Town and Village of Horseheads

Hazard Mitigation Action Plan

October 2004

Prepared with assistance from:

Southern Tier Central Regional Planning and Development Board
145 Village Square
Painted Post, NY 14870

This hazard mitigation plan encompasses the Town of Horseheads and Village of Horseheads in Chemung County, New York. It excludes the portion of the Town of Horseheads that is within the incorporated limits of the Village of Elmira Heights. Development of this plan was funded, in part, by a Pre-Disaster Mitigation program grant from the New York State Emergency Management Office and Federal Emergency Management Agency.

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REVISION HISTORY

Revision Date	Pages Added or Replaced

SECTION 1 – EXECUTIVE SUMMARY

The *Town and Village of Horseheads Hazard Mitigation Action Plan* includes resources and information to assist public and private sectors in Horseheads to reduce the losses from future hazard events. This plan is not a manual of what to do if a disaster occurs. Instead, it concentrates on actions that can be implemented prior to disaster events in order to reduce the damage to property and potential loss of life. The plan includes an assessment of the community's risks and vulnerabilities, a strategy for minimizing those risks (goals and objectives), and an action plan that will be implemented to achieve the objectives.

This plan is intended to fulfill the planning requirements for state and federal assistance programs. It will enable the Town and Village of Horseheads to apply for hazard mitigation grants that will assist with implementation of the proposed projects identified in this plan.

BACKGROUND

The Town and Village of Horseheads are home to a mix of residential, commercial, and industrial development. Both the Town and Village have been proactive in mitigating flood hazards throughout the community. Both municipalities are actively involved in promoting transportation safety related to the Horseheads Bypass Project and access management along other transportation corridors.

PLANNING PROCESS

The *Town and Village of Horseheads Hazard Mitigation Action Plan* was developed as part of an ongoing hazard mitigation planning process in the Town of Horseheads, Village of Horseheads, and Chemung County. In 1999, a *Chemung County Hazard Analysis Report* was prepared based on the analysis of natural and man-made hazards by a group of local officials using the HAZNY (Hazards New York) computer program. In 1999, the Town and Village completed a *Flood Mitigation Action Plan, Town and Village of Horseheads*. The flood mitigation plan was updated and revised in 2000. The present plan incorporates and expands on the information assembled during these and other previous planning efforts. This plan documents the Town of Horseheads and Village of Horseheads programs for mitigating the risks from natural and man-made hazards.

A series of meetings were held to gather information and recommendations for this hazard mitigation plan. Participants in this planning process included representatives from the Town Board, Village Manager, Town Highway Department, Village Public Works Department, Town and Village Building Department, Town and Country Fire Department, Horseheads Fire Department, Horseheads Police Department, New York State Department of Environmental Conservation, and Chemung County Emergency Management Office. Staff support was

provided by Flood Mitigation Specialist from Southern Tier Central Regional Planning and Development Board. In addition to the information and recommendations assembled at the planning meetings, numerous agencies, organizations, and members of the public were contacted for additional input.

RISK ASSESSMENT

The recommendations in the *Town and Village of Horseheads Hazard Mitigation Plan* are based on an assessment of the community's vulnerability to each of 31 hazards. Each potential hazard was evaluated and ranked based on the scope (area of impact and potential for a cascade effect), frequency, impact, onset (warning time), and duration of a hazard event. This plan focuses on the fifteen hazards given a high priority or moderately high priority ranking. These hazards (in order of priority) are:

High Priority Hazards:	Hazardous material released in transit
Moderately High Priority Hazards:	Flood/flash flood
	Explosion
	Petroleum spill
	Severe storm
	Terrorism
	Hazardous material released from a fixed site
	Extreme temperatures
	Ice storm
	Aging infrastructure
	Severe winter storm
	Transportation accident
	Tornado
	Utility failure
	Fire

MITIGATION STRATEGY

The overall purpose of the *Town and Village of Horseheads Hazard Mitigation Action Plan* is to protect life and property from natural and human-caused hazards.

The proposed mitigation strategy is represented by the following long-range goals, which encompass the highest ranked hazards for the Town and Village of Horseheads. The *Town and Village of Horseheads Hazard Mitigation Action Plan* identifies specific objectives for achieving each goal.

Multi-Hazard Mitigation Goals

- Raise public awareness about hazards and how to respond.
- Provide emergency services in a timely and effective manner.
- Maintain the viability of all critical facilities and operations.
- Maintain political support for hazard mitigation and emergency response.
- Establish and maintain partnerships between public and private sectors.

Hazardous Material Goals

- Provide the public with information about how to respond appropriately to a hazardous material incident.
- Ensure quick and effective response by emergency response personnel to a hazardous material release or explosion.
- Design and locate new development in such a manner as to minimize risks associated with the transport and use of hazardous materials.
- Utilize equipment, processes, and procedures that minimize the risk of explosion or exposure to hazardous substances at facilities that store and/or use hazardous materials.

Transportation Safety Goals

- Maintain and upgrade roads in a manner that promotes transportation safety.
- Promote transportation safety.
- Design and locate new development projects to promote transportation safety.
- Ensure quick and effective response by emergency response personnel to a major transportation accident.

Flood/Flash Flood Goals

- Raise public awareness about flood hazards, flood safety, and flood damage protection measures.
- Protect new development from flooding hazards.
- Protect new and existing development from streambank erosion.
- Ensure that runoff from new construction and land use changes does not contribute to increased flood risks.
- Maintain streams, drainage ways, and drainage structures to minimize the potential for obstruction of flow.
- Mitigate flood risks for existing development.
- Provide timely and reliable warning of floods and flash floods.

Severe Weather Goals

- Maintain trees appropriately in areas where broken branches can severely impact

infrastructure and other development.
- Bury utility cables so they are not susceptible to damage by wind and ice.
- Raise public awareness about severe weather conditions and how to respond.
- Require that buildings be designed to withstand high wind and heavy snow.
- Reopen transportation routes as quickly as possible following a severe weather event.

Terrorism and School Violence Goals

- Provide the public with information about potential terrorist threats and how to respond.
- Address terrorist threats in the operating policies of facilities that may be potential terrorist targets.
- Ensure a quick and effective response to any emergency at a school.
- Coordinate with county, state, federal, and international task forces and agencies that are preparing for or responding to terrorist threats.

Aging Infrastructure Goals

- Conduct periodically inspection and maintenance of infrastructure.
- Upgrade infrastructure.

Utility Failure Goals

- Maintain essential services and emergency operations during a utility failure.
- Restore utility service as quickly as possible following an outage.
- Provide the public with information about what to do during an extended power outage.

Fire/Wildfire Goals

- Raise public awareness about fire safety.
- Ensure quick and effective response by fire departments to fires and wildfires.
- Construct new development in such a manner as to reduce the susceptibility to fire damage.

ACTION PLAN

The *Town and Village of Horseheads Hazard Mitigation Action Plan* recommends implementation of the following high priority actions.

Measures To Be Implemented through Existing Programs

Some of the mitigation objectives for the Horseheads community are already being implemented. Others can be incorporated into existing municipal operations and ongoing local programs. The following recommended activities utilize existing or anticipated local resources to mitigate hazards.

Multi-Hazard Mitigation

- Disseminate hazard information at municipal offices
- Include hazard information in *Community Policing* newsletter articles
- Disseminate hazard information on the County website
- Support education efforts
- Encourage greater utilization of NOAA weather radios
- Review and update Emergency Plan
- Support Environmental Emergency Services, Inc.
- Periodically review and revise Comprehensive Plan and land use regulations
- Provide hazard mitigation training for Planning Board members

Hazardous Materials

- Implement radon testing and education program
- Provide hazardous material awareness training for Highway Department

Transportation Safety

- Maintain communication with the NYS Department of Transportation
- Provide municipal personnel with defensive driving training
- Update Village code for vehicles and traffic

Flood/Flash Flood

- Utilize direct mailing to owners of flood-prone property
- Expand network of volunteer rain gauge readers
- Install stream gauges in Newtown Creek
- Inspect and maintain drainage ways
- Participate in joint maintenance program for Old Chemung Canal
- Request updated Flood Insurance Rate Maps
- Encourage establishment and maintenance of vegetated riparian buffers
- Assist property owners with floodproofing measures
- Upgrade existing drainage structures
- Improve Community Rating System classification

Severe Weather

- Provide brush pickup and/or drop-off services

Terrorism and School Violence

- Assess the vulnerability of the Village water system to a terrorist attack

Proposed Projects for Which Additional Resources Are Needed

Additional funding is needed in order to fulfill the proposed hazard mitigation goals for Horseheads. The high priority mitigation projects that the Town and Village propose to implement if funding can be secured include the following.

Multi-Hazard Mitigation

- Address municipal staffing needs
- Disseminate hazard information through municipal websites
- Develop community emergency training program
- Obtain and equip a multi hazard support trailer for Town and Country Fire Department
- Provide emergency response training for municipal officials, first responders, and school administrators
- Provide NOAA weather radios to public facilities

Hazardous Materials

- Provide financial assistance for radon mitigation
- Provide radon mitigation training

Flood/Flash Flood

- Develop the public outreach and public involvement components of the Town and Village stormwater management programs
- Develop and implement stormwater management programs
- Purchase street sweeper for the Village of Horsheheads
- Purchase street sweeper for the Town of Horseheads
- Collect LIDAR topographic data
- Implement stream stabilization projects
- Replace North Main Street retaining wall
- Repair culvert under Hanover Square

Groundwater Contamination

- Maintain Chemung County water testing program

PLAN MAINTENANCE

The *Town and Village of Horseheads Hazard Mitigation Action Plan* is an active document that will be periodically reviewed, updated, and revised. Municipal officials, emergency response personnel, agency staff, and the public will be involved in this ongoing planning process.

SECTION 2 – BACKGROUND

The Town of Horseheads is located north of the City of Elmira in Chemung County, NY. It is the most populous town in the county, with 19,561 residents (2000 census). The Village of Horseheads (population 6,452) is located within the Town of Horseheads on the west side of Newtown Creek. Part of the Village of Elmira Heights is also located within the Town of Horseheads (including 3,138 Village residents), but is not included in this plan. The population of the Town of Horseheads has decreased 1.83% since 1990 (1990 census population 19,926). The population of the Village of Horseheads has decreased 5.15% since 1990 (1990-census population 6,802). Of the Town of Horseheads residents, 23.4% are children (under 18 years old) and 19.7% are elderly (65 years old and over). Of the Village residents, 22.6% residents are children (under 18 years old) and 21% are elderly (65 years old and over).

LAND USE AND ASSETS

The land area of the Town is 35.9 square miles and the Village is 3.9 square miles. The distribution of land uses (based on property tax classifications) is shown on the Land Use maps and tables in Attachment A. The community contains a mix of residential, industrial, and commercial development. It is the second largest residential area in Chemung County (after the City of Elmira). There are 8,350 housing units in the Town of Horseheads, of which 3,007 are in the Village of Horseheads (2000 census). The Town and Village are also home to numerous industrial facilities (including the Chemung County Commerce Center, Latta Brook Industrial Park, and Horseheads Industrial Park) and several retail shopping areas. Urbanized development is concentrated in and near the Village of Horseheads and south of the Village (toward the Village of Elmira Heights). The Town also contains rural areas with scattered residential development and agriculture.

The Town and Village are traversed by State Route 17, which is a major east-west transportation corridor that is in the process of being upgraded to Interstate Highway standards. Route 17 currently has at-grade intersections and traffic lights in the Village of Horseheads. Construction of a Horseheads Bypass began in 2003. This project will ease traffic congestion in a heavily traveled commercial area and greatly improve safety.

The Town of Horseheads has an equalized assessed value of over $479 million, of which $375 million is in buildings and the remainder in land. In the Village of Horseheads, the equalized assessed value is more than $324 million, of which $274 million is in buildings and the remainder in land. The distribution of these assets over the various property classes is shown in the Town and Village Assets tables in Attachment A. Approximately 68% of the assessed value within the Town is residential and 13% is commercial. The remainder (in order of total value) is community services, industrial, vacant land, public services, recreation/entertainment, and agriculture. In the Village of Horseheads, 49% of the assessed value is industrial, 22% is commercial, and 17% is community services. The remainder (in order of total value) is

industrial, public services, recreation/entertainment, vacant land, and forested.

Information from the property tax records about the age of residential construction is provided in the Age of Residential Structures tables in Attachment A. In the Village, about 44% of the residential structures were built in the 1950's; 31% were built before 1950 (including 168 structures built before 1900); and 25% were built since 1960. Development in the Town was more recent, with 46% of residential structures built in the 1950's and 60's, 22% before 1950 (including 93 structures built before 1900); and 33% since 1970.

CRITICAL FACILITIES

For the purposes of this plan, critical facilities are defined as follows:

*A **critical facility** is any facility that is an integral part of emergency response operations or one that requires special emergency response due to the potential at the site for triggering an additional hazardous incident.*

A table listing the Critical Facilities and Operations Serving the Town and Village of Horseheads is included in Attachment A. The locations of some of these facilities are shown on the maps of Critical Facilities and Transportation Infrastructure in Attachment A. Additional areas that are vulnerable to hazards are shown on the Vulnerable Sites map and the Flood Hazards and Problems map in Attachment A.

DEVELOPMENT TRENDS

Horseheads has experienced increased residential development in recent years, despite a declining population. Most of this development has occurred north and west of the Village in the Town of Horseheads. If the current trend of residential expansion into rural areas surrounding Elmira continues, development pressure is expected to spread to the hill areas in other parts of the Town.

The proposed designation of State Route 17 as an interstate highway (I-86) is expected to stimulate commercial and/or industrial development near the highway corridor and along Routes 13 and 14. An access management plan has been developed for the Route 13 corridor to address traffic safety issues associated with the anticipated development along this highway. It is also estimated that the interstate designation will lead to three times more truck traffic on State Route 13 and five times more on State Route 14.

HAZARD MITIGATION EFFORTS

The *Town and Village of Horseheads Hazard Mitigation Action Plan* is part of an ongoing effort

on behalf of the Town and Village to be proactive in mitigating the consequences of natural hazards, particularly flooding. This plan expands on the *Flood Mitigation Action Plan, Town and Village of Horseheads* that was prepared in 1998-99 and updated in 2000.

National Flood Insurance Program

The Town and Village of Horseheads both joined the Regular Phase of the National Flood Insurance Program in 1986. Since that time, development within the areas designated as the 100-year floodplain (on Flood Insurance Rate Maps) has been regulated by local ordinances. These regulations specify that new development within the designated floodplain must comply with elevation requirements and construction standards that protect structures from the 100-year flood event. The floodplain development standards also protect neighboring properties from increased flood damage that might result from new development. The Town and Village Code Enforcement Officer has received training in implementation of these floodplain standards.

Flood insurance can be purchased for any building in the Town or Village. On February 28, 2003, there were 66 flood insurance policies in the Town of Horseheads (excluding the villages) and 27 policies in the Village of Horseheads. The value of the property covered by these policies is $4.9 million in the Town and $1.9 million in the Village. Flood insurance claims since 1978 have totaled $27,508 (10 claims) in the Town of Horseheads and $28,620 (5 claims) in the Village of Horseheads. This represents only a fraction of the total flood damages because many property owners do not carry flood insurance and many damages (particularly to basements and basement contents) are not covered. One property in the Town of Horseheads is classified by the National Flood Insurance Program as a "repetitive loss property," indicating that it has experienced two or more flood insurance claims within any ten year period since 1978. The flooding problem at this site is described in this Plan under Problem #34 in Attachment D and is addressed through the ongoing joint maintenance program for the Old Chemung Canal.

In 1991, both the Town and Village of Horseheads began participation in the Community Rating System of the National Flood Insurance Program. Participation in this program enables property owners to purchase flood insurance at reduced rates as a result of activities that reduce the flood risks within the municipality. The Town and Village presently qualify for a 5% reduction in flood insurance premiums.

Flood Mitigation

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), through which four dams were constructed in the Newtown Creek Watershed upstream of Horseheads. Sediment and debris have been repeatedly removed 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. Many erosion sites have been rehabilitated with rock riprap. Local regulations require that developers and timber harvesters address stormwater management and erosion control. The Town and Village are both in the process of developing comprehensive stormwater management programs and have obtained permit coverage for the Municipal Separate Stormwater Sewer System (MS4) within the Elmira urbanized area. These corrective and preventive measures are credited with reducing the severity of damages from recent storm events.

Transportation Safety

The Town and Village have both interacted closely with the NYS Department of Transportation (DOT) throughout the design phase of the Route 17 Horseheads Bypass project. Emergency management issues related to the project design were discussed at a meeting of the County, Town, Village, DOT, and design engineer consultants. A number of hazards were discussed in detail, such as drainage, hazardous material spills, location of fire hydrants, evacuation routes, etc.

In anticipation of the increased development pressure expected from the designation of Route 17 as I-86, a steering committee of local representatives prepared an access management plan for the Route 13 corridor. This committee worked with the NYS Department of Transportation and the Elmira-Chemung Transportation Council to develop a plan that protects the efficiency and safety of this transportation facility, while allowing development to proceed consistent with local desires. Other corridors, such as State Route 14, will also be examined with a view toward using access management techniques to improve overall mobility in the Town and Village.

Water Supply Protection

Both the Village of Horseheads Water System and the Elmira Water Board have conducted Vulnerability Assessments on their systems and developed Contingency Plans. Any identified deficiencies are being addressed.

All-Hazard Mitigation and Response

The Town of Horseheads makes an annual financial contribution to Environmental Emergency Services, Inc. This is a two-county not-for-profit organization that operates the Chemung Basin Flood Warning Service and a Chemical Hazard Information Team. The Flood Warning Service operates a network of climate stations, precipitation gauges, and river gauges. The Chemical Hazard Information Team provides chemical and safety information and guidance to local emergency responders in the event of hazardous material incidents.

In January 2003, the Town and Village of Horseheads adopted the new New York Uniform Fire

Prevention and Building Code, which increases the safety standards for new construction.

Local government is the lead decision-maker in times of emergency. The Town of Horseheads has an *Emergency Management Plan*; the Village of Horseheads has an *Emergency Response Plan*. These documents outline the procedures and cite the authority to guide action in the event of a major emergency or disaster. These emergency response plans are reviewed and updated periodically.

SECTION 3 – PLANNING PROCESS

The *Town and Village of Horseheads Hazard Mitigation Action Plan* was developed as part of an ongoing hazard mitigation planning process in Horseheads and Chemung County. In 1998, the Town and Village established a joint Flood Mitigation Planning Committee to prepare the *Flood Mitigation Action Plan, Town and Village of Horseheads*. The flood mitigation plan was finalized in September 1999 and updated in September 2000. In 2002 and 2003, additional meetings were held to update the flood mitigation information and expand the plan to incorporate other hazards. The resulting plan is now called the *Town and Village of Horseheads Hazard Mitigation Action Plan*.

The *Town and Village of Horseheads Hazard Mitigation Action Plan* documents the community's approach to mitigating the adverse impacts of natural and human-caused hazards. It is not a manual of what to do if a disaster occurs. Instead, it concentrates on actions that can be implemented prior to disaster events in order to reduce the damage to property and potential loss of life. The plan includes an assessment of the community's risks and vulnerabilities, the strategy for minimizing those risks (goals and objectives), and the action plan that will be implemented to achieve the objectives. The process of developing this plan enabled the Town and Village to identify and implement policies, programs, and projects that will reduce the potential losses from future disasters. The *Town and Village of Horseheads Hazard Mitigation Action Plan* is an active document that will be periodically reviewed, updated, and revised.

PLANNING MEETINGS

The Horseheads Flood Mitigation Planning Committee was formed in 1998 to develop a joint flood mitigation plan for the two municipalities. The Committee was comprised of the Deputy Town Supervisor, Village Board representative, Village Director of Public Works, Town Highway Superintendent, Town and Village Code Enforcement Officer, and Village Planning Board Chairman. Additional participation was solicited from both municipalities. However, most of those contacted about participation in the flood mitigation planning process (including many members of the public) were unable to attend meetings. Staff support for development of the *Flood Mitigation Action Plan, Town and Village of Horseheads* was provided by Flood Mitigation Specialist for Southern Tier Central Regional Planning and Development Board. The committee held the following meetings to gather information and recommendations for the flood mitigation plan:

- **6/12/98: Organizational meeting:** Introduction to the flood mitigation planning process. Identify planning committee members. Develop a strategy for coordinating with other agencies. Develop a strategy for involving the public. Identify individuals (agency staff and members of the public) who will be asked to participate.
- **6/25/98: Assess hazards and problems:** Update on outreach activities. Define the scope of the planning process. Compile flood hazard and problem information about riverine flooding

and streambank erosion along Newtown Creek and some of its tributaries.

- **7/22/98: Assess hazards and problems:** Review and revise hazard and problem information compiled from previous meeting. Compile flood hazard and problem information for the remaining flood-prone areas. Mark flood problem areas on a map.
- **8/26/98: Set flood damage reduction goals:** Review other community goals. Discuss the committee's vision of how flooding issues can be addressed and future damages prevented. Compile a list of flood damage reduction goals for the Town and Village of Horseheads.
- **10/22/98: Flood Solutions Workshop:** At a joint meeting with other Flood Mitigation Planning Committees and County and State agency personnel, review and discuss possible solutions to flooding and drainage problems. Complete a flood solutions worksheet to indicate the solutions applicable to flooding problems in the Town and Village of Horseheads. The agencies represented at this workshop included the County Emergency Management Office, County Soil and Water Conservation District, County Planning Department, County Environmental Management Council, County Legislature, Regional Planning Board, State Department of Environmental Conservation, and State Emergency Management Office.
- **12/8/98: Prepare an action plan:** Review a map of land uses in relation to flood-prone areas. Using the flood mitigation goals and the flood solutions worksheet, prepare a list of the action items needed to implement the proposed solutions. Recommend post-disaster mitigation policies and procedures. Develop a strategy for implementation, evaluation, and revision of the Plan. Recommendation for public review of the draft Plan.
- **1/20/99: Public information meeting:** Solicit public input on the draft plan.

In 2000, the *Flood Mitigation Action Plan, Town and Village of Horseheads* was distributed to volunteers, elected officials, and staff of the Town and Village of Horseheads for review and recommendations. The Flood Mitigation Planning Committee then met to review and update the plan:

- **9/7/00: Update flood mitigation plan:** Update flood hazard and problem information. Document the flood mitigation activities that were implemented after completion of the September 1999 *Flood Mitigation Action Plan.* Revise the list of flood mitigation action items to be implemented.

In November 2002, the committee reformed as the Horseheads Hazard Mitigation Planning Committee and began to update the information in the *Flood Mitigation Action Plan* and expand the plan to incorporate other hazards. Village representatives to this committee included the Village Manager, Police Chief, Director of Public Works, Fire Chief, and an elected official from the Board of Trustees. Town participants included the Town/Village Code Enforcement Officer (also a member of the Town and Country Fire Department), Building Inspector, two Town Councilpersons, Town Highway Superintendent, and the Town and Country Fire Chief. This committee participated in the following meetings:

- **11/19/02: Hazard mitigation planning workshop/organizational meeting:** Committee

representatives attended a hazard mitigation planning workshop conducted by the State Emergency Management Office, followed by a brief organizational meeting.

- **12/19/02: Risk assessment:** Review the *Chemung County Hazard Analysis Report* based on a HAZNY (Hazards New York) workshop on December 1, 1998. For each hazard, assign a tentative priority for the Town and Village of Horseheads (later revised). Compile information about historic events, the probability of future occurrences, vulnerable areas, and potential losses.
- **1/27/03: Strategy development workshop:** At a joint meeting with Hazard Mitigation Planning Committees for several municipalities, evaluate mitigation options for high priority hazards. Identify reasonable goals and objectives to mitigate the potential consequences for the following hazards: multi-hazard mitigation, hazardous material releases (hazardous material released in transit, hazardous material released from a fixed site, petroleum spill, explosion, radiological release in transit), severe weather (severe storm, severe winter storm, ice storm, tornado, extreme temperatures), transportation safety (transportation accident, hazardous material released in transit), and terrorism.
- **5/5/03: Hazard analysis:** The Chemung County Emergency Management Office facilitated a hazard analysis for the Town and Village of Horseheads using the HAZNY computer program developed by the NY State Emergency Management Office.
- **5/27/03: Prepare an action plan:** Begin to review and revise draft mitigation strategy. Begin preparation of a mitigation action plan that includes measures that will be implemented through existing programs and proposed projects for which additional resources are needed. Hazards covered include multi-hazard mitigation, flooding/flash flooding, and hazardous materials.
- **6/4/03: Complete action plan and maintenance procedures:** Review and revise the draft mitigation strategy. Complete the mitigation action plan. Hazards covered include hazardous materials, severe weather, terrorism/school violence, aging infrastructure, and transportation safety. Identify plan maintenance procedures.
- **8/20/03: Public information meeting:** Solicit public input on the draft plan.

PUBLIC INVOLVEMENT

Horseheads has a history of active citizen involvement in flooding and stormwater management issues. The Town of Horseheads, Village of Horseheads, and Village of Elmira Heights held a series of about 20 public meetings following the 1996 floods in order to obtain public input concerning flooding problems and proposed solutions. These meetings continued into 1997 and allowed routine interactions while channel maintenance and other mitigation activities were implemented. The concerns and suggestions voiced during those meetings were incorporated into this planning process. Additional public input has resulted from the repeated interactions between residents, businesses, and municipal officials concerning water management issues.

Additional public input was sought throughout the planning process. The members of the public

who were invited to attend flood mitigation planning meetings were asked to provide comments if they were unable to attend meetings. Information about flooding and other hazards was displayed at the Town and Country Fire Department open house (held each year during fire prevention week in October) with the Town/Village Code Enforcement Officer available to answer questions. A brief article apprising the public of the flood mitigation planning effort was published in the November/December 1998 issue of the Horseheads Community Policing Newsletter, which is sent to all residents in the Town and Village (included in Attachment B). A fact sheet about the all-hazard mitigation planning process was posted in the Town and Village Halls (included in Attachment B). Two press releases were issued, announcing development of the all-hazard mitigation plan.

A draft of the *Flood Mitigation Action Plan, Town and Village of Horseheads* was presented at a public information meeting on January 20, 1999. This meeting was publicized in the local newspaper (clipping in Attachment B). About 20 citizens and municipal officials attended the meeting. Presentations were made about the planning process and the proposed action items. This was followed by a discussion of flooding issues, concerns, and mitigation measures. A large-format copy of the Flood Hazards and Problems map (Attachment A) was displayed for review and discussion. Each participant was given a handout summarizing the flood mitigation planning process (included in Attachment B) and the Action Plan section of the draft document. Copies of the entire Plan were available for review. Those in attendance were supportive of the Plan and asked numerous questions. Topics discussed include the drainage impacts of a proposed development near Gardner Road, drainage from Oakhill Drive, flooding from May's Creek, maintenance of Beaver Brook, permit requirements for stream maintenance, and the procedure for amending floodplain maps. Information provided by participants was incorporated into the *Flood Mitigation Action Plan* and subsequently into this plan.

A draft of the *Town and Village of Horseheads Hazard Mitigation Action Plan* was presented at a public information meeting on August 20, 2003. This meeting was publicized in the local newspaper, notices posted in public areas (copy in Attachment B), direct mailing (to municipal officials, agency personnel, and elected officials), and by word of mouth. Each participant at the public meeting received a copy of the Executive Summary of the draft plan. The Town and Village Code Enforcement Officer and Village Superintendent of Public Works led a discussion about hazard mitigation and the draft hazard mitigation plan. Most of the discussion focussed on transportation issues associated with the Horseheads Bypass project on State Route 17 (future Interstate 86). Residents expressed concern about the increased truck traffic on State Routes 14 and 13 that is anticipated following completion of Interstate 86. Questions were raised about aging infrastructure issues, particularly the culvert under Hanover Square. In response to this public meeting, additional information provided by residents was added to the draft plan, but no major changes were requested. The meeting received local television news coverage.

Copies of the draft plan were distributed to municipal officials and were available at the Town Hall and Village Hall for review by the public. All comments received during the plan review period and at the public meeting have been evaluated and incorporated into the plan, as appropriate.

Once this plan is finalized, the Village plans to post it on their municipal website. This will provide an ongoing opportunity for public review and comment.

COORDINATION WITH AGENCIES

County, regional, and state agencies were contacted for relevant information and recommendations about the flood mitigation planning effort and the subsequent hazard mitigation planning effort. Personnel from these agencies attended planning meetings, provided information, answered questions, reviewed minutes, and reviewed draft sections of the documents. The contributions from agencies and organizations that contributed to this planning process are summarized below:

- Chemung County Emergency Management Office – attended planning committee meetings; reviewed minutes and draft text; presented information about emergency services at the Flood Solutions Workshop; met separately with the plan facilitator to provide risk assessment information and mitigation strategy recommendations; facilitated hazardous analysis workshop for the Town and Village of Horseheads; answered numerous questions
- Chemung County Soil and Water Conservation District (County Hazard Mitigation Coordinator) – provided information about channel stabilization and flood mitigation; reviewed minutes and draft text; responded to questions; presented information about natural resource protection at the Flood Solutions Workshop
- Chemung County Planning Department – reviewed minutes and draft text; met with the plan facilitator; utilized GIS data to provide population and property value information for use in the damage estimates
- Elimira-Chemung Transportation Council – met with the plan facilitator to provide information about transportation safety initiatives; provided information from the crash database for vulnerability assessment
- Chemung County Environmental Management Council – reviewed minutes and draft text; presented recommendations about public information measures at the Flood Solutions Workshop
- Chemung County Health Department – was notified of the hazard mitigation planning process; did not have relevant information
- Chemung County Water Quality Strategy Committee – received reports on the planning process
- Chemung County Public Works Department – was notified of the flood mitigation planning process and the hazard mitigation planning process; did not have relevant information
- American Red Cross – attended planning committee meeting; provided copies of brochures used for public outreach; provided estimate of sheltering expenses for use in the damage estimates; provided information about the Community Disaster Education program
- Steuben County Planning Department – presented information about land use planning at the Flood Solutions Workshop
- Steuben County Soil and Water Conservation District – presented information about stormwater management and drainage system maintenance at the Flood Solutions Workshop

- Steuben County Emergency Management Office – presented information about emergency services at the Flood Solutions Workshop
- Southern Tier Central Regional Planning and Development Board – facilitated development of both the flood mitigation plan and the all hazard mitigation plan; presented recommendations about floodplain regulations at the Flood Solutions Workshop
- Sullivan Trail Resource Conservation and Development Council – was notified of the flood mitigation planning process; did not have relevant information
- New York State Emergency Management Office – reviewed minutes and draft text; presented information about property protection measures at the Flood Solutions Workshop; conducted a Hazard Mitigation Planning Workshop; met with the plan facilitator to provide guidance with the hazard mitigation planning process; provided damage information for disasters that occurred in other parts of the state for use in preparing damage estimates
- New York State Department of Environmental Conservation, Regional Flood Control Engineer – reviewed minutes and draft text; presented information about structural flood control measures at the Flood Solutions Workshop; provided information about flooding and ice jams; responded to questions
- New York State Department of Environmental Conservation, Regional Spills Engineer – attended planning committee meetings; reviewed minutes and draft text; met with the plan facilitator to provide information about hazardous material incidents; responded to questions
- New York State Department of Transportation – was notified of hazard mitigation planning process; did not have relevant information
- National Weather Service – provided statistical information about past weather hazards; responded to questions
- Federal Emergency Management Agency – reviewed and approved *Flood Mitigation Action Plan, Town and Village of Horseheads*
- USDA Natural Resources Conservation Service – was notified of the flood mitigation planning process and hazard mitigation planning process; did not have relevant information

ADOPTION OF PLAN

This plan and each subsequent revision will be presented to the Horseheads Town Board and Horseheads Village Board for formal adoption. All resolutions related to this plan are in Attachment B.

SECTION 4 – RISK ASSESSMENT

In order to prepare for and mitigate the consequences of hazardous events, it is necessary to understand the local vulnerability. Vulnerability is based on the natural and man-made factors that determine the probability of an event occurring and community factors that contribute to the severity of the impacts.

A quantitative risk assessment for the Town and Village of Horseheads was conducted using the HAZNY program developed by the New York State Emergency Management Office. HAZNY is an automated interactive spreadsheet that enables a group of local experts to rank hazards based on the scope (area of impact and potential for a cascade effect), frequency, impact, onset (warning time), and duration of each hazard considered. The Chemung County Emergency Management Office facilitated a HAZNY assessment for the Town and Village of Horseheads on May 5, 2003. Participants included representatives of the Town and Village Boards, Town Highway Department, Town and Village Code Enforcement, Village Manager, Town and Country Fire Department, County Emergency Management Office, and Regional Panning board. Weather hazard information provided by the National Weather Service was used in the analysis. Participants also utilized information from the Chemung County HAZNY analysis, for which participants included the Chemung County Health Department, County Sheriff, NYS Spills Engineer, NYS Regional Flood Control Engineer, County Emergency Management Office, and Regional Flood Mitigation Specialist. The group evaluated 31 natural, technological, and human caused hazards that can potentially impact the Town and Village of Horseheads. The hazard rankings derived from this HAZNY analysis are presented below (with numerical HAZNY rating scores on a scale of 44 to 400). These hazard ratings were used as the basis for prioritizing hazards in this mitigation plan.

<u>High Hazards</u>:	Hazardous material – in transit	366.5
<u>Moderately High Hazards</u>:	Flood	318.8
	Explosion	306.2
	Oil spill	303.8
	Severe storm	295.5
	Terrorism	292.8
	Hazardous material – fixed site	285.5
	Extreme temperatures	274.8
	Ice storm	271.2
	Aging infrastructure	266.2
	Severe winter storm	260.5
	Transportation accident	260.2
	Tornado	256.8
	Utility failure	251.8
	Fire	247.2

Moderately Low Hazards:	Earthquake	235.8
	Structural collapse	217.8
	Infestation	217.5
	Wildfire	210.8
	School violence	210.2
	Epidemic	201.8
	Water supply contamination	200.2
	Civil unrest	192.2
	Drought	188.2
	Air contamination	188.2
	Dam failure	180.5
	Radiological – in transit	179.8
	Ice jam	174.8
	Landslide	174.2
Low Hazards:	Fuel shortage	155.8
	Food shortage	121.8

The following assessment evaluates the risks associated with each hazard that was given a high or moderately high ranking in the Town and Village of Horseheads (in order of priority). Assessments for the moderately low and low priority hazards are included in Attachment C. The responses used for the HAZNY assessment are presented, along with additional information about historic occurrences and vulnerabilities. Those hazards that were not assessed because they are not applicable to Horseheads are also listed in Attachment C.

#1. HAZARDOUS MATERIAL RELEASED IN TRANSIT

Definition: The uncontrolled release of material during transport, which when released can result in death or injury to people and/or damage to property and the environment through the material's flammability, toxicity, corrosiveness, chemical instability and/or combustibility.

HAZNY analysis:

- Scope: Large region is vulnerable
- Cascade effects: Highly likely to trigger another hazard
- Frequency: Frequent event (occurs more than once a year)
- Onset: No warning
- Hazard duration: More than one week
- Incident stabilization: Three days to one week of overtime emergency operations
- Potential impact: Serious injury or death is likely in large numbers
  Severe physical and/or economic damage to private property
  Severe structural damage to community infrastructure

Past hazard events: The most frequent occurrences of hazardous material releases in Chemung County involve the release of fuel and other substances as a result of transportation crashes. The NYS Department of Environmental Conservation responds to about 90 spills per year in Chemung County, which includes an average of 17 per year in Horseheads. About half of these reported spills involve the release of materials in transit. The DEC Spills Engineer estimates that 95% of the spills involve petroleum products. Noteworthy incidents in Chemung County have included:

- In the late 70's or early 80's, a railroad car spilled sodium hydroxide in the hamlet of Big Flats.
- A train derailment in the Town of Big Flats involved cars containing propane and sulfuric acid.
- Sulfuric acid was spilled from a truck at a loading dock in the Town of Big Flats. A couple of people were treated for burns.
- Toluene was released at a truck terminal in the Town of Elmira when a drum was punctured during unloading. One person was injured.
- A truckload of agricultural chemicals shifted in transit; the damage was discovered at the loading dock of a farm supply store in the Town of Horseheads.
- A pipeline in the Town of Southport (located near the Pennsylvania Avenue Bridge in Pine City) was exposed by erosion during the August 1994 flood.
- A high-pressure natural gas pipeline under Clark Hollow Creek in the Town of Southport was exposed by erosion during the November 1996 flood. It is reported that the outer casing of this pipeline appeared to be rusted and cracked. Subsequent sedimentation has covered the pipeline, but no protective measures have been taken.

Probability of future events: The Town and Village of Horseheads occasionally have transportation crashes that result in the release of hazardous materials. Fortunately, these incidents generally involve small quantities of material. The potential also exists for a more serious incident involving a pipeline failure, train derailment, or tank truck crash that releases large volumes of hazardous materials.

Potential impact: The packaging used to ship hazardous material generally prevents catastrophic releases of highly toxic substances. However, transportation accidents resulting in the release of hazardous materials can result in fire, explosion, toxic fumes, water supply contamination, agricultural damage, or environmental contamination. If an acutely toxic substance is dispersed in the atmosphere, the area of concern can extend as far as 10 miles from the site of the release. Rupture of a natural gas pipeline can cause an explosive force sufficient to level buildings. An overturned tanker or derailed tank car may take a week or more to mitigate. If contaminants are dispersed into the environment, the cleanup can take years.

Vulnerable areas: The transportation routes through the Town and the areas that have historically been vulnerable to transportation accidents are shown on the Transportation Infrastructure map in Attachment A. Although a transportation accident involving hazardous materials could occur on county and municipal roads, the probability is greatest along the railroad line and the state highways (Routes 17, 14, and 13). These principal transportation routes pass through heavily

populated areas of the Town and Village. In addition, a Norfolk Southern Railroad switching yard is located in the Horseheads Industrial Park in the northern part of the Village. Natural gas transmission pipelines and distribution lines are also vulnerable. The erosive nature of the area's streams poses a threat to shallow pipelines in the valleys or at stream crossings. Most of the residents and businesses in the Town and Village of Horseheads are located within one mile of a railroad, state highway, or pipeline.

Estimate of potential losses: A credible worst-case hazardous material incident could result from an accident that ruptures a railroad car containing hazardous materials. If the released material is subject to atmospheric dispersion, the radius of concern could be as much as 10 miles (for example, ammonia, chlorine, or nitric acid). If a release occurs along the railroad near the Village and requires evacuation of a 5-mile radius, all but a few Town and Village residents would be displaced. The estimated cost of sheltering these residents would be at least $500,000 (based on a Red Cross estimate that sheltering expenses are in the range of $25-100 per person per day). In addition to the emergency response expenses, casualties, and medical expenses, the property damage and environmental cleanup costs resulting from a hazardous material release could be hundreds of thousands of dollars (estimate from DEC Spills Engineer). The assessed value of property within one mile of this potential derailment site is $192,382,152. The release of a corrosive substance could necessitate cleanup and repair costs exceeding $4 million (based on an average expense of 10% of the assessed value within a 90^{o} sector, extending one mile from the site in the worst-case wind direction).

#2. FLOOD/FLASH FLOOD

Definition: Flooding usually is a natural, cyclic occurrence in existing waterbodies or drainage ways. When a waterbody overflows its "normal" banks, a potentially violent and/or destructive waterway can form. A flash flood is a sudden transformation of a small stream into a violent waterway after heavy rain and/or rapid snowmelt. Urban flooding occurs in developed areas where the drainage system is inadequate to safely convey runoff.

HAZNY analysis:

- Scope: Large region is vulnerable
- Cascade effects: Highly likely to trigger another hazard
- Frequency: Frequent event (occurs more than once a year)
- Onset: No warning
- Hazard duration: Two to three days
- Incident stabilization: One to two days of overtime emergency operations
- Potential impact: Serious injury or death is unlikely
  Severe physical and/or economic damage to private property
  Moderate structural damage to community infrastructure

Past hazard events: Flooding is New York's most consistently damaging natural disaster. Since 1955, New York has recorded more flood events than any other state in the northeast. Millions

of dollars of flood losses are sustained each year due to private property damage, infrastructure damage, disruption of commerce, unemployment caused by floods, the expense of disaster relief, and other related costs. Annual economic losses throughout the state are estimated to be as high as $100 million (source: *Draft New York State All Hazard Mitigation Plan*, prepared by Mitigation Section, New York State Emergency Management Office, April 2003).

Since the early 1800s, major flooding has occurred along the Chemung River about every 20 years. The National Weather Service has documented 23 flooding events in Chemung County in the past 10 years. These events range from localized occurrences to major floods. Although many of these flood events caused only localized or minimal damages, some have been quite severe.

Noteworthy floods include:

- July 1935, Finger Lakes Flood: A complex of thunderstorms produced flash flooding throughout south central New York and northern Pennsylvania; more than forty deaths were recorded; damages ran in the hundreds of millions of dollars.
- May 1946: Severe thunderstorms caused the Chemung River to crest at an all-time high with heavy losses throughout the watershed.
- June 1972, Tropical Storm Agnes: The inland remnants of Hurricane Agnes dropped 12 to 18 inches of rain in a three day period across the mid-Atlantic states. Record breaking discharges in the Chemung River overtopped levees and floodwalls. This is the flood of record for Newtown Creek, which is a principle source of flooding in the Town and Village of Horseheads. This catastrophic flood resulted in deaths, mass evacuations, and destroyed homes. Fires that broke out could not be extinguished. Many bridges were washed away. Damaged infrastructure led to transportation problems, power outages, lack of communication, water supply interruption, a brief food shortage, etc. Property losses in Horseheads were not as severe as in surrounding communities, with the most serious damages sustained by the road system as a result of undersized culverts.
- September 1975, Tropical Storm Eloise: Heavy rain from the inland remnants of Hurricane Eloise caused another river flood that damaged and destroyed numerous buildings. The damages in the Town and Village of Horseheads were similar to those that had occurred in 1972.
- June 1976, Fathers' Day Flood: Severe thunderstorms caused damage in the millions of dollars in Steuben and Chemung Counties.
- April 1993, "Blizzard of '93" snowmelt: Rapid snowmelt caused urban and small stream flooding.
- August 1994, Topical Storm Beryl: Heavy rain associated with the remnants of Hurricane Beryl caused flash flooding in Chemung County. Numerous buildings were flooded and roads were damaged.
- January 1996: Heavy rainfall melted a deep snow pack (over 3 feet in spots) and produced widespread flash flooding and river flooding. Flooding and erosion damage to buildings and infrastructure were extensive.
- November 1996: Heavy rain caused flash flooding that damaged buildings and washed out roads.

In addition to these major flood events, many additional heavy rainfall events have caused localized drainage problems, ponding, streambank erosion, roadway damage, and other difficulties.

Probability of future events: Flooding can be caused by excessive precipitation, rapid snowmelt, ice jams, beaver dams, or dam failure. Urban or street flooding can result from heavy precipitation, clogged storm sewers, or a ruptured water main. Steep slopes make the area very prone to flash flooding. Slow-moving thunderstorms often produce flash floods, particularly during summer months. Remnants of tropical storm systems can produce both flash floods and river flooding. Rapid thawing in the winter produces runoff from snowmelt and ice jams. Flooding can occur at any time of year. Although major river floods only occur about once every 20 years, localized flash flooding and urban flooding occur much more frequently. The National Weather Service has documented an average of 2.3 flood events per year in Chemung County since 1993. The frequency of flooding in the Town and Village of Horseheads is somewhat lower, since some of these events were local occurrences impacting other parts of the county and others were relatively minor and did not necessitate emergency response. However, stream flooding, flash flooding, or urban flooding does occur in the Horseheads almost every year.

Potential impact: Although Horseheads has no history of flood deaths (and therefore considers it to be unlikely), it does have conditions similar to those in which tragedies have occurred (such as the washed out roadway that led to five deaths in Broome County, NY in June 2003). Flooding is the number one weather related killer, causing an average of three to four deaths per year in New York. Approximately half of those deaths involve people trapped in cars. Floods and flash floods also damage or destroy buildings, cars, utility poles, gas lines, roads, bridges, etc. Transportation and communication systems can be interrupted. Drinking water can be contaminated. Electric power and sewage treatment can be disrupted. Floodwaters often carry damaging debris, which can pose a risk to both life and property. Erosion of streambanks and road ditches has historically caused significant infrastructure damage in Horseheads. Additional hazards that are likely to be triggered by a flood event include: hazardous material release, transportation accident, power failure, fuel shortage, water supply contamination, food shortage, landslide, disease, and dam failure. The damages and consequent recovery time from a major flood can be extensive.

Vulnerable areas: The locations of flood hazards and the history of damages from flooding are described in Attachment D. The Flood Hazards and Problems map in Attachment A shows the sites where flooding problems have occurred or are anticipated. This information is summarized in the Summary of Flooding Problems table in Attachment A. More than 300 buildings in the Town and Village of Horseheads are in locations susceptible to flood or erosion damages from riverine flooding, flash flooding, or urban flooding (drainage and ponding problems). Most of these at–risk structures are located within the area mapped as 100-year floodplain. Some are located near small streams in areas that are at risk from flooding and/or bank erosion, but are not identified as flood-prone on the Flood Insurance Rate Maps. Many additional structures in the Village are at risk of urban flooding if aging storm sewer systems become blocked. In recent

years, both the Town and Village have invested in numerous projects to stabilize streams, alleviate drainage problems, and mitigate flood risks.

Estimate of potential losses: The Town and Village estimate that more than 300 buildings are located in areas prone to flood damage, including five major industrial facilities located near Halderman Hollow Creek. If these at-risk structures sustain average flood damages of $10,000, the total flood damages to buildings would be about $3 million. In addition, the damages to roads and bridges could also be several million dollars. (The Town of Southport spent $1.3 million replacing a bridge over Bird Creek that washed out in 1996.)

#3. EXPLOSION

Definition: The threat or actual detonation of an explosive device or material with the potential of inflicting serious injury to people or damage to property.

HAZNY analysis:

- Scope: Large region is vulnerable
- Cascade effects: Highly likely to trigger another hazard
- Frequency: Frequent event (occurs more than once a year)
- Onset: No warning
- Hazard duration: Less than one day
- Incident stabilization: Three days to one week of overtime emergency operations
- Potential impact: Serious injury or death is likely, but not in large numbers
  Severe physical and/or economic damage to private property
  Moderate structural damage to community infrastructure

Past hazard events: A number of explosions have occurred in Chemung County.

- During the 1972 Hurricane Agnes Flood, natural gas was released from a damaged pipeline in the hamlet of Big Flats.
- In the late 1980's, a pipeline explosion damaged a house in the Town of Big Flats.
- An explosion resulting from a natural gas leak destroyed the building of a small business in the Village of Wellsburg. The only person on the premises at the time was thrown from the building, but was not seriously injured.
- A natural gas leak in Horseheads caused an explosion that completely destroyed a building.
- An explosion at Kennedy Valve, in the City of Elmira, caused one death.
- In February 2001, a student took homemade bombs and other weapons to Southside High School. Fortunately, the situation was identified and resolved without any violence.
- There have been numerous instances in Chemung County involving the discovery of explosive materials, which were removed prior to any explosion. Several cases have involved old unstable munitions, which had been brought home by war veterans and kept in their residences. One case involved a number of pipe bombs. Another situation involved a civil defense fallout shelter with stored ether, which becomes picric acid (an explosive substance), with time. Picric acid was also discovered at a business located in the Village of

Elmira Heights and Town of Elmira. Some farmers have old dynamite, which becomes unstable when it crystallizes.

- Chemung and Tioga Counties have the highest concentration of identified methamphetimine labs in New York State. From January 31, 1999 to January 31, 2004, 17 meth labs were found in Chemung County. These illegal drug-manufacturing operations utilize explosive substances.

Probability of future events: Although the threat of an explosion occurs much more often than the actual detonation of an explosive device, this is not an uncommon event in the Town and Village of Horseheads.

Potential impact: An explosion generally occurs with little or no warning. It can cause serious injury or death to those in the immediate vicinity of the explosion and damage to the surrounding property. If it occurs in a building, that structure is likely to be extensively damaged or destroyed. An explosion can trigger a fire, transportation accident, hazardous material release, or other event.

Vulnerable areas: The types of situations that can lead to an explosion are so numerous, that most areas in the Town and Village must be considered vulnerable. Explosive materials can be stored and used at industrial sites, retail establishments, agricultural operations, mines, residences, and illegal methamphetimine labs. Explosive materials are transported through the community along roads, railroads, and pipelines (see Transportation Infrastructure map in Attachment A). Propane trucks and natural gas distribution lines deliver explosive materials to customers throughout Horseheads. A terrorist could also detonate an explosive device.

Estimate of potential losses: The possibility of injury from an explosion is high and death is possible. One or more buildings can be completely destroyed. The highest assessed property in the Village is assessed at $15,000,000; the highest assessed property in the Town is assessed at $8,600,000. A major explosion at one of these industrial facilities could cause damages exceeding a million dollars.

#4. PETROLEUM SPILL

Definition: The uncontrolled or accidental discharge of petroleum into water and/or onto land or sea.

HAZNY analysis:

- Scope: Large region is vulnerable
- Cascade effects: Highly likely to trigger another hazard
- Frequency: Frequent event (occurs more than once a year)
- Onset: No warning
- Hazard duration: Less than one day
- Incident stabilization: One to two days of overtime emergency operations

- Potential impact: Serious injury or death is unlikely
  Moderate physical and/or economic damage to private property
  Severe structural damage to community infrastructure

Past hazard events: Approximately 95% of the spill events that require response by the NYS Department of Environmental Conservation involve petroleum products. Most of these incidents involve leaking underground storage tanks or the release of fuel due to a motor vehicle crash. The DEC Spills Engineer estimates that he responds to an average of about 80 to 90 petroleum spill incidents a year in Chemung County, which includes an average of 16 per year in Horseheads.

- Over the years, the NYS Department of Environmental Conservation has responded to dozens of underground petroleum leaks from old storage tanks.
- In the 1990's, a significant release of gasoline occurred when a leaking underground tank at a gas station in the Town of Southport was filled without prior inspection. This incident contaminated three private water wells and required installation of a vapor extraction system to ventilate one nearby home.
- During the November 1996 flood, erosion in Seeley Creek exposed a gasoline pipeline south of Webb Mills in the Town of Southport. This pipeline, carrying 750 gallons of gasoline per minute, was left exposed to possible rupture for about two months until it was replaced at a greater depth.
- In 2001, erosion in Seeley Creek exposed a pipeline in the Town of Southport that is used to transport various petroleum products (diesel fuel, fuel oil, gasoline, jet fuel, and kerosene). Because this erosion also threatened State Route 328, the NYS Department of Transportation restored and stabilized the site.
- In 1995, pipeline corrosion in the Town of Big Flats resulted in the release of a couple hundred thousand gallons of gasoline, diesel fuel, fuel oil, and kerosene. This leak is thought to have occurred for about 6 months before it was discovered. A few neighboring wells were impacted, necessitating well replacement or water treatment systems. This incident seriously impacted the value of neighboring properties. Bioremediation efforts are still underway. It is estimated that expenditures to date have exceeded $2 million.

Probability of future events: The Town and Village of Horseheads have a history of frequent petroleum spills. These releases can occur as the result of transportation crashes, from petroleum pipelines, or from fixed sites. The sites that store and utilize petro-chemicals include industries, gas stations, and facilities that maintain fuel tanks (highway departments, farms, etc.).

Potential impact: The most frequent fixed site petroleum spill incidents responded to by Spills Engineers from the NYS Department of Environmental Conservation involve the releases from abandoned underground storage tanks. The cleanup costs for these incidents typically range from a minimum of $10,000 to $50,000 or more if groundwater is contaminated. The most frequent transit-related petroleum spills involve the release of fuel due to traffic accidents. A tractor trailer accident can result in a surface spill of 50 to 300 gallons of diesel oil, which requires a response from the NYS Department of Environmental Conservation (DEC) and contractor work to clean up the site. The typical cost for this type of incident is $2,500 to 10,000 (estimate from

DEC Spills Engineer). Smaller releases can be managed by fire departments. Ruptured pipelines can release large volumes of material, particularly if the rupture is not detected. The resulting environmental contamination can take years and millions of dollars to clean up.

Vulnerable areas: The transportation routes through the Town and the areas that have historically been vulnerable to transportation accidents are shown on the Transportation Infrastructure map in Attachment A. Although a transportation accident resulting in a petroleum spill could occur on county and municipal roads, the probability of significant releases is greatest along the state highways (Routes 17, 14, and 13), which carry more truck traffic. These principal transportation routes pass through heavily populated areas of Horseheads. Natural gas pipelines are also vulnerable. The erosive nature of the area's streams poses a threat to shallow pipelines in the valleys or at stream crossings. Horseheads contains numerous facilities that use, store, or sell petroleum products. Most of these sites are located in the urbanized areas where population densities are also greatest. Most of the residents and businesses in the Town and Village of Horseheads are located within one mile of a major roadway or a facility that stores petroleum products.

Estimate of potential losses: Although the typical cost of a petroleum release is estimated to be a few thousand dollars, a credible worst-case incident can be much more severe. The incident at Griffith Oil in the Town of Big Flats represents a credible worst-case scenario for the release of petroleum products from a transmission pipeline. The remediation costs for this release have exceeded $2 million, with significant additional property value losses incurred by the surrounding landowners.

#5. SEVERE STORM

Definition: Severe storms include hail storms, windstorms, and severe thunderstorms (with associated severe wind events). A thunderstorm is a local storm produced by a cumulonimbus cloud and is accompanied by lightning and thunder. Thunderstorms are often accompanied by gusty winds, heavy rain, and occasionally by hail. Although all thunderstorms are potentially hazardous, the National Weather Service classifies a thunderstorm as severe if it produces winds greater than 57 mph or hail ¾ inch in diameter or larger. (This definition does not include tornadoes, which are evaluated as a separate hazard.)

The damaging winds of thunderstorms include:

- Straight line winds – high winds across a wide area.
- Downbursts – localized currents of air blasting down from a thunderstorm, which induce an outward burst of damaging wind on or near the ground.
- Micro-bursts – minimized downbursts covering an area of less than 2.5 miles across. They induce a strong wind shear (a rapid change in the direction of wind over a short distance) near the surface. Micro-bursts may or may not include precipitation and can produce winds over 150 miles per hour.

HAZNY analysis:

- Scope: Large region is vulnerable
- Cascade effects: Highly likely to trigger another hazard
- Frequency: Frequent event (occurs more than once a year)
- Onset: No warning
- Hazard duration: Less than one day
- Incident stabilization: One to two days of overtime emergency operations
- Potential impact: Serious injury or death is likely, but not in large numbers
  Moderate physical and/or economic damage to private property
  Moderate structural damage to community infrastructure

Past hazard events: New York experiences an average of 323 severe thunderstorms each year. Nine to ten people per year die from thunderstorm winds, usually due to trees falling on a house or car. New York State ranks forth in the nation for lightning deaths (an average of 3 per year) and fifth for lightning injures (an average of 13 per year). National Weather Service records for Chemung County include 60 severe weather reports in the twenty years from 1983 to 2002. Thirteen of these storms had hail greater than 0.75 inches in diameter and three had "killer hail" greater than 1.5 inches in diameter (based on severe weather spotter reports).

- In 1974 (Easter), a garage in the Town of Big Flats blew apart and lumber lodged in nearby houses. The roof blew off of a house. Another house lost part of a wall.
- 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.
- A windstorm in the Town of Chemung tore down electric transmission towers and damaged homes and barns (sometime in the 1980's).
- In November 1989, a severe thunderstorm produced winds estimated at 110 mph at Coldenham, NY. Strong winds collapsed the wall of an elementary school, killing 9 children and injuring 18.
- In 1998, a system of severe thunderstorms spawned at least 20 tornadoes in northeast Pennsylvania and central New York. Although 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.
- On Labor Day, 1998, the Syracuse region was struck by very severe winds from a thunderstorm, with estimated wind speeds of around 110 mph. Two people were killed.
- On July 21, 2003, a system of severe thunderstorms swept through Steuben and Chemung Counties. Downed limbs and trees impeded transportation and caused localized damage. Near100 mph winds destroyed a mobile home in the Town of Woodhull (Steuben County). Approximately 36,000 NYSEG customers lost electric power; some rural customers were without electricity for several days. Local stores and restaurants lost perishable foods.
- Small short-lived tornado-like storms (also known as gustnados) have been reported, including two in the Town of Big Flats in the 1970's.

Probability of future events: In recent years, Chemung County experienced severe weather reports an average of three times per year, with the frequencies in neighboring counties ranging from two to five events per year. In Chemung County, hail occurred 0.65 times per year and

killer hail 0.15 times per year. Because severe thunderstorms and hail are generally localized events, the probability of occurrence in the Town or Village of Horseheads is lower than these county statistics would indicate.

Potential impact: Although tornadoes grab headlines due to their swift and destructive nature, flash floods, lightning, straight-line winds, and hail are more common by-products of thunderstorms and result in many more deaths and millions of dollars in damage each year. Large hail can impact surfaces at speeds greater than 100 mph, causing injury and property damage. Thunderstorms have the potential to spawn tornadoes or trigger utility failures, transportation accidents, flash flooding, and fires. Most thunderstorms occur during the late afternoon and evening hours of spring and summer, which coincides with the season of outdoor activities. The impacts of severe thunderstorms and hailstorms are usually localized.

Windstorms involve sustained, potentially damaging, high winds. Straight-line thunderstorm winds occasionally exceed 100 mph. Major high-wind events can extend horizontally for hundreds of miles. The duration of the event ranges from about 4 hours up to 2 to 3 days, usually with nocturnal lulls. The greatest dangers from high winds are: roof failure, breaking glass, and flying debris (airborne missiles). Strong winds can knock down trees, utility poles, and power lines. They can damage or destroy buildings, vehicles, and crops. Blowing dust can impair visibility. Debris can block transportation routes. If the strong wind occurs in conjunction with a winter storm, it can create wind-driven snow, severe drifting, and dangerous wind chill. The New York State Building Code requires construction for a design wind speed of 90 mph. Beginning in January 2003, the building code includes higher wind standards for structures that represent a higher hazard to human life in the event of failure.

Vulnerable areas: The entire community is vulnerable to damage from thunderstorms, hail, or wind. Those most at risk from lightning are people who are outdoors, especially under or near tall trees, in or on water, and on or near hilltops. Severe storms occasionally produce strong winds that exceed the design speeds of building codes and can thus impact the entire Town and Village. The most severe damage from wind would be expected in mobile homes, farm buildings, and other structures that may not have been constructed to withstand high wind speeds. The locations of mobile home parks are shown on the Vulnerable Sites map in Attachment A. Agricultural areas may experience financial losses associated with crop damage.

Estimate of potential losses: The most devastating damages from severe storms (in addition to the potential to trigger tornadoes and floods) are likely to result from high winds. Wind speeds in excess of 100 miles per hour can cause damages comparable to those from a moderate-intensity tornado. If a severe windstorm impacts a developed area within the Town or Village, the potential damages could exceed a million dollars.

#6. TERRORISM

Definition: The threat or use of violence to achieve political/social ends usually associated with community disruption and/or multiple injuries or deaths.

HAZNY analysis:

- Scope: Large region is vulnerable
- Cascade effects: Highly likely to trigger another hazard
- Frequency: Regular event (occurs once every one to seven years)
- Onset: No warning
- Hazard duration: Less than one day
- Incident stabilization: One to two days of overtime emergency operations
- Potential impact: Serious injury or death to large numbers
  Severe physical and/or economic damage to private property
  Moderate structural damage to community infrastructure

Past hazard events: Chemung County has no history of terrorist incidents.

- Past threats of school violence in Chemung County have included bomb threats and a student who took weapons to a high school in February 2001. The motivations for these threats were such that they are not considered to be terrorist incidents.
- In 1998, a bomb threat was made to a New York State office building in the City of Elmira. The motivation for this threat is not known.
- Following anthrax poisoning in 2001, the nation experienced copycat mailing of white powder and widespread paranoia. Although this did not result in any actual terrorist incidents in Chemung County, it necessitated emergency response to about 50 concerns.

Probability of future events: Chemung County does not have attractive targets for politically motivated terrorist attacks. Computer viruses or hacking can cause damages, but are unlikely to disrupt essential services. The most likely terrorist incidents to impact the Town or Village of Horseheads are those which actually occur elsewhere. The September 11, 2001 terrorist attacks have had emotional and economic impacts on the local community. Likewise, local concerns following the anthrax poisonings in 2001 necessitated repeated emergency response.

Potential impact: A terrorist incident in Horseheads could have significant human costs, with community-wide impacts. Terrorists often seek to maximize destruction, so their intent may very well be to trigger other hazards, such as air/water contamination, utility failure, civil unrest, fire, hazardous material release, structural collapse, or explosion. Computer viruses or hackers could cause significant disruptions and economic losses, but would not prevent critical government operations or emergency services.

Vulnerable areas: Terrorist attacks or civil unrest can occur anywhere, but are most likely to target government buildings, places of assembly, symbolic landmarks, and locations with controversial occupancies. The Critical Facilities and Vulnerable Sites maps in Attachment A

show the locations of schools, government buildings, emergency response facilities, auditoriums, and religious meeting places.

Estimate of potential losses: Consideration of a credible worst-case terrorist incident for Horseheads was influenced by the airplane that crashed in Somerset County, Pennsylvania on September 11, 2001. Although this terrorist attack was not targeted at Somerset County, the local consequences were significant. If a similar incident were to result in an airplane crash in the urbanized portion of Horseheads, it could result in many deaths and millions of dollars in damages and emergency expenses. The highest assessed property in the Village is assessed at $15,000,000; the highest assessed property in the Town is assessed at $8,600,000. A credible terrorist attack could destroy one of these structures and surrounding properties.

#7. HAZARDOUS MATERIAL RELEASED FROM A FIXED SITE

Definition: The uncontrolled release of material from a stationary facility, which when released can result in death or injury to people and/or damage to property and the environment through the material's flammability, toxicity, corrosiveness, chemical instability and/or combustibility.

HAZNY analysis:

- Scope: Small region is vulnerable
- Cascade effects: Highly likely to trigger another hazard
- Frequency: Regular event (occurs once every one to seven years)
- Onset: No warning
- Hazard duration: One day
- Incident stabilization: One to two days of overtime emergency operations
- Potential impact: Serious injury or death to large numbers
  Severe physical and/or economic damage to private property
  Moderate structural damage to community infrastructure

Past hazard events: Most hazardous material incidents at fixed facilities are successfully managed by onsite containment and ventilation systems and do not necessitate activation of emergency responders. The most frequent hazardous material releases from fixed sites involve petroleum products, which are addressed as a separate hazard. Fixed site releases involving other hazardous materials may necessitate response by the NYS Department of Environmental Conservation to a couple of incidents a year in Chemung County. Noteworthy incidents have included:

- An ammonia release from a fertilizer plant in the Town of Big Flats impacted neighbors, but dissipated before reaching the elementary school.
- A serious hazardous material spill occurred in the Town of Ashland (Chemung County) during the Hurricane Beryl flood in August of 1994. Illegally stored hazardous material bulk containers overturned and spilled their contents into the floodwaters. Most of the materials that were released were carried away by the floodwaters. The contamination stretched for several miles, contaminated homes and water supplies, and affected agricultural plants and

animals. This incident exceeded the NYS Department of Environmental Conservation's capabilities and required remediation efforts by the U. S. Environmental Protection Agency. The cleanup took many years, with estimated expenses exceeding $500,000 (emergency response, remediation expenses, testing, agricultural losses, etc.). None of these costs were recovered from the responsible party.

- In 1997, an aboveground storage tank at the Cutler-Hammer industrial facility in the Town of Horseheads burst at its seams, releasing approximately 30,000 gallons of sodium hydroxide solution. Fortunately, no one was near the tank when the spill occurred. The circumstances of the spill were such that the material released offsite was diluted and the Horseheads Fire Department was able to neutralize the remainder.
- Chemung and Tioga Counties have the highest concentration of identified methamphetimine labs in New York State. From January 31, 1999 to January 31, 2004, 17 meth labs were found in Chemung County. These illegal drug-manufacturing operations utilize a number of hazardous substances. Although most drug lab discoveries were in rural areas, two recent busts occurred in the City of Elmira, where hazardous materials pose a risk to the civilian population, as well as to emergency responders.
- The American LaFrance/Remington Rand hazardous waste site is located adjacent to Southside High School in the Town of Southport. Remediation of the industrial facility included removal of several inches of soil and testing of school property. Cancer clusters among the school population have been alleged. An estimated $500,000 have been spent investigating potential contamination of the school grounds.
- Radon testing has identified high levels of naturally occurring radon in Chemung County.

Probability of future events: The sites from which releases of hazardous materials might occur include hazardous waste sites, industries, retail establishments (gas stations, auto supply stores, garden supply stores, hardware stores, etc.), agricultural operations, and illegal drug manufacturing sites. Nine facilities in the Town and 26 facilities in the Village report hazardous material inventories to the Chemung County Emergency Management Office under SARA Title III. Additional facilities file 209-U reports with the fire departments. The legal businesses and facilities that utilize or store hazardous materials are all believed to be in compliance with reporting and safety requirements, which minimize potential risks. Additional protection is provided by the Building Code of New York State, adopted January 2003, which sets higher standards for seismic, snow loading, and wind for structures that contain "sufficient quantities of toxic or explosive substances to be dangerous to the public if released." However, the Town's rural areas and abandoned farm buildings are potential sites for clandestine drug manufacturing operations, from which the probability of a hazardous material release is much higher than from legal operations. The disturbance of a brownfield site contaminated by improper disposal of hazardous materials could result in dangerous exposure to unknown contaminants.

Potential impact: Incidents involving hazardous materials may result in fire, explosion, release of toxic fumes, water supply contamination, or environmental contamination. If air or water disperses a hazardous material, the impacts can extend for miles from the site of the release. Hazardous material reporting requirements aid emergency responders in identifying the materials involved and responding appropriately. If hazardous materials cannot be cleaned up quickly they

can be dispersed into the environment. The site could then become a superfund site (similar to those resulting from improper waste disposal), which typically involve years of cleanup activities and expenditures of a million dollars or more.

Vulnerable areas: The Chemung County Emergency Management Office has SARA Title III Emergency and Hazardous Chemical Inventory Reports on file for 26 facilities in the Town and Village of Horseheads. Additional facilities, such as automobile repair, contracting, and retail sites, are also likely to use, store, or sell hazardous materials (but do not meet the SARA Title III reporting requirements). Most of these facilities are located in urbanized areas where population densities are also greatest. Additional risks occur on farms that use hazardous substances, but are exempt from the above reporting requirements. Unknown vulnerabilities occur in locations where illicit storage or use of hazardous materials occurs. Most of the residents and businesses in the Town and Village of Horseheads are located within one mile of a facility that handles hazardous substances.

Estimate of potential losses: The threat zone for an airborne chemical release from an industrial facility includes the potential for severe contamination within about a mile of the facility in the downwind direction and an evacuation radius of five miles. The acute toxicity could preclude evacuation from some areas. The Town and Village population within five miles of two major industries is 19,491 and 18,384 (99 and 94% of the population). The estimated cost of sheltering the residents who live within this threat zone could exceed $500,000 (based on a Red Cross estimate that sheltering expenses are in the range of $25-100 per person per day). In addition to the human casualties, emergency response, and medical costs, property damage and environmental cleanup costs resulting from a hazardous material release can be hundreds of thousands, or even millions, of dollars. The cleanup costs associated with a flood induced hazardous material spill in the Town of Ashland in 1994 are estimated at $500,000. If this contamination had not been washed away by floodwaters, the DEC Spills Engineer estimates that the cleanup costs could have been $1 million or more. The assessed value of property within one mile of a major industrial facility in the Village is $311,257,439. The release of a corrosive substance could necessitate cleanup and repair costs exceeding $7 million (based on an average expense of 10% of the assessed value within a 90^{o} sector, extending one mile from the site in the worst-case wind direction).

#8. EXTREME TEMPERATURES

Definition: Extended periods of excessive cold or hot and humid weather with a serious impact on human and/or animal populations particularly elderly and/or persons with respiratory ailments.

HAZNY analysis:

- Scope: Large region is vulnerable
- Cascade effects: Some potential to trigger another hazard
- Frequency: Frequent event (occurs more than once a year)

- Onset: One day warning
- Hazard duration: Four days to one week
- Incident stabilization: One to two days of overtime emergency operations
- Potential impact: Serious injury or death is likely, but not in large numbers
  Moderate physical and/or economic damage to private property
  Moderate structural damage to community infrastructure

Past hazard events: National Weather Service records for Chemung County indicate that extreme cold (minimum temperature –10 degrees F or below) occurred 19 times in the twenty years from 1983 to 2002 and extreme heat (maximum temperature 100 degrees F or above) occurred 3 times in the same period. The National Weather Service is typically able to provide 12 to 24 hours of advanced warning for these events.

Probability of future events: Cold winter temperatures are a normal occurrence in Chemung County, occurring an average of about once per year and lasting 1 to 7 days. Extreme heat occurs an average of once every seven years and lasts 1 to 7 days. These extreme temperature conditions generally impact only a few isolated individuals. However, compounding circumstances, such as severe winter weather that strands motorists or an extended power failure, can increase the number of people affected. U.S. Centers for Disease Control estimates that an average of 384 people per year die from excessive heat, but few of these occur in upstate New York. Excessive heat or cold that impacts a significant portion of the population, is an infrequent occurrence.

Potential impact: Freezing temperatures can cause problems with burst pipes, ruptured water mains, and automobiles that will not start, but the greatest danger is to people. Prolonged exposure to extreme cold can lead to frostbite, hypothermia, and death. New York statistics for deaths attributed to exposure to cold indicate that 50% are people over 60 years old, over 75% are males, and about 20% occur in the home (source: National Weather Service). If extreme cold conditions do not occur in combination with a power failure or other hazard, the greatest impact will be on low-income residents who do not have access to adequate heating. If a prolonged power outage occurs during cold weather the entire population will be impacted. Injury and deaths can result from fires or carbon monoxide poisoning that result from unsafe use of alternate sources for heating. Extreme cold can also cause damage to livestock, crops, landscaping, and other property.

There are practical problems that can result from high temperatures, such as overheated car engines, "brownouts" from overuse of electricity for air conditioning, and changes in airplanes' performance. However, as with extreme cold, the major danger of extreme heat is to humans and animals. Heat-related ailments can range from annoying conditions to life-threatening situations, such as heat cramps, fainting, heat exhaustion, and heatstroke. Those most at risk are those with health conditions (respiratory ailments, overweight, alcohol problems, etc.) or those on certain medications or drugs.

Vulnerable areas: The entire community is vulnerable to the impact of excessive heat or cold. The people most often affected by extreme temperatures are elderly people and infants. At any

one time, Horseheads may have a few homeless people, who would also be vulnerable to extremely cold conditions. Low-income residents, who may be unable to adequately heat their homes, are concentrated in the mobile home parks indicated on the Vulnerable Sites map in Attachment A. Other residents who are vulnerable to extreme temperature conditions, due to limited income or health concerns, are scattered throughout the community.

Estimate of potential losses: Although extreme temperatures can result in serious injury or death, the number of people impacted is typically small. Frozen pipes and ruptured water mains can cause thousands of dollars in property damage.

#9. ICE STORM

Definition: Freezing rain that accumulates in a substantial glaze layer of ice resulting in serious disruptions of normal transportation and possible downed power lines.

HAZNY analysis:

- Scope: Large region is vulnerable
- Cascade effects: Highly likely to trigger another hazard
- Frequency: Regular event (occurs once every one to seven years)
- Onset: One day warning
- Hazard duration: Two to three days
- Incident stabilization: More than two weeks of overtime emergency operations
- Potential impact: Serious injury or death is likely, but not in large numbers
  Moderate physical and/or economic damage to private property
  Severe structural damage to community infrastructure

Past hazard events: National Weather Service records for Chemung County indicate that ice storms occurred three times in the ten years from 1993 to 2002. The National Weather Service is typically able to provide 12 to 24 hours of advanced warning for these events.

- An ice storm in 1991 resulted in massive power outages throughout an area extending from Steuben County to Rochester.
- A January 1998 ice storm impacting six counties in the North Country region of New York was one of the most severe in the state's history. Nine people were killed, most by carbon monoxide poisoning associated with alternate heating devices. Damage was widespread. During the peak of the storm, more than 320,000 people were without electricity. Power was not completely restored for 23 days. Many dairy farmers lost their cows. The New York State Emergency Management Office documented damages of about $56 million (based on disaster assistance, which does not cover all damages).
- In January 2003, an ice storm led to sporadic power outages in parts of Chemung County. The power outages occurred in different areas over a several day period, affecting about 500 customers at a time. In Tompkins County and northeastern Chemung County, 1000 customers were without power for 4 days. Only 10% of those affected sought shelter with the Red Cross. No shelters were opened in Chemung County.

Probability of future events: The National Weather Service reports that southern New York has one of the highest incidences of ice storms in the U.S., with freezing rain and icing occurring somewhere in this region about 10 days per year. An ice storm as severe as the 1998 North Country disaster could also occur in Chemung County. In recent years, Chemung County experienced significant ice accumulation an average 0.3 times per year (or every three years). These events have typically lasted for one to two days.

Potential impact: When ice encases exposed surfaces, hazardous road conditions disrupt transportation. The weight of the ice can knock down trees and power lines, disrupting power and communication for days. Additional hazards that can be triggered by an ice storm include: transportation accidents, power failure, fuel shortage, and food shortage. Normal emergency operations, such as police, fire and ambulance service, can also be impeded. Since the same conditions may occur over a large area, aid from neighboring jurisdictions may not be available.

Vulnerable areas: The entire community is vulnerable to the impact of ice storms.

Estimate of potential losses: The 1998 North Country ice storm resulted in power outages for 320,000 people in seven counties and documented disaster assistance totaling $55,950,736 (source: New York State Emergency Management Office). This corresponds to average damages of about $175 per person. These statistics do not include all damages and the average is much lower than the damages incurred in the most severely impacted areas. If the Town and Village of Horseheads (2000 census population 16,423, excluding the Village of Elmira Heights) experience an ice storm with damages of $175 per person, the losses would be about $2.9 million.

#10. AGING INFRASTRUCTURE

Definition: The Town and Village of Horseheads have chosen to include aging infrastructure as a hazard due to the potential for hazardous conditions to develop due to the deficiencies of aging water lines, storm sewer systems, or other infrastructure. Although aging infrastructure is not technically a hazard in and of itself, it is a condition that can trigger another hazard or magnify its impact (such as urban flooding, utility failure, water supply contamination, or transportation accident). Aging infrastructure is included in this plan as a separate hazard in order to highlight these increased risks and vulnerabilities in the older parts of the community.

HAZNY analysis:

- Scope: Large region is vulnerable
- Cascade effects: Highly likely to trigger another hazard
- Frequency: Regular event (occurs once every one to seven years)
- Onset: No warning
- Hazard duration: More than one week
- Incident stabilization: Less than one day of overtime emergency operations

- Potential impact: Serious injury or death is unlikely
  Moderate physical and/or economic damage to private property
  Moderate structural damage to community infrastructure

Past hazard events: Water main, drainage, and storm sewer problems develop periodically in the Town and Village of Horseheads due to the age of this infrastructure. Limited local budgets preclude rapid upgrading of these systems.

- The Old Chemung Canal, in the Town of Horseheads and neighboring municipalities, became blocked with vegetation and debris and contributed to frequent flooding problems. In 1996 and 1997, a coalition of municipalities, the County, and businesses undertook the removal of sediment and debris from this abandoned canal. The Town of Horseheads, Town of Elmira, Village of Elmira Heights, City of Elmira, and Chemung County have signed an agreement to share maintenance expenses and responsibilities for this abandoned canal.
- The Town and Village periodically inspect drainage ways and storm sewers in order to remove debris and make repairs before problems develop. However, budget constraints limit the frequency of inspection of underground storm sewer pipes and may delay the correction of identified deficiencies.

Probability of future events: Many components of the infrastructure serving the Village of Horseheads are quite old. The original Village of Horseheads water lines were installed in 1904 and remain in service. The Hanover Square culvert, which conveys Prospect Creek under the business district of the Village, includes old sections made of brick. Although portions of these systems are fixed whenever problems are identified and local budgets permit, the potential for a major failure of degraded systems remains high.

Potential impact: A major water main failure can cause lack of service to area residents and necessitate costly repairs. A partial collapse of underground storm sewer conveyances could cause serious flooding in the Village. If the Hanover Square culvert becomes blocked, it could result in flooding of a large area in the Village, including the Hanover Square business district.

Vulnerable areas: The oldest infrastructure, which is most vulnerable to failure is located in the Village of Horseheads, particularly the area around Hanover Square.

Estimate of potential losses: A major failure of the storm sewer system for the Village of Horseheads could cause flooding of numerous businesses and hundreds of homes. The resulting damages could be a million dollars or more.

#11. SEVERE WINTER STORM

Definition: A storm system 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. Ice storm is included as a separate hazard. For this analysis, the following could meet this definition:

- 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.

HAZNY analysis:

- Scope: Large region is vulnerable
- Cascade effects: Some potential to trigger another hazard
- Frequency: Frequent event (occurs more than once a year)
- Onset: One day warning
- Hazard duration: Two to three days
- Incident stabilization: One to two days of overtime emergency operations
- Potential impact: Serious injury or death is unlikely
  Moderate physical and/or economic damage to private property
  Moderate structural damage to community infrastructure

Past hazard events: National Weather Service records for Chemung County indicate that heavy snow occurred 32 times in the ten years from 1993 to 2002. The National Weather Service is typically able to provide 12 to 24 hours of advanced warning for these events.

- 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; over 3 million customers were without electricity; damages 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.
- A snowstorm in the mid-1990's resulted in scattered power outages in Chemung County. Some people were without electricity for several days. Three or four families were sheltered.

Probability of future events: New York experiences severe winter storms each year, resulting in a statewide average of 2 deaths per year. In recent years, Chemung County experienced heavy snow an average of 3.2 times per year. These events have typically lasted for one to two days.

Potential impact: Although the Town and Village of Horseheads are accustomed to dealing with winter weather, heavy snowfall or blizzards can exceed the normal capacity of highway departments and emergency crews. Accumulated winter precipitation causes hazardous traffic conditions and disrupts transportation routes. This can leave travelers and rural residents stranded and stop the flow of supplies. Heavy snow accumulation can collapse buildings and knock down trees and power lines. Shoveling snow can cause heart attacks. During a blizzard, snow and strong winds combine to produce a blinding snow (near zero visibility), deep drifts, and life-threatening wind chill. The reduced visibility can lead to extreme transportation

problems and fatalities due to exposure. Additional hazards that can be triggered by severe winter weather include: transportation accidents, power failure, fuel shortage, food shortage, structural collapse, landslide, and flooding (if heavy snowfall is followed by rapid melting). Normal emergency operations, such as police, fire and ambulance service, can also be impeded. Since the same storm conditions may occur over a large area, aid from neighboring jurisdictions may not be available.

Vulnerable areas: The entire community is vulnerable to the impact of severe winter storms.

Estimate of potential losses: The principle cost resulting from winter storms is the expense of snow removal by highway departments, which can impact local budgets in years with a large number of winter storm events. Indirect losses result from the disruption of normal transportation (crashes, closed work places, lack of commerce, etc.). Some structural damage can occur if heavy snow knocks down trees or buildings. Because severe winter storms are a frequent occurrence in the Town and Village of Horseheads, these impacts are considered to be "normal."

#12. TRANSPORTATION ACCIDENT

Definition: A mishap involving one or more conveyances on land, sea, and/or in the air that results in mass casualties and/or substantial loss of property.

HAZNY analysis:

- Scope: Large region is vulnerable
- Cascade effects: Some potential to trigger another hazard
- Frequency: Frequent event (occurs more than once a year)
- Onset: No warning
- Hazard duration: Less than one day
- Incident stabilization: Less than one day of overtime emergency operations
- Potential impact: Serious injury or death is likely, but not in large numbers
  Little or no physical and/or economic damage to private property
  Little or no structural damage to community infrastructure

Past hazard events: Although highway crashes with multiple casualties are relatively common, Chemung County has not experienced a major transportation accident resulting in large numbers of casualties. It has not been necessary to utilize the Southern Tier Regional Emergency Medical Service (STREMS) mass casualty trailer in the last five years, except for training and standby status.

- A major train accident occurred in the Town of Southport in the late 50's or early 60's.
- In January 1988, a railroad derailment occurred behind Southside High School. No serious injuries occurred.
- In 1994, a busload of visitors heading for the Southport Correctional Facility went over an embankment on Highway 17 in the Town of Chemung. No serious injuries occurred.

- In Tioga County, Pennsylvania, a charter bus collided with a tractor trailer truck, resulting in a couple of casualties.
- A couple of school bus accidents have occurred in Chemung County in recent years. Although none of these incidents resulted in serious injuries, the emotional trauma is increased when a traffic accident involves school children.

Probability of future events: Crashes on the local roadways are common in the Town and Village of Horseheads. Because the community is transected by highways, secondary roads, railroad tracks, and flight paths, the potential for a major transportation accident must also be anticipated. This risk may increase while the Horseheads Bypass (on Route 17) is under construction. Many hazards impact transportation systems and thus increase the probability of a serious accident. Contributing factors in traffic accidents include poor traction (due to snow, ice, rain, or spilled materials), limited visibility (due to rain, snow, fog, smoke, darkness, etc.), obstructions (such as downed trees or power lines), flooded or damaged roadways, etc.

Potential impact: A credible worst-case event in the Town or Village of Horseheads would be an accident involving a school bus. Potential cascade effects include: hazardous material spill, power outage, fire, and explosion.

Several local organizations are actively involved in improving traffic safety in Chemung County and reducing the probability of major transportation accidents. The Elmira-Chemung Transportation Council (ECTC) conducts planning efforts related to the safety of transportation systems throughout Chemung County. The Chemung County Traffic Safety Board promotes safety education for drivers, pedestrians, bicyclists and all users of the road and street system. A Geographic Information System (GIS) Crash Reporting System has been developed and used for many purposes. Corrective measures that have been implemented at high crash locations include tree trimming and planned turn lanes. Local police departments are using the crash database to target enforcement activities.

Vulnerable areas: Since school buses transport children throughout the community, most roads in the Town and Village are considered to be vulnerable to a major transportation accident. The roads, railroads, and sites of past roadway crashes are shown on the Transportation Infrastructure map in Attachment A. All areas are also vulnerable to an airplane accident. The vulnerability to an airplane accident is greatest below the runway approaches for the Elmira Corning Regional Airport.

Estimate of potential losses: A transportation accident involving a school bus, charter bus, or commercial airline could result in mass casualties. The Chemung County Emergency Management Office estimates that the financial losses from such an incident could be millions of dollars. The highest assessed value for a single property in the Town of Horseheads is $8,600,000; the highest assessed value for a single property in the Village of Horseheads is $15,000,000. An airplane crash could destroy either of these structures and surrounding properties.

#13. TORNADO

Definition: A tornado is a violently rotating column of air that extends from the base of a thunderstorm and comes in contact with the ground. The vortex, up to several hundred yards wide, is visible to the observer as a whirlpool-like column of winds rotating about a hollow cavity or funnel. Tornadoes are the most violent storms on earth, with estimated wind speeds as high as 400 miles per hour.

HAZNY analysis:

- Scope: Large region is vulnerable
- Cascade effects: Highly likely to trigger another hazard
- Frequency: Infrequent event (occurs once every eight to fifty years)
- Onset: No warning
- Hazard duration: Less than one day
- Incident stabilization: One to two days of overtime emergency operations
- Potential impact: Serious injury or death is likely, but not in large numbers
  Severe physical and/or economic damage to private property
  Severe structural damage to community infrastructure

Past hazard events: National Weather Service records indicate that Chemung County has experienced one tornado in the past 20 years (1983 to 2002). In addition, there have been sightings of tornadoes that did not touch down and windstorms, which are classified as severe storms for this analysis. Tornado reports in neighboring counties over the same period include two in Steuben County, two in Schuyler County, two in Tompkins County, two in Tioga County (NY), and four in Bradford County (PA).

- The only confirmed tornado to have impacted Chemung County occurred on May 2, 1983. It was rated an F3 on the Fujita Scale, a potentially devastating storm (with wind speeds of 158 to 206 mph). The area damaged by this tornado was 300 yards wide and 6 miles long in the Town of Chemung. Even though this tornado hit a predominately rural area, it caused an estimated $2.5 million in property damage (source: National Weather Service).
- On May 31, 1985, as many as 41 tornadoes tracked across Ohio, Pennsylvania, and New York. Several of these tornadoes were rated at F4 or F5 strength (on the Fujita Scale, which ranks tornadoes from F0 to F5, with F5 being most severe). Damage from the event was estimated at 450 million dollars, with 75 people killed in the U.S. (source: National Weather Service).
- On May 31 and June 2, 1998, at least 20 tornadoes touched down in northeast Pennsylvania and central New York. Four of these tornadoes were rated F3, with estimated wind speeds in excess of 200 mph. Damage to homes was severe in two New York communities and power outages were reported across the state. 292 homes in Saratoga and Rensselaer Counties sustained damage, with private insurance covering losses on 90% of the damaged structures. The American Red Cross opened ten shelters, housing approximately 600 people, most in Saratoga County. Damages were estimated in the millions of dollars. This outbreak claimed two lives in Pennsylvania (sources: National Weather Service and the NY State Emergency

Management Office *Hazard Mitigation Strategy Report, FEMA-1222-DR-NY*). Two funnel clouds associated with this storm system appeared over Chemung County, but did not touch down in the County.

Probability of future events: Contrary to a popular myth, hills and mountains offer no protection from tornadoes. New York State has an average of five tornadoes a year, which can occur in any region. Based on historic occurrences, Chemung County is expected to experience a tornado an average of once every 10 to 20 years. Because these events are localized, the frequency of occurrence in the Town or Village of Horseheads would be less.

Potential impact: Despite improved weather forecasting capability, tornadoes can occur with little or no warning. A tornado is a great threat to life and usually causes catastrophic damage to property within its path. The winds in the strongest tornadoes are the fastest winds experienced anywhere on earth, with rotation velocities up to 300 mph. They can result in the total destruction of homes (especially mobile homes), businesses, cars, etc. and cause many deaths. Extensive damage to electric and telephone lines is likely. Extensive tree damage along roadways may inhibit or block access. Damaged or destroyed radio and television towers can impede communication. Because tornadoes are associated with thunderstorms, they may be preceded or followed by heavy rainfall or hail. This violent path of destruction caused by a tornado is likely to result in serious injury or death and moderate to severe damage to public and/or private property. Tornadoes can trigger many other hazards, including power outages, structural collapse, fires, and hazardous chemical releases.

The design wind speed as set forth by the American Society of Civil Engineers (ASCE) for tornado safe rooms (shelters) in this region is 200 mph (source: *Understanding Your Risks: Identifying Hazards and Estimating Losses*, FEMA 386-2, August 2001). This standard is based on the extreme loads that can be generated by tornadoes, but is beyond the recommended building code requirements. The New York State Building Code requires construction for a design wind speed of 90 mph. Beginning in January 2003, the building code includes higher wind standards for structures that represent a higher hazard to human life in the event of failure. Buildings constructed in compliance with this code should be able to withstand lower intensity tornadoes, but may be unable to withstand the design wind speed recommended by the ASCE. The NY State Emergency Management Office reports that the vast majority of tornadoes are within the design speeds of building codes (85% have wind speeds of less than 112 miles per hour).

Vulnerable areas: The entire community is vulnerable to tornado damage. Damage paths for tornadoes can be in excess of 1 mile wide and 50 miles long.

Following the 1998 tornadoes, 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. Houses with plywood sheathing held up better than those with cheaper materials, such as chipboard. 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. 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. The locations of mobile home parks are shown on the Vulnerable Sites map in Attachment A. 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 Town or Village could be vulnerable to damage from even a moderate intensity tornado. A worst-case situation would be a tornado striking a gathering of people. The locations of schools, apartment buildings, religious institutions, and gathering places are shown on the Critical Facilities and Vulnerable Sites maps in Attachment A.

Estimate of potential losses: Although a tornado can cause severe damage along its track, the damage is usually localized and does not impact the community at large. A tornado of any intensity can occur in Horseheads, even the most devastating F5 category tornado (with wind speeds of 261 to 318 mph). Since wind speeds associated with tornadoes can be significantly higher than the design criteria in either recent or current building codes, it is anticipated that most buildings within the path of a credible worst-case tornado will sustain at least some damage. If this were to occur in a densely developed part of the community, it could result in several deaths, numerous injuries, and millions of dollars in damages. The estimated damages from the devastating series of tornadoes in 1985 ($450 million of damage from 41 tornadoes in Ohio, Pennsylvania, and New York) corresponds to average losses of $11 million from each tornado. This is greater than the damages reported by NY SEMO for the 1998 events ($5 million in disaster assistance for multiple tornadoes), but the path of the most severe 1998 tornado avoided the most densely populated areas and disaster assistance does not cover all damages. Likewise the tornado that touched down in the Town of Chemung in 1983 (causing an estimated $2.5 million in property damage) impacted a predominantly rural area. A credible estimate of potential losses from a tornado in the Town and/or Village of Horseheads is thus estimated to be $11 million.

#14. UTILITY FAILURE

Definition: Loss of electric and/or natural gas supply, telephone service, or public water supply as a result of an internal system failure and as a secondary effect of another disaster agent.

HAZNY analysis:

- Scope: Large region is vulnerable
- Cascade effects: Some potential to trigger another hazard

- Frequency: Frequent event (occurs more than once a year)
- Onset: No warning
- Hazard duration: Less than one day
- Incident stabilization: Less than one day of overtime emergency operations
- Potential impact: Serious injury or death is unlikely
  Little or no physical and/or economic damage to private property
  Little or no structural damage to community infrastructure

Past hazard events: Localized utility failures occur relatively frequently in Horseheads, but service is typically restored within a few hours.

- In the early 1990's, a transformer failure resulted in loss of power in the northern half of Chemung County for about 6 hours.
- Brownout incidents in the mid-1960's impacted the entire northeast.
- In 2003, the telephone company briefly lost the capability to call toll free numbers from parts of Chemung County.
- A private water system serving the Harris Hill Manor area in the Town of Big Flats was unable to supply water for about three days. This failure resulted from poor maintenance of the private system, which was subsequently taken over by the Town of Big Flats in 1992 (now District 4).
- On August 15-16, 2003, a major failure of the electric power grid affected 50 million people in seven U.S. states and parts of Canada. Power was interrupted for 80% of New York State residents.
- High winds, ice storms, snowstorms, and floods frequently contribute to power outages and other utility failures. Many utilities were disrupted following the 1972 flood. It took several days to fully restore power following a 1991 ice storm, a mid-1990's snowstorm, and a July 2003 windstorm.
- Telephone systems are occasionally overloaded during severe weather, particularly when schools are closed.
- During a July 2003 flood, a reservoir dike broke in the village of Nunda (Livingston County) and cut the Village's 10-inch water main supply, causing major service disruption.

Probability of future events: A widespread and prolonged utility outage is most likely to occur as a cascade effect of another hazard (severe winter storm, ice storm, windstorm, flood, etc.). These incidents are evaluated elsewhere under the triggering event. The loss of power generally results from damage to power lines (due to wind, ice, traffic accidents, etc.) or transmission equipment (often resulting from animal damage). Telephone service can be lost due to overloaded systems, mechanical problems, or damage to phone lines. The Village of Horseheads Water System or the Elmira Water Board can have service interruptions due to treatment or distribution problems, but protection against a prolonged disruption is provided by interconnections with neighboring municipal water supplies (Elmira, Big Flats, and Horseheads). Both the Village of Horseheads Water System and the Elmira Water Board have conducted vulnerability assessments in compliance with federal requirements and are presently addressing all identified security deficiencies. The ongoing maintenance and operational procedures of each utility provider are intended to minimize the risk of service disruption. Although a utility failure of some sort

impacts Horseheads relatively frequently, it is unlikely that a prolonged outage will occur independently of a triggering disaster.

Potential impact: Due to our widespread reliance on electricity, telephones, and potable water, the loss of these services can disrupt many ordinary activities. Emergency communications may be impaired if it becomes necessary to rely on radio communication. A water supply failure can result in an increased fire hazard if it becomes necessary to transport water to areas normally served by fire hydrants. A prolonged power failure can impact heating, food (spoilage, inability to cook), water supplies, industrial processes, and businesses. The most likely cause of injury or death is from unsafe use of alternate fuel sources for heating, cooking, and lighting. Essential services and emergency operations can continue to function during a power outage. Generators are available to provide emergency power for each fire department serving the Town and Village, the Town highway garage, the Village of Horseheads Water System, the Elmira Water Board, and area hospitals.

Vulnerable areas: The entire community is vulnerable to the potential impacts of an electricity or telephone outage. The Village of Horseheads Water System serves about 3,300 customers in the Village and surrounding areas in the Town. The Elmira Water Board serves about 2,700 Horseheads customers south of the Route 17. Properties with gas and electric facilities are shown on the Critical Facilities map in Attachment A.

Estimate of potential losses: An extended utility outage in Horseheads would represent an inconvenience for most residents, with economic losses for some businesses. The greatest economic loss would be for the utility itself, which must provide the crews and equipment to restore service. If a power outage results in 10% of the Town and Village residents seeking overnight shelter with the American Red Cross, the anticipated expense would be over $100,000 (based on a Red Cross estimate that sheltering expenses are in the range of $25-100 per person per day, with higher amounts for overnight sheltering).

#15. FIRE

Definition: Uncontrolled burning in residential, commercial, industrial, institutional, or other properties in developed areas.

HAZNY analysis:

- Scope: Several individual locations are vulnerable
- Cascade effects: Some potential to trigger another hazard
- Frequency: Regular event (occurs once every one to seven years)
- Onset: No warning
- Hazard duration: One day
- Incident stabilization: One to two days of overtime emergency operations
- Potential impact: Serious injury or death is likely, but not in large numbers
  Severe physical and/or economic damage to private property

Little or no structural damage to community infrastructure

Past hazard events: Some of the more severe fires in Chemung County include:

- In the 1980's, a major fire at the Arnot Mall in Big Flats resulted in partial collapse of the roof. Shoppers and employees were successfully evacuated with no injuries.
- Anchor Glass in the Town of Elmira and Village of Elmira Heights has experienced several fires near the molten glass tanks in which employees were near the fire trying to "save" the molten glass. If the tank fails, it is necessary to spray water on the molten glass to solidify it.
- In November 2000, a 300-foot warehouse in the Town of Southport was destroyed by fire, resulting in millions of dollars of losses.

Probability of future events: Most fires are started by people through negligent behavior. Although house fires are a regular occurrence in the Town and Village of Horseheads, they rarely spread to adjacent properties. Fires impacting larger facilities can occur occasionally.

Potential impact: A major fire in the Town or Village of Horseheads is expected to be confined to a single structure or building complex. Development patterns are such that most buildings are surrounded by lawns or parking areas, which protect against the spread of fires to adjacent structures. The use of asphalt shingles also protects against the spread of fire. All fires pose a risk to occupants of the buildings involved and to the firefighters who work to control the blaze. Fires may cause power failures, air contamination, hazardous material releases, structural collapse, or transportation accidents.

Vulnerable areas: The areas most vulnerable to multi-structure fires are those with closely spaced older buildings. The mobile home parks (shown on the Vulnerable Sites map in Attachment A) have closely spaced, old trailers. Industrial facilities that utilize flammable materials are also at risk. Many church buildings (shown on the Vulnerable Sites map in Attachment A) are vulnerable due to the wide expanses within which it would be unsafe for firefighters to combat a blaze. Elderly residents are more likely to be injured or killed by a fire, due to limited mobility and susceptibility to respiratory problems from the smoke.

Estimate of potential losses: The County Emergency Manager/Fire Coordinator indicates that a credible worst-case fire in Horseheads would be one that results in the complete loss of an industrial or commercial building. The Town and Village have several buildings for which the loss of the structure and its contents would exceed a million dollars. The highest assessed value for a single property in the Town is $8,600,000; the highest assessed value for a single property in the Village is $15,000,000.

SECTION 5 – MITIGATION STRATEGY

The overall purpose of the *Town and Village of Horseheads Hazard Mitigation Action Plan* is to protect life and property from natural and human-caused hazards.

The following mitigation strategy outlines the approach that the Town and Village of Horseheads intend to follow in order to reduce their vulnerability to the high priority hazards identified in the previous section. This strategy was developed at a workshop (on January 27, 2003) attended by hazard mitigation planning committees for five neighboring communities that experience similar hazards and risks. This workshop provided a forum for participants to share mitigation ideas and success stories. Following the workshop, numerous agency experts were consulted to refine the draft strategy, which was further refined during the local review and revision process. As part of this strategy development process, committee members reviewed the draft risk assessment information (Section 4 and Attachment C of this plan) to insure that the mitigation strategy incorporates the characteristics of each hazard and the local vulnerabilities. In addition, the goals and objectives that had previously been developed as part of the flood mitigation planning process and other planning efforts were reviewed and incorporated into this mitigation strategy.

Each mitigation goal is a general statement of what the Town and Village of Horseheads wish to achieve in order to reduce the community's vulnerability to natural, technologic, and man-made hazards. These goals specifically address the highest ranked hazards for Horseheads and focus on those measures that will provide the greatest benefit in hazard reduction. For each mitigation goal, the committee assessed the local circumstances in order to identify the types of activities that are needed to achieve the goal. In addition, information about mitigation techniques (provided by federal, state, and local emergency officials) was reviewed in order to insure that a full range of viable mitigation alternatives was considered. Based on this evaluation, objectives were developed for each goal. Each objective is a measurable statement of what the community would like to achieve. Taken together, these goals and the corresponding objectives represent the overall strategy for reducing the community's vulnerability to hazards. The specific implementation measures proposed by the Town and Village are presented in the following section (Section 6).

Many of the mitigation measures recommended in this plan address multiple hazards. More specific recommendations were also developed for the hazards ranked as high priority and moderately high priority. The moderately low and low priority hazards are addressed as part of the multi-hazard mitigation strategy.

MULTI-HAZARD MITIGATION

Goal: Raise public awareness about hazards and how to respond.

Objectives:

- Develop and implement a public outreach and education program about natural/manmade hazards and family preparedness. Conduct outreach programs targeting at-risk populations (elderly, young adults, vulnerable neighborhoods, children, etc). Topics should include hazard information, family disaster planning, emergency supplies, how to respond to sirens and other warnings, how to obtain current warning information, how to shelter-in-place, evacuation procedures, "good neighbor" policies, transportation safety, mitigation measures, etc.
- Be available to assist schools with fire, weather hazard, and terrorism education and drills.
- Encourage greater utilization of NOAA Weather Radios by residents, businesses, and institutions to improve dissemination of emergency warnings and information.
- Encourage participation in the Community Disaster Preparedness workshops and other training sponsored by the Chemung-Schuyler Chapter of the American Red Cross.
- Make the *Town and Village of Horseheads Hazard Mitigation Action Plan* available to the public at municipal offices, public libraries, and online.
- Integrate the educational outreach efforts of the Town and Village stormwater management programs (required by MS4 Stormwater permits) with public outreach about other hazards.

Goal: Provide emergency services in a timely and effective manner.

Objectives:

- Review the Town *Emergency Management Plan* and the Village *Emergency Response Plan* annually to verify that they are current and consistent with the *Chemung County Comprehensive Emergency Plan*.
- Provide municipal officials with periodic training in the Incident Command System and the operations procedures specified in the Town *Emergency Management Plan* and the Village *Emergency Response Plan*.
- Periodically verify that the equipment identified in the Town *Emergency Management Plan* and the Village *Emergency Response Plan* is available and in good condition.
- Periodically test all emergency communication equipment; upgrade as appropriate.
- Identify local animal hospitals, kennels, and other places where pets and farm animals can be housed during an evacuation.
- Periodically verify that there are current emergency response plans in effect for schools, nursing homes, emergency health care facilities, the airport, and businesses that handle hazardous materials. Provide any needed technical assistance to ensure that each plan is adequate and consistent with municipal and county plans.
- Maintain communication among highway departments to enable coordinated maintenance of emergency transportation routes.
- Periodically meet with the safety officer of each school and daycare center to review the Safe Schools Against Violence in Education (S.A.V.E.) plan or emergency plan and verify

consistency with municipal emergency operations.

Goal: Maintain the viability of all critical facilities and operations.

*A **critical facility** is any facility that is an integral part of emergency response operations or one that requires special emergency response due to the potential at the site for triggering an additional hazardous incident.* A list of Critical Facilities and Operations Serving the Town and Village of Horseheads is included in Attachment A.

Objectives:

- Periodically review and update the list of critical facilities serving the Town and Village.
- Develop and implement a program to ensure that all critical facilities are able to provide essential services during a power outage.
- Ensure that the operator of each critical facility conducts a structural evaluation, assesses the facility's vulnerability to hazard events, recommends mitigation measures, and identifies safety zones within the structure (areas that offer the greatest protection from roof failure, broken glass, flying debris, etc.). Provide technical assistance as needed.
- Develop and implement strategies to mitigate identified risks to critical facilities.
- Periodically review and update the emergency operation plans for critical facilities.

Goal: Maintain political support for hazard mitigation and emergency response.

Objectives:

- Review contents of the Town *Emergency Management Plan* and the Village *Emergency Response Plan* with the Town and Village Boards each time the plans are updated.
- Invite municipal elected officials to meetings of the Horseheads Hazard Mitigation Planning Committee, which monitors implementation of this *Hazard Mitigation Action Plan* and oversees its periodic revision (at least every 5 years).
- Review contents of the *Town and Village of Horseheads Hazard Mitigation Action Plan* with the Town and Village Boards and Planning Boards each time that the plan is updated.
- Provide hazard mitigation and response training for municipal board members.

Goal: Establish and maintain partnerships between public and private sectors.

Objectives:

- Maintain and expand public/private sector coordination through organizations that are actively involved in hazard reduction activities (see table of Public/Private Organizations Involved in Hazard Mitigation and Response in Attachment A).
- Encourage leadership within public and private sector organizations to prioritize and implement hazard mitigation activities.

HAZARDOUS MATERIALS (hazardous material released in transit, hazardous material released from a fixed site, petroleum spill, explosion, radiological release in transit)

Goal: Provide the public with information about how to respond appropriately to a hazardous material incident.

Objectives:

- Periodically disseminate disaster education information in neighborhoods near major transportation routes, pipelines, and facilities that use or store hazardous materials, with particular emphasis on evacuation and shelter-in-place procedures.

Goal: Ensure quick and effective response by emergency response personnel to a hazardous material release or explosion.

Objectives:

- Ensure that first responders periodically obtain hazardous material training.
- Ensure that first responders periodically inventory their equipment and supplies for hazardous material response and make additional purchases as needed.
- Ensure that fire departments maintain up-to-date information about hazardous materials stored and used within their jurisdictions (209-U reports) and are familiar with the layout of these facilities. Additional effort may be required to maintain familiarity with agricultural operations, since they are exempt from hazardous material reporting requirements.
- Provide emergency responders with access to up-to-date information about hazardous substances and appropriate management techniques.
- Ensure that emergency and highway personnel periodically review procedures, detour routes, and equipment needs for traffic and crowd control.
- Ensure that hospitals have access to the medications and equipment needed to treat people exposed to hazardous materials.

Goal: Design and locate new development in such a manner as to minimize risks associated with the transport and use of hazardous materials.

Objectives:

- Periodically review the Town and Village Comprehensive Plans and land use regulations (and revise as necessary) to verify that they promote development patterns in which major transportation routes and industrial facilities are located away from population centers, schools, gathering places, groundwater recharge areas, etc.
- When highway construction projects are in the design stage, ensure that emergency response personnel review draft plans to evaluate drainage, site access, and other conditions that might impact the dissemination of hazardous materials and the ability of emergency personnel to respond.

Goal: Utilize equipment, processes, and procedures that minimize the risk of explosion or exposure to hazardous substances at facilities that store and/or use hazardous materials.

Objectives:

- Encourage the owners of facilities that store and/or utilize hazardous materials to retrofit storage and operational facilities, as appropriate, to enhance safety.
- Assist facilities that store and/or use hazardous materials to periodically review and update each facility's emergency operation plan.

TRANSPORTATION SAFETY (transportation accident, hazardous material released in transit)

Goal: Maintain and upgrade roads in a manner that promotes transportation safety.

Objectives:

- Ensure that highway departments monitor weather conditions and forecasts to enable timely response to snow, ice, and high water conditions.
- Ensure that highway departments periodically review and revise plowing schedules, high water inspection procedures, and road maintenance schedules to maximize roadway safety. High accident sites will be given priority for plowing and road maintenance.
- Ensure that highway departments periodically survey road lighting and approved traffic control devices (signs, markers, signals, etc.) and upgrade as needed.
- Ensure that transportation planners and highway departments use the information in the Crash Reporting System developed by the Elmira-Chemung Transportation Council to identify locations that might require an engineering improvement to prevent future accidents.
- When highway departments prepare budgets and schedules for road improvements, give priority to those projects that enhance safety by improving traffic patterns, road conditions, and signage.
- In conjunction with the Elmira-Chemung Transportation Council and NYS Department of Transportation, develop an Access Management Plan for the major travel corridors in the Town and Village.
- In conjunction with the Elmira-Chemung Transportation Council, evaluate potential applications of Intelligent Transportation System technology for improving traffic safety.
- Implement traffic calming techniques as "add-ons" to other road projects or as freestanding projects.

Goal: Promote transportation safety.

Objectives:

- In conjunction with the Chemung County Traffic Safety Board, raise public awareness about traffic safety issues by participating in outreach efforts and disseminating safety information.
- Provide municipal personnel with opportunities to participate in defensive driving training. In particular, school bus drivers, public transit drivers, snowplow drivers, and those who

transport hazardous materials should be encouraged to participate.
- Utilize the GIS Crash Reporting System maintained by the Elmira-Chemung Transportation Council to target police enforcement efforts at high crash locations and times.

Goal: Design and locate new development projects to promote transportation safety.

Objectives:
- Periodically review the Town and Village Comprehensive Plans and land use regulations (and revise as necessary) to verify that they promote development patterns in which major transportation routes and industrial facilities are located away from population centers, schools, and gathering places.
- Periodically review Town and Village regulations (and revise as necessary) to verify that they promote proper access management on busy corridors and secondary roads. (By limiting the number of driveway accesses, traffic flow is more predictable and therefore safer.)
- Promote greater use of context-sensitive design principles that harmonize the relationship between the road and nearby land use and incorporate traffic calming techniques.
- Encourage interconnection of subdivision roads in order to diffuse traffic patterns.
- Periodically provide transportation safety training for the Town and Village Planning Boards.
- Ensure that highway departments periodically review their standards for new roads and curb cuts to verify that they promote road safety.

Goal: Ensure quick and effective response by emergency response personnel to a major transportation accident.

Objectives:
- Develop comprehensive traffic management plan(s) for routine, special, and emergency traffic conditions.
- Establish intermunicipal/interagency agreements for traffic-related information sharing.
- In conjunction with the Elmira-Chemung Transportation Council, evaluate potential applications of Intelligent Transportation System technology for improving incident response.
- Ensure that emergency and highway personnel periodically review procedures, detour routes, and equipment needs for traffic and crowd control.
- Ensure that emergency personnel periodically evaluate the need for alternate access routes to areas that may become isolated if a bridge, railroad crossing, or other transportation route becomes blocked. If problem areas are identified, evaluate alternative solutions and seek funding for implementation.
- Periodically review and update the *Chemung County Offsite Air Disaster Response Plan*.
- Periodically review and update the *Elmira-Corning Airport Emergency Response Plan*. Ensure that fire departments participate in airport drills.
- Periodically review and update hospital disaster plans.
- The Chemung County Emergency Management Office maintains custody of the Southern Tier Regional Emergency Medical Service (STREMS) trailer, which is designed for response to mass casualty incidents.

FLOOD/FLASH FLOOD

Goal: Raise public awareness about flood hazards, flood safety, and flood damage protection measures.

Objectives:

- Periodically disseminate flood hazard information to owners of flood-prone property and the general public. Topics should include information about flood-prone areas (including known locations of high water table), property owner responsibilities for streams, flood-proofing measures, flood insurance, and flood safety measures.
- Develop and implement a public outreach and education program about stream management, drainage, and stormwater issues in conformance with the requirements of the Municipal Separate Storm Sewer System (MS4) permit for urbanized areas and in cooperation with neighboring municipalities.

Goal: Protect new development from flooding hazards.

Objectives:

- Ensure that Code Enforcement Officer(s) receive periodic training and political support to effectively enforce existing floodplain development regulations.
- Improve flood hazard assessment information on which development standards are based.
- Evaluate the need to enact local floodplain development standards that are more stringent than the National Flood Insurance Program requirements.
- Evaluate mechanisms for insuring that basements of new buildings are elevated above known high water table levels.

Goal: Protect new and existing development from streambank erosion.

Objectives:

- Evaluate the effectiveness of local land use regulations in protecting private bridges and structures from erosion damage and protecting stream corridors from alterations that may result in increased erosion. Modify regulations as appropriate.
- Develop and implement a strategy for stabilizing stream channels in locations where bank erosion threatens development.

Goal: Ensure that runoff from new construction and land use changes does not contribute to increased flood risks.

Objectives:

- Implement an effective municipal stormwater management program in conformance with the requirements of the Municipal Separate Storm Sewer System (MS4) permit for urbanized areas and in cooperation with neighboring municipalities.
- Develop and implement a strategy for incorporating watershed planning and regional

stormwater management practices into the Town and Village stormwater management programs.
- Develop and implement a strategy to minimize the drainage impacts of timber harvesting activities.

Goal: Maintain streams, drainage ways, and drainage structures to minimize the potential for obstruction of flow.

Objectives:
- Develop and implement a program for routine inspection and maintenance of streams, roadside ditches, and drainage ways in order to reduce the potential for flooding caused by debris obstructions.
- Develop and implement a strategy for maintenance of privately owned stormwater drainage systems.
- Formalize the drainage system maintenance program and document inspection activities in order to maintain National Flood Insurance Program Community Rating System Credit for these activities.

Goal: Mitigate flood risks for existing development.

Objectives:
- Develop and implement a strategy for maintaining and enhancing the natural hydrologic functions of stream/river channels, floodways, floodplains, and wetlands.
- Evaluate opportunities (and implement as appropriate) to alleviate flooding problems by retaining or retarding water upstream.
- Develop and implement a strategy for replacing undersized bridges and culverts on public roadways and on private property.
- Encourage/assist property owners with implementation of measures that will protect existing development from flood risks (elevation of utilities, sewer backup protection, flood-proofing measures, extension of municipal sewer and water, property buyouts, etc.).
- Promote flood insurance coverage for at-risk structures.
- Maintain and expand involvement in the National Flood Insurance Program Community Rating System Program so that properties in the Town and Village receive a discount on flood insurance premiums.

Goal: Provide timely and reliable warning of floods and flash floods.

Objectives:
- Support maintenance and expansion of the flood warning capabilities of the Chemung Basin Flood Warning Service (operated by Environmental Emergency Services).
- Provide municipal officials and emergency response personnel with periodic training in the use of flood stage maps and other tools.

SEVERE WEATHER (severe storm, severe winter storm, ice storm, tornado, extreme temperatures)

Goal: Maintain trees appropriately in areas where broken branches can severely impact infrastructure and other development.

Objectives:

- Maintain trees along municipal rights of way, as needed.
- Support/encourage utility companies to maintain trees near telephone and power lines.
- Periodically disseminate educational information about maintenance of trees adjacent to homes and other structures and recommended trees for urban landscaping.
- Provide brush pickup services and/or designated drop-off locations to encourage residential tree maintenance.
- Provide developers with guidance concerning the location of aboveground utilities in order to facilitate easy access by maintenance vehicles.

Goal: Bury utility cables so they are not susceptible to damage by wind and ice.

Objectives:

- Recommend and encourage the use of underground utilities in new developments, where feasible.
- Support/encourage electric utility companies to use underground construction methods wherever possible.

Goal: Raise public awareness about severe weather conditions and how to respond.

Objectives:

- Periodically disseminate disaster education information with guidance about how to obtain severe weather information, how to respond to severe weather conditions, how to shelter at home if that is necessary.
- Disseminate information prepared by the NY State Emergency Management Office and National Weather Service for "Severe Weather Awareness Week" in March and "Winter Weather Awareness Week" in October.
- Support maintenance and expansion of the early warning capabilities of the National Weather Service and Chemung Basin Flood Warning Service (operated by Environmental Emergency Services).
- Encourage greater utilization of NOAA Weather Radios by residents, businesses, and institutions to improve dissemination of severe weather watches, warnings, and advisories.
- Provide municipal personnel with opportunities to participate in defensive driving training, which includes information about how to respond to severe weather conditions. In particular, school bus drivers, public transit drivers, snowplow drivers, and those who transport hazardous materials should be encouraged to participate

Goal: Require that buildings be designed to withstand high wind and heavy snow.

Objectives:

- Ensure that Code Enforcement Officer(s) receive periodic training and political support so that they can effectively enforce the structural standards in the New York State Building Code.
- Encourage structural inspection of older buildings that may not conform with the structural standards of the current New York State Building Code to identify potential vulnerabilities.
- Encourage implementation of preventive measures for existing development to reduce the vulnerability to severe weather damage.

Goal: Reopen transportation routes as quickly as possible following a severe weather event.

Objectives:

- Ensure that highway departments monitor weather conditions and forecasts to enable timely response to snow, ice, and high water conditions.
- Ensure that highway departments periodically review and revise plowing schedules and hazardous weather response procedures to minimize the time required to restore safe roadways.
- Ensure that highway departments coordinate with emergency service providers to assist with the transportation necessary to provide emergency services.

TERRORISM AND SCHOOL VIOLENCE

Goal: Provide the public with information about potential terrorist threats and how to respond.

Objectives:

- Encourage residents, businesses and institutions to utilize NOAA weather radios, which can activate an alarm for civil emergency messages in addition to weather information.
- Educate residents about the Emergency Alert System, which utilizes radio and television to broadcast emergency messages.

Goal: Address terrorist threats in the operating policies of facilities that may be potential terrorist targets.

Objectives:

- Identify potential terrorist targets; develop target protection plans and public response plans.
- Ensure that public water suppliers prepare and periodically update vulnerability assessments (mandatory for all public water systems serving 3,300 or more persons).
- Ensure that public water suppliers prepare and periodically revise emergency response plans, which incorporate the findings of the vulnerability assessments (mandatory for all public

water systems serving 3,300 or more persons).

Goal: Ensure a quick and effective response to any emergency at a school.

Objectives:

- Ensure that first responders actively participate with each school in the planning and implementation of the Safe Schools Against Violence in Education (S.A.V.E.) program.
- Ensure that municipal officials periodically meet with the safety officer of each school to review the S.A.V.E. plan and verify consistency with municipal emergency operations.
- Ensure that school administrators receive periodic training in the Incident Command System and the operations procedures specified in the S.A.V.E. Plan.

Goal: Coordinate with county, state, federal, and international task forces and agencies that are preparing for or responding to terrorist threats.

Objectives:

- Assist the Regional Terrorism Task Force, when asked. This police task force facilitates information transfer between the federal, state, and local levels.
- Assist the Chemung County Emergency Management Office, when asked. The EMO is responsible for county level coordination of terrorism response.
- Develop emergency response plans for public water suppliers and other potential terrorist targets in coordination with emergency response agencies.

AGING INFRASTRUCTURE

Goal: Conduct periodic inspection and maintenance of infrastructure.

Objectives:

- Develop and implement a drainage system maintenance plan for periodic inspection of aboveground and subsurface drainage ways and routine maintenance as needed.
- Implement periodic inspection and maintenance of the Village of Horseheads water system.

Goal: Upgrade infrastructure.

Objectives:

- Prioritize infrastructure needs.
- Seek funding for priority infrastructure projects.

UTILITY FAILURE

Goal: Maintain essential services and emergency operations during a utility failure.

Objectives:

- Evaluate the ability of each critical facility serving the Town to provide essential services in the absence of power, telephone service, natural gas, or municipal water.
- Develop and implement strategies to provide critical facilities with stationary or portable generators or to identify alternate procedures/locations that can be utilized in the event of a power outage.
- Verify that backup generators at critical facilities are periodically tested and maintained.
- Develop and implement strategies to provide critical facilities with radio equipment or other means of communication that do not rely on telephone service.
- Periodically test all emergency communication equipment.

Goal: Restore utility service as quickly as possible following an outage.

Objectives:

- Periodically verify that the Town *Emergency Management Plan* and the Village *Emergency Response Plan* have up-to-date utility contact information, so that the Town and Village can assist with the dissemination of information and/or the restoration of service as appropriate.

Goal: Provide the public with information about what to do during an extended power outage.

Objectives:

- Periodically disseminate disaster education information with guidance about how to get information about a power outage and how to manage in the absence of electricity.

FIRE/WILDFIRE

Goal: Raise public awareness about fire safety.

Objectives:

- Periodically disseminate educational information about fire prevention and safety to school children and the general public.

Goal: Ensure quick and effective response by fire departments to fires and wildfires.

Objectives:

- Ensure that fire department personnel have the training and equipment needed to respond effectively to fires and wildfires.
- Effectively coordinate responses among multiple fire department responding to an incident.

Goal: Construct new development in such a manner as to reduce the susceptibility to fire damage.

Objectives:

- Develop and implement building standards with greater fire safety provisions than those in the NYS Building Code.

SECTION 6 – ACTION PLAN

In order to meet the goals and objectives identified in the previous section, the Town and Village of Horseheads recommend implementation of the following actions. These high priority mitigation actions were developed at hazard mitigation planning committee meetings (held on May 27, 2003 and June 4, 2003) and subsequently refined based on individual communications and review of draft documentation. The committee reviewed the mitigation strategy for this plan (Section 5) and identified projects that are needed to facilitate achievement of the goals and objectives. The committee also reviewed the mitigation actions recommended during previous flood mitigation planning efforts. This information was supplemented by a review of existing literature and discussions with local experts. The mitigation actions considered encompass a variety of approaches, including: prevention, property protection, public education/awareness, natural resource protection, emergency services, and structural projects. The committee focused on those mitigation actions that address the high priority hazards for the Town and Village of Horseheads (presented in Section 4) and contribute to achieving the goals and objectives in Section 5 of this plan. Alternative mitigation actions were evaluated, selected, and prioritized based on the following criteria:

- Social: Will the action be accepted and supported by the individuals who will be impacted and by the community at large?
- Technical: Is the action a technically feasible, long-term solution with minimal or no adverse secondary impacts?
- Political: Is the action supported by political leaders, local proponents (to help see the action to completion), and the public?
- Legal: Does the Town, Village, or County have the legal authority to implement the proposed action?
- Economic: Is the action a cost-effective means of providing hazard mitigation and community benefits?
- Environmental: Is the action consistent with community environmental goals?
- Administrative: Are the staff and funding available to implement and maintain the action? NOTE: Inadequate resources did not preclude consideration of an action.

Those actions that satisfy the first six criteria are recommended as high priority actions and are presented in this section. These are the measures that are recommended for implementation in the Town and Village of Horseheads in order to meet the goals and objectives identified in the previous section. Some of the proposed actions do not constitute a complete solution, but represent the portion of a desired action that can currently be implemented. The proposed actions that also fulfill the administrative criterion and can be implemented through existing municipal programs are listed separately from those for which additional funding is needed.

This action plan only includes those items that can be accomplished over the next several years by the Town of Horseheads, Village of Horseheads, and Chemung County Emergency Management Office. Fully achieving the goals and objectives set forth in this plan obviously

necessitates additional activities in future years, as well as the active participation of additional partners.

MEASURES TO BE IMPLEMENTED THROUGH EXISTING PROGRAMS

The Town and Village of Horseheads are already implementing programs and enforcing regulations that achieve many of the mitigation objectives identified in this strategy. These hazard mitigation efforts will be maintained. Additional objectives can be met by incorporating additional hazard mitigation components into existing municipal operations and ongoing local programs. The following high priority activities utilize existing or anticipated local resources to mitigate hazards. Implementation of these measures would move Horseheads further toward its goal of being a disaster resistant community. The Town and Village of Horseheads plan to continue or initiate each of the following activities using existing or anticipated resources. However, it must be recognized that fiscal constraints limit the staff and financial resources that can be devoted to these activities and may delay or preclude full implementation of some of these proposed measures.

Multi-Hazard Mitigation – Public Information

Disseminate hazard information at municipal offices: At least once a year, the Code Enforcement Officer will review the brochures that are available in the Town and Village offices and evaluate the need for additional information about hazards, emergency preparedness, hazard mitigation, and stormwater management. Appropriate brochures will be procured and maintained on the display racks. The map of flood hazard and flood problem areas that is included in this plan will be displayed in the Town and Village offices. Copies of the *Town and Village of Horseheads Hazard Mitigation Action Plan* will be available at the Town Hall and Village Hall.

Include hazard information in *Community Policing* newsletter articles: The Town will continue to print articles about flooding and other hazards in the *Horseheads Community Policing Newsletter,* which is distributed to all residents in the Town, Village, and neighboring areas. Newsletter articles will inform residents about the measures they can take to prepare for disasters and mitigate the potential impacts.

Disseminate hazard information on the County website: When the Chemung County Emergency Management Office expands the scope of information available on the County website, additional information about hazards and emergency response will be incorporated directly or by linking to other sites. Topics will include hazard information, family disaster planning, emergency supplies, how to obtain current warnings, how to shelter-in-place, evacuation procedures, "good neighbor" policies, transportation safety, mitigation measures, etc.

Support education efforts: The Town and Village of Horseheads will continue to participate in and support County, regional, and state education efforts that address: natural hazards, flood

mitigation, stormwater management, emergency preparedness, and related topics. Both municipalities will continue to participate in the Chemung County Stormwater Coalition. The Town and Village Code Enforcement Officer will continue to participate, as requested, in Career Development Council programs and an annual one-day program about development at Horseheads High School. Site-related hazards, such as flooding and drainage, are incorporated into each presentation. Outreach efforts to senior citizens can be coordinated through TRIAD, a coalition of senior citizen support organizations serving Chemung County.

Encourage greater utilization of NOAA weather radios: The National Weather Service uses the NOAA Weather Radio system to broadcast weather forecasts, flood forecasts, warnings, watches, other hazard information, and post-event information. In order to increase utilization of these emergency broadcasts, Environmental Emergency Services is planning a public information campaign and has initiated contacts with potential local business partners.

Multi-Hazard Mitigation – Emergency Services

Review and update Emergency Plan: The Town of Horseheads *Emergency Management Plan* and Village of Horseheads *Emergency Response Plan* document procedures that enable each municipality to provide leadership and coordination during an emergency. These plans will be periodically reviewed and updated to insure that the information is current and accurate. At a minimum, contact information (for municipal officials, emergency personnel, utilities, etc.) will be updated annually. A complete review of each plan will be conducted every two years or after any event that triggers activation of the plan.

The Chemung County Emergency Management Office will be involved in this planning process in order to insure consistency with the *Chemung County Comprehensive Emergency Plan*. In addition, each fire department and police department that serves the Town and Village will be asked to participate in the plan review process in order to insure their familiarity with the plans. Once revised, the contents of the Town and Village Emergency Plans will be reviewed with the municipal elected officials and staff.

Issues that will be evaluated as part of the plan review process, include:

- Verify that the equipment identified in the Town *Emergency Management Plan* and Village *Emergency Response Plan* is available and in good condition.
- Test emergency communication equipment; upgrade as appropriate.
- Review and update the list of critical facilities serving the Town and Village.
- Evaluate each critical facility to identify potential vulnerabilities, such as: structural problems, outdated emergency operation plan, lack of an identified safety zone within the structure (areas that offer the greatest protection from roof failure, broken glass, flying debris, etc.), inability to function during a power outage, etc. Develop a strategy that will mitigate or compensate for any identified risks to critical facilities.
- Contact the American Red Cross to confirm the adequacy of evacuation shelters, particularly for a regional event, such as a widespread power outage during cold weather.

- Identify local animal hospitals, kennels, and other places where pets and farm animals can be housed during an evacuation and enter into agreements with these facilities. Include a list of these resources in the plan.
- Assemble a list of key equipment that may be available from neighboring municipalities and the County to assist with municipal operations during an emergency. Include a list of these resources in the plan.
- Review and document procedures for highway departments to assist with the transportation needs of emergency service providers when the roads are not generally passable.
- Meet with the safety officer of each school and daycare center to review the school's Safe Schools Against Violence in Education (S.A.V.E.) plan or emergency plan and verify consistency with the Town *Emergency Management Plan* and Village *Emergency Response Plan*. Schools and daycare facilities in the Town and Village of Horseheads include: Horseheads Central High School, Horseheads Middle School, Center Street School, Gardner Road School, Ridge Road School, Sing Sing Road School, St. Mary Our Mother School, Twin Tiers Baptist School, BOCES (Philo Road), Bethany Village Day Care, and Blue Skies Daycare Center.
- Contact key industries and businesses (nursing homes, health care facilities, the airport, businesses that handle hazardous materials, etc.) to verify that they have emergency response plans, that those plans are consistent with the municipal emergency response plans, and that up-to-date 209-U reports are on file with the fire department.
- Identify potential terrorist targets; develop target protection plans and public response plans.
- Meet with NYS Department of Transportation staff to review risk and response issues related to potential transportation accidents and hazardous material in transit incidents.
- Review Dam Safety Plans for dams located upstream of the Horseheads to verify consistency with the Town *Emergency Management Plan* and Village *Emergency Response Plan*.
- Evaluate the need for alternate access routes to areas that may become isolated if a bridge, railroad crossing, or other transportation route becomes blocked.

Support Environmental Emergency Services, Inc.: Environmental Emergency Services, Inc. is a not-for-profit organization that utilizes volunteers to run the local Flood Warning Service and Chemical Hazard Information Team for Steuben and Chemung Counties. The Town of Horseheads has historically contributed to the operating expenses of this organization. When the Town and Village consider the annual request for funding from Environmental Emergency Services, they will request presentations about the services provided, so that each municipal board can make an informed decision about the appropriate level of financial support.

Multi-Hazard Mitigation – Preventive Measures

Periodically review and revise Comprehensive Plan and land use regulations: The Village Comprehensive Plan was developed in 1969 and requires revision. Both the Town and Village of Horseheads enacted major code revisions in 2001. Additional review and revision of land use regulations will be conducted as needed. The following issues will be evaluated as part of this review process:

- Is the Town/Village effectively promoting development patterns in which major transportation routes and industrial facilities are located away from population centers, schools, gathering places, groundwater recharge areas, etc.?
- Does the Town/Village maintain predictable (and therefore safe) traffic flow by limiting the number and use of driveway accesses?
- Does the Town/Village encourage the use of traffic calming treatments in roads and parking areas constructed for new development?
- Does the Town/Village encourage interconnection of subdivision roads in order to diffuse traffic patterns and minimize single access roads?
- Do local regulations include adequate stream setbacks and standards to protect buildings and private bridges from damage due to streambank erosion?
- Do the Town/Village floodplain development regulations (required by the National Flood Insurance Program) provide adequate flood protection for new development in areas with known flood risks? When updated digital Flood Insurance Rate Maps are available, each municipality will consider the desirability of additional construction standards or regulation of additional areas not identified on the Flood Insurance Rate Maps.
- Do the stormwater management and erosion control standards provide adequate protection against increased flood damages? Prior to 2008, these regulations must be revised to meet the requirements of the Town's MS4 stormwater permit. At that time, the Town will evaluate the desirability of additional measures, such as promotion of regional stormwater management.
- Do the stormwater management standards discourage the use of drywells in wellhead protection areas and other sensitive locations?
- When regulations prohibiting illicit discharges into the municipal separate stormwater sewer systems are developed for the MS4 stormwater program, both municipalities will consider more inclusive requirements that also prohibit stream dumping.
- Are there urban and suburban areas where underground utilities should be required if feasible?

Provide hazard mitigation training for Planning Board members: The Code Enforcement Officer periodically briefs the Town and Village Planning Boards and municipal Boards about hazards that relate to site planning, transportation patterns, and development standards. Recent briefings have addressed stormwater management and National Flood Insurance Program floodplain development standards.

Hazardous Materials – Public Information

Implement radon testing and education program: The Chemung County Environmental Management Council will continue their ongoing radon testing program. Radon test kits are provided to the public at a discounted price. Test results obtained through this program are maintained in a database linked to map locations. Grant funding has been obtained to implement a radon education program that targets minority and low-income residents.

Hazardous Materials – Emergency Services

Provide hazardous material awareness training for Highway Department: Staff in the Town Highway Department and Village Public Works Department should receive periodic training in hazardous material awareness. The Chemung County Safety Coordinator/Emergency Planner will offer this training annually and invite participation from the Town Highway Department, Village Public Works Department, fire departments, and the Horseheads Police Department.

Transportation Safety – Preventive Measures

Maintain communication with the NYS Department of Transportation: The Town and Village of Horseheads will continue to participate in a working group that is doing advanced planning for corridor management along future Interstate 86 (State Route 17) and State Route 13. Other participants are the NYS Department of Transportation and the Elmira-Chemung Transportation Council. This working group's objective is to identify and mitigate future risks along these major transportation corridors. Through this process and other means, the Town and Village will actively seek to maintain good lines of communication with the NYS Department of Transportation during the planning, design, and implementation of any DOT projects within their jurisdictions. Municipal representatives and emergency response personnel will review draft plans to evaluate drainage, site access, and other conditions that might impact the dissemination of hazardous materials and the ability of emergency personnel to respond.

Provide municipal personnel with defensive driving training: Municipal staff who drive private or municipally owned vehicles as part of their jobs will be provided the opportunity to attend defensive driving classes taught by the Chemung County Safety Coordinator. The cost to the municipality is reduced by participation in the county training. The Village Department of Public Works has offered department staff the opportunity to participate every three years. Consideration will be given to expanding this participation to include other Village staff and Town staff.

Update Village code for vehicles and traffic: The Village of Horseheads periodically surveys approved traffic control devices (signs, markers, signals, etc.) and updates their local code for vehicles and traffic. This local code enhances the ability of the Horseheads Village Police to promote traffic safety through enforcement activities. The survey of traffic control devices enables identification and resolution of any deficiencies or traffic safety needs.

Flood/Flash Flood – Public Information

Utilize direct mailing to owners of flood-prone property: The Town and Village will continue to distribute flood information to owners of property in the 100-year floodplain as part of their Community Rating System outreach effort. Each year, the Code Enforcement Officer will review the information that is sent and the distribution list. Revisions will be made as appropriate. In addition, both municipalities will continue to mail information to the owners of property in specific problem areas whenever the need arises.

Flood/Flash Flood – Emergency Services

Expand network of volunteer rain gauge readers: The Town and Village will continue to work with the Chemung County Emergency Management Office (EMO) to recruit volunteer rain gauge readers located in Horseheads and provide them with National Weather Service rain gauges.

Install stream gauges in Newtown Creek: The Town and Village of Horseheads will work with the Chemung County Emergency Management Office (EMO) and the Flood Warning Service of Steuben and Chemung Counties to address the lack of stream gauge information for Newtown Creek. High priority will be placed on establishing either a painted staff gauge or an automated real-time gauge with the same datum as the U.S. Geological Survey gauge on Newtown Creek in Elmira (which no longer provides real-time data). Level measurements from this gauge would enable utilization of the existing Newtown Creek Flood Stage Forecast Maps for emergency operations. An additional gauge upstream of the Village is also desired to provide advanced warning of high water levels. When additional gauges are installed, procedures will be developed for reading staff gauges, reporting levels during high water events, and maintaining records. When sufficient gauge data are available, stage relation plots and travel time estimates will be prepared.

Flood/Flash Flood – Preventive Measures

Inspect and maintain drainage ways: Both the Town and Village have ongoing programs for routine inspection and maintenance of road ditches, culverts, streams, and other drainage features. Improved documentation procedures will be developed to improve the effectiveness of these inspection and maintenance activities and to qualify for increased Community Rating System credit for drainage system maintenance.

Participate in joint maintenance program for Old Chemung Canal: The Town of Horseheads will continue to participate in a joint maintenance program for the Old Chemung Canal, in cooperation with Chemung County, the Town of Elmira, the Village of Elmira Heights, and the City of Elmira. These partners have signed an agreement in which routine maintenance responsibilities are rotated among the participants. In addition, each partner contributes annually to an account that will pay for any restoration needs in excess of this routine maintenance. This program is administered by the Chemung County Soil and Water Conservation District and protects development along McCann's Tributary, including the National Flood Insurance Program "repetitive loss property" on Valley Avenue.

Request updated Flood Insurance Rate Maps: In order for the municipal floodplain development regulations to effectively prevent flood damages, they must be based on accurate floodplain mapping. The Town and Village of Horseheads will both write letters to the Department of Environmental Conservation, Bureau of Flood Control (which is implementing map modernization efforts in New York) requesting that Chemung County be assigned a high priority for floodplain map modernization efforts.

Flood/Flash Flood – Natural Resource Protection

Encourage establishment and maintenance of vegetated riparian buffers: The Town and Village will continue to support the establishment and maintenance of vegetated buffer strips along waterways. Funding assistance for establishment of riparian buffers is available through NRCS programs and other sources. In addition, the Town and Village will consider enacting a stream setback requirement for building construction.

Flood/Flash Flood – Property Protection

Assist property owners with floodproofing measures: The Town and Village Code Enforcement Officers will continue to provide technical assistance for elevation of utilities and other measures for floodproofing existing structures. When time permits, the Code Enforcement Officer plans to obtain additional training in floodproofing measures and other preventive techniques (from the Federal Emergency Management Agency at the Emergency Management Institute). If property owners are interested in implementing flood protection measures that are beyond their financial means, the Town will evaluate the desirability of applying for financial assistance for floodproofing or property acquisition.

Upgrade existing drainage structures: When roads, ditches, and culverts are damaged due to drainage and flooding problems, the Town and Village make every effort to mitigate the problem when repairs are made. The Town Highway Department and Village Department of Public Works will continue the ongoing efforts to upgrade existing drainage structures as the need and funding permit.

Improve Community Rating System classification: The Town and Village of Horseheads are both working to reduce the cost of flood insurance by improving their Community Rating System classification (which currently enables a 5% reduction in the cost of flood insurance). The feasibility of qualifying for an improved rating is evaluated during the annual re-certification process. If new credit activities are initiated or documented, a rating modification will be requested. The goal is to achieve and maintain a 10% reduction in flood insurance premiums for property owners in both municipalities. The reduced premiums will encourage the owners of flood-prone property to purchase and maintain adequate flood insurance coverage.

Severe Weather – Preventive Measures

Provide brush pickup and/or drop-off services: The availability of a program for disposal of brush and tree branches encourages residents to conduct periodic maintenance, which can reduce damages from an ice storm or wind storm. The Village has a designated drop-off site where brush and tree branches can be left year round and conducts an annual brush pickup service, in which materials are picked up at the curbside and chipped. This Village program will be continued. In addition, the Town Highway Superintendent will evaluate the cost and feasibility of establishing and maintaining a brush drop-off location.

Terrorism and School Violence – Preventive Measures

Assess the vulnerability of the Village water system to a terrorist attack: The Village of Horseheads water system has prepared a vulnerability assessment, which included an evaluation of terrorist threats. All identified vulnerabilities are being addressed through operating procedures and emergency response planning. Both the vulnerability assessment and the emergency response plan will be reviewed and updated annually.

PROPOSED PROJECTS FOR WHICH ADDITIONAL RESOURCES ARE NEEDED

The following high priority actions are recommended for achieving the goals and objectives of this hazard mitigation plan, but cannot be accomplished with existing resources. These recommended projects require funding or other resources that are not currently available to the Town or Village, but satisfy the other evaluation criteria. The Town and Village of Horseheads will seek funding to enable implementation of the following recommended actions. More accurate estimates of the potential dollar losses to vulnerable structures (included in the risk assessments in Section 4 and Attachment C of this plan) will be developed, as needed, to support funding requests.

Multi-Hazard Mitigation – Staff and Financial Resources

Address municipal staffing needs: The Town and Village Code Enforcement Officer reports that he could easily spend all of his time on tasks related to hazard mitigation, emergency preparedness, stormwater management, public outreach, and the National Flood Insurance Program, with no time left for his Code Enforcement responsibilities. The Town Highway Superintendent and Village Director of Public Works report that limitations of available staff and resources limit the effectiveness of their drainage system maintenance efforts. Both municipalities would benefit from additional staff resources to enable effective implementation of their hazard mitigation, flood mitigation, drainage system maintenance, and stormwater management programs. Municipal budgets are currently very tight and additional funding is needed to fully implement and expand these programs.

Estimated cost:	To be determined
Potential funding sources:	Municipal budgets; grant funding if possible
Project lead:	Town and Village Boards
Supporting partners:	
Estimated timetable:	When conditions warrant and funding is available

Multi-Hazard Mitigation – Public Information

Disseminate hazard information through municipal websites: The Town and Village of Horseheads plan to develop more robust municipal websites in order to enhance their ability to provide the public with relevant information. This will enable posting of additional information

or links about hazards and emergency response. The ability to post meeting notices, meeting minutes, and key documents will improve the ability to involve the public in future updates to this plan. The *Town and Village of Horseheads Hazard Mitigation Action Plan* will be posted if possible.

Estimated cost:	$2-3,000 initially; $800/year for maintenance
Potential funding sources:	Municipal budgets
Project lead:	Village Manager
Supporting partners:	Municipal staff; Chemung County
Estimated timetable:	2005

Develop community emergency training program: Develop a Citizen Corps Council program that utilizes American Red Cross training resources and volunteers to teach emergency awareness courses. Training will be based on the Red Cross "Preparing for Disasters" curriculum. It is anticipated that six training courses will be offered with 150 to 300 people from throughout Chemung County attending.

Estimated cost:	$4,100 for 6 courses (for manuals and travel expenses)
Potential funding sources:	Grant funding
Project lead:	Chemung-Schuyler Chapter of the American Red Cross
Supporting partners:	Chemung County Emergency Management Office, Retired Senior Volunteer Program of Chemung County (RSVP)
Estimated timetable:	Initiate an ongoing program when funding is available

Multi-Hazard Mitigation – Emergency Services

Obtain and equip a multi hazard support trailer for Town and Country Fire Department: A capability and risk assessment of the Town and Country Fire Department (conducted in February 2003) showed the department to be very competent, but also identified the following areas of concern: (1) scene protection for fire fighters and emergency medical service personnel, (2) lack of equipment for handling mass casualty incidents, (3) inter-agency and inter-departmental radio communication problems, and (4) lack of support and scene protection equipment for dealing with hazardous material scenes particularly in transit hazardous materials. (Chemung County contracts with the Elmira Fire Department for hazmat services; the role of other fire departments is for scene protection, support, and basic spill response.) In order to address these deficiencies, the Town and Country Fire Department is seeking funding to purchase and equip a multi hazard support trailer. The trailer will be a twenty-four foot dual axle cargo trailer that can be pulled by department vehicles. This trailer will respond to all types of emergency situations and will be available to neighboring fire departments, as well as to law enforcement agencies. The trailer will be equipped with scene protection equipment (reflective highway cones, lane markers, reflective vests, and portable signs), lighting capabilities to increase scene security (a telescopic roof mounted scene light, four tripod lights, rechargeable hand held lights, and generator to provide power), mass casualty equipment (back boards, spider straps, and blankets), six multi-band portable radios (with an onboard charging system), and basic equipment (goggles, gloves, hard hats, shovels, squeegees, brooms, hand tools, and a tool kit).

Estimated cost:	$70,000

Potential funding sources:	Application not funded by FEMA; other funding options have not yet been identified
Project lead:	Town and Country Fire Department
Supporting partners:	Neighboring fire departments
Estimated timetable:	When funding is available

Provide emergency response training for municipal officials, first responders, and school administrators: The Chief Executive Officer of each municipality, key municipal staff, school administrators, and first responders should receive periodic training in the Incident Command System and emergency operations procedures. The Town and Village of Horseheads will seek funding for critical incident management training taught by PSCIM instructors. This training will be conducted every two years if funding and staff resources permit.

Estimated cost:	$2,500 for a 2-day training with 20-30 participants
Potential funding sources:	To be determined
Project lead:	PSCIM
Supporting partners:	Town and Village Code Enforcement Officer
Estimated timetable:	Biennially if funding and staff resources permit

Provide NOAA weather radios to public facilities: Conduct a survey of those locations at which public safety would be enhanced if they had NOAA weather radios with alarm functions to alert staff of severe weather or other emergency warnings (municipal buildings, public parks, schools, etc.). Each location that does not currently have this equipment will then be provided with a free radio or an opportunity to purchase one at a discounted price.

Estimated cost:	$7,500 for two-county project
Potential funding sources:	NYS Legislative Initiative
Project lead:	Environmental Emergency Services, Inc.
Supporting partners:	Chemung County Emergency Management Office
Estimated timetable:	2004 to 2005

Hazardous Materials – Preventive Measures

Provide financial assistance for radon mitigation: In order to reduce the potential health risks associated with residential radon contamination, the Chemung County Environmental Management Council would like to supplement the ongoing radon testing and education program with financial assistance for mitigation measures. The program would provide funding to mitigate radon problems for low-income households where high levels of radon have been detected.

Estimated cost:	To be determined (depends on scope of program)
Potential funding sources:	To be determined
Project lead:	Chemung County Environmental Management Council
Supporting partners:	
Estimated timetable:	When funding is available

Provide radon mitigation training: The Chemung County Environmental Management Council is seeking funding to conduct training about radon risks and mitigation techniques for municipal Code Enforcement Officers, real estate agents, mortgage lenders, and contractors.

Estimated cost:	To be determined
Potential funding sources:	To be determined
Project lead:	Chemung County Environmental Management Council
Supporting partners:	
Estimated timetable:	When funding is available

Flood/Flash Flood – Public Information

Develop the public outreach and public involvement components of the Town and Village stormwater management programs: Two components of the stormwater management programs that are being developed for the Town and Village of Horseheads (as required by their MS4 Stormwater permits) are: (1) public education and outreach and (2) public involvement and participation. This program will address both the water quality impacts of stormwater and the water quantity impacts as they relate to flooding and erosion damage. To the extent possible, these outreach and public involvement efforts will be integrated with additional hazard mitigation information (particularly flooding). Once the program is developed, it will be implemented on an ongoing basis.

Estimated cost:	To be determined
Potential funding sources:	To be determined
Project lead:	Chemung County Stormwater Coalition
Supporting partners:	Chemung County Environmental Management Council, Southern Tier Central Regional Planning and Development Board
Estimated timetable:	Ongoing program will be initiated when funding is available (no later than 2008)

Flood/Flash Flood – Preventive Measures

Develop and implement stormwater management programs: The Town and Village of Horseheads have until 2008 to develop and implement stormwater management programs consistent with the requirements of their MS4 permits. Some components of these stormwater programs will require additional staff time and expertise to implement. Current staffing levels are not sufficient to implement the required stormwater management program. The Town and Village Boards will work with neighboring municipalities to reduce costs through coordination and cooperation.

Estimated cost:	To be determined
Potential funding sources:	Grants, municipal budgets
Project lead:	Code Enforcement Officer, Village Manager
Supporting partners:	Chemung County Stormwater Coalition, Chemung County Soil and Water Conservation District, Southern Tier Central Regional Planning and Development Board

Estimated timetable: Ongoing programs will be expanded as funding permits (with full implementation no later than 2008)

Purchase street sweeper for the Village of Horsheheads: Surface runoff from about 80% of the Village of Horseheads is managed by drywells. Routine vacuum cleaning of streets and drywells is necessary to remove sediment and debris that would otherwise limit the capacity of this drainage system. The street sweeper that is currently used to clean streets and drywells is more than 10 years old. Because this equipment is an essential part of their urban flood prevention program, the Village is seeking funds to purchase a new street sweeper. They plan to purchase one with a flusher that can also be used to clear debris out of plugged pipes during a flood event. The flusher will reduce the risks to Public Works Department personnel, who frequently remove debris from culverts during high water events in order to maintain flow.

Estimated cost: $130,000
Potential funding sources: To be determined
Project lead: Village Director of Public Works
Supporting partners: Village Manager
Estimated timetable: When funds are available

Purchase street sweeper for the Town of Horseheads: The Town of Horseheads maintains its surface and subsurface drainage ways in order to maintain carrying capacity and minimize the risk of flooding. This maintenance program utilizes a street sweeper to vacuum clean drywells and to remove cinders, sediment and debris from road surfaces. The street sweeper that is currently used is more than 10 years old. Because this equipment is an essential part of their urban flood prevention program, the Town is seeking funds to purchase a new street sweeper. They plan to purchase one with a flusher that can also be used to clear debris out of plugged pipes during a flood event. The flusher will reduce the risks to Highway Department personnel, who frequently remove debris from culverts during high water events in order to maintain flow.

Estimated cost: $130,000
Potential funding sources: To be determined
Project lead: Town Highway Superintendent
Supporting partners:
Estimated timetable: When funds are available

Collect LIDAR topographic data: The Chemung County Soil and Water Conservation District is seeking funding to collect LIDAR (Light Imaging Detection and Ranging) topographic data for the entire county. This airborne laser technology enables development of a digital topographic data layer with one-foot contours. The collection of LIDAR topographic data for the Town of Southport has confirmed the high resolution of these data. The availability of LIDAR topographic data will facilitate the design of wetlands (for flood attenuation and other purposes) by reducing the expense of field surveying. The data will also be used for hydrologic modeling. It is anticipated that once LIIDAR topographic data are available, the NYS Department of Environmental Conservation will utilize this information to develop updated digital Flood Insurance Rate Maps for Chemung County. LIDAR topographic mapping and aerial photography can also be used to improve site planning and stormwater management.

Estimated cost:	$242,000 for entire County; may reduce costs by coordinating with neighboring counties
Potential funding sources:	Grant, municipalities, county
Project lead:	SWCD Manager
Supporting partners:	Upper Susquehanna Coalition, NYS DEC
Estimated timetable:	When funding is available; data collection must be done when leaves are off the trees

Flood/Flash Flood – Natural Resource Protection

Implement stream stabilization projects: It is anticipated that when Chemung County again experiences severe flooding and streambank erosion problems, the County will seek funds to re-establish the successful 1/3 – 1/3 – 1/3 program in which stream stabilization projects were jointly funded by the County, municipality, and property owner(s). If county funding for this program is resumed, the Town and Village will work cooperatively with the County Soil and Water Conservation District (SWCD) and property owners to implement high priority stream stabilization projects.

Estimated cost:	To be determined
Potential funding sources:	Chemung County, Town of Horseheads, Village of Horseheads, property owners
Project lead:	Chemung County Soil and Water Conservation District
Supporting partners:	Highway Superintendent, Director of Public Works
Estimated timetable:	When funding is available

Flood/Flash Flood – Structural Solutions

Replace North Main Street retaining wall: The Village of Horseheads is seeking funding to replace a deteriorated retaining wall that is separating from the bank on North Main Street. A concrete wall will replace the existing structure of interlocked railroad timbers.

Estimated cost:	$35,000
Potential funding sources:	Village Highway budget
Project lead:	Village of Horseheads Dept. of Public Works
Supporting partners:	Village Manager
Estimated timetable:	When funding is available

Repair culvert under Hanover Square: The drainage culvert that conveys Prospect Creek under Hanover Square (in the Village of Horseheads) was built about 1900 using double brick wall construction techniques. The culvert is 1000 feet long and runs underneath existing buildings. Although the most recent inspection indicated that this structure is currently functioning adequately, problems with falling bricks were identified. A major failure that results in blockage of this structure could cause flooding of a large area in the Village of Horseheads, including the Hanover Square business district. In order to reinforce this structure and prolong the life of the system, the Village would like to install a liner within the existing conduit. Due to the uneven

nature of the original brick construction and the length of the structure, this would be a major project, beyond the budgetary resources of the Village.

Estimated cost:	$500,000
Potential funding sources:	Grant funding is needed, Village Highway budget
Project lead:	Village of Horseheads Dept. of Public Works
Supporting partners:	Village Manager
Estimated timetable:	When funding is available

Groundwater Contamination – Public Information

Maintain Chemung County water testing program: Recent staffing cuts will result in elimination of the Chemung County Health Department's private well testing program (because the County will no longer qualify for the state funding that has paid for this program). This program has enabled County residents to obtain free testing of water samples and technical assistance for alleviating health risks from identified water quality problems. The Town of Horseheads strongly supports the continuation of this beneficial program.

Estimated cost:	$15,000 per year
Potential funding sources:	To be determined
Project lead:	Chemung County Health Department.
Supporting partners:	Chemung County Environmental Management Council, Chemung County Water Quality Coordinating Committee
Estimated timetable:	When funding is available

SECTION 7 – PLAN MAINTENANCE

When new elected or appointed officials begin their terms of service, they will be given an opportunity to review the *Town and Village of Horseheads Hazard Mitigation Action Plan* (along with other materials). This will provide them with an awareness of the community's risks and the plan that has been prepared to address those risks. It is anticipated that this will increase the incorporation of hazard mitigation objectives into the decision making process for the municipality.

The contents of this *Hazard Mitigation Action Plan* will be reviewed and updated whenever conditions change that may affect the plan. A complete review will be conducted every two years. (In order to maintain eligibility for state and federal grant funds, it must be updated at least every 5 years.) The Chemung County Emergency Management Office will be asked to facilitate another HAZNY analysis for Horseheads about every five years.

The biennial update of this plan will be synchronized with the review of the Chemung County Hazard Mitigation Plan so that consistency can be maintained between the local and county plans. When the County Emergency Management Office initiates the review process for the County Plan, each municipality will be contacted. At that time, the Code Enforcement Officer and Village Manager will organize a meeting to review and revise this plan. At a minimum, the following people will be asked to participate or send a representative:

- Town Board representative
- Village Manager
- Village Board of Trustees representative
- Town Highway Superintendent
- Village Director of Public Works
- Town and Village Code Enforcement Officer
- Town and Country Fire Chief
- Horseheads Fire Chief
- Horseheads Police Chief
- Planning Board members
- At least one citizen from each municipality
- Chemung County Safety Coordinator/Emergency Planner
- Chemung County Director of Emergency Services
- Chemung County Hazard Mitigation Coordinator (Soil and Water Conservation District Manager)
- Regional Flood Mitigation Specialist (Southern Tier Central Regional Planning and Development Board)

The planning committee will solicit public input and comments each time this plan is revised. The media that can be used to encourage public involvement include municipal websites, newspaper articles, *Horseheads Community Policing Newsletter*, posting notices in municipal

offices, and directly contacting potentially interested individuals. Citizens will be encouraged to participate in the plan revision process by attending meetings and/or notifying municipal officials of their concerns and recommendations.

When the committee meets for a biennial update of the plan, they will review the maps, data, and risk assessment information (Attachment A, Section 4, Attachment C, and Attachment D) to identify those items that should be updated or modified. Any additional vulnerability assessment information that has been assembled since the previous update will be provided for incorporation into the revised plan. The committee will review each goal and objective in the mitigation strategy (Section 5) to determine the ongoing relevance to changing situations in the community. The parties responsible for each recommended measure in the action plan (Section 6) will report on the status of the implementation action. The committee will evaluate the need to revise, eliminate, or replace each action item. Based on the hazard mitigation successes and failures, the goals and objectives in the plan, and changing local circumstances, the committee will also recommend any new action items that may warrant inclusion in the plan. Each recommended action will be evaluated and prioritized using the seven criteria presented in Section 6. Those recommendations that meet the criteria for high priority action items will be incorporated into the revised plan.

Following the plan revision meeting(s), the Code Enforcement Officer and Village Manager (or their designee) will incorporate all recommended revisions into an updated draft of the *Town and Village of Horseheads Hazard Mitigation Action Plan*. The draft revision will be distributed to committee members, the Town Board, the Village Board of Trustees, municipal staff, the Town and Village Planning Boards, the Chemung County Emergency Management Office, and other interested parties for review. It will be available at municipal offices for public review and citizen comments will be solicited. This local review process will insure consistency with municipal planning objectives, community values, and the Chemung County Hazard Mitigation Plan. It will encourage municipal board members and staff to periodically consider the hazards faced by the community and the opportunities for mitigating those hazards. All comments received during this local review period will be reviewed and analyzed by relevant members of the planning committee and appropriate modifications incorporated into the plan.

When all recommended changes are considered and incorporated, the revised *Town and Village of Horseheads Hazard Mitigation Action Plan* will be reviewed with the Town Board and Village Board of Trustees and presented to both boards for formal adoption. Once adopted, the plan revisions will be incorporated into all copies of this document, including those posted on the municipal websites.

ATTACHMENT A

MAPS AND DATA

The attached materials include the following:

- Map: Current Land Use
- Map: Current Land Use (Village area)
- Table: Land Use, Town of Horseheads
- Table: Land Use, Village of Horseheads
- Table: Town of Horseheads Assets
- Table: Village of Horseheads Assets
- Table: Age of Residential Structures, Town of Horseheads
- Table: Age of Residential Structures, Village of Horseheads
- Table: Critical Facilities and Operations Serving the Town and Village of Horseheads
- Map: Critical Facilities
- Map: Transportation Infrastructure
- Map: Vulnerable Sites
- Map: Flood Hazards and Problems
- Table: Summary of Flooding Problems
- Table: Public/Private Organizations Involved in Hazard Mitigation and Response

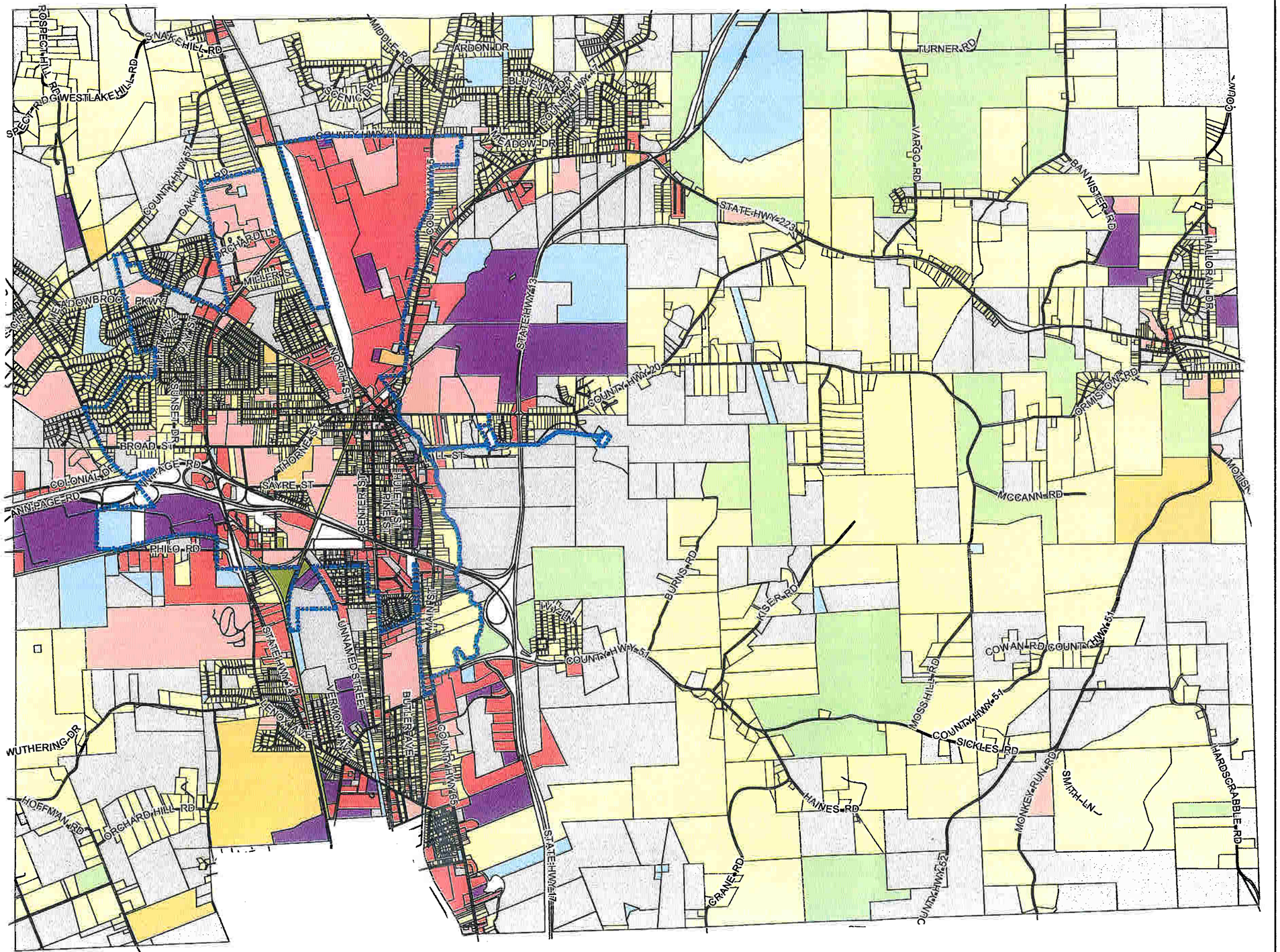
Town of Horseheads Current Land Use

Legend

- No Property Class Given
- Agriculture
- Residential
- Vacant
- Commercial
- Recreation and Entertainment
- Community Services
- Industrial
- Public Services
- State and Forested Lands
- Village Boundary

0 0.25 0.5 1 Miles

N W E S



Town of Horseheads Current Land Use

(Village Area)

Legend

- Agriculture
- Residential
- Vacant
- Commercial
- Recreation and Entertainment
- Community Services
- Industrial
- Public Services
- No Property Class Given
- Village Boundary

N

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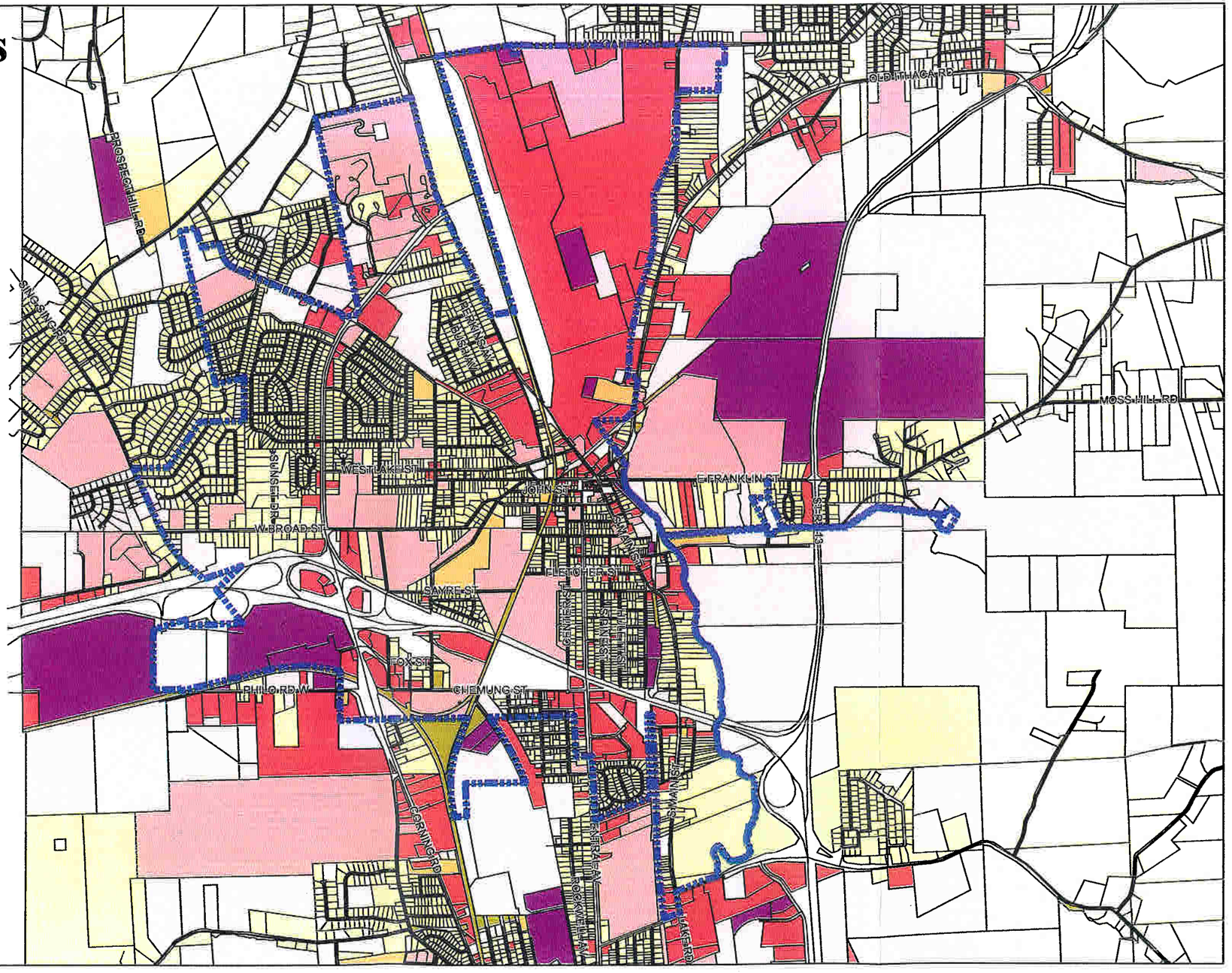


LAND USE
TOWN OF HORSEHEADS

Land Use	Acres	Percentage of Total
Agricultural (100's)	1,861	9.7%
Residential (200's)	8,237	42.9%
Vacant Land (300's)	6,273	32.6%
Commercial (400's)	539	2.8%
Recreation & Entertainment (500's)	454	2.4%
Community Services (600's)	586	3.0%
Industrial (700's)	612	3.2%
Public Services (800's)	655	3.4%
Wild, Forested, Conservation Lands & Public Parks (900's)	0	0.0%
Total Acres	**19,217**	**100.0%**

Source: 2003 Chemung County real property tax records

LAND USE
VILLAGE OF HORSEHEADS

Land Use	Acres	Percentage of Total
Agricultural (100's)	0	0.0%
Residential (200's)	731	35.0%
Vacant Land (300's)	160	7.7%
Commercial (400's)	604	28.9%
Recreation & Entertainment (500's)	38	1.8%
Community Services (600's)	341	16.3%
Industrial (700's)	91	4.4%
Public Services (800's)	48	2.3%
Wild, Forested, Conservation Lands & Public Parks (900's)	57	2.7%
Unknown	20	1.0%
Total Acres	**2,090**	**100.0%**

Source: 2003 Chemung County real property tax records

TOWN OF HORSEHEADS ASSETS
(based on assessed value and property class codes)

Property Class	Number of Parcels	Cumulative Assessed Value (all parcels in class)			Average Assessed Value		
		Land	Buildings*	Total	Land	Buildings*	Total
Agricultural (100's)	22	$963,545	$308,900	$1,272,445	$43,798	$14,041	$57,838
Residential (200's)	3,314	$66,387,630	$258,382,840	$324,770,470	$20,032	$77,967	$98,000
Vacant Land (300's)	740	$13,721,215	$249,950	$13,971,165	$18,542	$338	$18,880
Commercial (400's)	213	$11,021,300	$50,755,436	$61,776,736	$51,743	$238,288	$290,032
Recreation & Entertainment (500's)	11	$1,623,050	$2,300,550	$3,923,600	$147,550	$209,141	$356,691
Community Services (600's)	40	$3,267,700	$35,904,800	$39,172,500	$81,693	$897,620	$979,313
Industrial (700's)	22	$3,478,900	$23,525,900	$27,004,800	$158,132	$1,069,359	$1,227,491
Public Services (800's)	43	$3,505,665	$3,958,657	$7,464,322	$81,527	$92,062	$173,589
Wild, Forested, Conservation Lands & Public Parks (900's)	0	$0	$0	$0	$0	$0	$0
Total	**4,405**	**$103,969,005**	**$375,387,033**	**$479,356,038**			

* building assessment is total assessment minus land assessment

Source: 2003 Chemung County real property tax records

VILLAGE OF HORSEHEADS ASSETS
(based on assessed value and property class codes)

Property Class	Number of Parcels	Cumulative Assessed Value (all parcels in class)			Average Assessed Value		
		Land	Buildings*	Total	Land	Buildings*	Total
Agricultural (100's)	0	0	$0	0	$0	$0	$0
Residential (200's)	2,098	$29,479,306	$130,123,019	$159,602,325	$14,051	$62,022	$76,074
Vacant Land (300's)	116	$2,682,950	$49,600	$2,732,550	$23,129	$428	$23,556
Commercial (400's)	195	$10,275,750	$61,929,650	$72,205,400	$52,696	$317,588	$370,284
Recreation & Entertainment (500's)	12	$591,175	$2,942,025	$3,533,200	$49,265	$245,169	$294,433
Community Services (600's)	45	$4,669,100	$49,945,100	$54,614,200	$103,758	$1,109,891	$1,213,649
Industrial (700's)	11	$1,584,300	$23,154,400	$24,738,700	$144,027	$2,104,945	$2,248,973
Public Services (800's)	17	$541,700	$6,351,447	$6,893,147	$31,865	$373,615	$405,479
Wild, Forested, Conservation Lands & Public Parks (900's)	1	$11,400	$0	$11,400	$11,400	$0	$11,400
Total	**2,495**	**$49,835,681**	**$274,495,241**	**$324,330,922**			

* building assessment is total assessment minus land assessment

Source: 2003 Chemung County real property tax records

AGE OF RESIDENTIAL STRUCTURES
TOWN OF HORSEHEADS

Year Built	Number of Residences	Percent
2000-2003	116	3.5%
1990-1999	243	7.4%
1980-1989	207	6.3%
1970-1979	509	15.4%
1960-1969	756	22.9%
1950-1959	751	22.8%
1940-1949	275	8.3%
1930-1939	108	3.3%
1920-1929	100	3.0%
1910-1919	24	0.7%
1900-1909	118	3.6%
Before 1900	93	2.8%
Total	**3,300**	**100.0%**

Source: 2003 Chemung County real property tax records

AGE OF RESIDENTIAL STRUCTURES
VILLAGE OF HORSEHEADS

Year Built	Number of Residences	Percent
2000-2003	5	0.2%
1990-1999	18	0.9%
1980-1989	47	2.2%
1970-1979	80	3.8%
1960-1969	378	18.0%
1950-1959	917	43.7%
1940-1949	114	5.4%
1930-1939	78	3.7%
1920-1929	102	4.9%
1910-1919	28	1.3%
1900-1909	165	7.9%
Before 1900	168	8.0%
Total	**2,100**	**100%**

Source: 2003 Chemung County real property tax records

CRITICAL FACILITIES AND OPERATIONS SERVING THE TOWN AND VILLAGE OF HORSEHEADS

*A **critical facility** is any facility that is an integral part of emergency response operations or one that requires special emergency response due to the potential at the site for triggering an additional hazardous incident.*

Town Hall (Primary Emergency Operations Center)

Alternate Emergency Operations Center for the Town: Town and Country Fire Department

Village Hall (Primary Emergency Operations Center)

Alternate Emergency Operations Centers for the Village: Horseheads Fire Department, Horseheads Village Grange, Former LRC Building (South Avenue), Horseheads Town Hall

Fire Departments: Breesport Fire Department, Elmira Heights Fire Department, Horseheads Fire Department, Town and Country Fire Department, mutual aid from neighboring fire departments

Police Departments: Horseheads Village Police, Chemung County Sheriff's Office, New York State Police

Chemung County Emergency Management Office (located in the City of Elmira)

Chemung Basin Flood Warning Service (emergency operations center located in the City of Corning)

911-dispatch center (located in the City of Elmira)

Emergency medical and ambulance services: Erway Ambulance Service (based in the Town of Southport, with several satellite locations)

Hospitals: Arnot Ogden Medical Center (located in the City of Elmira), St. Joseph's Hospital (located in the City of Elmira)

Highway Departments: Town of Horseheads Highway Garage, Village of Horseheads Highway Garage, Chemung County Highway Department (located in the Village of Horseheads), NYS Department of Transportation (Regional Office in the City of Hornell, Steuben County; nearest maintenance garage is in the Town of Campbell, Steuben County)

Public schools/shelters: Horseheads Central High School, Horseheads Middle School, Center Street School, Gardner Road School, Ridge Road School, Sing Sing Road School, BOCES (Philo Road)

Utilities: Elmira Water Board facilities, Elmira Sewer District facilities, Village of Horseheads Water System, electric transmission system, telephone system, natural gas transmission system

Chemung-Schuyler Chapter of the American Red Cross (located in the City of Elmira)

Broadcast media: Radio Works (WCBA-AM, WCBA-FM, WENY-AM, WENY-FM, WCLI-AM, WGMM-FM; studio in City of Corning; broadcast towers in Town of Corning, Village of South Corning, City of Elmira, and Town of Ashland), Backyard Broadcasting (WPGI-FM, WINK-FM, WNGZ-FM, WGMF-AM, WWLZ-AM; studio in Village of Elmira Heights; broadcast tower in Town of Corning), WENY-TV (studio in Town of Horseheads; broadcast tower in Town of Big Flats), WETM-TV (studio in City of Elmira; broadcast tower in Town of Big Flats), WYDC-TV Big Fox (studio in City of Corning; broadcast towers in Town of Corning and Town of Horseheads), Time Warner Cable (located in Village of Horseheads), NOAA Weather Radio (from Binghamton, NY, National Weather Service office; Elmira transmitter in Town of Big Flats; Mount Washington transmitter in Town of Bath, Steuben County; Towanda transmitter in Bradford County, PA)

Major transportation routes: State Route 17 (future Interstate 86), State Route 14, State Route 13, Norfolk Southern railroad line, Norfolk Southern railroad switching yard, Elmira-Corning Regional Airport (located in the Town of Big Flats)

Facilities with significant amounts of hazardous materials: Twenty-six facilities in the Town and Village of Horseheads have hazardous material inventories that meet the reporting requirements for SARA Title III

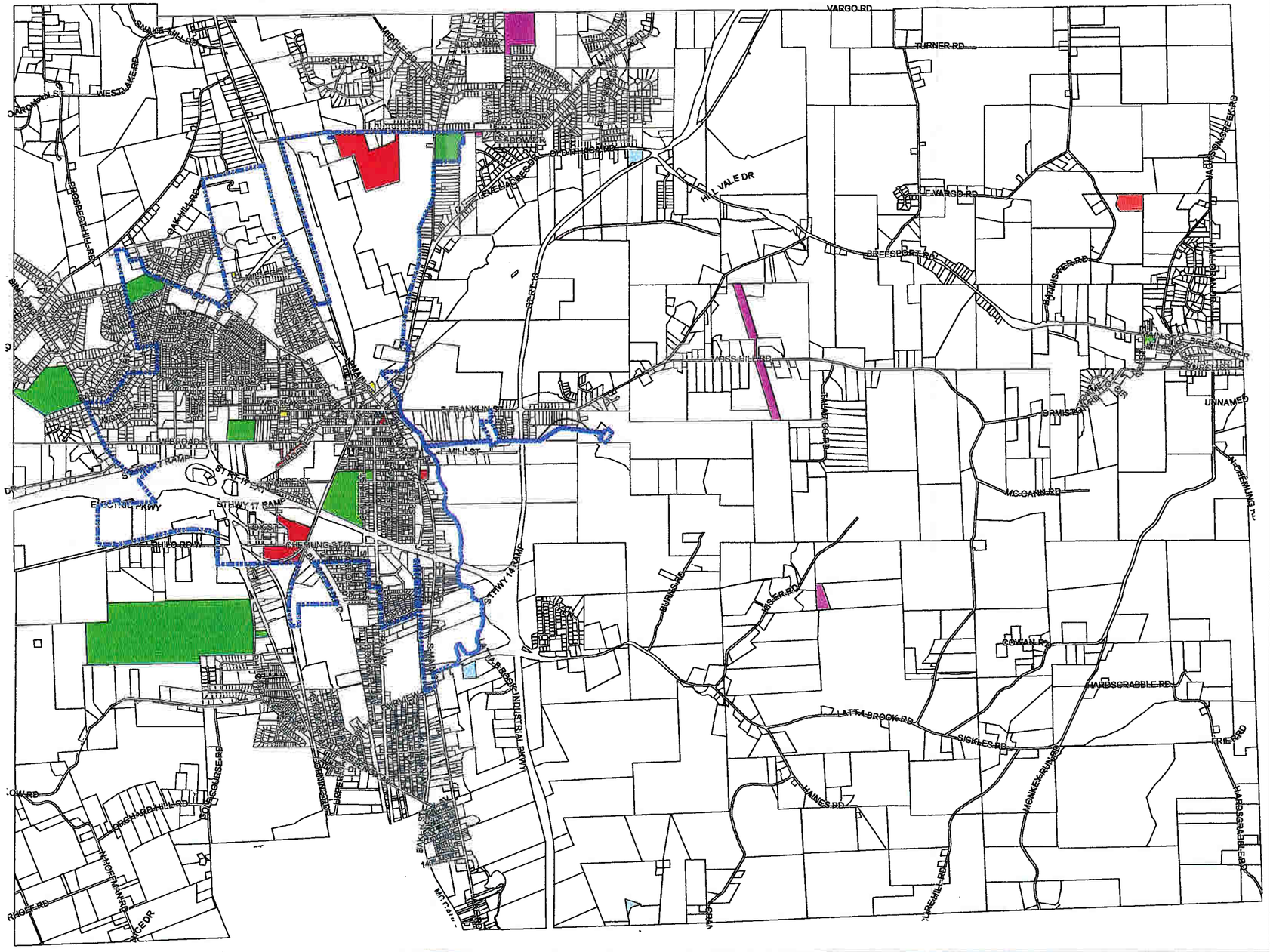
Town of Horseheads Critical Facilities

Legend

- Village Boundary
- Gas/Electric
- Media
- Schools
- Government
- Police/Fire

N

0 0.4 0.8 1.6 Miles



Town of Horseheads Critical Facilities

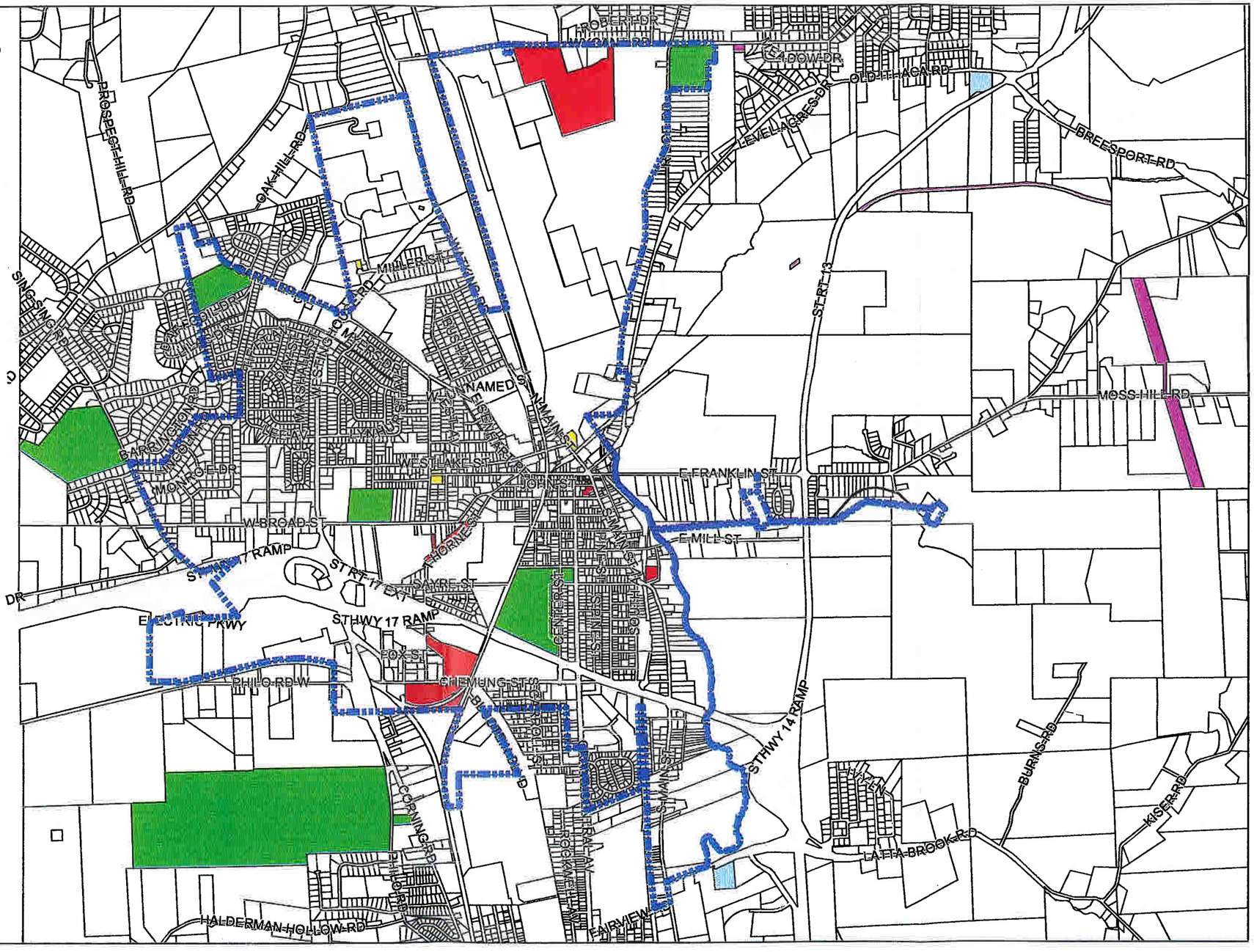
(Village Area)

Legend

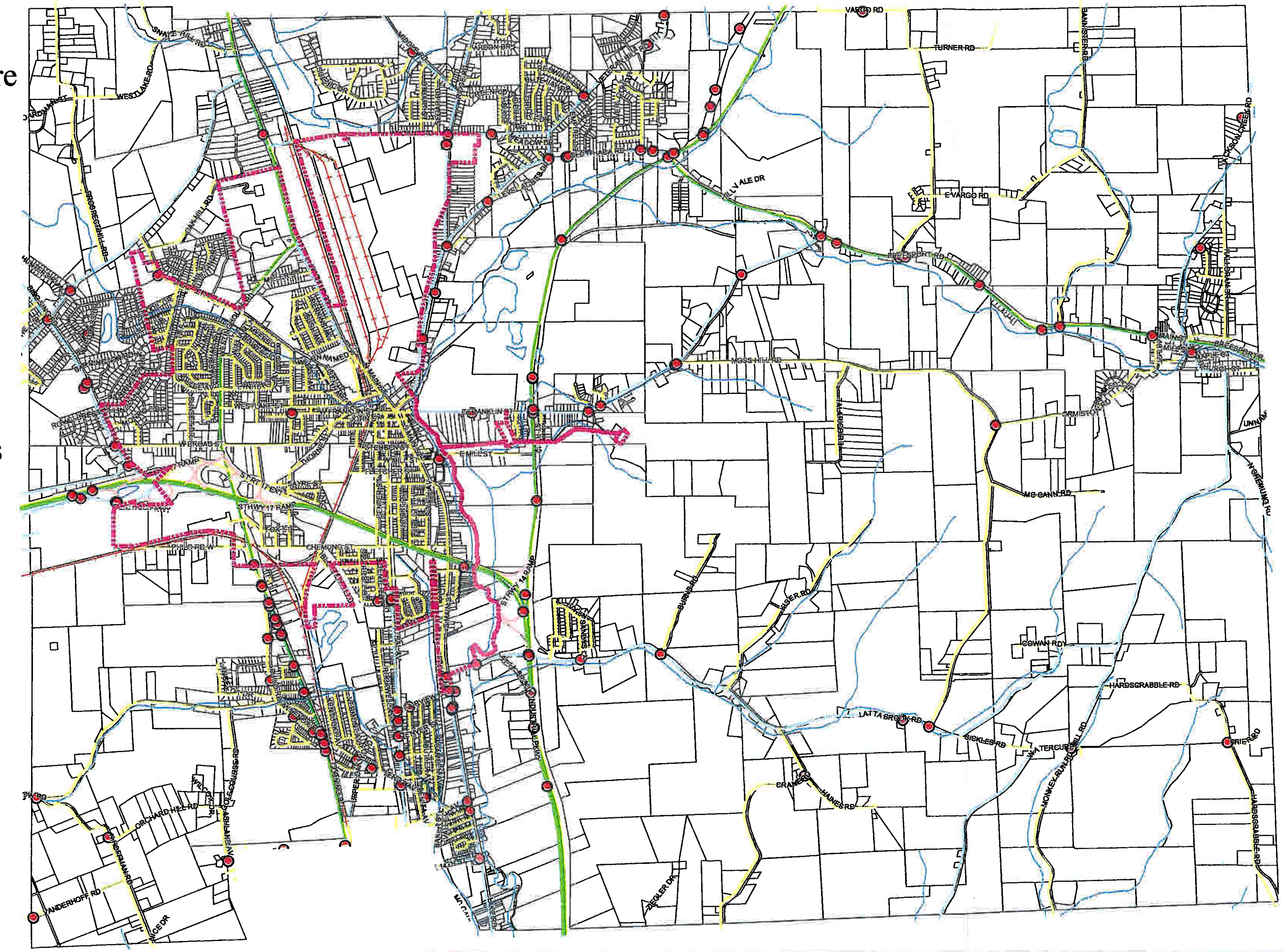
- Village Boundary
- Gas/Electric
- Media
- Schools
- Government
- Police/Fire

N

0 0.25 0.5 1 Miles



Town of Horseheads Transportation Infrastructure



Legend

VILLAGE BOUNDARY

2002 ANNUAL CRASHES

RAILROADS

STREAMS

ROAD CLASSIFICATIONS

COUNTY RD

LOCAL RD

NYS ROUTE

RAMP

N

0 0.25 0.5 1 Miles

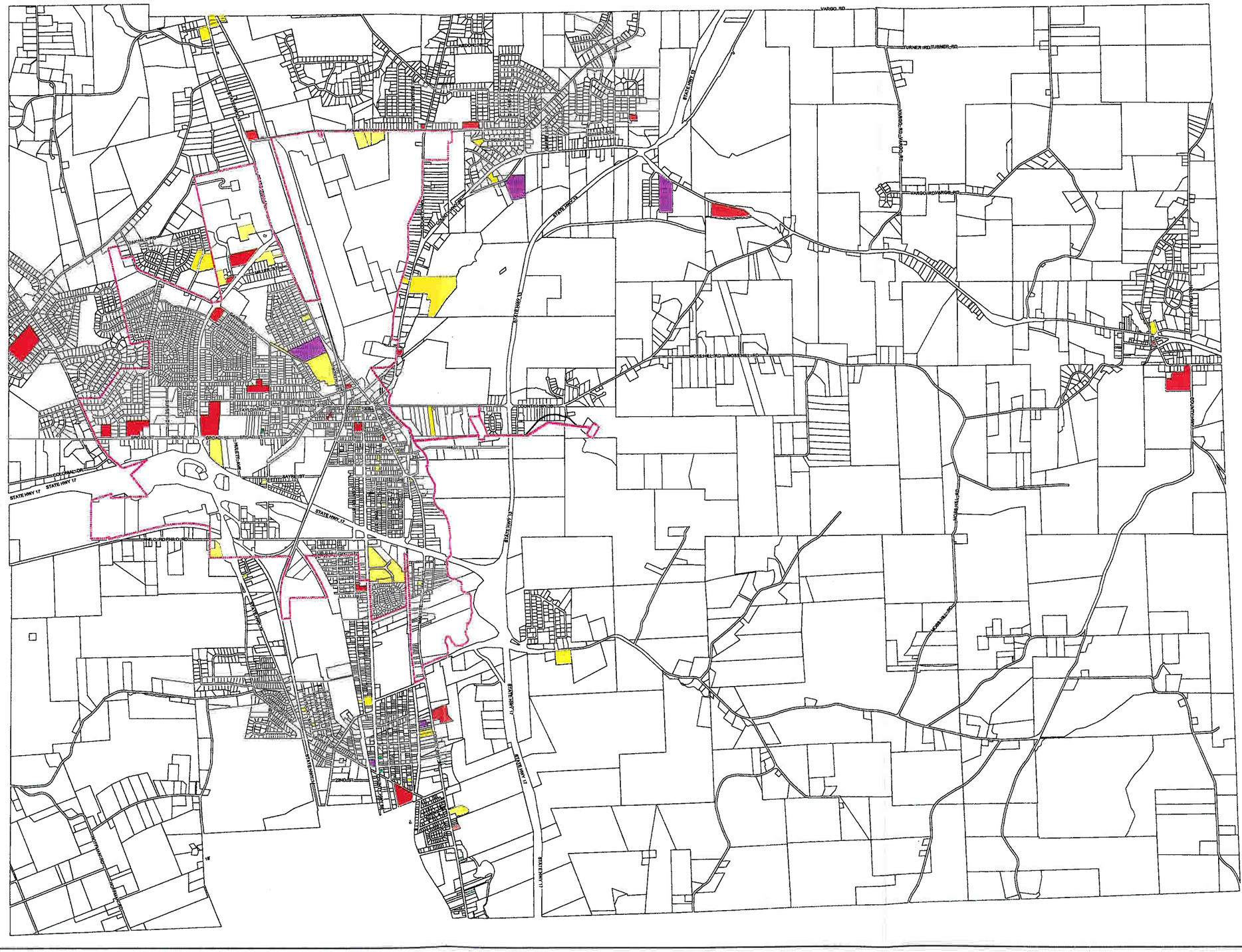
Town of Horseheads Vulnerable Sites

Legend

- Village Boundary
- Apartments
- Mobile Home Parks
- Auditorium
- Bar
- Religious

N

0 0.5 1 Miles



Source: Chemung County Real Property Tax Service

Town of Horseheads
Vulnerable Sites
(Village Area)

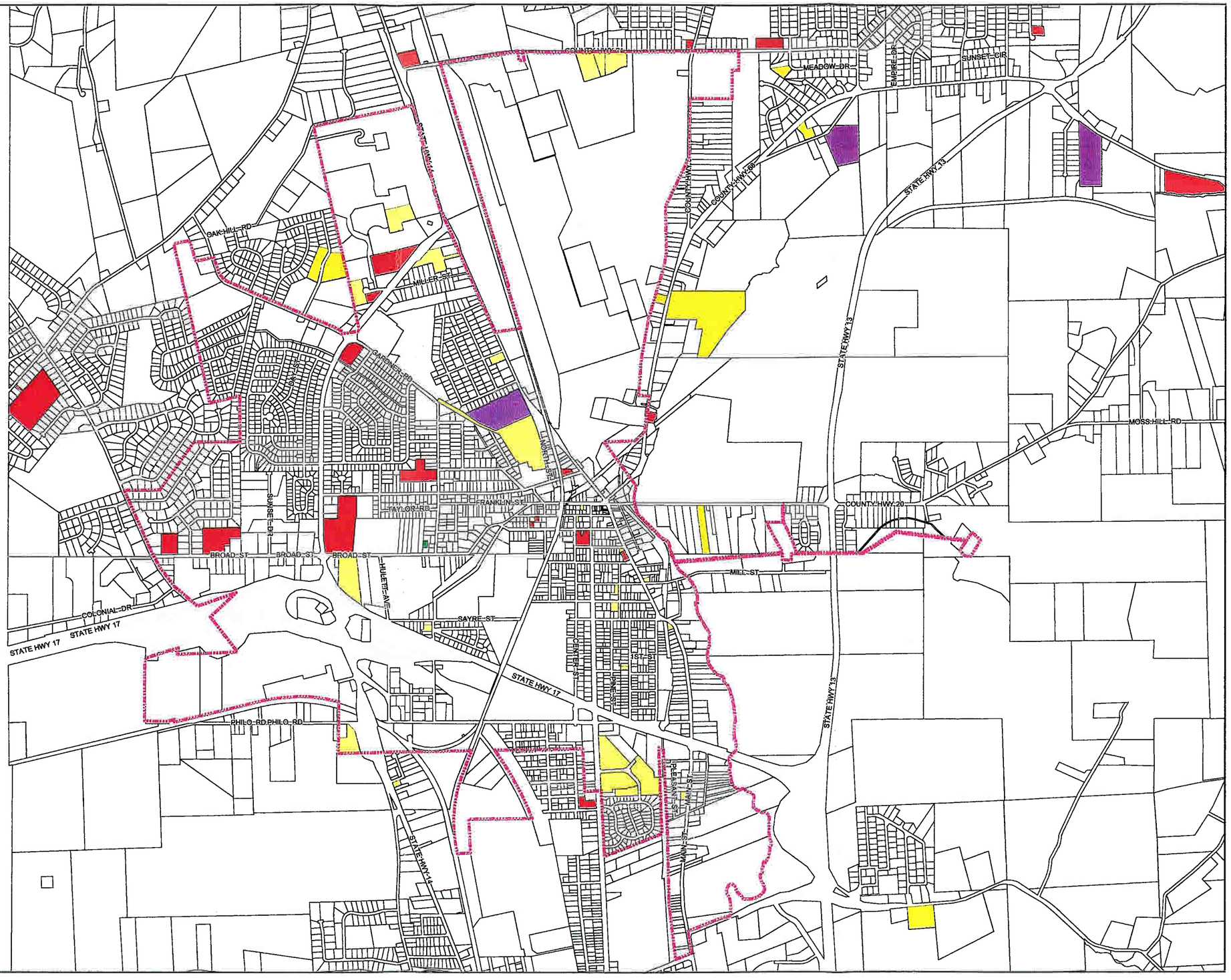
Legend

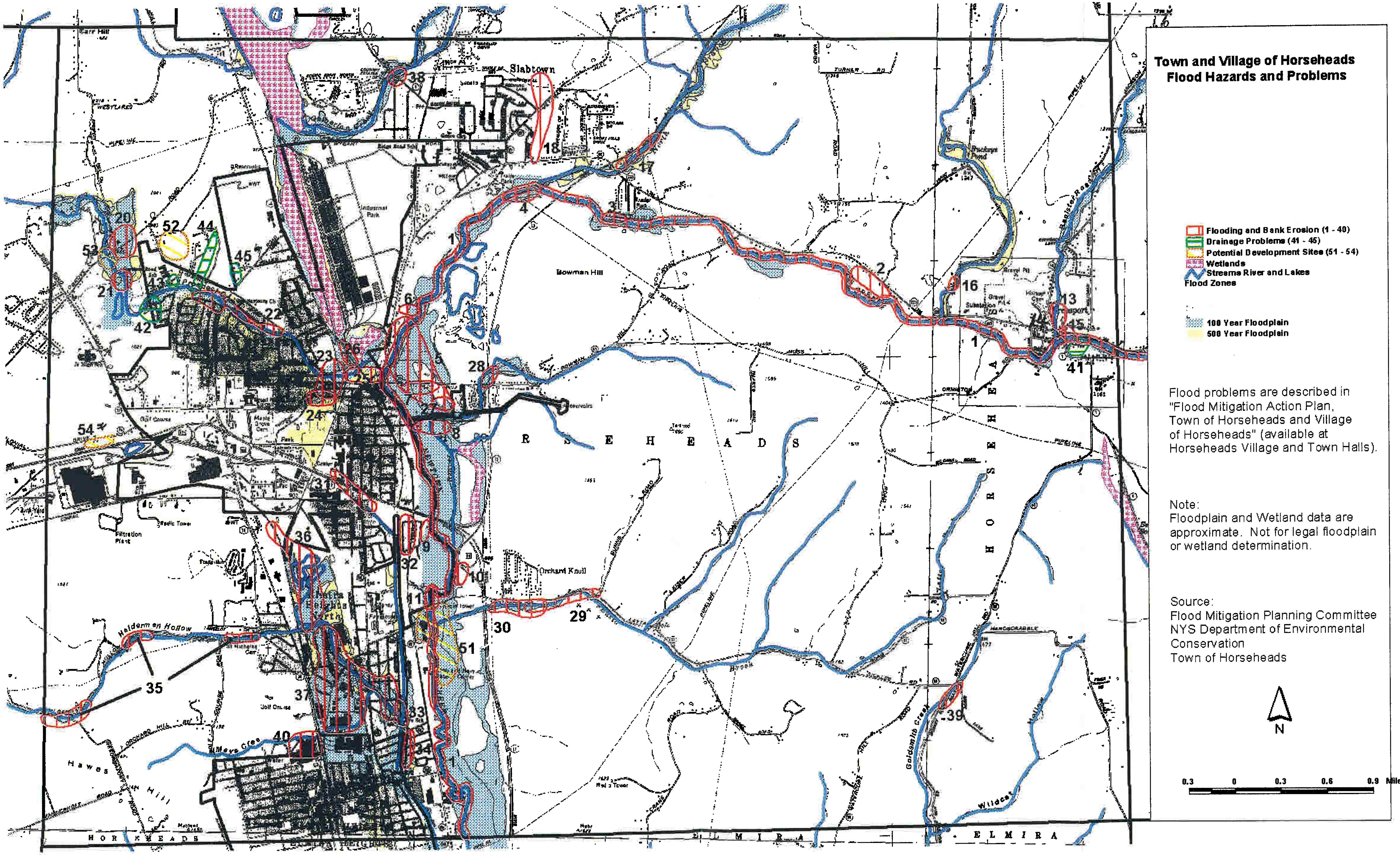
- Village Boundary
- Apartments
- Mobile Home Parks
- Auditorium
- Bar
- Religious

N

0 0.25 0.5 Miles

Source: Chemung County Real Property Tax Service




Town and Village of Horseheads
Flood Hazards and Problems
Flooding and Bank Erosion (1 - 40)
Drainage Problems (41 - 45)
Potential Development Sites (51 - 54)
Wetlands
Streams River and Lakes
Flood Zones
100 Year Floodplain
500 Year Floodplain
Flood problems are described in "Flood Mitigation Action Plan, Town of Horseheads and Village of Horseheads" (available at Horseheads Village and Town Halls).
Note:
Floodplain and Wetland data are approximate. Not for legal floodplain or wetland determination.
Source:
Flood Mitigation Planning Committee
NYS Department of Environmental Conservation
Town of Horseheads
N
0.3
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0.3
0.6
0.9
Miles
Slabtown
Bowman Hill
Orchard Knoll
Industrial Park
Golf Course
Filtration Plant
Radio Tower
Junk Yard
Haldermen Hollow
Hawes Hill
Goldsmith Creek
Banister Road
Buckeye Pond
Gravel Pit
Substation
Breesport
H O R S E H E A D S
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SUMMARY OF FLOODING PROBLEMS
Town and Village of Horseheads

Problem #	Stream/Drainage Basin	Problem Name	Municipality	Houses Affected	Roads/Culverts/Bridges?	Streambank/Lakeshore Erosion	Riverine Flooding?	Stormwater Flooding?	Groundwater Flooding?	Potential Development
RIVERINE FLOODING AND STREAMBANK EROSION										
1	Newtown Creek	Streambank Erosion	T/V Horseheads	0	x	x				
2	Newtown Creek	Between Bannister Road and Vargo Road	T. Horseheads	12			x			
3	Newtown Creek	Sun Valley Drive	T. Horseheads	0		x	x			
4	Newtown Creek	Ithaca Road	T. Horseheads	0		x				
5	Newtown Creek	Berms	T. Horseheads	16			x			
6	Newtown Creek	Village Wells #4 and #5	V. Horseheads	0	x		x			
7	Newtown Creek	East Franklin Street	T. Horseheads	9			x			
8	Newtown Creek	East Mill Street	T. Horseheads	3			x			
9	Newtown Creek	Willow Street	V. Horseheads	3			x			
10	Newtown Creek	Near State Highway 17	T. Horseheads	0			x			
11	Newtown Creek	Latta Brook Road	T. Horseheads	0	x		x			
12	Newtown Creek	Dam Failure	T. Horseheads	x	x		x			
13	Jackson Creek	Jackson Creek Road	T. Horseheads	0	x	x				
14	Jackson Creek	State Route 223	T. Horseheads	8	x	x	x			
15	Jackson Creek	Breesport	T. Horseheads	4			x			
16	Bannister Road Tributary	Bannister Road	T. Horseheads	0	x	x				
17	North Branch of Newtown Creek	State Route 13	T. Horseheads	2			x			
18	North Branch of Newtown Creek	Redwing Lane, Empire Drive, and Valley Lane	T. Horseheads	20			x			
19	North Branch of Newtown Creek	Dam Failure	T. Horseheads	x			x			
20	Prospect Creek (also called Horseheads Creek)	Prospect Hill Rd. & Hickory Grove Road	T. Horseheads	7			x			
21	Prospect Creek (also called Horseheads Creek)	Meadowbrook Detention Basin	T. Horseheads	0			x			
22	Prospect Creek (also called Horseheads Creek)	Tifft Ave.,William Lane,Lynhurst Ave,Gardner Rd.	V. Horseheads	50			x			
23	Prospect Creek (also called Horseheads Creek)	Union Street Area	V. Horseheads	35	x		x			
24	Prospect Creek (also called Horseheads Creek)	Broad Street	V. Horseheads	5			x			
25	Prospect Creek (also called Horseheads Creek)	Hanover Square Culvert	V. Horseheads	x	x		x			
26	Old Chemung Canal (North of Prospect Creek)	North Main Street	V. Horseheads	4			x			
27	Beaver Brook	Village Wells #1 and #2	V. Horseheads	0			x			
28	Beaver Brook	Franklin Street	T. Horseheads	1			x			

SUMMARY OF FLOODING PROBLEMS
Town and Village of Horseheads

Problem #	Stream/Drainage Basin	Problem Name	Municipality	Houses Affected	Roads/Culverts/Bridges?	Streambank/Lakeshore Erosion	Riverine Flooding?	Stormwater Flooding?	Groundwater Flooding?	Potential Development
29	Latta Brook	Streambank Erosion	T. Horseheads	0	x	x				
30	Latta Brook	Latta Brook Road	T. Horseheads	3			x			
31	McCann's Tributary	State Route 17 culvert	V. Horseheads	x	x		x			
32	McCann's Tributary	Pleasant Street and South Main	V. Horseheads	6			x			
33	McCann's Tributary	Camden Avenue	T. Horseheads	4			x			
34	McCann's Tributary	Valley Avenue	T. Horseheads	5			x			
35	Halderman Hollow Creek	Steambank Erosion	T. Horseheads	0	x	x				
36	Halderman Hollow Creek	Hardinge Brothers Retention Basin	T. Horseheads	x			x			
37	Halderman Hollow Creek	Downstream of Retention Basin	T. Horseheads	100			x			
38	Catharine Creek	Middle Road	T. Horseheads	2		x	x			
39	Goldsmith Creek	Streambank Erosion	T. Horseheads	0	x	x				
40	May's Creek	State Route 14	T. Horseheads	0			x			
DRAINAGE PROBLEMS										
41	Newtown Creek	Breesport	T. Horseheads	0	x			x		
42	Prospect Creek	Aster Drive and Lilac Drive	T./V Horseheads	6				x		
43	Prospect Creek	Wisteria Way	V. Horseheads	3				x		
44	Prospect Creek	Hilton Drive and Gardner Road	T. Horseheads	0	x			x		
45	Prospect Creek	Westinghouse Road	V. Horseheads	0	x			x		
FLOOD WARNING										
46	All	Flash Flooding	T/V Horseheads	x	x		x			
47	Newtown Creek	Stream Gauges	T/V Horseheads	x	x		x			
48	All	Rain Gauges	T/V Horseheads	x	x		x			
49	All	Disaster Plans	T/V Horseheads	x	x		x			
DEVELOPMENT TRENDS										
50	All	Stormwater Management	T/V Horsheads	x				x		x
51	Newtown Creek & Latta Brook	Latta Brook Industrial Park	T. Horseheads	0						x
52	Prospect Creek	Gardner Road Area	T/V Horseheads	x						x
53	Prospect Creek	Hickory Grove Drive	T. Horseheads	x						x
54	Sing Sing Creek	Colonial Drive	T. Horseheads	0						x

PUBLIC/PRIVATE ORGANIZATIONS INVOLVED IN HAZARD MITIGATION AND RESPONSE

American Red Cross, Chemung-Schuyler Chapter: A volunteer-led humanitarian organization that provides relief to victims of disasters and helps people prevent, prepare for, and respond to emergencies.

Environmental Emergency Services, Inc. (EES): A not-for-profit organization with the following mission statement: "To advise and inform the populace of Chemung and Steuben Counties in an effort to reduce the adverse effects of severe flooding, drought and hazardous material incidents which contribute to environmental emergencies." The Board of Directors consists of members from Chemung and Steuben Counties as well as members from industry and other affiliated organizations.

Chemung Basin Flood Warning Service (FWS): A committee of EES with the following mission statement: "To collect pertinent rainfall, climate and river data and to use this information to assist Emergency Management Offices (EMO) in determining areas of concern for potential high water or drought problems in Chemung and Steuben Counties."

Chemical Hazard Information Team (CHIT): A committee of EES with the following mission statement: "To provide chemical and safety information and guidance to local emergency responders in the event of hazardous material incidents."

Chemung County Local Emergency Planning Committee (LEPC): A state-mandated committee of public and private sector representatives that meets quarterly to review hazardous material storage, transportation, and spill response issues. The committee is charged with creating and maintaining the Chemung County Hazardous Material Response Plan, which is updated annually.

Southern Tier Environment, Health, and Safety Group: Individuals from the public and private sector who meet monthly to discuss environmental, health, and safety issues and regulations, as well as preventive measures.

Chemung County Water Quality Strategy Committee: Representatives from municipalities, agencies, and organizations with involvement in water quality in Chemung County who meet monthly to coordinate and enhance the efforts of the respective groups. Hazard-related topics that have been addressed by the committee include: contamination of private wells, flooding, stormwater management, and drought.

ATTACHMENT B

PLANNING PROCESS DOCUMENTATION

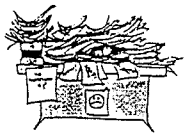
The attached materials include the following:

- Newsletter article in the *Horseheads Community Policing Newsletter* (November/December 1998) announcing the flood mitigation planning effort
- Newspaper announcement of public information meeting for the draft *Flood Mitigation Action Plan, Town and Village of Horseheads* that was held on January 20, 1999
- Handout summarizing the *Flood Mitigation Action Plan, Town and Village of Horseheads* that was distributed at the public information meeting
- Village of Horseheads resolution on September 14, 2000, adopting the *Flood Mitigation Action Plan, Town and Village of Horseheads*
- Town of Horseheads resolution adopting the *Flood Mitigation Action Plan, Town and Village of Horseheads*
- Hazard mitigation planning information sheet that was posted in municipal offices during the hazard mitigation planning process
- Notice of public information meeting for the draft *Town and Village of Horseheads Hazard Mitigation Action Plan* that was held on August 20, 2003
- Town of Horseheads resolutions adopting the *Town and Village of Horseheads Hazard Mitigation Action Plan* and all subsequent revisions
- Village of Horseheads resolutions adopting the *Town and Village of Horseheads Hazard Mitigation Action Plan* and all subsequent revisions

Horseheads Community Policing Newsletter
November/December 1998

www.stny.lrun.com/horseheadspd/

MESSAGE FROM "THE CHIEF"



As 1998 comes to a close, I would like to share a few thoughts. As our community grows and changes, so has the police department. The police officers have about 130 years of "collective" experience. We have added three "Community Service Officers". We are currently in the process of obtaining State Accreditation. Our Advisory Board has now completed it's third year and developed many successful programs through Community Policing. We feel that we have grown closer to the people in our community. I encourage everyone to visit our "recently updated" web site listed above.

Thank you.

IN THE SPOTLIGHT

Officer Michael J. Barton was appointed to the Horseheads Police Department on July 8, 1993. Mike is responsible for the police departments mountain bike program and is certified as a police mountain bike patrol instructor, police general topics instructor and as an arson investigator. He is a member of the area multi-jurisdictional tactical response team and is the president of the Horseheads Village Fire Company. Mike is a native of Horseheads and a valuable member of the police department.

PERSONNEL NEWS

Congrats to Jamie Masclee, our newest police officer, for recently attending and becoming certified as a D.A.R.E. instructor in Vestal, NY - Look for Jamie in the next edition under the officer spotlight.

HOLLY DAYS FESTIVAL

The Horseheads Holly Days Festival will be held on November 28th from 4:00 p.m. - 9:00 p.m. in Hanover Square. The annual festival sponsored by the Horseheads Merchants Associations brings the sense of community spirit into the holiday season. The evening includes food, crafts, a visit from Santa, and entertainment featuring Fillipetti's Dance Academy and vocalists under the direction of Dan Palmer. This year's raffles will include five money wreaths. Take your chance at winning for $1.00 a ticket or 6/$5.00. Tickets are available at these Horseheads Merchants - Hanovers Grill, Beef's, Confections Bakery, Glacier Lakes Systems, Chemung Canal and Zeiglers Florist.

NEIGHBORHOOD WATCH

Horseheads District #11 Neighborhood Watch Group held their first organizational meeting at the Locy Reality Group Building September 28th. Sergeant Dave Kole conducted an informational session assisted by Neighborhood Watch Chairperson, Don Biegun. The group presently consists only of Day Street Residents and we are beginning recruitment campaign for more concerned citizens in this area. For further information, call Gene Hepner at 739-3292 or the Horseheads Police Department.

PUBLIC WELCOME

The C.O.P. Advisory Board will meet on November 16th and December 14th at 7:00 p.m. The meetings are held at Our Saviour's Lutheran Church in Horseheads. They are open to the public and all are welcome to attend.

P.B.A. FUND DRIVE The Horseheads Police Benevolent Association will be conducting its annual fund drive during November and December. Businesses will be solicited over the telephone and if you have any questions, please contact Officer Hetzler, P.B.A. President, at 739-5668.

SOLUTIONS TO FLOODING PROBLEMS

Committees for the Town of Horseheads, Village of Horseheads, Town of Veteran, and Village of Millport are preparing Flood Mitigation Action Plans - ways to protect these communities from flood damages. The committees are documenting existing flooding problems, evaluating the range of potential solutions, and identifying the best ways to address the problems. This planning process will enable the municipalities to qualify for project funding from the recently established Flood Mitigation Assistance grant program. For more information contact Janet Thigpen at 739-2096 or Tom Skebey, Horseheads Code Enforcement at 739-7605.

CITIZENS POLICE ACADEMY

The Police department will be scheduling another session of the Citizens Police Academy next Spring. If you would like to be involved or would like more information, call or stop by the Horseheads Police Department.

IT'S THE LAW NYS Vehicle & Traffic Law Section 1225 prohibits driving across or upon a sidewalk, driveway, parking lot or private property, or otherwise drive off the roadway, in order to avoid an intersection or traffic control device.

"INSIDE" NEWS A Special thanks to Thomas and Betts for their recent donation of a computer and printer to the police department. In September, five officers attended "Life Skills Training" conducted at the Horseheads High School. In October, six officers attended Domestic Violence training in Elmira. Several officers also conducted training programs throughout the community. Officer Todd Adams became the P.B.A. Treasurer.

COLORING CONTEST Thank you to all that participated in the coloring contest at the Village of Horseheads Fire Departments Open House on October 9, 1998. Choosing the winners out of all the wonderful entries was a tough job for our judges.

4 yrs and under -
- 1st Annabelle Hyde
- 2nd Amanda Willette
- 3rd Kristy Grannis

5 yrs - 8 yrs -
- 1st Bobby Thorborg
- 1st Ryan Finefrock
- 2nd Jonathon Willette
- 3rd Kayla Fivie

9 yrs - 12 yrs -
- 1st Kelly Walters
- 2nd Austin Leach
- 3rd Stacie Snyder

HAVE A SAFE AND HAPPY HOLIDAY SEASON FROM THE ENTIRE STAFF OF THE HORSEHEADS POLICE DEPARTMENT.

This Newsletter is brought to you by the following sponsors:

Convenient Food Mart

Van Buskirk-Lynch Funeral Home

Chemung Canal Trust Company

Horseheads-Big Flats Ecumenical Council

Horseheads Do-It Center

Horseheads P.B.A.

If you have any questions or comments about this newsletter, please contact Chief Banfield at the Horseheads Police Department at 739-5668.

Star-Gazette 4/17/99

HORSEHEADS

Flood plan will be discussed Wednesday

Residents of the town and village of Horseheads can discuss a draft flood mitigation plan at a public informational meeting at 7 p.m. Wednesday at the Horseheads Town Hall, 150 Wygant Road, Horseheads.

The plan documents the community's flood problem areas and identifies activities to address these problems.

For more information, call 607/739-8783.

Flood Mitigation Planning
Town of Horseheads & Village of Horseheads

The Horseheads Flood Mitigation Planning Committee has evaluated the community's flooding problems and a variety of potential solutions in order to prepare a program of activities that the Town and Village can undertake to tackle these problems.

WHY?

- Planning is a critical step toward coordinated implementation of activities that will reduce flood damages.
- Fulfill planning requirements for state or federal assistance programs (particularly the newly established Flood Mitigation Assistance Program).
- Qualify for Community Rating System credit toward reduced flood insurance premiums.

ASSESS THE FLOOD HAZARDS AND PROBLEMS

The Flood Mitigation Planning Committee identified and documented 53 flooding problems or potential flooding problems in the Town and Village of Horseheads. This documentation includes problems that have been addressed by the municipalities as well as those that still require resolution. A map indicating the locations of flood problem areas was prepared.

SET RISK REDUCTION GOALS

Long range goals for reducing future flood damages in the Town and Village of Horseheads were proposed. These goals emphasize preventive measures to protect existing development and insure that future development does not contribute to additional problems..

ASSESS POSSIBLE MITIGATION MEASURES

Committee members attended a Flood Solutions Workshop at which they reviewed a comprehensive list of possible measures for resolving flooding problems. They identified those solutions that are most applicable to the flooding problems and community needs in the Town and Village of Horseheads.

DEVELOP AN ACTION PLAN

The committee prepared an Action Plan, which describes 23 activities that the Town and Village can implement with existing resources to address flooding problems. Each year this Plan will be reviewed and updated to incorporate the next steps that need to be taken to reach the communities' long term flood damage reduction goals.

REVIEW AND ADOPTION OF THE PLAN

The Planning Committee is now soliciting comments and input to the Draft Flood Mitigation Action Plan. Once local input has been incorporated, the Plan will be submitted to the State Emergency Management Office and Federal Emergency Management Agency for approval. It will then be presented to the Horseheads Town Board and the Horseheads Village Board for adoption. Adoption of this plan will enable the Town and Village to qualify for Flood Mitigation Assistance grant funding.

610

4. The Association shall provide for and cause the clean up of the hereinabove referred to site and all adjacent public areas (streets and sidewalks) together with adjacent private property removing and lawful disposal of any and all litter deposited from the conduct of the event and shall provide appropriate and an adequate quantity of trash receptacles for the disposal of same.

Trustee Swartz asked if the parking lot will be closed across from Village Hall. Chris Lawrick said that we will only be closing a portion of it - first four parking spaces at the most.

Village Manager Samson said that the plan he saw did not show a lot of activity planned in that parking lot.

Police Chief Banfield said that it is contingent on what the Masons have planned.

Roll Call Vote:

Mayor Gross:	Aye
Trustee Zeigler:	Aye
Trustee Swartz:	Aye
Trustee Miller:	Aye

Resolution by Trustee Miller, seconded by Trustee Swartz

WHEREAS, officials of the Village of Horseheads and Town of Horseheads, as well as others, have met over the last several years for the purpose of developing a flood mitigation action plan, and

WHEREAS, various meetings, workshops and assessment reviews as well as other measures has resulted in the development of a proposed flood mitigation action plan by Southern Tier Central Regional Planning and Development Board, and

WHEREAS, a white paper entitled Flood Mitigation Action Plan, Town of Horseheads and Village of Horseheads, Chemung County, New York, dated September 1999 ("Plan") has been submitted to this Board for its consideration following review of same by the New York State Emergency Management Office and the Federal Emergency Management Agency, and

WHEREAS, this Board subscribes to the goals reflected in the Plan, being in part protection of persons and property from flood damage, preservation of performance and maintenance of drainage systems, assurance of reliable flood warning and appropriate emergency response, review of land use patterns and policies together with development of same so as to control damage and injury from flooding.

NOW THEREFORE BE IT RESOLVED, that the Village of Horseheads Board of Trustees does hereby adopt, in principle, the above-noted Plan, and be it further

RESOLVED, that the Village Manager is authorized to make the Plan available to parties who may be effected by same including employees of the Village, and to take such further and necessary

action as may be required by the Plan.

Roll Call Vote:

Mayor Gross:	Aye
Trustee Zeigler:	Aye
Trustee Swartz:	Aye
Trustee Miller:	Aye

Resolution by Trustee Zeigler, seconded by Trustee Miller

BE IT RESOLVED, that an item to Authorize Village Justice to Attend Magistrates Conference be added to the agenda.

Roll Call Vote:

Mayor Gross:	Aye
Trustee Zeigler:	Aye
Trustee Swartz:	Aye
Trustee Miller:	Aye

Resolution by Trustee Miller, seconded by Trustee Swartz

BE IT RESOLVED, that Village Justice William Driscoll is hereby authorized to attend the NYS Magistrates Association Annual Conference, October 15-18, 2000, in Ellenville, NY with all expenses paid as are allowed under Section 77B of the General Municipal Law.

Roll Call Vote:

Mayor Gross:	Aye
Trustee Zeigler:	Aye
Trustee Swartz:	Aye
Trustee Miller:	Aye

Village Manager Samson stated that the Pegasus Festival is on Friday, September 22nd from 5-9. All the Merchants have put in a lot of hard work to sponsor a good event. This week he also attended a C.O.P. Advisory Board meeting. In order to have a great community, we have to have peole who care about the community. People put it high on their priority list, which is making a difference in our community.

Chris Lawrick asked the Board to look at the new playground equipment at Thorne Street Park. Our DPW crew worked very hard installing it. We are waiting for additional wood chips, but it is complete.

Chief Banfield stated that the officers have responded to calls to rental residences in the Village. The action plan about working with code enforcement has really paid off. Two recent incidents

Hazard Mitigation Planning for Horseheads

WHAT IS HAZARD MITIGATION PLANNING?

The Town and Village of Horseheads are susceptible to numerous hazards, including floods, hazardous material spills, tornadoes, and terrorism. Hazard mitigation is any action that reduces or eliminates the loss of life or property damage resulting from natural and human-caused hazards. In order to reduce the risks and potential damages from future disasters, the Town and Village of Horseheads are preparing a hazard mitigation plan. The objective of this planning process is to prevent damage from future disasters by anticipating where the damage will occur and identifying measures that will reduce the impacts.

WHY BOTHER?

- Planning leads to judicious selection of risk reduction actions. Hazard mitigation planning is the systematic process of learning about the hazards that can affect the community; setting clear goals; and identifying and implementing policies, programs, and actions that reduce the effects of losses from future disasters.
- Planning builds partnerships. Hazard mitigation planning enhances collaboration and mutual support among the parties whose interests might be affected by hazard losses.
- Planning contributes to sustainable communities. An essential characteristic of a sustainable community is its resilience to disasters.
- Planning establishes funding priorities. The hazard mitigation plan will save money by focusing efforts on hazard areas that pose the greatest risks and the mitigation measures that are both cost-effective and technically feasible.
- Planning qualifies the town and village for grant funding and reduced flood insurance premiums. Hazard mitigation planning is required to qualify for federal assistance programs that fund hazard mitigation projects. The hazard mitigation plan will also qualify for Community Rating System credit toward reduced flood insurance premiums.

WHAT IS INVOLVED?

- Organize resources. Establish a planning team of elected officials, public agencies, businesses, and citizens.
- Assess risks. Identify the characteristics and potential consequences of hazards.
- Develop a mitigation plan. Determine mitigation priorities, identify ways to avoid or minimize disaster-related losses, and develop an implementation strategy.
- Implement the plan and monitor progress. The plan comes to life when mitigation projects are implemented and operational changes are made. Periodic review will keep the plan current.

HOW CAN YOU PARTICIPATE?

Your collaboration and involvement will improve the planning process. Whether you want to join the planning committee or just share a few ideas, your input is welcome. Please talk to your municipal officials or call Janet Thigpen at 737-2096.

PUBLIC INFORMATION MEETING

TOWN AND VILLAGE OF HORSEHEADS HAZARD MITIGATION ACTION PLAN

The Town and Village of Horseheads are sponsoring a public information meeting to solicit input on the draft *Town and Village of Horseheads Hazard Mitigation Action Plan*. This plan will serve as a guide for reducing the losses from future hazard events. It includes an assessment of the local risks from natural and man-made hazards and presents a strategy for pre-disaster implementation of projects that will minimize the damage to property and potential loss of life.

The public information meeting is scheduled for:

Wednesday, August 20, 7:00 p.m.
Horseheads Town Hall, 150 Wygant Road, Horseheads

Copies of the draft plan are available for review at municipal offices, as well as at the public information meeting.

FOR MORE INFORMATION CONTACT: Janet Thigpen, Flood Mitigation Specialist, Southern Tier Central Regional Planning and Development Board, 737-5271

Resolution #59 of 2005

RESOLUTION TO ACCEPT HAZARD MITIGATION PLAN

Resolution by Mr. Riopko, seconded by Mr. Lewis.

WHEREAS, the Town of Horseheads pursuant to a continuing process has developed a hazard mitigation action plan to be cooperatively adopted with the Village of Horseheads, and

WHEREAS, pursuant to this process, in 1999 the Town and Village completed a flood mitigation action plan which was revised in the year 2000, and

WHEREAS, a Chemung County Hazard Analysis Report was prepared in 1999 analyzing natural and man-made hazards using The HAZNY (Hazards New York) computer program, and

WHEREAS, the current hazard mitigation plan for October, 2004 has been prepared based upon reference to the prior planning efforts as well as further study and analysis, and

WHEREAS, the Town Board has duly considered the same.

NOW, THEREFORE, BE IT RESOLVED, that the Town Board of the Town of Horseheads hereby adopts the Town and Village of Horseheads Hazard Mitigation Action Plan, (October, 2004).

Ayes: Curren, Fischer, Riopko, Lewis, and Edwards. Nays: None.

VILLAGE OF HORSEHEADS

202 SOUTH MAIN STREET
HORSEHEADS, NEW YORK 14845
Clerk's Office (607) 739-5691
Village Manager (607) 739-5666
FAX (607) 739-3941
www.horseheads.org

Mayor	*Patricia E. Gross*	*Deputy Mayor*	*Kevin R. Sullivan*
Village Manager	*Vincent Azzarelli*	*Trustees*	*Earle R. Catlin*
Attorney	*John G. Groff*		*Ronald R. Swartz*
Clerk-Treasurer	*Sharron Cunningham*		*Howard E. Miller*

May 12, 2005

Resolution by Trustee Swartz, seconded by Trustee Miller

BE IT RESOLVED, that the Hazard Mitigation Plan for the Town and Village of Horseheads dated October, 2004 be received and adopted, and same is to be placed on file in the Village Clerk's Office.

STATE OF NEW YORK)
)ss.
COUNTY OF CHEMUNG)

I, Sharron Cunningham, Clerk-Treasurer of the Village of Horseheads, New York do hereby certify that I have compared the foregoing copy of resolution with the original resolution on file in my office and that same is a true and correct transcript of said original resolution and of the whole thereof as duly adopted by the Village of Horseheads Board of Trustees at a meeting duly called and held at 202 S. Main St., Horseheads, New York on May 12, 2005 by the required necessary vote of the members to approve the resolution.

Witness my hand and the official seal of the Village of Horseheads, New York, the 13th day of May, 2005.

Sharron Cunningham
Clerk-Treasurer

/rmb

ATTACHMENT C

ASSESSMENT OF LOW PRIORITY HAZARDS

The following assessment evaluates the risks associated with each hazard that was given a moderately low or low priority ranking for Horseheads. The hazards are presented in order of priority, followed by a list of the hazards that are not applicable to the Town or Village of Horseheads.

#16. EARTHQUAKE

Definition: A sudden motion of the ground caused by release of subterranean strain energy, due to plate tectonics, resulting in surface faulting (ground rupture), ground shaking, or ground failure (collapse).

HAZNY analysis:

- Scope: Large region is vulnerable
- Cascade effects: Highly likely to trigger another hazard
- Frequency: Rare event (occurs less than once every 50 years)
- Onset: No warning
- Hazard duration: Less than one day
- Incident stabilization: More than two weeks of overtime emergency operations
- Potential impact: Serious injury or death is likely, but not in large numbers
  Severe physical and/or economic damage to private property
  Severe structural damage to community infrastructure

Past hazard events: There have been few recorded earthquakes in Chemung County. However, in February 2001, parts of neighboring Steuben County were rocked by a series of 4 earthquakes. These events had magnitudes ranging from 2.1 to 2.9 on the Richter scale and caused only minor damage.

Probability of future events: An earthquake can occur anywhere in New York State. In 1993, the New York State Earthquake Code Advisory Committee recommended seismic provisions for building codes, using Peak Ground Acceleration Values as a measure of the earthquake risk for each county in the state. The basis for their recommendations was an assessment of the earthquake risk in New York State. An earthquake with the Peak Ground Acceleration Value has a 10% probability of occurring over a 50-year period or a 100% probability over 500 years. For planning purposes it is believed to be the appropriate choice for a credible worst-case event. The Peak Ground Acceleration Value assigned to Chemung County is 0.09g for "average soil conditions." This is the lowest earthquake risk in New York State and corresponds to a Richter Scale earthquake magnitude somewhat greater than 5, for which damage would be slight. The

ground acceleration of an earthquake can be amplified by unconsolidated soft soils, so the credible worst-case event in areas with glacial or alluvial deposits could be a magnitude 6 earthquake. (Analysis is based on "hazard expert" information for the NY State Emergency Management Office HAZNY program.) This risk assessment indicates that an earthquake of sufficient magnitude to activate emergency response operations is possible in Chemung County, but would be a rare event.

Potential impact: Earthquakes can damage buildings and infrastructure and disrupt utilities. In addition, an earthquake can trigger landslides, fire, flash floods, levee failure, dam failure, transportation accidents, and hazardous material releases. An earthquake measuring 6 on the Richter Scale (considered the worst credible event for Chemung County) is described as follows: "Everybody runs outdoors. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable in poorly built or badly designed structures; some chimneys broken. Noticeable when driving car." Prior to January 2003, the New York State Building Code did not address seismic design. In the current building code, structures that represent a higher hazard to human life in the event of failure must meet minimum seismic requirements. Because Horseheads is located in a seismically inactive area, the average building does not require any seismic provisions.

Vulnerable areas: Most buildings in the Town and Village can be described as well-built ordinary structures, which could be subject to slight to moderate damage during an earthquake, particularly if they are located on unconsolidated soft soils. Older structures, particularly abandoned farm buildings, would be more vulnerable.

Estimate of potential losses: On April 20, 2002, a magnitude 5.3 earthquake struck six counties in northern New York. The most severely impacted areas were in Clinton County (federal disaster assistance of $1.5 million, corresponding to an average of $20 per resident or $1,506 per square mile) and Essex County (federal disaster assistance of $1.2 million, corresponding to an average of $30 per resident or $647 per square mile) (source: NY State Emergency Management Office). These figures underestimate the actual damage since not all losses qualify for federal disaster assistance. If a comparable event were to occur in Horseheads, damages could be as high as $500,000 (based on per capita damages of $30).

#17. STRUCTURAL COLLAPSE

Definition: A sudden structural failing, partially or fully, of buildings, bridges or tunnels, threatening human life and health.

HAZNY analysis:

- Scope: Several individual locations are vulnerable
- Cascade effects: Unlikely to trigger another hazard
- Frequency: Regular event (occurs once every one to seven years)
- Onset: No warning

- Hazard duration: Less than one day
- Incident stabilization: One to two days of overtime emergency operations
- Potential impact: Serious injury or death is likely, but not in large numbers
  Moderate physical and/or economic damage to private property
  Little or no structural damage to community infrastructure

Past hazard events: Chemung County has experienced several incidents involving partial or full collapse of structures.

- Farm buildings occasionally collapse. These are generally abandoned structures that are not in use and therefore cause minimal damage.
- There have been several incidents in which a motor vehicle hit a house and caused partial collapse of the structure. One such occurrence was in the Town of Horseheads in 1996, when a tractor-trailer collided with a house and shifted the building on its foundation.
- In 1976, three children playing in an old tobacco shed in the Town of Big Flats were hitting the structural supports of the shed with lumber. The building collapsed and one child was killed.
- In the 1990's the wall of a commercial building in the City of Elmira collapsed during construction.
- Heavy snow in 1993 resulted in roof collapse of two agricultural buildings in the Town of Big Flats.
- There was a partial collapse of a commercial building in Elmira in 1998.
- Bridges have also collapsed due to erosion damage during flood events. The Pine Hills Drive Bridge over Bird Creek in the Town of Southport was completely destroyed during the August 1994 flood, eliminating all access to approximately 100 houses in the Pine Hills and Woodland Park areas. The Town installed a temporary bypass within 18 hours and subsequently replaced the bridge with a larger structure at a cost of $1,300,000.

Probability of future events: A structural collapse can be induced by a traffic accident, heavy snowfall, high winds/tornado, an earthquake, flooding, an explosion, or some other incident. The schools, churches, and other buildings where people gather in Horseheads are well-built structures that are not considered vulnerable to collapse. The previous and current building codes set standards for structural loads. In addition, the current Building Code of New York State sets higher standards for seismic, snow loading, and wind for structures that represent a higher hazard to human life in the event of failure. The buildings with the greatest probability of failure are abandoned structures and farm buildings. The probability of collapse when a building is occupied or while traffic is on a bridge is considered to be relatively low.

Potential impact: Although there may be warning of an event that can trigger a structural collapse, the collapse itself can occur with little or no warning time. The impact of a structural collapse depends on the type of structure impacted and the occupancy or use of the structure at the time of collapse. The collapse of an unused building in a remote area would have minimal impact. The collapse of an occupied gathering place (church, school, fire station, etc.) could cause serious injury or death to a number of people. The most credible event that the Town or

Village anticipates is the collapse of one or more residential buildings due to a traffic accident, heavy snow load, or other triggering event.

Vulnerable areas: Most buildings in the Town and Village of Horseheads are reasonably well-built structures, which are unlikely to collapse unless they are subject to an extreme event, such as a tornado. Older buildings and mobile homes are more likely to be vulnerable than newer structures built in compliance with existing and recent building code standards. The most vulnerable structures are abandoned farm buildings.

Estimate of potential losses: The credible worst-case building collapse in the Town or Village of Horseheads would probably be limited to one older home or part of a larger structure. Injury of death could result; the financial loss is unlikely to exceed $50,000. The collapse of a public or privately owned bridge could result in greater losses. The cost of replacing a collapsed bridge on a public roadway can exceed $1 million.

#18. INFESTATION

Definition: An excessive population of insects, rodents, or other animals requiring control measures due to their potential to carry diseases, destroy crops, or harm the environment.

HAZNY analysis:

- Scope: Large region is vulnerable
- Cascade effects: Unlikely to trigger another hazard
- Frequency: Frequent event (occurs more than once a year)
- Onset: More than one week warning
- Hazard duration: More than one week
- Incident stabilization: Less than one day of overtime emergency operations
- Potential impact: Serious injury or death is unlikely
  Moderate physical and/or economic damage to private property
  Little or no structural damage to community infrastructure

Past hazard events:

- Gypsy moths defoliated trees throughout the region in the early 1980's.
- In the late 1990s mosquito problems developed on a wetland in the Town of Horseheads and were controlled with biological techniques.
- Deer populations have increased significantly in recent years. This has been accompanied by increased crop and foliage damage and significant numbers of motor vehicle accidents involving deer. Police reports for Chemung County in 2002 include 215 animal-car crashes and 254 collisions due to drivers' actions to miss animals. The majority of these reported incidents involved deer. The actual number of incidents is probably significantly larger, since most deer-auto collisions are not reported to police.
- An article on the AAA web site states that "each year there are about 500,000 deer/auto collisions resulting in more than 100 deaths and thousands of injuries."

Probability of future events: As deer populations increase and more rural areas are developed, the problems caused by deer are becoming more prevalent. In addition to ongoing deer problems, other types of infestation occur occasionally.

Potential impact: High deer populations result in damage to crops, ornamental foliage, and forest resources. In particular, the value of timberland is threatened by the tendency for deer to eat the shoots and saplings of desirable species. The Chemung County Traffic Safety Board reports that deer are the primary cause of crashes in Chemung County. An infestation of mosquitoes or other disease-bearing animals can cause health concerns. Gypsy moth infestations damage forest resources.

Vulnerable areas: The areas of vulnerability depend on the type of infestation. Deer damage and deer-auto collisions are highest in rural parts of the Town. As deer populations increase, the resulting problems are encroaching into the suburban and even urban areas of the Town and Village.

Estimate of potential losses: According to the Insurance Information Institute, each deer/auto collision costs the auto insurance industry about $2,000. The Chemung County police reports for 2002 attributed 269 collisions to animals (primarily deer). If these incidents were distributed evenly over the 412 square miles in the county, approximately 40 would have occurred in Horseheads, costing the auto insurance industry approximately $80,000. Since many deer-auto collisions are not reported to police and many of the costs incurred are not covered by auto insurance, the expense of deer related collisions is estimated to be well over $100,000 per year and rising. In addition, deer damage agricultural crops, forest resources, and landscaping.

#19. WILDFIRE

Definition: An uncontrollable combustion of trees, brush, or grass involving a substantial land area that may have the potential for threatening human life and property.

HAZNY analysis:

- Scope: Small region is vulnerable
- Cascade effects: Some potential to trigger another hazard
- Frequency: Regular event (occurs once every one to seven years)
- Onset: No warning
- Hazard duration: Less than one day
- Incident stabilization: Less than one day of overtime emergency operations
- Potential impact: Serious injury or death is unlikely
  Moderate physical and/or economic damage to private property
  Little or no structural damage to community infrastructure

Past hazard events: Chemung County has a history of wildfire, though the severity of such events has been significantly less than those in the western U.S. Local fire fighting crews are typically able to control these incidents before developed areas are threatened. On several occasions, sheds or other outbuildings have burned, but the overall structural losses from wildfires have been small.

- Two wildfires occurred in the Town of Big Flats in the 1990's. One was the result of a downed power line. One took several days to subdue.
- In the late 1990's, open burning led to a wildfire in the Town of Chemung that spread very quickly across hillsides. This occurred in April, when hot, dry weather occurred before vegetation started to grow.
- In 2000, open burning resulted in a large wildfire that burned over 100 acres of forest and approached park buildings at the Newtown Battlefield State Park in the Town of Elmira.
- In 2000, a downed power line ignited a wildfire that burned forestland on Mount Zoar in the Town of Southport.
- A fire occurred during the burnoff of a natural gas well in the Town of Big Flats, but was contained on the site.
- In March 2003, a brush fire occurred in the Town of Van Etten.

Probability of future events: Most wildfires are started by people through negligent behavior or by downed power lines. The risk of wildfire is greatest during drought conditions, when the moisture content of forests and grasslands is low. The National Weather Service uses the term fire weather for the meteorological conditions that promote the spread of fire. Those weather conditions that promote the ignition and rapid spread of fires include: low humidity, high winds (over 10-20 mph), dry thunderstorms (i.e., lightning without rain), unstable air, and dry antecedent conditions. Other factors that contribute to the spread and severity of fires include the available fuel, terrain (fire spreads faster uphill than downhill), and the urban-wildland interface. The ongoing spread of residential areas into forested parts of the Town means that the population faces a greater risk of forest fires. Many of the wooded areas in Horseheads are thought to contain significant amounts of burnable material and have steep slopes that can promote the spread of fire.

Potential impact: Wildfires in Chemung County seldom burn more than a few acres before they are controlled. Development patterns in the Town of Horseheads are such that a wildfire is not likely to impact a large number of structures. Most buildings in the rural and developed parts of the community are surrounded by lawns, which protect against the spread of fires from wooded areas. The use of asphalt shingles also protects against the spread of fire. All fires pose a risk to the firefighters who work to control the blaze. Heavy rains following a wildfire may induce landslides, mudflows, and floods due to the inability of the burned areas to absorb water because of the absence of foliage and groundcover. In addition, fires may cause power failures, air contamination, hazardous material releases, structural collapse, or transportation accidents.

Vulnerable areas: The risk of wildfires is greatest in densely wooded areas with steep slopes. The densely wooded rural hillsides of the Town of Horseheads contain scattered residential development, which is at risk from wildfires. Additional residential development in wooded

areas may contribute to an increase in the urban-wildland interface that is vulnerable to wildfire damage.

Estimate of potential losses: A credible worst-case wildfire in Horseheads would be one that results in the complete loss of several rural structures. This damage could amount to a couple hundred thousand dollars.

#20. SCHOOL VIOLENCE

Definition: Violence or the threat of violence within a public or private school.

HAZNY analysis:

- Scope: Several individual locations are vulnerable
- Cascade effects: Some potential to trigger another hazard
- Frequency: Regular event (occurs once every one to seven years)
- Onset: No warning
- Hazard duration: Less than one day
- Incident stabilization: Three days to one week of overtime emergency operations
- Potential impact: Serious injury or death is likely, but not in large numbers
  Little or no physical and/or economic damage to private property
  Little or no structural damage to community infrastructure

Past hazard events:

- Bomb threats have been made to schools. During a period with repeated bomb threats at the Horseheads Central High School, tensions mounted between parents and staff over how to handle the situation.
- In February 2001, a serious incident occurred when a student took an arsenal of weapons and bombs to Southside High School in the Town of Southport. Fortunately, no injuries occurred.

Probability of future events: Eight schools are located within the Town and Village of Horseheads. The high number of students attending school in this community increases the potential for escalation of student fights, bomb threats, or other violent incidents.

Potential impact: In addition to the injuries and property damage that might result from violence in a school, this type of incident can take a significant emotional toll on students and the entire community.

Vulnerable areas: Eight schools are located within the Town and Village of Horseheads (Horseheads Central High School, Horseheads Middle School, Center Street School, Gardner Road School, Ridge Road School, Sing Sing Road School, St. Mary Our Mother School, Twin Tiers Baptist School). The locations are shown on the Critical Facilities map in Attachment A.

Estimate of potential losses: If a violent incident develops in a local school, it is anticipated that school staff and law enforcement personnel will be able to control the situation relatively quickly. Property damages are unlikely to exceed a few thousand dollars. If injuries and/or deaths occur, the emotional damages will be much greater, requiring counseling and other interventions.

#21. EPIDEMIC

Definition: The occurrence or outbreak of disease to an unusual number of individuals or proportion of the population, human or animal.

HAZNY analysis:

- Scope: Large region is vulnerable
- Cascade effects: Unlikely to trigger another hazard
- Frequency: Regular event (occurs once every one to seven years)
- Onset: More than one week warning
- Hazard duration: More than one week
- Incident stabilization: One to two days of overtime emergency operations
- Potential impact: Serious injury or death is likely, but not in large numbers
  Moderate physical and/or economic damage to private property
  Little or no structural damage to community infrastructure

Past hazard events: The Chemung County Health Department reports that a flu epidemic occurs every year. Most of the deaths resulting from these influenza outbreaks occur in the elderly population. Additional disease outbreaks in the last decade have included: repetitive outbreaks of rabies, increasing incidence of Hepatitis B, and two Hepatitis A incidents. West Nile virus was first detected in dead birds in Chemung County in 2000, but has not resulted in any known human cases in the county. Chronic wasting disease has impacted deer populations in other parts of the country, but there have been no reported cases in either New York or Pennsylvania. Historical events include the Swine Flu Scare in 1976 and the Hong Kong Flu in 1968. In 2003, severe acute respiratory syndrome (SARS) had severe impacts in other countries.

The U.S. Centers for Disease Control and Prevention (CDC) reports that in most years, influenza-related complications are responsible for 10,000-40,000 deaths, 50,000-300,000 hospitalizations and approximately $1-3 billion in direct costs for medical care in the United States. Flu pandemics have occurred in the United States in 1918, 1957, and 1968. Although death rates associated with the recent pandemics of 1957 and 1968 were confined primarily to the elderly and chronically ill, both pandemics were associated with high rates of illness and social disruption, with combined economic losses of approximately $32 billion (in 1995 dollars).

- The Spanish Influenza pandemic in 1918 is the catastrophe against which all modern pandemics are measured. It is estimated that approximately 20 to 40 percent of the worldwide population became ill and over 20 million people died. Between September 1918

and April 1919, approximately 500,000 deaths from the flu occurred in the U.S. alone. The attack rate and mortality was highest among adults 20 to 50 years old.

- Although the Asian influenza pandemic in 1957-58 was not as devastating as the Spanish Flu, about 69,800 people in the U.S. died. The elderly had the highest rates of death. The virus that caused this pandemic was quickly identifies and limited supplies of vaccine were available.
- The 1968 Hong Kong influenza pandemic was the mildest pandemic in the 20th century. The number of deaths between September 1968 and March 1969 was 33,800. The reasons cited for the lower death rate include: partial immunity due to similarities with the Asian flu virus, reduced transmission by school children due to school holidays, and improved medical care and antibiotics to treat those who became ill.

Probability of future events: Immunizations and sanitary practices have decreased the prevalence of what most people would classically think of as epidemics. However, the human population remains susceptible to influenza outbreaks, Hepatitis B, Hepatitis A, HIV, meningitis, or vector borne diseases such as West Nile Encephalitis and Lyme Disease. In addition, rabies and other diseases may affect the animal population (both wild and domestic). Recent concerns have focused on the possible use of anthrax or another biological agent by terrorists. In response to this threat, Chemung County is participating in national efforts regarding small pox vaccination. Flooding could also trigger an epidemic, since floodwater can carry bacteria that are harmful to both humans and animals.

Potential impact: Recent influenza outbreaks in other parts of the state have led to significant increases in hospital admissions and emergency room visits, sometimes causing hospitals to request that ambulances divert non-emergency patients to other hospitals. Less severe impacts would occur if a lower proportion of the population contracts the disease. A disease that impacts animals could have severe consequences on the affected farms.

Vulnerable areas: Although an epidemic could impact the entire population of Chemung County, it is generally the young, old, and those with existing medical conditions who are at the greatest risk. Depending on the disease, the mechanism of transmission can result in greater risks for some segments of the population than for others.

Estimate of potential losses: The impact of the next pandemic could have a devastating effect on the health and wellbeing of Horseheads residents. The CDC estimates of the possible impact in the United States are:

- Up to 200 million persons may be infected;
- Between 40 and 100 million persons may become clinically ill;
- Between 18 and 45 million persons may require outpatient care;
- Between 300,000 and 800,000 persons may be hospitalized;
- Between 88,000 and 300,000 persons may die.

Using the 2000 census data to scale the CDC estimates to the Town and Village of Horseheads (excluding the Village of Elmira Heights), this worst-case pandemic could have the following consequences:

- Up to 11,700 persons may be infected (71% of the population);
- Between 2,300 and 5,900 persons may become clinically ill (14 to 36% of the population);
- Between 1,000 and 2,600 persons may require outpatient care (6 to 16% of the population);
- Between 16 and 49 persons may be hospitalized (0.1 to 0.3% of the population);
- Between 5 and 18 persons may die (0.03 to 0.11% of the population).

The CDC estimates that the 1957 and 1968 pandemics had a combined economic loss in the U.S. of approximately $32 billion (in 1995 dollars). Splitting these losses equally between the two outbreaks and scaling this to the population of Horseheads, the economic losses that could result from a similar incident could exceed $900,000 in the Town and Village of Horseheads.

#22. WATER SUPPLY CONTAMINATION

Definition: The contamination or potential contamination of surface or subsurface public water supply by chemical or biological materials that results in restricted or diminished ability to use the water source.

HAZNY analysis:

- Scope: Large region is vulnerable
- Cascade effects: Unlikely to trigger another hazard
- Frequency: Infrequent event (occurs once every eight to 50 years)
- Onset: No warning
- Hazard duration: More than one week
- Incident stabilization: Less than one day of overtime emergency operations
- Potential impact: Serious injury or death is unlikely
  Little or no physical and/or economic damage to private property
  Little or no structural damage to community infrastructure

Past hazard events: The Chemung County Health Department reports that a boil-water advisory is issued for a public water supply somewhere in the County almost every year. In addition, private wells can become contaminated. Wells supplying the Village of Horseheads Water System have occasionally been threatened by flooding or fuel tank leaks. The primary source of water for the Elmira Water Board is the Chemung River. When the turbidity of the river is high, water is drawn from the Hoffman Reservoir. This occurs about 12 times per year.

- The Elmira Water Board filtration plant flooded during the 1972 Tropical Storm Agnes flood. Customers were advised not to drink the water for about a week.
- The area around Village of Horseheads wells 1 and 2 flooded in January 1996, when a berm along Newtown Creek ruptured. Both wells were shut down to prevent contamination.
- The Town of Big Flats discontinued the use of a public water supply well due to salt contamination.

- Town of Big Flats municipal wells have experienced nitrate pollution problems in the past. Possible contamination sources include industry and agriculture.
- In the 30 years from 1971 to 2001, there have been 619 reported waterborne outbreaks at community and non-transient non-community water systems in the United States. It is estimated that only about a third of the outbreaks are reported, so the actual occurrences are likely higher. Over 18% of the reported occurrences (or 113 outbreaks) have been associated with distribution system problems. The outbreaks caused by distribution system deficiencies caused over 21,000 cases of illness and resulted in 9 deaths and nearly 500 hospitalizations. These outbreaks were mostly attributed to microbial and chemical contamination from cross-connections and backsiphonage. (source: NYS Rural Water Association web site.)

Probability of future events: Public water in Horseheads is provided by the Village of Horseheads Water System and the Elmira Water Board. The Village Water System relies on four active wells, which are located near streams and developed areas, where contamination due to a hazardous material release (leaking fuel tanks) or flooding is possible. The primary source of water for the Elmira Water Board is the Chemung River Aquifer, with the Hoffman Reservoir serving as a backup water source. Additional protection is provided by interconnections between the Big Flats, Elmira, and Horseheads municipal water supplies.

The New York State Department of Health is currently evaluating the susceptibility of public water supplies to potential contamination as part of the Source Water Assessment Program. Protective measures will be implemented as warranted. Vulnerability assessments have been conducted for both the Horseheads and Elmira water systems in compliance with federal requirements and all identified security deficiencies are being addressed. These vulnerability assessments and the emergency response plans for both water systems will be reviewed and updated annually. In addition, the ongoing maintenance and operational procedures for the water supply systems are intended to minimize the risk of contamination within the distribution system.

Potential impact: It is anticipated that any contamination problem that may develop to a municipal system serving the Town and Village of Horseheads would be identified and resolved quickly. Because of the frequency of water quality testing, it is unlikely that contamination of the public water supply will have public health impacts prior to detection and notification of consumers. However, contamination of private well water can go undetected and untreated for a prolonged period of time.

Vulnerable areas: The Village of Horseheads Water System serves approximately 3,300 residential, commercial, and industrial customers in the Village and surrounding areas of the Town of Horseheads. The Elmira Water Board serves approximately 2,700 customers in areas if the Town and Village south of Route 17. The remainder of the Town of Horseheads is served by private water supply wells, which are vulnerable to aquifer contamination, particularly in areas where onsite wastewater treatment systems are located on small lots.

Estimate of potential losses: If the Village of Horseheads and Elmira Water Board are unable to provide potable water to any of the 6,000 customers in the Town and Village of Horseheads, it is

anticipated that drinking water could be supplied by truck or some other means with few resulting health threats. The Chemung County Emergency Management Office estimates that the expense for providing alternate water would be a few thousand dollars. More significant expenses would be incurred if a new well or water treatment system is necessary or if aquifer contamination necessitates extension of public water service to areas that are currently served by private wells.

#23. CIVIL UNREST

Definition: An individual or collective action causing serious interference with the peace, security, and/or normal functioning of a community (e.g., riot).

HAZNY analysis:

- Scope: Several individual locations are vulnerable
- Cascade effects: Some potential to trigger another hazard
- Frequency: Regular event (occurs once every one to seven years)
- Onset: Several days warning
- Hazard duration: Less than one day
- Incident stabilization: One to two days of overtime emergency operations
- Potential impact: Serious injury or death is likely, but not in large numbers
  Severe physical and/or economic damage to private property
  Little or no structural damage to community infrastructure

Past hazard events: Although most labor disputes and public protests occur peacefully, volatile situations have occasionally developed in Chemung County.

- In the late 1980's, a riot occurred at the Southport Correctional Facility (a maximum-security prison), in which guards were taken hostage. The State Police response was rapid. This incident lasted for one day and resulted in a fire and some serious injuries.
- Bomb threats have been made to schools. During a period with repeated bomb threats to an area high school, tensions mounted between parents and staff over how to handle the situation.
- In February 2001, a serious incident occurred when a student took an arsenal of weapons and bombs to Southside High School in the Town of Southport. Fortunately, no injuries occurred.
- Labor disputes and strikes frequently necessitate increased police scrutiny. Although violent incidents have occasionally been triggered, labor disputes have not led to any incidents of widespread unrest in Chemung County.

Probability of future events: Civil unrest can be triggered by political protests, labor disputes, prison violence, or other incidents in the community. Hazards that could trigger civil unrest include: terrorism, epidemic, food shortage, fuel shortage, or radiological release.

Potential impact: By definition, an incident of civil unrest would interfere with the peace, security, and/or functioning of the community. However, it is anticipated that any situation that develops in the Town or Village of Horseheads could be brought under control relatively quickly, thus limiting the overall impact.

Vulnerable areas: Although civil unrest can spread throughout the community, it is most likely to originate at the site of a triggering controversy. Potential locations include work places, schools, prisons, places of worship, or other public areas. The Critical Facilities and Vulnerable Sites maps in Attachment A show the locations of schools, government buildings, emergency response facilities, auditoriums, and religious meeting places.

Estimate of potential losses: If a riot develops in the Town or Village of Horseheads, it is anticipated that law enforcement activities will successfully confine the violence and destruction to a small area. The potential property damage from such an incident could be a few hundred thousand dollars. Additional economic losses can occur if businesses are unable to function.

#24. DROUGHT

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

HAZNY analysis:

- Scope: Large region is vulnerable
- Cascade effects: Some potential to trigger another hazard
- Frequency: Regular event (occurs once every one to seven years)
- Onset: More than one week warning
- Hazard duration: More than one week
- Incident stabilization: Less than one day of overtime emergency operations
- Potential impact: Serious injury or death is unlikely
  Moderate physical and/or economic damage to private property
  Little or no structural damage to community infrastructure

Past hazard events:

- Based on 100 years of Palmer Index values, the western plateau of New York (Allegany, Cattaraugus, Chemung, and Steuben Counties) has repeatedly experienced severe and extreme drought conditions. A "severe drought" classification (corresponding to the state drought stage of "emergency") occurred about 5% of the time; an "extreme drought" classification (corresponding to the state drought stage of "disaster") occurred about 2% of the time. The periods with a severe or extreme drought classification are listed below (source: "hazard expert" information for the NY State Emergency Management Office HAZNY program):
  September 1895 – January 1896
  August 1897 – July 1898 (except May 1898; extreme drought October – December1897)

July 1899 – February 1901 (except March 1900; extreme drought June 1900; extreme drought August 1900 through February 1901)
October 1908 – January 1910 (except April – May 1909; extreme drought November 1908 – January 1909; extreme drought November – December 1909)
October – December 1910
May & July 1911
June & October 1921
August – November 1923
October 1930 – June 1931 (extreme drought November 1930 – April 1931)
July 1934 – March 1935 (except September 1934)
September 1936
November – December 1949
November 1960 – January 1961 (extreme drought December 1960 – January 1961)
November – December 1964
September – November 1991

- In recent years, New York State has issued the following drought declarations for Chemung County (source: Susquehanna River Basin Commission):
  Drought Watch declared on October 13, 1995
  Drought Watch declared on June 23, 1999; Drought Warning declared on July 9, 1999; Drought Emergency declared on August 7, 1999; returned to normal on March 27, 2000
  Drought Watch declared on August 8, 2001; returned to normal on May 7, 2002
- During the 1999 drought, numerous private wells went dry. Public water supplies were not threatened.
- During the 2001 to 2002 drought, some private wells experienced problems.

Probability of future events: Even though New York normally possesses an adequate water supply with sufficient annual precipitation to replenish surface- and ground-water resources, the region is still susceptible to periods of drought. The Chemung River Aquifer, which supplies both the Village of Horseheads Water System and the Elmira Water Board, is a reliable and abundant water supply even during dry periods. In addition, the Hoffman Reservoir serves as a backup water source for the Elmira Water Board. Additional protection is provided by interconnections with neighboring municipal water supplies (Horseheads, Elmira, and Big Flats). Drought conditions severe enough to impair the ability of the Village of Horseheads and Elmira Water Board to provide water for essential uses are unlikely. However, droughts that impact private well supplies, agriculture, and wildfire risks are likely to occur, on the average, every 5 to 10 years (estimate is based on the 15 events in 100 years listed above).

Potential impact: Drought periods progress through stages and drought intensity may vary considerably during the drought period. The time of occurrence and duration can cause significant variations in drought impacts. The initial impact of a drought is likely to be felt by agriculture and by those relying on private wells. Agriculture faces major losses when adequate soil moisture cannot be maintained and when sufficient water is not available for livestock. If it becomes necessary to impose mandatory water use restrictions or import water, additional

economic impacts will occur. Some businesses and industry may be affected by reduced revenues resulting from increasingly severe restrictions on nonessential water uses. Dry conditions increase the potential for water supply contamination. Parched lands are more susceptible to wildfires during a period of drought. Structural fires also present a problem if there is not sufficient water available for fire fighting needs or if the time required to transport the water is significantly increased. If dry conditions are so severe and widespread that the region is unable to obtain adequate potable water, a drought can cause serious threats to public health and sanitation. However, the NY State Emergency Management Office reports that the historical record lacks instances of serious injury or death due to drought conditions. Additional impacts can include wildlife mortality, loss of ornamental vegetation, and damage to fish and wildlife habitat.

Vulnerable areas: Private wells located outside of the river valley aquifers are most vulnerable to drought conditions. The ground in these upland areas stores less water and therefore requires more frequent recharging than the primary aquifer in the Chemung River Valley. Agricultural operations and landscaping are also at risk.

Estimate of potential losses: The potential costs associated with a severe drought include the cost of replacing private wells with deeper wells, agricultural damages, and industrial losses.

#25. AIR CONTAMINATION

Definition: Pollution caused by atmospheric conditions (as opposed to a chemical spill or release), such as a temperature inversion induced smoggy condition sufficiently serious to create some danger to human health.

HAZNY analysis:

- Scope: Large region is vulnerable
- Cascade effects: Unlikely to trigger another hazard
- Frequency: Regular event (occurs once every one to seven years)
- Onset: Several hours warning
- Hazard duration: Less than one day
- Incident stabilization: Less than one day of overtime emergency operations
- Potential impact: Serious injury or death is unlikely
  Little or no physical and/or economic damage to private property
  Little or no structural damage to community infrastructure

Past hazard events: Ozone alerts for Chemung County are not common, but did occur several times during a hot spell during the summer of 2002.

Probability of future events: Ozone alerts or other air contamination conditions can occur occasionally in the Town and Village of Horseheads.

Potential impact: Some health problems can be triggered by high ozone concentrations. Those most seriously impacted are those with preexisting medical conditions, such as asthma, and those who fail to heed warnings against outside physical exertion.

Vulnerable areas: The entire community is vulnerable to air contamination.

Estimate of potential losses: Because air contamination problems in the Horseheads are not expected to be severe or prolonged, it is anticipated that the medical consequences will be limited to a small number of people.

#26. DAM FAILURE

Definition: Structural deterioration, either gradual or sudden, resulting in the facility's inability to control impounded water, resulting in danger to people and/or property in the potential inundation area. Dams may be either man-made or exist because of natural phenomena, such as landslides or beavers.

HAZNY analysis:

- Scope: Small region is vulnerable
- Cascade effects: Highly likely to trigger another hazard
- Frequency: Rare event (occurs less than once every fifty years)
- Onset: Several hours warning
- Hazard duration: Less than one day
- Incident stabilization: Three days to one week of overtime emergency operations
- Potential impact: Serious injury or death is likely, but not in large numbers
  Severe physical and/or economic damage to private property
  Severe structural damage to community infrastructure

Past hazard events: Since 1890, there have been at least 41 dam failures in New York state, resulting in the loss of 10 lives. This number may not include failures of small structures, for which damages were minimal. The failure of beaver dams and un-maintained low hazard dams has occurred in surrounding communities. Because these structures are typically located in remote areas, significant damages have not generally occurred.

Probability of future events: Dam failure can result from many factors such as natural disasters, structural deterioration, or actions caused by man, including terrorism. According to the International Commission of Large Dams (ICOLD), the three major causes of dam failure are overtopping by flood, foundation defects, and piping. Failure of any of the four flood control dams in the Newtown Creek watershed could impact Horseheads. The Sullivanville Dam, Park Station Dam, Marsh Creek Dam, and Jackson Creek Dam are classified as high hazard dams, because failure would threaten life and property downstream. This classification does not imply that failure is likely. All of these structures were designed and constructed by the USDA Natural Resources Conservation Service (NRCS). Periodic safety inspections are conducted by NRCS

and the DEC Dam Safety Division, as well as County maintenance personnel. It is unlikely that any of these well-maintained structures will fail. In addition, there are two state permitted dams in the Town of Horseheads with a low hazard classification. One is located on Catharine Creek; the other is a retention basin on Hickory Grove Road. If one of these structures were to fail, the resulting damage is not expected to impact developed land.

Potential impact: In the event of a dam failure, the sudden release of enormous amounts of water would cause flash flooding downstream of the structure. In the case of the Marsh Creek Dam (a low hazard dam), the area of inundation could include roads and infrastructure, but no buildings would be at risk. The emergency plans for catastrophic releases of water from the Sullivanville, Park Station, and Jackson Creek Dams (high hazard dams) indicate that such an event could inundate developed areas in the Town and Village of Horseheads. The damage to private property and infrastructure located within the inundation zone could be extensive. The water surge can cause water supply failure, sewer system failure, hazardous material releases, power outages, and other cascade effects.

Vulnerable areas: Four high hazard flood control dams are located in the Newtown Creek Watershed. The Park Station, Marsh Creek, and Jackson Creek dams are located upstream in the Town of Erin. Although the peak discharge resulting from failure of one of these structures would be attenuated somewhat prior to reaching Horseheads, the hamlet of Breesport and areas downstream could be impacted. Breach inundation maps for the Jackson Creek Dam indicate vulnerable development along Jackson Creek Road and in Breesport. The Sullivanville Dam is located on the North Branch of Newtown Creek in the Town of Horseheads upstream of the Village of Horseheads. Depending on the breach scenario, the inundation area for failure of this structure could impact developed areas in the Town and Village, primarily along Old Ithaca Road and Franklin Street.

Estimate of potential losses: The failure of a high hazard dam could cause loss of life and millions of dollars in damage to downstream development in the Town and Village of Horseheads.

#27. RADIOLOGICAL RELEASE IN TRANSIT

Definition: A release or threat of release of radioactive material from a transportation vehicle (including truck, rail, air, and marine vehicle) or other mechanism.

HAZNY analysis:

- Scope: Large region is vulnerable
- Cascade effects: Some potential to trigger another hazard
- Frequency: Infrequent event (occurs once every eight to fifty years)
- Onset: No warning
- Hazard duration: Less than one day
- Incident stabilization: Less than one day of overtime emergency operations

- Potential impact: Serious injury or death is unlikely
  Little or no physical and/or economic damage to private property
  Little or no structural damage to community infrastructure

Past hazard events:

- The only event involving radiological material that is known to have occurred in Chemung County was a traffic accident involving a motor vehicle carrying low level radioactive material. The integrity of the container was maintained and no release occurred.
- Radioactive material was detected at the Steuben County transfer station in the Town of Erwin. The source of the contaminated material is not known.

Probability of future events: There are no sites in Horseheads where radioactive material is used or stored. A transportation accident involving radiological material could result in the release of radioactive substances. Although Horseheads is not located on a route routinely used to transport radioactive fuels, weapons or waste, small amounts of radioactive material associated with medical, research and industrial uses may pass through the community. If a transportation accident were to occur, the packing and other safety measures utilized are likely to prevent the release of radiation. Another mechanism for a radiation release is a terrorist attack utilizing a "dirty bomb." However, this is unlikely because the vandals and homegrown terrorists that pose the greatest risk in Chemung County are unlikely to have access to radioactive materials. The probability of that radiological material will be released in the Town or Village of Horseheads is very low.

Potential impact: The potential health risks associated with a release of radioactive material include direct exposure and ingestion through the food chain. Since it is unlikely that a large amount of material would be involved in an incident in Horseheads, the impact on public health is not expected to be great. The primary impact would be economic, due to the potentially high cost associated with decontamination of the affected area and the cost to farmers whose fields, livestock, or crops might be contaminated. Civil unrest might develop as a result of uncertainty and fear on the part of the public concerning possible exposure to radiation.

Vulnerable areas: The transportation routes through Horseheads and sites of past roadway crashes are shown on the Transportation Infrastructure map in Attachment A.

Estimate of potential losses: The most credible incident in which radiation could be released in the Town or Village of Horseheads would be a traffic accident involving a vehicle transporting radioactive material. The materials involved would probably be classified as low level and are likely to be identified, contained, and removed without widespread contamination. According to the Chemung County Director of Emergency Services, the response and cleanup costs from such an incident are unlikely to exceed $5,000.

#28. ICE JAM

Definition: Large accumulation of ice in rivers or streams interrupting the normal flow of water and often leading to flooding conditions and/or damage to structures.

HAZNY analysis:

- Scope: Small region is vulnerable
- Cascade effects: Highly likely to trigger another hazard
- Frequency: Infrequent event (occurs once every eight to fifty years)
- Onset: Several hours warning
- Hazard duration: One day
- Incident stabilization: Less than one day of overtime emergency operations
- Potential impact: Serious injury or death is unlikely
  Moderate physical and/or economic damage to private property
  Moderate structural damage to community infrastructure

Past hazard events: The Town and Village of Horseheads have not experienced ice jam problems in recent years. Two times in the 1990's ice jams developed in the Chemung River near the west end of the flood protection levee, threatening development in the Town of Elmira. In both of these incidents, the ice broke loose before any flooding problems developed. Localized ice jams occasionally develop on tributary streams in Chemung County. An ice jam in Bentley Creek has caused flooding in the Village of Wellsburg.

Probability of future events: Although ice jam flooding can occur in Horseheads, it is an infrequent event.

Potential impact: An ice jam in a river or stream effectively forms a hanging dam that can block flow and cause water to back up. The flooding caused by an ice jam will persist until the ice breaks up, either naturally or as a result of human intervention. The resulting flood damages would be localized.

Vulnerable areas: Areas along streams where debris jams have developed at bridges and culverts could experience similar flooding and erosion problems due to ice jams.

Estimate of potential losses: Ice jam flooding in Horseheads is not likely to impact more than ½ dozen houses. The maximum expected losses would be about $50,000 (based on flooding of 6 houses with average flood damages of $8,000).

#29. LANDSLIDE

Definition: The downward and outward movement of slope-forming materials reacting to the force of gravity. Slide material may be composed of natural rock, soil, artificial fill, or combinations of these materials. The term landslide is generalized and includes rock-falls,

rockslides, creep, block glides, debris slides, earth-flow, mud flow, slump, and other similar terms.

HAZNY analysis:

- Scope: Several individual locations are vulnerable
- Cascade effects: Some potential to trigger another hazard
- Frequency: Infrequent event (occurs once every eight to fifty years)
- Onset: No warning
- Hazard duration: One day
- Incident stabilization: Less than one day of overtime emergency operations
- Potential impact: Serious injury or death is unlikely
  Little or no physical and/or economic damage to private property
  Moderate structural damage to community infrastructure

Past hazard events:

- An active landslide is located on Seeley Creek 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 recent years.
- In 1994, a steep hillside failed in the Town of Veteran (Chemung County) 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.
- A small landslide area exists on the Mark Twain golf course in the Town of Horseheads.
- Unstable slopes along road cuts and roadside drainage ditches pose localized problems when erosion and mass wasting occurs.

Probability of future events: Horseheads is located in an area of New York State that is classified as having a low susceptibility for landslides (source: *Draft New York State All Hazard Mitigation Plan*, prepared by Mitigation Section, New York State Emergency Management Office, April 2003). The steep topography in some parts of the Town, combined with the presence of poorly consolidated glacial deposits, may pose landslide hazards in some areas, particularly in Halderman Hollow. The risk of landslides increases if clear cutting occurs on steep slopes (greater than 15%).

Potential impact: Most of the steep slopes in the Town of Horseheads that might be subject to slope failure are in undeveloped or sparsely developed areas. A landslide could destroy buildings and infrastructure in a localized area. Injury or death of people in the affected area is possible, but unlikely. In addition, a landslide that blocks a stream or drainage way could back up water and cause flood damage.

Vulnerable areas: The most likely area for a landslide in Horseheads is in Halderman Hollow. The steep areas, which pose the highest risk for landslides, are on rural hillsides where

development is unlikely to be impacted. However, it is advisable that development or timber harvesting on steep slopes include an evaluation of the potential to destabilize the slope and induce landslides.

Estimate of potential losses: The potential consequences of a landslide in the Town of Horseheads could include destruction of one or two rural buildings and adjacent infrastructure (roads, utilities, pipelines). These losses could cost several hundred thousand dollars.

#30. FUEL SHORTAGE

Definition: A situation in which the normal quantity and/or timely delivery of fuel supplies to distributors and retail establishments is interrupted for a substantial period of time.

HAZNY analysis:

- Scope: Large region is vulnerable
- Cascade effects: Some potential to trigger another hazard
- Frequency: Infrequent event (occurs once every eight to fifty years)
- Onset: More than one week warning
- Hazard duration: More than one week
- Incident stabilization: One to two days of overtime emergency operations
- Potential impact: Serious injury or death is unlikely
  Little or no physical and/or economic damage to private property
  Little or no structural damage to community infrastructure

Past hazard events: There have been no fuel shortages in Chemung County since the OPEC oil crisis in the early 1970's.

Probability of future events: A local fuel shortage could result from a prolonged disruption of transportation, which might be caused by a winter storm, flood, or other major event. Supply shortages can occur as a result of trade, transmission difficulties, or unexpectedly high demand. The probability of a severe fuel shortage is considered to be low.

Potential impact: The primary impact of the oil shortage in the 1970's was economic, with customers experiencing long lines and high prices. A wintertime shortage of heating oil or natural gas could lead to injuries and deaths due to an inability to provide adequate heat or inappropriate use of alternate heat sources.

Vulnerable areas: Since a fuel shortage would result in higher prices, lower income residents and businesses with high fuel use (such as truckers and farmers) would be most vulnerable.

Estimate of potential losses: The Chemung County Emergency Management Office estimates that the business losses resulting from a fuel shortage could reach a half million dollars.

#31. FOOD SHORTAGE

Definition: A situation where the normal distribution pattern and/or the timely delivery of foodstuffs to retail establishments for normal consumer demand is interrupted for a substantial period of time.

HAZNY analysis:

- Scope: Large region is vulnerable
- Cascade effects: Some potential to trigger another hazard
- Frequency: Rare event (occurs less than once every fifty years)
- Onset: Several days warning
- Hazard duration: Two to three days
- Incident stabilization: One to two days of overtime emergency operations
- Potential impact: Serious injury or death is unlikely
  Little or no physical and/or economic damage to private property
  Little or no structural damage to community infrastructure

Past hazard events: Chemung County experienced food shortages following Tropical Storm Agnes in 1972 and during the blizzard of 1993.

Probability of future events: A food shortage is most likely to occur as a result of a prolonged disruption of transportation, which could be caused by a winter storm, flood, or other major event. Widespread crop failures could also contribute to a shortage of some types of food products. The probability of a prolonged or severe food shortage is considered to be low.

Potential impact: A food shortage is unlikely to persist long enough to cause any serious problems. Possible cascade effects could include looting and civil unrest.

Vulnerable areas: Although the entire population of Horseheads could be vulnerable to a food shortage, high prices for limited food supplies would be expected to have the greatest impact on low income residents. Individuals with specific dietary requirements (such as formula-fed babies) would also be vulnerable.

Estimate of potential losses: One local grocery store, which does not serve the entire population of the Town and Village, does approximately $300,000 in business per week. It is estimated that the economic loss caused by a one week disruption in the food supply could be about a half million dollars.

HAZARDS NOT APPLICABLE

The following hazards are not applicable to the Town or Village of Horseheads. No additional assessment of risk was conducted.

- Avalanche: An avalanche is a mass of sliding snow which usually occurs in mountainous terrain where snow is deposited on slopes of 20 degrees or more.
- Blight: Blight is a disease of agricultural crops or non-agricultural plants resulting in withering, lack of growth, and death of its parts without rotting. Because the crops grown in the Town of Horseheads are not susceptible to blight, this hazard was not evaluated.
- Coastal Erosion
- Coastal Storm
- Hurricane: A hurricane is a tropical cyclone in which wind speeds reach 74 mph or more. Inland flooding from hurricanes can be a major threat to areas hundreds of miles from the coast as intense rainfalls from huge tropical air masses. Chemung County has suffered repeated damage from inland flooding associated with hurricanes (Agnes in 1972, Eloise in 1975, Beryl in 1994), but is not susceptible to hurricane force winds. When a hurricane tracks inland, its wind speeds generally decrease and the cyclone is downgraded to a tropical storm or tropical depression. The intense rainfall from these tropical storms is a major threat to Horseheads. This hazard is considered above with flooding and flash flooding.
- Land Subsidence: Land subsidence can occur in areas underlain by limestone bedrock, where dissolution of the limestone creates cavities, which can collapse and form sink holes. Areas with extensive mining of groundwater can also experience land subsidence. These conditions do not occur in Horseheads.
- Mine Collapse: There are no mining activities in Horseheads that involve the excavation of an underground cavity.
- Radiological Release from a Fixed Site: This hazard involves a release or threat of release of radioactive material from a nuclear power generating station, or research reactor, or other stationary source of radioactivity. Horseheads is located outside of the 50-mile radius of concern for any nuclear power generating stations (source: *Draft New York State All Hazard Mitigation Plan*, prepared by Mitigation Section, New York State Emergency Management Office, April 2003). The possibility that a catastrophic event at a nuclear facility could bring very low concentrations of radiation into the area is considered remote.
- Tsunami/Wave Action
- Volcano

ATTACHMENT D

FLOOD HAZARDS AND PROBLEMS

Flood hazards occur in areas that are prone to flooding, whether or not any development is affected. This Plan addresses the following hazards throughout the Town of Horseheads and Village of Horseheads: riverine flooding, overland flooding and ponding, and erosion of streambanks. The Flood Insurance Rate Maps and Flood Insurance Studies for the Town and Village include detailed analyses of the flood hazards from some of the principle waterways. The identified areas of 100-year flooding in the Town of Horseheads are shown on the Flood Hazards and Problems map in Attachment A. The Village of Horseheads includes significant floodplain areas that have not been digitized (since revision in 1996) and are therefore not shown in Attachment A. Additional hazards due to flooding and bank erosion exist along every stream and many unmapped drainage ways. The hazard areas for overland flooding and ponding are generally not recognized unless they contribute to flooding problems. The potential hazard areas are thus widespread.

Flood problems occur when development is adversely impacted by flood hazards. Numerous flood problem areas have been identified throughout the Town and Village of Horseheads. These problems are described below, shown on the Flood Hazards and Problems map in Attachment A, and listed in the Summary of Flooding Problems table in Attachment A. This information about flooding problems was assembled from previous documentation and the knowledge of Flood Mitigation Planning Committee members, municipal officials, residents, and agency personnel familiar with flooding in the Town and Village of Horseheads.

The principle sources of flooding in the Town and Village of Horseheads are Newtown Creek and its tributaries. Development is concentrated in the valleys of Newtown Creek, Prospect Creek, the lower reach of Halderman Hollow Creek, and along the route of the Old Chemung Canal. The floodplain areas contain a mixture of residential and commercial development.

The record discharge for the former Newtown Creek gage in the City of Elmira occurred during the 1972 Hurricane Agnes flood. However, private property losses during this event were relatively light in both the Town and Village of Horseheads (low velocity floodwater, basement flooding, road washouts, and bank erosion). The most serious damages were sustained by the road system as a result of undersized culverts. Similar damages occurred again during the Hurricane Eloise flood in 1975. Subsequent flooding has occurred in April 1993 (“Blizzard of ‘93” snowmelt), August 1994 (Hurricane Beryl), January 1996 (snowmelt and heavy rain), and November 1996 (heavy rain). In addition to these flood events, many additional heavy rainfall events have caused localized drainage problems, ponding, streambank erosion and other difficulties.

RIVERINE FLOODING AND STREAMBANK EROSION

Riverine flooding occurs when streams and rivers overflow their banks and inundate adjacent valleys. This occurs when heavy rainfall or rapid snowmelt produces water runoff that exceeds the carrying capacity of the channel. Riverine flood damages can be triggered or exacerbated by constriction or obstruction of stream and river channels. This blockage can result from undersized drainage structures, debris dams, ice jams, or accumulation of sediment within the channel. Backwater flooding occurs when a stream is unable to flow into a larger stream due to high water in the downstream waterbody.

The Flood Insurance Rate Maps (FIRMs) for the Town of Horseheads and the Village of Horseheads identify the areas expected to be inundated by the 100-year and the 500-year flood for the principle drainage ways in the community. Development within the 100-year floodplain is regulated by local law. The FIRMs also provide the expected water elevations for the 100-year flood. Flood profiles and supporting documentation are provided in the Flood Insurance Study. It should be noted that the hydraulic analyses used to delineate floodplains on the FIRMs were based on the assumption of unobstructed flow. The floodplains and flood elevations indicated on these maps are thus considered valid only if all channels and drainage structures remain unobstructed, operate properly, and do not fail. If these conditions do not exist, the impact of 100-year flooding could be greater.

The potential for riverine flooding from some of the smaller streams in the Town was not evaluated when the Flood Insurance Study and Flood Insurance Rate Maps were prepared. Yet these streams have floodplains and pose flood hazards. Because there is no floodplain designated on the FIRMs, development along these streams is not regulated by the Town's local law for flood damage prevention. Yet development in these areas is at risk from both flooding and streambank erosion.

Erosion of streambanks and the subsequent deposition of eroded materials are major concerns in both the Town and Village of Horseheads. The severity of these problems is due, in part, to the widespread occurrence of poorly consolidated glacial deposits, which are particularly susceptible to erosive forces. Natural erosional processes are accelerated during flood events. Bank erosion leads to the loss of lawns and agricultural land and can undermine buildings, roads, and bridges. Severe erosion also degrades riparian and aquatic habitat. Accelerated erosion of banks loosens large volumes of material that are subsequently deposited within stream channels, limiting the capacity for carrying water. Sediment and debris accumulation can plug culverts and lodge under bridges, displacing the flow of water. Eroded material that is carried downstream contributes to increased deposition rates in downstream reservoirs, the Chesapeake Bay, and Seneca Lake. Although bank erosion and channel migration are natural processes, they can be accelerated by human activities.

Newtown Creek

Newtown Creek is the primary drainage for the Village of Horseheads and much of the Town. It enters the Town of Horseheads from the east, flows south near the eastern border of the Village of Horseheads, and exits the Town to the south. The floodplain is not extensively developed. No buildings are located within the 100-year floodplain of Newtown Creek above its confluence with the North Branch (near Highway 13). Farther south, the floodplain areas contain scattered residential, commercial, and agricultural development.

Flood protection along Newtown Creek is provided by four dams constructed by the Natural Resources Conservation Service as part of the Newtown-Hoffman Creeks Flood Protection Project. These structures are: Marsh Dam (located on Marsh Creek in the Town of Erin), Park Station Dam (located on Newtown Creek in the Town of Erin), Jackson Creek Dam (located on Jackson Creek in the Town of Erin), and Sullivanville Dam (located on the North Branch of Newtown Creek in the Town of Horseheads). These structures reduce peak flows during flood events and prolong the period in which Newtown Creek is bank full following each event. The 100-year and 500-year floodplains designated on the Town and Village FIRMs have been revised to incorporate the flood protection provided by the Marsh Dam, Park Station Dam, and Sullivanville Dam.

The U.S. Army (not the Army Corps of Engineers) constructed dikes along both banks of Newtown Creek upstream of Franklin Street during World War II. These structures were not designed or built according to engineering standards for flood control dikes. In addition, they have not been maintained and are covered with woody vegetation that threatens their integrity. Despite these limitations, these berms have historically provided flood protection for development on Franklin Street, Ithaca Road, Sunset Circle, and Hillcrest Drive. The western berm (on the right bank of Newtown Creek) was deliberately breached by a property owner in 1994 in order to alleviate ponding on the uphill side. The site flooded from Newtown Creek during the August 1994 (Hurricane Beryl) flood. The berm was subsequently repaired. During the January 1996 flood, the eastern berm (on the left bank) broke, flooding an area north of Beaver Brook. This flooding affected Village wells (#1 and #2), five or six houses, and about ten buildings in an apartment complex. The ruptured section has since been repaired and armored with riprap. However, the remaining sections of the two berms have not been maintained.

PROBLEMS:

1. Streambank erosion: The entire length of Newtown Creek in the Town and Village of Horseheads experiences problems with streambank erosion, gravel deposition, and debris accumulation. Gravel and debris are routinely removed and streambanks have been stabilized at several locations.
2. Between Bannister Road and Vargo Road (Town): In the area between Bannister Road and Vargo Road, the flow in Newtown Creek is altered by an abandoned railroad bed located north of the main channel. During high water events, water flows along the north side of this elevated railroad bed and is unable to return to the channel, flowing instead through back yards and into basements of about a dozen houses. One septic system has

been exposed by erosion. All the affected homes are located outside of the predicted 100-year floodplain.

3. Sun Valley Drive (Town): The section of Newtown Creek near the end of Sun Valley Drive constantly accumulates sediment and debris. The Town has repeatedly cleaned the creek at this site to prevent flooding of the surrounding area.
4. Ithaca Road (Town): Downstream of the confluence with the North Branch of Newtown Creek, farmland is being eroded by Newtown Creek.
5. Berms: The potential for another failure of the berm above Franklin Street threatens the 15 to 16 buildings that were flooded by the 1996 rupture. Although the damaged section of berm has been repaired, the remainder of the structure and the berm protecting Ithaca Road are at risk of failure. The high velocity floodwater that can occur if a berm fails poses a greater threat than slowly rising water that would be expected if the structure were not present.
6. Village wells #4 and #5: Village wells #4 and #5 are located on the west side of Newtown Creek. Well #5 is close to the creek within the 100-year floodplain. Well #4 is located on the berm, outside of the mapped floodplain. Both wells are elevated and have not experienced flooding problems. The access road to these wells repeatedly washes out and has been repaired five times since 1994.
7. East Franklin Street (Town): One business and nine houses on East Franklin Street are located within the 100-year floodplain of Newtown Creek.
8. East Mill Street (Town): The 100-year floodplain on East Mill Street contains one business and three houses. The business and one house are in the part of the floodplain designated as the floodway, in which high water velocities can be expected.
9. Willow Street (Village): Three or four houses and two businesses are located within the 100-year floodplain on the east side of Willow Street. One house is elevated above the predicted height of the 100-year flood. The other structures are at risk of flooding, particularly those with basements. In 1994, this area was evacuated and several buildings experienced first floor flooding. The area was evacuated again in 1996.
10. Near State Highway 17: Flooding of Newtown Creek affects farmland and pastures in the Village and Town. Ponding upstream of the State Highway 17 bridge results in frequent loss of crops for property owners on South Main Street (in the Village).
11. Latta Brook Road: High velocity floodwater has flowed across Latta Brook Road, causing road damage and cutting off access to areas in the Town. Chemung County has since installed stream stabilization structures along this section of Newtown Creek (replacing an Army Corps of Engineers stream stabilization structure that was in disrepair).
12. Dam failure (not shown on map): Failure of any of the flood protection dams in the Newtown Creek watershed could send a wave of high water down Newtown Creek. The primary hazards in the event of failure of the Marsh Creek, Park Station, and Jackson Creek Dams would be upstream in the Town of Erin. However, Breesport and areas downstream along Newtown creek could also be impacted. Failure of the Sullivanville Dam during high storage times could have severe consequences in the Town and Village of Horseheads, with less than 15 minutes of warning time. All three dams are routinely inspected and maintained. The probability of failure is small.

Jackson Creek (Town)

Jackson Creek is a tributary that enters Newtown Creek in the hamlet of Breesport in the eastern part of the Town of Horseheads. The 100-year floodplain identified on the FIRM is largely undeveloped, but contains a few buildings in the hamlet of Breesport. Unstable streambanks occur throughout. The risks associated with future flooding problems along Jackson Creek (and Newtown Creek) have been reduced by construction of the Jackson Creek Dam in the Town of Erin (completed in 1999).

PROBLEMS:

13. Jackson Creek Road: Streambank erosion threatens Jackson Creek Road.
14. State Route 223: Streambank erosion near the State Route 223 bridge threatens the bridge, approximately 3 houses, and an apartment house with 4 or 5 units. The streambank at this site has been protected with rock riprap. The buildings also experience flooding from Jackson Creek. All are located outside of the 100-year floodplain.
15. Breesport: Three or four houses in the Hamlet of Breesport are located within the 100-year floodplain of Jackson Creek, but have not experienced flooding in recent years.

Bannister Road Tributary (Town)

Banister Road Tributary flows into Newtown Creek from the north. The area adjacent to this stream is mapped on the FIRM as a 500-year floodplain and is thus not regulated by floodplain development restrictions.

PROBLEMS:

16. Bannister Road: Streambank erosion has threatened Bannister Road. The site has been stabilized with riprap. This tributary has also washed out a culvert, which has been replaced. No existing buildings are threatened.

North Branch of Newtown Creek (Town)

Flood discharges in the North Branch of Newtown Creek are controlled by the Sullivanville Dam, which was completed in 1989. The Flood Insurance Rate Maps and Flood Insurance Studies for the Town and Village were revised in 1996 to reflect the flood attenuation provided by this structure.

PROBLEMS:

17. State Route 13: Two houses are located in the 100-year floodplain of the North Branch of Newtown Creek. One business is located within the 500-year floodplain.
18. Redwing Lane, Empire Drive, and Valley Lane: About five years ago, an unnamed tributary to the North Branch of Newtown Creek (enters near its confluence with the main branch of Newtown Creek) caused repeated basement flooding of about 20 houses on

Redwing Lane, Empire Drive, and Valley Lane. The Town deepened and reformed the channel and continues to maintain it. No problems have occurred since.

19. Dam failure (not shown on map): Failure of the Sullivanville Dam could send a wave of high water down the North Branch of Newtown Creek, with less than 15 minutes of warning time. The dam is routinely inspected and maintained by the County and procedures are in place for monitoring the dam's inflow and outflow rates. The probability of failure is small.

Prospect Creek (also called Horseheads Creek)

Prospect Creek enters the Town of Horseheads from the west. The Town has constructed a detention basin on Prospect Creek upstream of Hickory Grove Road to reduce peak flows from Prospect Hill. Farther downstream, Prospect Creek flows through the Meadow Brook Detention Basin (located upstream of Lilac Drive and maintained by the Town). This basin was designed for floods with a frequency of less than 50 years and is intended to have a significant effect on major floods. The developer of an upstream site has agreed to improve Stephen Pond, which will increase the capacity of the Meadow Brook Detention Basin. From the Meadow Brook Detention Basin, the stream flows east through the Village of Horseheads and discharges into a natural depression just east of North Main Street. This area serves as a detention pond. A culvert conveys some of the water from this detention pond beneath Hanover Square and discharges it into a swamp adjacent to Newtown Creek. The Flood Insurance Studies for the Town and Village attribute ponding near the entrance to this culvert to inadequate drainage through the culvert. The piped section of the creek is 4-500 feet long. A section of this pipe was damaged in the 1996 floods and subsequently replaced.

Flood hazard areas along Prospect Creek are indicated on the FIRMs for the predicted 100-year and 500-year floods. In addition to these areas, the Flood Insurance Study indicates that additional flooding of streets is expected between Lynhurst Avenue and Tifft Avenue on the right (south) side of Prospect Creek. Because these areas would not experience residential flooding, it was not shown in the flood delineation. However, the flooding of streets can result in access problems. The designated 100-year floodplain contains residential and commercial development in both the Town and Village. Both municipalities keep the channel cleared of debris. In recent years, flooding has been limited to localized flooding of roads.

PROBLEMS:

20. Prospect Hill Road and Hickory Grove Road (Town): In the area upstream of the Meadowbrook Detention Basin, about 6 or 7 houses and buildings of an Elks Club are located within the 100-year floodplain of Prospect Creek.
21. Meadowbrook Detention Basin (Town): Several out buildings are located within the 100-year floodplain and floodway in the Meadowbrook Detention Basin. These sheds may be encroaching on the Town easement for the detention basin.
22. Tifft Avenue, William Lane, Lynhurst Avenue, and Gardner Road (Village): The 100-year floodplain of Prospect Creek contains approximately 50 houses in the area upstream of Gardner Road. A ball field owned by the Village is allowed to flood.

23. Union Street area (Village): Approximately 35 houses and a few businesses are located within the 100-year floodplain in the area around Union Street. At the intersection of Eisenhart Place and Westlake Street, debris in the creek causes frequent road flooding.
24. Broad Street (Village): An old feeder canal that once connected the Chemung Canal to Big Flats was located near the present locations of Broad Street and Thorn Street. This canal has been filled and the area developed. Approximately 5 houses located along the route of this old canal experience basement flooding.
25. Hanover Square culvert: The integrity of the pipes that convey Prospect Creek into Newtown Creek is a concern. Blockage of this structure could result in flooding of a large area in the Village of Horseheads, including the Hanover Square business district (located in the 500-year floodplain). Some of the older sections of this culvert are made of brick. The Village of Horseheads has inspected this structure and found that the overall condition of the system is good. Some components were replaces as part of the Hanover Square project.

Old Chemung Canal (north of Prospect Creek)

The Chemung Canal was built in 1829 to connect Seneca Lake in Schuyler County with the Chemung River in the City of Elmira. Since its abandonment in 1877, the section of canal north of Prospect Creek has reverted to a wetland that stores floodwater. Because encroachment into this area would reduce the storage of the valley and aggravate the risk of flood damage elsewhere, the FIRM shows a floodway designation for much of the 100-year floodplain. A check dam at Wygant Road reduces the flow from the north end of the wetland into Catherine Creek. The majority of the Old Chemung Canal floodplain is owned by a local sportsman's association and managed for wildlife. Ponding is caused, in part, by inadequate inlet capacity of the culvert through which Prospect Creek flows into Newtown Creek (in the Village of Horseheads), resulting in backwater along the Old Chemung Canal.

PROBLEMS:
26. North Main Street (Village): Seven businesses and 3 or 4 houses on the west side of North Main Street are located within the 100-year floodplain. They have no history of flooding.

Beaver Brook

Beaver Brook is an eastern tributary to Newtown Creek, located primarily in the Town of Horseheads. It passes through the areas of the Village of Horseheads near Village wells #1 and #2. A regulated 100-year floodplain is designated on the FIRMs for the lower reach of this stream. Water leaves the banks within the floodplain almost every year. Mill Street was elevated 18 inches to prevent flooding of the road. The Flood Insurance Study indicates that the uppermost reach of Beaver Brook, where no floodway was delineated, can also have hazardous velocities.

PROBLEMS:

27. Village wells #1 and #2: Village wells #1 and #2 are located within the 100-year floodplain of Beaver Brook. Both wells are elevated. This area was flooded in 1996, when the berm along Newtown Creek ruptured, necessitating that both wells be shut down to prevent contamination.
28. Franklin Street (Town): Beaver Brook has repeatedly flooded one residential property and one business located within the 100-year floodplain near the intersection of State Highway 13 and Franklin Street. The house is elevated and has not been flooded, but the yard floods almost every year. The driveway was recently raised to reduce flood damages. The business has experienced flooding of buildings, some of which are located in the floodway. Chemung County replaced the culvert conveying Beaver Brook under East Franklin Street and upgraded drainage in this area. In addition, the Town of Horseheads has cleaned the channel upstream of State Route 13.

Latta Brook (Town)

Latta Brook is an eastern tributary to Newtown Creek, located in the Town. There is no development within the designated 100-year floodplain along the lower reach of this creek. Farther upstream, flooding and streambank erosion impact the road, buildings, and private bridges. The Town of Horseheads has replaced the culvert that conveys Latta Brook under Crane Road with a larger capacity structure.

PROBLEMS:

29. Streambank erosion: Streambank erosion threatens Latta Brook Road and the private bridges needed for access to about 6 houses.
30. Latta Brook Road: One business and 2 or 3 homes on Latta Brook Road experience basement flooding. The business is located within the 100-year floodplain. The houses are located outside of the delineated 100-year floodplain.

McCann's Tributary

McCann's Tributary originates in a swampy area in the 500-year floodplain of Prospect Creek (in the Village of Horseheads). This creek is piped approximately 1/4 mile beneath State Route 17, Center Street, and Grand Central Avenue. The Village of Horseheads has inspected this culvert and found that it is in good condition. McCann's Tributary then flows south along the route of the Old Chemung Canal in the Town of Horseheads, is joined by Halderman Hollow Creek, and exits the Town to the south before entering Diven Creek (a tributary to Newtown Creek). There is no existing development along the upstream portions of McCann's Tributary. Below the confluence with Halderman Hollow Creek, the floodplain contains a mixture of residential and commercial development, which has experienced frequent flooding problems. In 1996 and 1997, sediment and debris were removed from this lower reach of McCann's Tributary, lowering the creek bed by three to four feet. The 5-foot round culvert at Lenox Avenue was replaced by an arch pipe 10 feet wide and 5 feet high. Additional work was done downstream (beyond the Town of Horseheads border) in order to facilitate the flow of water out of this flood-prone area.

PROBLEMS:

31. State Route 17 culvert (Village): The culvert that carries McCann's Tributary beneath Highway 17, Center Street, and Grand Central Avenue is about 1/4 mile long. The condition of this culvert is not known.
32. Pleasant Street and South Main (Village): About 6 houses on Pleasant Street and South Main Street have experienced basement flooding as a result of debris accumulation within the channel of McCann's Tributary. These residences are located in the Village of Horseheads, upstream of the designated 100-year floodplain. Flooding resulted from trees and other debris that had accumulated in a section of the stream that is owned by Chemung County and located within the Town of Horseheads. Although limited access precluded the use of heavy equipment along this section of creek, the Village of Horseheads removed trees and other debris from the channel to alleviate the flooding problems.
33. Camden Avenue (Town): About four houses on Camden Avenue are located within the 100-year floodplain of McCann's Tributary.
34. Valley Avenue (Town): Approximately 5 houses in the 100-year floodplain on Valley Avenue (below the confluence of McCann's Tributary and Halderman Hollow Creek) are particularly susceptible to flooding. In recent years, the bed of the creek has been above the elevations of these homes. One house on Valley Avenue is classified by the National Flood Insurance Program as a "repetitive loss property," due to flood insurance claims in January 1996 and November 1996. In 1997, the creek bed was lowered by 3 to 4 feet in this area. However, these houses are still at risk.

Halderman Hollow Creek (Town)

Halderman Hollow enters the Town of Horseheads from the west and flows into a retention basin east of State Route 14/Oakwood Avenue (behind Hardinge Brothers). Upstream of this retention basin, Halderman Hollow and its tributaries are in narrow valleys with streambank erosion problems, but little space for floodplain development. Downstream of the retention basin, Halderman Hollow Creek has a wide floodplain that is extensively developed with a mixture of residential and commercial structures. This area has experienced frequent flooding of basements. In 1997, sediment and debris were removed from the lower section of Halderman Hollow Creek and the detention basin was enlarged. Additional channel cleaning of the remaining section of creek below the detention basin is planned. An agreement among local government entities has recently been initiated to insure continued maintenance of Halderman Hollow from the retention basin to McCann's Boulevard.

PROBLEMS:

35. Streambank erosion: Streambank erosion problems on the upstream reach of Halderman Hollow Creek have threatened roads and bridges at several sites (near Town line, along Reformatory Road, private bridge on Halderman Hollow Road, above Lenox Avenue, etc.). Repairs have been made as necessary.

36. Hardinge Brothers retention basin: Chemung County has recently cleaned and enlarged the detention basin located behind Hardinge Brothers. However, the future maintenance needs and responsibilities for this structure have not been clearly defined. Beaver dams in this area have caused water to back up into low-lying areas along a northern tributary.
37. Downstream of retention basin: The 100-year floodplain of Halderman Hollow Creek is extensively developed in the area downstream of the retention basin. This development includes 7 businesses in the Oakwood Avenue area, 5 major industrial facilities, and about 100 houses. Most of the houses have basements. Only about three are elevated according the current requirements for floodplain development.

Catharine Creek (Town)

Catharine Creek is part of the Seneca Lake Drainage Basin. It enters the Town of Horseheads from the north and flows through a large wetland before turning north again and exiting the Town. Floodwaters on an eastern tributary to Catharine Creek (labeled Trib. #5 on the FIRM) were found in the Flood Insurance Study to have hazardous velocities. However, no floodway was delineated for this narrow floodplain.

PROBLEMS:

38. Middle Road: Two houses on Middle Road are located within the 100-year floodplain of Catharine Creek. Bank erosion threatens yards in this area. The Town has cleaned gravel from the channel.

Goldsmith Creek (Town)

The headwaters of Goldsmith Creek are located in the southeastern part of the Town of Horseheads and drain southward into the Town of Elmira. Significant problems with flooding, streambank erosion, and sedimentation occur downstream in the Town of Elmira. Potential sites for detention or retention basins may exist within the Town of Horseheads.

PROBLEMS:

39. Streambank erosion: Streambank erosion on Goldsmith Creek and its tributaries has threatened roads and culverts in the Town of Horseheads. Three Culverts on Monkey Run Road were replaced in 1998. Several culverts on the unmapped tributary drainage ways have also had to be replaced. The sediment load produced by this bank erosion becomes a serious problem downstream in the Town of Elmira.

May's Creek (Town)

May's Creek originates on Hawes Hill in the southwestern part of the Town of Horseheads. It is conveyed through an underground "flume" on business property prior to entering the Village of Elmira Heights, where it flows into McCann's Tributary. Flooding of May's Creek has caused damage to residential properties in the Village of Elmira Heights as well as a business in the Town of Horseheads.

PROBLEMS:

40. State Route 14: A golf course and a business near State Route 14 have experienced flood damage from May's Creek. The most damaging recent flooding occurred on August 18, 1994, when inundation of the business resulted in damages exceeding $800,000 plus lost production and lost employee wages. A prior flooding event on July 20, 1986 required massive cleanup of the facility. Both of these events exceeded the problems and damage experienced at the facility during the Hurricane Agnes flood in June 1972. The company has subsequently deepened and diverted the aboveground portions of May's Creek. Several buildings have also been removed. The remaining structures were successfully protected with sandbags and other floodproofing measures during the January 1996 and November 1996 floods. However, tons of gravel were deposited in the underground "flume," which was cleaned following each of these flood events.

DRAINAGE PROBLEMS

Overland flooding and ponding occurs when excess runoff is not carried in a defined channel. It leads to flood damages when structures are improperly sited and stormwater runoff is not properly managed at development sites. Alteration of natural drainage patterns has contributed to drainage problems in some areas in the Town and Village of Horseheads. Some residents perceive problems when intermittent natural drainage ways cross their properties. However, if no buildings or roads are impacted, Town and Village policies are to avoid interfering with natural drainage patterns.

PROBLEMS:

41. Breesport (Town): Low streets in Breesport (in the Newtown Creek drainage area) experience ponding during high water events.
42. Aster Drive and Lilac Drive (Town and Village): Ponding of stormwater runoff in flat areas near Prospect Creek has flooded yards and basements of six houses on Aster and Lilac Drive. This has not been a problem since the upstream installation of roads, vegetation, and drainage structures for the Barrington Estates housing development.
43. Wisteria Way (Village): Poor drainage along Wisteria Way has resulted in groundwater flooding of basements located beyond the limits of the mapped floodplain of Prospect Creek. A detention basin has been constructed uphill of this area for the Highland Hills development and appears to have alleviated these basement flooding problems.
44. Hilton Drive and Gardner Road (Town): Dumping in drainage ways on Hilton Drive (in the Prospect Creek drainage area) has caused debris accumulation downhill at Gardner Road. The Town removed the debris from the drainage swale at Hilton Drive and now mows the swale. The adjecent residents received a letter indicating that the Code Enforcement Officer will issue a summons if material is placed within the drainage swale.
45. Westinghouse Road (Village): Drainage swales along Westinghouse Road, between Miller Street and Gardner Road (in the Prospect Creek drainage area), convey water into an inadequately sized pipe.

FLOOD WARNING

Flood warnings in the Town and Village of Horseheads are provided by the Chemung County Emergency Management Office, which obtains flood warning information from the Flood Warning Service of Steuben and Chemung Counties (operated by Environmental Emergency Services, Inc.) and from the National Weather Service. These warnings are based on a network of automated rain and river-level gauges, supplemented by additional observations and reports.

Flood warnings for the streams in Horseheads are based on rain gauge data and rainfall forecasts by the National Weather Service. An automated rain gauge is located in the Newtown Creek watershed in the Town of Erin, upstream of Horseheads. Automated rain gauges located in Big Flats and Catlin provide additional information about the rates and amounts of rainfall in the area. Data from these gauges are relayed by telemetry to the Flood Warning Service for Steuben and Chemung Counties and to the National Weather Service for use in preparing flood forecasts. Additional information can be provided by volunteer rain gauge readers.

The Flood Stage Forecast Maps that were prepared for Newtown Creek cannot be used because the stream gauge on which they are based is no longer operational. These maps show the areas expected to be inundated by various flood stages on the creek, and would be useful for emergency operations. However, they are keyed to flood stages at the U.S. Geological Survey automated Newtown Creek Gauge at Elmira (at the Linden Place Bridge), which is no longer in operation. There is no staff gauge at the site to provide relevant flood stage information.

PROBLEMS:

46. Flash flooding: The short steep tributary streams in the Town and Village of Horseheads are highly susceptible to flash flooding, which can occur suddenly with little or no lead-time.
47. Stream gauges: There are no stream gauges or stream monitoring locations on the streams that flow through the Town and Village of Horseheads. Of particular concern is the absence of the stream level data needed to utilize the Newtown Creek Flood Stage Forecast Maps (based on the former Newtown Creek Gauge downstream in Elmira). A staff gauge on the old Latta Brook bridge was eliminated when the bridge was replaced.
48. Rain gauges: A procedure for timely reporting of high rainfall rates and amounts by volunteer rain gauge readers in the Horseheads area has not been established.
49. Disaster plans: The Town and Village disaster plans need to be reviewed to insure that they include specific information that will enable municipal officials to respond appropriately to flood warnings and data from stream and rain gauges.

DEVELOPMENT TRENDS

The Town and Village of Horseheads are located north of the City of Elmira. The area has experienced increased development in recent years, particularly in the western part of the Town. Additional development pressure is anticipated when Route 17 is designated as Interstate 86. As

existing development sites are utilized, this development pressure is expected to spread to the hill areas farther east. In order to accommodate current development, the Town has constructed detention/retention basins to reduce the impact of increased runoff on downstream areas. Both municipalities are paying increased attention to the drainage impacts of new development. Analysis of the runoff from a 100-year storm is now required for any new development.

PROBLEMS:

50. Stormwater management: Adequate stormwater management for all new development is an ongoing concern.
51. Latta Brook Industrial Park (Town): All existing development in the Latta Brook Industrial Park is located outside of designated 100-year floodplain areas. However, the park includes potential development sites within the floodplains of Newtown Creek and Latta Brook. Access to this area is sometimes limited by flooding. The potential use of hazardous materials by industries in flood-prone locations is a particular concern.
52. Gardner Road area (Town and Village): The Highland Hills development, when complete, will consist of about 100 units on 19 acres in the Prospect Creek drainage area (uphill of Gardner Road). The drainage system for this development has been completed and the remainder of the project is under construction. The developer installed a detention basin designed for the 100-year storm. This basin collects sheet flow from the hillside and appears to have alleviated the drainage problems downhill on Wisteria Way (Problem #43). The Town of Horseheads upgraded the sluice pipe that conveys runoff from this area under Hilton Drive to increase the capacity. Subsequent to this construction the area received about 1-½ inches if rain in an hour and no drainage problems developed.
53. Hickory Grove Drive (Town): Potential development sites on Hickory Grove Drive include low-lying areas within the 100-year floodplain of Prospect Creek.
54. Colonial Drive (Town): Potential development sites on Colonial Drive include low-lying areas that may be prone to ponding and shallow water table problems (in the Sing Sing Creek watershed).