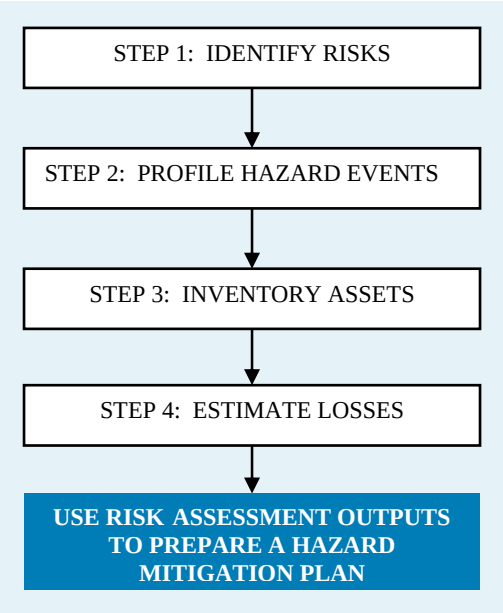
SECTION 4 - RISK ASSESSMENT

This section addresses the risk assessment portion of the mitigation plan. The risk assessment process used for this pilot project is consistent with the process and steps presented in FEMA 386-2, State and Local Mitigation Planning How-to-Guide, *Understanding Your Risks – Identifying Hazards and Estimating Losses* (FEMA 2001). Figure 4-1-1 shows the steps that comprise the risk assessment process. The risk assessment process considers the assets that are at risk in the community and what assets could be damaged lost should a hazard event occur. This analysis allows the community to make informed decisions to compare hazards and guide its mitigation strategy (Section 5 of this plan).

This section describes the identification of hazards, presents profiles of hazards of concerns, summarizes the inventory of assets, and presents the loss estimates for the Delaware County's Multi-Jurisdictional Risk Assessment. The risk assessment was developed to evaluate hazards of primary concern to local decision-makers, and to estimate potential damages and losses. This risk assessment provides a foundation for the community's decision makers to evaluate mitigation measures that can help reduce the impacts of a hazard when one occurs. To address the requirements of DMA 2000 and better understand potential vulnerability and losses associated with hazards of concern, Delaware County and participating municipalities used standardized tools, combined with local, state, and federal data and expertise to conduct the risk assessment. Two standardized tools used to support the risk assessment are introduced below.

Figure 4-1-1. Risk Assessment Process



Hazards NY (HAZNY)

HAZNY is an automated interactive spreadsheet designed to support communities in evaluating hazards that could be a concern. This tool was developed by NYSEMO and the ARC to support consistent identification and ranking of hazards across the state. HAZNY includes historical and expert data on selected hazards. HAZNY is designed specifically for group, rather than individual, use and was prepared for use at a municipal, rather than county level. Therefore, each jurisdiction applied the software and then average values were evaluated by the group for this plan. The program interface asks specific questions about potential hazards in a community and records and evaluates the responses to these questions to prepare a preliminary score for each hazard. This score helps the community to develop an initial ranking of the priority of each hazard. This plan used HAZNY to identify and profile the hazard events; this process included a consideration of background and local conditions, historic frequency and probability of occurrence, severity, historic losses and impacts, and designated hazard areas. It also identified the potential impact, onset, frequency, hazard duration, cascading effects and recovery time for each hazard. Additional information on the methodology and results of the HAZNY are discussed in Section 4.2.

Hazards U.S. – Multi-Hazard (HAZUS-MH)

HAZUS-MH is a nationally applicable, standardized methodology and software program for estimating potential losses from earthquakes, floods, and hurricane hazards. HAZUS-MH was developed by the FEMA in partnership with the National Institute of Building Sciences. Loss estimates produced with HAZUS-MH are based on current scientific and engineering knowledge regarding the effects of earthquakes, floods, and hurricane hazards. HAZUS-MH is designed to generate an estimate of the

consequences to a city or a region of a "hazard event" (i.e., an earthquake, flood or a hurricane of a given severity and location) or for probabilistic events (i.e., a flood that has an annual probability of occurrence of 0.01 percent). The resulting "loss estimate" describes the scale and extent of damage and disruption that may result from different hazards. To generate this information, HAZUS-MH uses HAZUS-MH provided data for inventory, vulnerability, and hazards; this default data can be supplemented with local data to provide a more refined analysis. The guidance *Using HAZUS-MH for Risk Assessment: How-to Guide* (FEMA 433) was used to support application of HAZUS-MH for this risk assessment and plan.

Two methodologies were used to assess potential exposure and losses associated with hazards of concern to Delaware County and its participating municipalities. These both used HAZUS-MH to some extent and are summarized below:

- **HAZUS-MH** was applied using HAZUS-MH software and associated tools to estimate losses associated with the flood and hurricane hazards. (Note: Hurricanes are considered unlikely to impact Delaware County at full force so the risks associated with the hurricane hazard are primarily considered to include wind and are integrated for presentation with the severe storm hazard, which also includes severe windstorms, thunderstorms, hailstorms, and tornadoes.)

- **HAZUS-MH support** was used to evaluate other hazards, as feasible. For most of the hazards evaluated in this risk assessment, historic data are not adequate to model future losses at this time. However, HAZUS-MH can map hazard areas and calculate exposures if geographic information on the locations of the hazards and inventory data are available. For some of the other hazards of concern, areas and inventory susceptible to specific hazards were mapped and exposure was evaluated to help guide mitigation efforts discussed in Section 5. For still other hazards, a qualitative analysis was conducted using the best available data and professional judgment. This approach was applied to all hazards of concern to Delaware County.

In addition, this approach was applied to the non-hurricane components of the severe storm hazard. For this risk assessment, the loss estimates, exposure assessments, and hazard-specific vulnerability evaluations rely on the best available data and methodologies. Uncertainties are inherent in any loss estimation methodology and arise in part from incomplete scientific knowledge concerning natural hazards and their effects on the built environment. Uncertainties also result from the following:

1) Approximations and simplifications necessary to conduct such a study
2) Incomplete or dated inventory, demographic, or economic parameter data
3) The unique nature, geographic extent, and severity of each hazard
4) Mitigation measures already employed by Delaware County and the municipalities and the amount of advance notice residents have to prepare for a specific hazard event

These factors can result in a range of uncertainty in loss estimates, possibly by a factor of two or more. Therefore, potential exposure and loss estimates are approximate. These results do not predict precise results and should be used to understand relative risk. Over the long term, Delaware County will collect additional data to assist in estimating potential losses associated with other hazards.

4.1 Identification of Hazards

The hazard identification process included identifying an initial list of hazards and then selecting the priority hazards of concern for the area. Natural (e.g., flood), technological (e.g., utility failure), and human-caused (e.g., terrorism) hazards were selected for further profiling and assessment. This section 1) presents background information for Delaware County and the participating municipalities and 2) identifies hazards of concern identified for the study area.

4.1.1 Background of Delaware County

Delaware County is a rural community in the Catskill Mountain region located within the eastern part or "Southern Tier" of NYS. It is east of Binghamton and southwest of Albany and approximately 100 miles northwest of NYC. Delaware County occupies approximately 1,460 square miles and includes a population of approximately 47,328 (U.S. Census Bureau 2004). While the population density of Delaware County is very low compared to the densely populated New York Boroughs, it is comparable to other counties in the region. The county consists of nineteen townships and ten villages. The largest villages and hamlets are in the valleys, adjacent to major waterways. Downsville, Margaretville, Fleischmanns, and Hancock lie in the valley of the East Branch of the Delaware River. Walton, Delhi, Stamford and Hobart lie in the valley of the West Branch of the Delaware River. The valley of the Susquehanna River includes the Village of Sidney, which is the largest village in the County. The County seat is the centrally located Village of Delhi.

The largest town in Delaware County is Sidney, which has a population of approximately 6,109 (U.S. Census Bureau 2000). Other major townships in the region include Delhi, Hancock, Middletown, and Walton.

The study area for this risk assessment includes all 19 townships and 9 villages located entirely within the county boundaries. Townships include: Andes, Bovina, Colchester, Davenport, Delhi, Deposit, Franklin, Hamden, Hancock, Harpersfield, Kortright, Masonville, Meredith, Middletown, Roxbury, Sidney, Stamford, Tompkins and Walton. Villages include: Delhi, Fleischmanns, Franklin, Hancock, Hobart, Margaretville, Sidney, Stamford, and Walton. Figure 4-1-2 illustrates the study area and surrounding areas.

Delaware County contains rural landscapes, small commercialized areas, dramatic terrain and natural features, including two major reservoirs which are contributing to NYC's water supply (Cannonsville and Pepacton), agriculturally productive areas, as well as the State University of New York (SUNY) Delhi College of Technology. This combination of natural and developed features lays the foundation for Delaware County's vulnerability to natural, human-caused, and technological hazards, both in terms of hazard frequency and the potential impact of hazard events.

A *Major Disaster Declaration* is a post-disaster status requested by a state's governor when local and state resources are not sufficient to meet disaster needs. It is based on the damage assessment and an agreement to commit state funds and resources to the long-term recovery. The event must clearly exceed the capacity of the state or local government to manage the event alone.

A *Presidential Disaster Declaration* puts into motion long-term federal recovery programs, some of which are matched by state programs, and designed to help disaster victims, businesses, and public entities in the areas of human services, public assistance (infrastructure support), and hazard mitigation. If declared, funding comes from the President's Disaster Relief Fund and disaster aid programs of other participating federal agencies.

Repetitive flooding, **severe winter storms** (including ice storms/ice jams), and **severe non-winter storms** (including severe windstorms, tornados, hurricanes, and thunderstorms) are major persistent hazards that affect the area and result in repetitive losses and rehabilitation costs. The NWS estimates that Delaware County experiences about 18.2 weather hazard events annually (severe weather, floods, winter storms, and extreme temperatures, causing an unknown amount of damages annually (NWS, 2005). According to FEMA, Delaware County has received between seven to nine Presidential disaster

declarations between 1965 and 2003. From 1996 to 2005, Delaware County has received Presidential Disaster Declarations (DR), Emergency Declarations (EM) and local states of emergency for flooding and other severe events, as summarized in Table 4-1-1. In addition, hazard events and losses documented between 1995 and 2000 were provided through National Atlas, which was compiled by information obtained from the Hazard Research Lab at the University of South Carolina (USC). Information provided by National Atlas is summarized in Table 4-1-2. These two sources are a few sources of many that provided detailed information on losses within Delaware County.

Table 4-1-1. Presidential Disaster and Emergency Declarations (1996 to 2005)

Type of Event	Date	Declaration Number	Cost of Losses (approx.)
Severe Storm and Flooding	January 1996	DR 1095	TBD
Severe Storm and Flooding	November 1996	DR 1148	TBD
Severe Storm and Flooding	July 1998	DR 1233	TBD
Tornado	May 1998	State of Emergency	TBD
West Nile Virus Threat	October 2000	EM 3155	TBD
Severe Storm, Tornadoes and Flooding	August 2003	DR 1486	TBD
Snow	March 2003	EM 3184	TBD
Snow	February 2003	EM 3173	TBD
Severe Storm and Flooding	October 2004	DR 1564	TBD
Severe Storm (Tropical Depression Ivan)	October 2004	DR 1565	TBD
Severe Storm and Flooding	August 2004	DR 1534	TBD
Severe Storm and Flooding	April 2005	DR 1589	TBD
Severe Storm	April 2005	DR 1587	TBD
Total Cost			TBD

Notes: Dollars rounded to nearest thousand. Recorded losses indicate the dollar value of loss made available through public records reviewed for this risk assessment. Source: FEMA website (http://www.fema.gov/library/drcys.shtm)

Table 4-1-2. Hazard Events between 1995 and 2000 (National Atlas)

Type of Event	# of Events	Property Damage	Crop Damage	Fatalities	Injuries	Cost of Losses (approx.)
Flooding	10	$12,528,500	$500,000	6	2	$13,028,500
Drought	1	N/A	$2,941,176	N/A	N/A	$2,941, 176
Tornado	3	$1,400,000	N/A	N/A	N/A	$1,400,000
Wind	30	$653,418	N/A	N/A	0.47	$653,418
Winter Weather	13	$595,532	N/A	N/A	N/A	$595,532
Severe Storm/Thunderstorm	7	$150,000	N/A	N/A	N/A	$150,000
Hail	1	$35,000	N/A	N/A	N/A	$35,000
Lightning	1	$2,000	N/A	N/A	N/A	$2,000
Total Cost		$15,364,450	$3,441,176	N/A	N/A	$18,805,626

N/A – None Reported

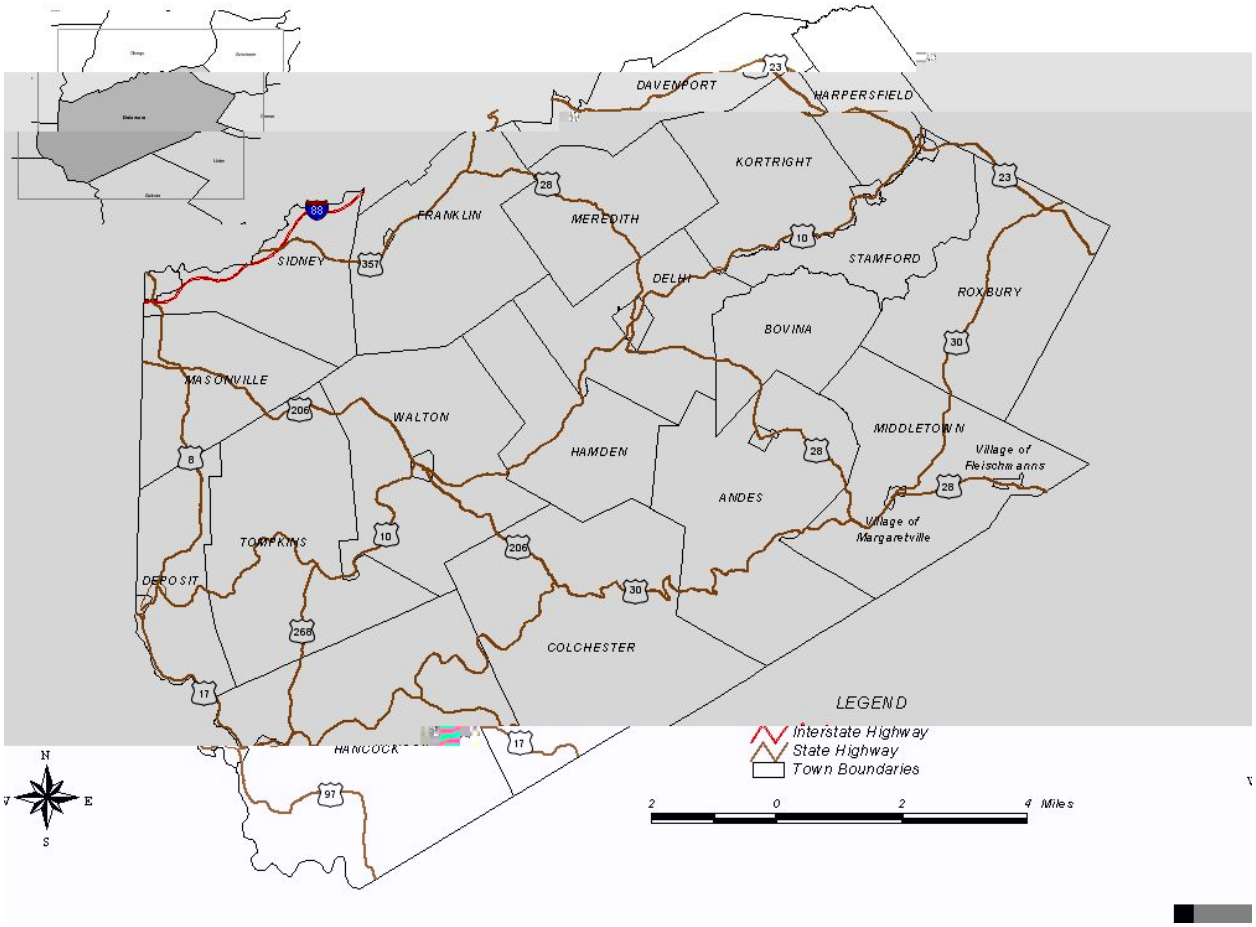
Notes: The following hazard events were not listed for the Delaware County: Fog, Avalanche, Heat, Hurricane/Tropical Storm, Tsunami, and Wildfire. Source: National Atlas website (http://www.nationalatlas.gov/natlas/layerlist.cfm)

Extreme weather events can have cascading effects; for example, severe weather can cause technological hazard events like utility failures in Delaware County. Delaware County's steep topography and susceptibility to lake effect weather systems increases extreme weather occurrences and the associated impacts, especially in areas located within close proximity to the Cannonsville Reservoir and the Pepacton Reservoir. These events typically affect residents throughout the county each year.

The intrastate, interstate, and international travel associated with academia, agricultural practices, commercial businesses and recreational activities and the transient nature of the populations associated, could impact hazards of concern in the Delaware County area. Specifically, the transient nature of the population is considered to increase the potential that 1) local residents will be exposed to hazards

affecting the global community (such as exposure to non-native bacteria and viruses, bioterrorism, etc.) and 2) any epidemic-related hazards identified within Delaware County could be spread beyond the county's boundaries. Based on this situation, Delaware County and its municipalities must consider health-related hazards such as epidemics and take steps to prepare for, and address, such hazard events.

Figure 4-1-2. Mitigation Plan Area and Surrounding Counties



Delaware County is characterized by glacially-dominated soils that result in significant volumes of run-off to less stable soils during extreme weather events. In addition, relatively extreme elevation changes within the county interfere with emergency public safety communications and increase susceptibility to power outages. These conditions expose Delaware County to chronic losses from events such as flooding, utility failures and inconsistent and unreliable public communications and warnings. Delaware County residents are particularly vulnerable to repetitive flooding because historic population centers are clustered in valleys and along the shores of local tributaries, rivers, and reservoirs. In addition, according to the U.S Census Bureau, Delaware County consists over 4,599 manufactured homes (that is, trailers/mobile homes), making up 15% of the total housing units within Delaware County. These types of homes have an increased vulnerability to extreme weather events and generally house lower-income populations that may be less financially capable of recovering from a hazard event (U.S. Census Bureau, 2000).

Though only one federal interstate highway known as the Warren M. Anderson Highway (I-88) traverses slightly along the northwestern corner of Delaware County, the convergence of several state highways in Delaware County (State Routes 17, I-88, 10, 30, 206, 97, 367, 8, 23, and 28) and County roads raises concerns associated with the transportation of hazardous materials and accidents along those highways.

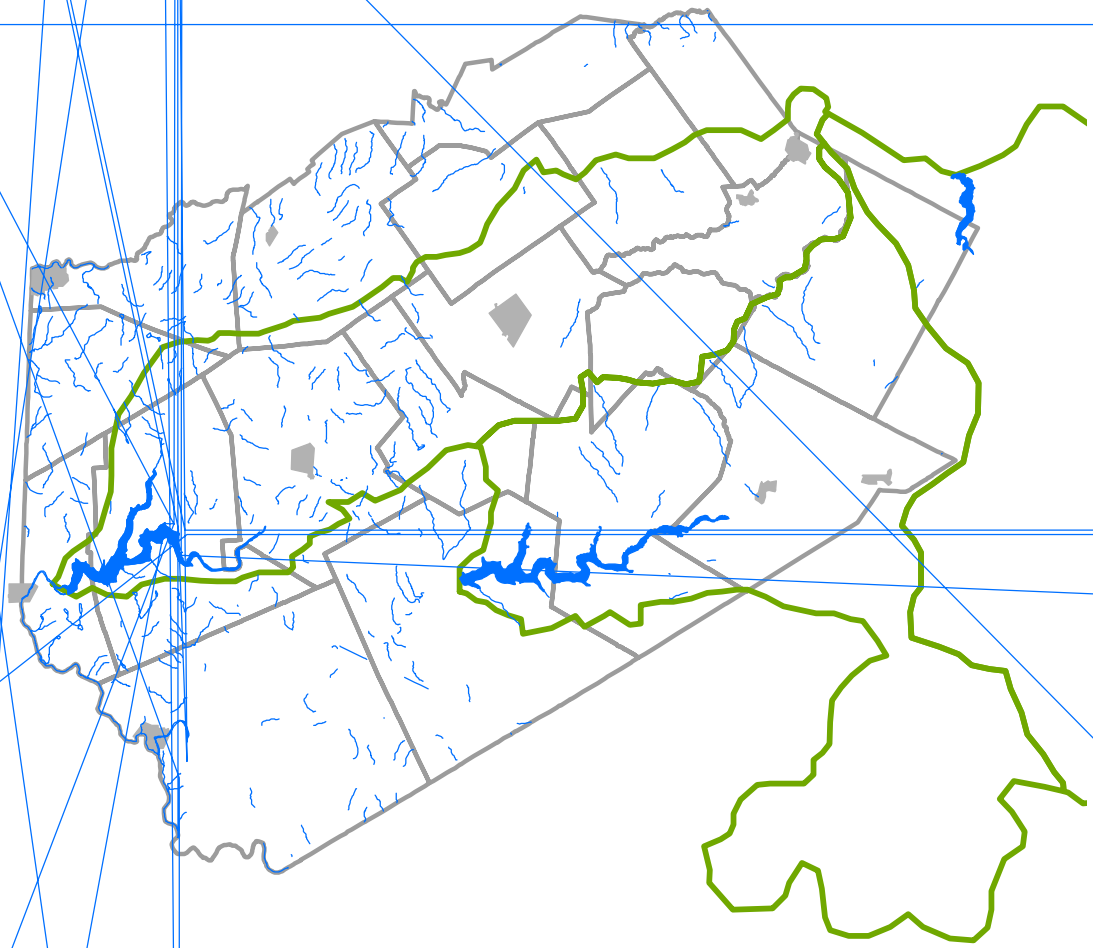
Because these routes pass through rural communities and landscapes, remediation of spills along roadways is often hampered by delayed detection and/or limited accessibility to areas of concern. The number of trucks that pass through Delaware County hauling hazardous materials and waste is difficult to determine. In addition to hazardous material or accident related disasters along the various local and state roadways; flooding, and severe storms can be very detrimental to the roadway network throughout the County, resulting in extreme damage to the transportation system. An example of this occurred as a result of a flash flood event on July 4th 1999, where the Township of Roxbury suffered $500,000 in losses to highways, the Township of Harpersfield suffered $80,000 in losses for town roads and other related structures, and the DCDPW reported the damage of various bridges, highways, and other related structures. According to a NYSEMO Damage Assessment Worksheet for a federally declared November 1996 flood event, estimated damages/losses were primarily associated with damage to railroads, roads, bridges, culverts and shoulders within various Townships and Villages throughout the County.

Water resources are abundant in Delaware County. However, the availability of reliable drinking water supply is a concern among County residents. A majority of Delaware County residents rely on groundwater for their drinking water supply, with the source of groundwater supply being predominantly bedrock and unconfined aquifers. Residents relying on groundwater often rely on private or area wells. Most wells tap bedrock aquifer and yield less than 50 gallons per minute. Also, natural springs are plentiful in the County and many are used as drinking water sources. During dry seasons, these residents frequently report having inadequate well-water to meet their needs. Potential contamination of these wells is also a concern as the bedrock and unconfined aquifers are susceptible to contamination from spills, herbicides and pesticides in run-off, leaking underground storage tanks, and potential spills of hazardous materials or waste. As the stratigraphy of bedrock aquifers is complex, it is often difficult to find alternate water supplies once they are contaminated.

Delaware County is also a part of the Catskill/Delaware Watershed, consisting of two reservoirs (Cannonsville and Pepacton) that significantly contribute to the NYC's water supply. Additionally, a small portion of the Schoharie Reservoir is located within the northeast corner of the property, which is also part of the NYC's System. According to the NYCDEP, these two main reservoirs are a part of the Delaware Water Supply System, whereby the City augments its water supply from the headwaters of the Delaware River. The Cannonsville watershed's drainage basin is 455 square miles (the largest basin the City's system) and includes parts of 17 towns within Delaware County (Andes, Bovina, Delhi, Deposit, Franklin, Hamden, Harpersfield, Jefferson, Kortright, Masonville, Meredith, Middletown, Roxbury, Sidney, Stamford, Tompkins, and Walton. The Pepacton Reservoir contributes more than 25% of the total daily water flow into NYC. The Pepacton watershed's drainage basin is 371 square miles and includes part of 13 towns within three counties, eight of which are located within Delaware County (Andes, Bovina, Colchester, Delhi, Hamden, Middletown, Roxbury, and Stamford) (NYCDEP, 2005). A map showing regional hydrology and the Cannonsville and Pepacton watersheds is provided as Figure 4-1-3. Based on the size and storage capacity of these reservoirs and their significant contributions to the NYC water supply, drought-related disasters within Delaware County could impact the supply of water that is being routed to the City. However, NYC's water supply is receiving water from various other locations as well, therefore, unless an extreme drought is taking place within all regions of NYC's water supply sources, impact would be minimal. However, intentional or unintentional contamination of these water supplies is of concern because of the number of people that rely on each system and the difficulty associated with supplying alternate water should a contamination or natural disaster issue arise.

Dam failure is a concern to some Delaware County residents because of the Cannonsville Dam (located in the Town of Tompkins and Deposit and impacting the Towns downstream of the dam) and the Downsville Dam along the southwestern vicinity of the Pepacton Reservoir in the Town of Andes and Colchester. Additionally, several other dams are located along tributaries and streams and some are of questionable structural integrity. A list of dams within Delaware County is provided in Section 4.3 (Table 4-3-15).

Figure 4-1-3. Regional Hydrology and Watersheds



Hazards of Interest are those hazards that are considered most likely to impact a community. These are identified using available data and local knowledge.

categorized numerically as: a high hazard (321-400), moderately high hazard (241-320), moderately low hazard (161-240) or a low hazard (44-160). The list of hazards of interest included the following hazards: flood, tornado, severe storm, fire, explosion, ice jam, winter storm (severe), hazardous material transit, terrorism, extreme temperature, water supply contamination, oil spill, transportation accidents, ice storm, infestation, wildfire, dam failure, utility failure, hazardous materials at fixed site, radiological in transit, epidemic, drought, earthquake, and fuel storage (DCPD, 2003).

All relevant hazards for this geographic area were considered. Other natural hazards such as tsunami, avalanche, coastal erosion, and volcanoes were not considered geographically relevant and therefore, were not considered further as part of this risk assessment.

The remaining list of hazards identified with the HAZNY model for Delaware County were classified as moderately low to high hazards as presented in Table 4-1-2, in order of their initial hazard "score."

Table 4-1-3. Summary of HAZNY Qualitative Hazard Ranking

Ranking	Hazard in this Category	Initial Average Ranking Score (average for the seven municipalities)
High Hazard	Flood	328.8
Moderately High Hazard	Tornado	307.8
	Severe Storm	297.8
	Fire	287.2
	Explosion	276.8
	Ice Jam	266.2
	Winter Storm (Severe)	261.2
	Hazardous Materials in Transit	260.2
	Terrorism	254.5
	Extreme Temperature	245.5
	Water Supply Contamination	241.5
Moderately Low Hazard	Oil Spill	236.2
	Transportation Accident	236.2
	Ice Storm	231.8
	Infestation	231.8
	Wildfire	217.5
	Dam Failure	215.8
	Utility Failure	215.8
	Hazardous Materials at Fixed Site	203.2
	Radiological in Transit	183.8
	Epidemic	173.8
	Drought	164.8
Low Hazard	Earthquake	149.2
	Fuel Shortage	113.8

Source: Delaware County Hazard Analysis Report (HAZNY 2003)

In 2005, the Delaware County Steering Committee, NYSEMO, and the county's mitigation consultant discussed the results of the scoring, and applied local knowledge, additional research, and further input to group similar hazards for further evaluation and refined the qualitative ranking of the hazards of concern. Factors considered to support this effort included the potential cascading effects of hazards, hazard groupings that made sense for this study area, additional data, and input regarding the costs associated with previous events.

Additional data were collected from newspapers, local records (including county and town offices), FEMA databases, NOAA databases, Hazard Research Lab databases – Spatial Hazard Events and Losses Database for United States (SHELDUS), National Atlas databases, and local, state, and federal agencies.

Based on local knowledge, further discussion, and the professional judgment of the planning group, the list of hazards for Delaware County was further modified and the ranking was and refined.

Specifically, the epidemic hazard was divided into two separate categories (human and agricultural) based on the nature, relative risk, and potential for the spread of disease between different for each type of epidemic. Also, the agricultural hazard in this area merits separate consideration because agriculture represents a significant portion of the local economy and a crop or livestock epidemic could have a significant impact on the local economy. Human epidemics merit consideration based on the transient academic population, the tourist economy, the second home population, and the potential impact on human and medical resources in the community. After further consideration, the hurricane and tornado hazard was grouped as part of the severe storm hazards. Severe storms usually entail a variety of other influencing weather conditions, including tornados, hurricanes, wind storms, thunderstorms, or lightning storms, therefore, all such conditions have been categorized as being a severe storm hazard. The potential for full-force hurricanes and tornados to impact Delaware County is low; impacts associated with hurricanes and tornados include high wind and rains, similar to those associated with other storms that are included in the severe storm category. Similarly, snow, hail, and freezing rain hazards were considered as part of the severe winter storm hazard; however, ice storm and ice jam hazards are separated from such a category due to being separate types of hazard events from a winter storm.

The qualitative ranking of hazards was then refined by the Steering Committee, based on the professional judgment and evaluation of the group. Factors used to refine the qualitative ranking included the frequency, magnitude, geographic extent, possible direct and cascading effects, impacts to critical facilities and vulnerable populations, and historic costs associated with each hazard. The following list of hazards of concern, in order of significance for the study area as a whole, was then prepared for further evaluation during the risk assessment:

1. Flood
2. Severe Storm (wind, including hurricane and tornado)
3. Ice Jam
4. Severe Winter Storm (snow)
5. Extreme Temperature
6. Ice Storm
7. Infestation (agricultural and disease-carrying insects)
8. Wildfire
9. Epidemic (agricultural)
10. Drought
11. Dam Failure
12. Water Supply Contamination

The hazards evaluated further were then grouped by their root causes as follows: natural (flood, severe storm, ice jam, severe winter storm, extreme temperatures, ice storm, infestation, wildfire, epidemic, and drought), technological (dam failure), and human-caused (water supply contamination). Water supply contamination is categorized as human-caused because most historical instances of water supply contamination in the Delaware County area have been the result of releases of contaminants (spills). Table 4-1-4 summarizes the hazards selected for further analysis and summarizes historical event data and information sources identified for each hazard. Section 4.2 provides detailed profiles of each of these hazards, grouped in the order presented above. Section 4.5 presents a summary of each hazard of concern by municipality.

Table 4-1-4. Summary of Priority Hazards of Greatest Concern in Delaware County

Hazard	Years	# of Events	Impacts	Available Data Sources and Maps
Natural				
Flood	1935-2005	48 Annual events = 2.4	$33M (1950-2005) – NOAA National Climate Data Center (NCDC) $2.7M paid in losses (1978-2004) – NFIP $12.5M (1995-2000) - USC Hazard Research Lab $45M (Jan. 1996) $2M (1998) $5M (Apr. 2005)	NOAA-NCDC, Delaware County historical data, NWS, HAZNY, FEMA, NFIP, NY SEMO, USC Hazard Research Lab, SHELDUS
Severe storm (including thunderstorm, wind, hail, lightning, tornado and hurricane)	Severe storm: 1950-2005; Hurricane: 1979-2004 Tornadoes: 1986-2004	Severe storm: 169 (NCDC) and 109 (NWS); Hurricane: 8 Tornadoes: 8	$9.7M in damages and 12 injuries (1950-2005) – NOAA NCDC $2.2M (1995-2000) - USC Hazard Research Lab $3.2M (1960-2003) - SHELDUS	NOAA-NCDC, NWS, Delaware County historical data, HAZNY, NOAA National Hurricane Center, FEMA, USC Hazard Research Lab, SHELDUS
Ice Jam	1930-2001	77	Not Available	USACE Cold Region Research and Engineering Laboratory (CRREL), Northeast States Emergency Consortium (NESEC)
Severe winter storm (Snow)	1950-2005	71 (NCDC) 47 snow events (NWS)	$23M (1950-2005) and three fatalities/ten injuries –NOAA-NCDC $595K (1995-2000) - USC Hazard Research Lab $785K (1960-2003) - SHELDUS	NOAA-NCDC, USC Hazard Research Lab, FEMA, NWS, SHELDUS
Extreme Temperatures	1950-2005	77 (NWS) Annual events = 3.8	$463K (1950-2005) – NOAA-NCDC	NOAA-NCDC, NWS
Ice Storm	1998-2003	8	$1.2M (other counties included) – NOAA-NCDC	NOAA-NCDC
Infestation (agricultural and disease-carrying insects)	2000-2005	Not Available	21 birds found dead from WNV (NYSDOH) One Emergency Declaration for WNV in October 2000 (FEMA)	NYSDOH, FEMA, Center of Disease Control and Prevention (CDC)
Wildfire	Not Available	0	Not Available	Not Available
Epidemic (agricultural)	Not Available	0	Not Available	Not Available
Drought	1999-2001	3	$50M (1999) (other counties included) – NOAA-NCDC $2.9M (1999) – USC Hazard Research Lab County-wide cropland impacted as a result of 2000 drought event (Delaware County Farm Service Agency) Drought emergency declared for NYC reservoirs in the Upper Delaware Basin in 2001 (Trout Unlimited)	NOAA-NCDC, USC Hazard Research Lab, Delaware County Farm Service Agency, Trout Unlimited-Fly Fishing Connection
Technological				
Dam failure	Not Available	0	Not Available	Not Available
Human-Caused				

Table 4-1-4. Summary of Priority Hazards of Greatest Concern in Delaware County

Hazard	Years	# of Events	Impacts	Available Data Sources and Maps
Water supply contamination	1997-2002 (USEPA SDWIS)	TBD	1997 – coliform contamination in Walton Village (serving 3070 residents) 2001 – coliform contamination within Davenport Water Company (serving 104 residents) 2002 – lead and copper contamination in Downsville Water District (serving 500 residents) 2002 – Heavy metals, nutrients, phosphorus and pathogens were present within the Pepacton, Cannonsville and Schoharie Reservoirs and the Upper West Branch Delaware River.	EPA Safe Drinking Water Information System (SDWIS)

Source: Modified from FEMA 386-2, Worksheet #1 (FEMA 2001).
Notes:
CDC – Center of Disease Control and Prevention
FEMA – Federal Emergency Management Agency
HAZNY – Hazards New York
NESEC – Northeast States Emergency Consortium
NFIP – National Flood Insurance Program
NOAA-NCDC – National Oceanic and Atmospheric Administration-National Climate Data Center
NWS – National Weather Service
NYSDOH – New York State Department of Health
NY SEMO – New York State Emergency Management Office
SHELDUS –Spatial Hazard Events and Losses Database for United States
USACE-CRREL – U.S. Army Corps of Engineers – Cold Region Research and Engineering Lab
USC – University of South Carolina
USEPA SDWIS – U.S. Environmental Protection Agency – Safe Drinking Water Information System