could be significant to properties and critical structures as well as the impact on safety of people such as debris impact, personal harm, direct critical structure damage, and public panic.

Profile Details:

Explosions are ranked moderately low with a HIRA-NY score of 196. Fueling activities at gasoline stations and natural gas use in homes contribute to risk factors. Compressed gas cylinders also cause explosion hazards. Flammable solvents such as paint from paint shops or natural gas from commercial and industrial facilities are concerns. While the risk of occurrence is low, there is a large area of impact with strong effects, from severe structural damage to loss of life.

At present, emergency response to an explosion event is overseen by the various Fire Departments and Mount Pleasant Police Departments, including Public Safety. Quantitative assessment of explosion hazards will not be performed, due to their sporadic and inconsistent nature making them difficult to quantify.

Probability of Future Occurrences:

Since explosions are a result of HAZMAT, oil spills, or other man-made events, explosion events are unpredictable and future occurrences are difficult to estimate.

6.2.13. Transportation Accidents- (187)

Description:

Transportation accidents occur when a vehicle (automobile, train, boat, etc.) collides with another vehicle, pedestrian, animal, road debris, or other stationary obstruction, such as a tree or utility pole. The Town had experienced transportation accidents in the past causing property and structural damage.

Profile Details:

Transportation accidents are ranked as a moderately low hazard for the Town and have a HIRA-NY score of 187. These occur on any roadway or transportation system within the Town, and involve losses to individuals not directly involved in the accident, and damage to private and public property. Transportation accidents between passenger vehicles are common, although accidents with a strong impact are infrequent events. Accidents involving public transportation, such as the railroads through the Town, cause more damage and casualties. Damages of accidents in the Town could be significant to properties and critical structures as well as the impact on safety of people such as immediate personal and structural damage and traffic increase. Being a sporadic and inconsistent event, quantitative analyses will not be made.

Past Occurrences:

The Metro-North Railroad train on the Harlem Line struck an SUV outside of Valhalla on February 3, 2015, killing six and injuring fifteen people. Other, less impactful transportation accidents occur frequently, especially during winter or ice storms.

Probability of Future Events:

Due to the Metro-North Railroad accident, the Metropolitan Transportation Authority is currently working with municipalities to reduce train accidents (removal of road-railroad crossings, improved warning systems, etc.).

Automobiles are also improving in safety systems, however there is no reason as of yet to assume any change in occurrence or impact of automobile accidents. Due to being a man-made threat, transportation accidents are considered an sporadic and unpredictable event.

6.2.14. HAZMAT (186)

Description:

Hazardous materials are chemical substances that, if released or misused, can pose a threat to the environment or human health. Hazardous material exposures come in the form of explosives, flammable and combustible substances, poisons, and radioactive materials. They are often released because of a chemical accident at plant site, or in transit to and from said sites. Both in-transit and on-site hazards were evaluated. The Town has experienced minor, contained occurrences and as such it is considered a moderately low hazard.

Damages of hazardous materials in the Town could be significant to properties and critical structures as well as the impact on safety of people such as: health impacts due to exposure, possibly death; contamination of food, livestock, and water supplies; possible fire and explosion hazards; and volatile substance air emissions.

Sources of Information:

Sources include discussion with the Town of Mount Pleasant Staff and the NYCDEP stakeholders, along with resources provided by the US EPA Facility Registry System, FEMA, and the NYCDEC website.

Profile Details:

HAZMAT releases are ranked as moderately low hazards and have a HIRA-NY score of 186. These can occur at a variety of locations, including, but not limited to, the locations shown in Figure 6-9, which shows the facilities in the US EPA Facility Registry System, and the major transportation systems within the Town that may be used to transport hazardous materials. Being a sporadic and inconsistent event, quantitative analyses will not be conducted for HAZMAT exposures.

HAZMAT extent:

Hazardous materials releases likely to happen within the Town would be small and localized disturbances. Releases may occur from a range of activities such as dry cleaning, mechanical repairs,

vehicle and home fueling, home building and maintenance, automobile repairs, and home use. Figure 6-9 shows possible risk locations found under the Facility Registry Service for hazardous materials sites. These sites include any location registered with the EPA to possibly contain hazardous wastes, ranging from minor to significant hazard contamination possibilities.

Major sources for possible hazardous materials leaks include Pepsico Inc., various town pump stations, the NYCDEP plants and water facilities, and NYCDEP Shaft 18. Minor localized hazardous materials may be products of various dry cleaners, auto body shops, other industrial sites, and environmental and chemical plants; however this list usually contains any dangerous chemicals in small to negligible quantities.

NYC Dept. of Environmental Protection – Shaft 18 (Delaware Aqueduct) Integrated Contingency Plan (ICP)

In the event of a chlorine spill emergency or at the Shaft 18 site located at 20 West Lake Drive, Valhalla, NY, the Town and NYCDEP will refer to the NYCDEP Integrated Contingency Plan (ICP). A copy of the ICP is located in the Mount Pleasant Police Dept. located at 1 Town Hall Plaza, Valhalla, NY. The ICP is regularly updated by the NYCDEP with the last revision date of August 2014.

The ICP includes mitigating actions to be taken during emergency events including: Fire; "regulated substance" or "highly hazardous chemical" (40 CRF 68 and 29 CRF 1910.119, respectively; chlorine) spill/release; hazardous substance (sodium hydroxide; 6 NYCRR Parts 597 and 598) spill/release; release of hazardous waste or hazardous waste constituents to air, soil, or surface water; natural gas leak; medical emergency; bomb threat; and severe weather threat.

The ICP contains all elements to meet the Emergency Response Plan portion of a compliant Risk Management Plan and all additional elements required to meet OSHA emergency planning regulations and the Agency's Emergency Planning Policy requirements. The ICP addresses:

1. Key Contact(s) for Plan Development and Maintenance

2. Initial Response – Instructions for Chlorine Release
3. Facility Alarms, Detectors, and Sensors
4. Response Management Structure
5. Response Actions
6. Spills/Releases of Hazardous Substances or Hazardous Wastes

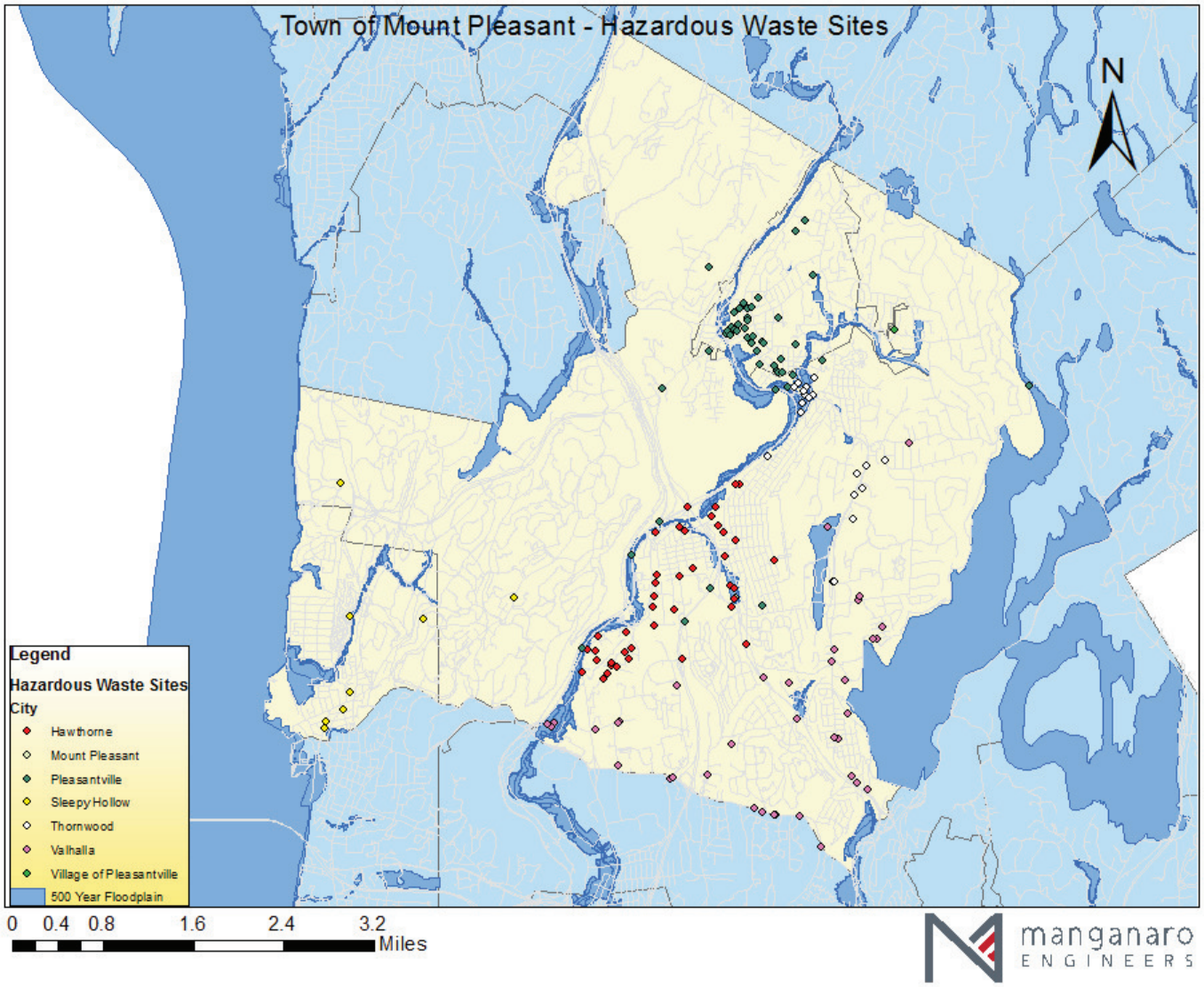
Past Occurrences:

See Oil Spills

Probability of Future Events:

Due to being a man-made threat, HAZMAT exposure is considered a sporadic and unpredictable event.

Figure 6-9 Facility Registry System Hazardous Waste Sites



6.2.15. Oil Spill- (186)

Description:

Is the large-scale release of a liquid petroleum hydrocarbon into the environment due to human activity and is a form of pollution. The Town experienced an oil spill in the past and as such, it is considered a moderately low hazard. The scale can vary depending on the spill source, whether it is transported by truck over land or by tanker. The EPA handles oil spills over inland waters, which cause contamination throughout the water systems of the Town. Over land spills are also dangerous due to their flammability, and can cause fires or explosions if ignited.

Damages of oil in the Town could be significant to properties and critical structures as well as the impact on safety of people such as:

- Contamination of water supplies
- Flammability hazard damage

Profile Details:

Oil spills are considered moderately low hazards for the Town and score 186 by HIRA-NY. These are singular, regular events that occur with no warning. The impact of oil spills are minor, with one (1) day of impact and clean-up usually. The Town is not in a location that is expected to be affected by major oil spills, and does not house major oil pipelines or oil transports. Usually, oil spills occur as a result of other hazard events. Since these are localized and sporadic events, quantitative analyses will not be made.

Past Occurrences:

On several occasions, home heating oil leaks have occurred. The most serious of these incidents resulted in oil accumulation in Carroll Park. Oil spills from automobile accidents occur, however they are considered minor spills.

6.2.16. Water Supply Contamination- (185)

Description:

Water supply contamination pertains to both infiltration of groundwater and reservoir by harmful contaminants. These include radioactive, chemical, and biological contaminants, and sources can include municipal waste, factory waste, spills, etc. The Pocantico Hills Dams is sole drinking water supply for many residents. The supply to the public is sensitive to rain fall amounts and dependent on the hydraulic head available. Other personal groundwater sources exist, which also hold the threat of contamination. Contamination is difficult to foresee, being due mostly to accidental spills or runoff, and proves a moderately low hazard.

Damages of water supply contaminations in the Town could be significant to the impact on safety of people such as:

- Loss of drinking water
- Health hazards associated with the contamination source

Water supply contamination events are infrequent events, and can occur with several hours warning. These can last for more than one week without detection, but recovery lasts one (1) to two (2) days.

Past Occurrences:

No past occurrences of contamination have occurred within the Town.

Probability of Future Events:

Since water supply contamination is a result of oil, HAZMAT or radiological hazards, all of which are sporadic and unpredictable hazards, water supply contamination is all the more unpredictable.

6.2.17. Drought (180)

Description:

A lack of precipitation can impact the Town's drinking water supplies, and is exacerbated by extreme heat. Droughts can occur at any time of the year, and extended droughts can severely impact crops and livestock. Droughts also increase the risks of domestic and forest fires, since droughts reduce water resources used to contain them. The Pocantico Hills Dams is sole drinking water supply for many residents. The supply to the public is sensitive to rain fall amounts and dependent on the hydraulic head available in reservoirs.

The Town had experienced droughts in the past. The Climate Prediction Center puts the Town at a moderate risk of short-term droughts, classified by duration of 6 months at most.

Sources of Information:

Information was provided based on discussion with the Town of Mount Pleasant and resources from the National Oceanic and Atmospheric Administration and Climate Prediction Center.

Profile Details:

Droughts are ranked as moderately low hazards and have a HIRA-NY score of 180. Damages of drought in the Town could be significant to the impact on safety of people such as loss of water supply. Droughts can be preceded by over one week warning, but can last over one week and impact large regions. Cascading effects include increased chance of fires and extreme temperatures, utility failures, and water supply contamination. Quantitative analyses for droughts will not be performed, due to their sporadic and inconsistent nature.

Past Occurrences:

In August 1995, a record-length drought affected the whole of Westchester County, and reduced the capacity of the Kensico Reservoir to 63.8%, roughly three-fourths normal capacity. Reservoirs in the Town also fell low during this time, requiring the Town to buy water from other districts.

Probability of Future Events:

According to the Climate Prediction Center, droughts will become increasingly more common due to future climate changes, such as volatility in currents and precipitation paths. However, the National Resources Defense Council advises through its "Climate Change, Water, and Risk" report that Westchester County has a low risk in regards to its Water Supply Sustainability Index for 2050, for both with and without climate change effects (NRDC July 2010). This suggests that climate change impacts on drought frequency is low for the Town, which has various water resources available. While future impact assessment should be reviewed periodically, the expected increase of drought impact is low.

6.2.18. Hurricane (180)

Description:

It is a large storm or cyclone, with winds exceeding 75 mph, though winds may reach over 150 mph during large storms. It is accompanied by heavy thunderstorms and severe wind damage. Debris due to extreme gusts is common during a hurricane event, and it is advised to remain indoors during one. Satellite weather images give up to three weeks of warning before arrival, since they move slowly from the deep Atlantic and Pacific Oceans. Each individual hurricane event is named for identification. They also lose power as they travel across land, and are called "tropical storms" once their wind speed is reduced below 75 mph; these have the same effects as hurricanes, with lessened impact.

All Atlantic coast states are subject to the risk of hurricane landfall, which occurs seasonally from June to November, presenting a moderately low hazard with severe impact to coastal regions.

Sources of Information:

Information was provided based on discussion with the Town of Mount Pleasant staff and resources from the National Oceanic and Atmospheric Administration, FEMA, and HAZUS-MH databases.

Profile Details:

Hurricanes are ranked as a moderately low hazard with a HIRA-NY score of 180. This score is low due to hurricanes downgrading to a tropical storm or coastal storm before making landfall in New York State, and is considered a rare occurrence to maintain hurricane status within the Town. Damage is mainly caused by high winds causing debris and heavy rain falls causing severe flooding. Wind speeds are mitigated by hills and trees, which are prevalent through the Town.

Damage caused by the hurricane in the Town could be significant on the properties as well as the impact on safety of people such as:

- Debris due to wind, fallen trees being most common

- Strike damage to structures due to debris and wind
- Thunderstorms
- Tornadoes associated (see Tornado hazard)
- Power outages due to power line damage
- Flooding and/or Flash Flooding

Past Examples:

HAZUS-MH offers damage assessments based on both probabilistic and historic storm scenarios. According to the HAZUS-MH databank there were 13 hurricanes that affected New York State within the past century, listed in Table 6-6 below. Appendix C shows the recorded hurricanes that impacted the Town within the past 100 years and their damage assessments.

Probability of Future Events:

Historically, hurricanes reach the Town once every few decades, although the tropical storms and other downgraded storms strike more often.

Table 6-6 New York Hurricanes since 1900 (ref. HAZUS-MH)

Year	Name	Peak Gust (mph)
1900	UN-NAMED-1900-1	146
1938	UN-NAMED-1938-4	134
1944	UN-NAMED-1944-7	92
1945	UN-NAMED-1945-9	134
1949	UN-NAMED-1949-2	139
1954	Edna	112
1954	Carol	109
1954	Hazel	135
1955	Connie	91
1960	Donna	156
1979	Frederic	122
1985	Gloria	99
1999	Floyd	97

6.2.19. Radiological (176)

Description:

The presence of the Indian Point Nuclear Power Plant, the major nuclear facility in proximity to the Town, requires the use of radioactive material, such as fuel rods during operation and relevant waste. Exposure to radioactivity in high doses can cause health impacts and can result in hospitalization or death from prolonged exposure. Many control and safety measures exist to prevent breaching of radioactive material, significantly reducing likelihood of occurrence; yet full-scale reactor meltdowns can cause great harm to the immediate area and present high risk. In catastrophic circumstances, a breach could cause a leak of radioactivity on a county-wide scale and have lasting environmental and societal impacts. As such, it also presents a target for terrorism to cause widespread damage. Radioactive materials can also cause risk in transit, such as radioactive waste transport.

Figure 6-10 shows multiple zones for evacuation. The Evacuation Planning Zone (EPZ) covers within 10 miles range of Indian Point. This is the zone where evacuation in case of a breach is absolutely necessary. The Town is completely contained within the 17.5 mile radius of secondary evacuation—the edge of the 10-mile radius shown ends in the Village of Briarcliff Manor, the neighboring municipality northwest to the Town. As of 2012, the Indian Point evacuation maps increased to include evacuation plans for an area of 50 miles within Indian Point, including the Town. These plans are controlled by New York State, the procedures are known by the Mount Pleasant Police, and these will not be analyzed further in this report.

Sources of Information:

Information was provided based on discussion with the Town of Mount Pleasant staff, and resources from the Indian Point Energy Center website, FEMA, Town, and the Westchester County Board of Legislators.

Profile Details:

Radiological on-site exposures are moderately low hazards with a HIRA-NY score of 176. In-transit exposures are a low hazard, with a HIRA-NY score of 136. Damages of radiological impact in the Town could be significant to properties and critical structures as well as the impact on safety of people such as:

- Widespread health impacts, including death.
- Contamination of food, livestock, and water supplies

Quantitative analysis on Radiological events will not be conducted, due to the sporadic and varying nature of the hazards.

Probability of Future Occurrences:

The Ramapo fault zone has a close proximity to the Indian Point Nuclear Power Plant, and while earthquake risk and impact in this region are deemed very low, any additional information regarding their proximity must result in re-evaluation of the risks to the Town.

Figure 6-10 Indian Point Evacuation Zones (ref. Westchester Legislators)

6.2.20. Epidemic (166)

Description:

The affordability of long distance travel, reduced border security and natural progression of diseases/viruses can increase the changes of an epidemic outbreak. These diseases cause personal debilitation or fatalities, and epidemics occur when the disease's ability to spread outmatches society's ability to quarantine it. It causes additional impact when there is a lack of vaccination or cure for the disease. They are designated as pandemics when such a disease occurs globally, although these are historically uncommon. Epidemics rank as a moderately low hazard.

Profile Details:

Epidemics are ranked as a moderately low hazard with a HIRA-NY score of 166. Damage caused by an epidemic in the Town could be significant to the safety of people such as personal harm or fatalities on a large scale, excessive strain on hospital facilities, and/or public panic.

Epidemics are massive events that are rare or infrequent. Their scale is usually regional or greater, and usually would fall under the jurisdiction of Westchester County Department of Public Health, or by county and state public health measures. Therefore, this Mitigation Plan will not address mitigation actions regarding epidemic events.

Past Occurrences:

It was feared in 2009 that the H1N1 swine flu virus could cause a global epidemic. In late 2014, the Ebola virus caused potential threats to New York City, and one person was admitted to Phelps Memorial Hospital with Ebola-like symptoms, however was later designated safe. Minor influenza cases occur frequently in various areas, including the Town, and can be mitigated with regular flu vaccinations.

Probability of Future Events:

Although increased global transportation has increased the risk of epidemics, they are rare or infrequent hazards. They are also sporadic, and generally unpredictable.

6.2.21. Wildfire (156)

Description:

Wildfires are fires that grow uncontrollably within woodland areas. The fires can spread due to lack of notice, since they are most commonly caused by lightning strikes. They can also be caused due to human negligence, such as unattended campfires or improper disposal of cigarettes and flammables. The fires can cause significant damage to residential areas located within forests or woodland areas. Droughts may increase the likelihood of wildfires and also reduce the ability to contain and remove fires.

Wildfires prove to be a low hazard. Damage caused by Wildfires in the Town could be significant to properties and critical structures as well as the impact on safety of people such as property damage, injury, and death.

Profile Details:

Wildfires are ranked as low hazards with a HIRA-NY score of 166. Damage caused by wildfires in the Town could be significant to the safety of people such as personal harm or fatalities on a small scale and damage to properties and utilities. Wildfires are rare or infrequent, and likely have small impacts on the Town, with the current response capabilities of the local fire departments. Therefore, this Mitigation Plan will not address mitigation actions regarding wildfires.

Past Examples:

In 2013, a wildfire in the Bear Mountains burned 30 acres of forest. No houses were in danger due to the incident, and no injuries were sustained. The fire was most likely started by poorly contained fireworks.

Probability of Future Events:

Wildfires occur with low probability, due to the vast areas of open space within the Town and only occasional dry summer conditions. Wildfires are expected to maintain a rare or infrequent occurrence in the Town, since their frequency and impact are correlated to those of drought events (see Drought hazard profile).

6.2.22. Civil Unrest (153)

Description:

Social tensions, economic and emotional hardships can lead to civil unrest. This involves violence and rioting which leads to possible harm to civilians and police forces. Risk is moderately low for riots, yet they are spontaneous and unpredictable and have a wide variety of sources, and are low hazards.

Civil unrest in the Town could be significant to properties and critical structures as well as the impact on safety of people such as personal harm and fatalities to citizens, delays on emergency response teams, and riot damage to buildings.

Past Examples:

On a local level, few instances of civil unrest have occurred within the Town. One notable incident is the Pleasantville Cottage School Riot in 2011, which involved the arrest of eleven students and injury to four police officers.

Events in 2014 involving the shootings of Michael Brown in Ferguson, MI and the death of Eric Garner in Manhattan, NY have recently sparked into widespread national protests, with negative attitudes towards responding police officers. Multiple related protests have resulted in blocking of major transportation systems and consequential delay of emergency response actions as close as New York City; however no related incidents have occurred within Westchester County.

Probability of Future Events:

Civil Unrest is an infrequent event for the Town. Due to being a man-made event, civil unrest is considered a sporadic and unpredictable event. Their variety of sources from political climate to reactions to other hazards can give short warning towards possible events.

6.3. Inventory Assets

When all of the hazard profiles are completed, the inventory of the vulnerable assets was carried out. The initial inventory was done using the baseline data contained in HAZUS.

HAZUS is a standardized, nationally applicable earthquake, hurricane, and flood loss estimation methodology, which is also used for mapping and inventory collection. The data in HAZUS was used to identify the census tracts located in the Town of Mount Pleasant and contained:

- Demographic data (Population age, ethnicity and income)
- General building stock (square footage of occupancy classes for each census tract)
- Medical care facilities
- Emergency response facilities (fire, police, emergency operation centers)
- Schools
- Dams
- Hazardous material facilities
- Roads, airports and other transportation facilities; and
- Electric power, oil and gas lines and other utilities.

The information available locally and from the Westchester County Department of Planning was utilized.

The ARCGIS was used to further access and use the data available in HAZUS for other purposes, such as determining the people living in or near the flood hazard areas by census tracts, and computation of the current value of property located in the flood hazard area.

The basic steps in Inventory Assessment are:

A. Determining the proportion of buildings, value of buildings and number of people that are located in the Town that are located in hazard areas.

a. Determine the total number of buildings, value of buildings and number of people that are located in the Town.

b. Determining the total number of buildings, value of buildings and number of people that are located in each of the Town hazard zones.

c. Calculate the proportion of assets located in hazard areas.

B. Determine the location to collect additional inventory data.

C. Complete a detailed inventory of what can be damaged by a hazard event.

a. Determine priorities for the Town inventory collection efforts.

b. Gather building-specific information about the assets.

c. Gather hazard-specific information about the assets.

6.3.1. Building Inventory According to Property Use

Tables 6-7 and 6-8 below show the HAZUS data inventories of building counts and dollar exposures (in 2006 dollars) of all buildings within the Town. These are categorized by both occupancy and major structure composition. Table 6-7 highlights the critical facilities within the Town.

Table 6-7 Buildings by Occupancy Type (HAZUS)

Occupancy	Building Count	Percent of Total	Dollar Exposure ($1000)	Percent of Total
Residential	8,268	87.80%	2,348,299	69.74%
Commercial	743	7.89%	719,245	21.36%
Industrial	262	2.78%	138,367	4.11%
Agricultural	50	0.53%	11,692	0.35%
Religious	46	0.49%	39,962	1.19%
Government	16	0.17%	17,042	0.51%
Education	32	0.34%	92,693	2.75%
Total	9,417	100.00%	3,367,300	100.00%

Table 6-8 Buildings by Building Type (HAZUS)

Type	Building Count	Percent of Total	Dollar Exposure ($1000)	Percent of Total
Wood	6,955	73.86%	1,964,926	58.35%
Masonry	1,658	17.61%	675,593	20.06%
Concrete	239	2.54%	228,299	6.78%
Steel	556	5.90%	498,262	14.80%
Mobile Home	8	0.08%	220	0.01%
Total	9,416	100.00%	3,367,300	100.00%

Building Inventory is also provided by the New York State Office of Real Property Tax Services, which acts as a database for inventory data collected from each municipal inventory. Table 6-9 provides the Town building inventory as provided by the Town in 2014.

Table 6-9 Municipal Inventory Information (ref. NYS Office of Real Property Tax Services)

Occupancy Code	Occupancy Type	Number of Parcels	Total Assessed Property Value ($)	Average Property Value ($)	Total Property Market Value ($)	Average Property Market Value ($)	Percent of Total Market Value	Replace-ment Ratio[1]	Total Replacement Assessed Value ($)	Total Replacement Market Value ($)
		(1)	(2)	(2)/(1) = (3)	(2)/(RAR or ER)	(3)/(RAR or ER)		(4)	(2)*(4)=(5)	(5)/(RAR or ER)
210	Single Residential	9,876	89,861,258	9,099	5,581,444,596	565,152	53.54%	75.00%	67,395,944	4,186,083,447
220-280	Multiple Residential	955	8,417,360	8,814	522,817,391	547,453	5.02%	70.00%	5,892,152	365,972,174
400-485	Commercial	881	19,930,359	22,622	1,237,910,497	1,405,120	11.88%	60.00%	11,958,215	742,746,298
512-592	Recreation & Entertainment	42	1,427,740	33,994	88,679,503	2,111,417	0.85%	65.00%	928,031	57,641,677
600-615,682	Community Services & Education	56	15,928,960	284,446	989,376,398	17,667,436	9.49%	75.00%	11,946,720	742,032,298
620	Religion	35	1,539,225	43,978	95,604,037	2,731,544	0.92%	80.00%	1,231,380	76,483,230
631-662	Health, Government, & Protection	47	26,721,212	568,536	1,659,702,609	35,312,821	15.92%	100.00%	26,721,212	1,659,702,609
710	Industrial	19	3,998,350	210,439	248,344,720	13,070,775	2.38%	60.00%	2,399,010	149,006,832
Total		11,911	167,824,464		10,423,879,752		100.00%			7,979,668,565

RAR - Residential Assessment Ratio[2] 1.61%

ER = Equalization Rate[2] 1.61%

1 As per discussion with TMP representatives and in conjunction with regional averages.

2 From New York State Department of Taxation and Finance.

Total Replacement Assessed Value = Total Assessed Property Value * Replacement Ratio

Adjusted Replacement Market Value = Total Replacement Assessed Value / (RAR or ER)

Because of the discrepancy between HAZUS inventory, by which the loss estimates were run, and the municipal data, which shows more accurate inventory information, the HAZUS results were adjusted proportionally. These proportions are based on ratios between the HAZUS data and municipal data, as shown in Table 6-10. The Value Adjustment factors used are 1.94 for Residential class properties, 1.03 for Commercial and Industrial class properties. For the other properties, 2.37 was used as a value adjustment factor since the other value adjustment factors used were skewed by the inclusion of land values in the property assessments, while HAZUS only estimates building loss values.

Table 6-10 Value Adjustment Factor Tables

Category	Town Building Counts	HAZUS Building Counts	Count Adjustment Factor	TMP Replacement Market Value (Thousands of Dollars)	HAZUS Replacement Value (Thousands of Dollars)[1]	Value Adjustment Factor
Commercial/ Industrial/ Agricultural	900	1,055	0.85	891,753	869,304	1.03
Government, Protection, Health	47	16	2.94	1,659,703	17,042	97.39
Education/ Community Services	98	32	3.06	799,674	92,693	8.63
Religious	35	46	0.76	76,483	39,962	1.91
Residential	10,831	8,268	1.31	4,552,056	2,348,299	1.94
Total	**11,911**	**9,417**	**1.26**	**7,979,669**	**3,367,300**	**2.37**

In addition, HAZUS also automates loss estimates based on damage to critical facilities. Table 6-11 shows the list of critical facilities that HAZUS includes in its loss estimation algorithm.

Table 6-11 Essential Facilities Inventory

Name	Type of Facility	Address
Town of Mount Pleasant Town Hall	Town Hall	1 Town Hall Plaza, Valhalla
Pocantico Hills Fire Dept.	Fire Dept.	531 Bedford Road, Tarrytown
Grasslands Fire Dept.	Fire Dept.	4 Dana Road, Valhalla
Hawthorne Fire Dept.	Fire Dept.	330 Columbus Avenue, Valhalla
Thornwood Fire Dept.	Fire Dept.	25 Home Street, Hawthorne
Valhalla Fire Dept.	Fire Dept.	770 Commerce Street, Thornwood
Dept. of Public Safety, County Police	Police Dept.	1 Saw Mill River Parkway, Hawthorne
Mount Pleasant Police Dept.	Police Dept.	1 Town Hall Plaza, Valhalla
Blythedale Children's Hospital	Medical Facility	95 Bradhurst Avenue, Valhalla
Westchester Medical Center	Medical Facility	100 Woods Road, Valhalla, NY, 10595
Mount Pleasant Cottage School	School	1075 Broadway, Pleasantville
Edenwald School	School	1075 Broadway, Pleasantville
Virginia Road elementary School	School	86 Virginia Road, White Plains
Valhalla High School	School	300 Columbus Avenue, Valhalla
Kensico School	School	320 Columbus Avenue, Valhalla
Holy Rosary Elementary School	School	180 Bradhurst Avenue, Hawthorne
Pocantico Hills Central School	School	599 Bedford Road, Sleepy Hollow
Briarcliff High School	School	444 Pleasantville Road, Briarcliff Manor
Todd Elementary School	School	45 Ingham Road, Briarcliff Manor
Briarcliff Middle School	School	444 Pleasantville Road, Briarcliff Manor
Jenni Clarkson Campus	School	1700 Old Orchard Street, Valhalla
Valhalla Middle School	School	300 Columbus Avenue, Valhalla
Blythedale School	School	95 Bradhurst Avenue, Valhalla
Hawthorne Cedar Knolls Jr./Sr. High School	School	226 Linda Avenue, Hawthorne
Linden Hill Jr./Sr. High School	School	226 Linda Avenue, Hawthorne

Name	Type of Facility	Address
Hawthorne Elementary School	School	225 Memorial Drive, Hawthorne
Columbus Elementary School	School	580 Columbus Avenue, Thornwood
Westlake High School	School	825 Westlake Drive, Thornwood
Westlake Middle School	School	825 Westlake Drive, Thornwood
Hawthorne Train Station	Train Station	398 Elwood Ave, Hawthorne
Valhalla Train Station	Train Station	2 Cleveland Street, Valhalla
Pleasantville VAC	Ambulance Corps. Center	30 Gramercy Place, Thornwood
Valhalla VAC	Ambulance Corps. Center	1 Westlake Drive, Valhalla
Edith Macy Conference Center	Shelter	550 Chappaqua Road, Briarcliff Manor
Courtview Manor Home for Adults	Shelter	150 Old Saw Mill River Road
Volunteers of America	Shelter	25 Operations Drive, Valhalla
Children's Sanctuary Program	Shelter	Valhalla
Search for Change	Shelter	115 East Stevens Ave, Valhalla
Mount Pleasant Seniors Office	Senior Citizens Program	1 Town Hall Plaza, Valhalla
Ruth Taylor Nursing Home	Nursing Home	25 Bradhurst Ave, Hawthorne
Rosary Hill Nursing Home	Nursing Home	600 Linda Ave, Hawthorne
TMP Water Department	Water Department	119 Lozza Drive, Valhalla
Commerce Street Pump Station	Water Pumping, Treatment & Storage	7 Commerce Street, Hawthorne
Kensico Treatment Facilities & Water Storage Tanks	Water Pumping, Treatment & Storage	121 Lozza Drive, Valhalla
Palmer Lane Pump Station	Water Pumping, Treatment & Storage	265 Palmer Lane, Pleasantville
Pocantico Pump Station	Water Pumping, Treatment & Storage	591 Bedford Road, Sleepy Hollow
Pocantico Emergency Pump Station	Water Pumping, Treatment & Storage	Route 448, Sleepy Hollow
Countryside Sewer Station	Sewer Pump Stations	18 Carleton Ave, Briarcliff

Name	Type of Facility	Address
Leroy Street Sewer Station	Sewer Pump Stations	25 Leroy Street, Pleasantville
Park Street Sewer Station	Sewer Pump Stations	1 Park Street, Pleasantville
Pheasant Run Sewer Station	Sewer Pump Stations	10 Pheasant Run Road, Pleasantville
Spruce Hill Sewer Station	Sewer Pump Stations	18A Pond Hollow Court, Pleasantville
Deerfield Lane North Sewer Station	Sewer Pump Stations	201 Deerfield Lane North, Pleasantville
Tumblebrook Sewer Station	Sewer Pump Stations	7 Tumblebrook Court, Pleasantville
Hardscrabble Lake Sewer Station	Sewer Pump Stations	154 Hardscrabble Lake Drive, Chappaqua

6.4. Estimate Losses

After determining the hazards that may affect the Town, profiling the hazard events and inventorying the assets that can be damaged by the hazard event, all this information is brought together to estimate the losses in terms of the expected losses from the hazard events to people, buildings, and other important assets. Each hazard type has unique characteristics that can impact a community.

6.4.1. Flood Hazard Losses

HAZUS-MH Version 2.1 Software was used to analyze risk and vulnerability of a flood hazard in the Town of Mount Pleasant. It calculated a basic estimate of flood losses based on data elevation maps from the US Geographical Surveys (USGS) and using default inventory data supplied by FEMA. To increase the accuracy of the data, building stock counts and replacement values have been replaced with information supplied by the Town municipal information. The ratios shown in Table 6-9 were used to modify the damage amounts.

Population change between the 2000 Census used by HAZUS-MH and the 2010 Census is negligible, and HAZUS summary reports based on population were therefore not modified. HAZUS-MH estimates that 755 people will be displaced and 559 of them will seek temporary shelter for a 100-Year Flood event. This represents 2.9% and 2.1% of the Town population respectively. For a 500-Year Flood event, HAZUS estimates 815 persons displaced, with 596 of

them seeking public shelter, representing 3.0% and 2.2% of the population respectively. The number of persons displaced is based on 2.84 average persons per household in the 2010 US Census data. Because there was little to no significant population change between the HAZUS default information and the US Census Bureau data, no proportional scaling was applied to population-based HAZUS estimation results.

Table 6-12 Persons Displaced by Flood Events

	Households Displaced	Persons Displaced *	People Seeking Shelter
100-Year Event	273	775	559
500-Year Event	287	815	596

According to the Town Assessor's Office, 109 buildings are within the 100-year floodplain, and 149 buildings are within the 500-year floodplain. This corresponds to 0.92% and 1.25% of the total number of building in the Town. In both categories, a majority of these buildings are residential properties, followed by commercial properties. Of critical facilities, only the Pleasantville Volunteer Ambulance Corps lies within the 500-Year Flood Event area.

Table 6-13 Town Buildings Within Floodplains

	Town Buildings	Buildings in Floodplain	% Total
100-Year Event	11911	109	0.92%
500-Year Event	11911	149	1.25%

Building losses are categorized into direct building losses and business interruption. Building losses represent the economic value to repair building damage or contents. Business interruption consists of economic impact of wage losses, income losses, relocation, and rental expenses, including living expenses for displaced persons. The building replacement values supplied by the Town of Mount Pleasant Assessor's Office replaced the HAZUS values. Total economic losses for a 100-year flood event are estimated at $107 million, approximately 1.34% of the total market

replacement value for the Town. For a 500-year flood event, total economic losses are estimated at $113 million, approximately 1.42% of the total market replacement value for the Town.

Table 6-14 Flood Event Building Related Economic Loss Estimates (Adjusted)

x$1,000,000	Category	Area	Residential	Commercial	Industrial	Others	Total
100 Year Flood	Building Loss	Building	19.04	15.71	2.73	2.61	40.08
		Content	10.43	33.13	5.28	14.72	63.56
		Inventory	0.00	0.56	0.84	0.14	1.55
		Subtotal	**29.46**	**49.40**	**8.85**	**17.47**	**105.19**
	Business Interruption	Income	0.00	0.17	0.00	0.00	0.17
		Relocation	0.02	0.04	0.00	0.02	0.08
		Rental Income	0.00	0.03	0.00	0.00	0.03
		Wage	0.00	0.11	0.00	1.68	1.80
		Subtotal	**0.02**	**0.36**	**0.00**	**1.71**	**1.91**
	ALL	**Total**	**29.48**	**49.76**	**8.85**	**19.17**	**107.10**
500 Year Flood	Building Loss	Building	21.94	17.34	3.04	2.13	44.45
		Content	11.96	36.28	6.00	11.28	65.53
		Inventory	0.00	0.63	0.95	0.14	1.72
		Subtotal	**33.90**	**54.25**	**9.99**	**13.56**	**111.70**
	Business Interruption	Income	0.00	0.18	0.00	0.00	0.18
		Relocation	0.02	0.04	0.00	0.02	0.08
		Rental Income	0.00	0.03	0.00	0.00	0.03
		Wage	0.00	0.12	0.00	1.33	1.45
		Subtotal	**0.02**	**0.38**	**0.00**	**1.35**	**1.75**
	ALL	**Total**	**33.92**	**54.63**	**9.99**	**14.91**	**113.45**

6.4.1.a. Flood Insurance Claims and Repetitive Loss

Several flooding incidents have occurred consistently (See 6.2.1 Flood Hazard Past Occurrences).

FEMA defines repetitive loss property as an insurable building where two or more claims of more than $1,000 were paid by the National Flood Insurance Program (NFIP) within a continuous ten-year span. There are a total of twelve repetitive loss properties for the Town of Mount Pleasant: six single family residences, two multi-family residences, two other residential buildings, and two non-residential (i.e. commercial) buildings. Six of these properties are located in Zone A, while the others were located in B, C, and X zones. Payments for these claims totaled $1,164,582; of this, $1,025,039 went towards building damage payments, while $139,542 went to contents payment. Several areas included consistent repetitive losses; one site had eight repeat floods, another had twelve repeating floods.

6.4.2. Hurricane Hazard Losses

HAZUS-MH estimates hurricane damages from impacts of strong winds. While hurricanes are associated with heavy storms and precipitation, HAZUS only models damage directly caused by wind or resulting debris, and precipitation is modeled in the Flood Hazard section. The model uses elevation maps, tree inventories, and building inventories provided by FEMA with past hurricane information from the National Oceanic and Atmospheric Administration (NOAA). The past hurricane information holds a databank of hurricanes that made landfall in the United States within the past 100 years, and contains parameters for average wind speed, maximum gusts, storm track, and storm size in order to recreate hurricane events for updated inventories.

Hurricane events were modeled in two different types of scenarios: probabilistic and historic scenarios. Historical models are based on defined parameters of hurricanes that had previously made landfall in the town. The two chosen for historical analysis were hurricanes Donna and

Gloria. The HAZUS probabilistic models evaluated the risk and impact of a hurricane based on return period (probability of occurrence) and wind speeds based on the full list of prior hurricanes. The HAZUS Hurricane summary results can be found in Appendix C.

The HAZUS probabilistic model was used for multiple return periods to estimate damages and wind speeds. These return periods represent the probability of the hurricane event occurrence within a single year; for instance, a 50-year return period shows a hurricane that has a 2% chance of occurring annually. Table 6-15 shows the return periods and their peak three-second gust speeds for 50, 100, 200, and 500 year events found through HAZUS estimation models. All of these storms range from Categories 1, 2, and 3 storms. A 500-year hurricane event is considered a worst-case scenario for the Town, categorized as a Category 3 hurricane event.

Table 6-15 Hurricane Event Peak Wind Gusts

Return Period	Peak Wind Gusts (mph)
50 Year	70
100-Year	82
200-Year	91
500-Year	104

HAZUS models also shows the probabilistic risks buildings and counts the number of buildings damaged and the degrees to which they are damaged. HAZUS provides an estimate for the percent impacted, while inventories in Table 6-9 were used to replace HAZUS's default inventory. The results of the modified inventories in the HAZUS calculations are shown in Table 6-16.

Table 6-16 Hurricane Event Building Damage Count

Return Period	Property Class	Total Building Count	Wind Damage Extent									
			None		Minor		Moderate		Severe		Substantial	
			Impact (%)	Damage Count	Impact (%)	Damage Count	Impact (%)	Damage Count	Impact (%)	Damage Count	Impact (%)	Damage Count
50-Year	Commercial/Industrial	942	99.59	938	0.40	4	0.01	0	0.00	0	0.00	0
	Education/Community	47	99.57	47	0.43	0	0.00	0	0.00	0	0.00	0
	Government	56	99.55	56	0.45	0	0.00	0	0.00	0	0.00	0
	Religious	35	99.67	35	0.32	0	0.01	0	0.00	0	0.00	0
	Residential	10,831	99.85	10815	0.15	16	0.00	0	0.00	0	0.00	0
	Total	**11,911**		**11890**		**21**		**0**		**0**		**0**
100-Year	Commercial/Industrial	942	98.86	931	1.03	10	0.10	1	0.00	0	0.00	0
	Education/Community	47	98.97	47	1.02	0	0.01	0	0.00	0	0.00	0
	Government	56	98.88	55	1.11	1	0.01	0	0.00	0	0.00	0
	Religious	35	99.07	35	0.90	0	0.02	0	0.00	0	0.00	0
	Residential	10,831	98.81	10702	1.16	126	0.03	3	0.00	0	0.00	0
	Total	**11,911**		**11770**		**137**		**4**		**0**		**0**
200-Year	Commercial/Industrial	942	96.40	908	3.05	29	0.50	5	0.08	1	0.00	0
	Education/Community	47	97.04	46	2.86	1	0.10	0	0.00	0	0.00	0
	Government	56	96.83	54	3.06	2	0.11	0	0.00	0	0.00	0
	Religious	35	96.83	34	3.05	1	0.11	0	0.01	0	0.00	0
	Residential	10,831	94.74	10261	4.97	538	0.29	31	0.00	0	0.00	0
	Total	**11,911**		**11303**		**571**		**36**		**1**		**0**
500-Year	Commercial/Industrial	942	86.95	819	10.13	95	2.45	23	0.60	6	0.00	0
	Education/Community	47	88.86	42	9.72	5	1.36	1	0.06	0	0.00	0
	Government	56	87.77	49	10.46	6	1.70	1	0.08	0	0.00	0
	Religious	35	87.49	31	11.19	4	1.28	0	0.07	0	0.00	0
	Residential	10,831	81.94	8875	15.81	1712	2.14	232	0.06	6	0.04	4
	Total	**11,911**		**9816**		**1822**		**257**		**12**		**4**

The summaries from Table 6-16 show a majority of the damage to the Town will be caused to Residential buildings. For a 500-year event, 273 buildings will be at least moderately damaged, 2.3% of the total Town building inventory. For a 200-Year event, 37 buildings are expected to suffer moderate damage, only 0.3% of the Town building inventory. For both 100-year and 50-year events, greater than 99% of the building inventory will suffer little to no damage. In the case of each of these events, residential buildings have the highest count of buildings damaged.

As with the flood damage assessment, building losses are divided into direct building losses and business interruption categories. Building losses refer to direct structural damage and repair costs, while business interruption refers to economic losses caused by rent, relocation, and income losses. The HAZUS results for hurricane losses for each event period can be found in Appendix C. The results for economic losses, after being adjusted to current inventory exposure, are summarized in Table 6-17.

The loss adjustment ratios used in Table 6-17 can be found in Table 6-10. The total economic losses for a 500-year period, the total economic losses were estimated at $85.05 million, about 1.1% of the total market replacement value of the Town inventory. A majority of this damage is expected to occur to residential structures, which total $74.82 million. For a more common 50-year event, HAZUS estimates $3.39 million in total damages to the Town, with a large portion of that damage from residential building losses.

Table 6-17 Hurricane Event Building Related Loss Estimates

x$1,000,000	Category	Area	Residential	Commercial	Industrial	Others	Total
50-Year	Building Loss	Building	2.43	0.07	0.01	0.04	2.55
		Content	0.42	0.00	0.00	0.00	0.42
		Inventory	0.00	0.00	0.00	0.00	0.00
		Subtotal	**2.85**	**0.07**	**0.01**	**0.04**	**2.97**
	Business Interruption	Income	0.00	0.00	0.00	0.00	0.00
		Relocation	0.00	0.41	0.00	0.00	0.41
		Rental	0.00	0.00	0.00	0.00	0.00
		Wage	0.00	0.00	0.00	0.00	0.00
		Subtotal	**0.01**	**0.41**	**0.00**	**0.00**	**0.42**
	ALL	**Total**	**2.86**	**0.48**	**0.01**	**0.04**	**3.39**
100-Year	Building Loss	Building	9.69	0.27	0.04	0.10	10.10
		Content	1.53	0.00	0.00	0.00	1.53
		Inventory	0.00	0.00	0.00	0.00	0.00
		Subtotal	**11.22**	**0.27**	**0.04**	**0.10**	**11.63**
	Business Interruption	Income	0.00	0.00	0.00	0.00	0.00
		Relocation	0.03	0.01	0.00	0.00	0.03
		Rental	0.03	0.00	0.00	0.00	0.03
		Wage	0.00	0.00	0.00	0.00	0.00
		Subtotal	**0.06**	**0.01**	**0.00**	**0.00**	**0.07**
	ALL	**Total**	**11.29**	**0.28**	**0.04**	**0.10**	**11.70**
200-Year	Building Loss	Building	22.41	0.90	0.12	0.34	23.77
		Content	3.70	0.12	0.02	0.02	3.87
		Inventory	0.00	0.00	0.00	0.00	0.01
		Subtotal	**26.11**	**1.02**	**0.15**	**0.36**	**27.65**
	Business Interruption	Income	0.00	0.09	0.00	0.03	0.12
		Relocation	0.51	0.08	0.00	0.02	0.61
		Rental	0.29	0.04	0.00	0.00	0.34
		Wage	0.00	0.03	0.00	0.07	0.10
		Subtotal	**0.80**	**0.24**	**0.01**	**0.12**	**1.17**
	ALL	**Total**	**26.92**	**1.26**	**0.16**	**0.48**	**28.82**
500-Year	Building Loss	Building	57.93	3.35	0.60	1.37	63.25
		Content	14.10	0.77	0.27	0.28	15.43
		Inventory	0.00	0.02	0.04	0.01	0.07
		Subtotal	**72.03**	**4.14**	**0.91**	**1.67**	**78.75**
	Business Interruption	Income	0.00	0.51	0.01	0.22	0.74
		Relocation	1.83	0.59	0.04	0.26	2.72
		Rental	0.96	0.31	0.01	0.02	1.30
		Wage	0.00	0.49	0.02	1.03	1.54
		Subtotal	**2.79**	**1.90**	**0.08**	**1.53**	**6.30**
	ALL	**Total**	**74.82**	**6.04**	**0.99**	**3.20**	**85.05**

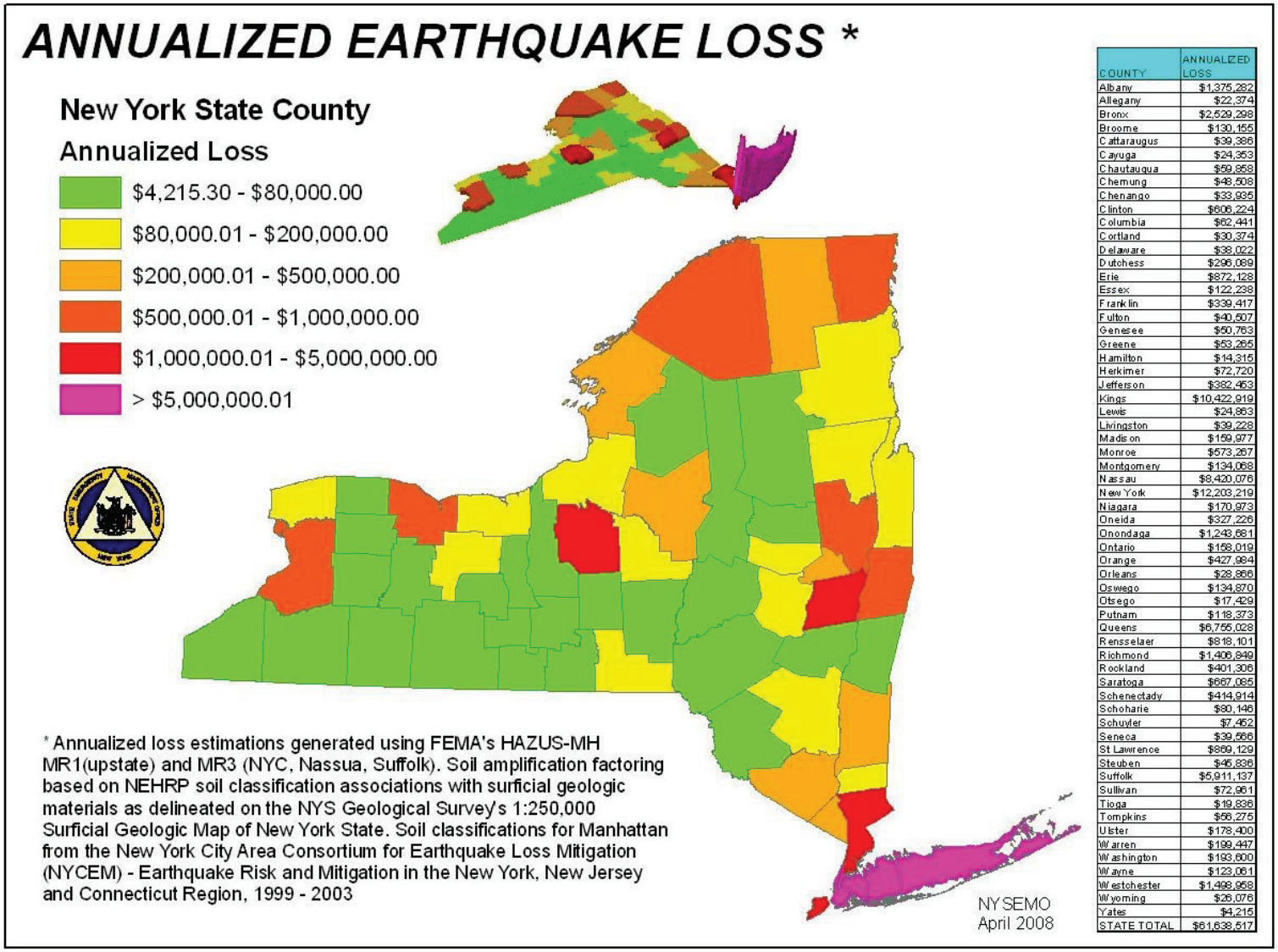
6.4.3. Earthquake Hazard Losses

Earthquakes can cause significant and widespread damage and are considered as a risk even though it has a low frequency of occurrence. Overall, HIRA ranks earthquakes as a moderately low hazard.

A 2008 FEMA study called "HAZUS MH Estimated Annualized Earthquake Losses for the United States" created a list of state rankings for annualized earthquake losses. Annualized losses refer to losses caused by an earthquake divided by the return period for the event; for example, the annualized loss for a 500-year earthquake would be the cost per year for the losses over each of 500 years. In this category, New York State came in 4th place. In annualized earthquake loss ratios, as a fraction of the replacement value of inventory, New York State came in 26th place. Annualized earthquake loss was determined to be $95,185,000, while annualized earthquake loss was $67 per million dollars of inventory.

The study also compiled annualized earthquake losses and annualized earthquake loss ratios as a part of the New York State Hazard Mitigation Plan, as shown in Figures 6-11, 6-12, and 6-13. Figure 6-11 shows the annualized loss for New York State to be $61,638,517, and the annualized earthquake losses for Westchester County to be $1,498,958. Figure 6-12 shows the annualized earthquake loss per capita to be in the $1.01-$2.00 category. Figure 6-13 shows the annualized earthquake loss per square mile to be between $250 and $50,000 for the Town (the Town is split between the $250-$1,000 category for one census tract and the $1,000 to 50,000 category for the other five tracts).

Figure 6-11 Annualized Earthquake Loss (ref. 2008 FEMA Study)



COUNTY	ANNUALIZED LOSS
Albany	$1,375,282
Allegany	$22,374
Bronx	$2,529,298
Broome	$130,155
Cattaraugus	$39,386
Cayuga	$24,353
Chautauqua	$59,858
Chemung	$48,508
Chenango	$33,935
Clinton	$606,224
Columbia	$62,441
Cortland	$30,374
Delaware	$38,022
Dutchess	$296,089
Erie	$872,128
Essex	$122,238
Franklin	$339,417
Fulton	$40,507
Genesee	$50,763
Greene	$53,265
Hamilton	$14,315
Herkimer	$72,720
Jefferson	$382,463
Kings	$10,422,919
Lewis	$24,863
Livingston	$39,228
Madison	$159,977
Monroe	$573,267
Montgomery	$134,068
Nassau	$8,420,076
New York	$12,203,219
Niagara	$170,973
Oneida	$327,226
Onondaga	$1,243,681
Ontario	$158,019
Orange	$427,984
Orleans	$28,866
Oswego	$134,870
Otsego	$17,429
Putnam	$118,373
Queens	$6,755,028
Rensselaer	$818,101
Richmond	$1,406,849
Rockland	$401,306
Saratoga	$667,085
Schenectady	$414,914
Schoharie	$80,146
Schuyler	$7,462
Seneca	$39,566
St Lawrence	$869,129
Steuben	$45,836
Suffolk	$5,911,137
Sullivan	$72,961
Tioga	$19,836
Tompkins	$56,275
Ulster	$178,400
Warren	$199,447
Washington	$193,600
Wayne	$123,061
Westchester	$1,498,958
Wyoming	$26,076
Yates	$4,215
STATE TOTAL	$61,638,517

Figure 6-12 Annualized Earthquake Loss Per Capita (ref. 2008 FEMA Study)

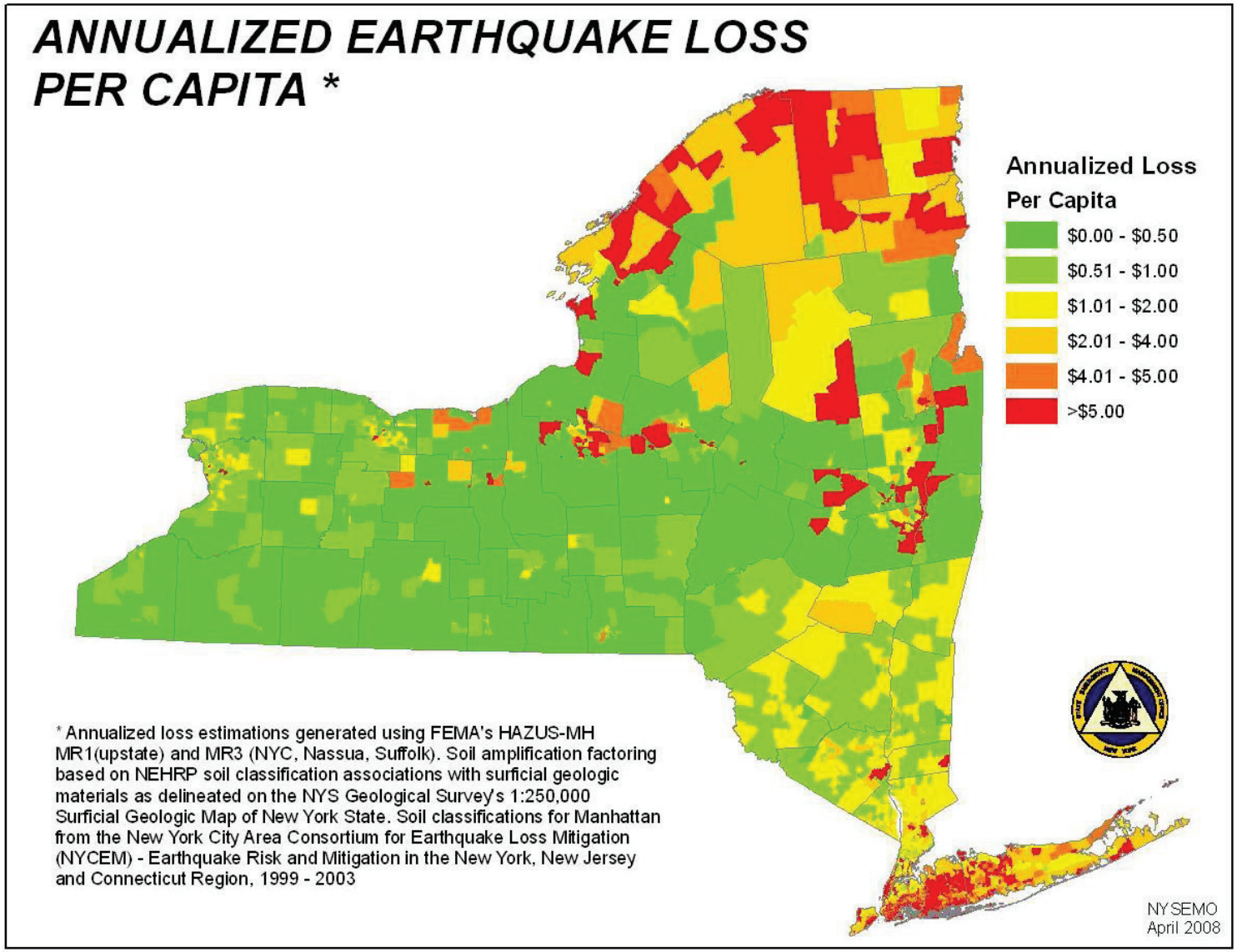
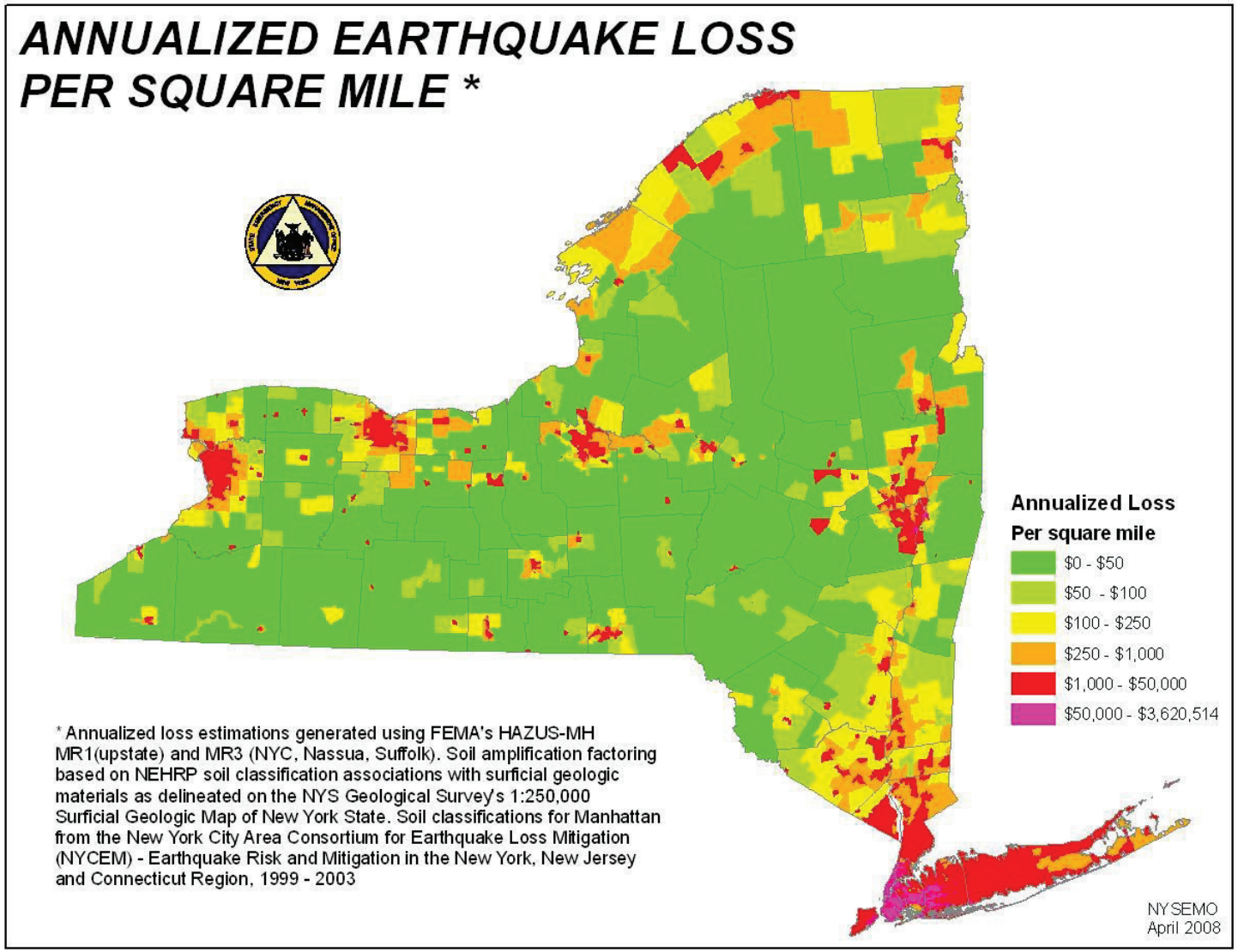


Figure 6-13 Annualized Earthquake Loss Per Square Mile (ref. 2008 FEMA Study)



A probabilistic earthquake assessment was conducted for 500, 1,000, and 2,500 year return periods using HAZUS-MH. A 500 year return period corresponds to a 0.2% chance of the mapped peak ground acceleration (PGA) would be exceeded annually. A 1,000 year event would have a 0.1% chance of exceeding the mapped PGA for the event annually, and 2,500 year events have a 0.04% chance of exceeding the mapped PGA for that event annually. All of the mapped PGAs are based on magnitude 5 earthquakes. A 2,500 year earthquake event is considered the worst-case scenario.

HAZUS estimates the number of people that will be injured and killed by the earthquake. The casualties are categorized by both time of occurrence and severity of injuries expected. HAZUS provides a description of the four levels of severity:

Level 1: Injuries will require medical attention but hospitalization is not needed.

Level 2: Injuries require hospitalization but are not considered life-threatening

Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated

Level 4: Victims are killed by the earthquake

The times of day estimated for are 2:00 AM, 2:00 PM, and 5:00 PM. These times represent peak occupancy of different facilities and buildings: 2:00 AM represents peak occupancy of residential buildings; 2:00 PM represents peak occupancy of commercial, education, industrial, and government buildings; and 5:00 PM represents peak occupancy of transportation systems and commuter routes. Table 6-18 shows the estimated casualties for each possible earthquake time:

Table 6-18 Earthquake Event Casualty Estimates

	Time	Level 1	Level 2	Level 3	Level 4	Total
500-Year	2:00 AM	1	0	0	0	1
	2:00 PM	2	0	0	0	2
	5:00 PM	1	0	0	0	1
1,000-Year	2:00 AM	4	0	0	0	4
	2:00 PM	5	1	0	0	6
	5:00 PM	5	1	0	0	6
2,500 Year	2:00 AM	15	2	0	0	17
	2:00 PM	23	4	0	1	28
	5:00 PM	21	5	3	1	30

HAZUS earthquake assessments estimated the number of households that would be displaced from their homes, as well as the number of people in the household that would require short-term public shelter. Table 6-18 summarizes the displaced households and displaced persons due to earthquakes for 500, 1,000, and 2,500 year return periods. The number of displaced persons is based on the 2010 US Census, where the Town had counted 2.84 average persons per household. For a 500 year event, no persons were displaced and no people were expected to seek shelter. For a 1,000 year event scenario, 9 people were displaced, of which 3 were expected to seek public shelter. For a 2,500 year event scenario, 48 people were displaced, of which 18 were expected to seek shelter.

Table 6-19 Earthquake Event Displaced Persons Estimate

Return period	Displaced households	Displaced persons	People Seeking Shelter
500-Year	0	0	0
1000-Year	3	9	3
2500-Year	17	48	18

Table 6-20 represents the number of buildings expected to be damaged in each of the earthquake events. In a 500-year event, it is estimated that 57 buildings will suffer at least moderate damage, or 0.5% of the Town inventory. In a 1,000-year event, 192 building are estimated to suffer at least moderate damage, or 1.6% of the Town inventory. In a 2,500-year event, 752 buildings are expected to suffer at least moderate damage, or 6.3% of the Town inventory. In each of these categories of damage, residential class buildings have the highest damage counts, even though commercial buildings in general are more greatly impacted percent-wise.

Building losses are divided into capital stock losses and income losses. Capital stock losses represent loss estimates from direct building and contents damage. Income losses represent estimated losses from indirect loss of income and expenses for relocation and rentals. The costs from HAZUS assessments were scaled to the current market replacement values using ratios provided in Table 6-10. These adjusted losses are summarized in Table 6-21. For a 500-year event, losses total $7.87 million, or 0.1% of the Town inventory replacement value. For a 1,000 year event, losses total $32.64 million, or 0.4% of the Town inventory replacement value. For a 2,500-year event, losses total $155.05 million, or 1.9% of the Town inventory replacement value. For each of these categories, the majority of damages occurred to residential properties. However, a greater percent of total commercial building inventory was damaged in comparison to residential properties.

Table 6-22 summarizes the losses due to structural damage to transportation and utility systems (in 2006 dollars). These systems are more heavily impacted by earthquakes than by either hurricanes or floods. These estimates show that 500-year events cause little damage. A 1,000 year event is estimated to cause $1 million in utility damages, or less than 0.1% of the $1.2 billion utility inventory. A 2,500-year event is estimated to cause $7.69 million in damages. The damage ratio on communications systems is 10.7% in a 2,500-year event, showing a significant vulnerability to earthquakes.

Table 6-20 Earthquake Event Building Damage Count

Return Period	Property Class	Total Building Count	Earthquake Damage Extent									
			None		Slight		Moderate		Extensive		Complete	
			Impact (%)	Damage Count	Impact (%)	Damage Count	Impact (%)	Damage Count	Impact (%)	Damage Count	Impact (%)	Damage Count
500-Year	Agriculture	42	97.96	41	2.04	1	0.00	0	0.00	0	0.00	0
	Commercial	881	96.51	850	2.55	22	0.81	7	0.13	1	0.00	0
	Education/Community	56	96.88	54	3.13	2	0.00	0	0.00	0	0.00	0
	Government	47	100.00	47	0.00	0	0.00	0	0.00	0	0.00	0
	Industrial	19	96.95	18	2.29	0	0.76	0	0.00	0	0.00	0
	Multi Residential	955	97.02	927	2.25	22	0.63	6	0.09	1	0.00	0
	Religion	35	97.78	34	2.22	1	0.00	0	0.00	0	0.00	0
	Single Residential	9,876	97.61	9640	1.97	195	0.38	37	0.04	4	0.00	0
	Total	**11,911**		**11612**		**242**		**51**		**6**		**0**
1000-Year	Agriculture	42	92.00	39	6.00	3	2.00	1	0.00	0	0.00	0
	Commercial	881	90.98	802	6.19	55	2.42	21	0.40	4	0.00	0
	Education/Community	56	90.63	51	6.25	4	3.13	2	0.00	0	0.00	0
	Government	47	93.75	44	6.25	3	0.00	0	0.00	0	0.00	0
	Industrial	19	91.60	17	5.73	1	2.29	0	0.38	0	0.00	0
	Multi Residential	955	91.79	877	6.04	58	1.89	18	0.27	3	0.00	0
	Religion	35	91.30	32	6.52	2	2.17	1	0.00	0	0.00	0
	Single Residential	9,876	92.89	9174	5.66	559	1.28	127	0.15	15	0.01	1
	Total	**11,911**		**11,035**		**683**		**170**		**21**		**1**
2500-Year	Agriculture	42	74.00	31	16.00	7	8.00	3	2.00	1	0.00	0
	Commercial	881	73.22	645	15.75	139	9.02	79	1.88	17	0.13	1
	Education/Community	56	72.73	41	15.15	8	9.09	5	3.03	2	0.00	0
	Government	47	80.00	38	13.33	6	6.67	3	0.00	0	0.00	0
	Industrial	19	74.05	14	14.89	3	9.16	2	1.91	0	0.00	0
	Multi Residential	955	76.56	731	15.33	146	6.67	64	1.26	12	0.18	2
	Religion	35	73.91	26	15.22	5	8.70	3	2.17	1	0.00	0
	Single Residential	9,876	78.91	7793	15.45	1526	4.86	480	0.70	69	0.08	8
	Total	**11,911**		**9,318**		**1,841**		**640**		**101**		**11**

Table 6-21 Earthquake Event Building Related Economic Loss Estimates (Adjusted)

x$1,000,000	Category	Area	Residential	Commercial	Industrial	Others	Total
500-Year Earthquake	Capital Stock Losses	Structural	1.10	0.25	0.04	0.12	1.51
		Non-Structural	2.93	0.58	0.10	0.31	3.92
		Content	0.56	0.27	0.06	0.14	1.03
		Inventory	0.00	0.01	0.01	0.00	0.02
		Subtotal	**4.59**	**1.11**	**0.22**	**0.57**	**6.49**
	Income Losses	Wage	0.00	0.22	0.01	0.05	0.27
		Capital	0.00	0.15	0.00	0.00	0.15
		Rental	0.16	0.12	0.00	0.02	0.30
		Relocation	0.35	0.17	0.01	0.12	0.65
		Subtotal	**0.50**	**0.67**	**0.02**	**0.19**	**1.38**
	ALL	**Total**	**5.10**	**1.77**	**0.24**	**0.76**	**7.87**
1000-Year Earthquake	Capital Stock Losses	Structural	3.70	0.79	0.12	0.36	4.97
		Non-Structural	12.27	2.57	0.53	1.33	16.71
		Content	3.45	1.52	0.34	0.83	6.14
		Inventory	0.00	0.03	0.06	0.00	0.09
		Subtotal	**19.42**	**4.91**	**1.06**	**2.51**	**27.91**
	Income Losses	Wage	0.04	0.74	0.02	0.14	0.94
		Capital	0.02	0.52	0.01	0.02	0.58
		Rental	0.52	0.40	0.01	0.05	0.98
		Relocation	1.20	0.61	0.05	0.38	2.24
		Subtotal	**1.78**	**2.27**	**0.09**	**0.59**	**4.74**
	ALL	**Total**	**21.21**	**7.18**	**1.15**	**3.10**	**32.64**
2500-Year Earthquake	Capital Stock Losses	Structural	14.01	3.32	0.54	1.52	19.40
		Non-Structural	58.85	11.93	2.50	6.07	79.35
		Content	22.02	7.81	1.69	4.36	35.88
		Inventory	0.00	0.15	0.29	0.05	0.49
		Subtotal	**94.89**	**23.21**	**5.03**	**11.99**	**135.12**
	Income Losses	Wage	0.16	3.17	0.09	0.57	3.99
		Capital	0.06	2.29	0.05	0.12	2.52
		Rental	2.15	1.57	0.04	0.19	3.95
		Relocation	4.88	2.65	0.22	1.73	9.48
		Subtotal	**7.25**	**9.67**	**0.40**	**2.61**	**19.93**
	ALL	**Total**	**102.14**	**32.89**	**5.43**	**14.60**	**155.05**

Table 6-22 Earthquake Event Critical Structure Loss Estimate

x$1,000,000			500 Year Event		1000 Year Event		2500 Year Event	
System	Component	Inventory Value	Economic Loss	Loss Ratio (%)	Economic Loss	Loss Ratio (%)	Economic Loss	Loss Ratio (%)
Highway	Segments	669.54	0.00	0.00	0.00	0.00	0.00	0.00
	Bridges	553.17	0.12	0.02	0.97	0.18	7.63	1.38
	Tunnels	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Subtotal	**1222.71**	**0.12**		**0.97**		**7.63**	
Railways	Segments	34.61	0.00	0.00	0.00	0.00	0.00	0.00
	Bridges	0.08	0.00	0.00	0.00	0.00	0.00	0.00
	Tunnels	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Facilities	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Subtotal	**34.69**	**0.00**		**0.00**		**0.00**	
Potable Water	Pipelines	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Facilities	0.00	0.00	0.00	0.00	0.08	0.00	0.00
	Distribution Line	6.41	0.00	0.03	0.01	0.00	0.02	0.28
	Subtotal	**6.41**	**0.00**		**0.01**		**0.02**	
Waste Water	Pipelines	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Facilities	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Distribution Line	3.85	0.00	0.02	0.00	0.07	0.01	0.24
	Subtotal	**3.85**	**0.00**		**0.00**		**0.01**	
Natural Gas	Pipelines	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Facilities	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Distribution Line	2.56	0.00	0.01	0.00	0.04	0.00	0.12
	Subtotal	**2.56**	**0.00**		**0.00**		**0.00**	
Communications	Facilities	0.24	0.00	0.42	0.01	2.50	0.03	10.68
	Subtotal	**0.24**	**0.00**		**0.01**		**0.03**	
	Total	**1270.46**	**0.12**		**0.99**		**7.69**	

SECTION 7. MITIGATION STRATEGIES

7.1. Mitigation Strategies

Mitigation strategies are designed to limit the potential losses incurred, in property damage or loss of life, as a result of the natural hazards listed in Section 6. Actions highlighted in these mitigation strategies include preventing, lowering occurrence rates, or minimizing losses of hazard events and emergency scenarios.

The Federal Emergency Management Agency (FEMA) Guide 386-3 presents requirements for mitigation strategies, which were used as guidelines in this Multi-Hazard Mitigation Plan:

- **Requirement §201.6(c)(3)(i):** [The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.
- **Requirement §201.6(c)(3)(ii):** [The mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure. [The mitigation strategy] must also address the jurisdiction's participation in the National Flood Insurance Program (NFIP), and continued compliance with NFIP requirements, as appropriate.
- **Requirement §201.6(c)(3)(iii):** [The mitigation strategy shall include] an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

7.2. Mitigation Goals and Objective

The purpose of the goals and objectives is to lay a foundation for the identification and mitigation of possible risks. Goals are designed to establish guidelines and target effects desired from these mitigation strategies, while the objectives are strategies designed to attain the goals laid out, which are achieved more directly by mitigation actions. The next step is to identify planning goals and objectives to guide the development of the mitigation actions. The Planning Team Committee with the Town Consultant's input and review by the community, Stakeholders, and government agencies, proposed these mitigation goals and objectives for developing mitigation measures as illustrated in the Table 7.1. Five hazard mitigation goals were proposed for implementing the Towns mitigation measures as follows:

1. Protect Life and Property
2. Ensure Minimal Damage to Public Facilities and Infrastructure
3. Improve Coordination, Communication, and Collaboration with all Relevant Organizations
4. Increase Public Understanding and Preparedness for Hazard Mitigation
5. Protect the Environment

The first goal, to Protect Life and Property, covers hazards that can cause personal harm and property damage. The list of hazards here is extensive, although flooding presents the greatest potential risk to the Town of Mount Pleasant. Mitigation actions targeted to this goal include managing stormwater and sewage systems, managing emergency alert systems, and forecasting and relaying information about extreme weather conditions.

The second goal, to Ensure Minimal Damage to Public Facilities and Infrastructure, is designed to reinforce the Town infrastructure so that, in the event of a hazard event, the damage is minimized and Town operations can resume quickly and smoothly. Actions and objectives for this goal are made to reinforce central town facilities and to ensure that major facilities can relocate or withstand hazard events.

The third goal, to Improve Coordination, Communication, and Collaboration with all Relevant Organizations, is made to promote quick response to hazards and the damages that can be caused by them. This includes establishing shelters and relocations and providing prior warnings to vulnerable areas.

The fourth goal, to Increase Public Understanding and Preparedness for Hazard Mitigation, allows for the public to understand hazard mitigation activities and act as needed to coordinate hazard response. Promoting public awareness of response systems allows for populations in hazard-prone areas to understand the risks of locations and to maneuver to safety during hazard events. Public notice systems and public hazard clarifications are indicative of the actions aimed to this goal.

The fifth goal, to Protect the Environment, integrates environmental damages into assessments of hazards and vulnerabilities. Understanding and protection of tree inventory, rivers and streams, and soil are all parts of environmental protection; neglect of these fields may propagate other hazard damages.

These goals were chosen based on the previous assessments of risks, hazards, and impacts from Section 6. These goals are made to answer the hazards and threats that the community faces.

The majority of damage due to natural hazards comes from flooding due to severe storms, coastal storms, hurricanes, and tropical storms; but the goals can be extended to include goals for other hazards. The hazards include:

- Flooding
- Severe Storms
- Hurricanes
- Winter Storms (Severe Winter/Ice Storms)
- Dam Failure
- Icing
- Fire

- Extreme Temperatures
- Tornadoes
- Utility Failure
- HAZMAT Exposure (on-site)
- Terrorism

Mitigation actions are classified under six categories in FEMA Publication 386-3:

1. Prevention: Government administrative or regulatory actions or processes that influence the way land and buildings are developed and built. These actions also include public activities to reduce hazard losses. Examples include planning and zoning, building codes, capital improvement programs, open space preservation, and storm water management regulations.
2. Property Protection: Actions that involve the modification of existing buildings or structures to protect them from a hazard, or removal from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.
3. Public Education and Awareness: Actions to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them. Such actions include outreach projects, real estate disclosure, hazard information centers, and school-age and adult education programs.
4. Natural Resource Protection: Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems. These actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.

5. Emergency Services: Actions that protect people and property during and immediately after a disaster or hazard event. Services include warning systems, emergency response services, and protection of critical facilities.
6. Structural Projects: Actions that involve the construction of structures to reduce the impact of a hazard. Such structures include dams, levees, floodwalls, seawalls, retaining walls, and safe rooms.

The Mitigation Actions and their descriptions, primary goals and objectives, and project classifications are detailed in Table 7-1.

7.2.1. Evaluating Mitigation Actions

The planning team selected mitigation actions suitable to the Town and then decided what sequence or order these actions will be pursued. The analysis of the various mitigations was accomplished using STAPLEE evaluation method furnished by FEMA, which fulfills the DMA 2000 requirements. The method enabled the planning team to consider the opportunities and constraints of implementing a particular mitigation action. The STAPLEE criteria are defined below in Table 7-2.

The STAPLEE evaluation results for the proposed hazard-specific mitigation actions are summarized in Table 7-3.

Table 7-1 Mitigation Actions

Action	Action Number	Description
Goal 1:To Protect Life and Property		
Objective 1 - Reduce the impacts of hazards on people, residences, businesses, and institutions.		
Warning emergency alert rapid notification	1.1.1	Alerts received at the right time can help keep the public safe and reduce injuries during an emergency. Warnings can be sent to mobile devices when harm is on the way, and can also use Facebook, Twitter, and website alerts. Nixel and Verizon are companies capable of implementing emergency alert systems.
WC OEM (Reverse 911)	1.1.2	A reverse 911 call can alert residents of hazardous situations, providing warning and specific instructions for disaster preparation to available phones and cell phones within a certain area. This system is currently implemented for NYCDEP facilities.
DEP Shaft 18 Custom Alert Plan	1.1.3	The response plan for the Shaft 18 site include the implementation of tactical plans and incident response protocols. While the planning is maintained by the NYCDEP, partial responsibility for mobilization of public resources is given to the Mount Pleasant Police Dept.
Elevate the furnace, water heater and electric panel	1.1.4	Effective for homes and buildings in the flood zones to reduce losses, can be championed by the Town or implemented in the Building Code.
Construct Berms	1.1.5	This option would only work in areas where the flooding is less than 2 feet deep. However, many of the sites at risk will get more than 4 feet of flooding during a 100-year flood. Also, this option requires significant land area around buildings being protected such as the Water District in Thornwood.
Provide Sand Bags	1.1.6	Sand bags can be used to divert floodplains, reinforce structures, and mitigate building damage. This is a relatively simple idea to use, with high feasibility and low costs, given warning of flooding hazards and ample time to place the bags.
Storm Drainage Improvements on Whittier Drive	1.1.7	Analysis of storm drainage on Whittier Drive, Thornwood and study of Leitas Pond hydraulics.
Bear Ridge Road Storm Sewer Replacement	1.1.8	Inspection and replacement of 48" storm sewer due to deterioration, on Bear Ridge Road between Meadowbrook and Palmer Lanes in Pleasantville.
Linda Avenue Installation of New Storm Sewer	1.1.9	Study and installation of a new storm sewer on Linda Avenue between Bradford and Frankford Streets in Hawthorne.
Kings Grant Way Drainage Improvements	1.1.10	Storm sewer inspection and replacement due to deterioration, on Kings Grant Way in Briarcliff Manor.
Woodfield Road Storm Sewer Installation	1.1.11	Storm sewer study and installation on Woodfield Road in Briarcliff Manor
Myrtle and Fairfax Drainage System	1.1.12	Survey and replacement of deteriorated storm sewers on private properties between Myrtle and Fairfax Avenues in Hawthorne.
Brookline Area Drainage Reconstruction	1.1.13	Reconstruction of storm sewer system on Brookline and Livingston Streets and Astor, Broad, and Weed Avenues in Hawthorne.
Stonegate Road Replacement of Storm Sewer	1.1.14	Replacement of 36" diameter storm sewer on Stonegate Road between West Lake Drive and Eastview Drive in Valhalla
Objective 2 - Minimize losses to existing and future structures within hazard areas.		
Avoid building in flood plains unless elevated and reinforced	1.2.1	Flood plains can be used for different purposes other than residential or commercial buildings. By reallocating areas with high flood risk to other projects, the Town can avoid construction and future building damage based on floods.

Action	Action Number	Description
Consider installing check valves	1.2.2	Check valves can identify and limit flows, and avoid water back up to homes for sanitary and stormwater issues. These would also limit flooding issues.
Raise Structures above BFE	1.2.3	Raising structures at high-risk would reduce building losses. This might not be cost effective if the cost of property losses are less than home relocation.
Buy out structures within flood zone	1.2.4	Structures can be bought out from owners by the Town, to reduce risk of public harm. Effective for properties at severe risk to consistent or repetitive flooding.
Objective 3 - Integrate mitigation measures in local building and zoning codes.		
Verify flood zones	1.3.1	Standardized building based on flood mapping and potential risk. This will verify buildings are up to code and ensure that they are able to withstand the flood risks of their area.
Objective 4 - Educate the property owners in preventative measures especially in repetitive loss areas prone to flooding		
Pre-emptive notification to the public in hazard-prone areas	1.4.1	Notification to the public can be through flyers in the mail, posted on the Town website or sent as a text message based on GIS mapping as a warning to hazardous areas before emergency events.
Public Education	1.4.2	Throughout the years the Town had experienced many natural and man-made hazards. Thus, the public must be notified and educated in case of a reccuring or new property- or life-threatening event. This will also stress the need for continuous hazard awareness due to climate change effects, in order to inform both current and future at-risk residents. Public events and information sessions can be held periodically by the Town.
Objective 5 - Identify the need for acquiring any special emergency equipment and training.		
Build a Town Staff emergency kit	1.5.1	A collection of basic items in Town buildings can be used as back-up supplies during emergency events. MREs, water bottles, cots, toothbrushes, etc. are required for EOCs.
Develop and educate public on family communications planning	1.5.2	A communication plan includes a contact such as a friend or relative who lives out-of-town, and can be advised through a town newsletter.
Goal 2: To Ensure Minimal Damage to Public Facilities and Infrastructure		
Objective 1 - Minimize losses to existing and future critical essential facilities within hazard areas, to ensure the continuity of local government operations, emergency services, and essential facilities, during and immediately after disasters hazard events.		
Government building relocation Plan/Study	2.1.1	Relocation of the government building is essential to ensure government operation during a disaster. Studies are required for in-depth identification of risks to government facilities and possible back-up locations.
Volunteer staff (CERT Team)	2.1.2	Before, during, and after a disaster, volunteer services can aid in response services. These volunteer teams require basic provisions and basic training for responses, including uniforms and emergency supplies. CERT Teams would increase capabilities to respond to emergencies for the Town and its facilities.
Emergency Generators for Town Infrastructure	2.1.3	Additional power sources should be installed for major buildings, such as Town Recreation Center and Community Center. These would ensure infrastucture functions during and after hazardous events. Generator costs include purchasing, installation, and verification that the generators are above the BFE.
Secondary Emergency Operation Center Establishment with backup generator	2.1.4	Development of backup EOC to ensure continuation of community services and communications during hazard events and recovery. Fire houses are available, as well as a mobile command unit.

Action	Action Number	Description
Objective 2 - Minimize losses to existing and future critical infrastructure within hazard areas.		
Relocate structures vulnerable to hazards	2.2.1	Relocation of private and public facilities in hazardous zones. One such example is the Pleasantville Volunteer Ambulance Corps, located within a repetitive flood loss zone and 500-year flood zone on Grammercy Place. This might not be cost effective if the cost of property losses are less than relocation.
Reinforce structures vulnerable to hazards.	2.2.2	Reinforcing structures could work as an alternative to structure relocation. For the Town, this applies to buildings such as Town Recreation Center, which acts as a shelter and requires hurricane-proofing.
Manhole sealing and ventilation, to prevent overflows	2.2.3	Sewer manholes are to be sealed to prevent overflows, and ventilation is to be placed to prevent buildup of gases after sealing. An engineering study will be conducted to assess the placement and costs of upgrades.
Objective 3 - Incorporate mitigation measures into the Town capital improvement and maintenance projects.		
Enforce building codes during construction	2.3.1	Providing building standards during construction will prevent the need to reinforce buildings later on.
Goal 3: to Improve Coordination, Communication, and Collaboration with all Relevant Organizations		
Objective 1 - Establish and maintain partnerships with local private businesses, schools and institutions of higher learning, and health institutions to collaborate during the disasters.		
Renovate and Stock Temporary Shelters	3.1.1	Taking care of the shelters is critical in times of disaster. This includes preparation and maintenance of the shelters available and stocking them with MREs, supplies, and emergency materials.
Develop Alternative Shelters (e.g. Edith Macy)	3.1.2	Coordinate with other facilities to make additional shelters available, such as the Edith Macy Conference Center. This includes legal fees and costs of coordination. Funds and means of agreement are currently available.
Evacuation Plans	3.1.3	In some circumstances hazards are serious and require mandatory evacuations. In others, evacuations are advised to avoid potentially dangerous situations. Evacuations are directed by the Town Police.
Objective 2 - Enhance and improve communication with various Town agencies and stakeholders including the neighboring municipalities.		
Direct Contact Personnel	3.2.1	Ensuring the proper personel communication lines will allow for quicker emergency communications and prevent miscommunications.
Regular emergency warning tests	3.2.2	Tests for the emergency warning systems will ensure public notifications of hazard events are clearly delivered between agencies, as well as to the public.
Coordination with Neighboring Emergency Services	3.2.3	Enable and enhance communications with emergency services in other towns to strengthen event response. The Town is in close proximity to other municipalities, including the Village of Pleasantville and the Village of Sleepy Hollow, and can share resources and response units with them.

Action	Action Number	Description
Goal 4: To Increase Public Understanding and Preparedness for Hazard Mitigation		
Objective 1 - Develop and promote education and outreach programs for the public, public officials, realtors, contractors and building owners.		
FIS Link on Town website to Base Flood Elevation Map	4.1.1	FIS link to keep an updated town inventory and allow easy access--will be refined for public use. This increases public awareness of the Base Flood Elevation and other hazards of their location.
Objective 2 - Promote understanding of natural hazards and the risks they pose.		
Risk Assessment (HIRA-NY and HMP availability)	4.2.1	Recognition of an impending hazard and analysis of associated risks depend on updates of studies and reports such as the HIRA-NY risk classifications and the Hazard Mitigation Plan updates.
Objective 3 - Prepare hazard information, such as databases and maps.		
Data Collection (GIS)	4.3.1	Includes the collection and compilation all necessary shapefile regarding certain hazards related to the town map for both internal and external use. This includes communicating with and updating information for the Westchester GIS. This task will continuously update in response to climate change and other future changes to hazard risks.
Inventory (HAZUS-MH)	4.3.2	Includes updating and maintaining the Town inventory of properties and infrastructure. This aids in assessment of hazard losses, and involves the communication with and updating information for the Westchester GIS, FEMA, and the New York State Office of Real Property Tax Services. This task will continuously update in response to climate change and other future changes to hazard risks.
Goal 5: To Protect the Environment		
Objective 1 - Implement mitigation actions that promote protection of the environment.		
River protection and cleaning	5.1.1	River protection activities include the cleaning and maintenance of rivers and banks, and removal of debris that may block river flow. These activities prevent erosion of the banks and flooding issues caused by irregular flow. Used on Brady Avenue improvements.
CRS Program Development	5.1.2	The CRS is a voluntary incentive program that highlights minimum NFIP requirements. Flood insurance rates discounts are given depending on CRS Class Rank--the Town is able to acquire up to 10% discounts on flood insurance premiums by enacting CRS activities, in addition to the benefits of the activities for the community (e.g. FIS mapping, river maintenance, etc.)
Objective 2 - Incorporate risk mitigation to include natural resources		
Tree Inventory and Management	5.2.1	Inventory and location logging of Town owned trees. This can be used to monitor wooded areas and quicken response and cleanup to fallen trees on public infrastructure and roadways.

Table 7-2 STAPLE+E Format

Social	Public support for overall implementation strategy and specific mitigation actions, community acceptance	Consider effects on selected segments of the population.
Technical	Technical feasibility to reduce losses in the long term and minimal secondary losses.	Considers effectiveness in avoiding or reducing future losses, impacts and risks.
Administrative	Examines the anticipated staffing, funding and maintenance requirements.	Ability to maintain and manage the mitigation measure.
Political	Acceptance and support by the current community and state political leadership.	Considers political and public support and participation.
Legal	Determine the legal authority at local and state level to implement the action	Considers the regulatory requirements and legal liabilities for an action.
Economic	Determines costs and benefits of an action	Considers outside funding sources and benefits, and burdens to the tax base or local economy.
Environmental	Effect on environment – land, water and endangered species.	Compliance with local, state and federal environmental laws or regulations.

Table 7-7.2.13 STAPLEE Criteria Sheet

+ Favorable - Not Favorable 0 No Impact	Action #	Social		Technical			Administrative			Political			Legal			Economic				Environmental			
		Community Acceptance	Effect on Segment of Population	Technically Feasible	Long-Term Solution	Secondary Impacts	Staffing	Funding Allocation	Maintenance/Operations	Political Support	Local Champion	Public Support	State Authority	Existing Local Authority	Potential Legal Challenge	Benefit of Action	Cost of Action ($100,000 threshold)	Contributes to Economic Goals	Outside Funding Prepared	Effect on Land/Water	Consistent with Community Environmental Goals	Consistent with Federal Laws	**Count (+1 for "+", -1 for "-")**
Warning emergency alert rapid notification	1.1.1	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	0	+	+	18
WC OEM (Reverse 911)	1.1.2	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+	-	0	+	+	16
DEP Shaft 18 Custom Alert Plan	1.1.3	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+	-	0	+	+	16
Elevate the furnace, water heater and electric panel	1.1.4	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+	-	+	+	0	+	+	16
Construct Berms	1.1.5	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	-	+	-	+	+	+	15
Provide Sand Bags	1.1.6	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	+	+	18
Storm Drainage Improvements on Whittier Drive	1.1.7	+	-	+	+	+	+	+	-	+	+	+	+	+	+	+	-	+	+	+	+	+	15
Bear Ridge Road Storm Sewer Replacement	1.1.8	+	-	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	17
Linda Avenue Installation of New Storm Sewer	1.1.9	+	-	+	+	+	+	+	-	+	+	+	+	+	+	+	-	+	+	+	+	+	15

+ Favorable - Not Favorable 0 No Impact	Action #	Social		Technical			Administrative			Political			Legal			Economic				Environmental			
		Community Acceptance	Effect on Segment of Population	Technically Feasible	Long-Term Solution	Secondary Impacts	Staffing	Funding Allocation	Maintenance/Operations	Political Support	Local Champion	Public Support	State Authority	Existing Local Authority	Potential Legal Challenge	Benefit of Action	Cost of Action ($100,000 threshold)	Contributes to Economic Goals	Outside Funding Prepared	Effect on Land/Water	Consistent with Community Environmental Goals	Consistent with Federal Laws	**Count (+1 for "+", -1 for "-")**
Kings Grant Way Drainage Improvements	1.1.10	+	-	+	+	+	+	+	-	+	+	+	+	+	+	+	-	+	+	+	+	+	15
Woodfield Road Storm Sewer Installation	1.1.11	+	-	+	+	+	+	+	-	+	+	+	+	+	+	+	-	+	+	+	+	+	15
Myrtle and Fairfax Drainage System	1.1.12	+	-	+	+	+	+	+	-	+	+	+	+	+	+	+	-	+	+	+	+	+	15
Brookline Area Drainage Reconstruction	1.1.13	+	-	+	+	+	+	+	-	+	+	+	+	+	+	+	-	+	+	+	+	+	15
Stonegate Road Replacement of Storm Sewer	1.1.14	+	-	+	+	+	+	+	-	+	+	+	+	+	+	+	-	+	+	+	+	+	15
Avoid building in flood plains unless elevated and reinforced	1.2.1	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	19
Consider installing check valves	1.2.2	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	19
Raise Structures above BFE	1.2.3	+	+	+	+	+	-	+	+	+	+	+	+	+	-	+	-	+	+	+	+	+	15
Buy out structures within flood zone	1.2.4	+	-	+	+	+	+	-	+	+	+	-	+	+	-	+	-	+	-	+	+	+	9

+ Favorable - Not Favorable 0 No Impact	Action #	Social		Technical			Administrative			Political			Legal			Economic				Environmental			
		Community Acceptance	Effect on Segment of Population	Technically Feasible	Long-Term Solution	Secondary Impacts	Staffing	Funding Allocation	Maintenance/Operations	Political Support	Local Champion	Public Support	State Authority	Existing Local Authority	Potential Legal Challenge	Benefit of Action	Cost of Action ($100,000 threshold)	Contributes to Economic Goals	Outside Funding Prepared	Effect on Land/Water	Consistent with Community Environmental Goals	Consistent with Federal Laws	**Count (+1 for "+", -1 for "-")**
Verify flood zones	1.3.1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	21
Pre-emptive notification to the public in hazard-prone areas	1.4.1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	+	+	20
Public Education	1.4.2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	+	+	20
Build a Town Staff emergency kit	1.5.1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	+	+	20
Develop and educate public on family communications planning	1.5.2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	+	+	20
Government building relocation Plan/Study	2.1.1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	0	+	+	18
Volunteer staff (CERT Team)	2.1.2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	+	+	20
Emergency Generators for Town Infrastructure	2.1.3	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	-	+	+	0	+	+	16
Secondary Emergency Operation Center Establishment with backup generator	2.1.4	+	+	+	+	+	-	+	-	+	+	+	+	+	+	+	-	+	+	0	+	+	14

+ Favorable - Not Favorable 0 No Impact	Action #	Social		Technical			Administrative			Political			Legal			Economic				Environmental			
		Community Acceptance	Effect on Segment of Population	Technically Feasible	Long-Term Solution	Secondary Impacts	Staffing	Funding Allocation	Maintenance/Operations	Political Support	Local Champion	Public Support	State Authority	Existing Local Authority	Potential Legal Challenge	Benefit of Action	Cost of Action ($100,000 threshold)	Contributes to Economic Goals	Outside Funding Prepared	Effect on Land/Water	Consistent with Community Environmental Goals	Consistent with Federal Laws	**Count (+1 for "+", -1 for "-")**
Relocate structures vulnerable to hazards	2.2.1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	0	+	+	14
Reinforce structures vulnerable to hazards.	2.2.2	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+	-	+	-	+	+	+	15
Manhole sealing and ventilation, to prevent overflows	2.2.3	+	+	+	+	-	+	+	-	+	+	+	+	+	+	+	-	+	+	+	+	+	15
Enforce building codes during construction	2.3.1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	+	+	20
Renovate and Stock Temporary Shelters	3.1.1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	+	+	20
Develop Alternative Shelters (e.g. Edith Macy)	3.1.2	+	+	+	+	+	-	+	-	+	+	+	+	+	-	+	+	+	+	0	+	+	14
Evacuation Plans	3.1.3	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	+	+	20
Direct Contact Personnel	3.2.1	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	0	+	+	18
Regular emergency warning tests	3.2.2	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	-	+	+	0	+	+	16
Coordination with Neighboring Emergency Services	3.2.3	+	+	+	+	+	-	+	-	+	+	+	+	+	+	+	+	+	+	0	+	+	16

+ Favorable - Not Favorable 0 No Impact	Action #	Social		Technical			Administrative			Political			Legal			Economic				Environmental			
		Community Acceptance	Effect on Segment of Population	Technically Feasible	Long-Term Solution	Secondary Impacts	Staffing	Funding Allocation	Maintenance/Operations	Political Support	Local Champion	Public Support	State Authority	Existing Local Authority	Potential Legal Challenge	Benefit of Action	Cost of Action ($100,000 threshold)	Contributes to Economic Goals	Outside Funding Prepared	Effect on Land/Water	Consistent with Community Environmental Goals	Consistent with Federal Laws	**Count (+1 for "+", -1 for "-")**
FIS Link on Town website to Base Flood Elevation Map	4.1.1	+	+	+	+	-	+	+	-	+	+	+	+	+	+	+	+	+	+	0	+	+	16
Risk Assessment (HIRA-NY and HMP availability)	4.2.1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	+	+	20
Data Collection (GIS)	4.3.1	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	0	+	+	18
Inventory (HAZUS-MH)	4.3.2	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	0	+	+	18
River protection and cleaning	5.1.1	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+	-	+	-	+	+	+	15
CRS Program Development	5.1.2	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	0	+	+	18
Tree Inventory and Management	5.2.1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	19

7.2.2. Prioritization of Mitigation Actions

Section 206(c)(3)(iii) states that a criteria of prioritization of alternative mitigation actions should be established, in order to rank priorities. These would include a cost/benefit review as well as an analysis on objectives and goals that each action achieves.

Benefits of each action were assessed using the STAPLE+E tables and weighing the benefits and favorability of each proposed action. Cost estimates were assessed in discussion with the Town of Mount Pleasant using previous and ongoing projects.

Table 7-4 describes the costs, mechanisms, related agencies, funding sources, and priority ranking. The project ranking is ranked High, Medium, and Low. High ratings correspond to actions with available funding or low costs, and a high count on the STAPLE+E table. Medium ratings correspond to actions with a moderate to high count on the STAPLE+E table, but either additional funding sources are required or costs of the project are high. Low ratings correspond to actions with both low STAPLE+E counts and either high costs or additional funding required.

Table 7-4 Mitigation Actions Summary Table

Action	Action Number	Action Type	Hazards Mitigated	STAPLEE Count	Estimated Cost	Planning Mechanism	Project Timeline	Agencies Involved	Funding Source	Project Rank
Warning emergency alert rapid notification	1.1.1	Prevention, Property Protection	Hurricane, Severe Storm, Severe Winter Storm, Flooding	18	$2,500-3,500 per year	TMP Operational Public Safety Budget	Ongoing	TMP/ NYCDEP	NYCDEP	High
WC OEM (Reverse 911)	1.1.2	Emergency Services	All Hazards	16	$10,000 per year	OEM	Ongoing	TMPOEM	Grants	High
DEP Shaft 18 Custom Alert Plan	1.1.3	Emergency Services	HAZMAT	16	Staff Salary $500 (review)	OEM	Ongoing	TMPOEM/ WCOEM	NYCDEP	High
Elevate the furnace, water heater and electric panel	1.1.4	Prevention, Property Protection,	Flooding, Severe Storm, Hurricane	17	$20,000 per structure (45 structures at risk 40% of BFE, $900,000 total	Flood Plain Management/ Building Code	5+ years	FEMA/ NYSOEM	Grants	Low
Construct Berms	1.1.5	Structural Projects	Flooding, Severe Storm, Hurricane	15	$14/cubic yard	Flood Plain Management	5+Years	TMP Eng. Dept.	Grants	Low
Provide Sand Bags	1.1.6	Structural Projects	Flooding, Severe Storm, Hurricane	19	$100,000	Annual Town Review	Ongoing	TMP Highway Dept.	Federal Funds	High
Storm Drainage Improvements on Whittier Drive	1.1.7	Prevention	Flood, Severe Storm, Hurricane, Dam Failure	13	$558,000	Flood Plain Management	Complete/ Ongoing	TMP Eng. Dept.	General Funding	Medium
Bear Ridge Road Storm Sewer Replacement	1.1.8	Prevention	Flood, Severe Storm, Hurricane, Dam Failure	15	$90,000	Flood Plain Management	Complete/ Ongoing	TMP Eng. Dept.	General Funding	Medium

Action	Action Number	Action Type	Hazards Mitigated	STAPLEE Count	Estimated Cost	Planning Mechanism	Project Timeline	Agencies Involved	Funding Source	Project Rank
Linda Avenue Installation of New Storm Sewer	1.1.9	Prevention	Flood, Severe Storm, Hurricane, Dam Failure	13	$231,500	Flood Plain Management	Complete/ Ongoing	TMP Eng. Dept.	General Funding	Medium
Kings Grant Way Drainage Improvements	1.1.10	Prevention	Flood, Severe Storm, Hurricane, Dam Failure	13	$174,000	Flood Plain Management	Complete/ Ongoing	TMP Eng. Dept.	General Funding	Medium
Woodfield Road Storm Sewer Installation	1.1.11	Prevention	Flood, Severe Storm, Hurricane, Dam Failure	13	$207,500	Flood Plain Management	Complete/ Ongoing	TMP Eng. Dept.	General Funding	Medium
Myrtle and Fairfax Drainage System	1.1.12	Prevention	Flood, Severe Storm, Hurricane, Dam Failure	13	$169,500	Flood Plain Management	Complete/ Ongoing	TMP Eng. Dept.	General Funding	Medium
Brookline Area Drainage Reconstruction	1.1.13	Prevention	Flood, Severe Storm, Hurricane, Dam Failure	13	$492,000	Flood Plain Management	Complete/ Ongoing	TMP Eng. Dept.	General Funding	Medium
Stonegate Road Replacement of Storm Sewer	1.1.14	Prevention	Flood, Severe Storm, Hurricane, Dam Failure	13	$101,000	Flood Plain Management	Complete/ Ongoing	TMP Eng. Dept.	General Funding	Medium
Avoid building in flood plains unless elevated and reinforced	1.2.1	Prevention	Flooding, Severe Storm, Hurricane	21	N/A	Building Code	Ongoing	TMP Building and Eng. Depts.	Funded by Staff Salary	High
Consider installing check valves	1.2.2	Prevention	Flooding, Severe Storm, Hurricane	19	$3,000 per structure	Town Code	5+ Years	Building and Eng. Depts., WS	Property Owner	Medium
Raise Structures above BFE	1.2.3	Prevention, Property Protection	Flooding, Severe Storm, Hurricane	15	$200,000 per structure	Town Code, Flood Plain Management	5+ Years/ Ongoing	FEMA	Grants/ Property Owner	Medium

Action	Action Number	Action Type	Hazards Mitigated	STAPLEE Count	Estimated Cost	Planning Mechanism	Project Timeline	Agencies Involved	Funding Source	Project Rank
Buy out structures within flood zone	1.2.4	Prevention	Flooding, Severe Storm, Hurricane	9	$400,000 - $1,000,000 per structure	Flood Plain Management	5+ Years	FEMA	Grants	Low
Verify flood zones	1.3.1	Property Protection	Flooding, Severe Storm, Hurricane	21	N/A	Flood Plain Management	1 Year	Eng. Dept.	Staff Salary	High
Pre-emptive notification to the public iin hazard-prone areas	1.4.1	Public Education, Emergency Services	Flooding, Severe Storm, Hurricane, tornadoes	20	$5,000	Hazard Mitigation Plan	1 Year	Eng. Dept.	General funds	High
Public Education	1.4.2	Public Education	All Hazards	20	$3,000 per event	Multiple	Ongoing	Town Depts. As per Topic	General Funds	High
Build a Town Staff emergency kit	1.5.1	Prevention, Public Education	All Hazards	20	N/A	HMP	1 Year	Town Depts. As per Topic	General Funds	High
Develop and educate public on family communications planning	1.5.2	Prevention, Public Education	All Hazards	20	$5,000	HMP	1 year initially, 5 years recurring	Supervisor's Office	General Funds and Staffing Salary	High
Government building relocation Plan/Study	2.1.1	Prevention, Property Protection	All Hazards	18	$25,000	Hazard Mitigation Plan	2+/5+ Years	TMP OEM	General Fund	High
Volunteer staff (CERT Team)	2.1.2	Public Education, Emergency Services	All Hazards	20	$5,000 startup, $2,500 annual	Hazard Mitigation Plan	1 Year	TMP OEM	General Fund	High
Emergency Generators for Town Infrastructure	2.1.3	Structural Projects	Flood, Utility Failure, Severe Storm, Fire	16	$200,000	OEM	2-5 Years	Eng. Dept.	Private/ Grant/ Finance	Medium

Action	Action Number	Action Type	Hazards Mitigated	STAPLEE Count	Estimated Cost	Planning Mechanism	Project Timeline	Agencies Involved	Funding Source	Project Rank
Secondary Emergency Operation Center Establishment with backup generator	2.1.4	Structural Projects, Emergency Services	All Hazards	12	$350,000	OEM	5 Years	TMP OEM	Grant	Medium
Relocate structures vulnerable to hazards	2.2.1	Prevention, Property Protection	All Hazards	19	$500,000-$1MM	Floodplain Management	5 years +	TMP OEM	Grant	Low
Reinforce structures vulnerable to hazards.	2.2.2	Structural Projects, Property Protection	Flooding, Hurricane, Severe Storm, Earthquake	17	$60,000	Town Code	2 Years	Building Dept.	Staffing Hours	Medium
Manhole sealing and ventilation, to prevent overflows	2.2.3	Structural Projects	Flood, Severe Storm, Hurricane, Dam Failure	15	$10,000 per manhole	Town Code	Ongoing	Eng. Dept.	Property Owners/ General Funding	Medium
Enforce building codes during construction	2.3.1	Prevention, Property Protection	Flooding, Hurricane, Severe Storm, Earthquake	20	Code	Town Code	1 Year	Building Dept.	General Funds	High
Renovate and Stock Temporary Shelters	3.1.1	Sturctural Projects, Emergency Services	Hurricane, Flooding, Dam Failure	20	$1,000 per day, $100 per person	Hazard Mitigation Plan, OEM	Complete/ Ongoing	Police Dept. and OEM	General Funds	High
Develop Alternative Shelters (e.g. Edith Macy)	3.1.2	Sturctural Projects, Emergency Services	All Hazards	14	$10,000 for legal, $ 150 per day	Hazard Mitigation Plan, OEM	2+ years	OEM	General Funds	High
Evacuation Plans	3.1.3	Emergency Services	Hurricane, Flooding, Dam Failure	20	Town Staffing	Hazard Mitigation Plan	Ongoing	OEM and Police Dept.	General Funds	High
Direct Contact Personnel	3.2.1	Public Education	All Hazards	18	Town Staffing	Hazard Mitigation Plan, OEM	2-5 Years	Multiple	Finance	Medium

Action	Action Number	Action Type	Hazards Mitigated	STAPLEE Count	Estimated Cost	Planning Mechanism	Project Timeline	Agencies Involved	Funding Source	Project Rank
Regular emergency warning tests	3.2.2	Public Education, Emergency Services	Hurricane, Flooding, Severe Storm	16	TBD	OEM	Ongoing	OEM and Police Dept.	General Funds	High
Coordination with Neighboring Emergency Services	3.2.3	Emergency Services	All Hazards	14	Town Staffing	OEM	Ongoing	TMP OEM	General Funding/ Staff Hours	High
FIS Link on Town website to Base Flood Elevation Map	4.1.1	Prevention	All Hazards	16	Town Staffing	Flood Plain Management	1 Year	Eng. Dept.	Staff Hours	High
Risk Assessment (HIRA-NY and HMP availability)	4.2.1	Prevention, Public Education	All Hazards	20	$10,000	Hazard Mitigation Plan	Ongoing as per NYSOEM	TMP, Eng. Dept.	Finance/ State	Medium
Data Collection (GIS)	4.3.1	Public Education	All Hazards	18	$20,000 - $50,000	OEM	Complete/ Ongoing	Eng. Dept./ OEM	Finance/ Staffing Hours	Medium
Inventory (HAZUS-MH)	4.3.2	Public Education, Prevention	All Hazards	18	N/A	Hazard Mitigation Plan	Complete/ Ongoing	Eng. Dept	Staffing Hours	High
River protection and cleaning	5.1.1	Natural Resource Protection, Structural Projects	Flooding, Hurricane, Severe Storm, Dam Failure	15	Various	Town Code	Ongoing	Eng. Dept./ Highway Dept./ Parks and Recreation	Staffing Hours	High
CRS Program Development	5.1.2	Property Protection	Flood	19	$25,000	Flood Plain Management	2-5 Years	Eng. Dept., FEMA	Grant/ Finance	High
Tree Inventory and Management	5.2.1	Natural Resource Protection	Hurricane, Severe Storm, Tornado, Fire	19	$150,000	HMP	2-5 Years	TMP/ Highway Dept.	General Funds	Low

SECTION 8. PLAN MAINTENANCE

8.1. Monitoring the Plan

Monitoring shall be a continuous process conducted by the Town of Mount Pleasant Department of Public Works and Engineering in conjunction with other municipal agencies having responsibility for the implementation of various mitigation strategies. On an annual basis, a report memorandum will be submitted on January 31st for all mitigation strategies and activities of the previous calendar year. The Hazard Mitigation Planning Team (HMPT) will meet annually to review this report, as well as after any instance or disaster that requires examination of current or future mitigation strategies. Annual meetings will include assessment of present and future funding, scope, completion, and feasibility of mitigation projects. The Town website will be modified to advertise updates to the Plan.

8.2. Implementation and Annual Review

The Town of Mount Pleasant will begin implementation of mitigation strategies noted in Section 7 upon review of the Multi-Hazard Mitigation Plan by FEMA. The respective lead agency and associated supporting agencies will be responsible for their respective mitigation strategies as per the projected timelines. The department head of the lead agency will be responsible for implementing his/her associated mitigation plans. Mitigation actions able to be undertaken within the current budget year funding of the Town of Mount Pleasant will be undertaken immediately. Projects that require funding may be funded through borrowing, grants, or funding by other agencies, or may be postponed until annual budgetary funding begins the following year.

Six months following the approval by FEMA, lead agency department heads will provide written reports to the Town Engineer and the HMPT, highlighting the ability to implement respective mitigation actions according to the given timeline. Individual mitigation actions will be classified as Funded, Unfunded, Underway, In Need of Modification, or Completed. Unfunded projects will be submitted for

consideration within projected timelines as part of Long Range or Strategic funding processes, and further funding will also be sought.

Twelve months after approval by FEMA, the Town Engineer and the HMPT will meet to review the past year's implementation of hazard mitigation plans and report all progress to the Town.

Every six months following, lead agency department heads will submit interim status reports to the Town Engineer and the HMPT. The Town Engineer is responsible for determining whether the annual HMPT review is satisfactory according to progress shown in the interim report, or if immediate meeting of the HMPT is necessary. Six and twelve month reports will be made publicly available on the Town Website and available to public inspection at the Department of Public Works and Engineering.

8.3. Evaluation

Evaluation of the mitigation strategies will focus on monitoring changes in noted vulnerabilities. These changes in vulnerabilities result from new development or results of implemented mitigation actions whether effective, ineffective, or failed. Any updates will consider changes to vulnerability due to implementation processes and document previous mitigation actions as well as their effectiveness. Updates will also include new or overlooked hazards, risks, capabilities, changes to city inventory, and any additional recommendations or priority changes.

Each mitigation measure will require a representative to the corresponding office to be responsible for project status reports to be submitted annually to the Town Engineer. This will also include input on the effectiveness of the project in respect to the scope and objectives. If the project is deemed unsatisfactory, the HMPT will determine additional members and assign an individual to be responsible for updating, implementing, and monitoring the modified project.

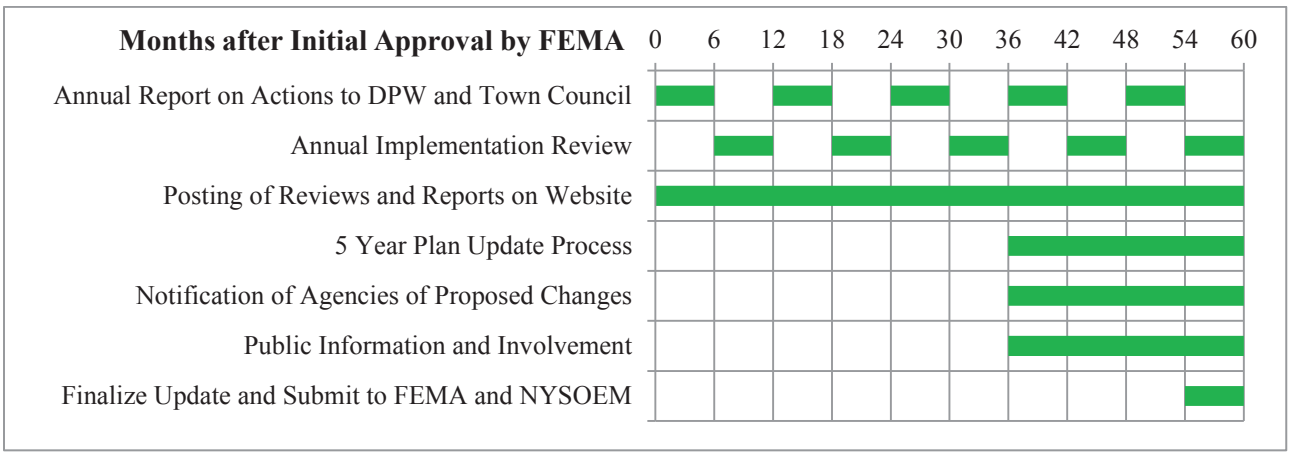
8.4. Updating the Plan

The Multi-Hazard Mitigation Plan will be updated every five years after the original FEMA approval. Annual reviews will be conducted by parties implementing the mitigation strategies. Once approved by the HMPT, the HMPT will recommend to the Town of Mount Pleasant the best implementation methods to the plan. The HMPT will meet when required until all updates have been completed and incorporated into the Plan. After re-approved by the Town, the plan will be resubmitted to FEMA for re-approval of the Hazard Mitigation Plan.

Updates to the Town Multi-Hazard Mitigation Plan will formally begin forty-two months following the original approval by FEMA. This will allow the HMPT and relevant agencies to evaluate hazard events to date, updated hazard possibilities, mitigation project progress, an analysis of funding of projects, resource and data updates, and Multi-Hazard Mitigation Plan changes lists.

Copies of the initial Plan will be provided to municipal and private sector agencies outlined in the Planning Process, and posted on the Town website. This allows other agencies and departments to become aware of the Town's proposed mitigation activities, so that any further improvements are coordinated with each other and will avoid undesirable impacts to each other. The six and twelve month reviewing process will also incorporate notifications to other departments and agencies affecting the Town of Mount Pleasant of any structural improvements that may impact their respective facilities.

Table 8-1 Plan Maintenance and Update Schedule



8.5. Incorporation into Existing Mitigation Mechanisms

Once approved, final copies of the Town of Mount Pleasant Multi-Hazard Mitigation Plan will be distributed to replace draft documents of all of the agencies and departments participating in the Plan, in order to integrate elements of the Plan into commonplace operations of the Town of Mount Pleasant.

Table 8-2 shows organizations and departments which will aid and be affected by the implementation of the mitigation plan. Mitigation actions will be implemented and budgeted after approval by the Town Board to proceed, and then administered by the Town Supervisor or the department or agency involved. Budgeting through the Town's funds can be provided through capital improvement budgets, operating budgets of the involved Town departments, or general funds through which consultants or Town staffing hours. In the event that the Town is not able to fund the project through general funds, Table 8-3 shows the specific available federal and state grants and agencies with available application for further funding. Actions involving additional funding by FEMA will likely be delayed until after approval of the Hazard Mitigation Plan by FEMA.

Mitigation Actions may be implemented through revisions of existing mechanisms, such as revisions to the Town Code or the Building Code.

Table 8-2 Town Aiding Organizations

Function	Action	Implementation of the Plan in the Town of Mount Pleasant
Administrative	Department work plans, policies and procedures	• TMP Department of Engineering • TMP Building Department • TMP Zoning Board
Administrative	Other agency plans	• WC Emergency Management Plan • WC Health Department • WC Department of Transportation • NYC Department of Environmental Protection • NYS Department of Transportation • NYS Thruway Authority • Metro-North Transportation Authority
Administrative	Jobs and Job Descriptions	• Volunteer/contractual assistance for HMP assistance • Assistance for grant applications and

		administration
Budgetary	Incorporated into capital and operating budgets, by Town Supervisor	• Hazard Mitigation Plan annual scheduled reviews and reports
Regulatory	Executive orders, ordinances and other directives	• Building and Zoning Codes • National Flood Insurance Program • Stormwater Management Plan • Future changes to plans that may impact the mitigation plan
Funding	Pursuit of financing revenue, both traditional and additional sources	• Flood Mitigation Assistance Program • Stafford Act, Section 406—Public Assistance Program Mitigation Grants • Federal Highway Administration • US Army corps of Engineers • US Department of Economic Development Administration Grants • Catalog of Federal Domestic Assistance • NYS Department of Environmental Conservation
Partnerships	Other federal, local, and state agencies.	• American Red Cross • Federal emergency Management Agency • National Weather Service • NYS Emergency Management Office • US Environmental Protection Agency • US Department of Transportation

Table 8-3 Available Funding Sources

Program	Description
Flood Mitigation Assistance (FMA)	The FMA program is authorized by Section 1366 of the National Flood Insurance Act of 1968, as amended with the goal of reducing or eliminating claims under the National Flood Insurance Program (NFIP). FMA provides funding to States, Territories, federally-recognized tribes and local communities for projects that reduce or eliminate long-term risk of flood damage to structures insured under the NFIP. FMA funding is available for flood hazard mitigation projects, plan development and management costs. Funding is appropriated by Congress annually through FEMA.
National Flood Insurance Program (NFIP)	The National Flood Insurance Program of FEMA aims to reduce the impact of flooding on private and public structures. It does so by providing affordable insurance to property owners and by encouraging communities to adopt and enforce floodplain management regulations.

	These efforts help mitigate the effects of flooding on new and improved structures. Overall, the program reduces the socio-economic impact of disasters by promoting the purchase and retention of general risk insurance, but also of flood insurance, specifically.
Pre-Disaster Mitigation (PDM) Competitive Grant Program	The PDM Program, authorized by Section 203 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, is designed to assist States, territories, Federally-recognized tribes, and local communities in implementing a sustained pre-disaster natural hazard mitigation program. The goal is to reduce overall risk to the population and structures from future hazard events, while also reducing reliance on Federal funding in future disasters. This program awards planning and project grants and provides opportunities for raising public awareness about reducing future losses before disaster strikes. PDM grants are funded annually by Congressional appropriations and are awarded on a nationally competitive basis.
National Dam Safety Program	The federal government uses the National Dam Safety Program (NDSP) to protect Americans from dam failure. The NDSP is a partnership of the states, federal agencies, and other stakeholders that encourages individual and community responsibility for dam safety.
Disaster Housing Program	Emergency assistance for housing and mortgage and rental assistance. (MRA). Covers disaster-related needs and necessary expenses not covered by insurance. These may include replacement of personal property, and transportation, medical, dental and funeral expenses. Loans are also available for property loss and economic injury.
Public Assistance Program	Grants to States and Communities to repair damaged infrastructure and public facilities and help restore services following disasters. Mitigation funding is available for work related to damaged components of the eligible building or structure
Repetitive Flood Claims	Reduction or elimination of flood damage under the NFIP that have one or more claims. Acquisition, demolition or relocation of severe repetitive loss properties.
Empire State Flood Recovery Grant Program	Loans for various projects. Discounted Small Business Loans; Small Business Loans; Lines of Credit
New York State Office of Emergency Management (NYSOEM)	Mitigation activity and action planning funding and agency through which FEMA contact is made for Federal funding
Hudson River Estuary Grant Program	Grants available to municipalities located within the geographic boundaries of the Hudson River Estuary and associated shore lands. Grants for education projects; open space planning; inventory and acquisition; or river access; community conservation and river stewardship; watershed planning.

8.6. Public Involvement

The Town of Mount Pleasant will be responsible for maintaining public involvement and public notification as well as maintenance and updating of the hazard mitigation plan. They will be maintained and made publicly available at:

The Town of Mount Pleasant

Municipal Building

1 Town Hall Plaza

Valhalla, New York 10595-1267

Town of Mount Pleasant Website

http://www.mtpleasantny.com

Plan updates will also be made available on the Town website, and changes will be appended to all existing Multi-Hazard Mitigation Plan documents. Public notification falls under the responsibility of the Town Engineer, as well as notification for the annual plan meetings and public feedback. All references to the Multi-hazard Mitigation Plan will be accompanied by appropriate contact information. Sufficient announcement of the annual reviews and the five-year plan updates will be given, to allow public comment and attendance. The Town Engineer will also ensure feedback and comment incorporation into the five-year plan updates.

SECTION 9. PLAN ADOPTION

9.1. Plan Adoption

The Town received the FEMA authorization of funding for preparation of the Multi-Hazard management Plan on May, 26, 2013. On February 25, 2014, the Town Board through a resolution authorizing Charles A. Manganaro Consulting Engineers, P.C. (CAMCE) to develop the Town Multi-Hazard Mitigation Plan (HMP). Mitigation planning involves cycles of learning about the community and then acting on what is discovered. As we understand the issues, important concerns, and capabilities in our community, the mitigation activities become more precise and efficient.

Table 9-1 Plan Adoption Schedule

Date	Meeting
Sunday, May 26, 2013	Approval of Funding from the New York State Office of Emergency management (NYSOEM) to prepare the Town of Mount Pleasant Multi-Hazard Mitigation Plan (HMP).
Tuesday, May 14, 2013	TMP Town Board authorization of contract agreement with the NYSOEM.
Thursday, February 25, 2014	Authorization of CAMCE by the Town Board to prepare the Multi-Hazard Mitigation Plan.
Monday, March 24, 2014	Kick off Meeting between the Town of Mount Pleasant (TMP) personnel and CAMCE to discuss the scope of work.
Tuesday, May 13, 2014	Follow Up Meeting with the TMP and CAMCE personnel.
Wednesday, May 28, 2014	Kick off Meeting between the HMP Planning Team and CAMCE to discuss the scope of work.
Thursday, June 26, 2014	FEMA approval of extension of Hazard Mitigation Plan to July 9, 2015
Monday, August 18, 2014	Approval of extension of Hazard Mitigation Plan to July 9, 2015 by NYSOEM.
Wednesday, July 2, 2014 Tuesday, August 5, 2014 Monday, September 08, 2014	Meetings between the Town Staff and CAMCE to discuss the HMP.

Date	Meeting
Monday, September 22, 2014	Meeting between the HMP Planning Team and CAMCE to discuss the HMP.
Wednesday, November 12, 2014	Meeting of Planning Team, Stakeholders and CAMCE.
Thursday, December 04, 2014	Meeting with NYCDEP to discuss HMP
Tuesday, February 3, 2015	Meeting with Consolidated Edison to discuss HMP
Thursday, February 19, 2015 Wednesday, April 29, 2015 Thursday, May 28, 2015	Meetings between the HMP Planning Team and CAMCE to discuss the HMP.
Tuesday, June 16, 2015	HMP Draft Presentation to Town Board for Approval to send for Public Meeting
Tuesday, June 23, 2015	Request to Town Board for Approval to send for Public Meeting
Wednesday, June 24, 2015	Submit Legal Notice Announcement to Journal News
Wednesday, July 15, 2015	Hold Public Meeting on Hazard Mitigation Plan at Town Hall and commence input from public with comments due 8/17/15.
Monday, August 17, 2015	Last Day for receiving public comments at close of business.
Monday, August 31, 2015	Response to public comments (Final Draft Completed)
Tuesday, September 15, 2015	Town Board Working Session to review Final Draft
Tuesday, September 22, 2015	Public Meeting – Resolution for approval to send to NYSOEM/FEMA
Friday, March 04, 2016	Response to NYSOEM/FEMA Comments and re-submission
Saturday, June 18, 2016	Adoption of Plan by the Town Board and pending acceptance by the NYSOEM and FEMA.

SECTION 10. ACRONYMS AND GLOSSARY

10.1. Acronyms and Terms

ANSI – American National Standards Institute

CFR - Code of Federal Regulations

CRS - Community Rating System

DMA 2000 - Disaster Mitigation Act of 2000

EOC – Emergency Operations Center

ETG - Environmental Technology Group, Inc.

FEMA - Federal Emergency Management Agency

FIRM - Flood Insurance Rate Map

FIS - Flood Insurance Study

FMAP - Flood Mitigation Assistance Program

GIS - Geographical Information System

HAZMAT – Hazardous Materials operation or incident

HAZNY - Hazards New York, Computer process for identifying and ranking hazards

HAZUS - Hazards United States, GIS-based software tool developed by FEMA for estimating losses from various hazards

HMGP - Hazard Mitigation Grant Program

LCSN – Lamont-Doherty Cooperative Seismographic Network of Columbia University.

NCDC - National Center for Disaster Control

NFIP - National Flood Insurance Program

NIMS – National Incidence Management System

NOAA - National Oceanographic and Atmospheric Administration

NWS – National Weather Service.

NYC DEP - New York City Department of Environmental Protection

NYCEM – New York City Earthquake Mitigation

NYS - New York State

NYSDEC - New York State Department of Environmental Conservation

NYSDOT - New York State Department of Transportation

NYSOEM - New York State Office of Emergency Management

PDM - Pre-Disaster Mitigation Grant Program

PGA - Peak Ground Acceleration

SEQRA – State Environmental Quality Review Act

SLOSH - A tidal flood inundation zone caused by a hurricane

USACE – U. S. Army Corps of Engineers

USEPA - United States Environmental Protection Agency

USDOT - United States Department of Transportation

SHMO – State Hazard Mitigation Officer

USGS – United States Geological Survey

10.2. Glossary of Key Terms

100-Year Flood (or Base Flood): A flood event that statistically has a one percent chance of being equaled or exceeded in any given year. The base flood is the national standard used by the National Flood Insurance Program (NFIP) and all Federal agencies for the purposes of requiring the purchase of flood insurance and regulating new development. Base Flood Elevations (BFEs) are typically shown on Flood Insurance Rate Maps (FIRMs).

500-Year Flood: A flood event that statistically has a 0.2 percent chance of being equaled or exceeded in any given year.

Acquisition of Hazard-Prone Structures: Local governments can acquire lands in high hazard areas through conservation easements, purchase of development rights, or outright purchase of property.

Air contamination: Air contamination is the result of emissions chemicals from industry and transportation into the air.

Base Flood: The flood having a one percent chance of being equaled or exceeded in any given year. It is also known as the "100-year flood."

Base Flood Elevation (BFE): The computed elevation to which floodwater is anticipated to rise during the base flood, usually in feet, in relation to National Geodetic Vertical Datum of 1929, the North American Vertical Datum of 1988, or other datum referenced in the Flood Insurance Study Report. Base Flood Elevations (BFEs) are shown on Flood Insurance Rate Maps (FIRMs) and on the flood profiles. The BFE is the regulatory requirement for the elevation or floodproofing of structures. The relationship between the BFE and a structure's elevation determines the flood insurance premium.

Base Map: Map that depicts cultural features such as roads, railroad, bridges, dams, culverts etc.; drainage features; and the corporate limits of the community.

Benefit-cost analysis (BCA): Benefit-cost analysis is a systematic, quantitative method of comparing the projected benefits to projected costs of a project or policy. It is used as a measure of cost effectiveness.

Best Management Practices (BMPs): Appropriate, site-specific management techniques that maximize the benefits of land and natural resource management actions, while minimizing impacts.

Bond: A debt obligation issued by states, cities, counties, and other governmental entities to raise money to pay for public projects, such as government facilities and infrastructure.

Building: A structure that is walled and roofed, principally above ground and permanently affixed to a site. This includes manufactured homes on permanent foundation on which wheels and axles carry no weight.

Building codes: Regulations that set forth standards and requirements for the construction, maintenance, operation, occupancy, use, or appearance of buildings, premises, and dwelling units. Building codes can include standards for structures to withstand natural hazards.

Blizzard: Low temperatures, winds 35 mps or more, and sufficient falling and or blowing snow to reduce visibility to ¼ mile or less for a duration of at least three hours.

Capability assessment: An assessment that provides an inventory and analysis of a community or state's current capacity to address the threats associated with hazards. The capability assessment attempts to identify and evaluate existing policies, regulations, programs, and practices that positively or negatively affect the community or state's vulnerability to hazards or specific threats.

Channel maintenance: Ensuring that flood channels, storm sewers, retaining ponds, etc. do not become blocked by debris, sedimentation, overgrowth, or structural failure.

Civil Unrest: The unruly or violent crowds during public events, and political protests.

Coastal Storm: Non-tropical storm that produce gale-force winds and precipitation in the form of heavy rain or snow and includes Nor'easters and severe winter low-pressure systems.

Coastal zone: The area along the shore where the ocean meets the land as the surface of the land rises above the ocean. This land/water interface includes barrier islands, estuaries, beaches, coastal wetlands, and land areas with direct drainage to the ocean.

Coastal zone management regulations: Regulations enacted to control growth and protect natural resources along coastlines. Under the federal Coastal Zone Management Act (CZMA) enacted in 1972, states and local

governments adopt coastal zone management regulations designed to preserve, protect, and, where possible, restore or enhance valuable natural coastal resources such as wetlands, floodplains, estuaries, beaches, dunes, barrier islands, and coral reefs, as well as the wildlife dependent on those habitats.

Community Rating System (CRS): A voluntary program for National Flood Insurance Program (NFIP) participating communities. The goals of the CRS are to reduce flood damages to insurable property, strengthen and support the insurance aspects of the NFIP, and encourage a comprehensive approach to floodplain management. The CRS has been developed to provide incentives in the form of premium discounts for communities to go beyond the minimum floodplain management requirements to develop extra measures to provide protection from flooding. Once qualified, the community benefits by obtaining flood insurance premium rate credits for its residents, which vary by the level of activities undertaken by the community.

Comprehensive plan: A document, also known as a "general plan," covering the entire geographic area of a community and expressing community goals and objectives. The plan lays out the vision, policies, and strategies for the future of the community, including all of the physical elements that will determine the community's future development. This plan can discuss the community's desired physical development, desired rate and quantity of growth, community character, transportation services, location of growth, and siting of public facilities and transportation. In most states, the comprehensive plan has no authority in and of itself, but serves as a guide for community decision-making.

Construction of barriers around structures: Protective structures, such as berms and retaining walls, created by grading or filling areas with soil meant to keep flood waters from reaching buildings.

Critical facilities: Facilities vital to the health, safety, and welfare of the population and that are especially important following hazard events. Critical facilities include, but are not limited to, shelters, police and fire stations, and hospitals.

Dam: Dams are artificial barriers which impound water, wastewater, or any liquidborne material for the purpose of storage or control of water. For a more detailed definition, see the National Dam Safety Program Act (as amended through P.L. 106-580, December 29, 2000).

Dam Failure: A dam failure is the collapse or failure of an impoundment that causes downstream flooding.

Debris: The scattered remains of assets broken or destroyed in a hazard event. Debris caused by a wind or water hazard event can cause additional damage to other assets.

Density controls: Regulations that manage growth by limiting the density of development, often expressed in terms of the number of dwelling units per acre. Density controls allow the community to plan in an orderly way for infrastructure.

Design review standards: Guidelines enacted by local governments requiring new development to meet certain appearance and aesthetic standards and establishing a process by which local officials can examine site plans or structure blueprints to assess compliance with those standards. Design review standards can help ensure new development blends with existing buildings and the landscape or meet other priorities, including hazard loss reduction.

Design standards: A set of guidelines pertaining to the appearance and aesthetics of buildings or improvements that governs construction, alteration, demolition, or relocation of a building or improvement of land.

Disaster: An occurrence of a natural catastrophe, technological accident, or human-caused event that has resulted in severe property damage, deaths, and/or multiple injuries.

Disaster Mitigation Act of 2000 (DMA 2000): DMA 2000 (Public Law 106-390) is the latest legislation to improve the planning process. It was signed into law on October 30, 2000. This new legislation reinforces the importance of mitigation planning and emphasizes planning for disasters before they occur.

Drought: A prolonged period of limited precipitation affecting the supply and quality of water.

Dune and beach restoration: Actions taken to re-establish dunes and beaches that serve as natural protection against coastal flooding and storm surge. Dune and beach restoration activities consist of replenishing sand, re-planting protective vegetation, controlling or restricting foot and vehicles traffic, and constructing sand traps or wind barriers.

Earthquake: A sudden motion or trembling that is caused by a release of strain accumulated within or along the edge of earth's tectonic plates.

Easements: Grant a right to use property, or restrict the landowner's right to use the property in a certain way.

Elevation of structures: Raising structures above the base flood elevation to protect structures located in areas prone to flooding.

Emergency: Any occasion or instance such as a hurricane, tornado, storm, flood, tidal wave, tsunami, earthquake, volcanic eruption, landslide, mudslide, snowstorm, fire, explosion, nuclear accident, or any other natural or man-made catastrophe that warrants action to save lives and to protect property, public health, and safety.

Emergency Operations Center (EOC): The physical location at which the coordination of information and resources to support domestic incident management activities normally takes place. An EOC may be a temporary facility or may be located in a more central or permanently established facility, perhaps at a higher level of organization within a jurisdiction. EOCs may be organized by major functional disciplines (e.g. fire, law

enforcement, and medical services), by jurisdiction (e.g. Federal, State, regional, county, city, tribal), or some combination thereof.

Emergency Response Services: The actions of first responders such as firefighters, police, and other emergency services personnel at the scene of a hazard event. The first responders take appropriate action to contain the hazard, protect property, conduct search and rescue operations, provide mass care, and ensure public safety.

Eminent Domain: The right of a government to appropriate private property for public use, with adequate compensation to the owner.

Environmental Review Standards: Guidelines established to ensure new development adheres to certain construction and site design standards to minimize the impact on the environment.

Erosion: Wearing away of the land surface by detachment and movement of soil and rock fragments during a flood or storm over a period of years, through the action of wind, water, or other geologic processes.

Epidemic: The occurrence or outbreak of disease in a large number of individuals or proportion of human or animal populations.

Explosions: An explosion is a sudden and violent release of energy from chemical reaction, ignition of a fuel, gas under pressure, or nuclear reaction.

Exposure: The number and dollar value of assets that are considered to be at risk during the occurrence of a specific hazard.

Extreme Temperatures: Extended periods of excessive cold or hot weather with a serious impact on human populations, particularly the elderly and/or persons with respiratory ailments.

Federal Insurance Administration (FIA): This organizational unit administers the National Flood Insurance Program (NFIP), which was created by Congress in 1968 in response to the rising cost of taxpayer-funded disaster relief for flood victims and the increasing amount of damage caused by floods.

Federal Emergency Management Agency (FEMA): Independent agency created in 1979 to provide a single point of accountability for all federal activities related to disaster mitigation and emergency preparedness, response, and recovery.

Fire Hazard: Uncontrolled combustion of materials, buildings or other structures that threaten human life and property.

Fire-proofing: Actions taken on and around buildings to prevent the spread of fires.

Flood: A general and temporary condition of partial or complete inundation of normally dry land areas from (1) the overflow of inland or tidal waters, (2) the unusual and rapid accumulation of runoff or surface waters from any source, or (3) from intense and sever rainfall.

Flood Mitigation Assistance (FMA) Program: A program created as part of the National Flood Insurance Reform Act of 1994. FMA provides funding to assist communities and states in implementing actions that reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other NFIP insurable structures, with a focus on repetitive loss properties.

Flood Insurance Rate Map (FIRM): A map on which the 100- and 500- year floodplain, BFEs and risk premium zones are delineated to enable insurance agents to issue accurate flood insurance policies to homeowners in communities participating in the NFIP.

Flood Insurance Study (FIS): An examination, evaluation, and determination of the flood hazards, and if appropriate, the corresponding water surface elevations.

Floodplain: The area adjoining a watercourse that may be covered by floodwater during a flood. Storm runoff and flood events may cause alterations in the floodplain.

Floodplain Development Regulations: Regulations requiring flood insurance and mandating certain design aspects of new or substantially improved structures that lie within regulated flood-prone areas. Current federal regulations through the National Flood Insurance Program require that, at a minimum, new residential buildings in the Special Flood Hazard Area have their lowest floor at or above the base flood elevation.

Floodplain Zoning: Zoning regulations that prescribe special uses for and serve to minimize development in floodplain areas.

Flood-proofing: Actions that prevent or minimize future flood damage. Making the areas below the anticipated flood level watertight or intentionally allowing floodwaters to enter the interior to equalize flood pressures are examples of flood proofing.

Flood Zone: An area shown on a Flood Insurance Rate Map (FIRM) that reflects the severity or type of flooding (See also Zones A, B, C and X).

Forest and vegetation management: The management of forests and vegetation so they are resilient to landslides, high-winds, and other storm-related hazards.

Forest fire fuel reduction: Minimizing fuel loads in forested areas by clearing excess ground cover and thinning diseased or damaged woodland to create healthier forests and to decrease the vulnerability to the devastation of forest fire.

Fuel oil spill: Release of any liquid fuels that when involved in an accident and released in sufficient quantities, poses a risk to people's health, safety, and/or property.

Geographic Information System: (GIS): System of computer hardware, software, and procedures designed to support the capture, management, manipulation, analysis, modeling, and display of spatially referenced data for solving complex planning and management problems.

Hazard: A source of potential danger or an adverse condition.

Hazard event: A specific occurrence of a particular hazard.

Hazard information center: Information booths, publication kiosks, exhibits, etc. that display information to educate the public about hazards that affect the jurisdiction and hazard mitigation activities people can undertake.

Hazard Mitigation: Any action taken to reduce or eliminate the long-term risk to human life and property from hazards or reduce the potential for damage to a facility or structure from a disaster event.

Hazard Mitigation Grant Program (HMGP): Authorized under Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, HMGP is administrated by FEMA and provides grants to states, tribes, and local governments to implement hazard mitigation actions after a major disaster declaration. The purpose of the program is to reduce the loss of life and property due to disasters to enable mitigation activities to be implemented as a community recovers from a disaster.

Hazard profile: A description of the physical characteristics of hazards and a determination of various descriptors, including magnitude, duration, frequency, probability, and extent. In most cases, a community can most easily use these descriptors when they are recorded and displayed as maps.

Hazard threat recognition: The process of identifying possible hazards and estimating potential consequences.

Hazard warning systems: Systems or equipment such as community sirens and National Oceanic Atmospheric Administration (NOAA) weather radios designed to provide advanced warning of an impending hazard. Warning systems allow communities to take protective actions before a hazard event occurs, including taking cover, finding shelter, or moving furniture, cars, and people out of harm's way.

Hazardous Material: Any substance or material that, when involved in an accident and released in sufficient quantities, poses a risk to people's health, safety, and/or property. These substances and materials include explosives, radioactive materials, flammable liquids or solids, combustible liquids or solids, poisons, oxidizers, toxins, and corrosive materials.

Hazardous Material Release: Release of any substance or material that, when involved in an accident and released in sufficient quantities, poses a risk to people's health, safety, and/or property. These substances and materials include explosives, radioactive materials, flammable liquids or solids, combustible liquids or solids, poisons, oxidizers, toxins, and corrosive materials.

Hazard Profile: A description of the characteristics of a hazard, including its magnitude, duration, frequency, probability, and extent.

Hazus-MH: The loss estimation software program that is useful in predicting the physical, economic, and social impacts of various hazard events. **Health and safety maintenance:** Sections of emergency response/operations plans that provide for the security of affected areas, including clean up and special precautions for each type of hazard (e.g., draining standing water after a flood, cautioning about aftershocks after an earthquake or successive tsunami waves, etc.).

Hillside development regulations: Site design and engineering techniques prescribed through regulations such as selective grading, drainage improvements, and vegetation clearance to eliminate, minimize, or control development on hillsides, thereby protecting the natural features of hillsides and reducing the likelihood of property damage from landslides.

Hurricane: An occurrence or event, natural or human-caused that requires an emergency response to protect life or property. Incidents can, for example, include major disasters, emergencies, terrorist attacks, wild land and urban fires, floods, hazardous material spills, nuclear accidents, aircraft accidents, earthquakes, hurricanes, tornadoes, tropical storms, war related disasters, public health and medical emergencies, and other occurrences requiring an emergency response.

Incident: Facilities serving the public and a community such as communication structures, public water supplies, sewage treatment facilities, electric power systems and transmission structures, transportation systems, navigable waterway facilities, dams, and other vital services. **Infrastructure:** Facilities serving the public and a community such as communication structures, public water supplies, sewage treatment facilities, electric power systems and transmission structures, transportation systems, navigable waterway facilities, dams, and other vital services.

Landslides: Downward movement of a slope and materials under the force of gravity.

Levees and floodwalls: Flood barriers constructed of compacted soil or reinforced concrete walls.

Loss estimation: Forecasts of human and economic impacts and property damage from future hazard events, based on current scientific and engineering knowledge.

Major Disaster: Any natural catastrophe (including any hurricane, tornado, storm, high water, wind-driven water, tidal wave, tsunami, earthquake, volcanic eruption, landslide, mudslide, snowstorm, or drought) or, regardless of cause, any fire, flood, or explosion in any part of the United States that, in the determination of the President, causes damage of sufficient severity and magnitude to warrant major disaster assistance under the Stafford Act to supplement the efforts and available resources of States, local governments, and disaster relief organizations in alleviating the damage, loss, hardship, or suffering caused.

Mitigation: The activities designed to reduce or eliminate risks to persons or property or to lessen the actual probability, potential effects or consequences of an incident. Mitigation measures may be implemented prior to, during, or after an incident.

Mitigation Goals: General guidelines that explain what you want to achieve. They are usually broad policy-type statements, long term in nature, and represent broad outcomes.

Mitigation Objectives: Objectives define strategies or implementation to attain the identified goals. Unlike goals, objectives are specific and have measurable outcomes.

Multi-Hazard Mitigation Plan: A plan that documents the process used for a systematic evaluation of the nature and extent of vulnerability to the effects of natural hazards typically present in a state or community. The plan includes a description of actions to minimize future vulnerability to hazards. This plan should be developed with local experts and significant community involvement.

National Flood Insurance Program (NFIP): The federal program, created by an act of Congress in 1968, that makes flood insurance available to residents in flood prone communities that enact satisfactory floodplain management regulations.

National Weather Services (NWS): Organization that prepares and issues flood, severe weather and coastal storm warnings and can provide technical assistance to federal and state entities in preparing weather and flood warning plans.

Open space preservation: Preserving undeveloped areas from development through any number of methods, including low-density zoning, open space zoning, easements, or public or private acquisition. Open space preservation is a technique that can be used to prevent flood damage in flood-prone areas, land failures on steep slopes or liquefaction-prone soils, and can enhance the natural and beneficial functions of floodplains.

Ordinance: A term for a law or regulation adopted by a local government.

Performance standards: Standards setting the allowable effects or levels of impact of development. Often used in conjunction with traditional zoning, the standards typically address specific environmental conditions, traffic,

or stormwater runoff. Can also be imposed on structures in hazard areas to ensure they withstand the effect of hazards.

Planning team: A group composed of government, private sector, and individuals with a variety of skills and areas of expertise, usually appointed by a city or town manager, or chief elected official. The group finds solutions to community mitigation needs and seeks community acceptance of those solutions.

Policy: A course of action or specific rule of conduct to be followed in achieving goals and objectives.

Pre-disaster Mitigation (PDM): Provides funds for hazard mitigation planning and projects on an annual basis. The PDM program was put in place to reduce overall risk to people and structures, while at the same time, also reducing reliance on federal funding if an actual disaster were to occur.

Post-disaster Mitigation: Mitigation actions taken after a disaster has occurred, usually during recovery and reconstruction.

Post-disaster Recovery Ordinance: An ordinance authorizing certain governmental actions to be taken during the immediate aftermath of a hazard event to expedite implementation of recovery and reconstruction actions identified in a pre-event plan.

Post-disaster Recovery Planning: The process of planning those steps the jurisdiction will take to implement long-term reconstruction with a primary goal of mitigating its exposure to future hazards. The post-disaster recovery planning process can also involve coordination with other types of plans and agencies, but it is distinct from planning for emergency operations.

Preparedness: Those activities, programs, and systems that exist before an emergency and that are used to support and enhance response to an emergency or disaster.

Public Education and Outreach Programs: Any campaign to make public more aware of hazard mitigation and mitigation programs, including hazard information centers, mailings, public meetings, etc.

Real estate disclosure: Laws requiring the buyer and lender to be notified if a property is located in a hazard-prone area.

Regulation: Most states have granted local jurisdictions broad regulatory powers to enable the enactment and enforcement of ordinances that deal with public health, safety, and welfare. These include building codes, building inspections, zoning, floodplain and subdivision ordinances, and growth management initiatives.

Relocation out of hazard areas: A mitigation technique that features the process of demolishing or moving a building to a new location outside the hazard area.

Reservoirs: Large water storage facilities that can be used to hold water during peak runoff periods for controlled release during off-peak periods.

Resources: Personnel and major items of equipment, supplies, and facilities available or potentially available for assignment to incident operations and for which status is maintained. Resources are described by kind and type and may be used in operational support or supervisory capacities at an incident or an EOC.

Response: Activities to address the immediate and short-term effects of an emergency or disaster.

Risk: The likelihood of hazard events resulting in an adverse condition that causes injury, death or damage.

Risk Assessment: The process of measuring the potential loss of life, personal injury, economic and injury, and property damage resulting from hazards.

Safe room/shelter: A small interior room constructed above grade and used to provide protection from tornadoes and other severe storm events. Bathrooms and large closets often double as safe rooms.

Seawalls/bulkheads: Vertical coastal walls that are built and designed to protect buildings against shoreline erosion. May also protect against storm surge.

Seawalls/bulkheads: Vertical coastal walls that are built and designed to protect buildings against shoreline erosion. May also protect against storm surge.

Section 406: Authorizes funds for hazard mitigation measures to meet the need for government services and infrastructure in areas affected by the disaster.

Section 408: Authorizes temporary housing for up to 18 months for displaced persons whose primary residences was heavily damaged or destroyed.

Sediment and erosion control regulations: Regulations that stipulate the amount of sediment and erosion that is acceptable for land undergoing development.

Shoreline setback regulations: Regulations that establish a minimum distance between the existing shoreline and buildable areas.

Snow Storm: A storm that deposits heavy snow which amounts to 12 inches in 12 hours or less**.**

Special use permits: Permits granted by local governments for land uses that have the potential for creating conflicts with uses on adjacent properties.

Stafford Act: Robert T. Stafford Disaster Relief and Emergency Assistance Act, PL 100-707, signed into law on November 23, 1988; amended the Disaster Relief Act of 1974, PL 93-288. A Federal statute designed to

supplement the efforts of the affected states and local governments in expediting the rendering of assistance, emergency services, and the reconstruction and rehabilitation of devastated areas.

Stakeholder: Groups or individuals including businesses, private organizations, agencies, and citizens that will be affected in any way, be an action or policy

State Hazard Mitigation Officer (SHMO): The representative of state government who is the primary point of contact with FEMA, other state and federal agencies, and local units of government in the planning and implementation of pre- and post-disaster mitigation activities.

Storm Surge: A dome of sea water created by the strong winds and low barometric pressure in a hurricane that causes severe coastal flooding as the hurricane strikes land.

Storm water management regulations: Regulations governing the maintenance and improvement of urban storm water systems and the implementation of land treatment actions to minimize the effects of surface water runoff. Land treatment actions include maintenance of vegetative cover, terracing, and slope stabilization.

Stream corridor restoration: The restoration of the areas bordering creeks, including the stream bank and vegetation.

Stream dumping regulations: Regulations prohibiting dumping in the community's drainage system, thereby maintaining stream carrying capacities and reducing the possibility of localized flooding.

Structural retrofitting: Modifying existing buildings and infrastructure to protect them from hazards.

Subdivision: The division of a tract of land into two or more lots for sale or development.

Subdivision and development regulations: Regulations and standards governing the division of land for development or sale. Subdivision regulations can control the configuration of parcels, set standards for developer-built infrastructure, and set standards for minimizing runoff, impervious surfaces, and sediment during development. They can be used to minimize exposure of buildings and infrastructure to hazards.

Terrorism: The use of, or threatened use of criminal violence against civilians or civilian infrastructure to achieve political ends through fear and intimidation. Emergency management is typically concerned with the consequences of terrorist acts directed against large numbers of people.

Thunderstorm: Storms accompanied by lightning, thunder, strong winds, and heavy rain. Other associated dangers of thunderstorms include tornadoes, strong winds, hail, and flash flooding. Flash flooding is responsible for more fatalities—more than 140 annually—than any other thunderstorm-associated hazard.

Tornado: A local atmospheric storm, generally of short duration, formed by winds rotating at very high speeds. The vortex, up to several hundred yards wide, is visible to the observer as a whirlpool-like column of winds rotating about a hollow cavity or funnel. Winds may reach 300 miles per hour or higher.

Tropical Storm: A tropical cyclone, formed in the atmosphere over warm ocean areas, in which wind speeds are less than 74 miles per hour.

Transfer of development rights (TDR): A growth management technique through which development rights are transferred from a designated "sending" area to a designated "receiving" area. The sending area is generally prohibited from development and the receiving area is a targeted development area that can be built at a higher density.

Utility Failure: Refers to periodic cessation of electrical or communication services due to adverse weather conditions, human error, or mechanical failure.

U.S. Geologic Survey (USGS): The Federal agency responsible for nationwide civilian mapping projects and standards development.

Vulnerability: Exposure or susceptibility to physical injury, harm, damage, or economic loss.

Watershed: An area from which water drains into a lake, stream or other body of water. A watershed is also often referred to as a basin, with the basin boundary defined by a high ridge or divide, and with a lake or river located at a lower point.

Wetlands development regulations: Regulations designed to preserve and/or minimize the impact of development on wetlands.

Wildfire: An uncontrolled fire including trees, brush, or grass involving a substantial land area which has the potential to threatening human life and property.

Wind Storm: Storms accompanied by strong gale force or stronger winds that may or may not be accompanied with precipitation. These winds may be associated with tornadoes, thunderstorms, Nor'easters, tropical storms and hurricanes.

Zoning: The division of land within a local jurisdiction by local legislative regulation into zones of allowable types and intensities of land uses.

Zoning Ordinance: Designation of allowable land use and intensities for a local jurisdiction. Zoning ordinances consist of two components: a zoning text and a zoning map.

Zone A (unnumbered): Flood insurance rate zone that corresponds to the 1-percent annual chance floodplains that are determined in the Flood Insurance Study (FIS) by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base flood elevations or depths are shown within this zone. Mandatory flood insurance requirements apply.

Zones AE and A1-30: Flood insurance rate zone that corresponds to areas subject to inundation by the one-percent annual chance floodplains that are determined in the FIS by detailed methods. Base Flood Elevations (BFEs) are shown within these zones and mandatory flood insurance purchase requirements and floodplain management standards apply. (Zone AE is used on the newer maps in place of Zones A1-30).

Zone AH: Flood Insurance rate zone that corresponds to areas subject to inundation by 1-percent-annual-chance shallow flooding (usually areas of ponding) where average depths are between one and three feet. Base Flood Elevations (BFEs) derived from detailed hydraulic analyses are shown in this zone. Mandatory flood insurance purchase requirements and floodplain management standards apply.

Zone AO: Flood Insurance rate zone that corresponds to areas subject to inundation by 1-percent-annual-chance shallow flooding (usually sheet flow on sloping terrain) where average depths are between one and three feet. Average flood depths derived from detailed hydraulic analyses are shown in this zone. Mandatory flood insurance purchase requirements and floodplain management standards apply.

Zone B and Zone X (shaded): Flood insurance zones that correspond to areas of moderate or minimal flood hazard, usually the area between the limits of the 100-year and 500-year floods. B Zones are also used to designate base floodplains of lesser hazards, such as areas protected by levees from the 100-year flood, or shallow flooding areas with average depths of less than one foot or drainage areas less than 1 square mile. Flood insurance is available in participating communities, but it is not required in these ones.

Zone C and Zone X (unshaded): Flood insurance rate zones that correspond to areas of minimal flood hazard, usually depicted on FIRMs as above the 500- year flood level. Zone C may have ponding and local drainage problems that don't warrant a detailed study or designation as base floodplain. Zone X is the area determined to be outside the 500-year flood and protected by levee from 100-year flood. Flood insurance is available in participating communities, but it is not required in these ones.

Zone D: Unstudied areas where flood hazards are undetermined but where flooding are possible. No mandatory flood insurance requirements apply, but coverage is available in participating communities.

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APPENDIX A

HIRA-NY ANALYSIS AND TOWN OF MOUNT PLEASANT COMPREHENSIVE EMERGENCY MANAGEMENT PLAN

The following Appendix documents the Town of Mount Pleasant Comprehensive Emergency Management Plan. Section VI: Appendix of the Plan highlights the HIRA-NY analysis which is used in the Hazard Profiling and Risk Assessment sections of the HMP Report.

Town of Mount Pleasant

1 Town Hall Plaza
Valhalla, New York 10595

COMPREHENSIVE EMERGENCY MANAGEMENT PLAN

Joan A. Maybury, Town Supervisor

Peter J. DeMilio, Town Councilman

Thomas A. Sialiano, Town Councilman

Carl Fulgenzi, Town Councilman

Mark Rubeo, Town Councilman

MARCH 2012

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Section I

Mission Statement

It is the goal of the Town of Mount Pleasant (the Town), its elected officials, departments and personnel in conjunction with the Town's emergency service responder organizations to provide for the protection of the lives and property of its residents by planning, preparing, mitigating, responding and recovering from any natural or man-made disaster or emergency; and to do so in a safe and orderly manner with as little disruption of essential services as possible. To facilitate this goal the Town has adopted the following Comprehensive Emergency Management Plan (the Plan).

Executive Summary

This plan results from the recognition on the part of Town government and its emergency service responder organizations that a comprehensive plan is needed to enhance the Town's ability to manage disaster and emergency situations. This plan was prepared by Town officials and its emergency service responder organizations working in a planning effort recommended by the New York State Office of Emergency Management (NYSOEM). Authority to undertake this effort is provided by both Article 2-B of the NYS Executive Law and the NYS Defense Emergency Act.

The development of this plan included an analysis of potential hazards that could affect the Town and an assessment of the capabilities existing within the Town to deal with potential problems; see the Appendix for the Hazards Identification and Risk Assessment – New York (HIRA-NY).

Comprehensive Approach

Dealing with disasters and emergencies is an ongoing and complex undertaking. Through implementation of risk reduction measures before a disaster or emergency occurs, with regular training opportunities, timely and effective response during an actual occurrence and provision of both short and long term recovery assistance after the occurrence, lives can be saved and property damaged minimized. This process, called Comprehensive Emergency Management, emphasizes the interrelationship of activities, functions and expertise necessary to deal with emergencies and disasters. The plan contains a number of sections to deal with each part of this ongoing process.

Management Responsibilities

The role and responsibilities of Town officials, departments, personnel and emergency service responder organizations, both emergency and non-emergency, are outlined in this plan. Assignments are made within the framework of the present Town capabilities and existing organizational responsibilities. The Emergency Management Council (EMC) is designated to coordinate all emergency management activities in the Town. The Town uses the National Incident Management System (NIMS) as a guide to coordinate the response to emergencies and periodically tests this plan. NIMS is a core of concepts, principles and terminology for incident command and multi-agency coordination. Compliance with the components of NIMS, as required by Presidential Declaration, offers a system for incident management and testing as promulgated through the Department of Homeland Security for nationwide usage.

Conclusion

The plan provides a general all hazards management guide, using existing Town departments, personnel and emergency service responder organizations to allow the Town to meet its responsibilities before, during and after a disaster or emergency.

Section II

General Consideration and Planning Guidelines

A. Policy Regarding Comprehensive Emergency Management

1. A wide variety of emergencies, either natural or man-made, can result in loss of life, property and income and disrupt the normal functions and continuity of government and in doing so cause human suffering and economic loss.

2. Town government must provide leadership and directions to prevent, mitigate, respond to and recover from dangers and problems arising from disasters and emergencies.

3. Under authority of Article 2-B of the NYS Executive Law, a town is authorized to develop a Comprehensive Emergency Management Plan to prevent, mitigate, respond to and recover from disasters and emergencies. To meet this responsibility the Town has developed this Comprehensive Emergency Management Plan.

4. The concept of the plan includes three phases:

   a. Risk Reduction (Prevention and Mitigation)

   b. Response

   c. Recovery

5. Risk Reduction (Prevention and Mitigation):

   a. Prevention refers to activities which eliminate or reduce the number of occurrences of disasters or emergencies.

   b. Mitigation refers to activities which reduce the effects of disasters or emergencies.

   c. Section II of the plan, Risk Reduction, describes activities to prevent or minimize the impact of hazards within the Town.

6. Response:

   a. Response operations may be initiated before a disaster or emergency materializes, i.e. upon receipt of a severe weather advisory pre-impact readiness activities may

include:

(1) Monitoring and assessing the hazard.
(2) Alerting and warning endangered populations.
(3) Engaging pre-event protective actions.
(4) Allocating and distributing equipment and resources.

b. Most response activities follow the immediate impact of a disaster or emergency. Generally they are designed to minimize casualties, protect property, minimize secondary damage and speed recovery.

c. The responsibility for response operations within the Town are dependent upon the type and location of the incident and may be controlled by other municipal subdivisions such as fire or ambulance districts.

7. Recovery:

a. Recovery activities are those actions that follow a disaster or emergency to restore the Town to its pre-event state, to correct adverse conditions and to protect and improve the quality of life within the Town.

b. Recovery also includes risk reduction actions to prevent or mitigate a reoccurrence of the disaster or emergency.

B. Purpose, Objectives and Resources of the Plan

1. The plan sets forth the basic requirements for emergency management in the Town.

2. The objectives of the plan are:

a. To identify, assess and prioritize local vulnerabilities to disasters or emergencies and the resources available for prevention, mitigation, response and recovery.

b. To outline short, medium and long range measures to improve the Town's capability to manage hazards.

c. To take appropriate actions to prevent and mitigate the effects of hazards and be prepared to respond to and recover from the occurrence of disasters or emergencies.

d. To provide for the efficient utilization of all available assets and resources during a disaster or emergency.

e. To provide for the utilization and coordination of county, state and federal programs to assist disaster victims and prioritize the response needs of the elderly, disabled and other at risk groups.

f. To provide for the utilization and coordination of county, state and federal programs for disaster recovery and the development of mitigation programs.

3. Resources and assets to be used to fulfill the objectives of the plan are:

a. Utilization of federal, state and local agencies, private companies and volunteer organizations to perform incident management missions, coordinate operations for the restoration of transportation infrastructure.

b. To provide communications support for incident management operations.

c. Utilization of Highway Dept., Water & Sewer Dept., Engineering Dept. and Building Dept. to assist damage mitigation and recovery operations by:
   (1) Providing technical advice, evaluation and engineering services
   (2) Construction management services
   (3) Building inspections
   (4) Structural damage assessment
   (5) Emergency repair of infrastructure
   (6) Secure unsafe locations

d. Utilization of the Fire Service to detect, suppress and resolve fires and hazardous material incidents, provide rescue services at vehicle, building and industrial accidents, conduct water and ice rescue and conduct area searches for missing / lost persons and to provide other services to support emergency operations.

e. To conduct information and planning activities to collect, analyze, process and disseminate information about potential or actual disaster or emergency situations in support of emergency decision making efforts. The Town EMC has conducted a HIRA-NY study and working in conjunction with the NYC Dept. of Environmental Conservation (NYCDEC) disseminated chlorine emergency information to residents living near the Shaft 18 chlorination facility.

f. Facilitate command and control by utilizing the Incident Command System (ICS).

g. Provide law enforcement assistance during all activities related to disaster and emergency planning, preparation, mitigation, response and recovery.

h. Partner with the Town's Emergency Medical Services (EMS), Westchester County Office of Emergency Management (WCOEM) and the American Red Cross (ARC) to support mass care efforts to meet the needs of disaster victims by providing emergency sheltering, feeding, personal hygiene needs and first aid at designated emergency shelters and to provide information collection on victim status in an effort to reunite displaced persons.

i. Provide operational and logistical assistance for the management of resources, including water, food, sanitary and other logistical needs during emergency operations.

j. Coordinate with the Westchester County Dept. of Health to provide health and medical assistance during emergency operations.

k. To secure and arrange for the transportation of food and potable water to affected areas until the restoration of normal supplies.

l. Assist in the restoration of energy systems.

m. The timely gathering and dissemination of accurate, consistent and easy to understand information about the ongoing disaster or emergency.

n. Utilize the Animal Control Officer (ACO) to address issues pertaining to animals, particularly companion and domestic animals.

o. Support the management of donated goods, supplies and funds and volunteers. The Town has future plans of creating a Citizens Emergency Response Team (CERT).

C. Legal Authority

This plan, in whole or in part, may rely upon the following laws for the power necessary for its development and implementation:

1. NYS Executive Law Article 2-B.

2. NYS Defense Emergency Act, as amended.

3. The Westchester County Charter.

4. Federal Robert T. Stafford Disaster Relief and Emergency Assistance Act, 93-288.

5. Federal Civil Defense Act of 1950, as amended.

6. NYS Executive Order #26, establishing the Emergency Management System.

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D. Concept of Operations

1. The primary responsibility for responding to disasters and emergencies rests with the Town government and the special municipal subdivisions located within the Town and their Chief Executive / Operating Officers.

2. Town government and local emergency service responder organizations play an essential role as the first line of defense.

3. The Town Supervisor, as the Town's Chief Elected Official, has the authority to direct and coordinate disaster and emergency operations and may delegate this authority to a local coordinator.

4. Should local resources be inadequate, the Town Supervisor may obtain assistance from other political subdivisions, such as other municipalities, County, State or Federal governments.

5. The Town utilizes unified command through the EMC to coordinate emergency management activities.

E. Plan Maintenance and Updating

1. The EMC is responsible for maintaining and updating the plan as needed.

2. Town elected officials, Town departments and emergency service responder organizations are responsible for the annual review of their emergency response role and procedures identified in the plan to ensure they are current and relevant and to recommend necessary changes to the EMC.

A. Emergency Management Council (EMC)

1. The EMC shall serve as the Town's hazard mitigation advisors.

2. The EMC was created to provide the Town's elected officials the needed resources to aid in the decision making process prior to, during and after a disaster or emergency. By utilizing NIMS and ICS, whose use was adopted by Town Board resolution, the EMC plays an important role in any disaster or emergency event by providing advice and counsel to the Town's elected officials. Prior to any disaster or emergency the EMC will assist the Town Supervisor with preparation and mitigation efforts. During disaster or emergency response and recovery activities the EMC will continue to provide advice and counsel to the Town Supervisor and may assume added roles as integral parts of the ICS structure.

3. The EMC, in part, will consist of the individuals holding the following positions or their designees, (see list in Appendix):

a. Town Supervisor / Town Board representative

b. Superintendent of Water & Sewer

c. Superintendent of Highways

d. Superintendent of Recreation & Parks

e. Fire Marshall / Building Inspector

f. Fire Chiefs / Commissioners

g. EMS Captains / Directors

h. Police Department representative

i. WCOEM representative

j. American Red Cross representative

k. Utility company representatives (Con Ed, cable, telephone)

l. Town Comptroller

m. Town Attorney

n. Town Clerk (vital records)

o. Town Justice Court

B. Identification and Analysis of Potential Hazards

1. The EMC will:

a. Use the HIRA-NY program to identify potential natural and man-made hazards within the Town.

b. Determine the probable impact of each of those hazards.

c. Identify the geographic areas of the Town that could be affected by those hazards.

2. The HIRA-NY program:

a. Provides a basic method for analyzing and ranking identified hazards, including the identification of geographic areas and populations at risk to specific hazards.

b. Establishes priorities for planning for those hazards receiving a high ranking of significance.

c. Was conducted by the EMC with guidance provided by NYSOEM and WCOEM.

d. The EMC will conduct an annual review of the HIRA-NY and a full study and update every three (3) years or sooner if appropriate.

e. The most current version of the Town's HIRA-NY is included in the Appendix.

C. Risk Reduction Policies, Programs and Reports

1. All plan participants, including Town elected officials, departments, personnel and emergency service responders are encouraged to:

a. Promote policies, programs and activities to reduce hazard risks in their area of

responsibility and / or jurisdiction.

b. Conduct studies of anticipated problems and create appropriate response plans, see Agency Specific Actions in the Appendix.

2. During the course of carrying out their duties and responsibilities, the Town's Planning Board and Zoning Board of Appeals will take into consideration all potential hazards that could impact the Town.

D Training of Emergency Personnel

1. All agencies providing emergency services within the Town are responsible for ensuring that their personnel receive the required training necessary to effectively perform their emergency response duties.

2. The EMC will promote multi-agency and multi-discipline coordination by conducting table top and functional emergency response exercises.

E. Public Education and Awareness

1. The Town in cooperation with its emergency service responder organizations and other available resources shall:

a. Provide education on specific and potential hazards to residents of the Town.

b. Provide information to the public on protective measures that the Town, County, State and Federal governments have taken to respond to any potential disaster or emergency arising from an identified hazard.

2. Public education will:

a. Cover all possible hazards, with emphasis on those that present significant danger.

b. Utilize government resources, such as WCOEM, NYSOEM, FEMA, and non-government resources, such as the American Red Cross and utility companies.

c. Be shared with all local schools.

d. Use all available and practical media outlets, including public access TV channels,

Town websites and emergency notification systems.

Town of Mount Pleasant Comprehensive Emergency Management Plan

Section IV

Response Organization and Assignment of Responsibilities

A. Town Supervisor's Responsibilities, Powers and Succession

1. The Town Supervisor, as the Town's Chief Elected Official, is ultimately responsible for Town emergency response activities. The Town Supervisor:

a. May take or assume personal oversight of the Town's emergency response activities.

b. May take control of all Town resources, including personnel, equipment and facilities.

c. May declare a local state of emergency; and in consultation with the EMC promulgate emergency orders and waive local laws, ordinances and regulations.

d. May request assistance from other local municipalities, Westchester County and NYS when it appears that the incident will escalate beyond the capability of Town resources.

e. May provide assistance at the request of other municipalities.

2. Should the Town Supervisor be unavailable, the Deputy Town Supervisor is next in line of command and succession to ensure the continuity of government, as established by Town Board Resolution.

3. The Town Supervisor shall be familiar with the Town's Comprehensive Emergency Management Plan and shall be guided by a list of actions to be taken which can be found in the Appendix.

B. The Role of the Emergency Management Council

1. The EMC shall make recommendations to the Town Supervisor concerning the planning, preparation, mitigation, response and recovery from disasters and emergencies.

2. The EMC shall work with the Town's departments, personnel and emergency service responder organizations by:

a. Coordinating the Town's emergency response activities.

b. Assisting to staff the Town's Emergency Operations Center (EOC).

C. Managing Emergency Response

1. The Incident Command System (ICS):

a. The Town has adopted the use of the NIMS and ICS as promulgated by the Federal government by Presidential Directive and formally adopted by NYS for emergencies requiring a multiagency response.

b. ICS allows flexibility in its implementation so that its structure can be tailored to the specific situation.

c. Emergency responders should always use ICS at incident scenes.

d. ICS is organized by functions:
   (1) Command
   (2) Operations
   (3) Planning
   (4) Logistics
   (5) Finance

e. Under ICS the Incident Commander (IC) has overall responsibility for the on-scene management of the incident and must ensure an adequate response is in place to carry out all emergency functions.

f. Depending on the size and complexity of the incident, the five ICS functions may be managed by the IC or delegated to staff reporting to the IC.

g. Large scale disasters or emergencies encompassing large geographic areas may have more than one emergency scene, in this situation separate ICs may set up at multiple locations, in this case, an Area Command may be established. Area Command is structured similar to normal ICS with one exception; the overall IC is called the Incident Manager to whom all local ICs report.

h. During a disaster or emergency, emergency response personnel must be cognizant of ICS and their role in it. Some personnel may be responders to the scene and part of the on scene ICS structure. Other personnel may be assigned to the Town EOC, or other locations, in support of on scene responders.

2. Agency Responsibilities:

a. The Town Supervisor shall exercise overall responsibility and oversight for disaster or emergency response activities and shall delegate ICS responsibilities as circumstances warrant.

b. Due to the varied geo-political makeup of the Town, a town-wide disaster or emergency response may involve a multitude of independent municipal subdivisions. However, these municipal subdivisions have a long history of working with each other and providing mutual aid as needed.

c. ICS function and response activities by Town department or agency or support group:

DEPARTMENT / TITLE	RESPONSE ACTIVITIES
Town Supervisor	Overall situation responsibility, Declaration of Local State of Emergency, Promulgation of emergency orders
Police Command	Law enforcement, crime control, criminal investigations, communications, public warning, evacuation and traffic control
Fire Command	Fire suppression and control, search & rescue, Hazmat response
EMS Command	Emergency medical care
Fire Marshall / Building Inspector	Structural damage assessments, code violations
DEPARTMENT / TITLE	RESPONSE ACTIVITIES
Highway Superintendent	Damage control assessment, debris removal, transportation infrastructure restoration
Public Information Officer	Emergency public information, media liaison
Water & Sewer Superintendent	Water supply, sewage control, debris removal, engineering
Recreation & Parks Superintendent	Human needs assessment, sheltering, liaison with support groups, debris removal

Town Engineer	Advance planning, mitigation review, situational assessment, engineering
Town Comptroller	Financial support, situational record keeping
Town Clerk	Legal documents and filings
Town Attorney	Legal counsel
Traffic Safety	Road closure signage, traffic control repair
Animal Control Officer	Animal care and safety
Town Assessor	Property owner and insurance company liaison
Town Justice Court	Criminal and civil adjudication
Information Systems	Computer system support & records management
County Health Department	Medical advice, disease control
County Mental Health	Crisis counseling
County Social Services	Human needs assessment
DEPARTMENT / TITLE	RESPONSE ACTIVITIES
County Medical Examiner	Investigation into cause of death, identification and disposition of the deceased
American Red Cross	Sheltering and relief services
Utility Companies	Restoration of electrical, telephone and cable TV service

3. Command Post (CP) and Emergency Operations Center (EOC):

    a. On scene emergency operations will be directed and controlled by the IC from a

Command Post (CP) located near the incident scene.

b. The CP will selected by the IC based on logistical needs and located a safe distance from the incident scene.

c. Should the disaster or emergency have a significant or wide ranging impact on the Town or an area of the Town, the Town's Emergency Operations Center (EOC) may be opened to support CP activities and provide centralized coordination of available resources.

d. The Town EOC is located in the Lower Conference Room of Town Hall. Should the Town Hall EOC be unusable, for whatever reason, the EOC may be moved to an alternative location to be determined.

e. A decision to open the EOC may be made at the recommendation of any of the agencies who participate in the Town's EMC by notifying the Police Desk of the reason the EOC should be opened.

f. The Police Desk will commence notifying agencies required to represented in the EOC (see EOC Notification List in the Appendix) and assign personnel to set up the EOC in the Lower Conference Room (see EOC Setup Guide in the Appendix).

g. All agencies represented in the EOC shall be organized according to ICS protocols and will utilize unified command.

h. Based on information provided by and working in conjunction with the IC, EOC staff shall:
   (1) Analyze all available information on the disaster or emergency.
   (2) Evaluate the impact on public health and safety, human needs, the environment, legal and political implications of the disaster or emergency.
   (3) Explore alternative actions and their possible consequences.
   (4) Select and direct specific response actions.

i. The EOC may remain open 24/7; relief personnel are to be scheduled.

j. The decision to close the EOC shall be made after consultation with representatives from all participating agencies to ensure that the resources of the EOC are no longer needed.

4. Notification and Activation:

   a. The level of response shall depend on the type and magnitude of the disaster or emergency. The appropriate level of response may vary from a routine single agency response to a town wide response requiring all emergency service responder organizations.

   b. Upon notification of a significant disaster or emergency, the Police Desk shall commence notification of Town officials, including the Town Supervisor, Police Chief and Lieutenants.

   c. Town officials will assess the need to open the EOC. Regardless of whether or not the EOC is opened, Town officials shall notify all Town emergency service responder agencies of the significant disaster or emergency. This notification will be made utilizing the EOC Notification List in the Appendix.

5. Declaration of Local State of Emergency and Promulgation of Local Emergency Orders:

   a. In response to a disaster or emergency, or its likelihood, or upon finding that public safety is imperiled, the Town Supervisor may declare a state of emergency pursuant to Article 2-B, Section 24 of the NYS Executive Law.

   b. A declaration of emergency authorizes the Town Supervisor to deal with the disaster or emergency by promulgating local emergency orders; examples of which include but are not limited to:
      (1) Establish curfews.
      (2) Control vehicle and pedestrian traffic.
      (3) Designate specific zones of occupancy and use of buildings
      (4) Regulate the closing of places of amusement and assembly.
      (5) Suspend or limit the sale, dispensing, use or transportation of alcoholic beverages, firearms, explosives or hazardous materials.
      (6) Prohibit or control the presence of persons on public places.
      (7) Suspend such laws, ordinances or regulations as allowable within the guidelines of Section 24 of Article 26 of the NYS Executive Law.
      (8) Order the use of any or all Town resources, request or provide mutual aid to other municipalities.

6. Public Warning and Emergency Information:

a. In order to give the public an opportunity to take protective actions, such public warnings and emergency information should be transmitted in advance or as soon as possible after the onset of a disaster or emergency.

b. The Town shall use all available and practical means to issue public warnings and emergency information, including but not limited to the use of:
   (1) The Town's emergency notification system.
   (2) The Westchester County emergency notification system.
   (3) The Town and police department websites, www.mtpleasantny.com or www.mppdny.com.
   (4) The Town's public access cable TV stations.
   (5) Regional TV and radio stations.
   (6) Hudson Valley Region 211 public information call center.
   (7) NY-ALERT, NYS's all hazards alerting and notification system, sign up at www.nyalert.gov.
   (8) Emergency Alert System used by the broadcast media to issue emergency warnings.
   (9) NOAA Weather Radio, continuous weather radio broadcasts, including severe weather warnings.
   (10) Refer residents to www.coned.com for information on power outages by viewing the Outage Map and to report power outages or by calling 1-800-75-CONED (1-800-752-6633).
   (11) Utilizing variable message sign boards.
   (12) Emergency service vehicle siren and public address system.
   (13) Door to door notification by emergency service responders.
   (14) Continuous and prolonged activation of fire department sirens and horns.

c. The designated Public Information Officer (PIO) shall:
   (1) Designate the location of a Joint Information Center (JIC) to respond to inquiries from the news media and coordinate all official announcements and media briefings.
   (2) The JIC shall be established at location where its presence does not interfere with emergency operations.
   (3) Authenticate and verify the accuracy of sources of all information.
   (4) Provide essential information and instructions including appropriate protective actions to be taken by the public.
   (5) Coordinate the release of all information with the IC, EOC and other involved agencies.

(6) Check and control the spread of rumors.
(7) Approve and arrange media interviews with specific emergency personnel.
(8) Approve and arrange media tours of emergency sites, if appropriate.

7. Emergency Medical and Public Health:

a. A major disaster or emergency may cause injury or death to large numbers of people. Additionally, there may be significant damage to structures, including homes, public and private infrastructure, resulting in substantial risk of water contamination, lack of food, communicable diseases and exposure to the elements.

b. The Town, through the EMC and / or EOC, shall rely on the recommendations of the Westchester County Department of Health for appropriate response protocols to medical and health related issues.

c. The EOC may establish an Emergency Medical and Public Health coordinator to ensure health and medical problems are being addressed at the operational level.

8. Human Needs:

a. The Town, through the EMC and / or EOC, shall be responsible for ascertaining what human needs have been particularly affected by a disaster or emergency and to respond to unmet needs with available resources.

b. Special attention for human needs assessment shall be paid to those deemed "at risk", such as persons with special needs, persons dependent on life sustaining equipment, the elderly, unaccompanied children or any other person requiring special assistance.

c. The Town in coordination with the Westchester County Department of Emergency Services (WCDES) shall maintain a roster of special needs persons. During a disaster or emergency the EMC and / or EOC shall assign an emergency responder agency to check on the welfare of all special needs persons by making personal visits to their home and subsequent follow ups as needed.

d. Related to human needs are the needs of domestic, service and companion animals. Animal owners will often refuse to evacuate or get out of harm's way if they are not assured of the welfare of their pets. To that end the Town will make every effort to accommodate persons' pets at designated shelters and render other assistance to

pet owners as available resources permit.

e. Major disasters or emergencies may result in recommendations to the public that they "shelter in place". The Town will issue warnings to the public that they shelter in place based on recommendations from such authorities as the WCOEM or NYSOEM, WC or NYS Health Departments, NYS Office of Counter Terrorism, NYC DEP, etc.

f. Major Disasters or emergencies may cause significant damage to structures, including homes. Additionally, travelers may become stranded during a disaster or emergency, in such cases it will be necessary for the Town to designate a community shelter.

g. The Town has utilized Town Hall and the Town Community Center as emergency shelters:
   (1) Town Hall's Tower Room (third floor) will accommodate approximately 30 persons and Town Hall has emergency generator power.
   (2) The Town Community Center may accommodate approximately 300 persons, but it does not have emergency power.

h. The Town will coordinate its sheltering activities with WCOEM and the ARC, seeking assistance as needed for shelter supplies or other special needs.

h. Emergency Shelter Operating Protocols are in the Appendix.

9. Restoring Public Services:

a. The Town, through the EMC and / or EOC, is responsible for determining the disaster or emergency's effect on infrastructure and the impact on public services including transportation (highway), electric power, public water and sewer, telephone, and fuel distribution.

b. The Town, through the EMC and / or EOC, is responsible for ensuring that services are restored as soon as possible. This may be accomplished by assigning emergency responder agencies and / or Town personnel as liaisons to work with public and private utilities to assist with restoration efforts.

c. In the event of a major electric power outage the Town will immediately request a Con Edison municipal representative (muni rep) be assigned to the EOC or Police

Desk to facilitate communications between the Town and Con Edison in an effort to restore electric power as soon as possible.

10. Resource Management:

    a. The Town, through the EMC and / or EOC, is responsible for the identification and allocation of resources needed to respond to the disaster or emergency.

    b. Resources within the Town should be used first in responding to disasters or emergencies before requesting assistance (mutual aid) from outside the Town.

    c. Privately owned resources cannot be commandeered or confiscated by government during a disaster or emergency. However, purchases and leases of privately owned resources can be expedited during a declared emergency.

    d. Private businesses or organizations with known operational assets should be contacted prior to a disaster or emergency to arrange for their possible deployment if needed.

11. Termination Procedures:

    a. Every response to a disaster or emergency will have a corresponding termination phase, which must be carried out in a planned and orderly manner. Termination activities should not interfere with the recovery phase of the disaster or emergency.

    b. Prior to commencing the termination of disaster or emergency operations the Town, in coordination with the EMC and / or EOC, shall maintain the following priorities:
        (1) Ensure the safety of all personnel and the public.
        (2) Consultation with all participating agencies.
        (3) Ensure complete documentation and records management.
        (4) Identification of all potential remaining hazards.
        (5) If necessary, conduct decontamination of personnel and equipment utilized for disaster or emergency response operations.
        (6) Assess the restoration of public services in the affected area.
        (7) Establish procedures for the return of evacuees and the return of affected properties to owners.
        (8) Schedule a critique of response procedures.

12. Agency Standard Operating Guides and Procedures:

Each Town department and all emergency service responder organizations are responsible for maintaining their own Standard Operating Guide (SOGs) and / or Procedures (SOPs). The SOG and / or SOPs shall be comprehensive, addressing all aspects of disaster and emergency response, including planning, preparation, mitigation, response and recovery.

Section V

Recovery

A. Damage Assessment

1. All Town departments and emergency service responder organizations shall conduct damage assessments as it relates to their areas of responsibility and / or jurisdiction during and after a disaster or emergency. Depending on the scope of the disaster such damage assessments shall be reported to the IC and EOC and Town.

2. Damage assessments shall be made of:

   a. Infrastructure; damage to public property.

b. Individual Assistance; impact on individuals, families and private property.

3. Damage assessments conducted by Town departments and emergency service responder organizations shall include:

a. Reports or surveys of preliminary damage assessments conducted during a disaster or emergency should be made as soon as available to provide current situational awareness.

b. Accurate and detailed records of all actions associated with the disaster or emergency should include:
   (1) All expenditures.
   (2) All labor / man hours.
   (3) Use of all owned equipment.
   (4) Use of all borrowed or rented equipment.
   (5) Materials used.
   (6) Contracted services.

c. Post disaster or emergency, all Town departments and emergency service responder organizations shall conduct a complete and thorough damage assessment of their areas of responsibility and / or jurisdiction.

d. The post-disaster or emergency damage assessments shall be provided to the IC and EOC and the Town so that a complete damage record may be compiled for possible use in documenting damage claims.

4. The Town, in coordination with the IC, EMC and EOC, shall be responsible for compiling a complete damage assessment report for submission to WCOEM. WCOEM collects countywide damage assessment data for submission to NYSOEM and / or the Federal Emergency Management Agency (FEMA) to determine what government assistance, if any, may be made available.

5. The Town wide damage assessment report shall include:

a. The estimated dollar amount of all damaged public property.

b. The estimated dollar amount of all damaged private property.

c. The actual or estimated cost of all emergency response activities.

d. The actual or estimated cost of post disaster or emergency activities, such as debris clean up and reconstruction.

6. Damage assessment information shall be reported to the Town Comptroller, who shall serve as the Town's authorized agent for disaster assistance and shall:

a. Attend public assistance applicant briefings conducted by WC, NYS or FEMA.

b. Prepare and submit requests for State or Federal public assistance.

c. Arrange for local representatives to accompany County, State or Federal survey teams.

d. Submit required proof of insurance documentation.

e. Prepare and submit project grant applications.

f. Maintain accurate and thorough documentation of project costs.

g. Observe FEMA time limits for project completion.

h. Prepare and submit final claim for reimbursement upon project completion.

i. Assist with required audits.

j. Maintain a log of damages suffered and recovery actions taken.

B. Planning for Recovery:

1. Recovery includes community development and redevelopment and is based on a comprehensive development plan prepared at the direction of and adopted by the Town Board in consultation with the Town Planning Board, Town Zoning Board of Appeals and the Town Industrial Development Agency.

2. The Town will decide whether the recovery will be managed through existing organizations or by a recovery task force created exclusively for this purpose.

3. The Town or recovery task force shall:

a. Direct the recovery with the assistance of Town departments.

b. Prepare a local recovery and redevelopment plan pursuant to Section 28-A of the NYS Executive Law.

4. The recovery and redevelopment plan shall include:

a. Establish priorities for emergency debris removal and repair or replacement of infrastructure and buildings.

b. Account for and incorporate, to the extent practical, existing plans and policies.

c. As needed, amend existing or enact new local ordinances pertaining to zoning and building codes.

d. Prevention and mitigation measures to address possible future events.

5. If a Sate Emergency Declaration has been declared, the Town, under Section 28-A of the NYS Executive Law has the following responsibilities with respect to recovery procedures:

a. The Town, if included in the disaster declaration, shall prepare a local recovery and redevelopment plan.

b. Within 15 days after state disaster declaration the Town and / or County shall report to the NYS Disaster Preparedness Commission (DPC) through NYSOEM whether the preparation of a recovery and redevelopment plan has been started and if not, the reason why.

c. Proposed recovery and redevelopment plans shall be presented at a public hearing upon 5 days notice published in a newspaper of general circulation commonly used for the Town's legal notices and transmitted by broadcast media.

d. The recovery and redevelopment plan shall be prepared within 45 days after the declaration of a state disaster and shall be transmitted to the NYS DPC. The NYS DPC shall provide it s comments on the plan within 10 days after receipt.

e. The recovery and redevelopment plan shall be adopted by the Town within 10 days after receiving comments for the NYS DPC.

f. The adopted recovery and redevelopment plan:
   (1) May be amended at anytime in the same manner as originally prepared.
   (2) Shall be the Town's official policy for recovery and redevelopment.

C. Reconstruction

1. Reconstruction consists of two phases:

   a. The first phase is short term reconstruction designed to restore vital infrastructure and essential services.

   b. The second phase is long term reconstruction which may continue for years after a disaster and includes:
      (1) Utilization of recovery and reconstruction plans.
      (2) Utilization of programs to provide temporary housing and public assistance.
      (3) Coordinating County, State and Federal assistance.
      (4) Ensuring that recovery and redevelopment activities conform with all regulations relating to environmental impact.
      (5) Monitoring recovery and redevelopment progress.
      (6) Preparation of periodic progress reports to be submitted as required by County, State and / or Federal authorities.

D. Public Information on Recovery Assistance

1. The Town is responsible for ensuring that public information about recovery assistance is publicized, this includes:

   a. Types of emergency assistance that may be available to the public, including:
      (1) Food stamps.
      (2) Temporary housing.
      (3) Unemployment assistance and job placement.
      (4) Veteran's benefits.
      (5) Social Security benefits.
      (6) Disaster and emergency loans.
      (7) Tax refunds.
      (8) Individual and family grants.
      (9) Legal assistance.

b. Who provides assistance.

c. Who is eligible for assistance.

d. What records are needed to document damage suffered in the disaster.

e. How and where to apply for assistance.

f. Deadlines for submitting applications for assistance.

2. All information disseminated to the public about recovery assistance shall be maintained as part of the Town's official record.

Town of Mount Pleasant

Comprehensive

Emergency Management Plan

Section VI:

Appendix

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B. Agency Specific Actions

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A. Hazard Identification and Risk Analysis New York (HIRA-NY)

Background:

On April 28, 2011, the Town of Mount Pleasant (TMP) conducted a hazard analysis using the automated program, Hazards Identification and Risk Assessment New York (HIRA-NY), developed by the American Red Cross and New York State Office of Emergency Management (NYSOEM). This hazard analysis document is a key component in the process of creating a multi-hazard plan and will constitute a major section of your multi-hazard mitigation plan document; it forms the basis for our risk and vulnerability assessment. The results of this hazard analysis are presented in this report.

HIRA-NY evaluates five factors that are the cornerstones in the hazard analysis process. In considering these factors, it is also expected that the risk assessment components of the all-hazard mitigation planning process as outlined in 44 CFR Part 201, under which the hazard mitigation plan is being developed, will also be developed. The risk assessment process is required to identify all hazards that can impact a community and the profiling of the most prevalent hazards. Profiling hazard involves consideration of a) location or geographic areas affected; b) extent or magnitude / severity; c) previous occurrences; and d) probability of future occurrences. These five factors are:

1. Scope – This factor looks at two aspects: (1) What area or areas in your jurisdiction could be impacted by the hazard location and (2) What are the chances of the hazard triggering another hazard causing a cascade effect?

2. Onset – How much time is there between the initial recognition of an approaching hazard and when the hazard begins to impact the community? This is a very important factor because for some hazards (e.g. drought) ample warning time is available so that if plans and procedures have not been developed, there is still time to accomplish such. On the other hand, an earthquake could occur at any time without a warning and cause severe damage.

3. Impact – This factor involves the analysis of a hazard's impact on the community's infrastructure, private property and people.

4. Duration (also an indicator of extent) – This factor is concerned with three durations: (1) How long does the hazard remain active? (2) How long do emergency operations continue after the hazard event? (3) How long does the recovery process take?

5. Frequency (past occurrences) – This factor indicates how often a hazard has resulted in an emergency or disaster; historical frequency can also be a prediction of how often a hazard will

occur in the future (probability of future occurrences). Frequency is established by recording historical events and determining time intervals between each occurrence.

HIRA-NY and the Town of Mount Pleasant

HIRA-NY is an automated interactive spreadsheet that asks specific questions on potential hazards in a community and records and evaluates the responses to these questions. The selections made in HIRA-NY are based on information entered into preformatted Microsoft Excel worksheets recommended by FEMA and NYSOEM. HIRA-NY also includes historical and expert data on selected hazards. HIRA-NY is designed specifically for groups, rather than individual use. The TMP assembled a group of local officials (participants in the Town's Emergency Management Council) to consider and discuss the questions and issues raised by the HIRA-NY program. Representatives from NYSOEM and Westchester County Office of Emergency Management (WCOEM) facilitated the meeting and recorded the results.

All hazards potentially affecting the TMP were analyzed. HIRA-NY rated each hazard based on the group's assessment and assigned a numerical value; these values are categorized as follows:

321 to 400	High Hazard
241 to 320	Moderately High Hazard
161 to 240	Moderately Low Hazard
44 to 160	Low Hazard

The Group rated the 24 hazards as follows:

Flood	296
Winter Storm (Severe)	263
Dam Failure	241
Severe Storm	238
Ice Storm	231
Fire	230
Extreme Temps	218
Terrorism	211
Tornado	210

Utility Failure	195
Earthquake	194
Explosion	194
Trans Accident	187
HAZMAT (Fixed Site)	186
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Water Supply Contamination	185
Drought	180
Hurricane	180
Radiological (Fixed Site)	176
Epidemic	166
HAZMAT (In Transit)	158
Wildfire	156
Civil Unrest	153
Radiological (In Transit)	136

Hazards rated as moderately high: Flood; Winter Storm (Severe):

Flood:	296, Moderately High Hazard
Potential Impact:	Throughout a large region (location identified on map)
Cascade Effects:	Highly likely (cascading hazards identified and mapped) Explosion; Fire; Food Shortage; Fuel Shortage; HAZMAT (Fixed Site); HAZMAT (In Transit); Landslide; Oil Spill; Structural Collapse; Trans Accident; Utility Failure; Water Supply Contamination
Frequency:	A frequent event (frequency identified)
Onset:	No warning
Hazard Duration:	1 to 3 days
Recovery Time:	1 to 2 days
Impact:	Serious injury or death unlikely Moderate damage to private property Moderate structural damage to public facilities

Winter Storm (Severe):	263, Moderately High Hazard
Potential Impact:	Throughout a large region (locations identified on map)
Cascade Effects:	Some potential (cascading hazards identified and mapped) Fire; Food Shortage; Fuel Shortage; HAZMAT (Fixed Site); HAZMAT (In Transit); Oil Spill; Structural Collapse; Trans Accident; Utility Failure; Water Supply Contamination
Frequency:	A frequent event (frequency identified)
Onset:	1 day warning
Hazard Duration:	2 to 3 days
Recovery Time:	1 to 2 days
Impact:	Serious injury or death is likely, but not in large numbers Moderate damage to private property Moderate structural damage to public facilities

Hazards rated as moderately low: Dam Failure; Severe Storm; Ice Storm; Fire; Extreme Temps; Terrorism; Tornado; Utility Failure; Earthquake; Explosion; Trans Accident; HAZMAT (Fixed Site); Oil Spill; Water Supply Contamination; Drought; Hurricane; Radiological (Fixed Site); Epidemic:

Dam Failure:	241, Moderately Low Hazard
Potential Impact:	Single location (location identified on map)
Cascade Effects:	Highly likely (cascading hazards identified and mapped) Fire; Flood; HAZMAT (Fixed Site); HAZMAT (In Transit); Landslide; Oil Spill; Structural Collapse; Trans Accident; Utility Failure; Water Supply Contamination
Frequency:	A rare event (frequency identified)
Onset:	No warning
Hazard Duration:	1 day
Recovery Time:	More than 2 weeks
Impact:	Serious injury or death to extremely large numbers Severe damage to private property Severe structural damage to public facilities

Severe Storm:	238, Moderately Low Hazard
Potential Impact:	Throughout a large region (location indentified on map)
Cascade Effects:	Highly likely (cascading hazards indentified and mapped)

	Fire; Flood; HAZMAT (Fixed Site); HAZMAT (In Transit); Oil Spill; Structural Collapse; Trans Accident; Utility Failure; Water Supply Contamination
Frequency:	A frequent event (frequency identified)
Onset:	Several hours warning
Hazard Duration:	Less than 1 day
Recovery Time:	Less than 1 day
Impact:	Serious injury or death unlikely Little or no damage to private property Little or no structural damage to public property

Ice Storm:	231, Moderately Low Hazard
Potential Impact:	Throughout a large region (locations indentified on map)
Cascade Effects:	Highly likely (cascading hazards identified and mapped) Fire, Flood; HAZMAT (In Transit); Oil Spill; Structural Collapse; Trans Accident; Utility Failure; Water Supply Contamination
Frequency:	A regular event (frequency identified)
Onset:	Several hours warning
Hazard Duration:	2 to 3 days
Recovery Time:	1 to 2 days
Impact:	Serious injury or death unlikely Little of no damage to private property Moderate structural damage to public facilities

Fire:	230, Moderately Low Hazard
Potential Impact:	Single location (locations indentified on map)
Cascade Effects:	Some potential (cascading hazards indentified and mapped) Explosion; Fire; HAZMAT (Fixed Site); Structural Collapse; Utility Failure; Water Supply Contamination; Wildfire
Frequency:	A frequent event (frequency identified)
Onset:	No warning
Hazard Duration:	Less than 1 day
Recovery Time:	Less than 1 day
Impact:	Serious injury or death in likely, but not in large numbers Little or no damage to private property Little or no structural damage to public facilities

Extreme Temps:	218, Moderately Low Hazard
Potential Impact:	Throughout a large region (locations identified on map)

Cascade Effects:	Some potential (cascading hazards identified and mapped) Explosion; Fire; HAZMAT (Fixed Site); Oil Spill; Utility Failure; Water Supply Contamination
Frequency:	A regular event (frequency identified)
Onset:	1 day warning
Hazard Duration:	4 to 7 days
Recovery Time:	Less than 1 day
Impact:	Serious injury or death is likely, but not in large numbers Little or no damage to private property Moderate structural damage to public facilities

Terrorism:	211, Moderately Low Hazard
Potential Impact:	Throughout a large region (locations identified on map)
Cascade Effects:	Highly likely (cascading hazards identified and mapped) Civil Unrest; Dam Failure; Epidemic; Explosion; Food Shortage; Fuel Shortage; HAZMAT (Fixed Site); HAZMAT (In Transit); Oil Spill; Structural Collapse; Utility Failure; Water Supply Contamination
Frequency:	A rare event (frequency identified)
Onset:	No warning
Hazard Duration:	2 to 3 days
Recovery Time:	3 to 7 days
Impact:	Serious injury or death to large numbers Little or no damage to private property Moderate structural damage to public facilities

Tornado:	210, Moderately Low Hazard
Potential Impact:	Throughout a small region (location identified on map)
Cascade Effects:	Highly likely (cascading hazards identified and mapped) Explosion; Fire; HAZMAT (Fixed Site); HAZMAT (In Transit); Landslide; Oil Spill; Structural Collapse; Trans Accident; Utility Failure; Water Supply Contamination
Frequency:	An infrequent event (frequency identified)
Onset:	No warning
Hazard Duration:	Less than 1 day
Recovery Time:	3 to 7 days
Impact:	Serious injury or death is likely, but not in large numbers Moderate damage to private property Moderate structural damage to public facilities

Utility Failure:	195, Moderately Low Hazard
Potential Impact:	Throughout a large region (locations identified on map)
Cascade Effects:	Some potential (cascading hazards identified and mapped) Civil Unrest; Fire; Food Shortage; Fuel Shortage; Trans Accident; Water Supply Contamination
Frequency:	An infrequent event (frequency identified)
Onset:	No warning
Hazard Duration:	2 to 3 days
Recovery Time:	Less than 1 day
Impact:	Serious injury or death unlikely Little or no private property damage Little or no structural damage to public facilities

Earthquake:	194, Moderately Low Hazard
Potential Impact:	Throughout a large region (locations indentified on map)
Cascade Effects:	Highly likely (cascading hazards identified and mapped) Dam Failure; Explosion; Fire; Food Shortage; Fuel Shortage; HAZMAT (Fixed Site); HAZMAT (In Transit); Landslide; Oil Spill; Radiological (Fixed Site); Structural Collapse; Trans Accident; Utility Failure; Water Supply Contamination; Wildfire
Frequency:	A rare event (frequency identified)
Onset:	No warning
Hazard Duration:	1 day
Recovery Time:	3 to 7 days
Impact:	Serious injury or death is likely, but not in large numbers Moderate damage to private property Moderate structural damage to public facilities

Explosion:	194, Moderately Low Hazard
Potential Impact:	Single location (locations identified on map)
Cascade Effects:	Some potential (cascading hazards identified and mapped) Explosion; Fire; Flood; HAZMAT (Fixed Site); HAZMAT (In Transit); Oil Spill; Structural Collapse; Trans Accident; Utility Failure; Water Supply Contamination; Wildfire
Frequency:	A regular event (frequency identified)
Onset:	No warning
Hazard Duration:	Less than 1 day

Recovery Time:	Less than 1 day
Impact:	Serious injury or death is likely, but not in large numbers Little or no damage to private property Little or no structural damage to public facilities

Trans Accident:	187, Moderately Low Hazard
Potential Impact:	Single location (location identified on map)
Cascade Effects:	Some potential (cascading hazards identified and mapped) Explosion; Fire; HAZMAT (In Transit); Oil Spill; Utility Failure; Water Supply Contamination
Frequency:	An infrequent event (frequency identified)
Onset:	No warning
Hazard Duration:	1 day
Recovery Time:	1 to 2 days
Impact:	Serious injury or death is likely, but not in large numbers Moderate damage to private property Moderate structural damage to public facilities

HAZMAT (Fixed Site):	186, Moderately Low Hazard
Potential Impact:	Single location (locations identified on map)
Cascade Effects:	Some potential (cascading hazards identified and mapped) Oil Spill; Water Supply Contamination
Frequency:	A regular event (frequency identified)
Onset:	No warning
Hazard Duration:	Less than 1 day
Recovery Time:	Less than 1 day
Impact:	Serious injury or death unlikely Little or no damage to private property Little or no structural damage to public facilities

Oil Spill:	186, Moderately Low Hazard
Potential Impact:	Single location (location identified on map)
Cascade Effects:	Some potential (cascading hazards identified and mapped) Explosion; Fire; Trans Accident; Water Supply Contamination
Frequency:	A regular event (frequency identified)
Onset:	No warning
Hazard Duration:	Less than 1 day

Recovery Time:	Less than 1 day
Impact:	Serious injury or death unlikely Little or no damage to private property Little or no structural damage to public facilities

Water Supply Contamination:	185, Moderately Low Hazard
Potential Impact:	Throughout a large region (locations identified on map)
Cascade Effects:	Highly unlikely
Frequency:	An infrequent event (frequency identified)
Onset:	Several hours warning
Hazard Duration:	More than 1 week
Recovery Time:	1 to 2 days
Impact:	Serious injury or death unlikely Little or no damage to private property Little or no structural damage to public facilities

Drought:	180, Moderately Low Hazard
Potential Impact:	Throughout a large region (location identified on map)
Cascade Effects:	Some potential (cascading hazards identified and mapped) Extreme temps; Fire; Utility Failure; Water Supply Contamination; Wildfire
Frequency:	A regular event (frequency identified)
Onset:	More than 1 week warning
Hazard Duration:	More than 1 week
Recovery Time:	Less than 1 day
Impact:	Serious injury or death unlikely Little or no damage to private property Little or no structural damage to public facilities

Hurricane:	180, Moderately Low Hazard
Potential Impact:	Throughout a large region (location identified on map)
Cascade Effects:	Highly likely (cascading hazards identified and mapped) Explosion; Fire; HAZMAT (Fixed Site); HAZMAT (In Transit); Oil Spill; Structural Collapse; Trans Accident; Utility Failure; Water Supply Contamination
Frequency:	An infrequent event (frequency identified)
Onset:	Several days warning

Hazard Duration:	1 day
Recovery Time:	3 to 7 days
Impact:	Serious injury or death is likely, but not in large numbers Moderate damage to private property Moderate structural damage to public facilities

Radiological (Fixed Site):	176, Moderately Low Hazard
Potential Impact:	Single location (locations identified on map)
Cascade Effects:	Some potential (cascading hazards identified and mapped) Civil Unrest; HAZMAT (In Transit); Oil Spill; Trans Accident
Frequency:	A rare event (frequency identified)
Onset:	No warning
Hazard Duration:	More than 1 week
Recovery Time:	More than 2 weeks
Impact:	Serious injury or death unlikely Moderate damage to private property Little or no structural damage to public facilities

Epidemic:	166, Moderately Low Hazard
Potential Impact:	Throughout a large region (locations identified on map)
Cascade Effects:	Highly unlikely
Frequency:	An infrequent event (frequency identified)
Onset:	Several days warning
Hazard Duration:	More than 1 week
Recovery Time:	1 to 2 days
Impact:	Serious injury or death is likely, but not in large numbers Little or no damage to private property Little or no structural damage to public facilities

Hazards rated as low: HAZMAT (In Transit); Wildfire; Civil Unrest; Radiological (In Transit):

Hazmat (In Transit):	158, Low Hazard
Potential Impact:	Single location (locations identified on map)
Cascade Effects:	Some potential (cascading hazards identified and mapped) Explosion; Fire; Oil Spill; Trans Accident; Water Supply Contamination
Frequency:	An infrequent event (frequency identified)
Onset:	No warning

Hazard Duration:	Less than 1 day
Recovery Time:	Less than 1 day
Impact:	Serious injury or death likely, but not in large numbers Little or no damage to private property Little or no structural damage to public facilities

Wildfire:	156, Low Hazard
Potential Impact:	Single location (locations identified on map)
Cascade Effects:	Some potential (cascading hazards identified and mapped) Utility Failure
Frequency:	An infrequent event (frequency identified)
Onset:	No warning
Hazard Duration:	1 day
Recovery Time:	Less than 1 day
Impact:	Serious injury or death unlikely Little or no damage to private property Little or no structural damage to public facilities

Civil Unrest:	153, Low Hazard
Potential Impact:	Several locations (location identified on map)
Cascade Effects:	Some potential (cascading hazards identified and mapped) Civil Unrest; Explosion; Fire; HAZMAT (Fixed Site); HAZMAT (In Transit); Structural Collapse; Terrorism; Trans Accident
Frequency:	An infrequent event (frequency identified)
Onset:	Several hours warning
Hazard Duration:	1 day
Recovery Time:	Less than 1 day
Impact:	Serious injury or death is likely, but not in large numbers Moderate damage to private property Little or no structural damage to public facilities

Radiological (In Transit):	136, Low Hazard
Potential Impact:	Single location (locations identified on map)
Cascade Effects:	Some potential (cascading hazards identified and mapped) Fire; Trans Accident; Utility Failure
Frequency:	A rare event (frequency identified)
Onset:	No warning

Hazard Duration:	Less than 1 day
Impact:	Serious injury or death is likely, but not in large numbers Moderate damage to private property Little or no structural damage to public facilities

Hazards that occur most often:
Flood
Winter Storm (Severe)
Fire

Hazards that present the greatest threat to life:
Dam Failure
Terrorism

Hazards that occur with no warning:
Flood
Dam Failure
Fire
Terrorism
Tornado
Utility Failure
Earthquake
Explosion
Trans Accident
HAZMAT (Fixed Site)
Oil Spill
Radiological (Fixed Site)
HAZMAT (In Transit)
Wildfire
Radiological (In Transit)

B. Agency Specific Actions

1. Town Government

Declare State of Emergency

Open EOC

Notify media

Post notices on Town Website, Public Access TV and 211

Notify all Town residents via the County Emergency Notification System

Designate shelters at Town Hall and Community Center

Inventory shelter resources, cots, blankets, water and food

Assign Rec. Dept. personnel to supervise the shelters

Identify American Red Cross Liaison

Contact persons on the Special Needs Registry

Contact persons dependent on Life Sustaining Equipment

Coordinate with Villages and Westchester County

Notify all schools

Notify key personnel (Dept. Heads)

Assign staff to assist at Town Hall answering phones

Close Town offices

Notify non-essential Town personnel not to report for work

Prepare and secure all Town facilities for anticipated storm damage

Ensure a Town wide post-storm / event damage assessment is conducted

Ensure all responding departments / organizations document storm / event related costs, including manpower, equipment and materials usage

B. Agency Specific Action

2. Police Department

Open and staff EOC

Notify Emergency Management Council (EMC)

Request EMC representation in the EOC

Coordinate with all emergency management providers

Coordinate with WCOEM

12 hour shifts / 3 platoons

Prepare all equipment / fuel all vehicles

Marine Unit scheduling and equipment preparation and staging

Assign Traffic Safety personnel

Set up Town Hall shelter

Set up Community Center shelter

Stock provisions at Town Hall for assigned personnel

Conduct Town wide post-storm / event damage assessment, report findings to the EOC

Document all response costs including manpower, equipment and materials usage

B. Agency Specific Action

3. Highway Department

Pre-storm / event inspection of critical infrastructure

All personnel report for duty

Prepare staff duty schedule, including scheduled rest periods

Utilize available Rec. & Parks, Water & Sewer and Traffic Safety personnel

Prepare all motorized equipment

Prepare all barricades, sand bags, chain saws and emergency lighting

Stockpile road materials

Put private contractors on standby

Prepare to request or respond to mutual aid

Monitor critical infrastructure during the event

Post-storm / event inspection of critical infrastructure, document damage (take photos), report findings to the EOC, take protective actions

Document all response costs including manpower, equipment and materials usage

B. Agency Specific Action

4. Water & Sewer Department

Pre-storm / event inspection of critical infrastructure

Recall full staff

Prepare and fuel all vehicles, pumps and equipment

Man all pump stations

Ensure all emergency generators are operational

Monitor the status of Shaft 18 and filtration stations

Monitor flooded manholes and sewers

Request use of the Vactor

Board of Health notifications

Monitor critical infrastructure during the event

Post-storm / event inspection of critical infrastructure, document damage (take photos), report finding to the EOC, take protective actions

Document all response costs including manpower, equipment and materials usage

B. Agency Specific Actions

5. Recreation & Parks Department

Pre-storm / event inspection of critical infrastructure

Recall full staff

Prepare and fuel all vehicles, pumps and equipment

Ensure all emergency generators are operational

Assign personnel to shelter operation duties

Assign available personnel to assist the Highway Department

Monitor critical infrastructure during the event

Post-storm / event inspection of critical infrastructure, document damage (take photos), report findings to the EOC, take protective actions

Document all response costs including manpower, equipment and materials usage

B. Agency Specific Actions

6. Fire Service

Liaison assigned to the EOC

Coordinate with all emergency providers

Check all communications equipment, radios and cell phones

Charge all batteries

Prepare and fuel all apparatus, pumps, generators and saws

Prepare flares, barrier tape and EMS supplies

Notify membership, schedule staff standby and assign tasks

Monitor NOAA and NWS

Ensure care of members' families, shelter in place or evacuate to fire station or community shelter

Stock water, food and cots for members and their families

Check Special Needs residents, healthcare facilities and nursing homes

Relocate apparatus and equipment to alternate location (high ground) if necessary

Check local vendors for supplies and equipment

Prepare / secure fire station for anticipated storm damage

Sandbags from Highway Department

Conduct district wide assessment of storm damage, report findings to the EOC

Document all response costs including manpower, equipment and materials usage

B. Agency Specific Actions

7. Emergency Medical Services

Staff 12 hour shifts

Accommodations for duty crews, water, food and sleeping arrangements

Prepare and fuel all apparatus

Prepare and fuel all generators

Check all communications equipment, radios and cell phones

Charge all batteries

Confirm cell phone numbers

Official ID for crews

Request additional ALS resources

Plan for MCI

Check Special Needs residents, nursing homes and assisted living facilities

Prepare and secure corps building for anticipated storm damage

Relocate apparatus to high ground if necessary

Document all response costs including manpower, equipment and materials usage

TRANSCARE - Extra Car

B. Agency Specific Actions

8. Con Edison and other utilities

Coastal Storm Plan

CERC status

Establish 60 Control liaison

Establish municipal liaison (muni rep)

Stage equipment, relocate to high ground

Site safety

Conduct damage assessments

Establish task forces with municipal departments and other utilities to cut and clear to open roadways

Life Sustaining Equipment customers

Municipal priorities; emergency service providers, communications, water and sewer facilities, schools

Provide the EOC with updated damage assessments and estimates of service restoration

C. Emergency Shelter Operation Protocols

Emergency Shelter Locations:

1. Town Hall, 1 Town Hall Plaza, Valhalla:
2. Community Center, Lozza Drive, Valhalla

Emergency Shelter Equipment:

1. The Town has entered into an IMA with WCOEM for the use of a shelter equipment trailer containing shelter equipment and supplies for 300 persons.

2. Currently one shelter equipment bin for 30 persons has been removed from the trailer and is stored on the third floor of Town Hall.

3. The shelter equipment trailer, with the remaining equipment for 270 persons, is parked at the Community Center on Lozza Dr.

Deployment of Shelter Equipment:

1. Although the Town has use of the shelter equipment trailer as needed; it is also responsible to tow the shelter equipment trailer to another municipality at the request of WCOEM if so needed.

2. The Town may loan shelter equipment to local emergency service organizations.

3. Any organization accepting the loan of shelter equipment shall be responsible for the return of the equipment in good condition or shall replace any lost or damaged equipment.

Emergency Shelter Opening Procedures:

1. Staff (Town employees and volunteers) shall be assigned to prepare to open the emergency shelter.

2. A shelter manager (either Town employee or volunteer) shall be designated. The shelter manager position shall be reassigned to relief personnel as needed.

3. A police portable radio is to be assigned to the shelter manager for emergency use.

4. Shelter equipment bins shall be put in place. Do **not** set up shelter equipment until the number of displaced persons is known.

5. Ensure that electric generators are on site in case of a power failure. Town Hall has a backup generator, but the Community Center requires portable generators.

6. Ensure a supply of shelter registration forms are available.

7. Arrange for the delivery of shelter provisions (water and food).

8. Ensure the availability of refrigeration for displaced persons' medications.

9. Make necessary accommodations for displaced persons' pets.

10. Install shelter signs at Columbus Av. and Lozza Dr.

Emergency Shelter Reception:

1. Shelter staff shall utilize the provided shelter registration form to record pedigree information on all displaced persons entering the shelter; including information on any pets that accompany the displaced persons.

2. Upon registration, shelter staff shall specifically ask all displaced persons if they have any special needs, especially underlying medical issues that require treatment and / or medication.

3. EMS shall be immediately dispatched for all persons requiring medical aid.

4. Upon registration shelter staff shall provide displaced persons with a brief orientation to include:

a. The location of designated sleeping areas, restrooms and common or recreation areas.

b. The location of areas to be used to house and exercise pets.

c. Basic shelter rules, including being considerate and respectful of others, no loud or boisterous behavior, keeping pets leased or caged at all times, etc.

D. EOC Notification Protocols

1. The Town EOC is located in the Lower Conference Room of Town Hall. Should the Town Hall EOC be unusable, for whatever reason, the EOC may be moved to an alternative location to be determined.

2. The Town of Mount Pleasant Emergency Management Council (EMC) was created to provide the Town's elected officials the needed resources to aid in the decision making process

prior to, during and after a disaster or emergency. To meet this mission the representatives of the EMC are essential to staffing the EOC.

3. A decision to open the EOC may be made at the recommendation of any of the agencies who participate in the Town's EMC by notifying the Police Desk of the reason the EOC should be opened.

4. The Police Desk will commence notifying representatives of the EMC that the EOC is being opened and request that a representative of their organization or discipline respond:

Police Chief and Lieutenants
Town Supervisor or Deputy Town Supervisor
Fire Chiefs
EMS Captains
Highway Superintendent
Fire Marshall / Building Inspector
Superintendent of Water & Sewer
Superintendent of Recreation & Parks
Con Edison
Additional persons or organizations may be requested to respond to the EOC as needed.

5. All agencies represented in the EOC shall be organized according to ICS protocols and will utilize unified command.

6. The EOC may remain open 24/7; relief personnel are to be scheduled.

7. The decision to close the EOC shall be made after consultation with representatives from all participating agencies to ensure that the resources of the EOC are no longer needed.

E. EOC Setup Guide

1. Upon notification that the EOC is to be opened, the Police Desk is to:

   a. Commence making the necessary notifications.

   b. Assign personnel to set up the EOC in the Lower Conference Room.

2. The following equipment is to be made ready for use by EOC staff:

   a. Open the locked EOC cabinet.

   b. The Command Post radio box (stored in the Processing Room closet) is to be moved to the EOC and connected to the roof mounted antenna cables (located in the EOC cabinet) and electric power.

   c. The Westchester County EOC phone is to be disconnected from the Computer Room and connected in the EOC cabinet.

   d. Connect the 2 telephones (stored the EOC cabinet) to the wall jacks.

   e. Connect the mobile computer hotspot (stored in the EOC cabinet) to the wall jack and electric power.

   f. Tables and chairs will be set up as needed by EOC staff, with each represented discipline being allocated white board space.

   g. A supply of paper, pens, pencils, dry markers and erasers is located in the EOC cabinet.

   h. TV tuned to weather or local news station.

   i. Scanner tuned to local emergency channels.

   j. Intercom or personal handi-talkie radios for communications between Police Desk and EOC.

APPENDIX B

PLANNING TEAM MEETING DOCUMENTS

This Appendix compiles a list of Meeting Minutes and vital Planning Team Documents used in the HMP Report.

MEETING MINUTES

Project: Hazard Mitigation Plan (HMP)

Meeting Date: 3/24/2014

Time: 10:00 AM

Venue: Town of Mount Pleasant (TMP) – Engineering Department
1 Town Hall Plaza,
Valhalla, New York

Attendees: Shailesh Naik (SN) *CAMCE* David Smyth (DS) *TMP*
Raed Ghaly (RG) *CAMCE* Susan Closi-Maskiell (SCM) *TMP*

Item	Minutes	Action
1.	Community Rating System (CRS) Plan: Communities participating in CRS that go beyond the minimum standards for floodplain management under the National Flood Insurance Program (NFIP) are rewarded with discounts. DS - TMP is currently not participating in CRS. Will request Supervisor to sign the application. Will draft and send out a letter. We will put the CRS on an "ongoing" during the mitigation plan process.	DS
2.	DS - Review the FEMA Local Mitigation Planning Handbook.	RG
4.	Mitigation Plans by neighboring jurisdictions: DS - Pleasantville Mitigation Plan can be used as guide for ideas. We can ask them for a copy of their mitigation plan by sending a letter saying that we are working on a similar plan so that it is official. DS - Make sure we look at the border municipalities' mitigation plans such as Pleasantville's and see if they are depending on us (TMP) in their plan and/or if we find anything that is different or conflicts with the Town. SN – We have looked into and reviewed the plans by neighboring	

	municipalities: Sleepy Hollow, White Plains, Rye Brook, Rye, Peekskill etc. DS – Check to see New Castle, North Castle and Briarcliff. We might have to meet with neighboring municipalities to discuss. SCM – Remember seeing Briarcliff invitation to Joan. **Cont'd.** RG – Will make sure that the mitigation plans are not draft plans but approved by FEMA.	
5.	SN – Concentrate on gathering enough information as much as we can. We can include the Community and Stakeholder.	
6.	Identifying Planning Team Members .	DS
7.	Create an Outreach Strategy: Identify the Stakeholders DS – Westchester Planning Board should be invited we will also work on getting the organization involved. DS – We have to review where the town is in terms of Nuclear Power Plant but we should hold off on to this and do it on an as-needed basis. SN – Agencies involved such as: Schools, water facilities, dams, pump stations, jail and any facility that works with water is a critical facility	DS
9.	SCM – Susan will provide with Flood Maps. DS – When we put the Mitigation Plan to the Public, flooding issues will come up.	SCM
13	DS - The Mitigation Plan should include all Hazardous issues such as floods, hurricanes, tornados, earthquakes, and man-made hazards which threaten life and/or property. Should	

	focus on current flood and recurring issues in the Town and determine the locations of most occurrences. SCM – Westchester County will have a GIS event in which we should attend.	SN, RG
14	DS/SN – Pull out a list of all the drainage projects that were done in the past. Determine possible funding sources local/state/federal. DS – There is federal and state OEM. DS/ SCM – Find documentation on prior hazards for forecasting potential locations of hazards..	

GLOSSARY

MEETING MINUTES

Project: Hazard Mitigation Plan (HMP)
Meeting Date: 5/13/2014
Time: 10:00 AM
Venue: Town of Mount Pleasant (TMP) – Engineering Department
1 Town Hall Plaza,
Valhalla, NY

Attendees: Shailesh Naik (SN) *CAMCE* David Smyth (DS) *TMP*
Raed Ghaly (RG) *CAMCE* Susan Closi-Maskiell (SCM) *TMP*

Item	Minutes	Action
1.	Issues and Contact Personnel: DS – Contact Denis from Westchester County OEM. DS – Consider the New York State Hazard Mitigation Plan to determine what the State has already accomplished. The Town should use the State HMP as a guide, and should not repeat the tasks already accomplished by the State.	
2.	Assign Project Manager: Susan Closi-Maskiell to be the project manager.	SCM
3.	Documents and Records: SCM handed out the Flood Maps to the Town Consultant. DS – There are FEMA maps flood maps. We have to use the maps. Some local incidences are in locations which are not shown on FEMA Maps. Coordinate with the Town records.	RG
4.	Planning Team: Currently identified the following Town officials to the Planning Team: Town Supervisor, Joan Maybury; Superintendent of Water and	

	Sewer, Robert Guena; Building and Fire Inspector, Sal Pennelle; Police Chief, Paul Oliva; Highway Superintendent, Peter Sciliano; Superintendent of Recreation, Harry Canniff; Town Engineer, David Smyth; and Junior Town Engineer, Susan Closi-Maskiell DS – Will coordinate with Joan Mayberry about the Planning Team and set up a meeting for the HMP planning which will include: a. Finalizing Planning Team Members. b. Reason and objective of the Planning Team. c. Selecting the Stakeholder (send letters out) d. Tasks Allocation.	
5.	Questions and Concerns: DS – Questions to ask FEMA such as mutual municipalities to be included within the county and the Town's Mitigation Plan. DS – Should we have meetings w/ towns or villages that had previous Plans in place? DS – if there is any hazard on the border between two towns and/or if they are depending on one another? DS – Contact FEMA to get an idea of who we may use as a guidance and how to coordinate between various previously approved plans.	RG RG

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MEETING MINUTES

Project: Hazard Mitigation Plan (HMP)
Meeting Date: 5/29/2014
Time: 10:00 AM
Venue: Town of Mount Pleasant (TMP) – Engineering Department
1 Town Hall Plaza,
Valhalla, NY

Attendees: Shailesh Naik (SN) *CAMCE* David Smyth (DS) *TMP*
Raed Ghaly (RG) *CAMCE* Susan Closi-Maskiell (SCM) *TMP*

Item	Minutes	Action
1.	DS - Started the meeting w/ explaining the Mitigation Plan. SN - Followed up on DS's explanation and gave an overall description of the Hazard Mitigation Plan. We have to determine our stakeholders. How about the Hospitals? DS - Hospitals should fall under the county owned General Plan. However we should reach out to the county to make them aware of it. There are a lot of Agencies such as the DEP, DOT, local hospitals, Commercial business and Schools…etc. That is why we have this group to be able to tack all problems based on past experience. We will have a running list and we will make the appropriate changes to it as required. As far as the Stakeholders we need to send out a letter to the Stakeholders to request for attendance.	
2.	SN - Two issues to tackle in today's meeting:	

	1- Identify Hazards to be included in the HMP 2- Determine Stakeholders	
3.	BG - DEP has the largest chemical storage with the gaseous chlorine in which we had experience with that before. In addition to any Dam failure of course.	
4.	DS - Need to set up a table identifying all hazards or chemical danger and how to handle such danger before, during and after. DS - We definitely encountered power outage. We have to include all possible hazards so that we can fully prepared to deal with all hazard phases (before, during and after). Part of it could be just fuel shortage, the Town had talked about getting part of the mitigation may be to install xxx amount of gallons at the recreational center but it doesn't mean we have to go and fill it, once funding in available we can consider it. PO - If we have an extended event we have to make some sort of a plan or arrangement DS - Part of the Mitigation plan could be emergency purchases. PS - Maybe contact companies and make a deal with them to purchase on an emergency basis.	
5.	DS - The material we are looking for is for us to have these tools in which we are not put in a situation where we are in the middle of a Hurricane and not be prepared for it. DS - We have to prioritize our hazards in which we have to determine unlikely, likely or very likely to happen. HC - Showers is an issue.	

	DS - Maybe we can talk to companies (agencies) in which they can be part of our emergency contact at the time of an incident or a disaster such as: gyms or schools where the public can use their gyms. PO - Maybe we can include “shoot-out” in schools. Now we have active shooter plan in which if there is an active shooter the forces go in and deal with the situation but it is after the incident or at most during. We should learn how to prevent it or deal with it during the situation not after. SP - The Town building, if we have to evacuate the Town Building what is our potential areas or buildings to go in the Town and how to move the Government in Town. DS - The purpose of this plan is not to determine every little problem what it is to do is focus on the efficient hazards (dangerous). SN - We cannot focus on little things that are not a cause of a serious harm to the public and/or properties. CF - How do we communicate with the computer system if we are not in the building? That’s a Sullivan Data Issue, we need to get him on board (Stakeholder) – SP DS- meeting with Sullivan to discuss things such as what are our potential needs in some scenario, power outage, verify the system back up. SN - How secure is Sullivan System? DS - Part of the plan is how protective is the Town backup system. They might not have a protective system but this is the point of the plan is to address such issues. PO - It’s good for us to have a plan in place to handle these issues. PO- During Sandy fuel was an issue, it didn’t seem like food was too much of an issue, however there is a potential of such issues during natural and/or man-mad disasters.	

	JM - MRE's would be a good idea in terms of food during disasters. SP - Last storm we got our food supply from A&P PO - We keep a supply and demand there is one downstairs. SCM - As far as the stakeholders do we get all the stakeholders together or we set up separate meetings? DS - It depends certain agencies we might have to have separate meetings. But first we need to create a list of potential hazards potential impacts in town so that we know the appropriate questions to ask. Hazards that are on top of the list are: 1- Power outages. 2- Potential hazard material leaks 3- Flooding (It's not as bad for the Town as in others) 4- Solar emergency 5- If some other hazards SN - It would be logical if everyone here identifies the stakeholders that they think they could play a role in the HMP, Second is to identify hazards as it comes to your mind, finally what do you think the mitigation strategies that you would propose. DS - Harry, what are the situations that could affect you? HC - Personally the issues could be notifications, how are we going to get out to the people that certain things are closed. Try to work on to function as a center for the community. DS - at the time of disasters we need to focus on who is going to get the work done. We can have the right tools in place but do we have the expertise to put it to action. DS - WE do not have anything in place to say what we do in case ofan emergency. The plans main focus is to recognize what the hazards, categorize them as unlikely, likely, and very likely to occur then provide a plan to how to deal with all of these problems and whether we have the capacity to deal with such issues and if we do not we have to have steps in	

		place to deal with main hazardous materials.	
	JM -	We have to look at the construction of the building that we might use as a backup. "I like the school idea because of the construction of the schools, mostly brick buildings limited glass windows.	
	JM -	I always thought of a Fire House because you have everything you need there. Is the Fire House the first shelter option, is the community center the second location and what becomes the third location?	
	CF -	How far do we go on alternatives (relocating the government during emergency?	
	SP -	We have to make sure people can travel to the temporary government house in case of emergency, if we cannot get people there, there it's useless.	
	JM -	I think the recreational center is the best idea.	
	DS -	The federal will only fund those items that are in the plans. We will concentrate on the shelter and what would be most adequate. CAMCE will be working on the potential of probability of hazards happening as far as hurricanes, tornadoes, flooding. The flooding has to be outside the 500 year. The shelter buildings should be flood free zone.	
	SP -	Plan from the DEP of the catastrophic dam and the outflow of the water how far that water is going to travel on the parkway, almost up to the fire house.	DS
	DS -	We should include the DEP plan of the dam outflow in the HMP, we should a copy of this plan and include it in the HMP.	
	DS -	In case we have a dam break we should have a plan for it.	
	PS -	Check with Lu for the DEP plan.	

	JM - There is a meeting this evening in regards of hazards and one of the directions they are moving on is where to move the town hall in case of an emergency. All we have right now is that we are able to answer police calls at another location – that is all we have in place. JM - This thing about the EOC has been a holder for some information for this process as well, we can probably at some point go to this meeting and ask them about the feasibility going to that site in Valhalla. They should have no problem with it. DS - When we bring them in for a meeting we can mention these things to them will send a letter out to the JM - How about when we send a letter we combine it with the EOC meeting (meet every quarter) DS - We should use them as a tool to for the plan. What we do is create a draft in which the stakeholders and the public get to take a look at it and put their comments in. If we have any emergency plan it should be given to Shailesh. JM - Yes I have a binder downstairs. It was drafted by the EOC and adopted by the Town Board. And it has the list of people to call and such. What other functions do we need? I guess it would be the phones, how do you answer those phone calls and what you do if they can't reach you? PO - Verizon promised me to work on "blasting text msgs", they provide that service. It takes a while to set up. We do this also with facebook. SP - Is Verizon equipped to transfer the phone system to other location? DS - During power outage the people that are low on water and do not have generator, because your well is not working and you don't have a generator. Do we provide those	

	people with water? JM - We do not have a plan, we should provide a list of those people that would be affected by power outage. HC - We have a list of the people that are home on oxygen or disable. CF - Does it make any sense to have key personnel in different neighborhoods to notify people who cannot get out or disable or cannot communicate. JM - The SER-Team (Citizen Emergency Response Team), Volunteers. DS - DEP should set up signs and alarm sounds to notify people where to go at the time of emergency. JM - Do we need to know what to do if a tree goes into a house? DS - We do not know if we need to be that specific, however we should have something briefly in plan so that in such a case we know how to respond to it. CF - The people do not want to hear it is not the Town's responsibility. They want solutions. SN - We found that there was a lot of Plans that were on the Web. The ones that were approved are White Plans, Village of Sleepy Hollow, and Town of Warwick. JM - Why weren't the other plans approved? SN - They could be still in draft phase. DS - We also have a guide line and review manual that will guide us through the HMP planning and know what they look for to approve our Plan. DS - When it comes to the flooding part of it, We are supposed to look at the FEMA flood maps and we are supposed to point out area where there are localized flooding but it's not identified flooding map, the question is once you make those areas known they are picked up by FEMA and they might require flood insurance. We might want to think if its	

	repetitive flood or not. The way the Flood Maps are done over a period of 100 year flood plain which is 7 inches over 24 hrs so it's a slow gradual rainfall, rain event, what they are looking at is 25yrs, 50yrs rain events within an hour and fifteen minutes. So it's up to FEMA's interpretation to how to consider it. SN - Maybe we can come up with some kind of a table circulating hazards with their description and how to handle then before, during and after disaster occur. DS - When should we meet again? SN - Within 4 weeks DS - Susan is going to be the Project Manager on this, so any other information she will be the point of contacts.	

MEETING MINUTES

Project: Hazard Mitigation Plan (HMP)

Meeting Date: 7/02/2014

Time: 9:30 AM

Venue: Town of Mount Pleasant (TMP) – Engineering Department, 1 Town Hall Plaza, Valhalla, New York

Attendees:

Joan Maybury (JM) *TMP*	Carl Fulgenzi (CF) *TMP*	Bob Guena (BG) *TMP*
Susan Closi-Maskiell (SCM) *TMP*	David Smyth (DS) *TMP*	Paul Oliva (PO) *TMP*
Sal Pennelle (SP) *TMP*	Harry Canniff (HC) *TMP*	Peter Sciliano (PS) *TMP*
Shailesh Naik (SN) *CAMCE*	Raed Ghaly (RG) *CAMCE*	

Item	Minutes
1.	SN- CAMCE presented the list of all the hazards which correspond to the Town's comprehensive emergency management plan based on the HIRA-NY results. The hazards in CAMCE analysis report are listed in the same order as per the HIRA-NY. JM- The Town worked on a Hazard Mitigation Assessment (HIRA-NY) SN- The non-governmental agencies are not included in the Hazard Analysis Report which should be determined in today's meeting. CF- The supervisor should be the only person involved in all of the Hazards. Open discussion to determine government agencies (See Hazard Analysis Report). Open discussion to determine Stakeholders
	DS- Stakeholders that are interested in the plan would help shape and develop the plan. JM- Rosary Hill attended the EOC Meeting and Pepsi talked to us about their plan in case of disasters. Hence there could be a potential of them both participating in the preparation of the Mitigation Plan.

DS- We should add more stakeholders to our list such as Rosary Hill, Cedar Manor and Crestview Manor.

JM- Do we have a list of companies which have dangerous chemicals available?

PO- As a per the plan we get an updated list of hazardous chemicals that are stored in the Town.

DS- We should contact all commercial facilities with hazardous chemicals.

PO- We should also contact pharmaceutical companies.

JM- When notifying the Police Department we should automatically notify the Fire Department. There are new regulations in which chemicals must be listed. The public and the Fire Department must be notified.

CF- What about local environmental companies and local oil dealers?

DS- Environmental companies and local Oil dealers should be included in the preparation of this Plan.

JM- Do major Employers and businesses usually focus on helping during the storm?

DS- Involved Stakeholders should coordinate with the Town during a disaster to evacuate or use their resources. However the use of stakeholder's facility or resources can conflict w/ the Town as the Stakeholder might be seeking their use at the same time as a disaster.

JM- Pepsi always gave us resources and so does A&P, not so much from Shop Rite. There is a list of schools (JCCA) in which we can find out about the large one only.

DS- The Stakeholders will get a copy of the Mitigation Plan and they will fine tune it before it goes out to the Town Board as a draft. The Plan will then go out to the public for a comment period before sending it out as a final for the FEMA approval.

SCM- When do we get the Stakeholders Involved?

DS- The planning team should have a draft plan in place first before we get the Stakeholders involved. We need to concentrate on the next steps in the Mitigation Plan. This will entail What is the next step when getting the stakeholders involved, What are we expecting to do in the next meeting and

	when do we bring the Stakeholders in. JM- First we need to figure out what are our 1st, 2nd and 3rd choices of shelter. DS- We have to have an agreement with the Stakeholders, for example if we choose the girls scouts, their facilities are usually empty but they could have an event during an emergency or a disaster. CF- We should consider an empty facility as an option in case of a disaster. JM- We should consider relocating the Town Hall and determine the location to move the Town. HC- We could consider building a new building designed specifically for the Town Hall relocation. CAMCE to prepare a letter template for inviting stakeholders once the draft report is ready.

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MEETING MINUTES

Project: Hazard Mitigation Plan (HMP)

Meeting Date: 8/05/2014

Time: 9:30 AM

Venue: Town of Mount Pleasant (TMP) – Engineering Department, 1 Town Hall Plaza, Valhalla, New York

Attendees:

Joan Maybury (JM) *TMP*	Carl Fulgenzi (CF) *TMP*	Bob Guena (BG) *TMP*
Susan Closi-Maskiell (SCM) *TMP*	David Smyth (DS) *TMP*	Paul Oliva (PO) *TMP*
Sal Pennelle (SP) *TMP*	Harry Canniff (HC) *TMP*	Peter Sciliano (PS) *TMP*
Shailesh Naik (SN) *CAMCE*	Raed Ghaly (RG) *CAMCE*	

Item	Minutes
1.	SN- Open the meeting discussing various steps taken towards identifying risks and the actions taken towards the goals and objectives. RG- CAMCE added notes and classifications to the risk analysis report verifying the prevention, response and recovery to the related government agency. DS- Recommended to add “All” to the classification list in which one government agency is involved in all Hazard Activities. RG- CAMCE picked the first seven potential disasters in the risk assessment analysis to be analyzed in the Town Mitigation Plan. SN- CAMCE picked the Hazards to include in the report and analyze them based on their severity.

	SN-	Tornadoes are classified as low hazard; should we still consider it?
	DS-	Tornadoes are such a rare event in the Town we do not have to consider it.
	JM-	Hurricanes should be included in our Mitigation Plan.
	SN-	We are working on gathering the latest information on the severity of the hazards from HAZUS-NY.
	JM-	Hurricanes can fall under the same category as the Severe Storm.
	JM-	Was there times where the state or the county has funded us from FEMA?
	DS-	Yes, during tropical storms.
	JM-	FEMA had provided funding to the Town of Mount Pleasant three times in the past.
	SN-	The next step is to come up with mitigation goals and objectives. First, identify hazards, second, come up with goals followed by objectives.
		Currently CAMCE came up with the overall mitigation goals.
		Discussed mitigation goals and objectives.
	SN-	Next step after identifying the goals and objectives is to develop mitigation

	actions to prevent, respond and recover from disasters. DS- The purpose of the mitigation plan is help the government to assist the community prior to any disaster. SN- The mitigation plan is there to reduce the those losses to life and/or properties. JM- Is it our job to develop a broad education to the public, public officials, realtors, etc.? DS- There is a community resource system and that is part of their plan. CF- Storm Sewer Systems could be one of the reasons the public might use for their flood problems. DS- The public will always have an excuse or a reason to the floods, however, we should definitely consider our Storm Sewer Systems. We should have our Storm Sewer System (SSS) in our plan so that we can have a valid revenue source for funding a project such as upgrading the SSS. SN/DS- We have to have a mitigation plan in place for any FEMA funding. SN- CAMCE decided upon the major five goals for the plan, going into details regarding the objectives and actions to take in order to reduce the hazards impact on people and property. Some of the actions can be related to more than one objective. Actions not to be very specific to little areas when it does not have an impact on life. DS- Should the actions be general or specific to certain areas?

	SN- We will attempt to generate actions to serve various objectives and goals unless the objective is critical enough then it may require a specific action. CAMCE will begin with a plan to start up the process and send it to everyone on the planning team for feedback. SCM- We should have the draft report in place before we invite the stakeholders. DS- The purpose for sending out the stakeholder letters is to see who will contribute as a stakeholder and if not, will they sign someone else. The second letter is the invitation to the stakeholder. The first letter serves to give notice that there is a litigation plan in place. JM- Confirmed DS to send letters to other supervisors. CF- If no response to our letter, do they still remain on our stockholders list? SCM- We notify them by certified mail so that we have proof of notification. SN- We should include Westchester Airport DS- We will begin by making the appropriate changes to stakeholder's letter than mail it out. CAMCE will send. We can look into setting up forms on the web which can be filled in.

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MEETING MINUTES

Project: Hazard Mitigation Plan (HMP)

Meeting Date: 9/08/2014

Time: 9:30 AM

Venue: Town of Mount Pleasant (TMP) – Engineering Department, 1 Town Hall Plaza, Valhalla, New York

Attendees:

Susan Closi-Maskiell (SCM) *TMP* David Smyth (DS) *TMP*

Shailesh Naik (SN) *CAMCE* Raed Ghaly (RG) *CAMCE*

Item	Minutes
1.	SN- The chemical leak is a sensitive topic which may be done by an individual department DS- Asked if we should include the report. Discussion continued, to wait on the DEP in the Shareholders meeting and to ask about including the Chemical Hazards in our report. DS- Village of Mt. Kisco - recommended looking at the Noah program also included in Mt. Kisco. Make a list of examples of the Hazards; listing all hazards, write a blurb, do a table and propose it during the Stakeholder's Meeting. Examples of drought could be Pocantico situation contact Bob Guena regarding the drought. What is the likelihood? What is the plan of action in case of a drought? Are there any mitigation projects to reduce the impact of drought in the town. Discussions regarding White Plains and 9A explosions, which can and should be used as examples of certain scenarios, within the list of Hazards for the Stakeholders Meeting.

	Prepare list of critical facilities, list key infrastructure vulnerabilities. List the flood areas as we are doing them: 1) Brady Avenue 2) Cyprus Area Flooding 3) Weiter Drive Show the critical facilities on Flood Map to see whether they fall in those areas. Sue will look at the TMP- FIS (Flood Insurance Study) DS- Discussing current mitigation projects FUTURE EVENTS/ACTIIVITES/MEETINGS ON THE AGENDA: 9/12/14 – Friday Prepare: 1) List of Hazards 2) List of Critical Facilities 3) List of Infrastructure Vulnerabilities 9/22/14 - Monday Planning Team Meeting

	10/14/14 – Tuesday First Meeting with Stakeholders, provide them with lists of hazards and such.

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MEETING MINUTES

Project: Hazard Mitigation Plan (HMP)

Meeting Date: 9/22/2014

Time: 10:00 AM

Venue: Town of Mount Pleasant (TMP) – Engineering Department, 1 Town Hall Plaza, Valhalla, New York

Attendees:

Bob Guena (BG) *TMP*
Carl Fulgenzi (CF) *TMP*
Paul Oliva (PO) *TMP*
Susan Closi-Maskiell (SCM) *TMP*
David Smyth (DS) *TMP*
Harry Canniff (HC) *TMP*
Shailesh Naik (SN) *CAMCE*
Raed Ghaly (RG) *CAMCE*

Item	Minutes
1.	SN- Opens Meeting. Discussed potential occurring hazards in Town. The Mitigation Plan will focus on the most important hazards to the Town. Not all hazards will be analyzed for example: the chemical attacks which occur because they are done individually by the Town or WCC. DS- Discussed the list of hazards, their description and which hazards to include as Top 7. We have a stakeholder meeting on 10/15/14 to provide them with an overview on the HMP. SN- The hazards are listed in order based on their impact and frequency. CAMCE tried running the HIRA Program once again but according to FEMA personnel the HIRA-NY is being upgraded at the moment and the original hazard results from March, 2012 can be used.

	SN-DS Discussed hazard analysis list and critical facilities. PO- The DEP is building a new facility on Walker and Grasslane Road. Could be considered an essential facility. SN- CAMCE ran the flood analysis in the HAZUS program and will run the earthquake and hurricane analysis BG- Leroy Street area definitely floods. Discussed various areas to be listed and noted in the report. DS- Will make a list of the minor and major flood areas giving people the opportunity to comment on it. SN- No past examples of DAM failures. DS- Although we did not have an example of DAM failure we can show an issue that occurred in neighboring towns or villages so we can have the proper action for it. BG- There was a fire in Usonia and we were unable to get water from anywhere so tanks had to come up from Armonk. CF- We had an issue with rolling hills years ago.

	DS- The "mutual aid agreement" is just the agreement between towns to support each other in case of an emergency. PO- We have a monthly counter terrorists-zone 3 meeting in order to stay ahead of the game. DS- Due to past incidents, we may have to move HAZMAT (Fixed Site) up to our top 7 Critical Hazards to be analyze. DS- The issue of propane tanks in residential areas may have to be discussed with the DEP. SN- We may not have to relocate the HAZMAT (Fixed Site) to Top 7 on our list of Hazards because of the HIRA rating we can analyze it in our plan based on its severity. CF- Asks about some of the buildings with propane tanks. BG- We have had critical incidents where we had to buy additional water from Sleepy Hollow but never an issue of water restriction. No incidents of water supply contamination. DS- Discussed the list of stakeholders. SCM- Most stakeholders are confirmed, but some want to be notified when the draft plan is in

	place. DS- The next step is to assess the hazards and risks and create an inventory of mitigation strategies including goals and objections.

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MEETING MINUTES

Project: Hazard Mitigation Plan (HMP)

Meeting Date: 12/4/2014

Time: 10:00 AM

Venue: Town of Mount Pleasant (TMP) – Engineering Department, 1 Town Hall Plaza, Valhalla, New York

Attendees:

Bob Guena (BG) *TMP*
Susan Closi-Maskiell (SCM) *TMP*
Shailesh Naik (SN) *CAMCE*
Vishal Bhatty (VB) *CAMCE*
David Smyth (DS) *TMP*
Sal Pannelle (SP) *TMP*
Colleen Whitaker (CW) *DEP*
Paul Bennett (PB) *DEP*
Matt Warne (MW) *NYCDEP, BWS*

Item	Minutes
	DS opens meeting Hazardous materials for further analysis DS mentioned dam failure inundation maps at Stakeholder's meeting; PB asked if it was EAP or just inundation maps. Discussion continued, mentioned that Emergency Action Plan (EAP) was sent to Chief of TMP Police and Fire Depts. Updates for inundation maps should be sent around, EAP copies are controlled although readily available. DS asked about how to mention EAP within HMP. Discussion continued evacuations and notifications are responsibilities of local jurisdictions and should be mentioned that they exist. CW talks about Integrated Contingency Plan (ICP) that it mainly focuses on communication in a Chlorine release event and contacts at the Mount Pleasant PD. Also mentions annual drills with community for materials release events. Also ICP includes off-site consequence analyses and area of incidence based on 1-ton chlorine release and maximum wind conditions, following EPA standards. CW mentions annual community outreach and involvement (w/ powerpoint presentation) as a possible example for future mitigation actions. Also mentioned precedent of putting out radio announcements and newspapers. DS asks about evacuation plans for schools and major areas, and brings up a previous evacuation event. CW mentions Town is responsible for evacuation notices. SP recalls another prior event the Chief made the determination to evacuate based on

	readings outside of the building. CW says schools are secondary assembly areas, not within immediate danger but within a 1-mile radius. Off-site analyses factors where the risk ratings are depending on situations (wind, amount, etc.), but the Town is responsible for enacting evacuation plans. CW suggests to update ICP controlled copy with Police department, but not to put off-site analyses within HMP Report. The existence and management of off-site analyses should be mentioned at best. Evacuation plans are also not to be detailed in Report. SP mentions a list of hazardous materials mitigations plans: Pepsico, Regeneron, Progenics. Brings up a question with the new UV facility. CW says to be aware of EAP as well as ICP. PB mentions there are chemicals to clean the bulbs but not above a threshold. CW mentions that Pepsico would use ammonia for refrigeration, and would have a mitigation plant due to that. Radioactive materials have their own CFRs. Kensico Dam repairs come into discussion. PB mentions repairs on spillway, SP mentions stabilization on bank. Power failures mentioned. CW mentions several back-up power units. PB comments on issues with the HMP Report. Section 5 Coordination blank for point of contact, put MW for contact. Reference of Kensico Dam EAP should be in the Report. Section 8.5 DEP is part of planning and training exercises, it would be good to mention. CW mentions DEP is trained with Westchester County. List deviation in Section 6 for Hazards Lists. Critical emergency facilities don't mention Water Facilities. Snow removal would be good to mention in the report: DEP has its own snow removal. Minimal access to critical facilities to be mentioned in the report.

Project: Hazard Mitigation Plan (HMP)

Meeting Date: 2/3/2015

Time: 9:00 AM

Venue: Town of Mount Pleasant (TMP) – Engineering Department, 1 Town Hall Plaza, Valhalla, New York

Attendees:

Carl Fulgenzi (CF) *TMP*

Vishal Bhatty (VB) *CAMCE*

Richard Boscarino(RB) *CON. ED.*

Susan Closi-Maskiell (SCM) *TMP*

David Smyth (DS) *TMP*

Jane Skolnick(JS) *CON. ED.*

Shailesh Naik (SN) *CAMCE*

Sal Pannelle (SP) *TMP*

Item	Minutes
1.	VB opens meeting with discussion of hazard events that could impact Con. Ed. Utilities. RB mentions Eastview floods impact electrical facilities and poles for transfrormers. Damage to overhead lines are also prevalent from floods, storms, ice storms, and wind events. RB suggests that wind events should be mentioned. Nannyhagen wind events have caused previous damages to lines, and microbursts and macroblasts caused damages in other parts. Salting issues also may impact paving and manholes, but have no history within TMP. JS mentioned an ongoing study of NYS water mains that are near utility lines. These gas mains may be infiltrated by leaking water mains, or positioning of utility lines or water mains may interfere with needed construction on one or the other. SP notes that there is a considerable amount of water mains running adjacent to gas mains within the Town. RB mentioned Contracted Damage as a possibility; VB said it can be categorized as a subset of explosion hazards. RB mentioned that they have Emergency Response Plans available for gas leaks. RB questioned whether Emergency Response Plans would be in the report. VB mentioned that they will be mentioned, although not outlined in the report.

	CF asks if there is redundant power going to the UV plant, SP replies unsure. RB said earthquakes may affect gas mains and may lead to explosions and fires. After superstorm Sandy, Con. Ed. has produced gas main maps, although not for electric grids. RB mentions that loss of gas could be a major utility failure hazard, however there has yet to be a concern about this, citing multiple sources and a recent overabundance of gas rather than shortages.
2.	JS and RB mentioned, in regards to mitigation actions, that there has been foundation walling, storm hardening, and tree trimming activities ongoing in order to reduce impacts. Recently, Con. Ed. has input $1 billion into storm hardening, as a result of superstorm Sandy. Also mentions steel wire running over cables on power lines in order to deflect debris from above. JS said Con. Ed. has contingency plans in case of event at substation, while TMP only provides personnel to direct traffic. RB provides three substations as critical facilities: Eastview, Grasslands, and Commerce Street Substations

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Project: Hazard Mitigation Plan (HMP)

Meeting Date: 2/19/2015

Time: 10:00 AM

Venue: Town of Mount Pleasant (TMP) – Engineering Department, 1 Town Hall Plaza, Valhalla, New York

Attendees:

Shailesh Naik (SN) *CAMCE* Vishal Bhatty (VB) *CAMCE*

Susan Closi-Maskiell (SCM) *TMP* David Smyth (DS) *TMP*

Item	Minutes
	VB- Mitigation activities are designed to show priority of funding from grants for our mitigation activities. DS- It would be easier to label mitigation activites "High," "Medium", and "Low." In cases of general mitigation activities, labeling specific rankings is difficult. Also, this can be changed when sent in for review if more detail is needed. VB- The STAPLEE table provides a list of benefits and possible impediments to each activity (provided by FEMA), as a general guideline of "favorable" and "not favorable" or "not applicable". Counting the favorable categories gives a general idea on benefits. However, most of the activities have +'s across all categories. Not the case for "buy out flood plain structures," which had notably few favorable categories. It's possible to keep the "buy out" plan in the list as an example of not favorable activities, but we could remove it as well DS- We should keep it in, because it comes up in flood management plans that "buy out" plans are considered. It's always a consideration, even if the analysis for it generally turns out to be a costly option. DS- We just received and are currently reviewing information for that, we will provide that. Also not here is the EAP for the Kensico Dam. We should add that in here for an action plan, although it's more of a specific action plan. VB- Actually, we are looking for more specific plans, or to make our current general mitigation plans more specific. Actually, do we handle Dam EAPs? DS- We'll put a question mark on it for now. We'll go through them and see if we should cover dam EAPs VB- I haven't seen any in other HMPs, but then again, of all the other EAPs we reviewed, we have the most and largest dams to worry about. DS- So we may need to focus more attention on that.

	SN- Pocantico Lake Dam comes under the jurisdiction of the County, but the Kensico Dam is just the DEP? DS- Yes. Do we have a list of dams in the report? SN- Yes we have the four Pocantico Hills Dams, and Kensico Dam. We need to add the Pocantico Lake. DS- We'll call this a "high" priority. VB- You can also look at the STAPLEE table for the benefits, the priorities would be based on the costs versus the benefits. Although, this is one of the actions with +'s straight across. DS- Can we get a count on the these? VB- It got a little tricky with the environmental column. For instance, "effect on land and water," some of our mitigation actions have none. DS- We can put zeros for not applicable, or no impact. What would be a "not favorable" for "cost of action"? VB- What would be the threshold for that? DS- Maybe once we look this over, we can have a planning team meeting, we'll send out a notification for that, and have everyone look over the specifics, such as the thresholds. It's been a while since we had a planning team meeting, so this could be a good way to catch up everyone. VB- And get new ideas as well, we can always use new mitigation activity ideas. One of the problems is that this is a constant process, we'll be constantly modifying our ideas. DS- Back to the thresholds on costs, what did you put for "raise structures"? VB- Not favorable. What I found was most of this was relative, I don't have a definitive definition for "not favorable" here. DS- So that's about $200,000? Maybe we can make a threshold of $100,000. So going back to the Warning system, I'd give that a "High" rank. VB- What about the DEP Shaft 18 Plan? DS- Also High ranked. VB Also, for the DEP Shaft 18 Plan, I didn't know what to put for a description there. DS- Well, we might want to put that under the general "Evacuation Plans" action, because it's similar to the Dam EAPs. We want to figure out how these specific action plans coexist with the general plans. VB- Ideally, we want to get rid of the general actions instead and make them more specific. The more detailed plans would have a more accurate cost estimate, which means more accurate analysis on rankings. Like for "Construct berms", we would need a ballpark estimate on how many houses or area that's for.

	DS- Reverse 911, your cost is $10,000? And this number is from…? VB- Multiple other HMPs have given a similar estimate, so I went with that and highlighted it, since it was up for debate. DS- I can ask the police chief for more info on that. “Elevate furnaces and HVAC”, do we want to do a count on structures affected? We do have a list and number for structures impacted by the BFE. Do we have an elevation for each building? VB- We have the count on structures affected, it’s about 150. Although, we do not have individual elevations. FEMA estimates for us that the average BFE depth is about 3 feet on average. DS- We can also take estimates, such as “40% of structures within the BFE are at risk for HVAC inundation” and make our cost estimates based on that. SC- Then this would make the cost over the threshold, correct? DS- But this would be the cost for the Town, not the structures. We can say that we would champion certain amounts and activities, however. VB Is this for town structures or public structures? DS- There is two components—one for Town structures, one for responsibilities to structures at risk overall. VB- Then could we make two mitigation activities here? DS- Well, we don’t have much Town infrastructure at flood risk. VB- So then we can make this action for the overall structures at risk. SN- The City of Rye, houses along the Long Island Sound require you to raise your properties? DS- That would be part of a similar grant, but what they would do is rewrite your code so that any improvement to your house would include raising your house. SC- Should we change that project timeline to “ongoing”? DS- Depending on what we get back from Sal. VB- I just sent an e-mail to figure out the CRS, I haven’t heard back from them. DS- Buying Sand Bags, we’re already doing that, I need to talk to Peter for the costs. He buys them as he needs them, but I would call this an ongoing project. It would also be High ranked, because it’s low cost. “Check Valves” SN- Would this be a town code, not a town payment? DS- This would be a town assisted action. For the “Buy out structures”, this would be a per structure project and our cost would be based on that. FEMA would assist with the buyout, so the planning mechanism would be the OEM. The project rank would be low, due to the high costs. DS- Verify flood zones, the costs would be just staff salary.

	VB- Each of the other HMPs I looked at had some mitigation activity that was “do the Hazard Mitigation Plan.” Technically, this would be a part of it, maybe? DS- Public Education and mailings, we’ll need mailing costs from Peter. SN- The planning mechanism here would be HMP DS- Public Education Events, this would include mailing or costs for announcement and we would want to keep the costs as low as possible. DS- Volunteer staff to CERT Program, we would need to get info from Ryan. We would need to have maintenance and operations, that would be unfavorable on STAPLEE. We do have high interest on the project, so let’s put it as a “High ranking. DS- Relocate structures vulnerable to hazards, I’m trying to think of hazards located near hazards. VB- I’m not sure if we can relocate structures based on dam failures, but maybe floods? DS- I know there is one school near Kensico Dam that raises the risk. But let’s not bring that into the picture, it should already be accounted for. VB- I haven’t seen any major buildings within the flood plains. DS- What we can do is look at the flood plains and see if there are any restrictions. SN- I have a question of Dana Street, where the Town was looking to buy out DS- There are still floods in that area. SC- We did all the paperwork for the buyout, but then the project got cancelled. DS- Relocating structures would be something like how the abutments to a bridge might cause backwater flooding. SN- For reinforcing structures, there is a Highway garage that needed reinforcement VB- I think one of the targets here was roof reinforcement for icing DS- For the “stock shelters” plan, I think we should not use Edith Macy as an example here since it isn’t established yet. SC- But the Rec center and Town Hall would be good examples. DS- Edith Macy can be used under a separate action as “establish shelters”. The costs for that would just be the legal fees, since it’s an agreement. SC- We would have to pay for upkeep and rental fees for the situation? And upkeep during that time. DS- There would still be a cost per day for us renting during the time. VB- For “Regular Emergency Warning Tests”, the costs listed were costs per callout, which we needed info for.

	DS- We can look up costs from Paul, but I'm not sure if we do regular tests. SN- We can add drainage projects as completed projects, where the problem areas are and activities we looked at. SC- What is the chronology for the public hearings and meetings? VB- We have no template for this. Also, on a similar note, we have questionaires that we could give to the public. SC- One idea we had was to use postcards to advertise that these forms were on our website. DS- Another thing is that we were looking into redoing our Town website, and adding new things to it. The HMP Report and these questionnaires could go up as well.

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Project: Hazard Mitigation Plan (HMP)

Meeting Date: 5/28/15

Time: 9:00 AM

Venue: Town of Mount Pleasant (TMP) – Engineering Department, 1 Town Hall Plaza, Valhalla, New York

Attendees:

Bob Guena (BG) *TMP*
Vishal Bhatty (VB) *CAMCE*
Paul Oliva (PO) *TMP*
Susan Closi-Maskiell (SCM) *TMP*
David Smyth (DS) *TMP*
Peter Sciliano (PS) *TMP*
Shailesh Naik (SN) *CAMCE*
Carl Fulgenzi (CF) *TMP*

Item	Minutes
1	DS- On construction of Berms, to construct a berm in the Water District area to protect the buildings west of Nanny Hagen Brook, the berm would need to be 8 feet high and 2,000 LF, and would cost $1.6 million. We would need to look into possibilities for smaller berms covering smaller segments, and hydraulic studies for the impact on upstream and downstream flood zones. Costs estimate around $14 per cubic yard of material. SN – We also have a map showing possible paths for sand bag placement to protect the Pleasantville Volunteer Ambulance Corps. (PVAC) and surrounding areas in the Water district. Option 1 would block off traffic on Grammercy Place and secures a route for exit for PVAC, Option 2 lines the sand bags around the stream but would have greater effects on the floodplains elsewhere and would need a similar study to the berms. DS – The options only need to protect the building, since they preemptively evacuate the area. Operations do not continue during storm events from this location. Calculations show that it would cost around $13 per bag, and 7,300 bags would be needed to cover 350 LF for a 4 ft. high wall. CF – Information for time placing sand bags is needed, and amount of preparation before a storm event. VB – The requirements need evacuation and rerouting covered for critical facilities, of which only PVAC is in the 500-year floodplain.
2	VB – Also given out is a copy of the Plan Adoption section from the HMP Report, however past May 28, 2015 are only tentative dates, and we would like to discuss finalizing these dates. CF –The minimum time we need between a Public Meeting Announcement Resolution and a Public Meeting is two weeks minimum. We can look at June 9th for the resolution, and June 24th for the Public Meeting. SCM – We need to have the Report on the Town website before the June 24th Public Meeting, although we'll have to consider the file size limit for the website.

	VB – The full report in Word is around 50 MB, although in PDF it will be around 30 MB. We can also break it into sections, the largest ones are the Appendices CF – We might have the website redone around that time, and the file capacity might increase from that. DS – Setting up the website should be our first priority. CF – We also need physical copies of the Draft Report available to the public. Two copies to be available at Town Hall, and two for libraries in the Town. DS – An endpoint for public comments needs to be set after the June 24th meeting, at least 30 days after the meeting and a week or two to address those comments. We will call an end to the comments on July 29th, and a Final Draft completed on August 12th. After that, we need to have the Town Board review the Final Draft. CF – The next available Town Board Meeting would be September 1st, which means that we can approve the resolution to submit to NYSOEM/FEMA at the September 8th meeting. VB – The next two dates, for the Adoption of the Plan and response to NYSOEM/FEMA comments are dependent on how long it takes for them to return comments to us. SCM – It is estimated to take three to six months for that, so we should expect comments in late 2015 to early 2016. VB – We have estimated dates in the Report for re-submission to FEMA, but only if they require it. The latest we would expect the final Adoption is June 2016.

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Town of Mount Pleasant
Hazard Mitigation Plan Project
Kick Off Meeting
Monday, March 24, 2014 @ 10:00 AM, Town Hall

Name	Agency/Firm	Phone	E-Mail
DAVID SMYTH	TOWN OF MOUNT PLEASANT	914-742-2317	dsmyth@mtpleasantny.com
Susan Closi	" " " "	914-742-2349	sclosi@mtpleasantny.com
Shailesh Naik	Charles A. Manganaro Consulting Engineers, P.C.	914-769-0000	snaik@camenginuers.com
Raed Ghaly	CAMCE P.C.	914-769-0000	rghaly@camenginuers.com

Name	Signature	Date
DAVID SMYTH	[illegible]	5/13/14
Susan Closi	Susan Closi	5/13/14
Shailesh Naik	Shailesh R. Naik	5/13/14
Raed Shaly	[illegible]	5/13/14

CHARLES A. MANGANARO
CONSULTING ENGINEERS
A PROFESSIONAL CORPORATION

SIGN-IN SHEET

TOWN OF MOUNT PLEASANT

MULTI-HAZARD MITIGATION PLAN

Wednesday, May 28, 2014 at 9:00 A.M.

Name	Organization	Telephone & Fax Number	Initials
Shailesh R. Naik, P.E. President	Charles A. Manganaro Consulting Engineers. P.C.	Tel. No. 914-769-0000 Fax. No. 914-769-1976	SNaik
Raed Ghaly Project Manager	Charles A. Manganaro Consulting Engineers. P.C.	Tel. No. 914-769-3400 Fax. No. 914-769-1976	R.G
Joan Maybury Supervisor	Town of Mount Pleasant	Tel. No. 914-742-2337 Fax. No.	Jm
Carl Fulgenzi Councilman	Town of Mount Pleasant	Tel. No. 914-557-2590 Fax. No. 914-773-1461	CF
David Smyth Town Engineer	Town of Mount Pleasant	Tel. No. 914-742-2349 Fax. No.	D.S.
Susan Closi-Maskiell Town Junior Engineer	Town of Mount Pleasant	Tel. No. 914-742-2349 Fax. No.	SusanClosi
Robert Guena. Supt of Water/Sewer	Town of Mount Pleasant	Tel. No. 914-831-1062 Fax. No. 914-831-2679	RG
Peter Sciliano Highway Superintendent	Town of Mount Pleasant	Tel. No. 914-769-1045 Fax. No. (914) 769-0563	PSciliano
Paul Oliva Police Chief	Town of Mount Pleasant	Tel. No. 914 769-1551 C 914 774-0394 Fax. No. 914 769-7199	PO
Sal Pennelle Building Inspector	Town of Mount Pleasant	Tel. No. 914-742-2351 Fax. No. 769-3155	SP
Harry ~~Caniff~~ CANNIFF Superint. of Recreation	Town of Mount Pleasant	Tel. No. 760-9376 Fax. No. 769-1070	HC

CHARLES A. MANGANARO
CONSULTING ENGINEERS
A PROFESSIONAL CORPORATION

SIGN-IN SHEET

TOWN OF MOUNT PLEASANT

MULTI-HAZARD MITIGATION PLAN

Wednesday, July 2, 2014 at 9:30 A.M.

Name	Organization	Telephone & Fax Number	Initials
Shailesh R. Naik, P.E. President	Charles A. Manganaro Consulting Engineers. P.C.	**Tel. No. 914-769-0000** **Fax. No. 914-769-1976**	SN
Raed Ghaly Project Manager	Charles A. Manganaro Consulting Engineers. P.C.	**Tel. No. 914-769-3400** **Fax. No. 914-769-1976**	R.G
Joan Maybury Supervisor	Town of Mount Pleasant	**Tel. No. 914-742-2337** **Fax. No. 914-769-3155**	JM
Carl Fulgenzi Councilman	Town of Mount Pleasant	**Tel. No. 914-557-2590** **Fax. No. 914-773-1461**	CF
David Smyth Town Engineer	Town of Mount Pleasant	**Tel. No. 914-742-2318** **Fax. No. 914-769-3155**	D.S.
Susan Closi-Maskiell Town Junior Engineer	Town of Mount Pleasant	**Tel. No. 914-742-2349** **Fax. No. 914-769-3155**	SMC
Robert Guena. Supt of Water/Sewer	Town of Mount Pleasant	**Tel. No. 914-831-1062** **Fax. No. 914-831-2679**	
Peter Sciliano Highway Superintendent	Town of Mount Pleasant	**Tel. No. 914-769-1045** **Fax. No. 914-769-0563**	P.S
Paul Oliva Police Chief	Town of Mount Pleasant	**Tel. No. 914-769-1551** **Cell No. 914-774-0394** **Fax. No. 914-769-7199**	
Sal Pennelle Building Inspector	Town of Mount Pleasant	**Tel. No. 914-742-2351** **Fax. No. 914-769-3155**	
Harry Canniff Superint. of Recreation	Town of Mount Pleasant	**Tel. No. 914-760-9376** **Fax. No. 914-769-1070**	

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CHARLES A. MANGANARO
CONSULTING ENGINEERS
A PROFESSIONAL CORPORATION

SIGN-IN SHEET

TOWN OF MOUNT PLEASANT

MULTI-HAZARD MITIGATION PLAN

Tuesday, August 5, 2014 at 9:30 A.M.

Name	Organization	Telephone & Fax Number	Initials
Shailesh R. Naik, P.E. President	Charles A. Manganaro Consulting Engineers. P.C.	Tel. No. 914-769-0000 Fax. No. 914-769-1976	SN
Raed Ghaly Project Manager	Charles A. Manganaro Consulting Engineers. P.C.	Tel. No. 914-769-3400 Fax. No. 914-769-1976	R.G.
Joan Maybury Supervisor	Town of Mount Pleasant	Tel. No. 914-742-2337 Fax. No. 914-769-3155	Jm
Carl Fulgenzi Councilman	Town of Mount Pleasant	Tel. No. 914-557-2590 Fax. No. 914-773-1461	Cf
David Smyth Town Engineer	Town of Mount Pleasant	Tel. No. 914-742-2318 Fax. No. 914-769-3155	D.S.
Susan Closi-Maskiell Town Junior Engineer	Town of Mount Pleasant	Tel. No. 914-742-2349 Fax. No. 914-769-3155	SMC
Robert Guena. Supt of Water/Sewer	Town of Mount Pleasant	Tel. No. 914-831-1062 Fax. No. 914-831-2679	
Peter Sciliano Highway Superintendent	Town of Mount Pleasant	Tel. No. 914-769-1045 Fax. No. 914-769-0563	Sciliano
~~Paul Oliva~~ ~~Police Chief~~ Robert Milianuro Lieutenant	Town of Mount Pleasant	Tel. No. 914-769-1551 Cell No. 914-774-0394 Fax. No. 914-769-7199	BM
Sal Pennelle Building Inspector	Town of Mount Pleasant	Tel. No. 914-742-2351 Fax. No. 914-769-3155	
Harry Canniff Superint. of Recreation	Town of Mount Pleasant	Tel. No. 914-760-9376 Fax. No. 914-769-1070	

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Signing Sheet 9/8/2014

MEETING w/ TMP.

Name	Signiture
Raed Ghaly	[illegible]
Shailesh Naik	Shailesh Naik
David Smyth	[illegible]
Susan Closi	Susan Closi

manganaro
ENGINEERS

SIGN-IN SHEET

TOWN OF MOUNT PLEASANT

MULTI-HAZARD MITIGATION PLAN

Monday, September 22, 2014 at 10:00 A.M.

Name	Organization	Telephone & Fax Number	Initials
Shailesh R. Naik, P.E. President	Charles A. Manganaro Consulting Engineers. P.C.	**Tel. No. 914-769-0000** **Fax. No. 914-769-1976**	SN
Raed Ghaly Project Manager	Charles A. Manganaro Consulting Engineers. P.C.	**Tel. No. 914-769-3400** **Fax. No. 914-769-1976**	R.G
Joan Maybury Supervisor	Town of Mount Pleasant	**Tel. No. 914-742-2337** **Fax. No. 914-769-3155**	
Carl Fulgenzi Councilman	Town of Mount Pleasant	**Tel. No. 914-557-2590** **Fax. No. 914-773-1461**	CF
David Smyth Town Engineer	Town of Mount Pleasant	**Tel. No. 914-742-2318** **Fax. No. 914-769-3155**	D.S.
Susan Closi-Maskiell Town Junior Engineer	Town of Mount Pleasant	**Tel. No. 914-742-2349** **Fax. No. 914-769-3155**	SMC
Robert Guena. Supt of Water/Sewer	Town of Mount Pleasant	**Tel. No. 914-831-1062** **Fax. No. 914-831-2679**	
Peter Sciliano Highway Superintendent	Town of Mount Pleasant	**Tel. No. 914-769-1045** **Fax. No. 914-769-0563**	
Paul Oliva Police Chief	Town of Mount Pleasant	**Tel. No. 914-769-1551** **Cell No. 914-774-0394** **Fax. No. 914-769-7199**	
Sal Pennelle Building Inspector	Town of Mount Pleasant	**Tel. No. 914-742-2351** **Fax. No. 914-769-3155**	
Harry Canniff Superint. of Recreation	Town of Mount Pleasant	**Tel. No. 914-760-9376** **Fax. No. 914-769-1070**	

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manganaro
ENGINEERS

SIGN-IN SHEET

TOWN OF MOUNT PLEASANT

MULTI-HAZARD MITIGATION PLAN

Wednesday 15, 2014 at 10:00 A.M.

Name	Organization	Telephone & Fax Number	Initials
Shailesh R. Naik, P.E. President	Charles A. Manganaro Consulting Engineers. P.C.	**Tel. No. 914-769-0000** **Fax. No. 914-769-1976**	SN
Raed Ghaly Project Manager	Charles A. Manganaro Consulting Engineers. P.C.	**Tel. No. 914-769-3400** **Fax. No. 914-769-1976**	R.G
Joan Maybury Supervisor	Town of Mount Pleasant	**Tel. No. 914-742-2337** **Fax. No. 914-769-3155**	
Carl Fulgenzi Councilman	Town of Mount Pleasant	**Tel. No. 914-557-2590** **Fax. No. 914-773-1461**	CF
David Smyth Town Engineer	Town of Mount Pleasant	**Tel. No. 914-742-2318** **Fax. No. 914-769-3155**	D.S.
Susan Closi-Maskiell Town Junior Engineer	Town of Mount Pleasant	**Tel. No. 914-742-2349** **Fax. No. 914-769-3155**	SMC
Robert Guena. Supt of Water/Sewer	Town of Mount Pleasant	**Tel. No. 914-831-1062** **Fax. No. 914-831-2679**	
Peter Sciliano Highway Superintendent	Town of Mount Pleasant	**Tel. No. 914-769-1045** **Fax. No. 914-769-0563**	MB
Paul Oliva Police Chief	Town of Mount Pleasant	**Tel. No. 914-769-1551** **Cell No. 914-774-0394** **Fax. No. 914-769-7199**	
Sal Pennelle Building Inspector	Town of Mount Pleasant	**Tel. No. 914-742-2351** **Fax. No. 914-769-3155**	
Harry Canniff Superint. of Recreation	Town of Mount Pleasant	**Tel. No. 914-760-9376** **Fax. No. 914-769-1070**	

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TOWN OF MOUNT PLEASANT - HMP STAKEHOLDERS MEETING
NOV. 12, 2014
TMP RECREATION BLDG.

NAME	ORGANIZATION	PHONE	EMAIL
1. Peter Kelly	Valhalla Schools	914-804-6101	PKelly@valhallaschools.org
2. James Tipa	MTA Metro-North Railroad	914-461-0458	Tipa@mnr.org
3. Brian Anderson	Pace University	914 923 2818	BANDERSON@PACE.EDU
4. Robert Guerna	Town of Mt. Pleasant	914-831-1062	RGUERNA@MTPleasantNY.com
5. David Smyth	Town of Mt. Pleasant	914-742-2317	dSmyth@MtPleasantNY.com
6. Jeff Pitonzo	TransCare	914 663 8860	JEFFP@Transcare.com
7. Michael Brancamp	Westchester County Dept. of Public Safety	914 864-7702	MQB4@westchesterguv.com
8. Asterio Scopino	Pleasantville Fire	9145225379	ascopino@pfdny.org
9. Lois Allen	Blythedale	914-592-7555	loisa@blythedale.org
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TOWN OF MOUNT PLEASANT HMP STAKEHOLDERS MEETING
NOV. 12, 2014
TMP REC. BUILDING

	NAME	ORGANIZATION	PHONE	EMAIL
1	JOHN DONATO	VALHALLA UFSD	683-5000 x 4511	JDONATO@VALHALLASCHOOLS.org
2	David Vogt	Edith Macy Conf Ctr	914-945-8004	dvogt@edithmacy.com
3	LOUIS PETTY	HAWTHORNE CEDAR KNOLLS UFSD	914.749.2929	lpetty@hcks.org
4	OWEN BRADY	Blythedale Children Hosp.	914.831.2493	OWENB@Blythedale.org
5	ROGER GRIFFITH	WCDPW & T	(914)995-2556	rgg8@westchestergov.com
6	DAVE KVINGE	WC PLANNING	(914) 995-2089	DSK2@ " "
7	S. Mary Edwin	Rookery Hill Home	914-769-0114 #4	Hawthorne Nursing Home Sredwin@
8	Dave Graves	NYS Dept of Transportation	518-320-2079	dave.graves@dot.ny.gov
9	DANE SOLNICK	Con Edison	914-925-6496	solnickj@coned.com
10	Steve Chamberlain	Pleasantville UFSD	914-746-1414	chamberlains@pvillaufsd.org
11	Susan Closi	Town of Mt. Pleasant	914-742-2349	sclosi@mtpleasant.com
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TOWN OF MOUNT PLEASANT - HMP STAKEHOLDERS MEETING

NOV. 12, 2014

TMP RECREATION BUILDING

NAME	ORGANIZATION	PHONE	EMAIL
1. Luigi Vingo	Con Edison	914-925-6357	VINGOL@ConED.com
2. Jay Scotto-Friedman	Pocantico Hills CSD	914-631-2440 ext 108	Jscotto-friedman@pocanticohills.o
3. DAVID TURIANO	BRIARCLIFF MANOR	944-2770	ENGINEER@BRIARCLIFFMANOR.ORG
4. TED JACKSON	EDITH MACY CONF. CNTR	945-0318	TEJACKSON@GULSCOUTS.ORG
5. Paul Hoole	FEMA	cell 518-742-0419	paul.hoole@fema.dhs.go
6. Larry Bamberger	AT&T	631-424-3163	lbamberger@att.co
7. Carl Fulgenzi	Mt Pleasant	742-2300	cfulgenzi@mtpleasant
8. Shailesh Naik	Maganaro Engineers	769-0000	snaik@camengineers.
9. HARDY CANNIFF	MT PLEASANT	766-9376	hCANNIFF@MTPleasant
10. Stan Steele	Pocantico Hills	631-2440 ext. 109	SSteele@pocanticohill
11. Glenn Sullivan	TMP-IT	914-488-8810	gsullivan@sullivan
12. Sal Pennelle	TMP Building Dept.	914-879-0415	spennelle@mtpleasantny
13. CHARLES SUTTER	WC DPW+T	914-813-7761	CJS2@WESTCHESTERGOV.COM
14. Bob O'Hanlon	BMFD	914-714-8265	fdchief@briarcliffmanor
15. Ryan Roggens	MPPD/EMT	914 769 1941	RRoggens@MtPleasantNY
16. Louise Carosi Doyle	WCDEF	914 813 5404	LLD9@westchestergov.com
17. Maureen Desmond	Blythedale	914-831-2582	maureend@blythedale.org
18. PAUL OLIVA	MPPD	914-769-1941	POLIVA@MTPLEASANTNY.COM
19. Adrienne Scivolette	PepsiCo	845-729-8767	Adrienne.Scivolette@pepsico
20. Brian Mahoney	EF Academy	914-774-5517	Brian.Mahoney@ef.cu
21. Kevin Stewart	Red Cross	646-315-2109	kevin.stewart@redcross.org
22. Peter Sciliano	mtPleasantHighway	769-1045	psciliano@mtpleasantny.com

HMP MEETING w/ NYCDEP 12/4/14 @ 10AM

Attendance sheet 12.04.2015

Shailesh Naik	CAMCE	snaik@camengineers.com
SAL PENNELLE	TMP	SPennelle@mtPleasantNY.com
Susan Closi	TMP	sclosi@mtpleasantny.com
Colleen Whitaker	DEP	whitakerc@dep.nyc.gov
Paul Bennett	DEP	~~pat~~ pbennett@dep.nyc.gov
ROBERT GUENA	TMPWD	RGUENA@MTPLEASANTNY.COM
Matt Warne	NYCDEP, BWS	mwarne@dep.nyc.gov
DAVID SMYTH	TMP engineering	dsmyth@mtpleasanty.com
Vishal Bhatty	CAMCE	vbhatty@camengineers.com

PREPARED BY

DATE 2/3/15

Town of Mt. Pleasant / ConED HMP Meeting

Signature	Phone	Email
Richard Boscarino	347 203 3576	Boscarinor@coned.com
DAVID SMYTH (TMP)	914-742-2317	dsmyth@mtpleasantny.com
Jane Solnick	914-925-6496	Solnickj@coned.com
Carl Fulgenzi	914-742-2301	cfulgenzi@mtpleasanty.com
Vishal Bhatty	914-787-0186	vbhatty@camerginners.com
Shailesh Naik	914.769.0000	snaike camerginners.com
Susan Closi	914-742-2349	sclosi@mtpleasantny.com
Sal Pennelle	914-742-2351	spennelle@mtpleasantny.com

HMP Status Meeting 2/19/15 @ 10AM TMP ED Meeting Room

NAME	ORGANIZATION	SIGNATURE
DAVID SMYTH	TMP-ENGINEERING	
Susan Closi	TMP-ENGINEERING	Susan Closi
Vishal Bhatty	CAMCE	Vishal Bhatty
Shailesh Naik	CAMCE	Shailesh R. Naik

NEXT MEETING - MARCH 4 TO 6 - 9 TO 10:30 AM

CHARLES A. MANGANARO
CONSULTING ENGINEERS
A PROFESSIONAL CORPORATION

SIGN-IN SHEET

TOWN OF MOUNT PLEASANT

MHMP Planning Team Meeting

Friday, March 13, 2015 at 9:00 A.M.

Name	Organization	Telephone & Fax Number	Initials
S. Naik	CAMCE	Tel. No. 914.769.0000 Fax. No. 914.769.1976	SN
V. Bhatty	CAMCE	Tel. No. 914-769-0000 Fax. No. 914-769-1976	VB
J Pennelle	TMP	Tel. No. 914-742-2305 Fax. No.	SC
P. OLIVA	MPPD	Tel. No. 914-769-1551 Fax. No.	PO
R. GUENA	TMP W&S	Tel. No. 914-831-1062 Fax. No. 914-831-2679	[illegible]
S. Closi	TMP ENG.	Tel. No. 914-742-2317 Fax. No.	SMC
DAVID Smith	TMP ENG	Tel. No. 914-742-2318 Fax. No.	D.S.
Carl Fulgenzi	Supervisor	Tel. No. 914-742-2301 Fax. No.	CF
Peter Siciliano	Highway	Tel. No. (914) 769-1045 Fax. No. (914) 769-0563	PS
		Tel. No. Fax. No.	
		Tel. No. Fax. No.	

TOWN OF MOUNT PLEASANT, NEW YORK

TOWN OF MOUNT PLEASANT
HAZARD MITIGATION PLAN MEETING
SIGN-IN SHEET

Wednesday, April 29, 2015 at 9:00 A.M.

Name	Organization	Telephone & Fax Number
Shailesh R. Naik	Charles A. Manganaro Consulting Engineers. P.C.	Tel. No.914-769-0000
		Fax. No. 914-769-1976
Vishal M. Bhatty	Charles A. Manganaro Consulting Engineers. P.C.	Tel. No. 914-769-0000
		Fax. No. 914-769-1976
DAVID SMYTH	TMP-Engineer	Tel. No. 914-742-2317
		Fax. No.
Carl Fulgenzi	Supervisor	Tel. No. 914-742-2301
		Fax. No.
PAUL OLIVA	CHIEF OF POLICE	Tel. No.
		Fax. No.
ROBERT GUENA	TMP- WATER & SEWER	Tel. No. 914 831-1062
		Fax. No. 914 831-2679
Susan Closi	TMP ENG. DEPT.	Tel. No. 914-742-2317
		Fax. No.
Kellie Rizzi	TMP Recreation + Parks Dept.	Tel. No. 914-742-2335
		Fax. No. 914-769-1070
		Tel. No.
		Fax. No.

TOWN OF MOUNT PLEASANT, NEW YORK

TOWN OF MOUNT PLEASANT
HAZARD MITIGATION PLAN MEETING
SIGN-IN SHEET

Thursday, May 28, 2015 at 9:00 A.M.

Name	Organization	Telephone & Fax Number
Shailesh R. Naik	Charles A. Manganaro Consulting Engineers. P.C.	Tel. No.914-769-0000
		Fax. No. 914-769-1976
Vishal M. Bhatty	Charles A. Manganaro Consulting Engineers. P.C.	Tel. No. 914-769-0000
		Fax. No. 914-769-1976
DAVID SMYTH	TMP ENGINEERING	Tel. No. 914-742-2318
		Fax. No.
Carl Fulgenzi	TMP Supervisor	Tel. No. 742-2301
		Fax. No.
ROBERT GUENA	TMP WATER & SEWER	Tel. No. 914-831-1062
		Fax. No. 914 831-2679
PAUL OLIVA	MT. PLEASANT P.D.	Tel. No. 914-774-0394
		Fax. No. 914-769-7199
Susan Closi	MT. PLEASANT ENGINEERING	Tel. No. 914-742-2349
		Fax. No.
Peter Sciliano	mt Pleasant Highway	Tel. No (914) 769-1045
		Fax. No (914) 769-0563
		Tel. No.
		Fax. No.

Town of Mount Pleasant
1 Town Hall Plaza
Valhalla, NY 10595

Town of Mount Pleasant : Multi- Hazard Mitigation Plan (MHMP)

Public Meeting - Wednesday July 15, 2015 Time: 3:00 pm – 5:00 pm
Sign-in Sheet

Name	Address	Phone /Email	Comments:
Joseph Muccin	69 Eastview Dr. Valhalla, NY	914-610-6686	
DAVID SMYTH TMP ENGINEERING	ONE TOWN HALL PLAZA VALHALLA, NY 10595	914-742-2317	PRESENTER.
SAL PENNELLE TMP Building	1 Town Hall Plaza Valhalla	914-742-2351	
Shailesh Naik	7 West Cross Street Hawthorne, NY 10532	914.769.0000	Presenter
Vishal Bhatty	7 West Cross St Hawthorne, NY 10532	914.769.0000	Presenter
Susan Closi	1 Town Hall Plaza Valhalla, NY	914-742-2317	Presenter - Assistant

Town of Mount Pleasant
1 Town Hall Plaza
Valhalla, NY 10595

Town of Mount Pleasant : Multi- Hazard Mitigation Plan (MHMP)

Public Meeting - Wednesday July 15, 2015 Time: 7:00 pm – 9:00 pm
Sign-in Sheet

Name	Address	Phone /Email	Comments:
Laurie Smalley	19 Maple Hill Rd Valhalla	682-8437 lrogerssmalley@hotmail.com	
Shailesh Naik	7 West Cross street Hawthorne, NY 10532	914-769 0000 snaik@camengineers.com	Presenter
Susan Closi	1 TOWN HALL PLAZA Valhalla	914-742-2317	TMP ENGINEERING DEPT.
Vishal Bhatty	7 West Cross St Hawthorne, NY, 10532	914.769.0000	Presenter
David Smyth	One Town Hall Plaza, Valhalla, NY 10595	914.742.2317	Presenter.

ENGINEERING DEPARTMENT

DAVID A. SMYTH, P.E.
Town Engineer
SUSAN MASKIELL-CLOSI
Junior Civil Engineer

MEMORANDUM

TO: Supervisor Fulgenzi & Town Board Members
FROM: David Smyth, P.E.
SUBJECT: Public Meeting for TMP Hazardous Mitigation Plan
DATE: June 23, 2015

Authorization is requested to hold a Public Meeting on Wednesday July 15, 2015 for the purpose of making available the Town's Hazard Mitigation Plan (HMP) to the general public for their input and comments. The HMP will also be made available to the public via the Town's website.

The Town will receive public comments up until the close of business on Monday August 17, 2015

End of memo.

David Smyth, P.E.

Cc: Patricia Scova, Town Clerk
Darius Chafizadeh, Town Attorney

ONE TOWN HALL PLAZA VALHALLA, N.Y. 10595 PHONE: 914-742-2317 FAX: 914-831-1636

- Recycled Paper -

Town of Mount Pleasant: Multi-Hazard Mitigation Plan (MHMP)

The Town of Mount Pleasant (TMP) announces the release of their draft MHMP for review and input by Town residents and business owners, including the general public. Two (2) meetings are planned on July 15th to present and discuss this report.

Public Meeting

Wednesday July 15, 2015

3:00 pm – 5:00 pm

and

7:00 pm – 9:00 pm

at

Town Hall

(Court Room)

1 Town Hall Plaza

Valhalla, New York 10595

After the presentation there will be an open forum for questions and comments. The MHMP will be available for review on the Town's website and at the Mount Pleasant Public Library's located on 350 Bedford Road in Pleasantville, NY 10570 and at 125 Lozza Drive in Valhalla, New York 10595

For further information, contact

David Smyth, P.E.

Town Engineer

1-914-742-2317

A 30-day public comment period will commence upon closure of the evening meeting and remain open until August 17, 2015. The public comment period is an opportune time to provide any information or comment on the Town's Multi-Hazard Mitigation Plan.

Please submit all written comments to: David A. Smyth, P.E., Town Engineer, Town of Mount Pleasant, 1 Town Hall Plaza, Valhalla, NY 10595.

APPENDIX C.

HAZUS-MH MODEL OUTPUT

This appendix shows the direct results of HAZUS-MH software-generated summary reports, which were used in Section 6 of the HMP Report.

HAZUS Flood Reports

1. 100-Year Flood Report
2. 500-Year Flood Report

HAZUS Hurricane Reports

1. Quick Assessment Report
2. 50-Year Hurricane Report
3. 100-Year Hurricane Report
4. 200-Year Hurricane Report
5. 500-Year Hurricane Report
6. Hurricane DONNA Historical Assessment
7. Hurricane GLORIA Historical Assessment

HAZUS Earthquake Reports

1. 500-Year Earthquake Report
2. 1,000-Year Earthquake Report
3. 2,500-Year Earthquake Report

Hazus-MH: Flood Event Report

Region Name: TMP- Flood

Flood Scenario: 100 Year Flood Event

Print Date: Wednesday, October 15, 2014

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- New York

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 23 square miles and contains 652 census blocks. The region contains over 8 thousand households and has a total population of 26,835 people (2000 Census Bureau data). The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 9,417 buildings in the region with a total building replacement value (excluding contents) of3,367 million dollars (2006 dollars). Approximately 87.80% of the buildings (and 69.74% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 9,417 buildings in the region which have an aggregate total replacement value of 3,367 million (2006 dollars). Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	2,348,299	69.7%
Commercial	719,245	21.4%
Industrial	138,367	4.1%
Agricultural	11,692	0.3%
Religion	39,962	1.2%
Government	17,042	0.5%
Education	92,693	2.8%
Total	**3,367,300**	**100.00%**

Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	555,715	59.1%
Commercial	296,771	31.6%
Industrial	61,672	6.6%
Agricultural	3,733	0.4%
Religion	5,507	0.6%
Government	10,141	1.1%
Education	6,522	0.7%
Total	**940,061**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 2 hospitals in the region with a total bed capacity of 327 beds.
There are 20 schools, 5 fire stations, 2 police stations and no emergency operation centers.

Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	TMP- Flood
Scenario Name:	100 Year Flood Event
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

General Building Stock Damage

Hazus estimates that about 28 buildings will be at least moderately damaged. This is over 22% of the total number of buildings in the scenario. There are an estimated 5 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 5.3 of the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		Substantially	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	0	0.00	0	0.00	0	0.00	1	100.00	0	0.00	0	0.00
Education	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	0	0.00	1	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Religion	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Residential	0	0.00	5	19.23	3	11.54	6	23.08	7	26.92	5	19.23
Total	**0**		**6**		**3**		**7**		**7**		**5**	

Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		Substantially	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
ManufHousing	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	0	0.00	5	19.23	3	11.54	6	23.08	7	26.92	5	19.23

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 327 hospital beds available for use. On the day of the scenario flood event, the model estimates that 327 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Fire Stations	5	0	0	0
Hospitals	2	0	0	0
Police Stations	2	0	0	0
Schools	20	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 2,073 tons of debris will be generated. Of the total amount, Finishes comprises 76% of the total, Structure comprises 15% of the total. If the debris tonnage is converted into an estimated number of truckloads, it will require 83 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 273 households will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 559 people (out of a total population of 26,835) will seek temporary shelter in public shelters.

The total economic loss estimated for the flood is 80.43 million dollars, which represents 8.56 % of the total replacement value of the scenario buildings.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 79.34 million dollars. 1% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 18.91% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	9.82	15.31	2.66	1.10	28.89
	Content	5.38	32.30	5.15	6.21	49.03
	Inventory	0.00	0.55	0.82	0.06	1.42
	Subtotal	**15.20**	**48.16**	**8.62**	**7.37**	**79.34**
Business Interruption						
	Income	0.00	0.17	0.00	0.00	0.17
	Relocation	0.01	0.04	0.00	0.01	0.06
	Rental Income	0.00	0.03	0.00	0.00	0.03
	Wage	0.00	0.11	0.00	0.71	0.82
	Subtotal	**0.01**	**0.35**	**0.00**	**0.72**	**1.08**
ALL	**Total**	**15.21**	**48.51**	**8.62**	**8.09**	**80.43**

Appendix A: County Listing for the Region

New York

- Westchester

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Westchester	26,835	2,348,299	1,019,001	3,367,300
Total	26,835	2,348,299	1,019,001	3,367,300
Total Study Region	26,835	2,348,299	1,019,001	3,367,300

Hazus-MH: Flood Event Report

Region Name: TMP

Flood Scenario: 500 Year Flood Event

Print Date: Wednesday, October 15, 2014

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale . These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- New York

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 23 square miles and contains 652 census blocks. The region contains over 8 thousand households and has a total population of 26,835 people (2000 Census Bureau data). The distribution of population by State and County for the study region is provided in Appendix B .

There are an estimated 9,417 buildings in the region with a total building replacement value (excluding contents) of 3,367 million dollars (2006 dollars). Approximately 87.80% of the buildings (and 69.74% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 9,417 buildings in the region which have an aggregate total replacement value of 3,367 million (2006 dollars). Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	2,348,299	69.7%
Commercial	719,245	21.4%
Industrial	138,367	4.1%
Agricultural	11,692	0.3%
Religion	39,962	1.2%
Government	17,042	0.5%
Education	92,693	2.8%
Total	**3,367,300**	**100.00%**

Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	542,413	58.7%
Commercial	295,168	31.9%
Industrial	61,353	6.6%
Agricultural	3,733	0.4%
Religion	5,382	0.6%
Government	10,141	1.1%
Education	6,522	0.7%
Total	**924,712**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 2 hospitals in the region with a total bed capacity of 327 beds.
There are 20 schools, 5 fire stations, 2 police stations and no emergency operation centers.

Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	TMP
Scenario Name:	500 Year Flood Event
Return Period Analyzed:	500
Analysis Options Analyzed:	No What-Ifs

General Building Stock Damage

Hazus estimates that about 34 buildings will be at least moderately damaged. This is over 26% of the total number of buildings in the scenario. There are an estimated 6 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 5.3 of the Hazus Flood Technical Manual . Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		Substantially	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	0	0.00	0	0.00	0	0.00	1	100.00	0	0.00	0	0.00
Education	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Religion	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Residential	0	0.00	6	18.18	3	9.09	9	27.27	9	27.27	6	18.18
Total	**0**		**6**		**3**		**10**		**9**		**6**	

Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		Substantially	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
ManufHousing	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	0	0.00	0	0.00	0	0.00	0	0.00	1	100.00	0	0.00
Steel	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	0	0.00	6	18.75	3	9.38	9	28.13	8	25.00	6	18.75

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 327 hospital beds available for use. On the day of the scenario flood event, the model estimates that 327 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Fire Stations	5	0	0	0
Hospitals	2	0	0	0
Police Stations	2	0	0	0
Schools	20	1	0	1

If this report displays all zeros or is blank, two possibilities can explain this.

(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 2,213 tons of debris will be generated. Of the total amount, Finishes comprises 77% of the total, Structure comprises 14% of the total. If the debris tonnage is converted into an estimated number of truckloads, it will require 89 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 287 households will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 596 people (out of a total population of 26,835) will seek temporary shelter in public shelters.

The total economic loss estimated for the flood is 86.78 million dollars, which represents 9.38 % of the total replacement value of the scenario buildings.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 85.83 million dollars. 1% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 20.17% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	11.32	16.90	2.96	0.90	32.08
	Content	6.17	35.37	5.85	4.76	52.15
	Inventory	0.00	0.61	0.93	0.06	1.60
	Subtotal	**17.49**	**52.88**	**9.74**	**5.72**	**85.83**
Business Interruption						
	Income	0.00	0.18	0.00	0.00	0.18
	Relocation	0.01	0.04	0.00	0.01	0.06
	Rental Income	0.00	0.03	0.00	0.00	0.03
	Wage	0.00	0.12	0.00	0.56	0.68
	Subtotal	**0.01**	**0.37**	**0.00**	**0.57**	**0.95**
ALL	**Total**	**17.50**	**53.25**	**9.74**	**6.28**	**86.78**

Appendix A: County Listing for the Region

New York

- Westchester

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Tota
Westchester	26,835	2,348,299	1,019,001	3,367,300
Total	**26,835**	**2,348,299**	**1,019,001**	**3,367,300**
Total Study Region	**26,835**	**2,348,299**	**1,019,001**	**3,367,300**

Quick Assessment Report

December 29, 2014

Study Region : TMP-Hurricane

Scenario : Probabilistic

Regional Statistics

Area (Square Miles)	24
Number of Census Tracts	6
Number of People in the Region	26,835

General Building Stock

Occupancy	*Building Count*	*Dollar Exposure ($ K)*
Residential	8,268	2,348,299
Commercial	743	719,245
Other	406	299,756
Total	9,417	3,367,300

Scenario Results

Number of Residential Buildings Damaged

Return Period	*Minor*	*Moderate*	*Severe*	*Destruction*	*Total*
10	0	0	0	0	0
20	3	0	0	0	3
50	12	0	0	0	13
100	96	3	0	0	99
200	411	24	0	0	435
500	1,307	177	5	3	1,493
1000	2,134	478	35	19	2,666

Number of Buildings Damaged

Return Period	*Minor*	*Moderate*	*Severe*	*Destruction*	*Total*
10	0	0	0	0	0
20	5	0	0	0	5
50	17	0	0	0	17
100	108	4	0	0	112
200	446	29	1	0	476
500	1,425	203	11	4	1,643
1000	2,346	556	52	20	2,973

Shelter Requirements

Return Period	*Displaced Households (#Households)*	*Short Term Shelter (#People)*
10	0	0
20	0	0
50	0	0
100	0	0
200	1	0
500	17	3
1000	56	11

Economic Loss (x 1000)

	Property Damage (Capital Stock) Losses		*Business Interruption*
ReturnPeriod	*Residential*	*Total*	*(Income) Losses*

10	0	0	0
20	15	15	0
50	1,470	1,571	4
100	5,791	6,133	37
200	13,472	14,766	709
500	37,157	42,788	4,011
1000	79,112	94,529	10,474
Annualized	452	537	48

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using HAZUS loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Hazus-MH: Hurricane Event Report

Region Name: TMP Hurricane

Hurricane Scenario: Probabilistic 50-year Return Period

Print Date: Wednesday, October 15, 2014

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- New York

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 24.25 square miles and contains 6 census tracts. There are over 7 thousand households in the region and has a total population of 26,835 people (2000 Census Bureau data). The distribution of population by State and County is provided in Appendix B.

There are an estimated 9 thousand buildings in the region with a total building replacement value (excluding contents) of 3,367 million dollars (2006 dollars). Approximately 88% of the buildings (and 70% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 9,417 buildings in the region which have an aggregate total replacement value of 3,367 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,348,299	69.7%
Commercial	719,245	21.4%
Industrial	138,367	4.1%
Agricultural	11,692	0.3%
Religious	39,962	1.2%
Government	17,042	0.5%
Education	92,693	2.8%
Total	**3,367,300**	**100.0%**

Essential Facility Inventory

For essential facilities, there are 2 hospitals in the region with a total bed capacity of 327 beds. There are 20 schools, 5 fire stations, 2 police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 50 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	50	99.67	0	0.32	0	0.01	0	0.00	0	0.00
Commercial	740	99.59	3	0.40	0	0.01	0	0.00	0	0.00
Education	32	99.57	0	0.43	0	0.00	0	0.00	0	0.00
Government	16	99.55	0	0.45	0	0.00	0	0.00	0	0.00
Industrial	261	99.56	1	0.44	0	0.00	0	0.00	0	0.00
Religion	46	99.67	0	0.32	0	0.01	0	0.00	0	0.00
Residential	8,255	99.85	12	0.15	0	0.00	0	0.00	0	0.00
Total	**9,400**		**17**		**0**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 50 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	237	99.37	2	0.63	0	0.00	0	0.00	0	0.00
Masonry	1,651	99.59	7	0.40	0	0.01	0	0.00	0	0.00
MH	8	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	553	99.54	3	0.45	0	0.00	0	0.00	0	0.00
Wood	6,949	99.92	6	0.08	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had 327 hospital beds available for use. On the day of the hurricane, the model estimates that 327 hospital beds (only 100.00%) are available for use. After one week, 100.00% of the beds will be in service. By 30 days, 100.00% will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate Damage > 50%**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Fire Stations	5	0	0	5
Hospitals	2	1	0	2
Police Stations	2	0	0	2
Schools	20	0	0	20

Induced Hurricane Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 271 tons of debris will be generated. Of the total amount, 102 tons (38%) is Other Tree Debris. Of the remaining 169 tons, Brick/Wood comprises 50% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 3 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 84 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, un-compacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 26,835) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 1.6 million dollars, which represents 0.05 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 2 million dollars. 1% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 94% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	1,253.44	71.92	13.84	14.97	1,354.17
	Content	216.60	0.00	0.00	0.00	216.60
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**1,470.04**	**71.92**	**13.84**	**14.97**	**1,570.77**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	1.47	0.40	0.00	0.03	1.90
	Rental	2.02	0.00	0.00	0.00	2.02
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**3.49**	**0.40**	**0.00**	**0.03**	**3.92**
Total						
	Total	**1,473.53**	**72.32**	**13.84**	**15.00**	**1,574.69**

Appendix A: County Listing for the Region

New York
- Westchester

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
New York				
Westchester	26,835	2,348,299	1,019,001	3,367,300
Total	**26,835**	**2,348,299**	**1,019,001**	**3,367,300**
Study Region Total	**26,835**	**2,348,299**	**1,019,001**	**3,367,300**

Hazus-MH: Hurricane Event Report

Region Name: TMP Hurricane

Hurricane Scenario: Probabilistic 100-year Return Period

Print Date: Wednesday, October 15, 2014

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- New York

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 24.25 square miles and contains 6 census tracts. There are over 7 thousand households in the region and has a total population of 26,835 people (2000 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 9 thousand buildings in the region with a total building replacement value (excluding contents) of 3,367 million dollars (2006 dollars). Approximately 88% of the buildings (and 70% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 9,417 buildings in the region which have an aggregate total replacement value of 3,367 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,348,299	69.7%
Commercial	719,245	21.4%
Industrial	138,367	4.1%
Agricultural	11,692	0.3%
Religious	39,962	1.2%
Government	17,042	0.5%
Education	92,693	2.8%
Total	**3,367,300**	**100.0%**

Essential Facility Inventory

For essential facilities, there are 2 hospitals in the region with a total bed capacity of 327 beds. There are 20 schools, 5 fire stations, 2 police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 4 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	49	98.79	1	1.09	0	0.09	0	0.02	0	0.00
Commercial	735	98.86	8	1.03	1	0.10	0	0.00	0	0.00
Education	32	98.97	0	1.02	0	0.01	0	0.00	0	0.00
Government	16	98.88	0	1.11	0	0.01	0	0.00	0	0.00
Industrial	259	98.86	3	1.11	0	0.03	0	0.00	0	0.00
Religion	46	99.07	0	0.90	0	0.02	0	0.00	0	0.00
Residential	8,169	98.81	96	1.16	3	0.03	0	0.00	0	0.00
Total	**9,305**		**108**		**4**		**0**		**0**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	235	98.38	4	1.60	0	0.02	0	0.00	0	0.00
Masonry	1,633	98.50	23	1.41	1	0.09	0	0.00	0	0.00
MH	8	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	549	98.81	6	1.10	1	0.09	0	0.00	0	0.00
Wood	6,885	98.99	69	0.99	2	0.02	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had 327 hospital beds available for use. On the day of the hurricane, the model estimates that 327 hospital beds (only 100.00%) are available for use. After one week, 100.00% of the beds will be in service. By 30 days, 100.00% will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate Damage > 50%**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Fire Stations	5	0	0	5
Hospitals	2	1	0	2
Police Stations	2	0	0	2
Schools	20	0	0	20

Induced Hurricane Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 1,892 tons of debris will be generated. Of the total amount, 669 tons (35%) is Other Tree Debris. Of the remaining 1,223 tons, Brick/Wood comprises 32% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 16 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 826 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, un-compacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 26,835) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 6.2 million dollars, which represents 0.18% of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 6 million dollars. 1% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 94% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	5,000.49	264.26	34.51	43.61	5,342.87
	Content	790.17	0.00	0.00	0.00	790.17
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**5,790.66**	**264.26**	**34.51**	**43.61**	**6,133.04**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	14.27	4.90	0.19	0.24	19.61
	Rental	17.47	0.00	0.00	0.00	17.47
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**31.74**	**4.90**	**0.19**	**0.24**	**37.07**
Total						
	Total	**5,822.40**	**269.16**	**34.71**	**43.85**	**6,170.11**

Appendix A: County Listing for the Region

New York
- Westchester

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
New York				
Westchester	26,835	2,348,299	1,019,001	3,367,300
Total	**26,835**	**2,348,299**	**1,019,001**	**3,367,300**
Study Region Total	**26,835**	**2,348,299**	**1,019,001**	**3,367,300**

Hazus-MH: Hurricane Event Report

Region Name: TMP-Hurricane

Hurricane Scenario: Probabilistic 200-year Return Period

Print Date: Tuesday, December 02, 2014

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- New York

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 24.25 square miles and contains 6 census tracts. There are over 7 thousand households in the region and has a total population of 26,835 people (2000 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 9 thousand buildings in the region with a total building replacement value (excluding contents) of 3,367 million dollars (2006 dollars). Approximately 88% of the buildings (and 70% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 9,417 buildings in the region which have an aggregate total replacement value of 3,367 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,348,299	69.7%
Commercial	719,245	21.4%
Industrial	138,367	4.1%
Agricultural	11,692	0.3%
Religious	39,962	1.2%
Government	17,042	0.5%
Education	92,693	2.8%
Total	**3,367,300**	**100.0%**

Essential Facility Inventory

For essential facilities, there are 2 hospitals in the region with a total bed capacity of 327 beds. There are 20 schools, 5 fire stations, 2 police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 30 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	48	95.24	2	3.91	0	0.60	0	0.24	0	0.01
Commercial	716	96.40	23	3.05	4	0.50	0	0.05	0	0.00
Education	31	97.04	1	2.86	0	0.10	0	0.00	0	0.00
Government	15	96.83	0	3.06	0	0.11	0	0.00	0	0.00
Industrial	253	96.57	8	3.12	1	0.25	0	0.06	0	0.00
Religion	45	96.83	1	3.05	0	0.11	0	0.01	0	0.00
Residential	7,833	94.74	411	4.97	24	0.29	0	0.00	0	0.00
Total	**8,941**		**446**		**29**		**1**		**0**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	228	95.44	10	4.30	1	0.26	0	0.00	0	0.00
Masonry	1,573	94.85	76	4.59	9	0.52	1	0.03	0	0.00
MH	8	99.90	0	0.08	0	0.02	0	0.00	0	0.00
Steel	537	96.51	16	2.92	3	0.51	0	0.06	0	0.00
Wood	6,613	95.09	326	4.69	15	0.22	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had 327 hospital beds available for use. On the day of the hurricane, the model estimates that 327 hospital beds (only 100.00%) are available for use. After one week, 100.00% of the beds will be in service. By 30 days, 100.00% will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate Damage > 50%**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Fire Stations	5	0	0	5
Hospitals	2	1	0	2
Police Stations	2	0	0	2
Schools	20	0	0	20

Induced Hurricane Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 9,691 tons of debris will be generated. Of the total amount, 5,047 tons (52%) is Other Tree Debris. Of the remaining 4,644 tons, Brick/Wood comprises 27% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 51 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 3,371 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters . The model estimates 1 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 26,835) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 15.5 million dollars, which represents 0.46 % of the total replacement value of the region's buildings .

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 15 million dollars. 1% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 90% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	11,561.67	875.27	120.03	144.04	12,701.02
	Content	1,910.15	115.93	23.50	8.86	2,058.44
	Inventory	0.00	2.24	4.00	0.57	6.81
	Subtotal	**13,471.83**	**993.44**	**147.53**	**153.48**	**14,766.27**
Business Interruption Loss						
	Income	0.00	88.41	0.78	12.48	101.67
	Relocation	261.38	76.90	4.11	8.46	350.84
	Rental	152.16	41.09	0.78	0.75	194.79
	Wage	0.00	31.41	1.29	29.35	62.05
	Subtotal	**413.54**	**237.81**	**6.97**	**51.04**	**709.36**
Total						
	Total	**13,885.36**	**1,231.24**	**154.50**	**204.52**	**15,475.63**

Appendix A: County Listing for the Region

New York
- Westchester

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
New York				
Westchester	26,835	2,348,299	1,019,001	3,367,300
Total	**26,835**	**2,348,299**	**1,019,001**	**3,367,300**
Study Region Total	**26,835**	**2,348,299**	**1,019,001**	**3,367,300**

Hazus-MH: Hurricane Event Report

Region Name: TMP-Hurricane

Hurricane Scenario: Probabilistic 500-year Return Period

Print Date: Tuesday, December 02, 2014

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- New York

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 24.25 square miles and contains 6 census tracts. There are over 7 thousand households in the region and has a total population of 26,835 people (2000 Census Bureau data). The distribution of population by State and County is provided in Appendix B.

There are an estimated 9 thousand buildings in the region with a total building replacement value (excluding contents) of 3,367 million dollars (2006 dollars). Approximately 88% of the buildings (and 70% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 9,417 buildings in the region which have an aggregate total replacement value of 3,367 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,348,299	69.7%
Commercial	719,245	21.4%
Industrial	138,367	4.1%
Agricultural	11,692	0.3%
Religious	39,962	1.2%
Government	17,042	0.5%
Education	92,693	2.8%
Total	**3,367,300**	**100.0%**

Essential Facility Inventory

For essential facilities, there are 2 hospitals in the region with a total bed capacity of 327 beds.There are 20 schools, 5 fire stations, 2 police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

General Building Stock Damage

Hazus estimates that about 217 buildings will be at least moderately damaged. This is over 2% of the total number of buildings in the region. There are an estimated 4 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	41	82.63	6	12.73	2	3.03	1	1.47	0	0.14
Commercial	646	86.95	75	10.13	18	2.45	4	0.47	0	0.00
Education	28	88.86	3	9.72	0	1.36	0	0.06	0	0.00
Government	14	87.77	2	10.46	0	1.70	0	0.08	0	0.00
Industrial	229	87.49	26	9.99	5	2.03	1	0.45	0	0.03
Religion	40	87.46	5	11.19	1	1.28	0	0.07	0	0.00
Residential	6,775	81.94	1,307	15.81	177	2.14	5	0.06	3	0.04
Total	**7,774**		**1,425**		**203**		**11**		**4**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	202	84.48	30	12.64	7	2.83	0	0.04	0	0.00
Masonry	1,377	83.08	227	13.70	49	2.96	4	0.23	1	0.03
MH	8	98.87	0	0.84	0	0.26	0	0.00	0	0.02
Steel	486	87.43	51	9.23	15	2.68	4	0.66	0	0.00
Wood	5,746	82.62	1,082	15.56	119	1.71	5	0.07	2	0.03

Essential Facility Damage

Before the hurricane, the region had 327 hospital beds available for use. On the day of the hurricane, the model estimates that 0 hospital beds (only 0.00%) are available for use. After one week, 100.00% of the beds will be in service. By 30 days, 100.00% will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate Damage > 50%**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Fire Stations	5	0	0	5
Hospitals	2	1	0	0
Police Stations	2	0	0	2
Schools	20	0	0	0

Induced Hurricane Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 18,140 tons of debris will be generated. Of the total amount, 8,260 tons (46%) is Other Tree Debris. Of the remaining 9,880 tons, Brick/Wood comprises 41% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 161 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 5,846 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters . The model estimates 17 households to be displaced due to the hurricane. Of these, 3 people (out of a total population of 26,835) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 46.8 million dollars, which represents 1.39 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 47 million dollars. 3% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 82% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	29,882.67	3,269.94	582.34	579.87	34,314.82
	Content	7,274.43	748.40	267.20	119.63	8,409.66
	Inventory	0.00	18.60	39.80	4.63	63.02
	Subtotal	**37,157.10**	**4,036.94**	**889.34**	**704.13**	**42,787.51**
Business Interruption Loss						
	Income	0.00	497.03	9.24	91.20	597.47
	Relocation	941.69	576.26	41.85	108.22	1,668.02
	Rental	497.55	301.42	7.07	9.31	815.35
	Wage	0.00	478.00	15.74	436.70	930.45
	Subtotal	**1,439.23**	**1,852.72**	**73.90**	**645.43**	**4,011.29**
Total						
	Total	**38,596.33**	**5,889.66**	**963.24**	**1,349.56**	**46,798.79**

Appendix A: County Listing for the Region

New York
- Westchester

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
New York				
Westchester	26,835	2,348,299	1,019,001	3,367,300
Total	**26,835**	**2,348,299**	**1,019,001**	**3,367,300**
Study Region Total	**26,835**	**2,348,299**	**1,019,001**	**3,367,300**

Hazus-MH: Hurricane Event Report

Region Name: TMP Hurricane

Hurricane Scenario: DONNA

Print Date: Wednesday, October 15, 2014

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- New York

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 24.25 square miles and contains 6 census tracts. There are over 7 thousand households in the region and has a total population of 26,835 people (2000 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 9 thousand buildings in the region with a total building replacement value (excluding contents) of 3,367 million dollars (2006 dollars). Approximately 88% of the buildings (and 70% of the building value) are associated with residential housing.

General Building Stock

Hazus estimates that there are 9,417 buildings in the region which have an aggregate total replacement value of 3,367 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,348,299	69.7%
Commercial	719,245	21.4%
Industrial	138,367	4.1%
Agricultural	11,692	0.3%
Religious	39,962	1.2%
Government	17,042	0.5%
Education	92,693	2.8%
Total	**3,367,300**	**100.0%**

Essential Facility Inventory

For essential facilities, there are 2 hospitals in the region with a total bed capacity of 327 beds. There are 20 schools, 5 fire stations, 2 police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	DONNA
Type:	Historic
Max Peak Gust in Study Region:	64 mph

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy

	None		Minor		Moderate		Severe		Destruction	
Occupancy	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	50	99.79	0	0.21	0	0.00	0	0.00	0	0.00
Commercial	741	99.73	2	0.27	0	0.00	0	0.00	0	0.00
Education	32	99.71	0	0.29	0	0.00	0	0.00	0	0.00
Government	16	99.70	0	0.30	0	0.00	0	0.00	0	0.00
Industrial	261	99.70	1	0.30	0	0.00	0	0.00	0	0.00
Religion	46	99.76	0	0.24	0	0.00	0	0.00	0	0.00
Residential	8,262	99.93	6	0.07	0	0.00	0	0.00	0	0.00
Total	**9,408**		**9**		**0**		**0**		**0**	

Table 3: Expected Building Damage by Building Type

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	238	99.58	1	0.42	0	0.00	0	0.00	0	0.00
Masonry	1,654	99.76	4	0.24	0	0.00	0	0.00	0	0.00
MH	8	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	554	99.69	2	0.31	0	0.00	0	0.00	0	0.00
Wood	6,954	99.98	1	0.02	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had 327 hospital beds available for use. On the day of the hurricane, the model estimates that 327 hospital beds (only 100.00%) are available for use. After one week, 100.00% of the beds will be in service. By 30 days, 100.00% will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate Damage > 50%**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Fire Stations	5	0	0	5
Hospitals	2	0	0	2
Police Stations	2	0	0	2
Schools	20	0	0	20

Induced Hurricane Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 200 tons of debris will be generated. Of the total amount, 102 tons (51%) is Other Tree Debris. Of the remaining 98 tons, Brick/Wood comprises 14% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 1 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 84 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, un-compacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters . The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 26,835) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 0.7 million dollars, which represents 0.02 % of the total replacement value of the region's buildings .

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 1 million dollars. 2% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 86% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	499.50	71.92	13.84	14.97	600.24
	Content	108.67	0.00	0.00	0.00	108.67
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**608.17**	**71.92**	**13.84**	**14.97**	**708.90**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.17	0.00	0.00	0.00	0.17
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.17**	**0.00**	**0.00**	**0.00**	**0.17**
Total						
	Total	**608.34**	**71.92**	**13.84**	**14.97**	**709.07**

Appendix A: County Listing for the Region

New York
- Westchester

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
New York				
Westchester	26,835	2,348,299	1,019,001	3,367,300
Total	**26,835**	**2,348,299**	**1,019,001**	**3,367,300**
Study Region Total	**26,835**	**2,348,299**	**1,019,001**	**3,367,300**

Hazus-MH: Hurricane Event Report

Region Name: TMP Hurricane

Hurricane Scenario: GLORIA

Print Date: Wednesday, October 15, 2014

Disclaimer:
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi -hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- New York

Note:
Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 24.25 square miles and contains 6 census tracts. There are over 7 thousand households in the region and has a total population of 26,835 people (2000 Census Bureau data). The distribution of population by State and County is provided in Appendix B .

There are an estimated 9 thousand buildings in the region with a total building replacement value (excluding contents) of 3,367 million dollars (2006 dollars). Approximately 88% of the buildings (and 70% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 9,417 buildings in the region which have an aggregate total replacement value of 3,367 million (2006 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	2,348,299	69.7%
Commercial	719,245	21.4%
Industrial	138,367	4.1%
Agricultural	11,692	0.3%
Religious	39,962	1.2%
Government	17,042	0.5%
Education	92,693	2.8%
Total	**3,367,300**	**100.0%**

Essential Facility Inventory

For essential facilities, there are 2 hospitals in the region with a total bed capacity of 327 beds. There are 20 schools, 5 fire stations, 2 police stations and no emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	GLORIA
Type:	Historic
Max Peak Gust in Study Region:	56 mph

Building Damage

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 6 of the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

Table 2: Expected Building Damage by Occupancy

	None		Minor		Moderate		Severe		Destruction	
Occupancy	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	50	99.85	0	0.15	0	0.00	0	0.00	0	0.00
Commercial	742	99.80	1	0.20	0	0.00	0	0.00	0	0.00
Education	32	99.78	0	0.22	0	0.00	0	0.00	0	0.00
Government	16	99.77	0	0.23	0	0.00	0	0.00	0	0.00
Industrial	261	99.78	1	0.22	0	0.00	0	0.00	0	0.00
Religion	46	99.82	0	0.18	0	0.00	0	0.00	0	0.00
Residential	8,265	99.96	3	0.04	0	0.00	0	0.00	0	0.00
Total	**9,412**		**5**		**0**		**0**		**0**	

Table 3: Expected Building Damage by Building Type

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	238	99.70	1	0.30	0	0.00	0	0.00	0	0.00
Masonry	1,655	99.83	3	0.17	0	0.00	0	0.00	0	0.00
MH	8	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	555	99.77	1	0.23	0	0.00	0	0.00	0	0.00
Wood	6,954	99.99	1	0.01	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had 327 hospital beds available for use. On the day of the hurricane, the model estimates that 327 hospital beds (only 100.00%) are available for use. After one week, 100.00% of the beds will be in service. By 30 days, 100.00% will be operational.

Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate Damage > 50%**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
Fire Stations	5	0	0	5
Hospitals	2	0	0	2
Police Stations	2	0	0	2
Schools	20	0	0	20

Induced Hurricane Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0 tons of debris will be generated. Of the total amount, 0 tons (0%) is Other Tree Debris. Of the remaining 0 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 0 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier , uncompacted debris.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters . The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 26,835) will seek temporary shelter in public shelters.

The total economic loss estimated for the hurricane is 0.0 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 100% of the total loss. Table 4 below provides a summary of the losses associated with the building damage.

Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	0.00	0.00	0.00	0.00	0.00
	Content	30.81	0.00	0.00	0.00	30.81
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**30.81**	**0.00**	**0.00**	**0.00**	**30.81**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.09	0.00	0.00	0.00	0.09
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.09**	**0.00**	**0.00**	**0.00**	**0.09**
Total						
	Total	**30.90**	**0.00**	**0.00**	**0.00**	**30.90**

Appendix A: County Listing for the Region

New York
- Westchester

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
New York				
Westchester	26,835	2,348,299	1,019,001	3,367,300
Total	**26,835**	**2,348,299**	**1,019,001**	**3,367,300**
Study Region Total	**26,835**	**2,348,299**	**1,019,001**	**3,367,300**

Hazus-MH: Earthquake Event Report

Region Name: Earthquake - TMP

Earthquake Scenario: 500 year probabalistic event M5

Print Date: October 15, 2014

Totals only reflect data for those census tracts/blocks included in the user's study region.

Disclaimer:

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

General Description of the Region

Hazus is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop earthquake losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from earthquakes and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

New York

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 24.24 square miles and contains 6 census tracts. There are over 7 thousand households in the region which has a total population of 26,835 people (2002 Census Bureau data). The distribution of population by State and County is provided in Appendix B.

There are an estimated 9 thousand buildings in the region with a total building replacement value (excluding contents) of 3,367 (millions of dollars). Approximately 88.00 % of the buildings (and 70.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 1,257 and 0 (millions of dollars), respectively.

Building Inventory

Hazus estimates that there are 9 thousand buildings in the region which have an aggregate total replacement value of 3,367 (millions of dollars) . Appendix B provides a general distribution of the building value by State and County.

In terms of building construction types found in the region, wood frame construction makes up 74% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 2 hospitals in the region with a total bed capacity of 327 beds. There are 20 schools, 5 fire stations, 2 police stations and 0 emergency operation facilities. With respect to high potential loss facilities (HPL), there are 9 dams identified within the region. Of these, 3 of the dams are classified as 'high hazard'. The inventory also includes 0 hazardous material sites, 0 military installations and 0 nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 1,257.00 (millions of dollars). This inventory includes over 93 kilometers of highways, 49 bridges, 641 kilometers of pipes.

Table 1: Transportation System Lifeline Inventory

System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	49	553.20
	Segments	39	669.50
	Tunnels	0	0.00
		Subtotal	**1,222.70**
Railways	Bridges	1	0.10
	Facilities	0	0.00
	Segments	2	34.60
	Tunnels	0	0.00
		Subtotal	**34.70**
Light Rail	Bridges	0	0.00
	Facilities	0	0.00
	Segments	0	0.00
	Tunnels	0	0.00
		Subtotal	**0.00**
Bus	Facilities	0	0.00
		Subtotal	**0.00**
Ferry	Facilities	0	0.00
		Subtotal	**0.00**
Port	Facilities	0	0.00
		Subtotal	**0.00**
Airport	Facilities	0	0.00
	Runways	0	0.00
		Subtotal	**0.00**
		Total	**1,257.40**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	6.40
	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	**6.40**
Waste Water	Distribution Lines	NA	3.80
	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	**3.80**
Natural Gas	Distribution Lines	NA	2.60
	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	**2.60**
Oil Systems	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	**0.00**
Electrical Power	Facilities	0	0.00
		Subtotal	**0.00**
Communication	Facilities	2	0.20
		Subtotal	**0.20**
		Total	**13.10**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.

Scenario Name	500 year probabalistic event M5
Type of Earthquake	Probabilistic
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	500.00
Longitude of Epicenter	NA
Latitude of Epicenter	NA
Earthquake Magnitude	5.00
Depth (km) *	NA
Rupture Length (km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	NA

Note: For shallow crustal earthquakes in the western U.S. (strike-slip, normal, reverse), Hazus uses the latest Next Generation Attenuation (NGA) functions for Historic Epicenter, Fault and Arbitrary scenarios based on specific fault source geometry and earthquake scenario depth is not used.

Building Damage

Hazus estimates that about 47 buildings will be at least moderately damaged. This is over 0.00 % of the buildings in the region. There are an estimated 0 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	48	0.53	1	0.60	0	0.72	0	0.79	0	0.41
Commercial	718	7.82	19	9.58	6	13.42	1	15.26	0	10.76
Education	31	0.34	1	0.38	0	0.51	0	0.54	0	0.48
Government	16	0.17	0	0.19	0	0.26	0	0.26	0	0.17
Industrial	254	2.77	6	3.13	2	4.34	0	4.44	0	2.60
Other Residential	1,076	11.72	25	12.82	7	15.41	1	16.52	0	16.49
Religion	44	0.48	1	0.61	0	0.87	0	1.04	0	1.05
Single Family	6,988	76.16	141	72.68	27	64.48	3	61.14	0	68.04
Total	**9,175**		**195**		**43**		**4**		**0**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	6,832	74.46	111	56.88	13	29.46	0	9.91	0	0.00
Steel	541	5.89	12	5.97	3	7.87	0	6.46	0	0.00
Concrete	192	2.09	4	2.02	1	2.11	0	0.80	0	0.00
Precast	40	0.44	1	0.56	1	1.44	0	2.33	0	0.00
RM	180	1.96	4	1.80	2	3.83	0	4.24	0	0.00
URM	1,383	15.07	63	32.59	23	54.99	3	76.18	0	100.00
MH	8	0.08	0	0.18	0	0.30	0	0.09	0	0.00
Total	**9,175**		**195**		**43**		**4**		**0**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 327 hospital beds available for use. On the day of the earthquake, the model estimates that only 276 hospital beds (85.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 94.00% of the beds will be back in service. By 30 days, 99.00% will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	2	0	0	2
Schools	20	0	0	20
EOCs	0	0	0	0
PoliceStations	2	0	0	2
FireStations	5	0	0	5

Transportation and Utility Lifeline Damage

Table 6 provides damage estimates for the transportation system.

Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 %	
					After Day 1	After Day 7
Highway	Segments	39	0	0	39	39
	Bridges	49	0	0	49	49
	Tunnels	0	0	0	0	0
Railways	Segments	2	0	0	2	2
	Bridges	1	0	0	1	1
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	0	0	0	0	0
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	0	0	0	0	0
Communication	2	0	0	2	2

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (kms)	Number of Leaks	Number of Breaks
Potable Water	321	0	0
Waste Water	192	0	0
Natural Gas	128	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	7,918	0	0	0	0	0
Electric Power		0	0	0	0	0

Fire Following Earthquake

Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0.00 million tons of debris will be generated. Of the total amount, Brick/Wood comprises 75.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 40 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the earthquake. Of these, 0 people (out of a total population of 26,835) will seek temporary shelter in public shelters.

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

Severity Level 1:	Injuries will require medical attention but hospitalization is not needed.
Severity Level 2:	Injuries will require hospitalization but are not considered life-threatening
Severity Level 3:	Injuries will require hospitalization and can become life threatening if not promptly treated.
Severity Level 4:	Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	1	0	0	0
	Total	**1**	**0**	**0**	**0**
2 PM	Commercial	1	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	1	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**2**	**0**	**0**	**0**
5 PM	Commercial	1	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**1**	**0**	**0**	**0**

Economic Loss

The total economic loss estimated for the earthquake is 5.05 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 4.93 (millions of dollars); 21 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 54 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.00	0.00	0.21	0.01	0.02	0.24
	Capital-Related	0.00	0.00	0.15	0.00	0.00	0.16
	Rental	0.04	0.04	0.12	0.00	0.01	0.21
	Relocation	0.16	0.02	0.17	0.01	0.05	0.41
	Subtotal	**0.20**	**0.07**	**0.66**	**0.03**	**0.08**	**1.03**
Capital Stock Losses							
	Structural	0.47	0.10	0.24	0.04	0.05	0.90
	Non_Structural	1.23	0.28	0.57	0.10	0.13	2.31
	Content	0.24	0.05	0.26	0.06	0.06	0.67
	Inventory	0.00	0.00	0.01	0.01	0.00	0.02
	Subtotal	**1.94**	**0.44**	**1.06**	**0.21**	**0.24**	**3.89**
	Total	**2.14**	**0.50**	**1.73**	**0.23**	**0.32**	**4.93**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Hazus estimates the long-term economic impacts to the region for 15 years after the earthquake. The model quantifies this information in terms of income and employment changes within the region. Table 14 presents the results of the region for the given earthquake.

Table 12: Transportation System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	669.54	$0.00	0.00
	Bridges	553.17	$0.12	0.02
	Tunnels	0.00	$0.00	0.00
	Subtotal	**1222.70**	**0.10**	
Railways	Segments	34.61	$0.00	0.00
	Bridges	0.08	$0.00	0.00
	Tunnels	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**34.70**	**0.00**	
Light Rail	Segments	0.00	$0.00	0.00
	Bridges	0.00	$0.00	0.00
	Tunnels	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Bus	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Ferry	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Port	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Airport	Facilities	0.00	$0.00	0.00
	Runways	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
	Total	**1257.40**	**0.10**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Distribution Lines	6.40	$0.00	0.03
	Subtotal	**6.41**	**$0.00**	
Waste Water	Pipelines	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Distribution Lines	3.80	$0.00	0.02
	Subtotal	**3.85**	**$0.00**	
Natural Gas	Pipelines	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Distribution Lines	2.60	$0.00	0.01
	Subtotal	**2.56**	**$0.00**	
Oil Systems	Pipelines	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**$0.00**	
Electrical Power	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**$0.00**	
Communication	Facilities	0.20	$0.00	0.42
	Subtotal	**0.24**	**$0.00**	
	Total	**13.06**	**$0.00**	

Table 14. Indirect Economic Impact with outside aid

(Employment as # of people and Income in millions of $)

LOSS		Total	%

Appendix A: County Listing for the Region

Westchester,NY

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
New York					
	Westchester	26,835	2,348	1,019	3,367
Total State		**26,835**	**2,348**	**1,019**	**3,367**
Total Region		**26,835**	**2,348**	**1,019**	**3,367**

Hazus-MH: Earthquake Event Report

Region Name: Earthquake - TMP

Earthquake Scenario: Probabilistic 1000 year m5

Print Date: December 17, 2014

Totals only reflect data for those census tracts/blocks included in the user's study region.

Disclaimer:

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

General Description of the Region

Hazus is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop earthquake losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from earthquakes and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

New York

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 24.24 square miles and contains 6 census tracts. There are over 7 thousand households in the region which has a total population of 26,835 people (2002 Census Bureau data). The distribution of population by State and County is provided in Appendix B.

There are an estimated 9 thousand buildings in the region with a total building replacement value (excluding contents) of 3,367 (millions of dollars). Approximately 88.00 % of the buildings (and 70.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 1,257 and 0 (millions of dollars), respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 9 thousand buildings in the region which have an aggregate total replacement value of 3,367 (millions of dollars) . Appendix B provides a general distribution of the building value by State and County.

In terms of building construction types found in the region, wood frame construction makes up 74% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 2 hospitals in the region with a total bed capacity of 327 beds. There are 20 schools, 5 fire stations, 2 police stations and 0 emergency operation facilities. With respect to high potential loss facilities (HPL), there are 9 dams identified within the region. Of these, 3 of the dams are classified as 'high hazard'. The inventory also includes 0 hazardous material sites, 0 military installations and 0 nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 1,257.00 (millions of dollars). This inventory includes over 93 kilometers of highways, 49 bridges, 641 kilometers of pipes.

Table 1: Transportation System Lifeline Inventory

System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	49	553.20
	Segments	39	669.50
	Tunnels	0	0.00
		Subtotal	**1,222.70**
Railways	Bridges	1	0.10
	Facilities	0	0.00
	Segments	2	34.60
	Tunnels	0	0.00
		Subtotal	**34.70**
Light Rail	Bridges	0	0.00
	Facilities	0	0.00
	Segments	0	0.00
	Tunnels	0	0.00
		Subtotal	**0.00**
Bus	Facilities	0	0.00
		Subtotal	**0.00**
Ferry	Facilities	0	0.00
		Subtotal	**0.00**
Port	Facilities	0	0.00
		Subtotal	**0.00**
Airport	Facilities	0	0.00
	Runways	0	0.00
		Subtotal	**0.00**
		Total	**1,257.40**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	6.40
	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	**6.40**
Waste Water	Distribution Lines	NA	3.80
	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	**3.80**
Natural Gas	Distribution Lines	NA	2.60
	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	**2.60**
Oil Systems	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	**0.00**
Electrical Power	Facilities	0	0.00
		Subtotal	**0.00**
Communication	Facilities	2	0.20
		Subtotal	**0.20**
		Total	**13.10**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.

Scenario Name	Probabilistic 1000 year m5
Type of Earthquake	Probabilistic
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	1,000.00
Longitude of Epicenter	NA
Latitude of Epicenter	NA
Earthquake Magnitude	5.00
Depth (km) *	NA
Rupture Length (km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	NA

Note: For shallow crustal earthquakes in the western U.S. (strike-slip, normal, reverse), Hazus uses the latest Next Generation Attenuation (NGA) functions for Historic Epicenter, Fault and Arbitrary scenarios based on specific fault source geometry and earthquake scenario depth is not used.

Building Damage

Hazus estimates that about 158 buildings will be at least moderately damaged. This is over 2.00 % of the buildings in the region. There are an estimated 1 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	46	0.53	3	0.56	1	0.70	0	0.79	0	0.53
Commercial	676	7.76	46	8.52	18	12.84	3	14.76	0	12.95
Education	29	0.34	2	0.35	1	0.51	0	0.53	0	0.57
Government	15	0.17	1	0.17	0	0.26	0	0.26	0	0.24
Industrial	240	2.75	15	2.83	6	4.37	1	4.47	0	3.76
Other Residential	1,018	11.67	67	12.29	21	14.92	3	16.08	0	16.36
Religion	42	0.48	3	0.54	1	0.79	0	0.97	0	1.05
Single Family	6,652	76.31	405	74.73	92	65.60	11	62.13	1	64.55
Total	**8,717**		**542**		**140**		**17**		**1**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	6,548	75.12	351	64.81	53	38.11	3	17.73	0	0.00
Steel	513	5.88	30	5.48	12	8.52	1	7.27	0	4.19
Concrete	181	2.08	11	2.08	4	2.88	0	1.36	0	0.71
Precast	37	0.43	2	0.46	2	1.25	0	2.08	0	0.21
RM	171	1.97	8	1.52	5	3.59	1	4.26	0	0.00
URM	1,259	14.44	138	25.50	63	45.38	12	67.16	1	94.87
MH	7	0.08	1	0.15	0	0.29	0	0.13	0	0.02
Total	**8,717**		**542**		**140**		**17**		**1**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 327 hospital beds available for use. On the day of the earthquake, the model estimates that only 233 hospital beds (71.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 87.00% of the beds will be back in service. By 30 days, 97.00% will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	2	0	0	2
Schools	20	0	0	20
EOCs	0	0	0	0
PoliceStations	2	0	0	2
FireStations	5	0	0	5

Transportation and Utility Lifeline Damage

Table 6 provides damage estimates for the transportation system.

Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 %	
					After Day 1	After Day 7
Highway	Segments	39	0	0	39	39
	Bridges	49	0	0	49	49
	Tunnels	0	0	0	0	0
Railways	Segments	2	0	0	2	2
	Bridges	1	0	0	1	1
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	0	0	0	0	0
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	0	0	0	0	0
Communication	2	0	0	2	2

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (kms)	Number of Leaks	Number of Breaks
Potable Water	321	1	0
Waste Water	192	1	0
Natural Gas	128	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	7,918	0	0	0	0	0
Electric Power		0	0	0	0	0

Fire Following Earthquake

Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0.01 million tons of debris will be generated. Of the total amount, Brick/Wood comprises 69.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 200 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 3 households to be displaced due to the earthquake. Of these, 3 people (out of a total population of 26,835) will seek temporary shelter in public shelters.

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

Severity Level 1:	Injuries will require medical attention but hospitalization is not needed.
Severity Level 2:	Injuries will require hospitalization but are not considered life-threatening
Severity Level 3:	Injuries will require hospitalization and can become life threatening if not promptly treated.
Severity Level 4:	Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	1	0	0	0
	Single Family	2	0	0	0
	Total	**4**	**0**	**0**	**0**
2 PM	Commercial	2	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	2	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**5**	**1**	**0**	**0**
5 PM	Commercial	2	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	1	0	0	0
	Other-Residential	0	0	0	0
	Single Family	1	0	0	0
	Total	**5**	**1**	**0**	**0**

Economic Loss

The total economic loss estimated for the earthquake is 21.36 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 20.38 (millions of dollars); 17 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 54 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.00	0.02	0.72	0.02	0.06	0.81
	Capital-Related	0.00	0.01	0.51	0.01	0.01	0.55
	Rental	0.15	0.12	0.39	0.01	0.02	0.69
	Relocation	0.55	0.07	0.59	0.05	0.16	1.43
	Subtotal	**0.70**	**0.22**	**2.21**	**0.09**	**0.26**	**3.48**
Capital Stock Losses							
	Structural	1.57	0.34	0.77	0.12	0.15	2.95
	Non_Structural	5.13	1.20	2.51	0.52	0.56	9.92
	Content	1.48	0.30	1.48	0.33	0.35	3.94
	Inventory	0.00	0.00	0.03	0.06	0.00	0.09
	Subtotal	**8.18**	**1.85**	**4.79**	**1.03**	**1.06**	**16.90**
	Total	**8.88**	**2.07**	**7.00**	**1.12**	**1.32**	**20.38**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Hazus estimates the long-term economic impacts to the region for 15 years after the earthquake. The model quantifies this information in terms of income and employment changes within the region. Table 14 presents the results of the region for the given earthquake.

Table 12: Transportation System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	669.54	$0.00	0.00
	Bridges	553.17	$0.97	0.18
	Tunnels	0.00	$0.00	0.00
	Subtotal	**1222.70**	**1.00**	
Railways	Segments	34.61	$0.00	0.00
	Bridges	0.08	$0.00	0.00
	Tunnels	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**34.70**	**0.00**	
Light Rail	Segments	0.00	$0.00	0.00
	Bridges	0.00	$0.00	0.00
	Tunnels	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Bus	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Ferry	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Port	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Airport	Facilities	0.00	$0.00	0.00
	Runways	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
	Total	**1257.40**	**1.00**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Distribution Lines	6.40	$0.01	0.08
	Subtotal	**6.41**	**$0.01**	
Waste Water	Pipelines	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Distribution Lines	3.80	$0.00	0.07
	Subtotal	**3.85**	**$0.00**	
Natural Gas	Pipelines	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Distribution Lines	2.60	$0.00	0.04
	Subtotal	**2.56**	**$0.00**	
Oil Systems	Pipelines	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**$0.00**	
Electrical Power	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**$0.00**	
Communication	Facilities	0.20	$0.01	2.50
	Subtotal	**0.24**	**$0.01**	
	Total	**13.06**	**$0.01**	

Table 14. Indirect Economic Impact with outside aid

(Employment as # of people and Income in millions of $)

LOSS		Total	%

Appendix A: County Listing for the Region

Westchester,NY

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
New York					
	Westchester	26,835	2,348	1,019	3,367
Total State		**26,835**	**2,348**	**1,019**	**3,367**
Total Region		**26,835**	**2,348**	**1,019**	**3,367**

Hazus-MH: Earthquake Event Report

Region Name: Earthquake - TMP

Earthquake Scenario: Probabilistic 2500 Year Event M5

Print Date: December 29, 2014

Totals only reflect data for those census tracts/blocks included in the user's study region.

Disclaimer:

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

General Description of the Region

Hazus is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop earthquake losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from earthquakes and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

New York

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 24.24 square miles and contains 6 census tracts. There are over 7 thousand households in the region which has a total population of 26,835 people (2002 Census Bureau data). The distribution of population by State and County is provided in Appendix B.

There are an estimated 9 thousand buildings in the region with a total building replacement value (excluding contents) of 3,367 (millions of dollars). Approximately 88.00 % of the buildings (and 70.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 1,257 and 0 (millions of dollars), respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 9 thousand buildings in the region which have an aggregate total replacement value of 3,367 (millions of dollars) . Appendix B provides a general distribution of the building value by State and County.

In terms of building construction types found in the region, wood frame construction makes up 74% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 2 hospitals in the region with a total bed capacity of 327 beds. There are 20 schools, 5 fire stations, 2 police stations and 0 emergency operation facilities. With respect to high potential loss facilities (HPL), there are 9 dams identified within the region. Of these, 3 of the dams are classified as 'high hazard'. The inventory also includes 0 hazardous material sites, 0 military installations and 0 nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 1,257.00 (millions of dollars). This inventory includes over 93 kilometers of highways, 49 bridges, 641 kilometers of pipes.

Table 1: Transportation System Lifeline Inventory

System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	49	553.20
	Segments	39	669.50
	Tunnels	0	0.00
		Subtotal	**1,222.70**
Railways	Bridges	1	0.10
	Facilities	0	0.00
	Segments	2	34.60
	Tunnels	0	0.00
		Subtotal	**34.70**
Light Rail	Bridges	0	0.00
	Facilities	0	0.00
	Segments	0	0.00
	Tunnels	0	0.00
		Subtotal	**0.00**
Bus	Facilities	0	0.00
		Subtotal	**0.00**
Ferry	Facilities	0	0.00
		Subtotal	**0.00**
Port	Facilities	0	0.00
		Subtotal	**0.00**
Airport	Facilities	0	0.00
	Runways	0	0.00
		Subtotal	**0.00**
		Total	**1,257.40**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	6.40
	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	**6.40**
Waste Water	Distribution Lines	NA	3.80
	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	**3.80**
Natural Gas	Distribution Lines	NA	2.60
	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	**2.60**
Oil Systems	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	**0.00**
Electrical Power	Facilities	0	0.00
		Subtotal	**0.00**
Communication	Facilities	2	0.20
		Subtotal	**0.20**
		Total	**13.10**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.

Scenario Name	Probabilistic 2500 Year Event M5
Type of Earthquake	Probabilistic
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	2,500.00
Longitude of Epicenter	NA
Latitude of Epicenter	NA
Earthquake Magnitude	5.00
Depth (km) *	NA
Rupture Length (km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	NA

Note: For shallow crustal earthquakes in the western U.S. (strike-slip, normal, reverse), Hazus uses the latest Next Generation Attenuation (NGA) functions for Historic Epicenter, Fault and Arbitrary scenarios based on specific fault source geometry and earthquake scenario depth is not used.

Building Damage

Hazus estimates that about 158 buildings will be at least moderately damaged. This is over 2.00 % of the buildings in the region. There are an estimated 1 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	46	0.53	3	0.56	1	0.70	0	0.79	0	0.53
Commercial	676	7.76	46	8.52	18	12.84	3	14.76	0	12.95
Education	29	0.34	2	0.35	1	0.51	0	0.53	0	0.57
Government	15	0.17	1	0.17	0	0.26	0	0.26	0	0.24
Industrial	240	2.75	15	2.83	6	4.37	1	4.47	0	3.76
Other Residential	1,018	11.67	67	12.29	21	14.92	3	16.08	0	16.36
Religion	42	0.48	3	0.54	1	0.79	0	0.97	0	1.05
Single Family	6,652	76.31	405	74.73	92	65.60	11	62.13	1	64.55
Total	**8,717**		**542**		**140**		**17**		**1**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	6,548	75.12	351	64.81	53	38.11	3	17.73	0	0.00
Steel	513	5.88	30	5.48	12	8.52	1	7.27	0	4.19
Concrete	181	2.08	11	2.08	4	2.88	0	1.36	0	0.71
Precast	37	0.43	2	0.46	2	1.25	0	2.08	0	0.21
RM	171	1.97	8	1.52	5	3.59	1	4.26	0	0.00
URM	1,259	14.44	138	25.50	63	45.38	12	67.16	1	94.87
MH	7	0.08	1	0.15	0	0.29	0	0.13	0	0.02
Total	**8,717**		**542**		**140**		**17**		**1**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 327 hospital beds available for use. On the day of the earthquake, the model estimates that only 233 hospital beds (71.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 87.00% of the beds will be back in service. By 30 days, 97.00% will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	2	0	0	2
Schools	20	0	0	20
EOCs	0	0	0	0
PoliceStations	2	0	0	2
FireStations	5	0	0	5

Transportation and Utility Lifeline Damage

Table 6 provides damage estimates for the transportation system.

Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 %	
					After Day 1	After Day 7
Highway	Segments	39	0	0	39	39
	Bridges	49	0	0	49	49
	Tunnels	0	0	0	0	0
Railways	Segments	2	0	0	2	2
	Bridges	1	0	0	1	1
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	0	0	0	0	0
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	0	0	0	0	0
Communication	2	0	0	2	2

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (kms)	Number of Leaks	Number of Breaks
Potable Water	321	1	0
Waste Water	192	1	0
Natural Gas	128	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	7,918	0	0	0	0	0
Electric Power		0	0	0	0	0

Fire Following Earthquake

Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0.01 million tons of debris will be generated. Of the total amount, Brick/Wood comprises 69.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 200 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 3 households to be displaced due to the earthquake. Of these, 3 people (out of a total population of 26,835) will seek temporary shelter in public shelters.

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

Severity Level 1:	Injuries will require medical attention but hospitalization is not needed.
Severity Level 2:	Injuries will require hospitalization but are not considered life-threatening
Severity Level 3:	Injuries will require hospitalization and can become life threatening if not promptly treated.
Severity Level 4:	Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	1	0	0	0
	Single Family	2	0	0	0
	Total	**4**	**0**	**0**	**0**
2 PM	Commercial	2	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	2	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**5**	**1**	**0**	**0**
5 PM	Commercial	2	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	1	0	0	0
	Other-Residential	0	0	0	0
	Single Family	1	0	0	0
	Total	**5**	**1**	**0**	**0**

Economic Loss

The total economic loss estimated for the earthquake is 21.36 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 20.38 (millions of dollars); 17 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 54 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.00	0.02	0.72	0.02	0.06	0.81
	Capital-Related	0.00	0.01	0.51	0.01	0.01	0.55
	Rental	0.15	0.12	0.39	0.01	0.02	0.69
	Relocation	0.55	0.07	0.59	0.05	0.16	1.43
	Subtotal	**0.70**	**0.22**	**2.21**	**0.09**	**0.26**	**3.48**
Capital Stock Losses							
	Structural	1.57	0.34	0.77	0.12	0.15	2.95
	Non_Structural	5.13	1.20	2.51	0.52	0.56	9.92
	Content	1.48	0.30	1.48	0.33	0.35	3.94
	Inventory	0.00	0.00	0.03	0.06	0.00	0.09
	Subtotal	**8.18**	**1.85**	**4.79**	**1.03**	**1.06**	**16.90**
	Total	**8.88**	**2.07**	**7.00**	**1.12**	**1.32**	**20.38**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

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	Tunnels	0.00	$0.00	0.00
	Subtotal	**1222.70**	**1.00**	
Railways	Segments	34.61	$0.00	0.00
	Bridges	0.08	$0.00	0.00
	Tunnels	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**34.70**	**0.00**	
Light Rail	Segments	0.00	$0.00	0.00
	Bridges	0.00	$0.00	0.00
	Tunnels	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Bus	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Ferry	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Port	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Airport	Facilities	0.00	$0.00	0.00
	Runways	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
	Total	**1257.40**	**1.00**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Distribution Lines	6.40	$0.01	0.08
	Subtotal	**6.41**	**$0.01**	
Waste Water	Pipelines	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Distribution Lines	3.80	$0.00	0.07
	Subtotal	**3.85**	**$0.00**	
Natural Gas	Pipelines	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Distribution Lines	2.60	$0.00	0.04
	Subtotal	**2.56**	**$0.00**	
Oil Systems	Pipelines	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**$0.00**	
Electrical Power	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**$0.00**	
Communication	Facilities	0.20	$0.01	2.50
	Subtotal	**0.24**	**$0.01**	
	Total	**13.06**	**$0.01**	

Table 14. Indirect Economic Impact with outside aid

(Employment as # of people and Income in millions of $)

LOSS		Total	%

Appendix A: County Listing for the Region

Westchester,NY

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
New York					
	Westchester	26,835	2,348	1,019	3,367
Total State		**26,835**	**2,348**	**1,019**	**3,367**
Total Region		**26,835**	**2,348**	**1,019**	**3,367**

APPENDIX D.

STAKEHOLDER AND PUBLIC COMMENTS

This Appendix shows responses from public correspondence, and correspondence with the Stakeholders listed in Section 5.

PUBLIC QUESTIONAIRE RESULTS

NATURAL HAZARD INFORMATION

1. In the past five years, have you or someone in your household/business experienced a natural disaster such as an earthquake, severe windstorm, flood, wildfire, or other type of natural disaster?

   Yes (__)
   No (__)

   1.1. If YES, which of these natural disasters have you or someone in your household experienced?

   Drought (__)
   Earthquake (__)
   Flood (__)
   Landslide (__)
   Wildfire (__)
   Household Fire (__)
   Windstorm (__)
   Winter Storm (__)
   Other (specify) (__)
   _____

2. How concerned are you personally about the following natural disasters affecting the Town? (Circle the corresponding number for each hazard)

Natural Disaster	**Extremely Concerned**	**Very Concerned**	**Concerned**	**Somewhat Concerned**	**Not Concerned**
Drought					
Earthquake					
Flood					
Landslide/debris flow					
Wildfire					
Household Fire					
Wind Storm					
Winter Storm					
Other _____					

3. Have you ever received information about how to make your family, home, or business safer from natural disasters?

   Yes (__)

No (If NO, skip to question 4) (__)

3.1. If YES, how recently?

Within the last 6 months (__)
Between 6 and 12 months (__)
Between 1 and 2 years (__)
Between 2 and 5 Years (__)
5 years or more (__)

3.2. If YES, from whom did you **last** receive information about how to make your family/home/business safer from natural disasters? (Check only one)

News Media (__)
Government agency (__)
Insurance agent or company (__)
Utility company (__)
University or research institution (__)
American Red Cross (__)
Other non-profit organization (__)
Not sure (__)
Other (__)_____

4. Who would you most trust to provide you with information about how to make your family /home/business safer from natural disasters? (Check all that apply)

News Media (__)
Government agency (__)
Insurance agent or company (__)
Utility company (__)
University or research institution (__)
American Red Cross (__)
Other non-profit organization (__)
Not sure (__)
Other (__) _____

5. What is the most effective way for you to receive information about how to make your family/home/business safer from natural disasters? (Check all that apply)

Newspapers:

Newspaper stories (__)
Newspaper ads (__)

Television:

Television news
Television ads (__)

Radio

Radio news (__)
Radio ads (__)

Schools (__)
Outdoor advertisements (billboards, etc.) (__)
Books (__)
Mail (__)
Fire Dept./Rescue (__)
Internet (__)
Fact sheet/Brochure (__)
Chamber of Commerce (__)
Public workshops/meetings (__)
Magazines (__)
Academic Institutions (__)
Other (specify) (__)_____

6. To assist in communicating information to the Town public about how to better prepare for a natural disaster, which of the following phrases do you think is easiest to understand? (Check only one)

Natural disaster readiness (__)
Disaster preparedness (__)
Emergency preparedness (__)
Natural hazard risk reduction (__)
Other _____

There are many things that you can do to prepare for a natural disaster or emergency event. What you have on hand or are trained to do when a disaster strikes can make a big difference for you comfort and safety in the hours and days following the disaster, whether it is a natural disaster or other emergency. Basic services, such as electricity, gas, water, and telephones, may be cut off, or you may have to evacuate at a moment's notice. The following questions focus on your household's preparedness for disaster events.

7. In the following list, please check those activities that you have done in your household, plan to do in the near future, have not done, or are unable to do (Check only one answer for each preparedness activity)

Preparedness Activity	**Have Done**	**Plan To Do**	**Not Done**	**Unable To Do**
A. Attended meetings or received written information on natural disasters or hazard mitigation?	☐	☐	☐	☐
B. Talked with members in your household/company about what to do in case of a natural disaster or emergency?	☐	☐	☐	☐
C. Developed a "Household/Family/Company Emergency Plan" in order to decide what everyone would do in the event of a household emergency?	☐	☐	☐	☐
D. Prepared a "Disaster Supply Kit" (Extra food, water, Batteries, or other emergency supplies)?	☐	☐	☐	☐
E. Within the past year, have someone in the household/business trained in first aid or Cardio-Pulmonary Resuscitation (CPR)?	☐	☐	☐	☐

8. Building a disaster supply kit, receiving first aid training, and developing a household/family emergency plan are inexpensive activities that require a personal time commitment. How much time (per year) are you willing to spend on preparing yourself/your household for a natural disaster or emergency event? (Check only one)

0-1 hours (__)
2-3 hours (__)
4-7 hours (__)
8-15 hours (__)
16 or more hours (__)
Other (specify) (__)

_____

9. What steps, if any, have you or someone in your household taken to prepare for a natural disaster? (Check all that apply)

Have stored or stocked up on:

Food (__)
Water (__)
Flashlight(s) (__)
Batteries (__)
Battery-powered radio (__)
Medical supplies (First aid kit) (__)
Fire extinguisher (__)

Smoke detector on each house level (__)
Prepared a Disaster Supply Kit (__)
Received First Aid/CPR Training (__)
Made a fire escape plan (__)
Developed a reconnection plan: Where to go and who to call (__)
Discussed utility shutoffs (__)
Other (specify) (__)

10. Does your household have insurance coverage for flood events?

Yes (__)
No (__)

10.1. If NO, what is the main reason your household does not have insurance for flood events?

Not located in the floodplain (__)
Too expensive (__)
Not necessary (__)
Never considered it (__)

Deductibles too high/not worth it (__)
Not familiar with it/don't know about it (__)
Other (__)_____

11. Does your household have insurance coverage for earthquake events?

Yes (__)
No (__)

11.1. If NO, what is the main reason your household does not have insurance for flood events?

Too expensive (__)
Not available (__)
Not necessary (__)
Never considered it (__)

Deductibles too high/not worth it (__)
Not familiar with it/don't know about it (__)
Other (__)_____

NATURAL HAZARD RISK REDUCTION

12. Did you consider the possible occurrence of a natural hazard when you bought/moved into your current home?

Yes (__)

No (__)

13. Would you be willing to spend more money on a home/building that had features that made it more disaster resistant?

Yes (__)
No (__)

14. How much more money are you willing to spend to better protect your family, home, or business from natural disasters? (Check only one)

$5000 and above (__)
$2500-$4999 (__)
$1000-$2499 (__)
$500-$999 (__)
$100-$499 (__)
Less than $100 (__)
Nothing (__)
Don't Know (__)
Other (specify) (__)
_____

Question 15 includes nonstructural and structural modifications that can make your home more resistant to earthquakes. There are many measures that can be taken for other natural hazards, such as wildfires and floods.

15. What nonstructural or structural modifications for earthquakes have you made to you home? (Check all that apply)

Nonstructural:

Anchor bookcases, cabinets to wall (__)
Secure water heater to wall (__)
Install latches on drawers/cabinets (__)
Fit gas appliances with flexible connections (__)
Others (specify) (__)
_____

Structural:

Secure home to foundation (__)
Brace inside of cripple wall with sheathing (__)
Brace unreinforced chimney (__)
Brace unreinforced masonry & concrete walls and foundations (__)
Others (specify) (__)
_____

16. Which of the following incentives, if any, would motivate you to take additional steps to better protect your family and home from a natural disaster? (Check all that apply)

Insurance discount (__)
Low interest rate loan (__)
Lower new home construction costs (__)
Mortgage discount (__)
Tax break or incentive (__)
None (__)
Other (specify) (__)
_____

HOUSEHOLD INFORMATION

17. Please indicate your age: _____
    Between 18 and 30 years (__)
    Between 31 and 40 years (__)
    Between 41 and 50 years (__)
    Between 61 and 64 years (__)
    Over 65 years (__)

18. Gender:

    Male (__)
    Female (__)

19. Please indicate your level of education:

    Grade school/no schooling (__)
    Some high school (__)
    High school graduate/GED (__)
    Some college/trade school (__)
    College degree (__)
    Postgraduate degree (__)
    Other (__)

    _____

20. Zip code:
    10510 (__)
    10523 (__)
    10532 (__)
    10570 (__)
    10591 (__)
    10594 (__)
    10595 (__)

21. How long have you lived in the Town of Mount Pleasant?

    Less than one year (__)
    1-5 years (__)
    5-9 years (__)
    10-19 years (__)
    20 years or more (__)

22. If you have lived in the state for less than 20 years, in what state did you live before you moved to the Town?

Connecticut (__)
New Jersey (__)
Pennsylvania (__)
Massachusetts (__)
Rhode Island (__)
Other (__)_____

23. Do you have access to the Internet?

Yes (__)
No (__)

24. Do you own or rent your home?

Own (__)
Rent (__)

25. Do you rent/own a:

Single-family home (__)
Duplex (__)
Apartment (3-4 units in structure) (__)
Apartment (5 or more units in structure) (__)
Condominium/townhouse (__)
Manufactured home (__)
Other (__) _____

Other comments:

**The Town of Mount Pleasant has received zero (0) responses from the public as of the closing date period.

Town of Mount Pleasant Multi-Hazard Mitigation Plan
Flooding Hazard Work Session

November 12, 2014

Name: Maureen Desimone

Title: COO

Organization /Agency: Blythedale Children Hospital

Please complete the survey information below in regard to Flooding Hazard:

1. Are you affected by flooding in any way and list the impacts to your business/location? Are there concerns with your organization with the flood plain inundation areas shown? If no, proceed to Question No. 4.

   Yes, back parking lot floods along the west side of building

2. Do you have Flood Insurance? (Yes) / No

3. How many times have you been flooded in the last 3 years? Last 10 Years? What amount of damage was incurred during those periods?

   Once in last 10 years. Bottom floor flooded - we did not have to evacuate. Generator went on for 2 days.

4. Do you have an evacuation plan or flood prevention plan that is dependent on the infrastructure (passable roads, power, communication, etc.) for its execution?

   Yes - but we can survive for 72 hours by ourselves provided our building is intact

5. Are you aware of any other areas of flooding that are not shown on the map presented? Please specify.

   no

6. If interested, what assistance can you provide to the town, businesses or residents that could reduce the affects from the impacts of flooding?

   Could provide assistance to our neighborhood.

7. On a scale of 1 to 10 (10 being most concerning) how concerned are you in regard to flooding? 5.

Town of Mount Pleasant Multi-Hazard Mitigation Plan
Utility Failure/Extreme Storm/Winter Storm Work Session

November 12, 2014

Name: Maureen Desimone

Title: COO

Organization /Agency: Blythedale Children's Hospital

Please complete the survey information below in regard to Utility Failure, Extreme or Winter Storm:

1. Out of the three types of hazards (Utility Failure, Extreme or Winter Storm), which hazard are you affected by the most and why?

   Utility Failure

2. Are there losses of life or injury concerns with your organization in regard to these hazards? Explain.

   We have a generator but if it were to malfunction we have back-up batteries for ventilator. Water - could last 2 hours but would need to evacuate

3. What is your plan to reduce the effects from these hazards if roads become impassable, power outages, extreme heat or cold, loss of communications, shortage of medicines occurs for an extended period of time?

   We have food for over a week + medication - we have back up system in place with other agencies. We have a generator and input devices for a back-up generator if needed

4. If interested, what assistance can you provide to the town, businesses or residents that could reduce the affects from the impacts from these storms?

   We can provide services to the neighborhood if they are in need to get warm, eat, etc.

5. On a scale of 1 to 10 (10 being most concerning), how concerned are you in regard to these types of hazards? 8.

Town of Mount Pleasant Multi-Hazard Mitigation Plan
Dam Failure Work Session

November 12, 2014

Name: Maureen Derinone

Title: COO

Organization /Agency: Blythedale Children's Hospital

Please complete the survey information below in regard to Dam Failure Hazard:

1. Are you located within the inundation areas for a Town of Mount Pleasant Dam? (Y) / N . Which dam would impact your organization Kensico ? If no, proceed to Question No. 6.
   (Kensico Dam / Pocantico Lake Dams)

2. Were you aware of the impacts from a dam breach? (Y) / N . Do you know the depth of the inundation levels that would occur at your location?
   no

3. How would a dam breach effect your organization?
   total evacuation

4. How much time would be required to evacuate your location?
   5 hours

5. Are there ways to reduce the effects of this hazard? (Evacuation plan, recognition of hazard, relocation of critical features out of inundation areas, etc.)
   We have sand bags - we are built into a hill so we would move kids up. We have an evacuation plan tied into all other hospitals.

6. If interested, what assistance can you provide to the town, businesses or residents that could reduce the effects from the impacts of dam breach?
   none

7. On a scale of 1 to 10 (10 being most concerning), how concerned are you in regard to a dam failure?
   2 .

Town of Mount Pleasant Multi-Hazard Mitigation Plan
Hazardous Material Leak Work Session

November 12, 2014

Name: Maureen Derimore

Title: COO

Organization /Agency: Blythedale Children's Hospital

Please complete the survey information below in regard to a Hazardous Material Leak:

1. Does your organization use or store hazard materials? (Y) / N. If no, proceed to Question No. 5.
2. What kind of chemical/hazard material? chemo / needles waiting for pick-up
3. Do you have a release response plan? (Y) / N.
4. What is the area of inundation that requires response or action? none
5. Are you aware the presence of a hazardous material that may impact you or require your action during a release? (Y) / N.
6. How much time would be required to evacuate your location?
   All patients - about 5 hours
7. Are there ways to reduce the effects of this hazard? (Evacuation plan, recognition of hazard, relocation of critical features out of inundation areas, etc.)
   We recognize the hazard. They are in a locked box in a locked closet
8. If interested, what assistance can you provide to the town, businesses or residents that could reduce the effects from a hazardous material leak?
   none
9. On a scale of 1 to 10 (10 being most concerning), how concerned are you in regard to a hazardous material leak? 1.

Town of Mount Pleasant Multi-Hazard Mitigation Plan
Flooding Hazard Work Session

November 12, 2014

Name: David Voet

Title: General Manager, Edith Macy Conf. Ctr

Organization /Agency:

Please complete the survey information below in regard to Flooding Hazard:

1. Are you affected by flooding in any way and list the impacts to your business/location? Are there concerns with your organization with the flood plain inundation areas shown? If no, proceed to Question No. 4.

Yes, access to our facility is impacted by road flooding. Chappaqua Rd at Rt 100 and also at Westbury Road.

2. Do you have Flood Insurance? Yes / No

3. How many times have you been flooded in the last 3 years? Last 10 Years? What amount of damage was incurred during those periods?

No damage, but access has been limited at times

4. Do you have an evacuation plan or flood prevention plan that is dependent on the infrastructure (passable roads, power, communication, etc.) for its execution?

Indian Pt evacuation plan could be impacted if accompanied by flooding.

5. Are you aware of any other areas of flooding that are not shown on the map presented? Please specify.

Chappaqua Rd near Rt. 100, Westbury Rd opposite Toscanic

6. If interested, what assistance can you provide to the town, businesses or residents that could reduce the affects from the impacts of flooding?

Our hotel rooms + meeting space could serve as shelter

7. On a scale of 1 to 10 (10 being most concerning) how concerned are you in regard to flooding? 5.

Town of Mount Pleasant Multi-Hazard Mitigation Plan
Utility Failure/Extreme Storm/Winter Storm Work Session

November 12, 2014

Name: Ted Jackson

Title: Property Manager

Organization /Agency: Edith Macy Conference Center / Girl Scouts of USA

Please complete the survey information below in regard to Utility Failure, Extreme or Winter Storm:

1. Out of the three types of hazards (Utility Failure, Extreme or Winter Storm), which hazard are you affected by the most and why?

   Electrical Failure — Most storms, the power goes down for a few hours.

2. Are there losses of life or injury concerns with your organization in regard to these hazards? Explain.

   Injury due to ice conditions — we are located on hills — many guests walking the facility

3. What is your plan to reduce the effects from these hazards if roads become impassable, power outages, extreme heat or cold, loss of communications, shortage of medicines occurs for an extended period of time?

   We have partnered with Con Edison as a staging facility for out of town crews to stay during emergencies

4. If interested, what assistance can you provide to the town, businesses or residents that could reduce the affects from the impacts from these storms?

   We have hotel facilities — 50 + rooms — to offer displaced families

5. On a scale of 1 to 10 (10 being most concerning), how concerned are you in regard to these types of hazards? 6.

Town of Mount Pleasant Multi-Hazard Mitigation Plan
Dam Failure Work Session

November 12, 2014

Name: David Voot

Title: General Mgr

Organization /Agency: Edith Moore Conf Ctr

Please complete the survey information below in regard to Dam Failure Hazard:

1. Are you located within the inundation areas for a Town of Mount Pleasant Dam? Y / N. Which dam would impact your organization _____? If no, proceed to Question No. 6.
   (Kensico Dam / Pocantico Lake Dams)

2. Were you aware of the impacts from a dam breach? Y / N. Do you know the depth of the inundation levels that would occur at your location?

3. How would a dam breach effect your organization?

4. How much time would be required to evacuate your location?

5. Are there ways to reduce the effects of this hazard? (Evacuation plan, recognition of hazard, relocation of critical features out of inundation areas, etc.)

6. If interested, what assistance can you provide to the town, businesses or residents that could reduce the effects from the impacts of dam breach?

   Hotel rooms + meeting rooms used as shelter

7. On a scale of 1 to 10 (10 being most concerning), how concerned are you in regard to a dam failure?
   1.

Town of Mount Pleasant Multi-Hazard Mitigation Plan
Flooding Hazard Work Session

November 12, 2014

Name: Joy Scotto-Friedman

Title: Asst Supt

Organization /Agency: Pocantico Hills CSD

Please complete the survey information below in regard to Flooding Hazard:

1. Are you affected by flooding in any way and list the impacts to your business/location? Are there concerns with your organization with the flood plain inundation areas shown? If no, proceed to Question No. 4.

   No.

2. Do you have Flood Insurance? Yes / No

3. How many times have you been flooded in the last 3 years? Last 10 Years? What amount of damage was incurred during those periods?

   None.

4. Do you have an evacuation plan or flood prevention plan that is dependent on the infrastructure (passable roads, power, communication, etc.) for its execution?

   Yes.

5. Are you aware of any other areas of flooding that are not shown on the map presented? Please specify.

   No

6. If interested, what assistance can you provide to the town, businesses or residents that could reduce the affects from the impacts of flooding?

   If we had better electrical connections to our generator we could use our building as a shelter.

7. On a scale of 1 to 10 (10 being most concerning) how concerned are you in regard to flooding? 1.

Town of Mount Pleasant Multi-Hazard Mitigation Plan
Utility Failure/Extreme Storm/Winter Storm Work Session

November 12, 2014

Name: Jay Scotto-Friedman

Title: Asst Supt

Organization /Agency: Pocantico Hills CSD

Please complete the survey information below in regard to Utility Failure, Extreme or Winter Storm:

1. Out of the three types of hazards (Utility Failure, Extreme or Winter Storm), which hazard are you affected by the most and why?

   Winter Storm
   Utility Failure.

2. Are there losses of life or injury concerns with your organization in regard to these hazards? Explain.

   NO.

3. What is your plan to reduce the effects from these hazards if roads become impassable, power outages, extreme heat or cold, loss of communications, shortage of medicines occurs for an extended period of time?

   improve electrical connections to our generator to be able to shelter affected students and families

4. If interested, what assistance can you provide to the town, businesses or residents that could reduce the affects from the impacts from these storms?

   if we had better electrical connections to our generator we could be used as a shelter

5. On a scale of 1 to 10 (10 being most concerning), how concerned are you in regard to these types of hazards? 1.

Town of Mount Pleasant Multi-Hazard Mitigation Plan
Dam Failure Work Session

November 12, 2014

Name: Jay Scotta-Friedman

Title: Asst. Supt.

Organization /Agency: Pocantico Hills CSD

Please complete the survey information below in regard to Dam Failure Hazard:

1. Are you located within the inundation areas for a Town of Mount Pleasant Dam? Y / N . Which dam would impact your organization _____? If no, proceed to Question No. 6.
   (Kensico Dam / Pocantico Lake Dams)

2. Were you aware of the impacts from a dam breach? Y / N . Do you know the depth of the inundation levels that would occur at your location?

   It would effect our pool

3. How would a dam breach effect your organization?

   it would flood the pool

4. How much time would be required to evacuate your location?

   it would be ?

5. Are there ways to reduce the effects of this hazard? (Evacuation plan, recognition of hazard, relocation of critical features out of inundation areas, etc.)

   NO

6. If interested, what assistance can you provide to the town, businesses or residents that could reduce the effects from the impacts of dam breach?

7. On a scale of 1 to 10 (10 being most concerning), how concerned are you in regard to a dam failure?

   _____ 1

Town of Mount Pleasant Multi-Hazard Mitigation Plan
Hazardous Material Leak Work Session

November 12, 2014

Name: Jay Scotto-Friedman

Title: Asst. Supt.

Organization /Agency: Pocantico Hills CSD

Please complete the survey information below in regard to a Hazardous Material Leak:

1. Does your organization use or store hazard materials? Y / N. If no, proceed to Question No. 5.
2. What kind of chemical/hazard material? pool chemicals
3. Do you have a release response plan? Y / N.
4. What is the area of inundation that requires response or action?
5. Are you aware the presence of a hazardous material that may impact you or require your action during a release? Y / N.
6. How much time would be required to evacuate your location?

   1 minute
7. Are there ways to reduce the effects of this hazard? (Evacuation plan, recognition of hazard, relocation of critical features out of inundation areas, etc.)

   we have a spill prevention plan
8. If interested, what assistance can you provide to the town, businesses or residents that could reduce the effects from a hazardous material leak?
9. On a scale of 1 to 10 (10 being most concerning), how concerned are you in regard to a hazardous material leak? 1.

Town of Mount Pleasant Multi-Hazard Mitigation Plan
Flooding Hazard Work Session

November 12, 2014

Name: Sister Mary Edward

Title: Nursing Home Administrator

Organization /Agency: Rosary Hill Home

Please complete the survey information below in regard to Flooding Hazard:

1. Are you affected by flooding in any way and list the impacts to your business/location? Are there concerns with your organization with the flood plain inundation areas shown? If no, proceed to Question No. 4.

   NO

2. Do you have Flood Insurance? Yes / No

3. How many times have you been flooded in the last 3 years? Last 10 Years? What amount of damage was incurred during those periods?

4. Do you have an evacuation plan or flood prevention plan that is dependent on the infrastructure (passable roads, power, communication, etc.) for its execution?

   yes

5. Are you aware of any other areas of flooding that are not shown on the map presented? Please specify.

   NO

6. If interested, what assistance can you provide to the town, businesses or residents that could reduce the affects from the impacts of flooding?

   Shelter

7. On a scale of 1 to 10 (10 being most concerning) how concerned are you in regard to flooding? 1.

Town of Mount Pleasant Multi-Hazard Mitigation Plan
Utility Failure/Extreme Storm/Winter Storm Work Session

November 12, 2014

Name: Sr. Mary Edward OP

Title: Nursing Home Administrator

Organization /Agency: Rosary Hill Home

Please complete the survey information below in regard to Utility Failure, Extreme or Winter Storm:

1. Out of the three types of hazards (Utility Failure, Extreme or Winter Storm), which hazard are you affected by the most and why?

Winter storms – staffing getting to work
Utility – Generator fail

2. Are there losses of life or injury concerns with your organization in regard to these hazards? Explain.

NO

3. What is your plan to reduce the effects from these hazards if roads become impassable, power outages, extreme heat or cold, loss of communications, shortage of medicines occurs for an extended period of time?

Keep staff overnite – 14 days of meds, food + medical supplies
30 days of Generators
Automatic disaster food delivery
Meet deliveries at the bottom of our hill

4. If interested, what assistance can you provide to the town, businesses or residents that could reduce the effects from the impacts from these storms?

Shelter

5. On a scale of 1 to 10 (10 being most concerning), how concerned are you in regard to these types of hazards? 3

Fax 914-831-1631
Engineering

Town of Mount Pleasant Multi-Hazard Mitigation Plan
Dam Failure Work Session

November 12, 2014

Name: Sr. Mary Edward, OP

Title: Nursing Home Administrator

Organization /Agency: Rosary Hill Home

Please complete the survey information below in regard to Dam Failure Hazard:

1. Are you located within the inundation areas for a Town of Mount Pleasant Dam? Y / (N). Which dam would impact your organization _____? If no, proceed to Question No. 6.
   (Kensico Dam / Pocantico Lake Dams)

2. Were you aware of the impacts from a dam breach? Y / N. Do you know the depth of the inundation levels that would occur at your location?

3. How would a dam breach effect your organization?

4. How much time would be required to evacuate your location?

5. Are there ways to reduce the effects of this hazard? (Evacuation plan, recognition of hazard, relocation of critical features out of inundation areas, etc.)

6. If interested, what assistance can you provide to the town, businesses or residents that could reduce the effects from the impacts of dam breach?
   Shelter

7. On a scale of 1 to 10 (10 being most concerning), how concerned are you in regard to a dam failure?
   7

Town of Mount Pleasant Multi-Hazard Mitigation Plan
Hazardous Material Leak Work Session

November 12, 2014

Name: Sister Mary Edwin, O.P.
Title: Nursing Home Administrator
Organization /Agency: Rosary Hill Home

Please complete the survey information below in regard to a Hazardous Material Leak:

1. Does your organization use or store hazard materials? Y / (N) If no, proceed to Question No. 5.
2. What kind of chemical/hazard material? Medical Waste only.
3. Do you have a release response plan? Y / (N)
4. What is the area of inundation that requires response or action? _____
5. Are you aware the presence of a hazardous material that may impact you or require your action during a release? Y / (N)
6. How much time would be required to evacuate your location?
7. Are there ways to reduce the effects of this hazard? (Evacuation plan, recognition of hazard, relocation of critical features out of inundation areas, etc.)
8. If interested, what assistance can you provide to the town, businesses or residents that could reduce the effects from a hazardous material leak?
9. On a scale of 1 to 10 (10 being most concerning), how concerned are you in regard to a hazardous material leak? _____.

Town of Mount Pleasant Multi-Hazard Mitigation Plan
Flooding Hazard Work Session

November 12, 2014

Name: DAVID KVINGE

Title: DIRECTOR OF ENV. PLANNING

Organization /Agency: WESTCHESTER COUNTY DEPT. OF PLANNING

Please complete the survey information below in regard to Flooding Hazard:

1. Are you affected by flooding in any way and list the impacts to your business/location? Are there concerns with your organization with the flood plain inundation areas shown? If no, proceed to Question No. 4.

   N/A

2. Do you have Flood Insurance? Yes / No

3. How many times have you been flooded in the last 3 years? Last 10 Years? What amount of damage was incurred during those periods?

   N/A

4. Do you have an evacuation plan or flood prevention plan that is dependent on the infrastructure (passable roads, power, communication, etc.) for its execution?

   N/A

5. Are you aware of any other areas of flooding that are not shown on the map presented? Please specify.

   N/A

6. If interested, what assistance can you provide to the town, businesses or residents that could reduce the affects from the impacts of flooding?

   YES, COUNTY ~~CAPITAL~~ STORMWATER MANAGEMENT CAN PROVIDES FUNDING ASSISTANCE TO MUNICIPALITIES FOR FLOOD MITIGATION PROJECTS IDENTIFIED IN STORMWATER RECONNAISSANCE PLANS. WWW.WESTCHESTERGOV.COM/FLOODING

7. On a scale of 1 to 10 (10 being most concerning) how concerned are you in regard to flooding? 10.

Town of Mount Pleasant Multi-Hazard Mitigation Plan
Utility Failure/Extreme Storm/Winter Storm Work Session

November 12, 2014

Name: ROGER GRIFFITH

Title: ASSISTANT ENGINEER (TRAFFIC)

Organization /Agency: WESTCHESTER COUNTY DPW &T

Please complete the survey information below in regard to Utility Failure, Extreme or Winter Storm:

1. Out of the three types of hazards (Utility Failure, Extreme or Winter Storm), which hazard are you affected by the most and why?

UTILITY FAILURE BROUGHT ON BY EXTREME OR WINTER STORM. SPECIFICALLY THE COUNTY HAS (6) TRAFFIC SIGNALS WITHIN MT. PLEASANT. THESE SIGNALS CAN BE PUT OUT OF COMMISSION DUE TO THIS KIND OF EVENT.

2. Are there losses of life or injury concerns with your organization in regard to these hazards? Explain.

NO LOSS OF LIFE TO OUR ORGANIZATION DIRECTLY, BUT INDIRECTLY IN THE FORM OF WESTCHESTER COUNTY CITIZENS POTENTIALLY BEING HURT BY TRAFFIC ACCIDENT BELIEVING DUE TO A LACK OF TRAFFIC CONTROL AT A SIGNAL, DUE TO POWER OUTAGE

3. What is your plan to reduce the effects from these hazards if roads become impassable, power outages, extreme heat or cold, loss of communications, shortage of medicines occurs for an extended period of time?

ESSENTIALLY IF ROADS/SIGNALS ARE UNUSEABLE FOR AN EXTENDED PERIOD, CITIZENS WILL HAVE TO USE ALTERNATE ROUTES AS MUCH AS POSSIBLE. PUBLIC NOTIFIED VIA HUTMC, & LOCAL NEWS OUTLETS. AS WELL AS VIA THE COUNTIES WEBSITE publicworks.westchestergov.com. COUNTY WILL WORK WITH LOCAL MUNIS & PRIVATE CONTRACTORS TO GET FACILITIES BACK UP AND RUNNING ASAP. ALLOWS SIGNALS TO RUN ON GENERATOR UNTIL POWER IS RESTORED.

4. If interested, what assistance can you provide to the town, businesses or residents that could reduce the affects from the impacts from these storms?

COUNTY CAN INSTALL GENERATOR DISCONNECT SWITCHES AT SIGNALS. THESE WILL BE OPERATED/MAINTAINED BY LOCAL DPW OR PUBLIC WORKS DURING "EVENT". AGREEMENT BETWEEN COUNTY & MUNI NEEDS TO BE IN PLACE BEFORE HAND.

5. On a scale of 1 to 10 (10 being most concerning), how concerned are you in regard to these types of hazards? 8.

SIGNAL LOCATIONS: KENSICO RD @ COMMERCE
ROLLING HILLS
NANNY HAGEN

COLUMBUS AV @ ROSEHILL
SUMMIT NORTH
" SOUTH

Town of Mount Pleasant Multi-Hazard Mitigation Plan
Flooding Hazard Work Session

November 12, 2014

Name: James Tipa

Title: Fire Safety / Emergency Management

Organization /Agency: MTA Metro - North Railroad

Please complete the survey information below in regard to Flooding Hazard:

1. Are you affected by flooding in any way and list the impacts to your business/location? Are there concerns with your organization with the flood plain inundation areas shown? If no, proceed to Question No. 4.

During heavy flooding of the Bronx River or in the case of a dam failure we would be concerned with flooding that would cause rail service disruptions or affect infrastructure which would cause termination of service.

2. Do you have Flood Insurance? Yes / (No) - State Agency - Self Insured

3. How many times have you been flooded in the last 3 years? Last 10 Years? What amount of damage was incurred during those periods?

In recent years we have only had one major washout causing service disruptions. Flooding of the track bed in the area of Valhalla Station.

4. Do you have an evacuation plan or flood prevention plan that is dependent on the infrastructure (passable roads, power, communication, etc.) for its execution?

We have a companywide evacuation and flood planning but no plans in specific to Mount Pleasant.

5. Are you aware of any other areas of flooding that are not shown on the map presented? Please specify.

No, Not aware of other flooding in other areas.

6. If interested, what assistance can you provide to the town, businesses or residents that could reduce the affects from the impacts of flooding?

Not Available.

7. On a scale of 1 to 10 (10 being most concerning) how concerned are you in regard to flooding? 4.

Town of Mount Pleasant Multi-Hazard Mitigation Plan
Hazardous Material Leak Work Session

November 12, 2014

Name: James Tipa

Title: Fire Safety / Emergency Management

Organization /Agency: MTA Metro-North Railroad

Please complete the survey information below in regard to a Hazardous Material Leak:

1. Does your organization use or store hazard materials? Y / N. – Not Typically If no, proceed to Question No. 5.
2. What kind of chemical/hazard material? Various – No bulk material.
3. Do you have a release response plan? Y / N.
4. What is the area of inundation that requires response or action? Harlem rail line North white plains rail yards.
5. Are you aware the presence of a hazardous material that may impact you or require your action during a release? Y / N.
   Chlorine from dam site in addition to various Haz Mat transport vehicles.
6. How much time would be required to evacuate your location?
   No more than a half hour.
7. Are there ways to reduce the effects of this hazard? (Evacuation plan, recognition of hazard, relocation of critical features out of inundation areas, etc.)
   Recognition of the hazard.
8. If interested, what assistance can you provide to the town, businesses or residents that could reduce the effects from a hazardous material leak?
   Not Available.
9. On a scale of 1 to 10 (10 being most concerning), how concerned are you in regard to a hazardous material leak? 5.

Town of Mount Pleasant Multi-Hazard Mitigation Plan
Dam Failure Work Session

November 12, 2014

Name: James Tipa

Title: Fire Safety / Emergency Management

Organization /Agency: MTA Metro-North Railroad

Please complete the survey information below in regard to Dam Failure Hazard:

1. Are you located within the inundation areas for a Town of Mount Pleasant Dam? (Y) / N . Which dam would impact your organization _____? If no, proceed to Question No. 6.
   (Kensico Dam / Pocantico Lake Dams) – Not aware of Pocantico inundation.

2. Were you aware of the impacts from a dam breach? (Y) / N . Do you know the depth of the inundation levels that would occur at your location?
   Yes, we are aware and familiar with dam failure plans.

3. How would a dam breach effect your organization?
   we would suffer from severe loss of infrastructure due to the fact we are located in a low lying area. Heavy flooding would cause termination of rail service.

4. How much time would be required to evacuate your location?
   under a half hour time frame.

5. Are there ways to reduce the effects of this hazard? (Evacuation plan, recognition of hazard, relocation of critical features out of inundation areas, etc.)
   Recognition of the hazard.

6. If interested, what assistance can you provide to the town, businesses or residents that could reduce the effects from the impacts of dam breach?
   Not Available

7. On a scale of 1 to 10 (10 being most concerning), how concerned are you in regard to a dam failure?
   4.

Town of Mount Pleasant Multi-Hazard Mitigation Plan
Utility Failure/Extreme Storm/Winter Storm Work Session

November 12, 2014

Name: James Tipa

Title: Fire Safety / Emergency Management

Organization /Agency: MTA Metro-North Railroad

Please complete the survey information below in regard to Utility Failure, Extreme or Winter Storm:

1. Out of the three types of hazards (Utility Failure, Extreme or Winter Storm), which hazard are you affected by the most and why?

   All three hazards affect our service/operations.
   - utility outage affects electric mode train service.
   - Extreme storms affect service and track bed/infrastructure.

2. Are there losses of life or injury concerns with your organization in regard to these hazards? Explain.

   No, we do not operate in unsafe conditions.

3. What is your plan to reduce the effects from these hazards if roads become impassable, power outages, extreme heat or cold, loss of communications, shortage of medicines occurs for an extended period of time?

   We would follow guidelines set forth in contingency plans and continuation plans in addition to MTA and state support.

4. If interested, what assistance can you provide to the town, businesses or residents that could reduce the affects from the impacts from these storms?

   Not Available.

5. On a scale of 1 to 10 (10 being most concerning), how concerned are you in regard to these types of hazards? 8.

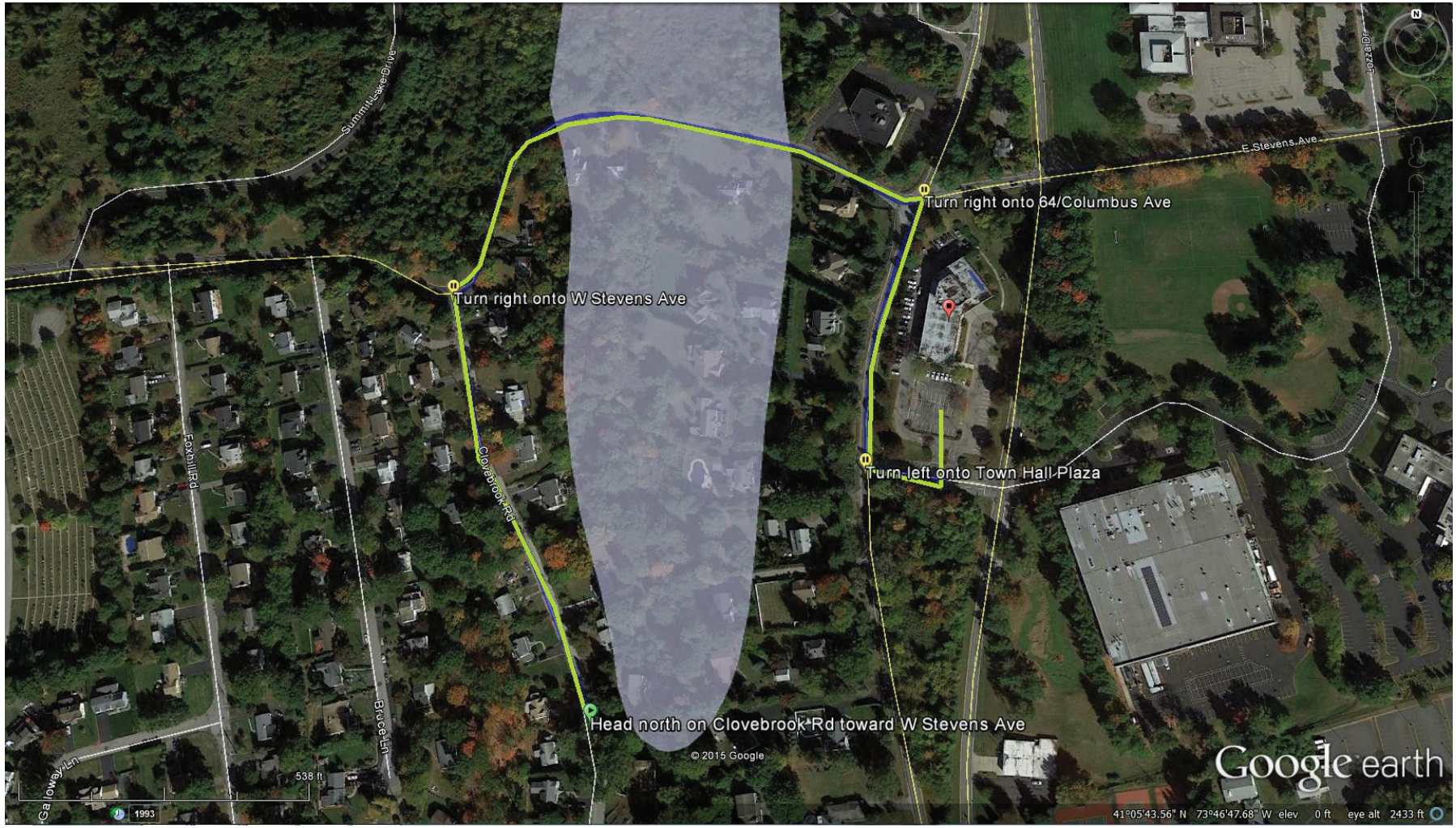
APPENDIX E.

FLOOD EVACUATION ROUTES

This Appendix denotes the routes to be taken for the evacuation of the four neighborhood areas within the 100-and 500-year floodplains in the event of a pre-emptive flood evacuation:

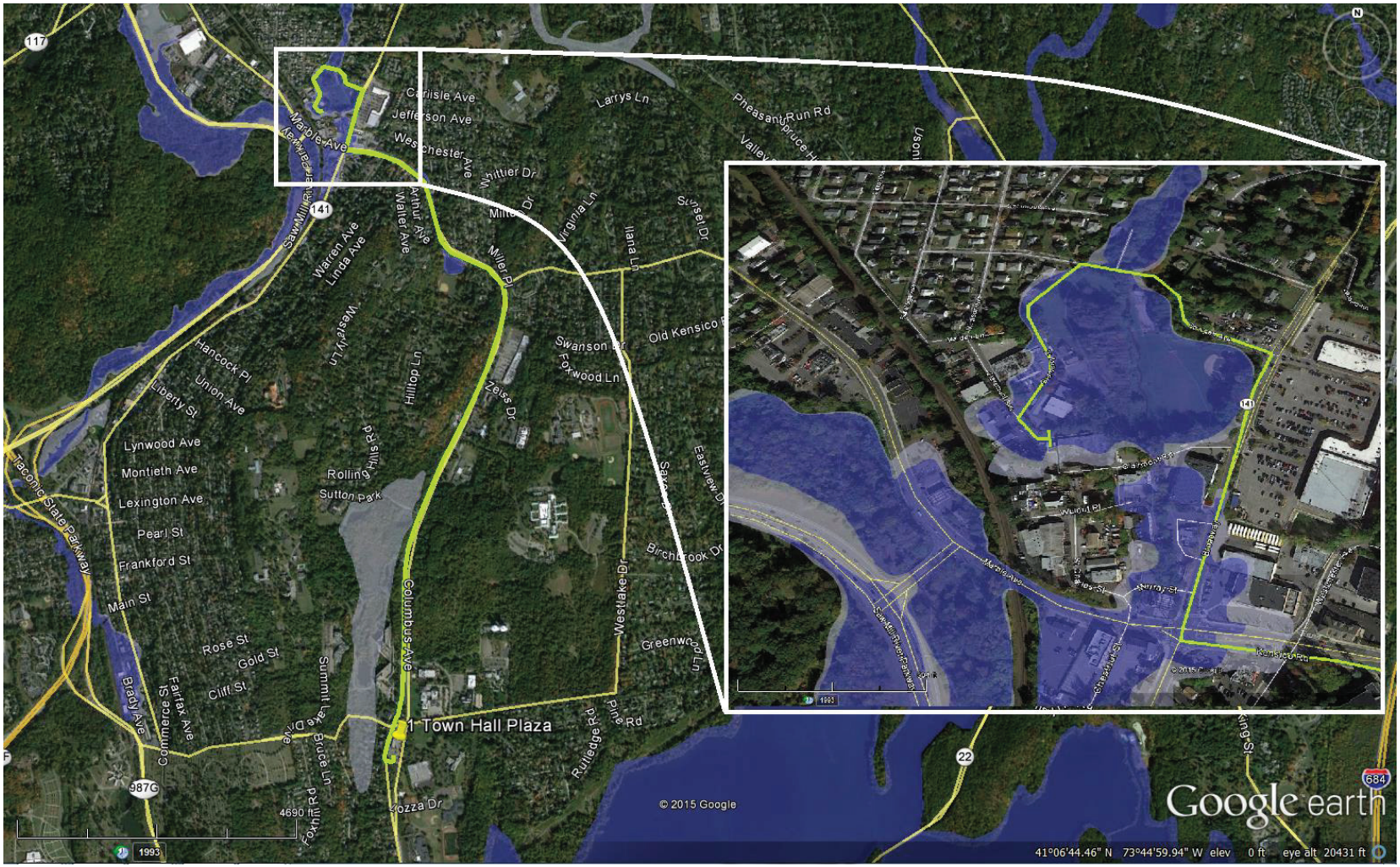
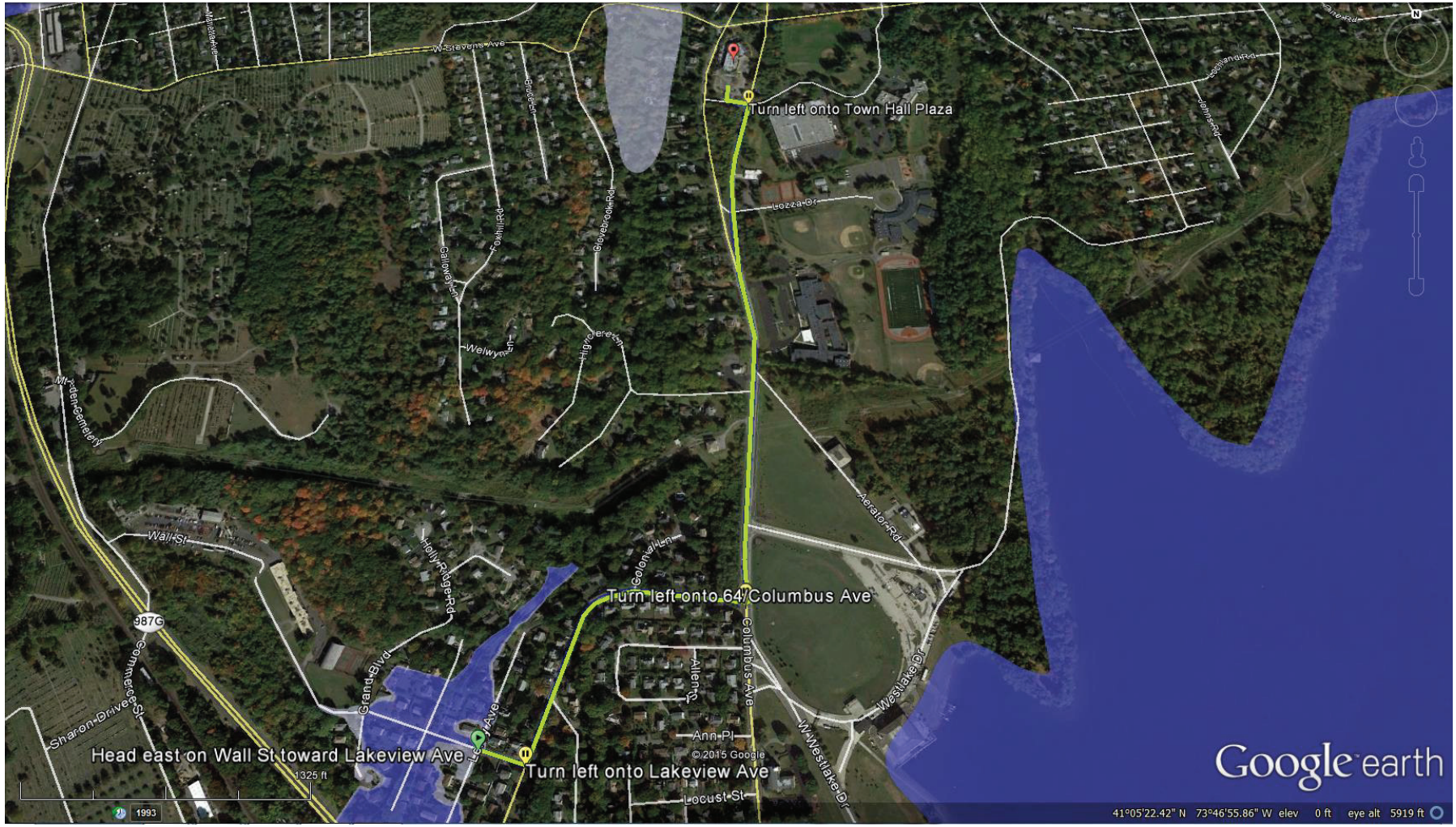
1. Clovebrook Road and W. Stevens Avenue
2. Brady Ave. and Elwood Avenue
3. Thornwood Water District Park and Gramercy Place
4. Wall Street and Leroy Avenue

Clovebrook Road and W. Stevens Avenue Evacuation Route



Brady Ave. and Elwood Avenue Evacuation Route

Thornwood Water District Park and Gramercy Place Evacuation Route



Wall Street and Leroy Avenue Evacuation Route