CHEMUNG COUNTY
ALL-HAZARD MITIGATION PLAN

SECTION I
CHEMUNG COUNTY COMPREHENSIVE EMERGENCY MANAGEMENT PLAN

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I. Background

A. Community Location and Population

Chemung County, NY is located in the Southern Tier of New York along the Pennsylvania border. Chemung County is 412 square miles, and has a population of 88, 331 (2010 Census) experiencing a slight decline from 91,070 (2000 Census). There are eleven towns, one city and five villages located within the boundaries of the County.

B. Water Resources and Infrastructure

Chemung County is located in the Susquehanna River Basin, and forms the headwaters for the watershed area that empties into the Chesapeake Bay. The Chemung River runs from the western border of the County to the southeast corner, where it empties into the Susquehanna River just south of the County border in Pennsylvania. An extensive network of streams feed into this drainage system, including Bentley Creek, Seeley Creek, Sing Sing Creek, Hoffman Creek, Beecher Creek, Hendy Creek, Jackson Creek, Cayuta Creek, Wyn Coop Creek, Baldwin Creek, and Newtown Creek. A portion of the northwest part of Chemung County is in the Seneca Lake watershed, which includes Catherine Creek.

The County is protected by numerous dams and levee systems. The largest dams are the Tioga-Hammond Dams and the Cowanesque Dam, all located to the southwest in Tioga County, Pennsylvania. Chemung County has the following high hazard earthen dams within its borders: Hoffman Dam/Elmira Water Board Dam (two structures on Hoffman Creek), Reformatory Dam (under control of NYS Corrections), Beecher Creek Dam (West Elmira), Sullivanville Dam, Jackson Creek Dam, Park Station Dam, Marsh Dam. A newly constructed dam in West Elmira, Larchmont Dam, is considered a medium or low hazard dam.

C. Transportation Resources

The area is traversed by several major transportation routes, including State Route 17, which is currently being upgraded to meet requirements for interstate designation (future I-86), and a rail line owned by Norfolk-Southern. The County is also home to the Elmira-Corning Regional Airport, currently served by three commercial airlines, and home to several private aviation concerns including Fed Ex, Corning Incorporated, Schweizer Aircraft Corp., and for-hire commuter companies. Known as “The Soaring Capitol”, Chemung County boasts the National Soaring Museum located on Harris Hill. The museum plays host each year to a national glider meet and competition, and offers glider rides to the public. The National Warplane Museum also calls Chemung County its home. Located in Big Flats near the Airport Corporate Park, the museum features displays of military aircraft from past to present.

D. Economic Development and Industry

The County was once home to large agricultural concerns. However, over the years, we have a seen a transition from mainly agricultural, to mainly heavy manufacturing concentrated in urban areas, to a current mix of light manufacturing and service oriented businesses in the more urban areas. Manufacturing facilities store a wide variety of hazardous materials. The County has a large "corporate park" that is growing tremendously, within a half mile of the airport. The county has two major shopping complexes, each also within a half mile of the airport, and a hockey arena in downtown Elmira. The City of Elmira is also home to Elmira College.

E. Hazard Mitigation Planning

Based on the topography and community profile, Chemung County is prone to several natural hazards. In the past the County and its municipalities have worked cooperatively to identify hazards, plan and accomplish mitigation projects, and respond to emergency situations. Elected officials certainly understand the importance of mitigation, and have shown their commitment in the past to supporting mitigation planning and projects. It is understood that this plan update will be, as the County's 2006 Hazard Mitigation Plan was, the road map to the future of mitigation in Chemung County. The County and its municipalities have worked cooperatively to identify the hazards that are most likely to affect our communities, have agreed to the goals and objectives to be accomplished in this plan, and have agreed to review and maintain this plan in the future. This plan documents past mitigation efforts in Section VI, Mitigation Strategies and Measures- Past and Present.

Recent Development Trends

Chemung County is one of three counties that together comprise the Southern Tier Central (STC) region. The STC region, characterized by rolling hills and river valleys, including areas with a moderate to severe topography, does not lend itself easily to development. It is well documented in the region's annual Comprehensive Economic Development Strategy (CEDS), funded by the U.S. Economic Development Administration, that it is anticipated that future growth will continue to be centered in or adjacent to the established major economic centers.

Of the three STC counties—Steuben and Schuyler counties are the other two—Chemung County contains the most flat, e.g., "developable" land. This flat area has been developed into the largest population cluster in the region: the City of Elmira and several surrounding towns and villages (with a combined population of 63,350 people). As indicated in the 2010 CEDS, even in Chemung County, land

available for development is limited, with many of the most promising locations already having been developed. Remaining developable lands consist primarily of two types: (1) large well connected, underutilized urban sites (with demolition/redevelopment costs); and (2) rural greenfield (with potential costs of bringing utilities to the site).

Between 1960 and 2010, Chemung County's population decreased by about 10%; the county population was 98,706 in 1960 and 88,830 in 2010. Most of the County's 17 local jurisdictions experienced population declines between 2000 and 2010. The only exception has been the Town of Big Flats, which increased by 4.1% in recent years (7,224 in 2000 as compared to an estimate of 7,520 in 2008). The development growth experienced in Big Flats has been a mix of residential development and commercial/industrial development.

Even prior to the upgrade of NYS Route 17 into Interstate 86, the presence of the County Airport—and Schweizer Aircraft, one of the County's largest employers, as well as the historical location of the Empire Zone, the NYS Route 17/Interstate-86 corridor traversing Elmira, Horseheads, and Big Flats, has been the primary site of new development in the county. Chemung County, including the Arnot Mall, is regarded as the retail 'powerhouse' of the STC region, serving the needs not only of the County and STC region including Steuben and Schuyler Counties, but also Tioga County and Pennsylvania's Bradford County.

Aside from the topographical constraints to new development, even if there was demand for growth, there is limited infrastructure in place to support substantial amounts of additional development. Construction of a 750,000 square foot regional CVS Pharmacy distribution center in the Town of Chemung has also resulted in the extension of water and sewer infrastructure to that site, funded through American Recovery and Reinvestment Act (ARRA) monies.

It should be noted, however, that even with a recent spate of hotel development in Chemung County and the surrounding region, many of these hotels, according to anecdotal evidence, often are at capacity. The energy development industry (and the ongoing drilling of the Marcellus shale for natural gas) is a growing concern in the county. According to the 2011 CEDS, nearly 1,000,000 ft2 of commercial space in Chemung County is occupied by Marcellus drilling related activities. Current population projects out to 2030 reflect continued population decline; however, it must be noted that these forecasts were developed not taking the Marcellus drilling into account.

Almost all new residential development (single- and multi-family) in the five years preceding the 2012 Update has remained concentrated in the Towns of Big Flats and Horseheads, although there has been a modest amount of new residential construction in the Towns of Veteran and Southport as well. The Chemung County Housing Market Analysis recently prepared by GAR Associates, Inc., for Southern Tier Economic Growth reports that occupancies generally remain high Countywide, and that the overall housing market remains stable.

New York State's expected termination of its moratorium on horizontal gas drilling / hydro-fracking in 2012 could make Chemung County a residential location of choice during the next decade. For the immediate future we would expect that both residential and commercial development will remain concentrated in the County's urban hub (City of Elmira, Horseheads, Big Flats) because of the availability of public infrastructure.

II. Planning Process

The purpose of this Hazard Mitigation Plan is to give the County and its municipalities a definitive direction for future mitigation projects. The goals and objectives set forth in this plan, and the action steps to be taken, have been cooperatively determined and agreed to by all governing bodies within Chemung County. It is understood that this is not a response plan, but a plan to guide future projects with the express goal of protecting lives and decreasing or eliminating damages to property and infrastructure caused by the natural hazards that affect our communities.

The planning process conducted for the development of the 2012 Hazard Mitigation Plan included active involvement of the local jurisdictions; the convening of the steering and planning teams; and outreach to stakeholders and the public.

A. Review and Incorporation of Existing Plans, Studies, and Reports

For the development of the Chemung County Hazard Mitigation Plan Update, a variety of existing documents and studies were also reviewed and incorporated, as appropriate, into the plan.

Hazard and risk data was obtained from:

- The 2006 Chemung County Hazard Mitigation Plan
- The New York State Hazard Mitigation Plan (2008 and 2011)
- NOAA’s National Climatic Data Center (NCDC)
- FEMA Federal Disaster Declarations Database

Community profile and land use information was obtained from:

- Chemung County Planning Local Land Use Plan and Zoning Survey

Table 1: 2012 Chemung County Land Use Survey

- Chemung County Economic Profile from Southern Tier Central Regional Planning Board
- Comprehensive Economic Development Strategy (CEDS 2012) from Southern Tier Central Regional Planning Board
- Comprehensive Economic Development Strategy (CEDS 2011) from Southern Tier Central Regional Planning Board
- The Town of Big Flats Hazard Mitigation Plan, October 2004
- The Town and Village of Horseheads Hazard Mitigation Action Plan, October 2004
- The Town of Southport Hazard Mitigation Action Plan, October 2004
- The Town of Elmira Hazard Mitigation Action Plan, October 2004

In addition to the past HMP, information on mitigation activities were culled

- Stormwater Coalition reports
- Soil and Water District reports
- Other internal Chemung County records and reports
- Susquehanna Chemung Action Plan, to be released February 2012

To identify the local land use tools available for mitigation, the Chemung County Planning Department conducted a survey of the resources each local jurisdiction has at its disposal. This information is provided in Table 1.

Local Jurisdiction	Written Comprehensive/ Master Plan	Zoning Regulations	Subdivision Regulations	Site Plan Review	Planning Board
City of Elmira	Yes	Yes	Yes	Yes	Yes
Town of Ashland	No	Yes	No	Yes	Yes
Town of Baldwin	No	Yes	No	Yes	Yes
Town of Big Flats	Yes	Yes	Yes	Yes	Yes
Town of Catlin	No	Yes	Yes	Yes	Yes
Town of Chemung	No	Yes	No	Yes	Yes
Town of Elmira	Yes	Yes	Yes	Yes	Yes
Town of Erin	Yes	Yes	Yes	No	Yes
Town of Horseheads	Yes	Yes	Yes	Yes	Yes
Town of Southport	Yes	Yes	Yes	Yes	Yes
Town of Van Etten	No	No	No	Yes	Yes
Town of Veteran	No	Yes	Yes	Yes(1)	Yes
Village of Elmira Heights	Yes	Yes	Yes	No	Yes
Village of Horseheads	Yes	Yes	No	Yes	Yes
Village of Millport	No	Yes	No	No	Yes
Village of Van Etten	No(2)	No	No	No	Yes
Village of Wellsburg	No	Yes	No	No	No

(1) Site Plan Review for Conditional Uses. (2) Anticipate adopting in 2012.

B. Coordination of the Planning and Steering Committees

A meeting of the Chemung County Steering Committee was held on October 12, 2010. The Steering Committee is the large group of participants who have interest or responsibilities in the Mitigation Planning process. The purpose of this meeting was to discuss the Chemung County Hazard Mitigation Plan Five Year Update. Many of the committee members also participated in the creation of the initial Hazard Mitigation Plan, adopted in 2006. Members present included: Kristin A. Card-Griffin, Chemung County Emergency Planner and Safety Coordinator; Michael Smith, Director Chemung County Emergency Management; Randy Olthof, Director Chemung County Planning Dept.; Ann Crook, Manager Elmira-Corning Regional Airport; Thomas Kump, Director Chemung County Environmental Health representing Robert Page, Director Chemung County Public Health Dept.; Jim Lynch, NYS Dept of Environmental Conservation Flood Control; Andy Avery, City of Elmira/Chemung County Director Public Works; Mark Watts, Chemung County Soil and Water Conservation and County Mitigation Coordinator.

Several members who did not attend this initial meeting included: Janet Thigpen, Southern Tier Central Regional Planning and Development Board; Robert Dieterle, Superintendent/Working Foreman Chemung County Buildings and Grounds; Karen Miner, Director Chemung County Public Information representing the Chemung County Executive's Office, and a representative from the Chemung County

Sheriff's Office. All those who did not attend the meeting have continued to be involved in the planning process via email and other correspondence.

Members spent numerous hours prior to the meeting reviewing the current plan and identifying hazard updates, possible new goals or objectives, and completed projects that could be removed from the plan or incomplete projects that were still being considered.

The major contributors of the 2012 Hazard Mitigation Plan Update, who make up the Planning Committee, a sub-committee formed during the 2012 Update process, included:

- Janet Thigpen, the regional Flood Mitigation Specialist, who played a large role in contributing new information to the hazard profiles and risk assessment;
- Mark Watts, the County Mitigation Coordinator, provided community specific information on the strategy outcomes from the 2006 HMP;
- Jimmy Joe Carl, an engineer with the Stormwater Coalition, provided information related to Mitigation Projects that have been completed and are being planned for the future
- Diane Fiorentino from the Chemung County Storm Water Coalition who provided the Coalition's goals, activities since the inception of the Coalition, and supporting documentation regarding meeting agendas, minutes and attendance rosters.
- Kristin Card-Griffin, Chemung County Emergency Planner and Safety Coordinator, coordinated the effort, sending emails and correspondence to stakeholders and gathering input and updated information for incorporation into the plan.
- Randy Olthof, Director Chemung County Planning Dept., and Scott Shaw, Planner, provided information and charts on recent development trends and the land use survey.

Due to the rural nature of Chemung County, and the limited budgets of our smaller municipalities, our local governments rely many times on the resources available through County Government departments and quasi-governmental agencies such as Southern Tier Economic Growth for a variety of services, including planning, mapping and engineering. This sub-committee is made up of the members who provide these services, or help to provide these services. Therefore, the members of this Planning Committee have the greatest responsibility during the planning and updating process to assist the municipalities and have the greatest opportunity to interface with municipal leaders. These members are either responsible for or assist with the writing, researching, planning, or actual completion of the HMP or the Action Items.

C. Local Jurisdiction Participation

Every City, Town and Village in Chemung County, and the County itself, participated in a planning process, and adopted the Chemung County Multi-Jurisdictional Hazard Mitigation Plan in 2006. Every municipality, from 2005 through 2006, participated in the "HAZNY" Hazard Analysis program during the planning process, and contributed historical information regarding the top hazards for the County and its municipalities.

In 2005, five municipalities- T/Southport, T/Elmira, T/Big Flats, and the T & V of Horseheads- each held their own planning meetings and created individual Hazard Mitigation Plans with assistance from Janet Thigpen, Flood Mitigation Specialist from STC Regional Planning. After these municipalities created their own Hazard Mitigation Plans, the County created the 2006 Multi-Jurisdictional Hazard Mitigation Plan, which was adopted by every municipality in Chemung County. The individual plans created in 2005 were annexed to the County's 2006 Plan.

For the 2012 Update, information from the individual Town/Village plans created in 2005 was merged into the County HMP**.** Once again, the City, and all Towns and Villages fully participated in the 2012 Hazard Mitigation Planning Process. Chemung County Emergency Planner, Kristin A. Card-Griffin, met with several members of the Chemung County RAMS organization- Rural Association of Mayors and (Town) Supervisors on October 26, 2010. On October 28, 2010, Card-Griffin met with the Highway and Public Works Supervisors for all Chemung County municipalities. Members of these two groups spent time prior to the meeting reviewing the current plan to identify updates, new goals or action items, and to determine projects that have been completed or are still pending.

To gain further insight and information, Card-Griffin created a survey, which was sent electronically to each of the municipalities (Chief Elected Official/Clerk, Code Officer/Floodplain Administrator, Highway Supervisor) and other stakeholders including Chemung County Planning Department, Soil and Water Conservation, Storm Water Coalition, Southern Tier Economic Growth, and STC Regional Planning. (see Appendix A for complete survey). The survey questioned damage sustained in the Spring 2011 storms, land use planning, zoning, capital improvement and infrastructure policies, environmental management, public safety, subdivision regulations, and mitigation efforts. Each municipality and stakeholder agency met at their agency / local level to discuss and complete the Mitigation Survey as it pertained to their municipality or agency. The Town of Ashland and Village of Wellsburg met together in November 2011 to discuss Mitigation Action items together as they are dependent on one another for many resources and services. A special meeting regarding the Wellsburg

Fire Department relocation was also held in December 2011 with FEMA also in attendance to do the cost-benefit analysis on this project, and to discuss funding sources.

After all survey information was returned and incorporated into the 2012 update, Card-Griffin sent the final draft of the update to the municipalities and stakeholders to review for correctness and completeness. When the update was satisfactory to the municipalities and stakeholders, Card-Griffin posted the 2012 Update draft on the Chemung County website for public review and comment. The public had 30 days to respond. Public comments were reviewed for pertinence and incorporated into the Update.

Table 2 identifies individual contacts from each jurisdiction who contributed to the plan update. As Chemung County's communities differ in nature, size, resources, and needs, the contributions made at the local level similarly varied. Local participation was demonstrated by a variety of activities including meeting attendance, survey completion, and draft plan review.

A great deal of time and effort was made during the planning process by Janet Thigpen, David Bubniak (STC); Mark Watts, Jimmie Joe Carl, Diane Fiorintino (Soil & Water/Storm Water Coalition); Randy Olthof, Scott Shaw (Chemung County Planning).

Table 2: Local Jurisdiction Participants

Local Jurisdiction	Name	Title/Department	Name	Title/Department
Chemung County	Thomas Santulli	County Executive	Andy Avery	DPW
City of Elmira	John Burin	City Manager	Andy Avery	DPW
Town of Ashland	Vern Robinson	Supervisor	Fred Roberts	DPW
Town of Baldwin	Keith G Rosekrans	Supervisor	Dave Ferriter	DPW
Town of Big Flats	Teresa Dean	Supervisor	Larry Wagner	DPW
Town of Catlin	Catherine Edwards	Supervisor	Alvin Jankowski	DPW
Town of Chemung	George Richter	Supervisor	Chris Doane	DPW
Town of Elmira	David Sullivan	Supervisor	Matt Mustico	DPW
Town of Erin	Donald N. Bower, Jr.	Supervisor	Roger Berlew	DPW
Town of Horseheads	Michael Edwards	Supervisor	Kevin Smith	DPW
Town of Horseheads	Tom Skebey	Code Enf.	Mark Vanderhoff	DPW
Town of Southport	David Sheen	Supervisor	Dave Bachman	DPW
Town of Van Etten	George Keturi	Supervisor	Tim Grippo	DPW
Town of Veteran	William Winkky	Supervisor	Curt Rhodes	DPW
Village of Elmira Heights	Margaret D. Smith	Mayor	Jean Cazorla	DPW
Village of Horseheads	Donald Zeigler	Mayor	Walt Herbst	Village Manager
Village of Millport	J. Earl Manwaring	Mayor		
Village of Van Etten	Roger Brown	Mayor		
Village of Wellsburg	Malcolm Coles	Mayor		

Attendance Sheets and the Mitigation Survey are included in Appendix A, the Planning Process Appendix.

D. Stakeholder Coordination

Many county and regional stakeholder groups –such as Storm Water Coalition, Soil and Water Conservation District, Southern Tier Economic Growth, County Planning Department and STC Regional Planning—were intrinsically involved in the 2012 Plan Update process. As such, representatives of these groups were invited to meetings, provided with copies of the mitigation survey, and were asked to answer any of the questions which pertained to them or their work. Card-Griffin contacted several of these agencies by phone for clarifications or further information. Soil and Water Conservation District and the Storm Water Coalition provided detailed lists of projects they were involved in, as well as minutes and attendance rosters for meetings. Janet Thigpen from STC provided assistance with updated information, and was deeply involved with the update process. All responses were incorporated into the 2012 Update in the proper sections.

When the update was satisfactory to the municipalities and stakeholders, Card-Griffin posted the 2012 Update draft on the Chemung County website for public review and comment. Neighboring communities including Tioga, Schuyler, Steuben and Tompkins Counties, as well as School Districts, the

Chamber of Commerce, Southern Tier Economic Growth, Elmira Downtown Development, Hospitals and the Library District were notified by email that the draft Chemung County Hazard Mitigation Plan Update was available for review and were given 30 days to comment. Input from neighboring counties was also accomplished through discussion at the monthly Lake District meetings attended by area Emergency Management officials. All comments from these groups and stakeholders were reviewed for pertinence and incorporated into the plan as appropriate. A sample copy of the attendance sheet for the Lake District group is included in Appendix D, along with a copy of the email list for area non-profits / stakeholder agencies.

E. Public Outreach

After all the municipal and stakeholder agency survey information was returned and incorporated into the 2012 update, Card-Griffin sent the final draft of the update to the municipalities and agencies to review for correctness and completeness. When the update was satisfactory to the municipalities / agencies, Card-Griffin posted the 2012 Update draft on the Chemung County website for public review and comment. A public notice was placed in the Elmira Star Gazette stating the plan was on the website for review. The local libraries all have public access computers, therefore, a hard copy of the plan was not needed in the libraries. The public had 30 days to respond.

Public comments were reviewed for pertinence and incorporated into the Update. A copy of the public notice posted in the Star Gazette is included in Appendix D. Upon adoption by all municipalities, the plan is available for viewing on the Chemung County website, and is made available to all municipalities and stakeholders to link to their websites. Future comments and feedback from the public can be accomplished through an email link found on the County website.

III. Hazard Analysis and Risk Assessment

A. 2006 HMP HAZNY Analysis

During the development of the County's 2006 Hazard Mitigation Plan, Chemung County conducted risk assessments and all-hazard analyses using the New York State Emergency Management Office HAZNY program for the County as a whole, and with each municipality within its borders. The HAZNY program is used as a discussion and analysis tool to include the following information for each hazard reviewed:

- Where could this hazard occur - the options available were a large region (affecting an area greater than a half of the municipality), a small region (affecting an area one third to one half the

municipality), several individual locations, a single location. For large scale hazards such as weather related incidents, large or small regions were general chosen as weather spreads across the county or municipality. For several hazards, such as hazardous materials release in transit, a small region was chosen as it was decided the hazard could happen anywhere along a transportation corridor. For some hazards, such as hazardous materials release from a fixed location, either a single location or several individual locations were chosen as the hazard was only possible at certain locations.

- How often does the hazard occur- historical data was analyzed to determine how often a hazard occurred in the municipality. The options available were a rare event (less than once every fifty years), an infrequent event (once every eight to fifty years), a regular event (once a year to once every seven years), a frequent event (more than once a year). There was, at times, rather lengthy discussions regarding past events, when and where they occurred, and what mitigation measures were taken after the event to prevent future occurrences.

- What are the cascade effects- the HAZNY actually asked "Could this trigger another hazard". However, we expanded the discussion to ask what the cascade affects actually were, and how often they occurred.

- How will the hazard impact the population, private property and public infrastructure- This series of questions included options for the population- is serious injury or death unlikely, likely but not in large numbers, likely in large numbers, or likely to extremely large numbers. We defined "not in large numbers" as the number of victims would not overwhelm our two area hospitals. Large numbers was defined as the number of victims would require an activation of the hospitals' emergency plans. Extremely large numbers was defined as requiring the transport of victims to hospitals outside our county. For private and public property the options for damage was little, moderate or severe. We defined little as either 1. a significant number of structures still habitable or useable but in need of minor repair or 2. severe damage to a very limited number of structures; moderate as not habitable or useable but able to be repaired and the damage was to a sizeable number (a quarter) of structures, and severe as a total loss and must be replaced to a sizeable number of structures.

- How much warning will you receive- options included no warning, several hours, one day, several days, more than a week.

- How long will the hazard remain active- options included less than one day, one day, two to three days, four days to a week, more than one week. The “hazard remains active” was defined as the actual hazard duration, such as a blizzard could be two to three days, flooding could be more than a week. However a hazard such as an explosion was less than one day as the explosion occurs and then is done, it is the after affects that remain.

- How long will emergency operations continue- options included less than one day, one to two days, three days to a week, one to two weeks, more than two weeks. “Emergency operations” was defined as operations “above and beyond normal work duties”. For instance, emergency operations would include around the clock or special crews that are needed to respond to the hazard or to recover to a point that the hazard does not pose a public threat. Highway crews cleaning up debris after a storm during their normal work hours is not considered emergency operations.

In addition to using the HAZNY results, during the initial HMP planning process historical data of disaster declarations and damages due to natural and manmade disasters was compiled and analyzed. Each municipality supplied a historian, or long time resident, that recalled incidents or events, and the dates, times, etc. were verified through media coverage, municipal documents such as highway records for damages and repairs, documentation from local, state and federal disaster declarations, and documentation from state and federal agencies such as spill reports from the NYS Department of Environmental Conservation and weather event statistics from the National Weather Service.

The findings of the analyses show that Chemung County and its municipalities have several reoccurring hazards, or imminent hazards, that must be addressed through a coordinated Hazard Mitigation Plan. While the HAZNY program covered thirty five hazards, some were not applicable (avalanche, blight, hurricane, mine collapse, radiological fixed site, tsunami- conditions do not exist in Chemung County to have these hazards) , and others were so rare or posed such little threat that they were either eliminated from consideration or ranked extremely low.

The following is a list of these hazards:

1. **Air contamination**: Chemung County rarely experiences smog due to our rural nature. The committee ruled it did not warrant further study.

2. **Drought**: While Chemung County does experience drought conditions, there are no serious effects from drought, and conditions are generally short lived. The committee ruled it did not warrant further study.

3. **Earthquake**: An earthquake risk map is included in Appendix G and shows Chemung County to be in an extremely low risk area. The committee ruled it did not warrant further study.

4. **Fire/Wildfire**: While Chemung County experiences structural and wild fires, they are planned for quite thoroughly by the fire service and do not need any further mitigation study in this plan.

5. **Food Shortage/Fuel Shortage**: Chemung County does not experience such problems as we are very centrally located and have many transportation routes available to our County. These could be cascade effects from other hazards, and are covered as such with the main hazards. The committee ruled it did not warrant further study.

6. **Infestation**: Chemung County does not experience this hazard. The committee ruled it did not warrant further study.

7. **Landslide**: In the 2006 plan, the County Steering Committee ruled that landslide was a highly localized hazard, with HAZNY results indicating that landslide is a moderately low hazard. The committee decided that the hazard did not warrant further study. The fact that Chemung County does have a few small areas susceptible to landslides was discussed. However, at that time, the municipalities had reported that landsides would not have an appreciable effect on residents or developed properties.

   One municipality, the Town of Southport, had addressed this hazard in its own 2005 Mitigation plan. After Southport created their own Town HMP, the County created the multi-jurisdictional plan, and annexed all the individual Town/Village plans. For the 2012 Update, information from the individual plans is being merged into the County HMP, so Southport's landslide hazard must now be addressed. Also, there is new information from the Town of Van Etten which has changed this former hazard determination for that town. This will be discussed further in Sections IV and V of this plan.

8. **Structural Collapse**: Chemung County has no large structures that pose serious risk. The committee ruled it did not warrant further study.

9. **Utility Failure**: Not considered a serious hazard in need of mitigation in Chemung County. The committee ruled it did not warrant further study.

It was determined when creating the 2006 Plan, for the sake of efficient time and resource management, that seven of the top ranking hazards would be focused upon in the Hazard Mitigation Plan. The Steering committee determined that it was not practical to waste time and effort addressing hazards that posed little or no threat to the county residents. They also determined that in order for the plan to be useful, it needed to be concise and should focus on those hazards that cause the greatest problems. However, several hazards were determined to be "an ever present threat that poses a serious public risk", but have a low occurrence according to history. Therefore, the committee opted to incorporate these hazards into other similar categories that fell within the top seven hazards.

Therefore, "ice storm" and "extreme temperature" were combined with "severe winter storm" due to the fact that they are both winter weather threats and the mitigation measures are very similar. Statistics tell us that Chemung County has had 35 winter storms (all snow and ice) during the years 1993-2002, 32 events were heavy snow and 3 were ice storms. The committee ruled that a "North Country" ice storm event (Northern NYS 1998) is always a possibility and a threat to Chemung County, and should not be overlooked in the mitigation plan. The fact that we have been spared a storm of that magnitude for quite some time should not lull us into a false sense of security, but due the low occurrence, it did not warrant a separate section. The discussions regarding extreme temperatures all focused on cold temperatures that could lead to burst water mains and residential water pipes. Some discussion also focused on the elderly keeping thermostats set low during extremely cold winter days due to financial reasons, and suffering from cold related illnesses. The committee felt the best way to include ice storm and extreme temperatures was to combine it with severe winter storm.

The second hazard in this category is tornado. The 2006 Plan included tornado in the Severe Summer Storm category. In 2006, the National Weather Service statistics showed that Chemung County had one F3 tornado in its history. A second source (Northeast States Emergency Consortium) listed two tornados for Chemung County of an F3 magnitude, however, the internet mapping program is no longer available and further information is not available on these statistics. The committee decided, again, that a tornado could hit Chemung County at any time. Chemung County receives several tornado watches each

summer, but the occurrence is very rare. Rather than overlook the hazard, it was decided to include it with Severe Summer Storm. National Weather Service statistics tell us Chemung County can expect an average of 3 Severe Summer Storms per year. At a 2005 Skywarn Training in Chemung County, Meteorologist David Nicosia also noted that straight-line winds are often more damaging than the tornados we can expect in this area. It was decided that if we were prepared for straight-line winds and microbursts, we would be prepared for a tornado as well, as mitigation measures are the same. When preparing the 2012 Update, Chemung County and its surrounding counties documented several tornados in the previous five years. It was decided that tornado would be split out and given its own section in the 2012 Update.

The final hazards to be combined were oil spill, explosion, hazardous material release from a fixed facility and hazardous materials and radiological released in transit. Chemung County has numerous industries that use and store hazardous materials, including a "tank farm", Griffith Oil, which stores very large amounts of petroleum products. Releases of serious consequence from these facilities have been rare. Griffith Oil had a large release which is described in the hazard narrative. The Hazard Analysis defined "Oil Spill" as including all petroleum products, therefore, ranking of this hazard included gasoline, fuel oil/kerosene, waste oil, and all other petroleum products released in Chemung County. Discussions regarding oil spill focused mainly on industrial releases of oils, transportation accidents which release petroleum products, residential fuel oil leaks and gas station incidents. Discussions regarding explosions also focused mainly on residential propane tanks or natural gas lines, natural gas well drilling operations, and other explosions associated with flammable petroleum products.

There is an abundance of hazardous materials that are shipped within and through the County on a daily basis by road and rail. Hazardous Materials released in transit and those released from fixed facilities appear to be about equal according to the DEC statistics. The stats could be misleading as many are listed at residences or commercial facilities, when in fact the spill was associated with a motor vehicle accident near the residence or a leaking vehicle. The risk assessment considered each category individually. However, as the response is the same for all categories and the threat is present for all categories, the committee elected to combine the four separate categories into one for ease and efficiency as mitigation measures are the same for all.

Another category that is discussed under hazardous materials release and flood is water contamination. Several municipalities ranked water contamination within the top ten. During Tropical Storm Lee in 2011, the Village of Horseheads had one well that was contaminated by stormwater.

Engineering studies determined the gravel/sand filter for the well was simply overwhelmed by the sudden rise in ground water. The filter lost its capacity to filter allowing stormwater to flow directly into the well. The Village must now install a filtration system for the Village water supply per Health Department Regulations.

Other municipalities have current contamination issues due to residential septic systems being damaged and leaking into wells in close proximity, and contamination from agricultural products washing out of crop fields and into private or municipal wells. Most have solved the problem by extending municipal water from neighboring communities, or as in the instance in Horseheads, installing filtering equipment. Upon revisiting and reviewing the 2006 Hazard Mitigation Plan, the municipalities that rated water contamination high have now remedied the situation, and rank water contamination as being a very low hazard. Water Contamination due to hazardous materials, and especially as it could pertain to gas exploration and fracking, will be addressed in the man-made portion of the Hazard Mitigation Plan that the County will now maintain separately from this Natural Hazards Mitigation Plan.

The five natural hazards ranked highest by the County and the municipalities are as follows:

1. Flooding
2. Severe Summer Storm
3. Tornado
4. Severe Winter Storm (including Ice Storm and Cold Temperature)
5. Landslide

Technological / Man-Made Hazards

1. Epidemic: Communicable Disease
2. Hazardous Materials Release: Fixed site or in Transit
    a. Water Contamination
3. Terrorism
4. Transportation Accident

As this plan is to address natural hazards, only flooding, severe summer storms, tornado, severe winter storms, and landslides will be evaluated. Mitigation information, strategies and action itmes for Technological and Man Made Hazards will be maintained by the Chemung County Emergency Management Office as a separate document.

B. 2012 Hazards Update

As part of the 2012 Plan Update process, the Steering Committee discussed the hazards identified during the past HMP plan development process, and the process used and concluded that the hazards have not changed for Chemung County in the past five years. Municipal leaders agree that the overall hazard categories have remained the same, with the exception of Tornado and Landslide. The HAZNY Analysis for both Tornado and Landslide overall in Chemung County remains at the "moderately low" level. There are two towns, Southport and Van Etten, that have requested that Landslide now be included in the County HMP as a natural hazard, as both municipalities have landslide issues. Tornado was separated out from the Severe Summer Storm section due to an increase in tornado events in Chemung and surrounding counties between the adoption of the 2006 Plan and the 2012 Update.

IV. Vulnerabilities to Identified Natural Hazards

Table 3 below shows the Disaster History for Chemung County, dating back to Tropical Storm Agnes in 1972. As is depicted on this chart, flooding is the number one disaster in Chemung County, however, it should be noted that the time of year and cause of the flooding can vary. Some are caused by Tropical Storms and Severe Summertime storms, while others have been from a large snow event that then melted during a mid-winter warm up.

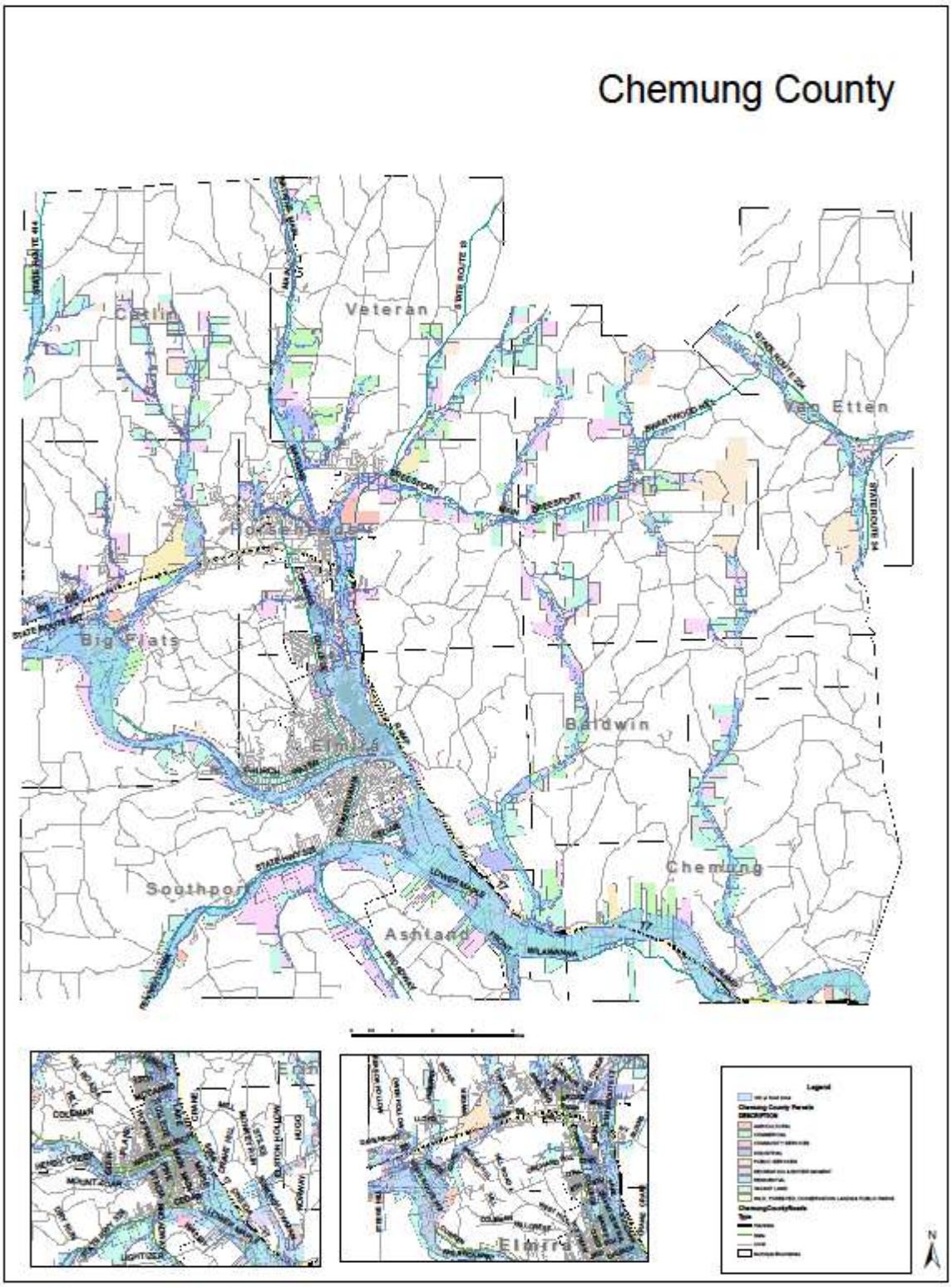
Table 3: Disaster History for Chemung County

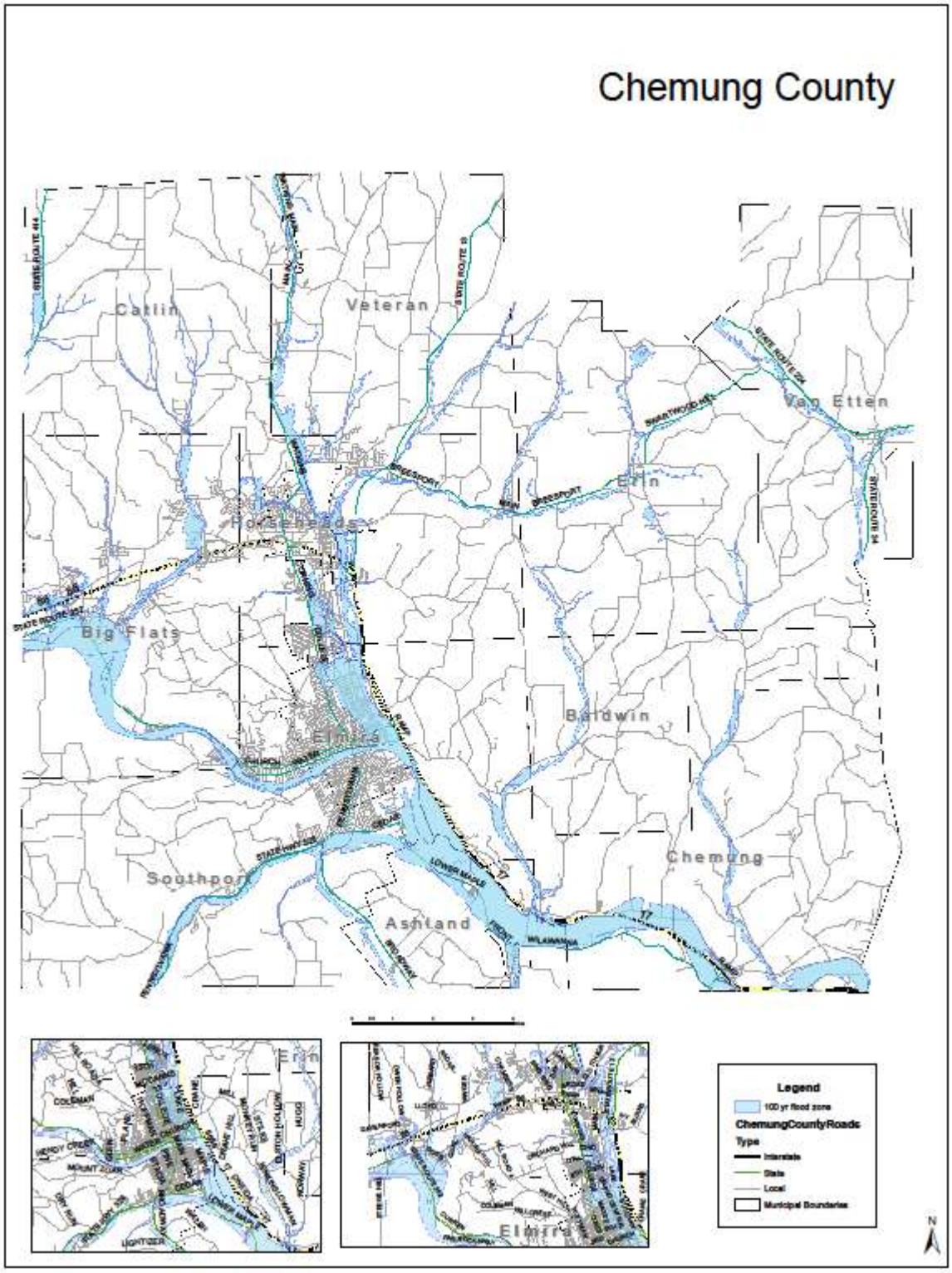
Sep 2011	Remnants of Tropical Storm Lee	4031-DR
Sep 2011	Remnants of Tropical Storm Lee	3341-EM
Jun 2011	Severe Storms, Flooding, Tornadoes, and Straight-line Winds	1993-DR
Sep 2005	Hurricane Katrina Evacuation	3262-EM
Aug 2003	Severe Storms, Flooding and Tornadoes	1486-DR
Aug 2003	Power Outage	3186-EM
Sep 2001	World Trade Center Terrorist Attack	1391-DR
Oct 2000	Virus Threat	3155-EM
Dec 1996	Severe Storms, Flooding	1148-DR
Jan 1996	Severe Storms, Flooding	1095-DR
Aug 1994	Chemung County Flooding	undeclared
Aug 1976	Broome, Chemung and Tioga County Flooding	undeclared
Jun 1976	Chemung, Schuyler, Steuben and Wayne County Flooding	undeclared
Feb 1976	Allegany, Broome, Cattaraugus, Chautaugua, Chemung, Columbia, Delaware, Greene and Tioga County Flooding	undeclared
Jun 1972	Tropical Storm Agnes	338-DR
Jun 1972	Coastal Storm Agnes	undeclared

For the 2012 Plan Update, new Flood Impact Maps were created as explained further in the flooding section below. Clicking on the maps brings up larger views of the maps. Also created was a new spread sheet containing land use information and values. Each of the following sections was also updated to reflect hazard occurrences and activity since the 2006 Plan.

Click the icon below to view the land use information and values spreadsheet.

Chemung_County_1
00_yr_floodplain_imp


Chemung County
Veteran
Van Etten
Big Flats
Baldwin
Elmira
Chemung
Southport
Ashland
Legend
N


Chemung County
Catlin
Veteran
Van Etten
Erin
Horseheads
Big Flats
Elmira
Baldwin
Chemung
Southport
Ashland
Legend
100 yr flood zone
ChemungCountyRoads
Type
Interstate
State
Local
Municipal Boundaries
N

A. Flooding

Chemung County received two Presidential Disaster Declarations in 2011, both for severe summer storms that caused widespread flooding. The first was the result of a series of storms that hit the County in April 2011. These storms caused flash flooding in numerous towns, causing close to one million dollars in public infrastructure damage. The storm cycle continued into May, however those storms were not included in the Declaration, leaving the municipalities to bear the costs of the storm damage, totaling over 300 thousand dollars.

The second Declaration came in early September when Tropical Storm Lee struck the southeastern corner of Chemung County causing severe flooding and damage to both public and private property. The Village of Wellsburg had approximately 60 homes and business that sustained damage due to flooding, many of which were considered severely damaged by New York State Building Code definition. The Towns of Chemung and Baldwin saw extensive damage to roads, culverts and bridges. There were also pockets of flash flooding around the County, causing minor flooding of homes and destroying culverts and roads in several other towns. Early estimates put the damages from Tropical Storm Lee over 5 million dollars, but work continues as of the writing of this update in November 2011.

The maps included above are new Flood Impact Maps, with and without land use data, that were created using GIS Mapping software. The maps were created by Southern Tier Central Regional Planning and Development Board (STC) using the current Q3 data and NFIP information supplied by FEMA. Lidar can also be used as a layer on the maps above, but becomes too confusing when coupled with the other layers for display in this plan.

It should be noted that the County's new FIRMS are only in draft stage and have not been released. The drafts are still under review. This map will continue to change as the levee and mapping information changes.

Below is a link to another new map. This map is interactive, also created by STC using FEMA supplied information. The map layers depict current NFIP policies in Chemung County, NFIP policy claims made by residents in Chemung County, and the repetitive loss properties in the County. This link below has layers that can be turned on or off for easier viewing of the individual layers. The bottom icon at the left of the map can be clicked, showing the layers that can be viewed or not viewed by clicking the eye icon. Click on PDF hyperlink to see map.

Chemung County Insurance.pdf

Also added is Table 4 below, entitled Chemung County, NFIP Repetitive Loss Properties Data, 2010, taken from the NYS 2011 HMP, Appendix 1. This is newer information that was supplied to Chemung County by FEMA and does contain slightly different statistics than that which is depicted on the map (linked) above.

Table 4: Chemung County, NFIP Repetitive Loss Properties Data, 2010

Jurisdiction	CRS Rating	Policy Total	Total Premium	Coverage Total	Claims since 1978	$ Claims since 78	RLPs	RLP Paid	Coverage Total	Target Loss
Ashland, Town of	9	29	$14,876	$2,361,300	**23**	$281,697	5	$152,269	$2,361,300	0
Baldwin, Town of	10	18	$13,200	$3,825,500	19	$27,397	0	$0	$3,825,500	0
Big Flats, Town	8	91	$48,118	$13,711,000	**36**	$144,364	2	$55,678	$13,711,000	0
Catlin, Town of	10	5	$1,553	$566,400	2	$4,198	0	$0	$566,400	0
Chemung, Town of	9	20	$9,747	$1,442,000	10	$26,287	0	$0	$1,442,000	0
Elmira Heights, Village	10	54	$25,693	$3,446,500	15	$33,498	3	$19,459	$3,446,500	0
Elmira, City of	8	243	$185,537	$40,153,100	**56**	$147,506	0	$0	$40,153,100	0
Elmira, Town of	9	73	$24,666	$10,476,800	15	$29,369	0	$0	$10,476,800	0
Erin, Town of	10	7	$2,621	$884,500	0	$0	0	$0	$884,500	0
Horseheads, Town of	9	85	$50,299	$8,661,100	12	$27,508	1	$11,735	$8,661,100	0
Horseheads, Village of	9	26	$11,271	$2,147,600	5	$28,620	0	$0	$2,147,600	0
Millport, Village of	10	3	$1,550	$175,300	1	$11,077	0	$0	$175,300	0
Southport, Town of	9	50	$23,453	$7,518,000	16	$71,148	1	$44,200	$7,518,000	0
Van Etten, Town of	10	0	$0	$0	3	$8,267	0	$0	$0	0
Van Etten, Village of	10	3	$1,303	$130,500	0	$0	0	$0	$130,500	0
Veteran, Town of	10	3	$1,420	$205,600	1	$1,085	0	$0	$205,600	0
Wellsburg, Village of	**9**	47	$28,989	$4,029,300	19	$293,862	0	$0	$4,029,300	0
Total	-	757	$444,296	$99,734,500	233	$1,135,883	12	$283,341	$99,734,500	0

Sources: data is from NYS 2011 Hazard Mitigation Plan, Appendix 1.

As is evident in the map and on the chart, the majority of flood insurance policies are clustered in the western central part of the County—predominantly in Big Flats, the Town and Village of Horseheads, the Town and City of Elmira, the Village of Elmira Heights and the Town of Southport. The Village of Wellsburg/Town of Ashland, in the southeastern section of the County, also has a concentration of flood insurance policies.

Many of these policies are along the Chemung River, a tributary of the Susquehanna River, which begins near Painted Post in Steuben County, just west of Corning by the confluence of the Tioga and Cohocton rivers. It flows generally east-southeast through Corning, Big Flats, Elmira, and Waverly. After crossing into northern Pennsylvania it joins the Susquehanna River.

Historically, the most claims, since 1978, have occurred in the City of Elmira, the Town of Big Flats, and the Town of Ashland. In recent years, claims have occurred in Big Flats, the Town of Baldwin and the Village of Wellsburg. Repetitive Loss Properties are located in the Village of Elmira Heights and the Town of Southport. The Village of Wellsburg saw several substantially damaged properties during Tropical Storm Lee. These properties are being considered for buyout using HMGP monies.

Since the first County Hazard Mitigation Plan in 2006, the number of flood insurance policies held in the County has decreased by a total of 19 policies. The largest change in policy holders occurred in the City of Elmira, where it was noted that there are 52 fewer flood insurance policies in effect than there was at the time of the first plan. The chart following this section has the complete policy details.

This change in policy holder numbers could be attributed to several different factors. A closer look at NFIP statistics by municipality shows a steady decrease in policies. The statistics below include the number of A-zone policies in effect, in addition to the total number of polices, for the years 1997 through 2003, and then for 2010. This is the most recent information available to Chemung County at the time of the 2012 Update.

4/17/97:	County Total policies: 1140	County A-Zone policies: 504
3/3/99:	County Total policies: 1054	County A-Zone policies: 470
10/13/03:	County Total policies: 783	County A-Zone policies: 369
2010:	County Total policies: 757	County A-Zone policies: 384
4/17/97:	City Total policies: 631	City A-Zone policies: 292
3/3/99:	City Total policies: 530	City A-Zone policies: 237
10/13/03:	City Total policies: 306	City A-Zone policies: 124
2010:	City Total policies: 243	City A-Zone policies: 98

A 1997 map revision for the City removed levee protected areas along Newtown Creek from Zone A (due to Sullivanville Dam). T/V Horseheads, Elmira Hts., and T. Elmira maps were also revised

in 1996 for Newtown Creek. The City had 2 Letters of Map Revision in 1997 and 1999 that removed structures in the College Avenue area from the SFHA.

The earlier reduction in A-Zone policies can be explained by these map changes that reduced the number of structures subject to mandatory purchase requirements. There haven't been major map changes since 1999. Chemung County would need to have more data to see if the decline in A-Zone policies stopped after the 2000 insurance renewals.

One significant factor that may come into play as a possible reason for the decline in policies, particularly in Zone X, is that more time has elapsed to erase memories of the last flood. It could be that this is more pronounced in the City, which has levee protection, because the 1972 flood was much longer ago than other floods (1996, 2003, etc.) that impacted other parts of the county.

Another significant factor, and one that is mentioned by residents as a reason for not having flood insurance, is that the cost of flood insurance has risen steadily and become less and less affordable, particularly for pre-FIRM structures. The economic issues faced by many Americans in the early 2000s has left many residents in Chemung County strapped for cash, and cutting spending whenever possible. Coupled with the short memories discussed above, many residents may feel cancelling flood insurance is the best alternative for cutting spending.

However, in the end, we can only guess about why the insurance policy numbers are declining without further study of the matter.

Table 5: Chemung County Comparison of NFIP Policies and Coverage, 2004 and 2010

	2004							2010							Changes between 2004 and 2010						
Jurisdiction	Total Premium	V-Zone	A-Zone	Policy Total	Coverage Total	Claims since 1978	$ Claims since 78	Total Premium	V-Zone	A-Zone	Policy Total	Coverage Total	Claims since 1978	$ Claims since 78	Total Premium	V-Zone	A-Zone	Policy Total	Coverage Total	Claims since 2004	$ Claims since 04
Ashland, Town of	$12,864	0	17	27	$2,017,200	23	$281,697	$14,876	0	21	29	$2,361,300	23	$281,697	2,012	0	4	2	$344,100	0	$0
Baldwin, Town of	$12,926	0	12	20	$3,747,900	15	$19,731	$13,200	0	10	18	$3,825,500	19	$27,397	274	0	-2	**-2**	$77,600	4	$7,666
Big Flats, Town of	$34,603	0	39	80	$7,502,000	32	$131,916	$48,118	0	49	91	$13,711,000	36	$144,364	13,515	0	10	11	$6,209,000	4	$12,448
Catlin, Town of	$1,468	0	2	6	$377,700	2	$4,198	$1,553	0	2	5	$566,400	2	$4,198	85	0	0	**-1**	$188,700	0	$0
Chemung, Town of	$8,593	0	12	19	$1,256,300	9	$26,287	$9,747	0	12	20	$1,442,000	10	$26,287	1,154	0	0	1	$185,700	1	$0
Elmira Heights, Vill	$21,244	0	35	49	$2,771,500	14	$25,371	$25,693	0	42	54	$3,446,500	15	$33,498	4,449	0	7	5	$675,000	1	$8,127
Elmira, City of	$178,898	0	125	295	$35,276,200	56	$147,506	$185,537	0	98	243	$40,153,100	56	$147,506	6,639	0	-27	**-52**	$4,876,900	0	$0
Elmira, Town of	$33,812	0	23	72	$8,228,700	15	$29,369	$24,666	0	13	73	$10,476,800	15	$29,369	-9,146	0	-10	1	$2,248,100	0	$0
Erin, Town of	$1,908	0	3	6	$422,000	0	$0	$2,621	0	3	7	$884,500	0	$0	713	0	0	1	$462,500	0	$0
Horseheads, Town	$33,081	0	46	68	$5,428,500	11	$27,508	$50,299	0	65	85	$8,661,100	12	$27,508	17,218	0	19	17	$3,232,600	1	$0
Horseheads, Village	$15,065	0	18	26	$2,382,600	5	$28,620	$11,271	0	16	26	$2,147,600	5	$28,620	-3,794	0	-2	0	-$235,000	0	$0
Millport, Village	$602	0	2	2	$45,700	1	$11,077	$1,550	0	3	3	$175,300	1	$11,077	948	0	1	1	$129,600	0	$0
Southport, Town	$22,027	0	10	49	$5,788,300	15	$47,948	$23,453	0	8	50	$7,518,000	16	$71,148	1,426	0	-2	1	$1,729,700	1	$23,200
Van Etten, Town	$619	0	1	2	$334,200	3	$8,267	$0	0	0	0	$0	3	$8,267	-619	0	-1	**-2**	-$334,200	0	$0
Van Etten, Vill	$1,686	0	3	3	$187,200	0	$0	$1,303	0	2	3	$130,500	0	$0	-383	0	-1	0	-$56,700	0	$0
Veteran, Town	$1,452	0	1	3	$213,600	1	$1,085	$1,420	0	2	3	$205,600	1	$1,085	-32	0	1	0	-$8,000	0	$0
Wellsburg, Village	$27,270	0	39	49	$3,645,900	17	$289,620	$28,989	0	38	47	$4,029,300	19	$293,862	1,719	0	-1	**-2**	$383,400	2	$4,242
Total	$408,118	0	388	776	79,625,500	219	1,080,200	$444,296	0	384	757	$99,734,500	233	$1,135,883	36,178	0	-4	-19	$20,109,000	14	$55,683

Sources: 2004 data is from 2006 Chemung County Hazard Mitigation Plan; 2010 data is from NYS 2011 Hazard Mitigation Plan.

B. Severe Summer Storms

New York State has had a rate of .3 federally declared severe storm events per year. New York State has applied for and been turned down or had modifications made to 6 severe storm hazards. When considered together, both declared and undeclared events, New York State averages .4 severe storm events per year with a probability of 1 severe storm event every two years. (Source: Allegany County Hazard Mitigation Plan, 2011)

The entirety of each municipality within Chemung County is vulnerable to Severe Summer Storms. According to National Weather Service Data, Chemung County has approximately 30 recorded incidents (50 if multiple event listings on the same day are counted) labeled as thunderstorm/wind, flash flooding (April – Sept months only were counted), hail or tornado. Occasionally Chemung County will get the remnants of a Hurricane or Tropical Storm which are mainly rain events causing flooding rather than wind events causing trees and utility lines to come down.

In 2011, Chemung County received two Presidential Disaster Declarations. The first declaration was for a series of severe summer storm events in the latter half of April that caused widespread flash flooding and one of these storms spawned one confirmed (by National Weather Service) and at least one other suspected tornado. The tornados hit in the early morning hours, making it difficult to see the funnels. The confirmation and assumption of tornados were determined by damage patterns. The storms continued into May, however, efforts to have these later storms included in the Declaration were repeatedly denied, leaving the municipalities to bear the burden of these damage costs. Total damages from these storms added up to over one million dollars.

The second declaration was for Tropical Storm Lee, which struck the southeastern corner of the County severely, and caused pockets of damage in the rest of the County. As is typical of this type of storm, this event was not a wind event, but a rain event causing flooding and extensive damage to both public and private properties in the Towns of Chemung, Baldwin and Ashland, and the Village of Wellsburg. Homes and businesses were severely impacted in Wellsburg, causing many residents to seek alternate housing and several businesses to close permanently. Early estimates of damages total over 5 million dollars.

Each property is vulnerable to Severe Summer Storms, but generally speaking not all properties in a municipality would be affected by the hazard at the same time.

Severe Summer Storms are usually localized and there is a distinct swath across an area where the storm has hit. Damage seen from these storms include trees and power lines down, damage to cars and other property from large hail, and damage to structures from wind. Flash Flooding is also an issue when the storm is accompanied by heavy downpours. It is impossible to predict where a storm would track, therefore, prediction of which properties would be damaged, and which would not, can only be general. A conservative average estimate would be that, in any municipality, 5 to 10 percent of the properties would suffer damage during a Severe Summer Storm.

Table 6 that follows provides estimates of the properties damaged as a result of flooding, severe summer and tornado hazards.

Table 6: Total Parcels, Estimates of Percent Damaged

		Flooding		Severe Summer		Tornado	
Jurisdiction	**Total Properties**	**% SFHA**	**SFHA Properties**	**5% Properties**	**10% Properties**	**1% Properties**	**5% Properties**
City Elmira	9,876	19.5%	1,928	494	988	99	494
Town Ashland	556	31.5%	175	28	56	6	28
Town Baldwin	630	6.2%	39	32	63	6	32
Town Big Flats	3,962	16.2%	641	198	396	40	198
Town Catlin	1,455	15.4%	224	73	146	15	73
Town Chemung	1,581	19.6%	310	79	158	16	79
Town Elmira	3,206	7.8%	250	160	321	32	160
Town Erin	1,324	20.8%	275	66	132	13	66
Town Horseheads	4,628	16.7%	771	231	463	46	231
Town Southport	5,625	5.7%	322	281	563	56	281
Town Van Etten	971	8.1%	79	49	97	10	49
Town Veteran	1,725	12.3%	213	86	173	17	86
Village Elmira Heights	1,935	15.3%	297	97	194	19	97
Village Horseheads	2,533	11.4%	290	127	253	25	127
Village Millport	186	36.0%	67	9	19	2	9
Village Van Etten	290	22.1%	64	15	29	3	15
Village Wellsburg	236	68.2%	161	12	24	2	12

Note: Parcel data provided by Chemung County Assessor.

C. Tornado

It is common knowledge that New York State has a definite vulnerability to tornadoes. Research has indicated that over 350 tornadoes ranging from F0 to F4 on the Fujita-Pearson Tornado Intensity Scale have occurred in New York State since 1952. (Source, NYS Hazard Mitigation Plan, 2008) The entirety of each municipality within Chemung County is vulnerable to tornado. However, damage from a tornado of the magnitude likely to hit Chemung County would be very localized. There is a distinct swath across the area where the tornado has hit. It is impossible to predict where a storm would track, therefore, prediction of which properties would be damaged, and which would not, can only be general. A conservative average estimate would be that, in any municipality, less than 1 to 5 percent of the properties would suffer damage during a tornado.

Subsequent to the 2006 Plan, Chemung and surrounding counties have experienced several tornados and tornado-like storms. The Planning Committee therefore decided to break out tornado into a separate category, rather than include it in severe summer storm as it was in the 2006 Plan.

D. Severe Winter Storms

Winter storm hazards in New York State are virtually guaranteed yearly since the State is located at relatively high latitudes resulting in winter temperatures ranging between 0 degree F and 32 degree F for a good deal of the fall through early spring season, that is from late October until Mid-April. In addition, the State is exposed to large quantities of moisture from both the Great Lakes and the Atlantic Ocean.

Chemung County experiences an annual average snowfall of 45.9 inches. The County is rated a 9 out of 25 in terms of vulnerability to snow loss. Chemung County is not identified by the State as being a location of extreme snowfall potential. Extreme snowfall potential locations include counties that are historically subject to persistent heavy lake effect / enhanced snow from Lakes Erie and Ontario and those with elevation and latitude snow vulnerability.(Source: NYS Hazard Mitigation Plan, 2008)

The entirety of each municipality within Chemung County is vulnerable to Severe Winter Storms. Chemung County is often spared storms that hit further north in the state, but still has a recorded 13 severe winter storms from January 2006 through April 2011 according to the National Weather Service.

A severe winter storm is one that develops in late fall to early spring and deposits wintry precipitation, such as snow, sleet, or freezing rain, with a significant impact on transportation systems and public safety. Some common terms used by the National Weather Service are:

- Heavy snow – Snowfall accumulating to 6 inches in 12 hours or less.
- Blizzard – A winter storm characterized by low temperatures, wind speeds of 35 miles per hour or greater, and sufficient falling and/or blowing snow in the air to frequently reduce visibility to ¼ mile or less for a duration of at least three hours.
- Severe blizzard – A winter storm characterized by temperatures near or below 10 degrees Fahrenheit, winds exceeding 45 mph, and visibility reduced by snow to near zero for a duration of at least three hours.

Difficulties caused by winter storms include poor driving conditions, some trees/utility lines down, and flooding from the sudden melting of snow or ice jams in the Chemung River.

Severe Winter Storms, especially those involving heavy ice accumulations, can also be localized. However, as was seen in the North Country (NY) Ice Storm in 1998, Severe Winter Storms can also be widespread over several counties. If a storm the magnitude of the 1998 ice storm in northern New York were to hit Chemung County, we would experience the same devastation that was seen in these northern counties. More localized storms could only effect hilltop properties, or may be limited to a geographic area such as the three towns in the southern portion of the county, the three northern towns, etc.

E. Landslide

Chemung County has several small areas that exhibit conditions favorable for landslides. The Town of Southport, Town of Veteran, Town of Horseheads, and since 2011 the Town of Van Etten, all have existing landslides. These areas are noted for having steep rocky or forested banks, along streams and creeks and rural roadways, or along the Chemung River. While there are currently no other areas within Chemung County that have been identified as being at risk for a landslide, and Chemung County is located in an area of New York State that is classified as having a low susceptibility for landslides (source: *New York State All Hazard Mitigation Plan*, prepared by Mitigation Section, New York State Emergency Management Office, 2008), certainly several towns have at least one area that exhibits the classic risk factors. Areas favorable for landslides, according to the NYS HMP 2008, "can be found along major river and lake valleys that were formerly occupied by glacial lakes resulting in glacial lake deposits (glacial lake clays) and usually associated with steeper slopes. A good example of this is the Hudson and Mohawk River valley." A State Landslide Susceptibility map can be found in Appendix C.

V. Hazard Profiles

A. Flooding Profile

1. **Locations**: All municipalities experience flooding in stream floodplains, and the Chemung River floodplain, see maps provided.
2. **Extent**: Flash Flooding to Riverine Flooding, Chemung River record 31.62 feet in 1972
3. **Previous Occurrences**: Major flooding every 10 to 25 years on average, minor flooding every year, see narrative that follows.
4. **Probability of Future Events**: Flooding of some magnitude occurs each year in Chemung County. Without mitigation this trend can be expected to continue.

Chemung County and its municipalities have a long history of flooding, with many larger events causing millions of dollars in damage. Chemung County's problems can be attributed to Riverine Flooding, Overland Flooding and Ponding (Urban Flooding), Groundwater Flooding, and Erosion. Flooding may also occur with an Ice Jam. Ice jams have occurred in Chemung county, most notably in the Chemung River near the Elmira Town Hall, but have historically not resulted in serious flooding.

Serious flooding of the Chemung River and the many streams that flow through the County have been documented throughout history, and can be expected, on average, every 10 to 25 years. Smaller, localized flooding events due to drainage problems and ponding of rain or snow melt runoff occur on a more frequent basis, causing minor, localized damage.

Chemung County's flooding history begins with sketchy information from the late 1700s and 1800s. Accounts of the floods include several "Pumpkin Floods" in the late 1700s and 1800s. The floods are so named because hundreds of thousands of pumpkins were washed out of fields by flood waters and swept away down streams and the Chemung River. Other floods, referred to as "The Tremendous Flood", "Big Flood of 1889", and "The Finger Lakes Flood" caused deaths of people and livestock, caused extensive damage to homes, and required "refugee camps" to be opened for flood victims. The flood of record was the "Big Flood of 1889". The "Great Flood" in May of 1946 became the next flood of record. Water levels during the May 1946 event were significant, but still did not reach the depths of the Agnes flood waters of 1972.

On March 2 and 3, 1972, Chemung County experienced flooding after a snow storm according a local newspaper article. Chemung County shut down several roads due to small stream flooding and flooding from the Chemung River, presumably from snow melt runoff. Roads in Big Flats, Ashland, Village of Horseheads, Town of Elmira and Elmira Heights were closed, and some residents were evacuated overnight. The County then received eight inches of snow and ice beginning in the early morning hours. Blowing and drifting snow caused more travel problems, but the flooding conditions started to ease with the colder temperatures. County residents thought this event was rather serious. A few months later, they would find that this early spring event was only a primer.

Accurate, available documentation of flooding damages starts with the most destructive flood on record in Chemung County. It was in June of 1972 when Hurricane Agnes moved into the region and collided with a low-pressure system over upstate New York. The two systems stalled over the region, dropping up to 14 inches of rain in some areas. The resulting flooding overtopped the levees and flood control structures in Chemung County and literally separated the northern and southern ends of the County for several days. Streets in the City of Elmira became part of the river, street level stores were filled with water nearly to their ceilings, homes were literally carried off by torrential flood waters, ripped from their foundations, bridges were destroyed. In total, damages reached the $300 million mark. A historical publication, The Flood of ’72 in Elmira, Chemung County, prepared by the Chemung Historical Journal, was included in Appendix G of the 2006 Chemung County Hazard Mitigation Plan.

In September of 1975, Chemung County would again see a tropical system cause extensive flooding and damage. Hurricane Eloise took the same path as Agnes three years before, but moved through the area more quickly than her predecessor. Damages were in the 40 million dollar range. A year later in June of 1976, the “Father’s Day Flood” wreaked havoc in the region, causing roughly two and a half million dollars in damage. The Big Flats town supervisor was quoted in the paper, saying there weren’t too many bridges left in the town. He also said a home in Big Flats was destroyed, and reported to the paper that the bridge below the home was “swept away by the rushing creek waters”. One local industry, Schweizer Aircraft, reported significant damage in both floods, and feared that contracts would be cancelled due to the hold up in production. The company sued the County after the 1975 flood saying they had never experienced flooding in the past, and that the 1975 flooding resulted from work being done at the nearby airport.

It would be eighteen years until Chemung County had to contend with its next big flooding event, when in August 1994 Tropical Storm Beryl caused widespread flooding. Also associated with this

flooding event was a hazardous materials release from improperly stored petroleum products. The product containers were swept up by the flood waters, creating a slick one mile long with the help of the floodwaters. Water and petroleum waste flowed into homes, and into agricultural pastures and crop fields. Three to five million dollars in damages were recorded, however the National Weather Service states that 50 million was the total damages, with the hazardous materials release accounting for over 500 thousand in total expense.

Smaller events occurred in July and August of 1994 as well, adding insult to injury. Thunderstorms producing strong winds and hail downed power lines and caused localized property damage before and after Beryl made his appearance. Horseheads received 5 inches of rain in three hours during one event, flooding many streets. Another event recorded three inches of rain washing out bridges and damaging roads in the southeast corner of the County.

Chemung County did not receive a Federal Declaration for Tropical Storm Beryl. Therefore, the costs to the County and its municipalities were two fold. For the Chemung County Public Works Department, damages totaled close to one million dollars for the repairs to roads and bridge approaches. The local municipalities faced a similar amount of damage, and the same problem, having to fix their damages without Federal or State aid. Those damage costs were paid from County and municipal 1994 Highway Budgets, leaving projects originally scheduled for completion to be cancelled or delayed. A large portion of the cancelled projects involved preventative maintenance activities, which were delayed two to three years, or were cancelled altogether. Our Public Works Commissioner has stated that the delay or cancellation of these projects in 1994 created a negative impact on the County highway system that is still evident today.

The residents of Chemung County did have the benefit of a Small Business Administration Disaster Declaration, which provided low interest loans that people still could not afford, and most did not take advantage of the loans. Many residents found that their current insurance policies did not cover the damage caused by this storm. Even residents with Flood Insurance Protection were improperly denied reimbursement as the flooding was not deemed “riverine flooding”. Out of pocket expenses for a great number of our residents caused financial hardships for years to come.

1996 would bring two flooding events to the County, one in January and another in November. In January, heavy rains combined with a heavy snow melt, causing widespread flooding. Residents in Wellsburg and Big Flats were evacuated from their homes, some by boat. Damages totaled 20 million

dollars. In November, rains again brought flash flooding, which was intensified by fallen leaves clogging storm sewers and drainage structures. Over three million dollars in damage was caused by this event.

Some of the most recent widespread flooding in Chemung County occurred August 9, 2003. Storm systems had plagued the County for several weeks. Finally, on August 9, heavy rains in the western and southern portions of the County caused major damage to roads, bridges, private property and homes. Chemung County received a Federal Disaster Declaration, #1486, covering the series of storms from July and August 2003. Road and bridge damage assistance from FEMA inspections totaled almost $1.2 million. Private assistance was requested by almost 300 people, figures on assistance are not available.

Other smaller events, and reoccurring flooding problems, happen on a more frequent basis due to drainage and groundwater problems. These repetitive events may occur as often as three or four times a year. The costs of these events add up quickly for the municipalities that must repair and maintain the roads and bridges, as well as for the residents who suffer basement flooding, septic and well problems, property damage and erosion losses.

On July 7, 2004, the northeast region of the County received three to 3 ½ inches of rain in very short time. The towns of Van Etten and Erin experienced flooding on several roads, and considerable erosion around a bridge's abutments but no damage to the bridge. The County also had high river levels during the hurricane remnants of Frances and Ivan in August and September 2004, however damage was minimal and Chemung County was not included in the disaster declarations.

Subsequent to the adoption of the County's initial HMP, Chemung County received two Presidential Disaster Declarations in 2011, both for severe summer storms that caused widespread flooding. The first was the result of a series of storms that hit the County in April 2011. These storms caused flash flooding in numerous towns, causing close to one million dollars in public infrastructure damage. The storm cycle continued into May, however those storms were not included in the Declaration, leaving the municipalities to bear the costs of the additonal storm damage, totaling over 300 thousand dollars.

The second Declaration came in early September when Tropical Storm Lee struck the southeastern corner of Chemung County causing severe flooding and damage to both public and private property. The Village of Wellsburg had approximately 60 homes and business that sustained damage due

to flooding, many of which were considered severely damaged by New York State Building Code definition. The Towns of Chemung and Baldwin saw extensive damage to roads, culverts and bridges. There were also pockets of flash flooding around the County, causing minor flooding of homes and destroying culverts and roads in several other towns. Early estimates put the damages from Tropical Storm Lee over 5 million dollars, but work continues as of the writing of this update in November 2011.

There was also a very small, localized event on December 1, 2010, that resulted in minor flooding within our borders. County Fire Departments did send aid to Broome County during the June 2006 high water event that affected much of eastern New York, and again sent aid during Hurricane Irene and Tropical Storm Lee in 2011. Some routine events, such as the closing of the Lowman Crossover or ponding in low lying areas, have occurred during spring thaws or heavy downpours. However, these are a "normal and expected" occurrence. Storm event history may be searched on: http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms.

In addition to the delineated flood areas, there are some areas that are subject to flooding that are not captured on maps. The potential for riverine flooding from many of the County's streams was not evaluated when the Flood Insurance Study and Flood Insurance Rate Maps were prepared. Yet these streams have floodplains, many of which pose serious flood hazards. Because there is no floodplain designated on the FIRMs, development along these streams has not been regulated by the local laws for flood damage prevention. Therefore, development in these areas is at risk from both flooding and streambank erosion. Localized flooding is also caused by drainage problems and debris accumulation in streams or ditches. Hundreds of homes and businesses are located in areas outside of regulated floodplains that may be subject to flooding, drainage problems, or erosion. The flood hazard recommendations in this plan thus encompass all known flood-prone locations.

Many of the municipalities had existing Flood Mitigation Action Plans, which were reviewed and considered in the 2006 multi-jurisdictional plan and in the individual town/village plans completed with the assistance of Janet Thigpen. (Appendix G of the 2006 plan contains these existing plans, and the plans will also remain on the STC website: http://www.stcplanning.org/index.asp?pageId=110). While the Flood Mitigation Plans are now "replaced" by this County Hazard Mitigation Plan, the older plans still exist and can be used for reference and historical information.

For the 2012 update, the individual plans have been reviewed by the individual municipalities, and pertinent information has been incorporated into the 2012 Update. The towns and villages with Flood

Mitigation Plans felt that the 2006 HMP took the place of the Flood Mitigation Plan, and therefore felt it was not a prudent use of time to review and update the old Flood Mitigation Plans.

The new goal for the 2012 Update is to formulate the Flood Hazard information in such a way that the Towns and Villages can review and update their information annually so that they can qualify for CRS credits. The Planning Committee continues to work on this goal as the 2012 Update is being written, and it is our hope to have a process in place to begin this annual update starting in 2013. This will also be a huge benefit for the overall Hazard Mitigation Planning process as these annual updates will be a large part of the 2017 Update.

The following paragraphs provide jurisdiction specific information about the flooding hazard and a discussion of past and ongoing efforts to mitigate the hazard at the local level.

1. City of Elmira

The City of Elmira sustained approximately $80,000 in damage from the April 2011 flooding event. There was also significant damage during the May 2011 wind storm, however, this storm was denied inclusion in the Presidential Disaster Declaration, so the taxpayers of the City and several other municipalities have had to foot the bill on the clean up efforts for the May storms. The City saw little damage during Tropical Storm Lee, but did supply significant assistance to the Village of Wellsburg in both equipment and man-hours.

Historically, the City of Elmira has dedicated considerable resources—both staff time and money on flood mitigation work. The City DPW conducts quarterly work and maintenance on culverts, screens, bridge inspections, conducting checks of all following each rain event. The City DPW is also responsible for inspection, maintenance and assembly, when needed, of several stop log closures. The City participates in the NFIP Community Rating System, and attends annual inspections of flood control projects and dams within their jurisdiction. The annual DPW budget for Flood and Summer events is $100,000.

Since the past HMP, some change has occurred with how work is conducted in the City. The Chemung County Sewer District has taken over responsibility for daily checking of 19 pump stations located in the city. This oversight was once conducted by the City's Department of Public Works.

The City of Elmira up until recently conducted an annual spring pick up day at a cost of $15,000; the intent behind this initiative was to keep lawn debris and garbage out of streams and drainage

structures. Rather than the pickup day, the City now runs "Dial a Truck," regarded as a more beneficial and cost effective program that is continuously available. Residents can call to have a City Truck pick up their lawn debris for a cost of $35.00. The debris is hauled to, and deposited at, a City run Compost Station. Residents also have the option of finding their own transportation for the debris, and making use of the free Compost Station. All City residents then have the added benefit of getting the resulting compost for free, for their personal use.

2. Town of Ashland

The Town of Ashland sustained approximately 40 thousand dollars in damage to infrastructure during Tropical Storm Lee in September 2011. The Town saw the highest water levels in the County for this event. The Town Highway Department also serves the Village of Wellsburg. Most of the damage sustained in the Village was to homes and businesses from flood waters, including the Volunteer Fire Station.

The Fire Station has been impacted severely in the past by flooding, each time causing the evacuation of personnel and equipment during a time when the Fire Department must be at its most active. The Fire Station was impacted once again during Lee, causing Fire Operations to move to temporary locations during the height of the storm and flooding, and also causing tens of thousands of dollars in damage to the facility. Moving the Fire Station has been a long time goal of the Village and Town. As of the writing of the 2012 Update, the Town and Village have been working to secure land and funding to finally move the Fire Station. After Lee, there was a meeting held with local officials and FEMA, the outcome of which is very promising for the Fire Station moving plan to now move forward.

Another Critical Facility, the Ashland Town Highway Department, is also located in an area that becomes inaccessible during high water events. The location at 228 Terrace Street Extension is near both Tyler Run and Bentley Creek. These two waterways form a triangular shaped area where Terrace Street Ext. leads to four homes and the Town Highway Barn. The roadway is sometimes cut off by flood waters, and the area becomes inaccessible until waters begin to recede. As the Village and Town meet and discuss the future of the municipalities, a plan for moving the Highway Facility may be considered.

Tropical Storm Lee impacted over 60 homes, churches and businesses in the Village of Wellsburg. At the writing of this update, final determinations are still being made regarding whether several of the homes and business were substantially damaged as defined in the New York State Building and Residential Codes. The Residential Code requires substantially damaged homes to be raised two feel above base flood elevation.

One possible solution to this flood threat is a project that has been of great interest to both the Town of Ashland and Village of Wellsburg for many decades. PL-566 is a project that would build a levee system along Bentley Creek from Pennsylvania into New York to help control flood waters. The Chemung County Soil and Water Conservation District has been involved in the project planning, in conjunction with interested partners in Pennsylvania. Recent renewed interest in seeing the project completed has now urged the last "red tape" to be addressed, with necessary municipal votes and paperwork now moving forward. As of December 2011, the Soil and Water Conservation District is proposing the project to the NRCS, in hopes of getting the levee built.

The Town of Ashland has a low lying roadway with a bridge crossing the Chemung River, known as The Lowman Crossover. This roadway suffers flooding an average of eight times per year for an average of four days during each event. The roadway is closed so often that a permanent flip-down sign has been installed to alert motorists that the Crossover is closed, causing a detour that is 5 to 8 miles long. When the roadway is closed, fire mutual aid plans must go into effect as the Wellsburg Fire Department cannot access areas of their territory. EMS must also institute alternate route plans, possibly delaying care for victims. A loss of business and profits is also realized by the area merchants as people are not willing to drive the long detour to patronize their establishments. Although many studies and discussions have taken place over the years, there has never been a viable solution to this problem.

In the Town of Ashland/Village of Wellsburg, several creeks are prone to flash flooding due to their size, and the quick collection of debris and build up of sediment also contribute. Bentley Creek, Seeley Creek, Tyler Run and White Hollow Run all cause problems on an annual basis. One of the more severe events occurred in May of 1988 when a heavy rain event caused flash flooding in both Tyler Run and Bentley Creek. This is the area of Terrace Street Ext. that leads to four homes and the Town Highway Barn, as described above. A contributing factor during this event was that the hill above the waterways had just been logged, allowing for an increased flow of storm water and debris down to the creeks. During the event the two bridges over the creeks washed out and isolated the residents and the Town Barn for an extended period. Temporary bridges and pipes were installed at a cost of $6000, and two permanent bridges were built with a cost for materials totaling $27,152. Other labor costs were not available for this project. Town and Village officials noted the need to realign the banks of Tyler Run after the storms of 2003 at a cost of four thousand dollars.

The Ashland Town Highway department is called out three to four times a year to clear debris from area creeks that is deposited on roadways, and they try to remove debris on a regular basis from area waterways. However, the Town Highway Department has had to borrow the equipment necessary for these projects, as the department does not own machinery big enough to complete these jobs. In the future, the borrowed equipment will no longer be available, and the Highway Department does not have the means to purchase equipment adequate for the jobs.

The Town of Ashland/Village of Wellsburg have, historically, had a serious water well issue that is a cascade effect of the flooding. The Village has municipal wells to supply water to residents in the Village and to some in the Town. The Village, at one time, had seven wells to supply water to the residents. Due to flooding directly, and indirectly from the subsequent damage to septic systems from flooding, all but one well has been contaminated and rendered useless. Each time the Chemung River rises out of its banks, the one useable well becomes contaminated with river water, creating elevated bacterial levels. Seventy thousand dollars was spent to drill two additional wells, however neither well produced sufficient water.

Water mains were extended from the City of Elmira to the Town/Village to mitigate this issue. Village residents are all using the municipal supply. However, many of the residents in the Town portion for whom this extension was created, opted not to hook up to the municipal water. This is now creating financial problems for the Town and Village as costs are not being spread as thinly and evenly as expected. Town residents who opted not to hook up to the new water mains are still reliant upon the old system, with its significant limitations.

One flooding issue that combines with the Hazardous Materials Release hazard category, involves the current location of the Wellsburg Volunteer Fire Station. The station is located within extremely close proximity (within yards) to Bentley Creek, the Chemung River, Route 427 and the rail road line, and Route 17 (I-86) is approximately a half mile away. Therefore, the Fire Station has a strong potential to be in the hot zone during a hazmat incident on 427 or the railroad. The current plan to move forward with the relocation of the Fire Station will solve this issue as well.

3. Town of Baldwin

The Town of Baldwin received damage to infrastructure during Tropical Storm Lee in September 2011 in the amount of 20 thousand dollars. Swift moving water was to blame for most of the damage to roads, ditches, bridges and culverts.

The Town of Baldwin has dirt roads that require constant repairs, as they are highly susceptible to flooding and erosion problems. Ditching efforts and maintenance to drainage structures are attempted on a regular basis. However, due to the dirt road surface that is easily washed into these water conveyances, continual maintenance and road repairs are required during each spring runoff season, and after any heavy rain event. As these dirt roads are also in rural, heavy forested areas, debris clogging the drainage ways is also a major battle.

The town tried to get a very small dirt road paved by the contractor that was paving the County's main cross road in August 2011. The Town Highway Supervisor was given a cost of $14,000 to pave approximately one tenth of a mile of dirt road. The Town could oil and stone the road for significantly less cost. However, with decreasing funding from CHIPS and other Federal and State programs, the town will go another season without replacing this, or any other, dirt road.

4. Town of Big Flats

The Town of Big Flats, as its name implies, is a large flat valley surrounded by steep, forested hills. The Town has a great number of streams, creeks, and small feeder streams that run throughout the mix of valleys, eventually emptying into the Chemung River. Many of these waterways pose annual problems and, as a result, maintenance of streams has been an ongoing concern.

In the 1980s, the Town organized teams of volunteers who removed debris from streams. In 1991, the Town hired a part time Drainage Officer, who evaluated drainage problems and identified potential mitigation projects. Mitigation work was conducted whenever funding and equipment were available. In 1995, the Town initiated a stream maintenance program under the supervision of the Drainage Officer. In March 1996, this program was formalized when the Town Board adopted the *Town of Big Flats Stormwater Drainage System Maintenance Plan*. The Town began using heavy equipment and hired a work crew to implement stream maintenance and restoration activities.

The Town has conducted hydrologic studies of most watersheds in the Town and has implemented recommendations from these studies whenever possible. Efforts at preventing flood damage include: acquisition of wetland areas, acquisition of stream corridors, installation of drainage systems, and replacement (or removal) of undersized bridges and culverts. When repairs have been necessary, every effort has been made to address the problem rather than just repairing the damage.

The Town also requires developers and timber harvesters to address stormwater management and erosion control. In 1977, in response to recurrent flooding problems caused by timber debris, the Town adopted the state's first timber harvesting ordinance. The Town Planning Board adopted a policy that the runoff from a developed site should not be channelized and should not adversely impact neighboring properties; no increase in the volume or rate of discharge is permitted. The Town prepared *Stormwater Management Guidelines for New Developments* and revised its Zoning Law in 1997. Seven percent of the Town, principally in floodplain and floodway areas, was designated as a Conservation District, within which development is restricted.

Despite these efforts, the Town of Big Flats incurred $150,000 in flooding damages from the April 2011 storms, and another $33,000 in flash flooding damage during storms in May 2011. The April flooding included water damage to the lower level of the Town Hall. Both the April and May flooding caused damage to roads and retaining walls and structures along creeks. The May costs are the burden of the taxpayers as the May 2011 storms were not included in the DR-4020-NY Declaration.

5. Town of Catlin

The Town of Catlin saw very little damage to public infrastructure from either of the Declared Disasters in 2011. Several homes in the Beaver Valley area did see some minor water damage during TS Lee when a creek backed up from a debris blockage. Mitigation Action Item Flood-1 found in the Action Items section of this plan are associated with this flooding event.

The Beaver Valley water system came close to being damaged by flood waters during TS Lee as well. Board member Dave Silvernail reported that the flood waters came just below the door to the water system pump house, nearly overtopping the well. The Town is working to establish a new well, and will raise the new pump house four feet in elevation to ensure future flood waters will not impact the water supply.

The Town attributes its ditch and drainage maintenance program for the lack of damage during these events. Private stream damage is discussed in the Soil and Water Conservation District section of this plan.

The Town of Catlin has dirt roads that require constant repairs, as they are highly susceptible to flooding and erosion problems. Ditching efforts and maintenance to drainage structures are attempted on a regular basis. However, due to the dirt road surface that is easily washed into these water conveyances, continual maintenance and road repairs are required during each spring runoff season, and after any heavy

rain event. As these dirt roads are also in rural, heavy forested areas, debris clogging the drainage ways is also a major battle.

6. Town of Chemung

The Town of Chemung sustained major damage to its infrastructure during Tropical Storm Lee in September 2011. Over a half million dollars in damage to roads and bridges was caused by high and swift moving water. Only a few residents reported any water damage to their homes. On December 1, 2010, a highly localized event also caused some damage to the Town of Chemung. The town received heavy rain which caused flash flooding on the small creeks in the Town. Wyn Coop and Mallory Creeks began to rise, causing 4 homes on Mallory Road to be evacuated for several hours.

The residents in the Town of Chemung have had problems with their private wells. Many of the wells in the hamlet of Chemung have been contaminated by septic systems after damage from flooding has occurred. Nitrates from agricultural operations that have been washed down the hills during heavy rain and flooding events have also caused contamination in the Chemung wells. The Chemung Town Board has tried to remedy this situation by proposing a municipal water system, however, disagreements among the board members have historically stymied these efforts. Subsequent to the initial Hazard Mitigation Plan, the Town had negotiated funding from the contracted management firm that runs the County Landfill located in the Town of Chemung to help pay for an extension of municipal water from Elmira to Chemung. However, the funding for the project was retracted due to other projects that had to take priority. Municipal water sourcing either from the east or the west is cost prohibitive for the Town. When the funding was cancelled, the Town was left with no other options or resources.

The Town of Chemung has identified at least four dirt roads that require constant repairs at a cost of $120,000 per year including labor and equipment costs. In addition, the Town of Chemung experiences flooding each year due to a debris dam located where the Wyn Coop Creek meets the Chemung River. The Town has looked into cleaning out the debris, however, due to issues of private property and State regulations, the work cannot be completed.

Dry Brook Creek also causes flooding each spring and during heavy summer rains due to debris, and local construction projects. New residential construction has changed the topography, sending more runoff, sediment and debris into the drainage structures. Larger structures and more effecting ditching techniques would help to solve this flooding problem, however, funding would have to be available.

7. Town of Elmira

The Town of Elmira, in the south-central area of Chemung County, is characterized by a mix of valleys nestled in steep, forested hills. Elmira has a number of streams and creeks that pose annual problems, damaging both public and private property within the town. In October 1994, the Elmira Town Board formed a citizens' committee, the Storm-Water Drainage Task Force, in response to flooding from Hurricane Beryl. After studying the Town's flooding and drainage problems, the Task Force recommended to the Board that: (1) a person be employed to create a storm-water program and (2) money be appropriated to begin work aimed at solving the storm-water problem, with a focus on the flooding of homes. The Town Board responded by hiring a Drainage Officer and allocating $40,000 to the Drainage Department for the remainder of the 1995 fiscal year. This allocation was increased to $117,000 in 1996 and has continued at various funding levels since that time.

Since 1995, the Town of Elmira has undertaken extensive efforts to resolve flooding, streambank erosion, and drainage problems. When repairs have been necessary, every effort has been made to address the problem rather than just repairing the damage. The Town has installed numerous drop structures in the streams of west Elmira in order to stabilize the area's steep, incising channels. The Town constructed two regional detention ponds to control stormwater runoff and protect against flooding and installed two debris basins to enable removal of sediment, trees, and other debris. Pipe entrances have been protected from the accumulation of debris. Erosion sites have been rehabilitated with rock riprap. Mitigation measures have been incorporated into local land use regulations.

Recognizing that flooding and erosion problems in West Elmira resulted from inadequate consideration of the effects of increased runoff on the area's small streams, the Town revised its Zoning Ordinance to include a number of flood mitigation measures: stormwater management standards, erosion and sediment control standards, maximum impermeable surfaces, and a Conservation Zone in the parts of floodplain regulated as "floodway." In 2000, the Town enacted an ordinance prohibiting littering and stream dumping.

The Town of Elmira received very little public infrastructure damage in either of the 2011 Declared Disasters. The Town did respond to flooding issues twice since the 2006 Mitigation Plan adoption, both as a result of ice jams on the Chemung River. The actions taken were preventive in nature, and very little damage was realized from either incident.

8. Town of Erin

The Town of Erin sustained road damage costing approximately $15,000 and had 6 residents report water damage to their homes during Tropical Storm Lee in September 2011. The town also had approximately $30,000 in damage during the flash flooding of April 2011.

The Town of Erin has been fairly successful in controlling minor flooding issues on roads. The town replaces 50 to 55 small pipes each year as they do their regular road projects. However, there is an area within the hamlet of Erin that still causes problems. In 1999 the Jackson Creek Dam was completed in the Town, and has done an excellent job managing water from Jackson Creek into the hamlet area of the town. Park Station Dam and Marsh Dam also are located in the town, and help to control water flow to this area. A mitigation project completed subsequent to the 2006 HMP, has been helpful in protecting some areas in the hamlet of Erin that experienced chronic flooding due to beaver activity and an elevated railroad embankment.

The Town of Erin has identified six dirt roads that require constant repairs, totaling approximately 42 miles of road and costing approximately $30,000 per year to maintain. Additionally, Church Street, Church Road and Rodburn Street are problem areas that require constant ditching and debris removal at a cost of $3000 per year. The town estimates that a manhole/pipe system would mitigate the problem, at a project cost of $20,000.

9. Town of Horseheads

The Town of Horseheads is characterized by a mix of valleys nestled in steep, forested hills. Like its neighboring communities, Horseheads has a number of streams and creeks that pose annual problems, damaging both public and private property within the town. Ongoing efforts to resolve flooding and drainage problems in the Town and Village of Horseheads have been extensive. When road, shoulder, culvert, and road ditch repairs have been necessary, every effort has been made to address the problem rather than just repairing the damage. Both municipalities are local sponsors of the ongoing PL-566 Newtown-Hoffman Creeks Watershed Project (with the Natural Resources Conservation Service).

The town has repeatedly removed sediment and from Newtown Creek. In 1996 and 1997, sediment and debris were removed from the Hardinge Brothers retention basin, Halderman Hollow Creek, and McCann's Tributary (where it follows the Old Chemung Canal route). The Town of Horseheads participates in an ongoing maintenance program for the Old Chemung Canal (in conjunction with the Chemung County Soil and Water Conservation District and three neighboring municipalities). The Town

constructed a detention basin on Prospect Creek and has rehabilitated many erosion sites with rock riprap. Local regulations require that developers and timber harvesters address stormwater management and erosion control. The Town is waiting for new inundation maps for the dams that would impact their municipality. They are planning to overlay the inundation footprint and will consider limiting critical infrastructure in those areas.

The Town of Horseheads lost an entire culvert due to Tropical Storm Lee in September 2011. Rushing water overtopped the culvert and the entire structure was washed away, leaving large chasm in the roadway. The repair cost $130,000. Debris also clogged a stream in the upper hills of the town, sending a torrent of water down the hill and through a residential area. Ten residents reported damage to their homes as a result of the storm. The Town also sustained approximately $40,000 in damage during the April 2011 storms. Some of the stream damage will need to be addressed using Mitigation Grant funds.

10. Town of Southport

The Town of Southport, in the southwestern corner of Chemung County, is similar in topography to its neighboring communities. Southport is characterized by a mix of valleys nestled in steep, forested hills. The Town has a number of streams and creeks that pose annual problems, damaging both public and private property within the town.

In June 1996, the Southport Town Board chartered a Drainage Committee (made up of private citizens) to investigate and resolve drainage and flooding issues in the Town. This committee supervised the hiring of a Drainage Officer in July 1996. The Drainage Officer's duties include: oversight of drainage, flooding, and aquifer problems; organization and oversight of mitigation efforts; soliciting funds for remediation and prevention projects; and long range planning for the Town of Southport and the Seeley Creek Watershed. This work continues to be directed by the citizen-run Drainage Committee.

Ongoing efforts to resolve flooding, streambank erosion, and drainage problems in the Town have been extensive. When road, shoulder, culvert, and road ditch repairs have been necessary, every effort has been made to address the problem rather than just repairing the damage. Every Town bridge has been replaced since 1994 (11 structures; approximate cost $3.5 million). Many erosion sites have been rehabilitated with rock riprap. The Town requires registration of timber harvesting operations.

A central element of the Town of Southport plan for mitigating flood damages is the construction of flood attenuation wetlands in the upland areas of flood-prone subwatersheds. The Town participated in

the construction of 7 wetlands in 2002 and 2003. Each constructed wetland is designed with a static pond for wildlife habitat and additional flood storage capacity to reduce and delay peak outflows. These projects—with a combined flood storage capacity of 19 acre-feet—provide localized flood protection for areas immediately downstream and combine to reduce the peak discharges in the larger streams. In order to facilitate the design of future wetland projects, the Town paid for LIDAR (Light Imaging Detection and Ranging) imaging of the entire town, with development of one-foot topographic contours.

The Town of Southport received infrastructure damage during Tropical Storm Lee in September 2011, caused by swift moving water. Damage estimates are still being compiled at the time of this writing in November 2011. The Town also sustained heavy tree damage and power outages during the May 2011 wind storm. However, as has been mentioned previously, the May storms were not included in DR-4020-NY, so the Town had to finance all clean up efforts, totaling over 15 thousand dollars.

11. Town of Van Etten

The Town (and the Village) of Van Etten have several creeks and streams, and a wetland, that cause flooding. During Tropical Storm Lee in September 2011, the Town sustained $325,000 in damage to roads due to fast moving water. One road that received the heaviest damage has only one home at the very end of the road. The Town is considering buying out the home and abandoning the road, however, other land ownership issues must be investigated before a final decision is made.

The Town also had approximately $95,000 in flash flooding damage during the May 2011 storms that were not included in DR-4020-NY. All of the damage was to dirt roads in the Town.

One area in the town on Swartwood Road is a successful mitigation site after residences experienced repetitive flood damage. Four properties were bought out, the bridge was removed and barricaded, and the area is now precluded from being developed. Langford Creek Road and Cooper Hill are also problem areas.

12. Town of Veteran

The Town of Veteran did sustain damage to roads during the April 2011 storms, but a significant part of the damage was due to the suspected tornado in the Town. Approximately $50,000 was caused by flash flooding.

The Town escaped damage in TS Lee, partly due the Highway Department's ditch maintenance efforts prior to the storm. The Town has also cooperated with the Chemung County Soil and Water

Conservation District in a plan to create decentralized wetland areas. The plan calls for one or two wetlands to be created per year. These wetlands are meant to help control storm water runoff as well as provide habitat for wildlife. The newest wetland is in the Town of Veteran near Middle Road and has already shown that it helps to control storm runoff in the Catherine Creek watershed.

The Town of Veteran has dirt roads that require constant repairs, as they are highly susceptible to flooding and erosion problems. Ditching efforts and maintenance to drainage structures are attempted on a regular basis. However, due to the dirt road surface that is easily washed into these water conveyances, continual maintenance and road repairs are required during each spring runoff season, and after any heavy rain event. As these dirt roads are also in rural, heavy forested areas, debris clogging the drainage ways is also a major battle.

Subsequent to the 2006 HMP, the Town of Veteran has identified two dirt roads that are vital transportation routes in the town. These roads, Merka Rd and Dann Blvd., are the only east-west routes connecting several major north-south routes in the Town, Ridge Road, Veteran Hill Road, and State Route 13. These two dirt roads are traveled routinely by town highway vehicles, police, fire, and EMS. If these roads are out of service due to flooding, erosion, or deep mud, emergency vehicles will have to travel up to 10 miles or even more down either Ridge Rd or Veteran Hill Rd in order to connect with other routes, depending on their destination. The Town Highway Dept. is located on Ridge Rd., forcing the use of these two dirt roads as the closest access to other towns roads. A dry hydrant used by the Millport Fire Departments is on Dann Blvd., one of the dirt roads, and can be unavailable to the fire department if the road conditions are not favorable for the heavy fire vehicles.

The Town of Veteran also created a goal of making its Highway Department Facility the Town EOC for Emergencies. The current facility did not have adequate meeting space, nor did it have cable service. The Town feels cable service is a crucial aspect of this plan as it allows for monitoring of The Weather Channel and other local news outlets, and would allow internet service for services such as DTN, and e-mail, and a host of on-line resources.

The town was in a position to do the road work on the oil and stone projects for the dirt roads, and only needed financial assistance with materials. However, as this update is being created, on December 2-3, 2010, the Town Highway facility was heavily damaged by fire along with two Town dump/plow trucks and a loader. The Town Supervisor met with the Chemung County Emergency Planner just days before the fire to discuss the new goals included here. This unfortunate incident has now set these projects back.

To further add to the inconvenience and expense, asbestos was found in the building during the fire clean up activities, postponing all work.

The repair of the fire damage will certainly cause the Town to realign their budget allocations, but the repair process could also provide an opportunity to easily install some of the desired upgrades to the building, bringing the Town closer to achieving this goal. However, cost for the mitigation of asbestos found in the building could also be detrimental to the Town's budget and efforts to improve the building at all. This goal is now uncertain until further information becomes available and investigation can be completed.

13. Village of Elmira Heights

The Village of Elmira Heights did not have any significant public infrastructure damage during either of the Declared Disasters in 2011.

The Village of Elmira Heights has made great strides in the past with mitigation projects to control flooding. However, more needs to be done to alleviate problems in the low lying areas of the Village, which encompasses residential neighborhoods and the bulk of Village's business district including the municipal offices, fire department and police station. Due to the flat topography of the area, and the fact that the ground is all clay and does not drain, any heavy rain event causes overland flow, ponding and urban flooding. These events happen several times a year, mainly during heavy summer rains and spring melt runoff. Several pump stations have been installed to help control the water and create a flow to drainage systems in the upper areas of the Village, however the low area is covered by a pump station that must be manually activated. The Village Police must report problems to the Highway Supervisor, so that personnel can be sent to turn on the system. Many times this occurs only after the water level has become dangerous to motorists and to the responding staff.

14. Village of Horseheads

Like its neighboring communities, the Village of Horseheads has a number of streams and creeks that pose annual problems, damaging both public and private property within the village. The Village has a system of underground sewer systems that allows water from the creeks to flow underground through the populated Village areas. These sewers are in need of maintenance and repair.

Ongoing efforts to resolve flooding and drainage problems in the Town and Village of Horseheads have been extensive. When road, shoulder, culvert, and road ditch repairs have been necessary, every effort has been made to address the problem rather than just repairing the damage. Both municipalities are local sponsors of the ongoing PL-566 Newtown-Hoffman Creeks Watershed Project (with the Natural Resources Conservation Service).

The Village of Horseheads received significant rain during Tropical Storm Lee in September 2011. Ponding of water at the well head of the Village's Well #5 caused contamination of the well. Engineering studies have found that the reason for the contamination was the sheer volume of water that infiltrated the ground in the well's gravel/sand filter. The high water level overwhelmed the natural filter, allowing water to just flow into the well without being properly filtered.

There were also numerous drywells damaged during the storm that were installed many years ago, as required by the Village during the building phase of a housing development for runoff control. The drywells are on private property, and neither the builder, nor the requirement by the Village, specify who would be responsible for the drywells in the future. Therefore, the Village is not able to maintain the drywells, and takes no responsibility for the maintenance or the necessary repairs from the storm damage. The property owners may now be responsible to fix the drywells, many of which are caving in and are a hazard to persons who venture near the damaged structures.

The Village also has an old storm water sewer system in the area of Hanover Square that empties into New Town Creek south of Franklin St. The sewer is constructed of brick and stone, which is now failing. The Village, in cooperation with the Soil and Water Conservation District, has applied for a grant to get the sewer relined. As of December 2011 they are waiting to hear if the grant will be approved.

15. Village of Millport

The Village of Millport has its share of flooding issues, mainly from Catherine Creek, but also on several hilly secondary roads that experience damage from runoff. However, the Village relies on the Town of Veteran and the County of Chemung Highway Departments as the Village does not have any municipal public works. Activities involving the Village are generally in cooperation with the Town or the County.

One such project that has benefited the Village is the Chemung County Soil and Water Conservation District a plan to create decentralized wetland areas. The plan calls for one or two wetlands to be created per year. These wetlands are meant to help control storm water runoff as well as provide habitat for wildlife. The newest wetland is in the Town of Veteran near Middle Road and has already

shown that it helps to control storm runoff in the Catherine Creek watershed, including the two events of 2011.

Another project that has just been completed in Village of Millport, in cooperation with the Storm Water Team and Chemung County, was the subject of a study done by the Storm Water Team. The project corrected a water runoff issue on Millport Hill Road, off Route 14, in the Village. Storm water ran down Millport Hill causing flooding and ponding issues on Route 14 routinely. The study mapped out a plan for the installation of a storm sewer system to control the runoff. The project has now been completed by the Chemung County Public Works Department, with work concluding in November of 2011.

The Village of Millport has just completed, in cooperation with the Soil and Water Conservation District, a project to protect their municipal water main which is in close proximity to Catherine Creek. The water main is located near a bend in the creek, which wass beginning to erode, threatening to expose the water main. Soil and Water has armored the bend with rip rap, protecting the water main and preventing further erosion.

16. Village of Van Etten

The Village of Van Etten has several creeks and streams, and a wetland, that cause flooding. The area around Hixson Street is flooded each spring and during wet periods due to the nearby Wildlife Refuge/Sanctuary wetland. When the water level is high in the wetland, area septic systems back up into the homes and water ponds. The residences in this area are all manufactured housing (mobile homes), so there is no basement to flood. These owners were offered buyouts many years ago but refused. The situation has not been resolved. Apparently the residents complain, but live with the problem.

Other residents in the Village of Van Etten have had problems with their private wells. Many of the wells in the Village of Van Etten have been contaminated by septic systems after damage from flooding has occurred. Some e-coli related sicknesses have been reported in Van Etten, mainly with the very young and the elderly. Following some random well testing done by the County Health Department to confirm their problem, the Village secured a New York State Grant and low interest loan to install a municipal water system. Unfortunately, now they have a problem in that some residents are not hooking up the new water system, not wanting to pay the costs associated with the move. This is creating a huge financial issue for the Village, and they are looking for assistance to help convince the residents that they must hook up to the system or remain hooked to the system. Some residents, in an effort to avoid paying

water bills, are now unhooking their connection to the municipal system and going back to using their contaminated wells.

17. Village of Wellsburg

The Village of Wellsburg was the hardest hit municipality by TS Lee in September of 2011. The flooding, caused by the Bentley Creek Watershed, affected approximately 60 homes and businesses. Numerous businesses and homes were severely damaged as defined by the New York State Building Codes. Families were displaced, forced to either live in campers along side their homes, or with family or friends. Many have tried to clean up the first floor of homes enough to move back in, living sparsely on an upper floor. At least two businesses in the Village have closed permanently, due to the expense and effort to try to re-build and re-open. One business owner had just made his last SBA loan payment on a loan he used to repair and continue operating after the last flood damage just two weeks prior to TS Lee.

The Wellsburg Fire Department was also a casualty of the flooding, just as they were in the last major event, Tropical Storm Beryl in 1993. For decades there has been discussion regarding the need to move the Wellsburg Fire House from its current location, which is threatened on all sides by flooding or hazardous materials releases from Bentley Creek, the Chemung River, the Norfolk Southern Rail Line, and State Rt. 427. The Village has never been able to secure enough funding to buy land and then build a new facility. Recent efforts to secure grant funding and purchase land have been successful, and the Village hopes that they will see this project to fruition before another flood decimates the Fire House again.

Another project of great interest to both the Town of Ashland and Village of Wellsburg is PL-566, a project that would build a levee system along Bentley Creek to help control flood waters. The Chemung County Soil and Water Conservation District has been working on the project plan in conjunction with interested partners in Pennsylvania. Recent renewed interest in seeing the project completed has now urged the last “red tape” to be addressed, including necessary paperwork and municipal votes. As of December 2011, the Soil and Water Conservation District was working on a proposal to the NRCS in hopes of getting the levee built. Further discussion on the Village can be found in the Town of Ashland section.

18. NFIP and Levee Issue

Chemung County is currently working with FEMA and other interested parties to update the County’s FIRMS. As of December 2011, the process continues and we are hopeful to include information from the new FIRMS in the 2017 update.

B. Severe Summer Storm Profile

1. **Locations**: All municipalities experience at one time or another.
2. **Extent**: 5 inches of rain in 3 hours, 2" hail- documented in Horseheads, many storms document winds 50-60 knots, rain at a rates of 1 inch per hour occur often, but are short lived
3. **Previous Occurrences**: Major damage about once a decade, localized damage every year, see narrative.
4. **Probability of Future Events**: NOAA's Severe Storm Laboratory estimates 5 days per year for a severe thunderstorm, and 2 days per year for hail over ¾".

1. History of Summer Storms

Most of Chemung County's severe summer weather is very localized and not well documented. During the years from 1963 to the early 1990s, the National Weather Service National Climate Data Center (NCDC) has dozens of summer weather events listed, however there is no description of the events and many simply list a thunderstorm with winds, but no velocity. There were numerous events that recorded wind from 50 knots up to 75 knots. Several events involved hail one inch in diameter or more, two events showed hail 1.75 inches in diameter. Some residents recall the events due to trees coming down in their neighborhood, or due to their personal property being damaged. Highway records are scanty, lost over the years, some employees recall replacing pipes, bridges, culverts, etc. but cannot pin point dates or costs. The NCDC lists many events as having property damage of five thousand up to fifty thousand dollars, with others giving accounts of damage, but no damage figures.

According to National Weather Service statistics, Chemung County has an average of three severe summer storms per year. As mentioned, these storms are localized and last from 15 to 30 minutes on average. Statistics also show us that these storms have yielded hail greater than .75 inches in diameter thirteen times from 1983 to 2002, and "Killer Hail" (greater than 1.5 inches in diameter) three times in the same period. There was one Tornado during the same reporting period. High winds and heavy rains, which lead to power outages and flooding, are the most common storm elements.

Since the 2006 HMP was adopted, there have been two Presidential Disaster Declarations in Chemung County. The first Declaration was for severe storms in April 2011 which spawned tornados. The second was for Tropical Storm Lee in September 2011 which resulted in severe flooding in the southeastern section of the County.

In April and May of 2011, numerous severe storms, including at least one tornado, ripped through Chemung County, causing extensive damage to public and private property. The April 2011 storms resulted in a Presidential Disaster Declaration, with almost one half million dollars of damage reported to public infrastructure. In May 2011, more storms hit the County, costing the municipalities another three hundred thousand dollars, mostly in overtime and debris removal. Efforts by the NYS OEM to get the Presidential Declaration extended to include these May 2011 storms were not successful, therefore the municipalities are shouldering the costs for the damage clean up and restoration projects.

In September 2011, Tropical Storm Lee, a remnant of a Hurricane that came up the east coast, hit Chemung County's southeastern corner directly, and affected other pockets of the County as well. The greatest damage was to infrastructure in the Town of Chemung by swift moving water, and to homes and businesses in the Village of Wellsburg by high flood waters. The Town of Chemung reported greater than 500,000 dollars worth of damage to roads, while the Village of Wellsburg reported over 60 residences and businesses having water damage. Determinations regarding substantially damaged structures as defined in the New York State Building and Residential Codes are still being made in November of 2011.

Other municipalities reported pockets of damage. Some of the most significant were a culvert entirely washed away in the Town of Horseheads, leaving a chasm in the middle of the road. The Town of Van Etten had one road entirely destroyed by the rushing water, losing a total of five bridges. In all, the affected municipalities reported a total of one million dollars in public infrastructure damage, and approximately 130 residents reported damage of their homes to FEMA.

Other events include a severe summer storm on June 26, 2009 that dropped golf ball sized hail in the Horseheads area. As is typical of these storms, it was short lived and no damage was reported.

November 16, 2006 also saw severe storm systems sweep through the County. While November is not typically a "summer month", severe summer type weather, including an F1 tornado and strong thunderstorms danced across the County.

The spring of 2004 was an eventful one, with the county experiencing numerous rain, hail and strong wind events during April and May that caused very localized and minor damage including downed trees and limbs and scattered power outages. There was an entire week in May 2004 during which there was a severe thunderstorm warning or tornado watch/warning every single day in the County. In April

2004, an F0 tornado was confirmed in Cayuga County, approximately 40 miles to the north, and in May 2004, an F1 tornado was confirmed in Broome County, the 40 miles to the east. On July 7, 2004, a severe thunderstorm came through the County, causing flooding in the northeast region and wide spread power outages. A house in Van Etten was struck by lightning and caught fire.

Severe storms in July and August 2003 caused tremendous damage in Chemung County's southern and central townships. A series of storms caused both wind damage and flooding. Local emergency declarations were issued on July 21 and August 9. Subsequently, a Presidential Disaster Declaration, #1486, was issued for this series of storms. FEMA Project Worksheet totals for Public Assistance was nearly 1.2 million dollars. This figure represents only a portion of the damage costs. Municipalities and residents also paid to fix damages. Individual Assistance was available, with a little over 200 residents requesting assistance. However, FEMA figures are unavailable for IA totals.

In late May and early June of 1998, a system of severe thunderstorms spawned at least 20 tornadoes in northeast Pennsylvania and central New York. Although funnel clouds were spotted forming, no tornadoes touched down in Chemung County. The storms also produced large hail (up to 2 inches in diameter), which damaged cars in the Towns of Horseheads and Elmira. Small, short-lived tornado-like storms have been reported numerous times in the past, bringing down trees, damaging homes and vehicles. A July 1999 lightning strike resulted in a barn catching fire and being destroyed. In September 2001 a metal building was struck by lightning. A man was entering the building at the time and the charge was transmitted to him causing injury.

On July 6, 1994 a thunderstorm producing strong winds and hail downed power lines and caused property damage. Horseheads received 5 inches of rain in three hours. Other events were recorded in August 1994, after Tropical Storm Beryl ripped through the County. Those events were listed as wind events, with down power lines and flash flooding. One year to the day, on July 6, 1995, a severe thunderstorm made its way from Arkport, Steuben County, through Van Etten in Chemung County. Each small municipality in its path recorded damages around three to five thousand dollars. On May 10, 1996 a thunderstorm with strong winds blew a mobile home over. The debris landed on State Route 17, closing the highway for several hours.

In the 1980s, a windstorm in the Town of Chemung tore down electric transmission towers and damaged homes and barns. On May 2, 1983 Chemung County experienced its first tornado on record according to National Weather Service statistics. The tornado traveled through the Town of Chemung on

a path six miles long and 300 yards wide. It was rated an F3 on the Fujita Scale, a potentially devastating storm (with wind speeds of 158 to 206 mph). Even though this tornado hit a predominately rural area, six people were reported injured and it caused an estimated $2.5 million in property damage according to National Weather Service statistics. Another weather source, the Northeast States Emergency Consortium, reports another tornado also touched down in the Town of Chemung, it was also an F3 and made a 9 mile path. No date was given for the event.

In the spring of 1974, a severe summer storm ripped through the County's mid-section. A garage in the Town of Big Flats blew apart and the lumber lodged in nearby houses. The roof blew off of another house. Another house lost part of a wall. Many residents reported damage to homes, vehicles and property. Severe winds (perhaps associated with an unconfirmed tornado) caused a band of severe forest damage in the Dry Run and Christian Hollow areas of the Town of Southport.

Storm event history may be searched on: http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms.

2. Specific Summer Storm Concerns

Chemung County and its municipalities recognize one of their greatest deficiencies during summer (and winter) storms is tree maintenance and removal. The County and the municipalities try to make an effort each year to remove, or contract to remove, dead or damaged trees. The County uses their Highway Department Employees when time permits, during normal work hours. The Town of Ashland has reported spending $2,400 per year on tree removal services, while the Village of Elmira Heights has reported spending $15,000 annually. The City of Elmira has allocates $70,000 in its budget for tree removal and trimming.

Despite these efforts, the most prevalent issue during summer and winter storms, besides flooding, is still the damage done to homes and vehicles, utility infrastructure and blocked roadways by downed trees or limbs. Our highway crews and first responders are put in harms way many times when they respond to one tree down, and another tree comes down with the electric lines tangled in it. On several occasions crews have been trapped on a road when trees with power lines fall on each side of their work zone or in their work zone.

The Town/Village of Van Etten have expressed concern regarding electrical service and communications during Severe Summer Storm (and winter storm) events. Their municipalities are served by three different service offices of NYSEG, Horseheads, Waverly and Ithaca. Notifications to the town,

village and the County Emergency Management Office are not always relayed in a timely manner. The fact that a power outage exists and residents may need assistance sometimes never reaches the proper authorities. In one case in the winter of 2002-2003, there were residents without power for approximately three days. The event began on a Friday and lasted through the weekend. However, no notification reached municipal authorities, apparently due to the fact that it is such a small part of the service area for any one of the three service offices. It wasn't until after the event concluded that residents voiced their displeasure at being without electricity for three days, in the winter, with no assistance from the Town/Village or County. A joint meeting was held with the residents and the Emergency Management Directors from Chemung and Tioga Counties to improve notification procedures.

Subsequent to the 2006 Plan, both the Town and Village elected officials agreed to ensure that the County Emergency Management Office will be notified of long term power outages and any need of assistance. A meeting with NYSEG officials was also held to determine which division controlled the areas of the Town and Village. The Emergency Management community continues to have dialogue with NYSEG regarding the provision of timely notification and accurate statistics when power has been interrupted and estimates for restoration.

As Van Etten is a rural area with many hills on the edge of the County, communication has historically been a problem. At the writing of the 2006 Plan, there were many "dead" spots for radio communications due to the hilly terrain. Cellular phones were an integral part of the emergency communications system in Van Etten due to this radio issue. During even mild summer thunderstorms, the cell phone service can fail, which left the municipalities virtually cut off from communication to surrounding areas if phone lines were damaged during the storm. The residents are also extremely limited in their ability to receive broadcast media stations. Many only receive one radio station out of Ithaca, the closest metropolitan area to the north, about 20 miles away. They may not always receive hazardous weather warnings in a timely manner from radio stations so distant.

Chemung County does not have any involvement in either cell phone service or commercial radio station/television station reception, therefore the County cannot mitigate these issues. The County did, however, implement a new County law enforcement radio system. All the radio equipment was moved to the Park Hill Road tower location. The fire radio equipment was also moved to Park Hill during this project. This has provided substantial improvement to both police and fire radio communications throughout the northeastern part of the County.

The Town of Catlin, in early 2012, began discussions with an energy company to erect windmills within the Town. While this project is still in the planning stages as of the writing of this 2012 five year update, the Town is making preparations to increase the setback distances in the area of the windmills to prevent damage to any future structures should one of the windmills sustain damage during a severe summer storm.

C. Tornado Profile

1. **Locations**: All municipalities could experience a tornado.
2. **Extent**: Two F3 tornados (158-206 mph wind) documented in Towns of Chemung and Erin
3. **Previous Occurrences**: several from early 2000s through 2011.
4. **Probability of Future Events**: Still rare, NOAA's Severe Storm Laboratory estimates .2-.4 days per year

1. History of Tornados

It is common knowledge that New York State has a definite vulnerability to tornadoes. Research has indicated that over 350 tornadoes ranging from F0 to F4 on the Fujita-Pearson Tornado Intensity Scale have occurred in New York State since 1952. (Source: New York State Multi-Hazard Mitigation Plan, 2008)

In Chemung County, tornados are a rare event. However, since the 2006 HMP was adopted, Chemung County has experienced several tornados. In light of these most recent occurrences, it was decided to split the Tornado discussion out from the Severe Summer Storm category where it was covered in the 2006 plan.

In April of 2011, a line of severe storms ripped through Chemung County, causing extensive damage to public and private property. The National Weather Service came to the Town of Erin the morning after the storm to survey the damage and determine if a tornado had occurred. The determination was that an F3 tornado had touched down in Erin.

A very small area in the Village of Millport also had damage that was identical to that found in Erin. This damage was not known during the National Weather Service visit, so the crew did not survey this area in Millport. It is assumed that the Millport damage was also caused by a tornado of similar magnitude. Oddly enough, both the Erin and Millport tornados caused extensive damage to the local cemeteries. Both communities also had damage to houses and lost barns.

These events caused enough damage County and Statewide to warrant a Presidential Disaster Declaration. The County sustained close to half a million dollars in damage, some of which occurred in the privately owned cemeteries. This damage, of course, did not qualify for public assistance under the declaration. The debris was cleared by the Town of Erin Highway Department in Erin, and the Millport debris was cleared by the Town of Veteran Highway Department with assistance from several other surrounding towns. Chemung County was not awarded Individual Assistance for the homeowners who sustained damage.

After the Erin tornado in April, people up to five miles away reported finding clothing, household items and building materials thought to have come from the homes destroyed by the tornado. There was also a butter knife found driven into a tree at the County's Park Station public park in Erin. Workers believe it was, "…one of those crazy things you find after a tornado. There's no marks on the handle of the knife to indicate someone pounded it into the tree." They firmly believe it is a result of the tornado.

The Town of Van Etten was the site of an F1 Tornado on November 16, 2006 at approximately 3:20-3:30 p.m. The damage was very localized and included trees down in a rural cemetery, a small outbuilding collapse, and a larger barn with a hole blown in its cement block wall. The Tornado affected an area 100 yards wide and one half mile long, and was located on both sides of State Route 224 near McDuffy Hollow Road.

Although these were all notable events, the County did not have to open its EOC or make any extraordinary response to these storms. Highway crews were able to respond to their areas of jurisdiction and open roads back up after several hours of labor.

It is also worth noting that from the late 1990s until 2011, several tornados have touched down in neighboring counties, causing similar damage to that found in Chemung County. Chemung County has also had small tornado-like storms that were not studied by the National Weather Service for confirmation, but according to anecdotal information from residents, funnels were spotted and the stereotypical comment, "it sounded like a train coming through the woods" was heard on many occasions.

Prior to this, Chemung County experienced its first tornado on record according to National Weather Service statistics on May 2, 1983. The tornado traveled through the Town of Chemung on a path six miles long and 300 yards wide. It was rated an F3 on the Fujita Scale, a potentially devastating storm

(with wind speeds of 158 to 206 mph). Even though this tornado hit a predominately rural area, six people were reported injured and it caused an estimated $2.5 million in property damage according to National Weather Service statistics. Another weather source, the Northeast States Emergency Consortium, reports another tornado also touched down in the Town of Chemung, it was also an F3 and made a 9 mile path. No date was given for the event, and it appears this website is no longer functioning.

Storm event history may be searched on: http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms.

2. Specific Tornado Concerns

There are a wide variety of opinions regarding our global weather patterns, whether or not we are experiencing abnormal or extreme changes in the severity of storms, and if global warming is real and has any bearing on severe weather issues. 2011 is "going into the books" as a year full of tornados across the Midwest, South and even Northern regions of the United States. Entire communities, such as Joplin, Missouri, have been wiped off the map by tornados or extensively damaged by severe storms. A stage at the Indiana State Fair was destroyed by a violent storm, killing and wounding several people. In 1998 a possible tornado struck during the New York State Fair, catching vendors and exhibitors who were sleeping in tents and campers by surprise, killing two and wounding several others.

Due to the rural nature of Chemung County, residents being surprised by a tornado is likely, especially if they are outdoors or the tornado hits at night while people are sleeping. Chemung County has been lucky in the fact that the past tornados have been short lived and have struck in scantily populated areas. One major concern is if the tornado were to strike one of the many camping or park areas in the County.

While park employees may try to give directions, there will always people who refuse to listen or want to do something other than what they are told. On a busy summer weekend, park staff would have a hard time herding people to their vehicles for safety (there are no substantial buildings other than bathrooms, which won't house everyone), and an even harder time trying to block people from leaving the park for accountability purposes. There is not enough night staff to visit individual sites to awaken all campers at night. It is likely many campers during a nighttime storm will be in tents or camper trailers when the storm hits, putting them at increased risk of injury or death.

If a tornado were to hit one of the more populated centers, such as the City of Elmira, or the Horseheads – Big Flats area, devastation similar to that of Joplin could occur. Many of the homes in these

areas are older, many are not properly maintained, and most likely these homes would not withstand the forces of a tornado.

The Town of Catlin, in early 2012, began discussions with an energy company to erect windmills within the Town. While this project is still in the planning stages as of the writing of this 2012 five year update, the Town is making preparations to increase the setback distances in the area of the windmills to prevent damage to any future structures should one of the windmills sustain damage from a tornado.

An interesting opinion noted that following the 1998 "tornado outbreak", building officials in Stillwater, NY observed that new and old construction was damaged equally. However, in Mechanicville, NY, building officials indicated that old construction seemed to fair better than new construction. Stone wall and concrete block foundations performed worse than poured concrete foundations. Some strap braces failed. Many homes were punctured with flying debris. This was less of a problem with homes that had plywood sheathing rather than cheaper materials, such as chipboard. Trusses in modular home construction were observed to have failed in the center at the gusset plate even though the remainder of the truss was intact. (Source: NY State Emergency Management Office *Hazard Mitigation Strategy Report, FEMA-1222-DR-NY.)*

The most severe damage from a tornado would be expected in mobile homes, farm buildings, and other structures that may not have been constructed to withstand high wind speeds. Chemung County has a fair amount of mobile / manufactured home parks that would sustain heavy damage in a tornado.

The most dangerous locations are generally large rooms with big expansive roofs. Rooms with large windows that may shatter are also extremely dangerous. Since designing buildings to extreme wind speeds is beyond the scope of current building codes, any development in the County could be vulnerable to damage from even a moderate intensity tornado.

As with all severe summer and winter storms, clearing debris with downed power lines tangled in the mess is a threat to both responders and residents. These storms will also damage communications systems, bringing down cable and telephone lines, and damaging cell towers. This makes it most difficult to communicate with the public to issue warnings or emergency instructions.

Issues with extended power outages would certainly be a concern. Some residents are well equipped to be self sufficient for several days in a power outage after a tornado. Those who are most at

risk for not being prepared for a power outage are generally those that have other issues as well. The elderly, those with health issues or those with financial difficulties are the populations most likely to need assistance, and many times have the most serious problems and live in areas that can be the most difficult to get to after a storm.

D. Severe Winter Storm Profile

1. **Locations**: All municipalities experience severe winter storms.
2. **Extent**: NYS HMP documents ave snowfall of 45.9 inches annually, 1993 and 1994 blizzards recorded over 3 feet of snow over two days for each event.
3. **Previous Occurrences**: Every year, see narrative.
4. **Probability of Future Events:** 3 to 4 events per season, see narrative.

1. History of Winter Storms

Most of Chemung County's severe winter weather is localized and not well documented. In fact, during the years from 1963 to the early 1990s, the National Weather Service National Climate Data Center (NCDC) reported no winter weather events. However, residents recall numerous events due to the heavy snow and cold curtailing activities and making driving almost impossible, trees coming down in their neighborhood, or due to their personal property being damaged. Highway records are scanty, lost over the years, the employees do recall long hours spent clearing roads and debris, but cannot pin point dates or costs.

In contrast to the decades prior, the NCDC lists many heavy snow events after 1993, including numerous events resulting in property damage of fifty thousand dollars or more, with others showing no damage costs. However, these statistics only account for what was actually reported to the National Weather Service by the Counties. They don't account for the local costs to municipalities for overtime, equipment wear and tear and damages due to debris or overuse, or costs associated with deicing materials that are lost due to inadequate storage facilities, or that run out and emergency purchases must be made at inflated rates due to high demand. Also, the loss of lives and damage to vehicles in car crashes due to poor weather conditions are not documented.

National Weather Service Statistics indicate that Chemung County experiences an average of 3.5 severe winter storms per year. Since the 2006 HMP was adopted, Chemung County has been extremely fortunate in our lack of severe winter weather events. The County has not had any widespread snow or ice events materialize in the five year period from 2005-2010. There have been some minor, localized issues

in the higher elevations that are expected during New York winters. We have had several warnings of events that have either gone around Chemung County or died out before reaching us.

The National Weather Service reports 32 heavy snow events occurring from 1993 through 2002, and three ice storm events in the same reporting period. These storms last from 1 to 2 days on average according to the Weather Service. However, these statistics met with some disagreement in our more rural townships, which tend to have more hills and more precipitation, and more ice events than the lower lying areas of the County.

In March 1993, a major storm event dumped massive amounts of snow from the Gulf Coast States northeastward through New England. At least 243 deaths were attributed to the storm and over 3 million customers were without electricity along the storm path. Damages nationwide were estimated at $2 billion. In Chemung County, this storm produced heavy snow and blizzard conditions, with over three feet of snow accumulating in a two-day period. Police officers were transported in snowplows. This storm resulted in a food shortage, which lasted for several days. It was necessary to provide food to those lodging in motels that do not have food service. Another snowstorm one year later almost to the day resulted in scattered power outages in Chemung County. Approximately three feet of snow was again dumped on the area. Some people were without electricity for several days. Three or four families were sheltered.

February 1, 1982 the Star Gazette reported an ice storm shut down schools and the local airport. Scattered power outages and trees down were reported. NYSEG officials were quoted as saying the damage was held down by the lack of wind during the heavy ice period.

The Blizzard of ’78 went into the history books as a benchmark for severe winter storms. Information from the National Weather Service states that hurricane force winds and record breaking snowfalls made this blizzard one of the most intense storms of the century. In Chemung County snowfall totals reached one and one half to two feet. White- outs from blowing and drifting snow and treacherous road conditions were reported. Storm event history may be searched on: http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms.

2. Specific Winter Storm Concerns

Due to Chemung County’s geographical location, the County is “expected” to receive more snow and ice –similar to other Upstate New York counties—as opposed to the coastal areas of the State, or the

southern states in the U.S. Therefore, there is also an expectation that we can efficiently manage our winter weather without difficulty. As we are a rural county rather than a heavily urbanized area, we have different types of problems associated with snow and ice as compared to large cities that receive significant winter precipitation amounts, such as Rochester or Buffalo. However, this does not minimize the problems we face each season. The larger cities tend to get more attention, and more help, with their winter weather problems than Chemung County due to their size and the large population affected. Chemung County, its municipalities, and its residents, must fend for themselves and fix their own problems without benefit of aid from outside agencies.

Chemung County continues to educate the public on winter weather preparedness each year. The County releases information each November regarding suggested emergency supplies that all residents should maintain in their homes and cars, and urge residents to create a family emergency plan.

The most common and costly problems, other than flooding, from both severe summer and winter storms is the wind and ice damage to trees and property, and traffic crashes. All municipalities report problems with trees and limbs falling into roadways, taking down utility lines, and damaging houses and cars. In many of the rural areas, our Volunteer Fire Departments are called out to help with trees down, water across roadways, etc. Most do not have all the equipment necessary, or the training, to respond to these calls. Chainsaws for our fire fighters, training in their use, and proper protective equipment is needed. Training and equipment for working with swift moving water is also needed, such as swift water rescue training and approved life preservers.

The Town/Village of Van Etten's concerns regarding electrical service and communications during severe weather events was described under summer storms' narrative. Another concern is that the Town/Village of Van Etten are extremely rural and have a rather large elderly population living in single family homes. These residents have to drive 20 miles or more in any direction to find pharmacies for their prescription drugs. They have one local grocery store that is rather small and has a limited inventory, which is quickly depleted when a winter storm advisory is published. It is "good" for picking up a few items, but major grocery shopping, pharmaceuticals and other special needs must be accomplished in the larger areas twenty miles away. Historically, elderly residents have sometimes found buying adequate supplies of food, water and medications prior to the onset of the storm a challenge.

Meetings have been held with Town and Village officials regarding preparation for storms, and improving communication of needs after an event. The Chemung County Executive issues a press release

in the late fall each year reminding residents to be prepared for winter weather with a detailed list of supplies and suggested actions. Other issues, such as NYSEG response and emergency communications have been addressed and improved as discussed in the summer storms section of this plan.

During winter storms, obtaining and storing de-icing materials has become an issue. Several towns do not have salt/sand storage facilities. Therefore, approximately one third of materials which must stored outside are lost due to wind and freezing. Two municipalities, Erin and Baldwin, are researching the possibility of a shared facility to help save on costs. In the past, they have applied for grants but have been denied.

The practice of salt "rationing" in the state due to low production and high demand has made costs for buying salt prohibitive for the smaller municipalities as well. They are forced to use sand or other materials that are less effective, and require greater quantities to get the job done. This forces crews to be out longer, use more materials, more fuel and more time to cover the required distance, with results that are mediocre as compared to salt use. Due to the lesser quality de-icing capability of the materials used, traffic crashes occur more often, emergency responders have a more difficult time getting to calls for help, and there have been several cases where fire trucks have not been able to get up roads due to icy conditions.

The City of Elmira reports a budget of $300,000 for snow removal and winter weather incidents.

E. Landslide

1. **Locations**: Several small areas with steep slopes along rural streams, creeks and roadways, or along the Chemung River.
2. **Extent**: numerous areas identified, two with potential to cause harm to private property.
3. **Previous Occurrences**: Four documented landslides through 2011.
4. **Probability of Future Events**: One event is inevitable with the slope showing signs of cracking. A second is likely based on the history of the slope. The remaining two are unknown.

According to information specific to New York State that can be found on FEMA's web site, http://www.fema.gov/hazards/landslides/landsli.shtm, there is a risk of landslides as determined by scientific information and proven by historical incidence. However, New York State is not identified as having the most serious landslide threat. According to information provided by USGS and NYSGS it is estimated that 80% of New York State has a low susceptibility to landslide hazard. In general the highest potential for landslides can be found along major river and lake valleys that were formerly occupied by

glacial lakes resulting in glacial lake deposits (glacial lake clays) and usually associated with steeper slopes. A good example of this is the Hudson and Mohawk River valley. The USGS provides a generally accepted landslide hazard overview map (see Appendix C) indicating landslide susceptibility and incidence. (Source: New York State Muti-Hazard Mitigation Plan, 2008)

Chemung County has five documented landslides as of the writing of the 2012 HMP Update. The first landslide, and the one most likely to have another failure in the near future, occurred in May 2011, when severe storms with heavy rain and high winds hit the southwestern and northeastern areas of Chemung County. Heavy rain in the Town of Van Etten caused a landslide along a feeder creek to Cayuta Creek, on Crammer Hollow Road. The landslide forced the rushing water out of its banks, and caused severe erosion and damage to the yard of a residence that borders the creek. The septic system of the residence is now at risk for failure, and will undoubtedly be damaged in the next high water event. The slope shows signs of further cracking, and another landslide in this area is certain to occur in the next large storm, if not before.

The second active landslide is located on the east side of Seeley Creek near Pine City in the Town of Southport. The exposed scarp is currently ¼ mile long and approximately 200 feet high. This unvegetated slope is steadily depositing sediment into the creek, but has not experienced large-scale or catastrophic motion in many years.

The third landslide occurred in 1994, when a steep hillside failed in the Town of Veteran causing a landslide that covered a road, but did not damage any homes. There was concern that the landslide would continue into Catharine Creek and cause flooding in the Village of Millport. The Town chose to abandon the affected section of road, rather than remove the deposited material. No further actions have been required. Should further sliding occur affecting Catherine Creek, appropriate action will be taken at that time.

A small landslide area exists on the Mark Twain golf course in the Town of Horseheads, but documentation on this area cannot be located other than it is known to exist.

Unstable slopes along road cuts and roadside drainage ditches occasionally pose localized problems when erosion and mass wasting occurs. Burch Hill Road in the Town of Veteran has an 80-foot high embankment which slides when the soil becomes saturated. During the November 1996 flood, this sliding inhibited drainage and led to erosion of a gully 10 feet deep along the edge of the road. The gully

was subsequently filled and the ditch was stabilized with fabric and rock. The high, unstable bank poses an ongoing threat. A tie wall stabilizing a section of the embankment has fallen over, allowing significant amounts of erosion at that site. Sediment from this unstable embankment is washed into Catharine Creek where it contributes to habitat degradation and channel instability.

In other areas of the County, the Town and County Highway Departments are able to correct these embankment and drainage ditch situations in most instances, and may occasionally seek the assistance of the Soil and Water Conservation District for advice on how best to remedy some of the larger slides. For further information on projects completed by Soil and Water, see section VI. Mitigation Strategies and Measures- Past and Present, subsection 5. Soil and Water Conservation District.

The probability for a future event at the Van Etten landslide site is extremely high. Mark Watts, Director of the Soil and Water Conservation District, and Jimmie Joe Carl, Engineer for the Storm Water Coalition, visited the site shortly after the slide occurred, and noted evidence of further soil cracking at the top of the slope. They believe another landslide is certain, in the next rain event or possibly sooner due to the unpredictable forces of gravity.

The timing of the next Van Etten landslide will determine the extent of further damage. If gravity causes the slide during a time of low water flow, there may be ample time to remove the debris and prevent the creek from being further pushed toward the residence and the septic system. However, if the slide occurs during a rain event with high or rising waters, the creek will most likely be forced further onto the private property, will impinge on the septic system, and possibly cause the raw sewage to be washed down stream. Damage to the residence itself is also a possibility if erosion continues. A letter of intent was filed with FEMA/NYSOEM to buy out this property, with no response as of the writing of this 2012 update. The cost of the buyout would most likely be less than $100,000

While the potential for a future failure certainly exists at the Southport landslide site, there has not been any activity in almost ten years prior to the writing of the 2012 HMP Update. Undercutting of the Pine City landslide by Seeley Creek still contributes to the threat of catastrophic failure, which could displace flow in Seeley Creek. This risk has been exacerbated by the 1997 realignment of the creek by the State Department of Transportation, which effectively protects Highway 328, but directs the current of Seeley Creek toward the base of the landslide. The present location of the creek is such that the landslide is on the outside edge of a bend and is thus susceptible to being undercut by the creek. The steep topography in the Town of Southport, combined with the presence of poorly consolidated glacial

deposits, may result in additional landslide prone areas that have not been identified. The risk of landslides increases if clear cutting occurs on steep slopes (greater than 15%).

If the Pine City landslide collapses catastrophically, it could fill the channel of Seeley Creek, completely displacing flow in the creek. The Town Drainage Officer estimates that the area of potential flooding from this catastrophe could encompass as many as 250 residences. In a 2005 PDM Grant Proposal to fix this slide (the grant was unsuccessful) the estimated potential for flooded homes was quoted at 338. Total costs for response, clean up and repair according to this 2005 proposal was over $3.7 million dollars.

There is also a potential for additional flooding that could occur downstream, if the blockage is breached rapidly, resulting in a dam failure type of event. Displacement of the creek would probably cause significant erosion damage to State Highway 328, Pennsylvania Avenue, and other areas as well, with a potential for several million dollars in damage to roadways.

Similarly, another slide at the Burch Hill site is possible, perhaps in a strong rain event, but it does not appear to be imminent. While this area continues to slowly deteriorate, the high unstable bank has not shown any movement in many years prior to the 2012 Update. As noted, the tie wall has fallen over and that area does show signs of continual erosion affecting wildlife habitat and channel flow, but no homes would be directly impacted. Currently there is no plan or funding to correct the damaged tie wall.

VI. Mitigation Strategies and Measures- Past and Present

Chemung County and its municipalities have shown their commitment and willingness to mitigate hazards in our community. However, our elected officials realize that much more needs to be done to help lessen the impact of the hazards that effect our residents. Therefore, a collaborative effort to continue our past practices and embark on new projects has been embraced by all governing bodies within Chemung County.

The following past and present measures taken by Chemung County and its municipalities will be continued in the future.

A. Flooding

1. Flood Mitigation Plans

After Agnes caused great destruction in 1972, flood mitigation efforts became a primary goal of Chemung County officials. Twelve of the 17 municipalities in Chemung County have adopted Flood

Mitigation Plans that were reviewed, with relevant information culled and incorporated into the 2006 HMP. These plans still exist, and can be used as a reference for historical data.

2. Levees and Flood Control

Levees and flood control systems along the Chemung River existed before 1972, but were not adequate to control the flood waters of Agnes. After the flood, these control structures were only restored to past conditions, they were not modified to give further protection. However, after 1972 a flurry of activity spawned several dam projects to help impound water that would flow to the Chemung River. The largest of the projects were the Tioga-Hammond Dams and the Cowanesque Dam.

To date, Chemung County has five earthen dams to help control water in the Newtown-Hoffman watersheds, all built after 1972. The Chemung County Buildings and Grounds Department is charged with the routine maintenance of these dams, such as exercising gate valves, mowing dam faces, and clearing debris from trash racks and spillways. There are numerous other dams within the county that are maintained by private property owners, New York State, other municipalities or the Elmira Water Board. The Chemung County Emergency Management Office, along with various other county departments, assists these agencies and municipalities in planning and emergency response operations and maintenance projects. Along with these dams, there are almost 77,000 feet of levees, concrete conduit, pump stations and various drainage structures along streams and the Chemung River to aid in flood control.

Chemung County takes an active role in the maintenance and inspection of these flood control projects and structures through participation in, and follow-up of, annual inspections with the New York State Department of Environmental Conservation, the Army Corps of Engineers, and the U.S.D.A. Natural Resources Conservation Service. Repair of any sloughs, removal of debris, seeding and mowing and armoring of eroded banks have been past inspection recommendations that have been completed by Chemung County.

Subsequent to the adoption of the 2006 HMP, a road construction project in the Village and Town of Horseheads revealed an unaccredited flood control levee built to control high water from Newtown Creek. The levee, located along Old Ithaca Road, is approximately 4,000 feet in length, and was terribly overgrown with weeds and trees. The Town has begun to refurbish the levee, and has taken borings to determine how the levee was constructed. The Town is working toward having the levee recertified and will maintain the levee into the future.

A project that would extend from the Commonwealth of Pennsylvania into Chemung County's Town of Ashland has been discussed and studied for many decades. PL-566 is a project that would create

a levee in the Town of Ashland/Village of Wellsburg along Bentley Creek. Had the levee been in place during Tropical Storm Lee in September 2011, it might have helped to spare many homes and businesses from the flooding that occurred. Movement on PL-566 has again begun, with votes by municipalities and investigation into funding sources underway as of November 2011. In December 2011, Mark Watts, Director of the Chemung County Soil and Water Conservation District, is writing a proposal for the NRCS in hopes of getting assistance for the completion of this project.

3. Channelization and Flow Capacity

In addition to flood control projects, Chemung County and several municipalities have completed numerous smaller projects such as re-establishment of channels, improvement of flow capacity, stream cleaning and maintenance, and stabilization of stream banks. Projects to protect roads, bridges and properties have also been completed. In general, Chemung County devotes about $50,000 to $100,000 each year to fund these mitigation projects, with an additional 25 percent being spent by landowners.

In 1997, additional money was spent on stream bank stabilization, totaling $200,000 for the County's share, with similar amounts paid by private landowners and towns. Through a coordinated effort by the County and several municipalities, a cleanup and dredging project of the old Chemung Canal was completed in 1996 which alleviated many flooding problems along the canal. After the completion of the project which totaled $718,190 in cash and in kind services, the participants agreed to contribute $2500 per year to fund ongoing future maintenance projects.

In 1996 the Chemung County IDA submitted an application for $200,000 in Federal Appalachian Regional Commission funding, matched by $282,000 in IDA funds, to enlarge the existing Halderman Hollow Creek detention basin located adjacent to Hardinge, Inc., in the Town of Horseheads, to provide assured 100-year storm flow protection to businesses located downstream. The application was approved by ARC and the work was completed the following year. The overall project site was approximately 20 acres in size, and the detention basin itself was increased from 39 acre-feet to 76 acre-feet in size.

Farther above this large detention basin are two smaller wetland areas situated in the hills to the west. These two ponds were "prototypes" of a sort for a continuing wetland initiative taken on by the Chemung County Soil and Water Conservation District. The plan is to create decentralized wetland areas, scattered across the County. The plan calls for one or two wetlands to be created per year. These wetlands are meant to help control storm water runoff as well as provide habitat for wildlife. The newest wetland is in the Town of Veteran near Middle Road and has already shown that it helps to control storm runoff in the Catherine Creek watershed. The next planned wetland is to be created in the Town of Southport.

The Town of Ashland has spent $379,701 from 1973 through 1997 on stream cleaning projects in a small portion of Bentley Creek. An additional $94,435 was spent by the Town in 1996-1997 for cleaning and maintenance projects in Seeley Creek. New York State, Chemung County and many County municipalities worked cooperatively in 2001 to 2003 to haul thousands of yards of material from the Chemung River and Bentley Creek in the largest debris and sediment removal projects in the County. Cost of the projects, much of it in-kind, totaled well over one million dollars.

The Town of Ashland and Village of Wellsburg officials met on November 29, 2011 to review and discuss the Hazard Mitigation Plan, and to formulate their joint Action Items. One top priority for the municipalities to again clean out the gravel and debris deposited in Bentley Creek during the 2011 flooding events. Estimates for this project are from $500,000 to one million dollars depending on how extensive the clean up is, and how much can be done with municipal equipment and labor.

4. Stormwater Coalition and Storm Water Team

The Chemung County Stormwater Coalition was founded in 2002 to address the storm water Phase II Construction Permit requirements for the MS4s in Chemung County. The Chemung County Stormwater Coalition is located in the Soil & Water Conservation District Building at 851 Chemung Street, Horseheads, NY 14845. The Chemung County Stormwater Coalition, at the time of its creation, was comprised of the 14 small MS4s, Soil & Water Conservation District, County and Regional Planning, Cornell Cooperative Extension, NYSDEC and the NYSDOT.

In 2008, the Coalition expanded to all municipalities in Chemung County and includes members of the Chemung County Water Quality Strategy Committee as well (see Section 6 below for an explanation of this committee's work). Every municipality participates in the meetings, discussing a wide variety of issues related to flooding and flood prevention, storm runoff and water quality, public education efforts, as well as many other topics listed below. The Stormwater Coalition meets on the third Wednesday of the month. Visit the following website to view agendas and minutes of the Stormwater Coalition meetings: http://www.stcplanning.org/index.asp?pageId=34

A funding mechanism was also established in 2008, to implement and manage a county-wide Stormwater Management Plan. It is in the form of an inter-municipal agreement with the County, all its municipalities, and the Soil & Water Conservation District (SWCD). The Plan included the formation of a Stormwater Team in July 2008 to support the Municipal Separate Storm Sewer System (MS4) programs

in the Elmira urbanized area (City of Elmira), where the storm and sanitary sewers are separate, and rural stormwater management in all other parts of the County where storm and sanitary sewers are combined. The team consists of an Engineer, Educator and a Stormwater Technician. A Stormwater Board oversees the work which addresses water quantity, as well as water quality, to alleviate the impacts of existing and new development on urban and riverine flooding. The Engineer reviews all SWPPS and drainage plans ensure adequate protection measures are being taken.

The 5 member board meets on the second Tuesday of the month. The plan of work for the Stormwater Team as well as the Stormwater Management Program Plan (SWMPP) is guided by the 6 Minimum Control Measures of the NYSDEC SPDES General Permit for Stormwater Discharges from Municipal Separate Storm Sewer Systems (MS4s), permit # GP-0-08-002. They are:

- **MCM1. Public Education & Outreach/MCM2**. **Public Involvement/Participation:** Public Education and Participation focuses on issues related to reduction of stormwater runoff and pollution prevention. The concept of "*slow it down, spread it out, soak it in"* is used to engage the public promoting low impact development practices such as the use of rain barrels and rain gardens in residential settings to control the flow of runoff. Public education and participation are requirements of the stormwater MS4 permit and continue on a yearly basis. The degree to which these programs are deployed is based on outside funding sources and grants.

- **MCM3. Illicit Discharge Detection and Elimination (IDDE**): Illicit Discharge Detection and Elimination employs various annual activities. The permit requires inspection for 20% of total outfalls each year so that in a 5 year period, every outfall in the MS4 has been inspected. Outfalls are cleaned and maintained on an as needed basis. There is a county-wide composting program to control the mishandling of organic yard waste. Many of the MS4s have municipal yard waste compost areas and small scale composting in a residential setting is promoted. There is a compost demonstration area on the county fair grounds and compost bins are available for sale at the District office. Lastly the Chemung County Water Quality Committee continues its in stream sampling for Water Quality Parameters. There are 11 sites sampled every two months.

  On April 14th, 2011 at Southern Tier Central's Regional Leadership Day held at Corning Community College, there was a session for Municipal planners, ZBAs and Supervisors on Green Infrastructure. Janet Thigpen from STC and Diane Fiorintino from Storm Water Coalition were the presenters. There were 62 municipal leaders in attendance for that presentation. The title was "Stormwater Green Infrastructure and Planning Boards." Subsequently, the Chemung Storm

Water Coalition and STC have been awarded a Water Quality Improvement Program (WQIP) grant to develop a public outreach campaign for green infrastructure and Illicit Discharge Detection and Elimination (IDDE) BMPs. As of December 2011 the agencies are still waiting for the signed contract from the state to begin the work and the project. The project will include printed brochures, workshops and a series of 15 - 30 second TV spots on IDDE BMPs. The roll out will be countywide, involving all the municipalities, through their participation in the MS4, Water Quality and Storm Water Coalition.

- **MCM4. Construction Site Stormwater Runoff Control & MCM5. Post-Construction Stormwater Management:** These Minimum Control Measures focus on construction activities and post construction management of stormwater. The permit requires us to evaluate the Stormwater Pollution Prevention Plan for new and redevelopment projects and to achieve pre-construction water quality and quantity levels post construction. A requirement of the permit is to inventory post construction management practices and to inspect on an annual basis.

- **MCM6. Good Housekeeping for Municipal Operations**: Municipal staff in each town/village and the City of Elmira tracks good housekeeping BMPs. Every 3 years these staff members also complete a self audit of municipal facilities. Beginning in 2012, education programs for the private sector will begin to help them "connect the dots" and see how they can fit into the IDDE BMPs.

Following is a brief description of the Stormwater Team's work since its creation. This is an excellent example of all the municipalities and agencies of Chemung County working cooperatively to accomplish common mitigation goals.

- The Stormwater Team assists the MS4s on all Minimum Control Measures, in an effort to be in compliance with the permit. The Stormwater Team maintains the Chemung County Stormwater Website that is hosted on the Chemung County Site. The Stormwater Team also cooperates and participates with the Rural Stormwater Coalition of Chemung, Schuyler and Steuben Counties. The Stormwater Team provides Coalition members a copy of the SWMPP, and also maintains a hard copy at their office and posts one online. The SWMPP, a living document, is updated on a regular basis through communication with the municipal members.

- The Stormwater Team assisted in the development of a study with the Town of Elmira for the Coleman Avenue area. This area has a long history of flooding and damage due to storm water

issues. The study includes three levels of work to address a two year, ten year and 25 year storm, with the associated costs detailed. The study will be presented in the near future and the Town will consider the options put forth. The Town of Elmira also has two high hazard dams within its municipality. The town is currently updating and revising the Emergency Response Plans for both dams, and updating the dam failure inundation maps.

- The Village of Millport, in cooperation with the Storm Water Team and Chemung County, participated in a study for a water runoff issue on Millport Hill Road, off Route 14, in the Village. Storm water runs down Millport Hill causing flooding and ponding issues on Route 14 routinely. The study has mapped out a plan for the installation of a storm sewer system to control the runoff. The project has now been completed by the Chemung County Public Works Department, with work concluding in November of 2011.

- The Village of Millport has recently completed a project with assistance from the Soil and Water Conservation District on a project to protect their municipal water main which is in close proximity to Catherine Creek. The water main is located near a bend in the creek, which is beginning to erode, threatening to expose the water main. Soil and Water assisted the Village to armor the bend with rip rap, protecting the water main and preventing further erosion.

5. Chemung County Soil and Water Conservation

Chemung County Soil and Water Conservation has completed many mitigation projects in cooperation with Municipal Public Works Departments and private citizens. Chemung County Soil and Water has created a database using a GIS Map to track stream and bank stabilization projects. The process of plotting each job that has been completed in the past is on-going, and new projects are being plotted as they occur. When this map is complete, it will show all locations of stream projects in the County, and will then be updated regularly. The map includes information on who did the work, who paid for the work, how much was paid, and in many cases there are photos of the before and after views. This will be an invaluable record of stream mitigation projects and will allow us to track the history of streams throughout the County. The map will serve as a way for the Hazard Mitigation Planning Team and Municipal Officials to review action items and help maintain the plan in the future.

Table 7 includes a list of projects completed by the County Soil and Water Conservation District.

Table 7: Chemung County Soil and Water Conservation District Flood Mitigation Projects

Year	Project Type/Name	Description	Notes
2005	Forest Lawn Cemetery	– Diversion Ditch with Pond and	County Highway

		Under Designed Outlet – 500’ Diversion – ¼ Acre Pond – 1,000’ 12” Pipe	Did work
2005	Wetlands	– Carey Wetland – Farmers Ephemeral Wetland – Dutch Hill Wetland	
2005	Road Ditch Stabilization 500’	– Breed Hollow, Big Flats – Benjamin Road, Veteran	
2005	Streams	– Brown Road, Big Flats 150’ – Eacher Hollow, Big Flats 100’ – Mc Duffy Hollow, Van Etten 150’	
2006	Streams	– Carolyn Mitchell, Horseheads 120’ – Seafuse Road, Millport 120’	
2006	Low Impact Development	– Baldwin Highway Underground Stormwater Detention	
2007	Wetlands	– Curren Road – Halderman North – Halderman South	
2007	Streams	– Holly Park Terrace 100’ – Orminston Road 180’	
2007	Road Ditch	– Chambers Road, Jim Radford – Detention Basin	
2008	Streams	– Halderman Hollow 5,000’ – Christian Hollow 800’ – Cleary 175’ – Ken Green Elcor 120’	
2008	Road Ditch	– 600’	
2009	Low Impact Development	– Parking Lot Stormwater Office	
2009	Streams	– Bentley Road 200’ – Baldwin Creek 150’	
2010	Horseheads Dike Maintenance	– 3,000’	
2010	Wetlands	– Tom Peck, Veteran	
2010	Stream Work	– George Poley 150’ – Steve Chaffee 150’ – Sitzer Road 150’ – Mathews Road 100’ – Seafuse Road 120’	
2011	Horseheads Dike Maintenance	– 3,000’	
2011	Dam Maintenance	– 5 dams-mowing & debris removal-inspections	
2011	Wetlands	– Pat Comb-Town of Southport-2 acres	
2011	Streams	– **Village of Millport**-180’ – **Newtown Creek** (Randy Parker)-125’ – **Newtown Creek** (Horseheads Dike)-320’ – **Village of Wellsburg** (White Hollow)-1,800’	

		– **Van Etten** (John Manchester)-80' – **Town of Erin** (Julie Peckam) -80' – **Town of Erin** (Randy West) -100' – **Town of Erin** (Mr. Peck)-100' – **Town of Chemung** (Mallory Road #1)-800' (Mallory Road #2)-600' (Lloyd's Farm)-450' (David Coyle)-200' (Sue Baxter)-100' (Sue Wenzel)-100' – **Town of Southport** (Christian Hollow)-1,200' (South Creek-Rubins)-100' – **Town of Horseheads** (Newtown Trailer Park)-300' – **Newton Debris Removal**-200' – **Randy Parker**-250'	

Information regarding Chemung County Soil and Water Conservation District activities and projects, including electronic versions of the Annual Report, can also be found at their website: www.chemungcountyswcd.com

6. Water Quality Committee

In 1993, Chemung County realized a need to formulate a strategy to protect and improve water quality. The Chemung County Water Quality Committee was organized to address various water quality impairments, including issues of flooding. A strategy was written with updates in 1996 and in 2007. The Chemung County Water Quality Committee meets monthly usually on the third Wednesday of the month. The goals of the committee include:

- Maintain an updated listing of countywide groundwater and watershed specific water quality concerns.
- Collect, tabulate and consolidate available water quality information.
- Establish a network between agencies.
- Promote and introduce specific programs that assist in preventing or alleviating water quality impairments.
- Educate the public on water quality issues.

Evaluate the program and make amendments as needed. The Water Quality Strategy Committee is available to municipalities to assist in improving water quality. Upon request, the committee will review projects, meet with officials and make recommendations. This service is offered to all municipalities and agencies within Chemung County.

The Committee routinely discusses issues related to flooding, and plan to create a public education video and accompanying written report that includes a wide variety of water issues, including flooding, stream functions, stream bank erosion, detention facilities and wetlands, and timbering best practices. The meetings are attended by many of the Town Supervisors/Village Mayors, Highway Supervisors, County Planning, County Health, Soil and Water Conservation, and the County Environmental Management Council through Cornell Cooperative. Access to agendas and meeting minutes can be viewed at the committee website, http://www.stcplanning.org/index.asp?pageId=40 .

7. Other Stormwater Management Projects and Actions

As of December 2011, the Soil and Water Conservation District has been working to create a funding mechanism for an Equipment and Projects account. The Towns and the County would all contribute to this common account, which would then be used to purchase and maintain equipment, and to purchase supplies and materials for projects, many of them Mitigation Projects. Legislative bodies are in the process of reviewing and voting on this innovative cooperative measure.

Village of Elmira Heights

The Village of Elmira Heights has been diligent in their efforts to maintain drainage systems to help reduce flooding. Improvements to pipes, culverts, etc. are made when the local road it serves is repaired or improved. The Village is 1.2 square miles and has 1000 drywells. In the early 2000s, they bought a piece of machinery dubbed "the dry well cleaner", at a cost of $12,000 to help in maintenance costs and time. They also purchased a "vac truck/street sweeper" to prevent dirt and silt build up in drainage structures. The truck was purchased in the late 1990s at a cost of $160,000.

The Village of Elmira Heights has undertaken a multi phase project to mitigate future flooding damages. In 1973, after Agnes caused great damage, Elmira Heights installed a pressure system to aid in water drainage in the extreme upper areas of the village (17th, 18th, 19th Streets), completing phase one of the overall project at a cost of four hundred thousand dollars. In 1977, the second phase was completed when a pressure system and detention basin was installed to cover 15th Street to Cohen Avenue at a cost of five hundred thousand dollars. There was also a manual activation pump station installed at 10th Street which helps pump some of the low lying area water over the railroad tracks to an existing drainage way. Several proposals have been discussed for accomplishing the third phase of the project. The most acceptable proposal included installing an automatic activation pump station at 16th Street, and making the 10th Street pump station an automatic activation system as well. These pump stations would remove the floodwaters and discharge it to the existing drainage way east of the railroad tracks. At the time of the 2006 HMP, the estimated cost was five hundred thousand dollars. The Village noted that the original

proposal called for an elaborate piping system to be installed throughout the low lying areas at a cost of $1.2 million, and would require digging people's yards, paved driveways and roadways to install the piping.

The Village of Elmira Heights also has identified several projects related to its existing pump stations. In 1993 new pumps were installed at a cost of $43,000. The pump pits were cleaned out once after installation, at great risk to the men who had to descend the pits with buckets and dig the silt and garbage out, bucket by bucket. The pits are obviously permit required confined spaces, and the Village no longer has employees that are qualified to enter the pits. The Village has contacted several companies to try to have the pits cleaned, however the pits are 23 feet deep and no company has vacuum equipment to go to such depths. The Village had both pumps repaired in 2003, but remain concerned that their inability to properly clean the pumps will perpetually result in further damage necessitating additional repairs. The Village must either buy equipment, or hire a specialized contractor to do the work. The Village needs funding to pursue either option.

The piping systems associated with all of the above pump stations must also be replaced due to age and deterioration. The Village hopes that an alternative to complete replacement of the pipes may be feasible. An available technology exists that uses a grouting injection method, in which the old, deteriorated pipes are coated with a cement product. However, more studies would have to be done on the Elmira Heights system before determining if the grout injection method would work. Again, if the piping were to be replaced, digging peoples' yards and driveways would be required, adding property repairs to the cost of the project.

During the five year period between the development of the 2006 HMP, and the 2012 Update, Elmira Heights looked into completing these three related projects, and unfortunately discovered that costs had risen dramatically. The search for funding has revealed that while there are grants available for these type of projects, such as the PDM Grant, all require a local share, most at least twenty five percent. The Village cannot afford these costs, as is the case with many municipalities in the current unfavorable economic climate. The Village, along with planning and engineering partners, are researching more funding avenues, or ways to possibly scale down these projects to make them more reasonable financially.

City of Elmira

The City of Elmira has continued its flood mitigation efforts, maintaining pump stations and stop log closures, and participating in flood control structure inspections. The City also upgrades pump station equipment, culverts, drainage structures, etc. when other work is being completed in the area.

Since the adoption of the 2006 HMP, the City of Elmira applied for a grant to mitigate a storm water flooding issue in the Hoffman St, Fassett Rd area. The grant was denied because of the cost and some of the elements of the project. The team working on this project is now trying to reorganize the project to cover primarily the storm sewer needs, and minimize the paving portion of the project.

Town of Horseheads

Another perplexing issue that is being investigated as of December 2011 involves two drainage pipes that traverse the Town of Horseheads, Village of Elmira Heights, and the NYS DOT right of way. The pipes, known locally as the "twin sixties", are approximately one mile long, running underground to drain storm water from the town and village. There is some question as to who is the responsible party for the maintenance and upkeep of these pipes, and some concern about who will clean these pipes out if they become clogged, and how they will be cleaned. The investigation is on-going.

8. Equipment Acquisition

Many of the Town and the County Highway Departments have also purchased equipment in recent years to help mitigate flooding. The County has bought specialized excavators and a vacuum truck, totaling $400,000 since the late 1990s. This equipment has been used by our Soil and Water Conservation District, as well as other municipalities and agencies, to complete mitigation projects such as wet land construction, debris removal and ditching. The Town of Erin spent $337,000 since the early 2000s to get a new grader, trucks and a drott excavator for more efficient ditching and debris removal. The Town of Chemung has routinely spent $12,000 annually on upgrades to their communications system, allowing them to better use staff and resources. All resources are shared among municipal departments through a Shared Services agreement for Highway Departments.

Cooperative Projects

The Towns and County complete numerous projects each year, replacing culverts, pipes and armoring roads and bridges. Each municipality's budget varies, from $30,000 annually to approximately $500,000 annually. All municipalities use a half to three quarters of the State CHIPS funding for mitigation projects as well.

Chemung County instituted a "one third program" after the 1994 flooding event that did not receive a Federal declaration. The program was designed to fund stream bank stabilization and stream restoration programs on private properties, in which the County, Town and landowner each paid one third of the project cost. The program was extremely successful, and was reinstituted during the January and November 1996 flooding events with projects continuing through 2001. Through the end of 1995, the total expenditures for the program were $351,665 actual and $14,300 in in-kind services. From 1996 to March of 2001 the expenditures for the program totaled $63,871. This program is one which is used after disasters to help private property owners repair damage that does not qualify for FEMA assistance. It is used only during recovery from major storms, and can be instituted as needed.

9. Land Acquisition

Chemung County has used property buyout programs in the past to mitigate flood hazards. The County may consider this action again after Tropical Storm Lee, taking advantage of Mitigation Grant funding associated with the 2011 Disasters. As of the writing of this update in December 2011, the Mitigation Grant funds have not yet been allocated, and conversations with interested home owners in Van Etten and Wellsburg are only in very preliminary stages.

Prior to the 2006 Hazard Mitigation Plan, the County did obtain five private properties that experienced reoccurring flood damage using the buyout program. To eliminate the flooding problems affecting these five homes would have cost millions of dollars and entailed rebuilding a bridge ($250,000) dredging streams, and building dams or dikes to protect the properties (no estimated cost as it was not practical, but would be in the millions). The County determined it was much more cost effective to purchase the five properties, with a total project cost, including wages, equipment and removal/destruction of bridge and homes, of $174,313. The County has taken steps to assure these areas will not be developed in the future by including prohibitions for development in the property deed.

The County has also assisted in getting two homes raised above the flood level, thereby preventing future flood damage to the homes. The possibilities of helping more home owners to raise homes damaged in the 2011 events also exist, again, dependent on the timing of the funding and agreement from the homeowners to complete the construction.

A major obstacle with both the buyout and municipal assistance with elevating residential structures is in fact the timing of the Mitigation Grant funding becoming available. Homeowners would have to wait over one year before funds would become available for the municipality or County of Chemung to even apply for the funds. Virtually no homeowner has the financial ability to just walk away

from a home with a mortgage to live someplace else for over one year waiting to be bought out. If elevating the structure is the solution, that would be done at the time the repairs are being made to the home. Again, no family can wait over a year to repair their damaged home waiting for assistance to raise the structure.

10. Local Laws and Regulations

County and municipal legislative bodies have also taken non-structural mitigation measures, such as local laws and regulations governing development in flood plains, zoning laws and the creation of conservation/agricultural districts, buy-outs of private properties in flood prone areas, and storm water management activities.

Since the 2006 HMP, many municipalities adopted regulations or created local laws to control timbering practices in their towns. By making those cutting forest lands use best practices, these municipalities have been successful at reducing damaging runoff and stripping away of land associated with clear-cutting and other poor timber practices. The Chemung County Soil and Water Conservation District has published a book, "Chemung County Forestry BMPs" (Best Management Practices), which is given to all people applying for timbering activities.

Those municipalities who require foresters to apply for a permit, and give each requestor a copy of the BMP book, are: Town of Erin and Town of Baldwin. The Town of Chemung is currently reviewing the Town of Baldwin requirements, and is considering adopting these regulations. Those municipalities that have local laws requiring foresters to follow the BMP book guidelines are: Town of Catlin, Town of Big Flats, Town of Ashland, Town of Southport, Town of Horseheads, Town of Elmira.

11. Public Education Activities

Funding of Environmental Emergency Services Inc. (EES), a tri-county not for profit group dedicated to flood mitigation and warning, has also been a past practice that will continue. With the help of this organization, Chemung County can better warn residents and businesses of impending flooding so that protective measures of properties can be completed before flooding becomes severe, thus reducing damage and reducing risk to lives. Chemung County provides $8400.00 each year to EES, and several of the municipalities provide another $6500.00 in combined funding support. EES operates an automated gauge network, trains Flood Warning Service volunteers, and conducts public education about flood hazards.

Since the 2006 HMP was adopted, in an effort to help all municipalities help their residents in mitigation of flooding damage to residential structures, Janet Thigpen secured a Hazard Mitigation Grant on behalf of Chemung County to send two (2) of our municipal Code Enforcement Officers (CEOs) to the Emergency Management Institute for a weeklong course, "Retrofitting Flood Prone Residential Structures". The two CEOs, upon their return from the EMI course, and with the help of Janet Thigpen the STC Flood Specialist, and Kristin Card-Griffin the Chemung County Emergency Planner, created a three hour "Introduction to Retrofitting Flood Prone Residential Structures" training course for all local CEOs. The course allowed CEOs to earn 3 hours of continuing education credits toward the required 24 hours by NYS. Through the tri-county EES Inc. website, the course information and fact sheets are also posted on the internet for use by all of New York State.

There were also three (3) one hour public meetings held to help homeowners understand the retrofitting techniques, teach them the pros and cons of each, and educate them on the NFIP. The two CEOs, Thigpen and Card-Griffin facilitated these public meetings. These meetings served as the inaugural events for the flood model described below.

After TS Lee devastated the many homes and business in Wellsburg, Thigpen, Card-Griffin, Joy Brewer from NYSDEC, and Tom Skebey, one of the EMI trained Code Officers, took the fact sheets and retrofitting information to the Village for a public education meeting. The information was disseminated, and discussion took place regarding the NYS Residential Building Code, which requires some homes in floodplains to be elevated with two feet of freeboard when making repairs after substantial flood damage.

EES also published two brochures, one for CRS credits on flooding, and another on water safety. The next brochures to be published by the group will concern the dangers of using flood control levees for motorcycle and ATV riding areas, and possibly an updated piece of a current brochure on the need to properly dispose of yard waste and debris to help prevent flooding.

Probably one of the most exciting additions for EES is their purchase of a flood simulation model. This portable table top model allows volunteers trained by EES to go out into the community and teach any group about the nature of storm water and storm water control devices. The model can simulate light or heavy rain events and has interchangeable inserts to simulate wetlands, storm water retention/detention structures, or a paved parking lot and includes clay for crafting dams or levees. The water is added to the model in the rainmaker, and then water flows downhill. Depending on the rainmaker and structures used within the model, water can flow within the stream banks, or can overflow its banks,

causing minor to major flooding. Volunteers plan to demonstrate this model at area schools, with civic groups and at public venues such as fairs and festivals.

B. Severe Summer Storms

Chemung County and its municipalities have more of a reactive, rather than proactive, approach to summer and winter storms. The Emergency Management Office, with assistance from the Red Cross, takes every opportunity to remind residents to be prepared. We advocate the Family Emergency Plan, the Family Emergency Kit, and remind the public whenever possible to store nonperishable food, water, batteries, flashlights, a battery powered radio and manual can opener all year long. The County participates in the biannual Hazardous Weather Awareness Week sponsored by the National Weather Service, when we use the local media to remind residents of the proper procedures to take outside or inside during inclement weather, and to know the signs of approaching inclement weather.

In the period between the 2006 HMP and the 2012 Update, Chemung County and all municipalities within its border formed a Highway/Public Works Shared Services working group. All municipalities now coordinate their efforts to get the most work done in the most efficient manner. As the group continues to meet, more plans are being created to increase efficiency in the cleanup efforts after a summer or winter storm. A more coordinated effort so that crews are not overlapping or passing over roads that need work to reach other areas should make response and recovery after severe summer or winter storms timely and organized. Cooperative purchasing agreements for pieces of heavy equipment and specialized equipment have been made through the working group as well. Other cooperative agreements like salt and sand storage, vehicle maintenance needs and equipment staging for large storm events have also been created through the working group.

C. Severe Winter Storms

See discussion on Severe Summer Storms.

VII. Hazard Mitigation Goals

Early on, the Chemung County Steering Committee reviewed the goals from the 2006 Chemung County Plan, assessing the extent to which the goals were still applicable. Several of these goals, while short and simple, were deemed to still be appropriate. The goals of the 2012 Chemung County Plan Update are the following:

- Goal 1: To make Chemung County More Resistant to Flood Damage.

- Goal 2: To Prevent Injury and Loss of Lives and Reduce Damage to Infrastructure as a Result of Sever Summer and Winter Storms.
- Goal 3: To Prevent Landslides that Cause Damage to Roadways, and Could Potentially Block Streams/Creeks Resulting in Flooding.

VIII. Hazard Mitigation Action Item Projects

A. Types of Mitigation Actions

The Planning Committee reviewed all pertinent information in the Risk and Vulnerability Assessment and Hazard Analysis, and compared the 2012 conditions to those in 2006. The committee concurred that the 2012 action items still reflect the risk assessment and are still appropriate and pertinent to our goals and strategies:

1. **Prevention**: government administrative or regulatory actions or processes that influence the way land and buildings are developed and built.

2. **Property Protection**: actions that involve the modification of existing buildings or structures to protect them from a hazard or remove them from the hazard area.

3. **Public Education and Awareness**: actions to inform and educate the public.

4. **Natural Resource Protection**: actions that preserve or restore the functions of natural systems.

5. **Emergency Services**: actions that protect people and property during and immediately after a disaster.

6. **Structural Projects**: actions that involve the construction of structures to reduce the impact of a hazard.

The action items were created by the individual municipalities based on the most recent natural disaster events and on their individual hazards, risks, and needs.

B. Prioritizing Hazard Mitigation Actions

The process for developing and selecting hazard mitigation actions, as found on the excel spreadsheet "Mitigation Goals and Action Items" that follows, does not include ranking or prioritization of hazard mitigation proposals. FEMA recommends applying the STAPLEE analysis tool for prioritization of action items. This arduous process was used during the original Plan creation, and it has been determined by the Planning Team, and the municipalities, that this rating system was of little value for determining prioritization of projects.

The Chemung County Emergency Planner surveyed other Counties in the State to inquire how they prioritized Mitigation Action Items. The process applied by Yates County to develop and select hazard mitigation actions seemed more reasonable and useful. This process considers the same issues that would be evaluated in the STAPLEE analysis, but does not put a "label" on the action item of "high, medium or low priority". Yates County made some very valid points in favor of NOT ranking and prioritizing hazard mitigation actions, for the following reasons:

- Identifying high priority objectives can result in diminishing the importance of other objectives
- It can be more difficult to mobilize funding and resources needed to insure implementation of lower priority, but still important goals
- It could contribute to complacency and lack of commitment toward achieving lower priority objectives
- As a multi-jurisdiction plan, many participating jurisdictions have specific mitigation actions that are a high priority to only their jurisdiction.
- Priorities differ among the plan's functional participants. The Highway Supervisor will have different opinions about a project's priority level, as will the Fire Chief or the Code Enforcement Officer.
- Priorities are often determined by the resources and funding available at a given time. If funding or resources become available to address a hazard mitigation goal, it will heighten everyone's efforts to advance the project, while an otherwise high priority project might be delayed for years until resources are mobilized.

The Chemung County Planning Team and municipalities agree with these points, in particular the final point concerning funding becoming available. Chemung County is choosing, instead of applying the

STAPLEE Method, to consider Funding Availability, Time Frame of Project, and Estimated Cost of Project for each Action Item. This allows all municipalities, and their working partners, to make realistic decisions about whether a mitigation project is achievable, has the appropriate public support, and therefore should be pursued and developed at a particular point in time. If a funding source is found, or an opportunity presents itself that will allow an action item to be completed, the municipalities feel they should seize the opportunity rather than dismiss it due to a prioritization label.

The Mitigation Goals and Actions follow in tabular format.

IX. Action Implementation and Plan Maintenance

Chemung County and each municipal governing body within the County will adopt the 2012 Chemung County Hazard Mitigation Plan no later than March of 2012. Implementation of the plan is on-going through the measure taken by our County Soil and Water Conservation District in concert with the municipal leaders and highway departments. The final Hazard Mitigation Plan Update will be posted to the Chemung County website. Each jurisdiction with a homepage will include a link to the Plan Update as well. All future comments and suggestions can be submitted via a link to an email account on the County website that will be created expressly for this purpose, or directly to the Towns/Villages/City. The Stakeholder Outreach information can be found in Appendix D.

In the past, we found that the review and update process was not as efficient as it needed to be. In the future, a more stringent time table will be kept, and a more vigorous line of communication between the Planning Committee members and the municipalities will help to ensure that the Mitigation Action Items are being reviewed and considered during project design and implementation. An annual review of the past year's work, as discussed in the Flooding Profile Section, for the purpose of assisting municipalities with CRS credits, will create much of the 2017 Update.

The Planning Committee will review the Chemung County Hazard Mitigation Plan on an annual schedule, consulting with each municipality in January of each year for the CRS annual updates. The Planning Committee, along with representatives from municipalities, will meet to review and discuss the progress and comments made for the year. At this time, action items will be reviewed, and any changes necessitated by economic, environmental or other factors will be made. Review criteria included whether action items have been completed, if conditions have changed and warrant a change in the action items, if funding sources warrant a change in the action items, or if resources have been added or lost and warrant a change.

June 2015 will mark the beginning of the next five year update process, which again will be less arduous due to the annual updates. This will ensure that the Hazard Mitigation Plan will not expire during the update process, and will keep Chemung County and its municipalities in a proactive, rather than reactive posture.

The Chemung County Emergency Planner will host a meeting for all municipal leaders in June 2016 for a final municipal approval. The plan as a whole will have a final review, highlighting updates or changes that have been made to the plan. The public will have the opportunity to express opinions and comments when the plan is posted on the County internet page after the June 2016 meeting for 30 days. The Plan will then be sent for approval to FEMA August 1, 2016.

The Chemung County Hazard Mitigation Plan will be implemented through inclusion in the County's Comprehensive Emergency Management Plan as "Section I", and through each municipal response plan. Chemung County and all its municipalities will ensure that Comprehensive Emergency Management Plans will include the Hazard Mitigation Plan as an annex, appendix, chapter, or otherwise referenced document.

When appropriate, action items will be met through inclusion in Capital Improvement and Economic Development Plans, Master Plans, Zoning and Land Use plans and ordinances, and other appropriate planning and regulatory actions.

The county will establish provisions in the protocol for county capital development or improvement that will require review of current and future capital improvement projects for hazard vulnerability and incorporation of hazard resistant construction standards into the design, engineering, and location of the project. In particular, the provisions will encourage consideration for the incorporation of hazard resistant design and citing standards that exceed local ordinances especially for essential infrastructure & critical facilities such as county government buildings, waste & drinking water treatment plants and emergency operations facilities.

The county will encourage all municipalities to develop protocol to ensure that prior to land-use or zoning designation or changes, the hazard mitigation plan and other appropriate hazard analysis and vulnerability material will be reviewed to ensure consistency and compatible land use. Similarly, prior to any development permitting and during the process to review and approve site plans, municipalities will ensure review and consider the hazard mitigation and other appropriate hazard analysis and vulnerability assessment material to ensure consistency and prevent incompatible land use.

X. Appendix Items

Appendix A

A-1, A-2: Attendance Records 2012 Update: Attendance originals on file in Chemung County EMO
A-3: Stakeholder Survey given to all municipalities and stakeholder agencies

1. RAMS Meeting, 10/26/2010 7:00PM – 9:00 Horseheads Town Hall

Mayor J. Manwaring, Village of Millport
Mayor Don Zeigler, Village of Horseheads
Supv. Michael Edwards, Town of Horseheads
Supv. David Sheen, Town of Southport
Atty John Mustico, Town of Horseheads Attorney
Supv. Teresa Dean, Town of Big Flats
Supv. Bill Winkky, Town of Veteran
Supv. Vern Robinson, Town of Ashland
Supv. George Richter, Town of Chemung

2. Highway Supervisor's Association, 10/28/2010 9:00am Chemung Co. Highway

Jean Cazorla, Village of Elmira Hts.
Curt Rhodes, Town of Veteran
Fred Roberts, Town of Ashland
Tim Mayer, City of Elmira
David Bachman, Town of Southport
Russell Toby, Town of Southport
Tim Grippo, Town of Van Etten
Steven Tyler, Town of Erin
Dave Ferriter, Town of Baldwin
Roger Berlew, Town of Erin
John Smith, Chemung County
Andrew Avery, Chemung County/City of Elmira
Alvin Janowski, Town of Catlin
Chris Doane, Town of Chemung

Kevin Smith, Town of Horseheads

Ron Little, Town of Chemung

Larry Wagner, Town of Big Flats

Matt Mustico, Town of Elmira/Village of Horseheads

John Webert, Chemung County

A-3

NATURAL HAZARDS MITIGATION PLANNING

Mitigation: to correct or improve a structure or property, or to prohibit specific actions, in order to prevent future damage during a natural disaster.

Examples: ● Increase the size of a culvert or pipe to prevent blockage or erosion in a severe storm. ● Bury utilities to prevent damage from falling trees or limbs in an ice storm or wind storm. ● Creating local laws that prohibit dumping of yard waste into streams or creeks. ●Local laws or regulations that prohibit development in a floodplain.

The Chemung County All Hazard Mitigation Plan: This plan identifies natural hazards that effect municipalities within the County borders, as determined by a hazard analysis program the County conducted with each municipality in 2004. The top natural hazards include flooding, severe summer storm and severe winter storm. These hazards are discussed in-depth in the Mitigation Plan, relating the history of the hazard within the county, what mitigation efforts have been taken by the County and the municipalities to help reduce the likelihood of damage during such events, and then the plan contains our goals and an action plan for future mitigation efforts.

This plan is required for any municipality that wants to apply for any type of Federal Mitigation Grant funding. All municipalities received a copy of, and passed resolutions approving and adopting, the County All Hazard Mitigation Plan in 2006. The plan requires updating every five years.

The County began the process of completing the mandatory five year update to this plan in 2010. In order for every municipality within the County to remain included in the plan, and to maintain eligibility for Mitigation Grant funding, the municipalities MUST participate in the planning and update process. Some of the Town Supervisors and Highway Supervisors have reviewed the original plan, and have given feedback regarding the mitigation actions that have been accomplished over the past five years, and some have shared new action items to be included in the updated version of the plan.

According to initial FEMA review comments, “Every municipality MUST show participation in the planning process, and MUST have at least one action item specific to their municipality included in the plan.” Mark Watts, Janet Thigpen, and the Storm Water Coalition staff have all been working with me to provide information and help update the plan. However, their involvement is not considered

"participation by each municipality", and they can't provide, "an action item specific to each municipality".

Following is a list of questions that can be used by each municipality to facilitate discussion at the local level. A suggestion would be to have a meeting of the elected officials of the municipality, along with the municipal department heads, so that a wide range of knowledge and opinions can be offered. Discuss and answer all questions that pertain to your municipality, **writing your answers into this electronic version**. Each municipality, using this guidance tool, should then be able to **identify at least two or three Mitigation Action Items that they would like to be included in the County Mitigation Plan Update.**

Mitigation Action Items: Some hints/direction on writing Mitigation Action Items- This is directly from our FEMA reviewer:

- Are the actions specific in nature? Actions not "objectives" or "goals".
- Does each jurisdiction have something specific that they are doing? (Not boilerplate, but actually specific to the community – land acquisition on Main Street or stormwater upgrades on Smith Street); For the county-led activities, we want to know what/if the local jurisdictions are doing something/contributing/actively involved in some fashion).
- Do the actions address the hazards identified in the plan? (If there are new hazards, we will need to include the hazard in the assessment secion)
- The actions can't be emergency response or preparedness actions. We don't really give "credit" for these types of actions since we're looking for mitigation actions that would hopefully reduce or eliminate long term risk, not just make the response better. The exception is generators which we give partial credit for, but we still want to see more substantial actions identified.

The electronic version of this survey, along with your written Action Items, should be returned via e-mail to Kristin Card, **Chemung County Emergency Planner, by Friday, Sept 2, 2011.** kcard@co.chemung.ny.us

STAKEHOLDER SURVEY QUESTIONS

Recent Storms

• Did your municipality suffer any damage during the 2011 spring storms?
• Did your municipality suffer damage or have to respond to any severe weather incidents in the past five years? (i.e. – clear more than a usual amount of trees and debris; close roads or restrict access to an area due to damage, high water, extreme ice and snow, impassible roads, etc; roads, culverts, pipes washed out, overtopped, undercut, etc.; power outages that lasted more than a day)

- Did any of these severe weather events or localized emergencies help identify a new or existing problem or issue that needs to be addressed? (i.e.- discarded yard waste that clogged pipes, sewers, etc; water runoff issues; erosion issues or bank failures) Do you have a plan or any ideas about how to address these issues? (i.e. local law or ordinance, retention pond or wetland construction, paving dirt roads, enlarging culverts or pipes, armoring banks)
- Did any of these events leave damaged areas that still need repairs, and/or caused damage that **will not** be covered by the May 2011Disaster Declaration 1993-NY.

Land Use Planning

- Does the municipal future land-use map clearly identify natural hazard areas?
- Do the municipal land-use policies discourage development or redevelopment within natural hazard areas?
- Does the municipal plan provide adequate space for expected future growth in areas located outside natural hazard areas?

Zoning Ordinance

- Does the zoning ordinance conform to the municipal comprehensive plan in terms of discouraging development or redevelopment within natural hazard areas?
- Does the ordinance contain natural hazard overlay zones that set conditions for land use within such zones?
- Do rezoning procedures recognize natural hazard areas as limits on zoning changes that allow greater intensity or density of use?
- Does the ordinance prohibit development within, or filling of, wetlands, floodways, and floodplains?

Capital Improvement and Infrastructure Policies

- Does the capital improvement program limit expenditures on projects that would encourage development in areas vulnerable to natural hazards?
- Do infrastructure policies limit extension of existing facilities and services that would encourage development in areas vulnerable to natural hazards?
- Does the capital improvement program provide funding for hazard mitigation projects identified in the County Mitigation Plan?

Environmental Management

- Are environmental systems that protect development from hazards identified and mapped?
- Do environmental policies maintain and restore protective ecosystems?
- Do environmental policies provide incentives to development that is located outside protective ecosystems?
- Does your municipality have a local law or ordinance, or otherwise regulate: timbering activities; yard waste/debris dumping; activities in or around creeks, streams, river or ponds; open burning?

Public Safety

- Are the goals and policies of the municipal comprehensive plan related to those of the County Hazard Mitigation Plan?
- Is safety explicitly included in the plan's growth and development policies?
- Does the monitoring and implementation section of the plan cover safe growth objectives?

Subdivision Regulations

- Does the municipality have subdivision regulations?
- Do the subdivision regulations restrict the subdivision of land within or adjacent to natural hazard areas?
- Do the regulations provide for conservation subdivisions or cluster subdivisions in order to conserve environmental resources?
- Do the regulations allow density transfers where hazard areas exist?

Other

- Do small area or corridor plans recognize the need to avoid or mitigate natural hazards?
- Does the building code contain provisions to strengthen or elevate construction to withstand hazard forces?
- Do economic development or redevelopment strategies include provisions for mitigating natural hazards?
- Does the municipality have a transportation plan, and does it limit access to hazard areas? Does it guide growth to safe locations?
- Did your municipality complete any mitigation projects in the past five years? Please include details of the project, the issue it addressed, and if the project has been "tested" by recent events. Did it help mitigate the problem as intended?
- Does your municipality participate in the Water Quality or Stormwater Coalition meetings? Are you an MS4 municipality?
- What has your municipality identified as risks, hazards, issues that are specific to your community, and have you taken actions to reduce these hazards or risks? Are you planning to take any actions in the future? What, if anything, does your municipality need to assist in taking these actions?

Appendix B: Weather Summaries

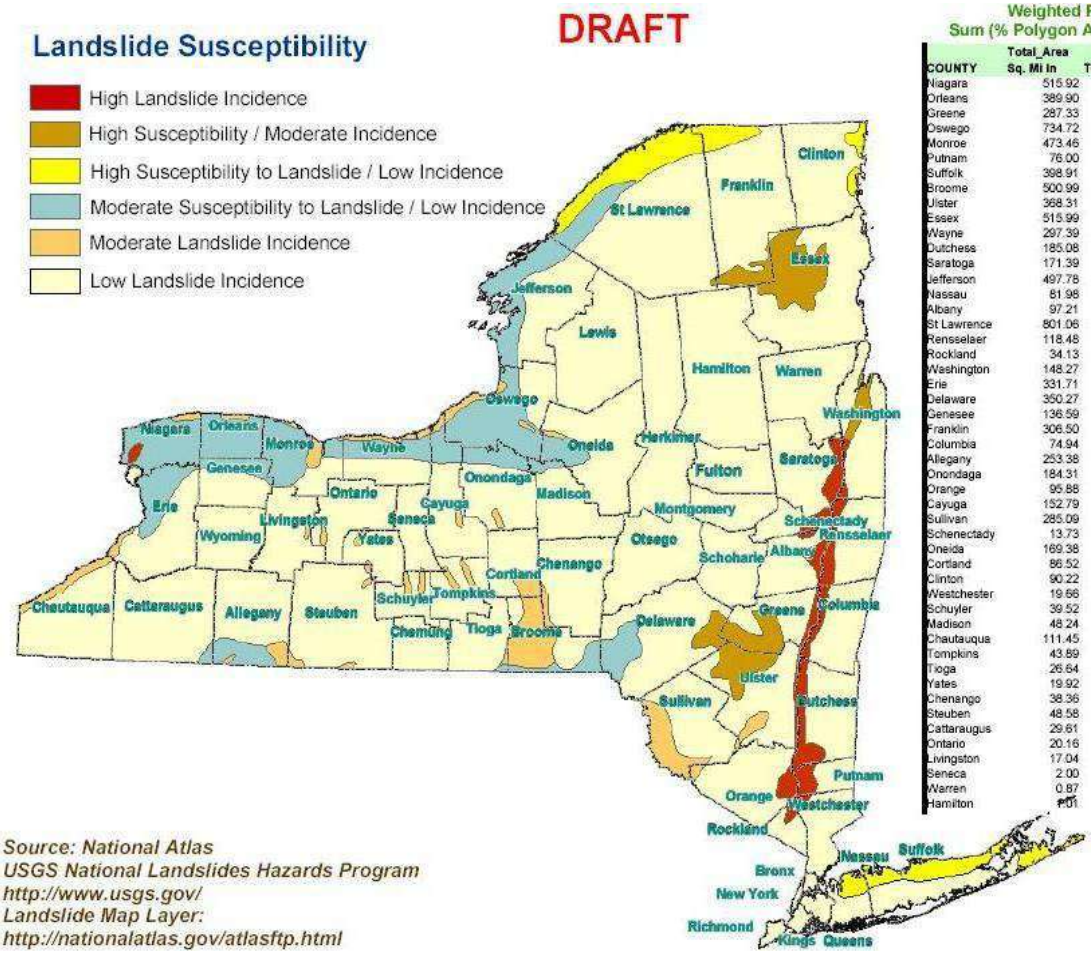
See a listing of NCDC Weather Summaries at the links below:

http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms

-or-

ChemungCo_NCDC_1.2006_9.2011.pdf

Appendix C: NYS Landslide Susceptibility Map



Source: National Atlas
USGS National Landslides Hazards Program
http://www.usgs.gov/
Landslide Map Layer:
http://nationalatlas.gov/atlasftp.html

Weighted Rank =
Sum (% Polygon Area x LSRank)

COUNTY	Total_Area Sq. Mi In	TotAreaIn	Weighted Rank
Niagara	515.92	97.80%	3.04
Orleans	389.90	99.12%	2.93
Greene	287.33	43.70%	2.27
Oswego	734.72	72.44%	2.10
Monroe	473.46	71.38%	2.05
Putnam	76.00	30.90%	1.85
Suffolk	398.91	43.36%	1.73
Broome	500.99	70.05%	1.60
Ulster	368.31	31.74%	1.49
Essex	515.99	28.16%	1.41
Wayne	297.39	49.05%	1.37
Dutchess	185.08	22.45%	1.35
Saratoga	171.39	20.32%	1.22
Jefferson	497.78	38.67%	1.16
Nassau	81.98	28.52%	1.14
Albany	97.21	18.24%	1.09
St Lawrence	801.06	29.03%	1.07
Rensselaer	118.48	17.81%	1.07
Rockland	34.13	17.12%	1.03
Washington	148.27	17.62%	0.92
Erie	331.71	31.64%	0.92
Delaware	350.27	23.88%	0.87
Genesee	136.59	27.56%	0.83
Franklin	306.50	18.09%	0.81
Columbia	74.94	11.57%	0.69
Allegany	253.38	24.48%	0.67
Onondaga	184.31	22.90%	0.66
Orange	95.88	11.45%	0.58
Cayuga	152.79	20.81%	0.58
Sullivan	285.09	28.62%	0.57
Schenectady	13.73	6.55%	0.39
Oneida	169.38	13.48%	0.39
Cortland	86.52	17.27%	0.35
Clinton	90.22	8.56%	0.34
Westchester	19.66	4.15%	0.25
Schuyler	39.52	11.54%	0.23
Madison	48.24	7.30%	0.22
Chautauqua	111.45	10.25%	0.21
Tompkins	43.89	8.93%	0.18
Tioga	26.64	5.10%	0.13
Yates	19.92	5.30%	0.11
Chenango	38.36	4.27%	0.09
Steuben	48.58	3.46%	0.07
Cattaraugus	29.61	2.24%	0.07
Ontario	20.16	3.04%	0.06
Livingston	17.04	2.66%	0.06
Seneca	2.00	0.51%	0.01
Warren	0.87	0.09%	0.01
Hamilton	1.01	0.06%	0.00

Appendix D- STAKEHOLDER OUTREACH:

E-Mail list of Non-Profit Stakeholders; Lake District Sign-In Sheet; Star Gazette Ad

School Districts:

Elmira City School District	jhochreiter@elmiracityschools.com
Horseheads School District	rmarion@horseheadsdistrict.com
Elmira Heights School District	mbfiore@gstboces.org
Twin Tiers Christian Academy	cshaw@twintierschristianacademy.org
Horseheads Christian School	jkane@horseheadschristian.org
Elmira Christian Academy	dcook@elmirachristianacademy.com
Chemung Valley Montessori School	headofschool@cvms.org
Notre Dame	srwalter@notredamehighschool.com
Holy Family	davidquinn@dor.org loriebrink@dor.org francisdevine@dor.org
St .Mary Our Mother	mzinn@bro.org
BOCES	hgraefe@gstboces.org

Hospitals:

Arnot Ogden/St. Joseph's	acoooper@aomc.org
Chemung County Library District	shawr@stl.org
Chamber of Commerce	info@chemungchamber.org
Southern Tier Economic Growth	mkrocci@steg.com
Elmira Downtown Development	jherrick@elmiradowntown.com

Lake District Emergency Managers Association

Host Agency NWS Binghamton

Date: 4/18/12

Lunch	Name	Agency Representing	Time In	Time Out	Signature
✓	Brian P. Dahl	Cayuga	1015		
	Niel Rivenburgh	Cayuga			
✓	Michael Smith	Chemung	1000		
✓	Kristin Card	Chemung	10:00		
	Jeff Harloff	Ontario			
	Debra Trickey	Ontario			
	Charles McCann	Seneca	1015		
	Melissa L. Taylor	Seneca	1015		
✓	William Kennedy	Schuyler	9:40		
✓	Brian Gardner	Schuyler	9:40		
	Michael Sprague	Steuben			
	Timothy Marshal	Steuben	9:50		
NO	Dick LeCount	Tioga	10:20		
	Michael McDonald	Tioga			
	Lee Shurtleff	Tompkins			
✓	Jessica Verfuss	Tompkins	930		
✓	Beth Harrington	Tompkins	0930		
	George Bastedo	Wayne			
	John O'Toole	Wayne			
	Brian Winslow	Yates	945		
	Diane Caves	Yates	945		
	NY SEMO Region 4	NY SEMO Region 4			
	Tom McCartney	NY SEMO Region 4	940		
	Ronald Raymond	NY SEMO Region 4			
	NY SEMO Region 5	NY SEMO Region 5			
	Doug Winners	NY SEMO Region 5			
	Bill Correa	NY SEMO Region 5			
		NY SEMO Region 5			
	Michael O'Donnell	NYSDOH	0940		
	Beau Alexander	NYSDOH			
	Patrick M. Byrne	NYSDOH			
		NYSDOH			

Lake District Emergency Managers Association

Lunch	Name	Agency Representing	Time In	Time Out	Signature
	Mark Kreyer	NYSDHLS			
		NYSDHLS			
		NYSDHLS			
	David Nicosia	National Weather Service	1001		DN
	Judy Levan	National Weather Service			
		National Weather Service			
	Sgt James McCormick	NYSP			
	Sgt Brian Weidman	NYSP			
		NYSP			
	Chuck Morse	OFPC	1000		
		OFPC			
		OFPC			
	Lynn Ann DeGraff	NYSDOT	945		
	Christine Klein	NYSDOT	945		
	Brian	NYSDOT			
		Red Cross			
		Red Cross			
	Robert Parker	NYS PESH			
	Robert Henrich	NYS Citizen Preparedness			

Lunch	Guest	Agency Representing	Time In	Time Out	Signature

PUBLIC NOTICE: The final draft of the Chemung County Natural Hazards Mitigation Plan has been posted on the Chemung County, NY website, www.chemungcounty.com . Comments on the plan will be accepted for 30 days, via the submit comment box on the website.