CONTENTS

Section	<u>on</u>			Page			
1.0	INTR	ODUCT	ION	1			
2.0	PI AN	PLANNING PROCESS					
	2.1						
	2.2		ed Stakeholders in Mitigation Planning.				
	2.2	2.2.1	Municipal and Local Involvement				
		2.2.2	State and Regional Agency Involvement				
		2.2.3	Public Participation - Citizen Involvement				
	2.3		ination of Planning with Existing Hazard Management and	10			
	2.3		ation Programs	17			
	2.4		nentation of Mitigation Plans through Existing Programs				
	2.5		ation of Existing Data and Plans into Mitigation Plan				
	2.3	mogre	ation of Existing Data and Frans into Minigation Francisco	22			
3.0	PLAN	ADOP7	ΓΙΟΝ	24			
4.0	RISK	ASSESS	SMENT	27			
T.U	4.1		cation of Hazards				
	7.1	4.1.1	Background of Delaware County				
		4.1.2	Identification of Hazards for Delaware County				
	4.2		es of Hazards				
	1.2	4.2.1	Natural Hazards				
		1.2.1	4.2.1.1 Flood				
			4.2.1.2 Severe Storm (wind, incl. hurricane and tornado)				
			4.2.1.3 Ice Jam				
			4.2.1.4. Severe Winter Storm (snow)				
			4.2.1.5 Extreme Temperatures				
			4.2.1.6 Ice Storm				
			4.2.1.7 Infestation (agricultural and disease-carrying insects)				
			4.2.1.8 Wildfire				
			4.2.1.9 Epidemic (agricultural)				
			4.2.1.10 Drought				
		4.2.2	Technological Hazards				
			4.2.2.1 Dam Failure				
		4.2.3	Man-Madel Hazards				
			4.2.3.1 Water Supply Contamination	79			
	4.3	Assess	Assessing Vulnerability: Identification of Assets and Development Trends				
		4.3.1	Population and Demographics				
		4.3.2	General Building Stock	87			
		4.3.3	Critical Facilities (Site Specific Inventory)	94			
			4.3.3.1 Essential Facilities				
			4.3.3.2 Transportation Systems				
			4.3.3.3 Utilities				
			4.3.3.4 High-Potential Loss Facilities	116			
			4.3.3.3 Hazardous Material Facilities				

CONTENTS (continued)

Section	1		Page		
		4.3.4 Analyzing Population and Development Trends	125		
	4.4	Assessing Vulnerability: Estimating Potential Losses			
		4.4.1 Natural Hazards			
		4.4.1.1 Flood	42		
		4.4.1.2 Severe Storm (wind, incl. hurricane and tornado)	46		
		4.4.1.3 Ice Jam			
		4.4.1.4. Severe Winter Storm (snow)			
		4.4.1.5 Extreme Temperatures			
		4.4.1.6 Ice Storm			
		4.4.1.7 Infestation (agricultural and disease-carrying insects)	66		
		4.2.1.8 Wildfire			
		4.4.1.9 Epidemic (agricultural)	72		
		4.2.1.10 Drought			
		4.4.2 Technological Hazards	77		
		4.4.2.1 Dam Failure	77		
		4.4.3 Man-Made Hazards	79		
		4.4.3.1 Water Supply Contamination	79		
	4.5	Additional Data Needs and Next Steps			
5.0	MITIGATION STRATEGIES				
	5.1	Background and Past Accomplishments	210		
	5.2	General Mitigation Planning Approach			
	5.3	Mitigation Goals and Objectives			
	5.4	Identification, Analysis, and Implementation of Mitigation Activities			
		5.4.1 Natural Hazards			
		5.4.1.1 Flood Mitigation Activities	218		
		5.4.1.1 Severe Storm (wind, incl. hurricane and tornado) Mitigation Activities			
		5.4.1.3 Ice Jam Mitigation Activities			
		5.4.1.4. Severe Winter Storm (snow) Mitigation Activities			
		5.4.1.5 Extreme Temperatures Mitigation Activities			
		5.4.1.6 Ice Storm Mitigation Activities			
		5.4.1.7 Infestation (agricultural and disease-carrying insects) Mitiga	ation		
		Activities	239		
		5.4.1.8 Wildfire Mitigation Activities			
		5.4.1.9 Drought Mitigation Activities			
		5.4.1.10 Epidemic (agricultural) Mitigation Activities			
		5.4.2 Technological Hazards			
		5.4.2.1 Dam Failure Mitigation Activities			
		5.4.3 Technological Hazards			
		5.4.3.1 Water Supply Contamination Mitigation Activities			
		5.4.4 Multi-Jurisdictional and Multi-Hazard Mitigation Activities			
		5.4.5 Next Steps	271		
6.0	PLAN MAINTENANCE PROCEDURES				
	6.1	Monitoring, Evaluating, and Updating the Plan			
	6.2	Continued Public Involvement			

Acronyms

References

Appendices

- A Adoption Resolution
- B Glossary
- C Data Summary Matrix
- D Federal Mitigation Programs, Activities, and Initiatives
- E HAZUS-MH Risk Assessment Tool Hurricane Results
- F HAZUS-MH Risk Assessment Tool Flood Results
- G Applicable Federal and State Regulations

TABLES

Tables

- 2-1-1 Summary of Steering Committee Efforts
- 2-2-1 Summary of Stakeholder and Public Involvement
- 2-4-1 Existing Processes and Programs in Delaware County and the Participating Jurisdictions for Mitigation Plan Implementation
- 4-1-1 Presidential Disaster and Emergency Declarations (1996 to 2005)
- 4-1-2 Hazard Events between 1995 and 2000 (National Atlas)
- 4-1-3 Summary of HAZNY Qualitative Hazard Ranking
- 4-1-4 Summary of Priority Hazards of Greatest Concern in Delaware County
- 4-2-1 HAZNY Risk Factors and Descriptions
- 4-2-2 Presidential Disaster Declarations for Flooding Events (1996-2005)
- 4-2-3 Presidential Disaster Declarations for Severe Storm Events (1996-2005)
- 4-2-4 Presidential Disaster Declarations for Severe Winter Storm Events
- 4-2-5 WNV Documentation for New York State and Delaware County (2000 to 2005)
- 4-3-1 Delaware County Population Statistics (2000 U.S. Census Data)
- 4-3-2 Inventory of General Building Stock for Delaware County (2000 U.S. Census Data)
- 4-3-3 Manufactured Housing in Delaware County
- 4-3-4 Police Stations in Delaware County
- 4-3-5 Fire Stations and EMS Facilities
- 4-3-6 Major Medical Facilities in Delaware County
- 4-3-7 Senior Living / Senior Care Facilities in Delaware County
- 4-3-8 Educational Facilities in Delaware County
- 4-3-9 Sheltering Agreements in Delaware County
- 4-3-10 Shelter Facilities in Delaware County
- 4-3-11 Road Segments by Classification
- 4-3-12 Potable Water Supply Sources in Delaware County
- 4-3-13 Wastewater Treatment Plants
- 4-3-14 Communication Towers in Delaware County
- 4-3-15 Dams in Delaware County

CONTENTS (continued)

TABLES (con't.)

Tables

4-3-16	Current Land Use in Delaware County				
4-3-17	Land Use Regulations and Planning Activities in Delaware County (August 2005)				
4-3-18	Projected Land Use and Development				
4-4-1	Summary of Risk Assessment Methodology Selection				
4-4-2	Estimated General Population at Risk from Riverine Flood in Delaware County				
4-4-3	Estimated Exposure and Loss for 100-Year Flood for Delaware County				
4-4-4	Estimated Exposure and Loss to General Building Stock from Floods for Delaware County				
4-4-5	Estimated Exposure and Loss for 100-Year Flood for Andes				
4-4-6	Estimated Exposures and Loss for 500-Year Flood for Andes				
4-4-7	Estimated Exposure and Loss for 100-Year Flood for Bovina				
4-4-8	Estimated Exposures and Loss for 500-Year Flood for Bovina				
4-4-9	Estimated Exposure and Loss for 100-Year Flood for Colchester				
4-4-10	Estimated Exposures and Loss for 500-Year Flood for Colchester				
4-4-11	Estimated Exposure and Loss for 100-Year Flood for Davenport				
4-4-12	Estimated Exposures and Loss for 500-Year Flood for Davenport				
4-4-13	Estimated Exposure and Loss for 100-Year Flood for Delhi				
4-4-14	Estimated Exposures and Loss for 500-Year Flood for Delhi				
4-4-15	Estimated Exposure and Loss for 100-Year Flood for Deposit				
4-4-16	Estimated Exposures and Loss for 500-Year Flood for Deposit				
4-4-17	Estimated Exposure and Loss for 100-Year Flood for Franklin				
4-4-18	Estimated Exposures and Loss for 500-Year Flood for Franklin				
4-4-19	Estimated Exposure and Loss for 100-Year Flood for Hamden				
4-4-20	Estimated Exposures and Loss for 500-Year Flood for Hamden				
4-4-21	Estimated Exposure and Loss for 100-Year Flood for Hancock				
4-4-22	Estimated Exposures and Loss for 500-Year Flood for Hancock				
4-4-23	Estimated Exposure and Loss for 100-Year Flood for Harpersfield				
4-4-24	Estimated Exposures and Loss for 500-Year Flood for Harpersfield				
4-4-25	Estimated Exposure and Loss for 100-Year Flood for Kortright				
	Estimated Exposures and Loss for 500-Year Flood for Kortright				
4-4-27	Estimated Exposures and Loss for 100-Year Flood for Masonville				
	Estimated Exposure and Loss for 500-Year Flood for Masonville				
4-4-29	Estimated Exposures and Loss for 100-Year Flood for Meredith				
	Estimated Exposure and Loss for 500-Year Flood for Meredith				
	Estimated Exposures and Loss for 100-Year Flood for Middletown				
	Estimated Exposure and Loss for 500-Year Flood for Middletown				
	Estimated Exposures and Loss for 100-Year Flood for Roxbury				
4-4-34	Estimated Exposure and Loss for 500-Year Flood for Roxbury				
4-4-35	Estimated Exposures and Loss for 100-Year Flood for Sidney				
	Estimated Exposure and Loss for 500-Year Flood for Sidney				
	Estimated Exposures and Loss for 100-Year Flood for Stamford				
	Estimated Exposures and Loss for 500-Year Flood for Stamford				
	Estimated Exposure and Loss for 100-Year Flood for Tompkins				
4-4-40	Estimated Exposures and Loss for 500-Year Flood for Tompkins				
4-4-41	Estimated Exposure and Loss for 100-Year Flood for Walton				

4-4-42 Estimated Exposures and Loss for 500-Year Flood for Walton

- 4-4-43 Estimated Damages to Critical Facilities from Flood For Delaware County
- 4-4-44 Estimated Flood Exposure Value for Farmland in Delaware County
- 4-4-45 Estimated Exposure for WWTPs in Delaware County Study Area
- 4-4-46 Estimated Damage to General Building Stock From 500-year Hurricane Event in Delaware County
- 4-4-47 Estimated percent Probability of Various Damage Levees Associated with 500-Year Hurricane Severe Storm Event
- 4-4-48 Manufactured Homes in Delaware County
- 4-4-49 Severe Winter Storm (Snow) Events Impacting Delaware County (1950 to June 2005)
- 4-4-50 Population Exposed to Severe Winter Storm (Snow) Hazard in Delaware County
- 4-4-51 Inventory of General Building Structural Exposure to Severe Winter Storm (Snow Hazard in Delaware County)
- 4-4-52 Manufactured Homes Exposed to Severe Winter Storm (Snow) Hazard in Delaware County
- 4-4-53 Extreme Temperature Events in Delaware County and Surrounding Area (1995 to June 2005)
- 4-4-54 Population Exposed to Extreme Temperature Events in Delaware County
- 4-4-55 Severe Winter Storm (Ice) Events Impacting Delaware County (1950 to June 2005)
- 4-4-56 Population Exposed to Severe Winter Storm (Ice) Events in Delaware County
- 4-4-57 Building Structural Exposure to Severe Storm (Ice) Hazard in Delaware County
- 4-4-58 Manufactured Homes and Potential Damage from Severe Storm (Ice) Events in Delaware County Study Area
- 4-4-59 WNV Documentation for NYS and Delaware County (2000 to 2005)
- 4-4-60 Drought Events for Delaware County and Surrounding Areas (1950 to June 2005)
- 4-4-61 Table of Exposed Farmland (Drought Hazard)
- 4-4-62 Data Needs to Support Future Refinement of Loss and Exposure Estimates
- 5-4-1-1 Flood Mitigation Activities
- 5-4-1-2 Severe Storm (wind, including hurricane and tornado) Mitigation Activities
- 5-4-1-3 Ice Jam Mitigation Activities
- 5-4-1-4 Severe Winter Storm (snow) Mitigation Activities
- 5-4-1-5 Extreme Temperatures Mitigation Activities
- 5-4-1-6 Ice Storm Mitigation Activities
- 5-4-1-7 Infestation (agricultural and disease-carrying insects) Mitigation Activities
- 5-4-1-8 Wildfire Mitigation Activities
- 5-4-1-9 Epidemic (agricultural) Mitigation Activities
- 5-4-1-10 Drought Mitigation Activities
- 5-4-2-1 Dam Failure Mitigation Activities
- 5-4-3-1 Water Supply Contamination Mitigation Activities
- 5-4-4-1 Multi-Jurisdictional and Multi-Hazard Mitigation Activities
- 6-2-1 Existing Processes and Programs in Delaware County for Mitigation Plan Implementation

CONTENTS (continued)

FIGURES

Figures

1-1	Mitigation Plan	n Area and Surro	ounding Counties
-----	-----------------	------------------	------------------

- 1-2 Delaware County Hazard Mitigation Process
- 4-1-1 Risk Assessment Process
- 4-1-2 Mitigation Plan Area and Surrounding Counties
- 4-1-3 Regional Hydrology and Watersheds
- 4-2-1 100- and 500- Year Flood Zones within the Delaware County
- 4-2-2 Delaware County Severe Storm Events (1950-Present)
- 4-2-3 Historical North Atlantic Tropical Cyclone Tracks (1851-2002)
- 4-2-4 Windstorm Damage at Camp Shankitunk in Delhi (2003)
- 4-2-5 Severe Storm Damage in Delaware County Forest (July 31, 2003)
- 4-2-6 Tornado Track Map of Two Tornado Events (May 31 and June 2, 1998)
- 4-2-7 Wind Zones in the United States
- 4-2-8 Delaware County Ice Jam Events (1930-2001)
- 4-2-9 Historical Ice Jam Locations within Delaware County
- 4-2-10 Delaware County Winter Weather Events (1993-2005)
- 4-2-11 Annual Mean Snowfall within U.S. and Delaware County, 2001
- 4-2-12 Record High Temperatures in the U.S. by State
- 4-2-13 Delaware County Low Temperature (<19F) Events (1956-2005)
- 4-2-14 Delaware County High Temperature (>98F) Events (1956-2005)
- 4-2-15 Delaware County Ice Storm Events (1998-2003)
- 4-2-16 Mosquito Hazard Areas in the Delaware County
- 4-2-17 Wild Land Fire Hazard Areas in the Delaware County
- 4-2-18 Agricultural Epidemic Exposure Areas in Delaware County
- 4-2-19 September 1999 Drought Condition in New York State
- 4-3-1 Distribution of General Population in Delaware County
- 4-3-2 Distribution of Elderly (<65) Population and Senior Centers in Delaware County
- 4-3-3 Distribution of Low-Income Population in Delaware County
- 4-3-4 Residential Exposure Density in Delaware County
- 4-3-5 Manufactured Housing in Delaware County (Exposure Density and Location of Trailer Parks)
- 4-3-6 Commercial Exposure Density in Delaware County
- 4-3-7 Industrial Exposure Density in Delaware County
- 4-3-8 Emergency Facilities in Delaware County
- 4-3-9 Major Medical Care Facilities in Delaware County
- 4-3-11 Educational Facilities in Delaware County
- 4-3-12 Major Roadways, Railroads and Associated Bridges in Delaware County
- 4-3-13 Electric Service Areas in Delaware County
- 4-3-14 Cannonsville Dam near Deposit
- 4-3-15 Pepacton Reservoir Dam near
- 4-3-16 Dams in Delaware County
- 4-3-17 Study Area Land Use Land Cover
- 4-4-1 Distribution of Population Density Relative to the 500-Year Flood Plain
- 4-4-2 Distribution of Elderly Population Relative to the 500-Year Flood Plain
- 4-4-3 Distribution of Low-Income Population Relative to the 500-Year Flood Plain

- 4-4-4 Critical Facilities At Risk of Flood for Delaware County
- 4-4-5 Agricultural Lands and Flood Plains in Delaware County
- 4-4-6 Peak Wind Speeds for 500-Year Hurricane Severe Storm Event for Delaware County
- 4-4-7 Manufactured Homes in Delaware County
- 4-4-8 Ice Jam Events in Delaware County
- 4-4-9 Manufactured Homes in Delaware County
- 4-4-10 Roadways Susceptible to Severe Storm (Ice) in Delaware County
- 4-4-11 Manufactured Homes in Delaware County
- 4-4-12 Land Cover Related to Infestation Hazard (Mosquitoes)
- 4-4-13 Land Cover Related to Wildfire Hazard for Delaware County
- 4-4-14 Map of Farmland Exposure Area for Agricultural Epidemic in Delaware County Study Area
- 4-4-15 Major Dams in Delaware County Study Area