



9.32 Township of Pequannock

This section presents the jurisdictional annex for the Township of Pequannock.

9.32.1 Hazard Mitigation Plan Point of Contact

The following individuals have been identified as the hazard mitigation plan’s primary and alternate points of contact.

Primary Point of Contact	Alternate Point of Contact
Name: Joseph Golden Address: 530 Newark-Pompton Turnpike Phone: (973) 835-5700 x188 E-mail: jgolden@peqtwp.org	Name: Robert Grant Address: 530 Newark-Pompton Turnpike Phone: (973) 835-5700 x188 E-mail: rgrant@peqtwp.org

9.32.2 Municipal Profile

The Township of Pequannock is location in the northeastern portion of Morris County in the Highlands Region of the State of New Jersey. The Township encompasses two communities, Pequannock and Pompton Plains, each served by their own post office. It has a total area of 7.17 square miles. The Township lies between the foothills of the Waughaw Mountains and the courses of the Pequannock and Pompton Rivers. According to the U.S. Census, the 2010 population for the Township of Pequannock was 15,420.

Growth/Development Trends

The following table summarizes recent residential/commercial development since 2010 to present and any known or anticipated major residential/commercial development and major infrastructure development that has been identified in the next five years within the municipality. Refer to the map in Section 9.32.8 of this annex which illustrates the hazard areas along with the location of potential new development.

Table 9.32-1. Growth and Development

Property or Development Name	Type (e.g. Res., Comm.)	# of Units / Structures	Location (address and/or Block & Lot)	Known Hazard Zone(s)	Description/Status of Development
Recent Development from 2010 to present					
75 West End Avenue	Residential	Single Family	1801/5	Flood: 1% Chance; NEHRP: D	complete
Morris Habitat for Humanity Subdivision 8 Highland Avenue	Residential	3 lots	1404/20-23	Flood: 0.2% Chance; NEHRP: E	complete
Heritage Home Builders Subdivision 749 Turnpike	Residential	2 lots	706/14	NEHRP: E	complete
Driesse Development Subdivision 62 West End Avenue	Residential	2 lots	1802/27 & 28	NEHRP: E	complete
DeGeorge Subdivision 76 Hopper Avenue	Residential	2 lots	1202/42	NEHRP: E	complete
Platt Subdivision 101 Mountain Avenue	Residential	2 lots	604/5	NEHRP: D	complete



Table 9.32-1. Growth and Development

Property or Development Name	Type (e.g. Res., Comm.)	# of Units / Structures	Location (address and/or Block & Lot)	Known Hazard Zone(s)	Description/Status of Development
Walid – 7 Eleven 540 Route 23	Commercial		2006/1	Flood: 1% Chance; NEHRP: E	complete
Bock Subdivision 341 Boulevard	Residential	2 lots	1203/9	NEHRP: E	complete
Sidoti Subdivision 85 Mountain Avenue	Residential	2 lots	603/7 & 8	NEHRP: D	complete
Handel Construction Co. 3 Ramapo Road	Residential	2 lots	704/18	NEHRP: E	complete
Known or Anticipated Development in the Next Five (5) Years					
Pequannock Senior Citizens 101 Boulevard	Residential	33 Senior Units	3505,3506,3902/4,7,8,11	NEHRP: E	
Heart and Vascular Assoc. 637 Route 23	Commercial	Minor Site	1404/8	Flood: 1% Chance; NEHRP: E	
Chilton Hospital 97 West Parkway	Institutional	Site	2401,2402?15,16, 1,-4	Flood: 1% Chance; NEHRP: E	
Happy Hound K9 721 Route 23	Commercial	Site	802/5	Flood: 1% Chance; NEHRP: E	
Cornerstone Chapel 620 Route 23	Commercial	Site	902/18	Flood: 1% Chance; NEHRP: E	
Kew Gardens – Delta Gas 341 Route 23	Commercial	Site	2701/1	Flood: 1% Chance; NEHRP: E	
New EKC – Toyota	Commercial	Site	902/4 & 36	Flood: 1% Chance; NEHRP: E	

* Only location-specific hazard zones or vulnerabilities identified.

9.32.3 Natural Hazard Event History Specific to the Municipality

Morris County has a history of natural and non-natural hazard events as detailed in Volume I, Section 5.0 of this plan. A summary of historical events is provided in each of the hazard profiles and includes a chronology of events that have affected the County and its municipalities. For the purpose of this plan update, events that have occurred in the County from 2008 to present were summarized to indicate the range and impact of hazard events in the community. Information regarding specific damages is included, if available, based on reference material or local sources. This information is presented in the table below. For details of these and additional events, refer to Volume I, Section 5.0 of this plan.

Table 9.32-2. Hazard Event History

Dates of Event	Event Type	FEMA Declaration # (If Applicable)	County Designated?	Summary of Damages/Losses
March 12 – April 15, 2010	Severe Storms and Flooding	DR-1897	Yes	Evacuation and sheltering occurred throughout the Township as a result of this two-storm event. Both storms forced the Township to close 30% of their roads and Route 23. There were also commercial closures along Route 23. Pump stations in the Township were damaged. Private properties were also





Table 9.32-2. Hazard Event History

Dates of Event	Event Type	FEMA Declaration # (If Applicable)	County Designated?	Summary of Damages/Losses
				damaged, including 400 homes and 40 commercial businesses. The Township had overtime costs for police and sheltering and costs for debris removal and emergency protective services, totaling \$42,500.
December 26-27, 2010	Severe Winter Storm and Snowstorm	DR-1954	Yes	The Township had police and DPW (road clearing) overtime, totaling over \$51,000.
March 7, 2011	Flood	N/A	N/A	Evacuation and sheltering occurred throughout the Township as a result of this event. The storm forced the Township to close 30% of their roads and Route 23. There were also commercial closures along Route 23. Private properties were damaged, 370 homes and 40 commercial properties. Other losses to the Township included police and shelter overtime, debris removal, and emergency protective services.
April 16, 2011	Flood	N/A	N/A	Evacuation and sheltering occurred throughout the Township as a result of this event. The storm forced the Township to close 30% of their roads and Route 23. There were also commercial closures along Route 23. Private properties were damaged, 380 homes and 30 commercial properties. Other losses to the Township included police and shelter overtime, debris removal, and emergency protective services.
August 26 – September 5, 2011	Hurricane Irene	EM-3332 DR-4021	Yes Yes	Hurricane Irene forced evacuations and the opening of shelters in the Township. On August 29 th , 40% of the Township roads were closed and were all reopened within a week of the storm. There were commercial properties closed along Route 23 due to flooding. The Route 23/Alexander Avenue jug handle was flooded as well. PV Lake, a public swim lake, was flooded and its spillway breached. There was damage to nearly 40% of Township homes and 45 to 50 homes had substantial damage. Other losses to the Township included police and DPW overtime, debris removal and shelter overtime, totaling \$2.2 million.
September 28 – October 6, 2011	Remnants of Tropical Storm Lee	DR-4039	No	Hurricane Irene forced evacuations and the opening of shelters in the Township. On August 29 th , 40% of the Township roads were closed and were all reopened within a week of the storm. There were commercial properties closed along Route 23 due to flooding. The Route 23/Alexander Avenue jug handle was flooded as well. PV Lake, a public swim lake, was flooded. The Township pump station flooded. There was damage to nearly 40% of Township homes and 45 to 50 homes had substantial damage. See loss information in Hurricane Irene write-up.
October 29, 2011	Severe Storm	DR-4048	Yes	Approximately 30% of the Township roads were closed due to downed trees. Total losses to the Township included debris removal, emergency protective measures, and water control facilities, totaling \$53,000.
October 26 – November 8, 2012	Hurricane Sandy	EM-3354 DR-4086	Yes Yes	The entire Township was without power after Sandy. Charging and hospitality centers were open for residents. Power was not restored until November 12 th . There were road closures and downed power lines throughout. There were also commercial closures. The Beverly pump station and four street lights were damaged. Additionally, the library roof, PV middle school roof, and the Township municipal roof were all damaged. Eight homes sustained damages due to downed trees. Total losses to the Township included police overtime, debris removal and shelter overtime, totaling \$120,000.



9.32.4 Hazard Vulnerabilities and Ranking

The hazard profiles in Section 5.0 of this plan have detailed information regarding each plan participant’s vulnerability to the identified hazards. The following summarizes the hazard vulnerabilities and their ranking in the Township of Pequannock. For additional vulnerability information relevant to this jurisdiction, refer to Section 5.0.

Hazard Risk/Vulnerability Risk Ranking

The table below summarizes the hazard risk/vulnerability rankings of potential hazards for the Township of Pequannock.

Table 9.32-3. Hazard Risk/Vulnerability Risk Ranking

Hazard type	Estimate of Potential Dollar Losses to Structures Vulnerable to the Hazard a, c	Probability of Occurrence	Risk Ranking Score (Probability x Impact)	Hazard Ranking b
Drought	Damage estimate not available	Frequent	27	Medium
Dam Failure	Damage estimate not available	Rare	6	Low
Earthquake	500-year MRP: \$12,119,830 2,500-year MRP: \$199,075,596	Occasional	32	High
Extreme Temperature	Damage estimate not available	Frequent	27	Medium
Flood	1% Annual Chance: \$185,163,191	Frequent	33	High
Geological Hazards	Exposed to Class A and Class B: \$3,775,593	Frequent	18	Medium
Severe Storm	100-Year MRP: \$4,289,718 500-year MRP: \$12,468,298 Annualized: \$293,376	Frequent	48	High
Winter Storm	1% GBS: \$49,039,884 5% GBS: \$245,199,422	Frequent	54	High
Wildfire	Estimated Value Exposed to Extreme, Very High and High: \$1,053,540	Rare	6	Low
Disease Outbreak	Damage estimate not available	Frequent	36	High
Hazardous Materials	Damage estimate not available	Frequent	36	High
Infestation	Damage estimate not available	Frequent	18	Medium

Notes:

- a. Building damage ratio estimates based on FEMA 386-2 (August 2001)
- b. The valuation of general building stock and loss estimates was based on custom inventory for the municipality.
High = Total hazard priority risk ranking score of 31 and above
Medium = Total hazard priority risk ranking of 20-30+
Low = Total hazard risk ranking below 20
- c. Loss estimates for the severe storm and severe winter storm hazards are structural values only and do not include the value of contents.
- d. Loss estimates for the flood and earthquake hazards represent both structure and contents.
- e. The HAZUS-MH earthquake model results are reported by Census Tract.



National Flood Insurance Program (NFIP) Summary

The following table summarizes the NFIP statistics for the Township of Pequannock.

Table 9.32-4. NFIP Summary

Municipality	# Policies (1)	# Claims (Losses) (1)	Total Loss Payments (2)	# Rep. Loss Prop. (1)	# Severe Rep. Loss Prop. (1)	# Policies in 100-year Boundary (3)
Township of Pequannock	770	1,990	\$65,928,349.72	206	98	679

Source: FEMA Region 2, 2014

(1) Policies, claims, repetitive loss and severe repetitive loss statistics provided by FEMA Region 2, and are current as of 9/30/2014.

Please note the total number of repetitive loss properties includes the severe repetitive loss properties. The number of claims represents claims closed by 9/30/14.

(2) Total building and content losses from the claims file provided by FEMA Region 2.

(3) The policies inside and outside of the flood zones is based on the latitude and longitude provided by FEMA Region 2 in the policy file.

Notes: FEMA noted that where there is more than one entry for a property, there may be more than one policy in force or more than one GIS possibility.

A zero percentage denotes less than 1/100th percentage and not zero damages or vulnerability as may be the case.

Number of policies and claims and claims total exclude properties located outside County boundary, based on provided latitude and longitude.

Critical Facilities

The table below presents HAZUS-MH estimates of the damage and loss of use to critical facilities in the community as a result of a 1- and 0.2-percent annual chance flood events.

Table 9.32-5. Potential Flood Losses to Critical Facilities

Name	Type	Exposure		Potential Loss from 1% Flood Event		
		1% Event	0.2% Event	Percent Structure Damage	Percent Content Damage	Days to 100-Percent ⁽²⁾
Chilton Memorial Hospital	Medical		X	-	-	-
Netherlands Reformed Christian	School	X	X	-	-	-

Source: HAZUS-MH 2.1

Note (1): HAZUS-MH 2.1 provides a general indication of the maximum restoration time for 100% operations. Clearly, a great deal of effort is needed to quickly restore essential facilities to full functionality; therefore this will be an indication of the maximum downtime (HAZUS-MH 2.1 User Manual).

Note (2): In some cases, a facility may be located in the DFIRM flood hazard boundary; however HAZUS did not calculate potential loss. This may be because the depth of flooding does not amount to any damages to the structure according to the depth damage function used in HAZUS for that facility type. Further, HAZUS-MH may estimate potential damage to a facility that is outside the DFIRM because the model generated a depth grid beyond the DFIRM boundaries.

NA Not available

X Facility located within the DFIRM boundary

- Not calculated by HAZUS-MH 2.1

Other Vulnerabilities Identified

According to the 2010 preliminary FEMA Flood Insurance Study (FIS) for Morris County, low-lying areas of the Township of Pequannock are subject to periodic flooding caused by the overflow of the Pompton River, Pequannock River, Ramapo River, East Ditch, West Ditch, and the tributaries to the East Ditch (FEMA FIS 2010).



9.32.5 Capability Assessment

This section identifies the following capabilities of the local jurisdiction:

- Planning and regulatory capability
- Administrative and technical capability
- Fiscal capability
- Community classification
- National Flood Insurance Program
- Integration of Mitigation Planning into Existing and Future Planning Mechanisms

Planning and Regulatory Capability

The table below summarizes the regulatory tools that are available to the Township of Pequannock.

Table 9.32-6. Planning and Regulatory Tools

Tool / Program (code, ordinance, plan)	Do you have this? (Yes/No) If Yes, date of adoption or update	Authority (local, county, state, federal)	Dept. /Agency Responsible	Code Citation and Comments (Code Chapter, name of plan, explanation of authority, etc.)
Planning Capability				
Master Plan	Yes	Local	Planning	Reexamined in 2003 and 2009
Capital Improvements Plan	Yes	Local	Manager	Yearly
Floodplain Management / Basin Plan	Yes	Local/Regional	Stormwater Coordinator	Element of Master Plan, 1995 Flood Acquisition Plan (with Morris County)
Stormwater Management Plan	Yes	Local	Township Engineer	Incorporated into the Master Plan and Ordinances, 2009
Open Space Plan	Yes	Local	Committee	Actively purchasing open space within hazardous areas
Stream Corridor Management Plan	No			
Watershed Management or Protection Plan	No			
Economic Development Plan	No			
Comprehensive Emergency Management Plan	Yes	Local	OEM and Coordinator	2012
Emergency Response Plan	Yes	Local	OEM and Coordinator	Part of EOP
Post-Disaster Recovery Plan	No	Local	Planning	Distribute information, provide guidance documentation
Transportation Plan	No			
Strategic Recovery Planning Report	No			
Other Plans: • Township Natural Resource Inventory • COOP/COG	Yes- NRI Yes	Local County, Local	Planning Township Manager	Prepared by the Land Conservancy Unknown
Regulatory Capability				
Building Code	Yes	State & Local		State Uniform Construction Code Act (N.J.S. 52:27D-119 et seq.)



Table 9.32-6. Planning and Regulatory Tools

Tool / Program (code, ordinance, plan)	Do you have this? (Yes/No) If Yes, date of adoption or update	Authority (local, county, state, federal)	Dept. /Agency Responsible	Code Citation and Comments (Code Chapter, name of plan, explanation of authority, etc.)
Zoning Ordinance	Yes	Local	Zoning Officer	Chapter 189 Zoning
Subdivision Ordinance	Yes	Local, County	Planning	Chapter 163 Subdivision of land;
NFIP Flood Damage Prevention Ordinance	Yes	Federal, State, Local	CFM	Chapter 085 Flood Damage Prevention; Rev. June 2014
NFIP: Cumulative Substantial Damages	No			
NFIP: Freeboard	Yes	State, Local	CFM	Required for all residential and commercial development
Growth Management Ordinances	Yes	Local	Planning	Incorporated into Flood Damage Prevention Ordinance; June 2014
Site Plan Review Requirements	Yes	Local	Engineering	Updated periodically
Stormwater Management Ordinance	Yes	State, Local	CFM	Chapter 157 Stormwater Management Regulations; Rev. June 2006
Municipal Separate Storm Sewer System (MS4)	Yes	State, County, Local	Department of Public Works	Tier A community that maintains a MS4; Township authorized to discharge stormwater into state waterbodies under NJPDES Permit #NJG0148342
Natural Hazard Ordinance	No			
Post-Disaster Recovery Ordinance	No			
Real Estate Disclosure Requirement	Yes	State	Division of Consumer Affairs	N.J.A.C. 13:45A-29.1, adding local ordinance
Other [Special Purpose Ordinances (i.e., sensitive areas, steep slope)]	Yes	Local	Planning	Multiple occurrences

Administrative and Technical Capability

The table below summarizes potential staff and personnel resources available to the Township of Pequannock.

Table 9.32-7. Administrative and Technical Capabilities

Resources	Is this in place? (Yes or No)	Department/ Agency/Position
Administrative Capability		
Planning Board	Yes	Planning, Volunteers, Professionals
Mitigation Planning Committee	Yes	CFM, Engineer, Police, Planning
Environmental Board/Commission	Yes	Volunteers
Open Space Board/Committee	Yes	Volunteers
Economic Development Commission/Committee	Yes	Volunteers
Maintenance Programs to Reduce Risk	Yes	CFM, Department of Public Works
Mutual Aid Agreements	Yes	Variable



Table 9.32-7. Administrative and Technical Capabilities

Resources	Is this in place? (Yes or No)	Department/ Agency/Position
Technical/Staffing Capability		
Planner(s) or Engineer(s) with knowledge of land development and land management practices	Yes	Professional Engineer and Planners on Staff
Engineer(s) or Professional(s) trained in construction practices related to buildings and/or infrastructure	Yes	Township Engineer, Construction Official, Multiple trade inspectors
Planners or engineers with an understanding of natural hazards	Yes	Professional Engineer and Planners on Staff
NFIP Floodplain Administrator	Yes	Township Engineer
Surveyor(s)	Yes	Retains a Contract Surveyor
Personnel skilled or trained in GIS and/or Hazus-MH applications	Yes	Do not currently own GIS Software
Scientist familiar with natural hazards	No	
Emergency Manager	Yes	OEM; Emergency Management Coordinator; Deputy Coordinator
Grant Writer(s)	Yes	Township Administrator
Staff with expertise or training in benefit/cost analysis	Yes	Township Engineer
Professionals trained in conducting damage assessments	Yes	Township staff

Fiscal Capability

The table below summarizes financial resources available to the Township of Pequannock.

Table 9.32-8. Fiscal Capabilities

Financial Resources	Accessible or Eligible to Use (Yes/No/Don't Know)
Community development Block Grants (CDBG, CDBG-DR)	Yes, limited availability based on demographics
Capital Improvements Project Funding	Yes, directed by Township Manager & Council
Authority to Levy Taxes for specific purposes	Yes, limited by statute
User fees for water, sewer, gas or electric service	Yes
Impact Fees for homebuyers or developers of new development/homes	No
Stormwater Utility Fee	No
Incur debt through general obligation bonds	Yes
Incur debt through special tax bonds	No
Incur debt through private activity bonds	No
Withhold public expenditures in hazard-prone areas	No
Other Federal or State Funding Programs	Yes
Open Space Acquisition Funding Programs	Yes - Morris County Flood Mitigation Program (acquisitions)
Other	N/A



Community Classifications

The table below summarizes classifications for community program available to the Township of Pequannock.

Table 9.32-9. Community Classifications

Program	Do you have this? (Yes/No)	Classification (if applicable)	Date Classified (if applicable)
Community Rating System (CRS)	Yes	7	10/1/1991
Building Code Effectiveness Grading Schedule (BCEGS)	Yes	4 – Residential 3 - Non-Residential	April 18, 2012
Public Protection (ISO Fire Protection Classes 1 to 10)	Yes	3	December 1, 2011
Storm Ready	Yes	N/A	2002
Firewise	No	N/A	N/A
Disaster/Safety Programs in/for Schools	No		
Organizations with Mitigation Focus (advocacy group, non-government)	Yes	N/A	N/A
Public Education Program/Outreach (through website, social media)	Yes	N/A	N/A
Public-Private Partnerships	No	N/A	N/A

N/A = Not applicable. NP = Not participating. - = Unavailable. TBD = To be determined.

The classifications listed above relate to the community’s ability to provide effective services to lessen its vulnerability to the hazards identified. These classifications can be viewed as a gauge of the community’s capabilities in all phases of emergency management (preparedness, response, recovery, and mitigation) and are used as an underwriting parameter for determining the costs of various forms of insurance. The CRS class applies to flood insurance while the BCEGS and Public Protection classifications apply to standard property insurance. CRS classifications range on a scale of 1 to 10 with class 1 being the best possible classification, and class 10 representing no classification benefit. Firewise classifications include a higher classification when the subject property is located beyond 1,000 feet of a creditable fire hydrant and is within five road miles of a recognized Fire Station.

Criteria for classification credits are outlined in the following documents:

- The Community Rating System Coordinators Manual
- The Building Code Effectiveness Grading Schedule
- The ISO Mitigation online ISO’s Public Protection website at <http://www.isomitigation.com/ppc/0000/ppc0001.html>
- The National Weather Service Storm Ready website at <http://www.weather.gov/stormready/howto.htm>
- The National Firewise Communities website at <http://firewise.org/>

Self-Assessment of Capability

The table below provides an approximate measure of Pequannock’s capability to work in a hazard-mitigation capacity and/or effectively implement hazard mitigation strategies to reduce hazard vulnerabilities.





Table 9.32-10. Self-Assessment Capability for the Municipality

Area	Degree of Hazard Mitigation Capability		
	Limited (If limited, what are your obstacles?)*	Moderate	High
Planning and Regulatory Capability			X
Administrative and Technical Capability		X	
Fiscal Capability	Multiple initiatives with limited funding		
Community Political Capability		X	
Community Resiliency Capability		X	
Capability to Integrate Mitigation into Municipal Processes and Activities.			X

National Flood Insurance Program

NFIP Floodplain Administrator

Joseph Golden, PE, CFM

Flood Vulnerability Summary

Pequannock Township joined the NFIP on October 1, 1991, and is an active member of the NFIP. The Township is currently classified as a 7 in the Community Rating System. The current effective Flood Insurance Rate Maps are dated September 17, 1992. The community’s Flood Damage Prevention Ordinance (FDPO), found in Chapter 085 Flood Damage Prevention of the local code was last updated on June 10, 2014.

All flood-damaged properties in the Township are identified in a database including structural identifiers, dates, damage estimates, and insurance settlement amounts. Properties that have been acquired or are currently in the closing process are included. To date, 46 properties have been elevated or are in the process of being elevated. Following Hurricane Sandy, the following damages were sustained to structures in the Township:

- Residential – 387 properties
- Commercial – 39 properties
- Industrial – 3 properties

After Hurricane Irene, 35 Substantial Damage estimates were made. However, there were no Substantial Damage estimates made following Hurricane Sandy.

In 2014, the Township issued a questionnaire inquiring about property owner’s interest in mitigation projects. There were 93 respondents to the survey, with six stating they were interested in a buyout. Other respondents were interested in softer subsidized mitigation methods. Since Hurricane Irene, private money, flood insurance, grant funding, and ICC have all been used to fund mitigation projects. Most homeowners utilized insurance payments to restore homes. During the permitting process, the building department advises the homeowner about various mitigation methods to reduce risk. Some residents’ took advantage of ICC funding and buyout grants.

Resources

The community FDPO identifies the Township Engineer as the local NFIP Floodplain Administrator, currently Joseph Golden, PE, CFM, for which floodplain administration is an auxiliary duty. The Township Construction Code Official and the Township Engineering Technician assist in all aspects of floodplain





management. The Township is in the process of hiring a full-time Planner to assist in floodplain management and mitigation.

Pequannock Township administers an aggressive permit approval process. The construction official evaluates commercial and residential applications for conformance to the Township's building and enhanced flood protection requirements. The Township Engineer evaluates all applications for conformance with the enhanced flood protection requirements as well as conformance with the NJDEP requirements for floodplain development. Inspections are performed for all milestone construction activities. Inspection records are maintained within the Building Departments filing system. Pequannock recently installed the FEMA Substantial Damage Estimator for use with any future floods. All applications for building additions or renovations are evaluated to determine if the project constitutes a substantial improvement. Public outreach programs are under development for multi-Township presentation.

Joseph Golden, PE, CFM feels he is adequately supported and trained to fulfill his responsibilities as the municipal floodplain administrator. The Township currently participates in the Community Rating System (CRS) program. No barriers have been identified which inhibit the implantation of the floodplain management program. Joseph Golden, PE, CFM is certified in floodplain management and attends regular continuing education programs for code enforcement.

Pequannock Townships maintains and is currently enhancing its public outreach opportunities. Programs are offered, under development, or being constantly improved based on methods learned by our multiple Certified Floodplain Managers. Residential programs include (pre, in and post) storm preparedness, structural improvements such as installing vents, and seminars on reducing risk. The importance of mitigation and insurance is always stressed. All information is available on-line to Township residents.

Compliance History

The community is currently in good standing in the NFIP and has no outstanding compliance issues. Township of Pequannock has completed Community Assistance Visits (CAV), with the most recent visit completed on July 7, 2009.

Regulatory

The communities Flood Damage Prevention Ordinance (FDPO) was last updated on June 10, 2014, and is found at Chapter 085 Flood Damage Prevention of the local code.

The floodplain management regulations and ordinances exceed the FEMA and State of New Jersey minimum requirements by enforcing a higher freeboard for residential and commercial development. The Township's Land Use Board Engineer is also a Certified Floodplain Manager. All applications are reviewed for compliance and often recommend enhancements in order to minimize impact and risk. All applications that add impervious surface requires infiltration for three inches of rain in a 24-hour period.

Community Rating System

The Township of Pequannock does participate in the Community Rating System (CRS) program and has a rating of 7.

Integration of Hazard Mitigation into Existing and Future Planning Mechanisms

For a community to succeed in reducing long-term risk, hazard mitigation must be integrated into the day-to-day local government operations. As part of this planning effort, each community was surveyed to obtain a better understanding of their community's progress in plan integration. A summary is provided below. In



addition, the community identified specific integration activities that will be incorporated into municipal procedures.

Planning

The Township has a Master Plan dated 1994. The Plan was reexamined in 2003 and again in 2009. The existing Master Plan considers steep slopes, lakes and wetlands, stream corridors, stormwater management, floodplain management, public outreach, open space preservation, and enhanced land use regulations. The Master Plan relates to the County HMP only in relation to the Passaic River dual inlet tunnel project intended to eliminate flooding.

The Township of Pequannock is a regulated Tier A community that maintains a MS4. The Township is authorized to discharge stormwater into state water bodies under NJPDES Permit #NJG0148342. The Township's approved Stormwater Management Plan incorporated into the Township Master Plan establishes how the Township implements each NJPDES permit requirement and provides a framework for permit compliance. The SPPP addresses stormwater quality issues related to new development, redevelopment and existing developed areas. The plan specifies the development and implementation of methods to meet specific permit requirements, referred to as Statewide Basic Requirements (SBRs). The SBRs are intended to create process-oriented rate and quality controls for stormwater that meet Clean Water Act (CWA) standards. There are seven SBRs included in the SPPP that the Township follows: Public Notice, Post-Construction Stormwater Management in New Development and Redevelopment, Local Public Education, Improper Disposal of Waste Ordinances, Solids and Floatable Controls, Maintenance Yard Operation, and Employee Training. Post-Construction Stormwater Management policies for New Development and Redevelopment require adherence to the state Stormwater Management Rules. Ordinance: Chapter 085 Flood Damage Prevention.

Additionally, the Township has an Open Space Plan that notes all open space, by category, and references and the Township Natural Resource Inventory (NRI). The NRI identifies critical natural resources such as floodplains, soils, forested areas, and waterbodies. The Township also has a Continuity of Operations/Continuity of Government (COOP/COG) plan and a Comprehensive Emergency Management Plan that are facilitated through the Township Office of Emergency Management and the Township OEM Coordinator. The Township does not have a post-disaster recovery plan or strategic recovery plan but does incorporate the Morris County HMP.

The Township of Pequannock participates in the County's Flood Mitigation Program (FMP) and has an approved Flood Acquisition Plan (FLAP). The Morris County FMP is the first dedicated, county-level flood acquisition program in the State of New Jersey. The FMP allows Morris County to assist municipalities in moving people out of harm's way, lowering municipal costs due to intense flooding episodes, and create natural flood capture and storage areas which protect the remaining homes and businesses. The FMP is funded by the Morris County Open Space tax and provides grant monies for municipalities to purchase flood-prone residential properties. In addition to MATCH funding available for projects with state or federal monies, Morris County has CORE funding in which the County takes the lead grant role, providing up to 75% of the cost of acquisition. To access this CORE funding, a municipality must have a FLAP. The FLAP is a dynamic, essential tool for understanding the unique flood hazards to residential homes within each community. Working closely with the municipality, Morris County creates this detailed, comprehensive analysis of the historic and current flood risks free of charge. A wide array of data is utilized from sources such as: FEMA, National Flood Insurance Program, USACE Flood Studies, USGS stream gage data, topography and soil analysis. All land acquired with MATCH and CORE funding within the FMP is permanently deed-restricted, preserved open space, available for public use as an active or passive recreation area. The acquired land is municipal-owned and managed in perpetuity.



Regulatory and Enforcement

The Township has a floodplain ordinance and floodplain development application that must be submitted with all ZBA/PB applications located in the floodplain. The NRI is used as needed and the Township Environmental Commission comments on all applications.

The Township Engineer provides the Board with a report that specifically addresses natural hazard risk management including recommendations for mitigation when appropriate. The Engineer provides interpretation and supplemental expertise throughout the application process including attending the evening Board meetings.

Township regulations require all applications with new impervious surface stormwater be infiltrated into the ground, whether the project qualifies as major or minor development. This requirement is enforced for all applications including expansions of existing single family dwellings. All utilities are required underground. Rain gardens are specified whenever space allows.

With regards to the Township's NFIP Flood Damage Prevention Ordinance, the Township exceeds the minimum federal and state NFIP regulatory requirements. Based on the Township's enhanced ordinance, the Township has achieved a CRS rating of 7. Freeboard is required for residential and commercial development. In June, 2014 the freeboard was raised to provide additional protection. The Township strictly enforces "0 net fill" requirements.

Operational and Administration

The Township has a planning consultant (Planner). The Planner reviews submitted subdivision/site plans which includes, as required, the Flood Plain Development Application. The Planner provides guidance and recommendations about development alternatives that better serve the purpose of the Zoning Ordinance and Master Plan as it relates to hazard mitigation.

The Township has a separate Zoning Board of Adjustment and Planning Board. Both Board's review applications and, when appropriate, considers the Flood Plain Development Application concurrently. The NRI is used, as needed and the Township Environmental Commission is provided time to evaluate and comment on all applications. The Board's consist of many residents that reside in flood prone areas. The members regularly attend the Township's flood advisory commission meetings and offer insight regarding the goals of the flood development portion of the Master Plan.

Additionally, the Township has an active environmental commission, flood advisory committee, and Green Team in addition to private groups like the Pequannock River Coalition. All of these groups focus on flood mitigation and helping the community.

The Stormwater Program Coordinator is the Township Engineer, Joseph Golden, PE, PP, CFM. The NFIP responsibilities are managed by Township Engineer, Joseph Golden, PE, PP, CME; the Construction Code Official, Robert Grant, CFM; and Field Engineer, James Hofstetter.

With regards to developing Benefit-Cost Analysis (BCA) for the Township's revised Floodplain Management Plan, the BCA is currently managed in-house by the Township Engineer. As the plan develops, an outside firm will be contracted to evaluate where buyouts, flood proofing, and/or wet proofing makes best financial sense. Substantial damage assessments, as well as evaluating substantial improvements, are performed by Township staff. Future determinations will be made utilizing the FEMA SDE program. The Township has prepared grants independently and jointly with adjacent communities. Once grants are identified, the Township evaluates whether the grant is best prepared with staff or by an outside expert.



The Township's staff attend training and/or continuing professional education classes that supports natural hazard risk reduction. The Township's CFM regularly attends continuing education classes that far exceed the minimum requirement for certification. In addition, Township staff would benefit from additional training and/or certification relating to natural hazard risk management. It would be a big help if public outreach training was offered that allows the attendees to individually present the outreach presentation to others. A library of PowerPoint presentations and handout material would greatly enhance the Township's ability to get the word out to others that cannot attend formal training sessions. The presentations should be designed as one to one and a half hour segments.

The Township does not have a specific vegetation management program. However, the Township strictly enforces the requirements of any soil erosion and sediment control permits. Rain gardens are required wherever they can work. The Township has conducted rain garden training classes including the construction of a 2,500 SF rain garden at the public library. Additional projects include river bank planting, detention and retention basin cleaning and native planting.

Township staff have job descriptions that specifically include identifying and/or implementing mitigation projects/actions or others efforts to reduce natural hazard risk. The Township has two CFMs and a person that specializes in improving the Township CRS rating through various proactive initiatives.

Fiscal

The municipal/operating budget includes several line items that are for mitigation projects. The budgets vary and are modified each year. Currently, the budget includes desnagging and desisting, clean communities, and miscellaneous items. The Township has a Capital Improvement Budget which includes budget for mitigation-related projects. Specific projects include back-up generators for emergency services, generators for sewage pumping stations, rain gardens, and public outreach.

The Township of Pequannock has received grant funding, including HMGP through FEMA in the amount of \$3,847,444; \$1,282,481 non-reimbursable; FEMA I, FEMA II, Morris County HMP. The Township also has other mechanisms to fiscally support hazard mitigation projects that include a SRL grant in the amount of \$4.95 million and a SRL local contribution of \$550,000. The Open Space Committee is purchasing land and the Flood Advisory Committee is planning and pursuing grants to elevate structures.

Education and Outreach

The Township maintains an aggressive flood information internet page containing significant pre and post flood instructions, links to alternate services. Other programs include mailings, books and handout material at the public library, pamphlets are distributed at the community summer event, distribution of new resident packets; engineering department conducts free site reviews to offer recommendations for mitigation, maintain and distribute pre & post storm information, insurance guidance.

Enhancements that would promote further public outreach and education in the Township with respect to natural hazard risk management, would be an availability of presentation material necessary to conduct short session, interactive outreach programs. Also, age appropriate materials for school presentations are important for children to understand environmental issues early on. An interactive model of a miniature town with a pre- and post-development overlay illustrating water quality and quantity would be easy to produce and very informational. While Township staff has the time and ability to present short seminars, they do not have the resources to generate the presentation materials.



9.32.6 Mitigation Strategy and Prioritization

This section discusses past mitigations actions and status, describes proposed hazard mitigation initiatives, and prioritization.

Past Mitigation Initiative Status

The following table indicates progress on the community’s mitigation strategy identified in the 2010 Plan. Actions that are carried forward as part of this plan update are included in the following subsection in its own table with prioritization. Previous actions that are now on-going programs and capabilities are indicated as such in the following table and may also be found under ‘Capability Assessment’ presented previously in this annex.



Table 9.32-11. Past Mitigation Initiative Status

2010 Mitigation Action	Lead	Status	Describe Status	Next Step	Describe Next Step
Pequannock 1: Chilton Memorial Hospital Nuclear Medicine Department; hazard identification marking.	Valley Medical Group	No Progress.	Independent agency has not acted.	Include in 2015 HMGP	The Township intends to step up its requests for identification marking
Pequannock 2: Pequannock Township High School (primary shelter); two back-up generators and rewiring building.	Township OEM	In Progress.	Generator has been purchased and is awaiting install	Installation	Installation scheduled in Spring 2015
Pequannock 3: The Glens Apartment complex; engineering for flood control measures (berms) downstream of Untermeyer Dam.	Township OEM/ private owner	In Progress.	An inundation study has been prepared for the area (by others) and the township is waiting for delivery of a copy.	Include in 2015 HMGP	Review inundation study
Pequannock 4: Elevate/acquire nine repetitive loss properties on River Road and Harrison Road Area.	Township OEM	In Progress.	3 properties left to demolish.	Discontinue	All subject properties should be demolished by the end of 2015
Pequannock 5: Elevate/acquire four severe repetitive loss properties located on N. Pequannock Avenue area along Pompton River.	Township OEM	Complete.	All properties located on N Pequannock have been demolished as of 2011	Discontinue	No further action
Pequannock 6: Elevate/acquire 75 repetitive loss properties located on Pequannock Avenue, Roosevelt Street, Village Road, and Voorhees Place.	Township OEM	In Progress.	18 properties on Pequannock Ave have been demolished since January of 2010 Funding by FEMA and Morris County	Include in 2015 HMGP	Contracting outside agency to prepare a database of 300 properties and a BCA of up to 30 properties
Pequannock 7: Arundel Road Sewage Pumping Station and Beverly Avenue Sewage Pumping Station; engineering study to determine appropriate mitigation action.	Township Engineer	No Progress.	Lack of Funding	Include in 2015 HMGP	Seek funding
Pequannock 8: Recognize high hazard areas in zoning code.	Planning and Zoning, Township Council	Complete	Zoning modifications incorporated into Flood Damage Prevention Ordinances; Rev. June 2014	Include in 2015 HMGP	None
Pequannock 9: Update Township Floodplain Ordinance to reflect zoning change notes in action eight.	Planning and Zoning, Township Council	Complete	Floodplain ordinance completely reviewed and updated.	Discontinue	None
Pequannock 10: Identify measures necessary to re-enter NFIP.	Township OEM	Complete.	Membership in good standing CS Classification 7	Discontinue	None



Table 9.32-11. Past Mitigation Initiative Status

2010 Mitigation Action	Lead	Status	Describe Status	Next Step	Describe Next Step
Pequannock 11: Train a Township Floodplain Manager.	Township OEM	Complete.	Both Joseph Golden and Robert Grant are certified Floodplain Managers	Discontinue	None
Pequannock 12: Develop all-hazards public education and outreach program for hazard mitigation and preparedness.	County and Municipal OEM	In Progress.	Initial steps taken to develop comprehensive outreach programs. Developing an outreach manual.	Include in 2015 HMGP	Prepare outreach manual



Proposed Hazard Mitigation Initiatives for the Plan Update

The Township of Pequannock participated in a mitigation action workshop in January 2015 and was provided the following FEMA publications to use as a resource as part of their comprehensive review of all possible activities and mitigation measures to address their hazards: FEMA 551 ‘Selecting Appropriate Mitigation Measures for Floodprone Structures’ (March 2007) and FEMA ‘Mitigation Ideas – A Resource for Reducing Risk to Natural Hazards’ (January 2013).

Table 9.32-12 summarizes the comprehensive-range of specific mitigation initiatives the Township of Pequannock would like to pursue in the future to reduce the effects of hazards. Some of these initiatives may be previous actions carried forward for this plan update. These initiatives are dependent upon available funding (grants and local match availability) and may be modified or omitted at any time based on the occurrence of new hazard events and changes in municipal priorities. Both the four FEMA mitigation action categories and the six CRS mitigation action categories are listed in the table below to further demonstrate the wide-range of activities and mitigation measures selected.

As discussed in Section 6, 14 evaluation/prioritization criteria are used to complete the prioritization of mitigation initiatives. For each new mitigation action, a numeric rank is assigned (-1, 0, or 1) for each of the 14 evaluation criteria to assist with prioritizing your actions as ‘High’, ‘Medium’, or ‘Low.’ The table below summarizes the evaluation of each mitigation initiative, listed by Action Number.

Table 9.32-13 provides a summary of the prioritization of all proposed mitigation initiatives for the Plan update.



Table 9.32-12. Proposed Hazard Mitigation Initiatives

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category	CRS Category
TPQ-1 (former Pequannock 1)	Chilton Memorial Hospital Nuclear Medicine Department; hazard identification marking.	Existing	All	G-1	Valley Medical Group	High	Low	Private	Short Term	Medium	LPR	PR
TPQ-2 (former Pequannock 3)	The Glens Apartment complex; engineering study for flood control measures (berms) downstream of Untermeyer Dam.	Existing	Flood	G-3	Township OEM/Private Owner	High	High	HMA Grants	Long Term DOF	Medium	LPR	PR
TPQ-3 (former Pequannock 6)	Elevate/acquire flood-vulnerable properties, including severe repetitive and repetitive loss properties located in the Township.	Existing	Flood	G-3	Township OEM	High	High	HMA Grants, FMA	Short Term DOF	High	SIP	SP
TPQ-4 (former Pequannock 7)	Arundel Road Sewage Pumping Station and Beverly Avenue Sewage Pumping Station; engineering study to determine appropriate mitigation action	Existing	Flood	G-3	Township Engineer Planning and Zoning	High	Medium	HMA Grants, Municipal Budget	Short Term DOF	High	LPR	PR
TPQ-5 (former Pequannock 8)	Recognize high hazard areas in zoning code.	N/A	Flood	G-2	Township Council	Medium	Low	Municipal Budget	Long Term DOF	Medium	LPR	PR
TPQ-6 (former Pequannock 12)	Develop/Enhance all-hazards public education and outreach program for hazard mitigation and preparedness.	N/A	All	G-2	County and Municipal OEM	Medium	Low	Municipal Budget	Short Term DOF	High	EAP	PE
TPQ-7	Forest restoration on buyout/demolished properties along river	N/A	Loss of Natural Systems	G-4	Township Engineer and Planning	Medium	Medium	Clean Water Grants, NJDEP	Short Term DOF	High	NRP	NR
TPQ-8	Banding High Water Marks	New and Existing	Flood	G-1	Township Engineer and Planner	Medium	Low	HMA Grants, Township Budget	Short Term DOF	High	EAP	PR
TPQ-9	Install automated sluice gate allowing the lake to be lowered in advance of major storm events	New and Existing	Flood	G-4	Township Engineer	High	High	HMA Grants	Short Term DOF	Medium	SIP	SP
TPQ-10	Install conveyance system from the Village to Woodland	New and Existing	Flood	G-4	Township Engineer	High	High	HMA Grants	Short Term DOF	High	SIP	SP



Table 9.32-12. Proposed Hazard Mitigation Initiatives

Initiative	Mitigation Initiative	Applies to New and/or Existing Structures*	Hazard(s) Mitigated	Goals and Objectives Met	Lead and Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category	CRS Category
	Lake											
TPQ-11	Install cofferdams to prevent flooding	New and Existing	Flood	G-4	Township Engineer	High	High	HMA Grants	Long Term DOF	Medium	SIP	SP
TPQ-12	Update ordinances to require the infiltration of 3inches of stormwater	New	Flood	G-3, G-4	Township Engineer	Medium	Low	Municipal Budget	Short Term	Medium	LPR	PR
TPQ-13	Publish a comprehensive document addressing pre, post and in-storm activities	N/A	Flood, Severe Storm	G-1	Township Engineer	Medium	Medium	HMA Grants, Municipal Budget	Short Term DOF	Medium	LPR	PR
TPQ-14	Purchase, standardize, train staff with current technology to expedite NFIP claims	N/A	Flood	G-2	Construction/ Planning Dept.	Medium	Low	FEMA NFIP Program Assistance, Municipal Budget	Short Term DOF	High	LPR	PR
TPQ-15	Create a needs assessment and priority property list for home elevation above BFE	Existing	Flood	G-3	Construction/ Planning Dept.	High	Medium	HMG Grants, Municipal Budget	Short Term DOF	High	LPR	PR

Notes:

Not all acronyms and abbreviations defined below are included in the table.

*Does this mitigation initiative reduce the effects of hazards on new and/or existing buildings and/or infrastructure? Not applicable (N/A) is inserted if this does not apply.

Acronyms and Abbreviations:

- CAV Community Assistance Visit
- CRS Community Rating System
- DPW Department of Public Works
- FEMA Federal Emergency Management Agency
- FPA Floodplain Administrator
- HMA Hazard Mitigation Assistance
- N/A Not applicable
- NFIP National Flood Insurance Program
- NJDEP New Jersey Department of Environmental Protection
- NJOEM New Jersey Office of Emergency Management
- OEM Office of Emergency Management

Potential FEMA HMA Funding Sources:

- FMA Flood Mitigation Assistance Grant Program
- HMGP Hazard Mitigation Grant Program
- PDM Pre-Disaster Mitigation Grant Program
- RFC Repetitive Flood Claims Grant Program (discontinued 2015)
- SRL Severe Repetitive Loss Grant Program (discontinued 2015)

Timeline:

- Short 1 to 5 years
- Long Term 5 years or greater
- OG On-going program
- DOF Depending on funding

Costs:

Benefits:





Costs:

Where actual project costs have been reasonably estimated:

- Low < \$10,000
- Medium \$10,000 to \$100,000
- High > \$100,000

Where actual project costs cannot reasonably be established at this time:

- Low Possible to fund under existing budget. Project is part of, or can be part of an existing on-going program.
- Medium Could budget for under existing work plan, but would require a reapportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.
- High Would require an increase in revenue via an alternative source (i.e., bonds, grants, fee increases) to implement. Existing funding levels are not adequate to cover the costs of the proposed project.

Benefits:

Where possible, an estimate of project benefits (per FEMA's benefit calculation methodology) has been evaluated against the project costs, and is presented as:

- Low= < \$10,000
- Medium \$10,000 to \$100,000
- High > \$100,000

Where numerical project benefits cannot reasonably be established at this time:

- Low Long-term benefits of the project are difficult to quantify in the short term.
- Medium Project will have a long-term impact on the reduction of risk exposure to life and property, or project will provide an immediate reduction in the risk exposure to property.
- High Project will have an immediate impact on the reduction of risk exposure to life and property.

Mitigation Category:

- Local Plans and Regulations (LPR) – These actions include government authorities, policies or codes that influence the way land and buildings are being developed and built.
- Structure and Infrastructure Project (SIP)- These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.
- Natural Systems Protection (NSP) – These are actions that minimize damage and losses, and also preserve or restore the functions of natural systems.
- Education and Awareness Programs (EAP) – These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities

CRS Category:

- Preventative Measures (PR) - Government, administrative or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, floodplain local laws, capital improvement programs, open space preservation, and storm water management regulations.
- Property Protection (PP) - These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a hazard or (2) removal of the structures from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.
- Public Information (PI) - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. Such actions include outreach projects, real estate disclosure, hazard information centers, and educational programs for school-age children and adults.
- Natural Resource Protection (NR) - Actions that minimize hazard loss and also preserve or restore the functions of natural systems. These actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.
- Structural Flood Control Projects (SP) - Actions that involve the construction of structures to reduce the impact of a hazard. Such structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.
- Emergency Services (ES) - Actions that protect people and property during and immediately following a disaster or hazard event. Services include warning systems, emergency response services, and the protection of essential facilities



Table 9.32-13. Summary of Prioritization of Actions

Mitigation Action/Project Number	Mitigation Action/Initiative	Life Safety	Property Protection	Cost-Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
TPQ-1 (former Pequannock 1)	Chilton Memorial Hospital Nuclear Medicine Department; hazard identification marking.	1	0	1	1	1	0	0	1	0	1	0	1	0	0	7	Medium
TPQ-2 (former Pequannock 3)	The Glens Apartment complex; engineering study for flood control measures (berms) downstream of Untermeyer Dam.	1	1	1	1	1	0	0	0	0	1	0	0	0	1	7	Medium
TPQ-3 (former Pequannock 6)	Elevate/acquire 75 repetitive loss properties located on Pequannock Avenue, Roosevelt Street, Village Road, and Voorhees Place.	0	1	1	1	1	1	0	1	1	1	0	1	1	1	11	High
TPQ-4 (former Pequannock 7)	Arundel Road Sewage Pumping Station and Beverly Avenue Sewage Pumping Station; engineering study to determine appropriate mitigation action	0	1	1	0	1	1	0	1	1	1	0	1	1	0	9	High
TPQ-5 (former Pequannock 8)	Recognize high hazard areas in zoning code.	1	1	1	0	0	0	0	1	1	1	0	0	1	1	8	Medium
TPQ-6 (former Pequannock 12)	Develop all-hazards public education and outreach program for hazard mitigation and preparedness.	1	1	1	1	1	1	0	0	1	1	1	0	1	1	11	High
TPQ-7	Forest restoration on buyout/demolished properties along river	0	1	1	1	1	0	-1	1	1	1	0	1	1	1	9	High
TPQ-8	Banding High Water Marks	0	1	1	1	0	0	1	0	1	1	0	1	1	1	9	High
TPQ-9	Install automated sluice	1	1	0	1	1	0	-1	0	0	1	0	1	1	1	7	Medium





Table 9.32-13. Summary of Prioritization of Actions

Mitigation Action/Project Number	Mitigation Action/Initiative	Life Safety	Property Protection	Cost-Effectiveness	Technical	Political	Legal	Fiscal	Environmental	Social	Administrative	Multi-Hazard	Timeline	Agency Champion	Other Community Objectives	Total	High / Medium / Low
	gate allowing the lake to be lowered in advance of major storm events																
TPQ-10	Install conveyance system from the Village to Woodland Lake	1	1	1	1	1	0	-1	0	0	1	0	1	1	1	8	High
TPQ-11	Install cofferdams to prevent flooding	1	1	1	1	0	0	-1	0	1	1	0	1	1	1	8	Medium
TPQ-12	Update ordinances to require the infiltration of 3inches of stormwater	1	1	1	1	0	0	1	1	0	1	0	1	1	1	10	Medium
TPQ-13	Publish a comprehensive document addressing pre, post and in-storm activities	1	1	1	1	1	0	1	0	1	1	1	1	1	1	12	Medium
TPQ-14	Purchase, standardize, train staff with current technology to expedite NFIP claims	1	1	1	1	1	0	1	0	1	1	1	1	1	1	12	High
TPQ-15	Create a needs assessment and priority property list for home elevation above BFE	1	1	0	1	1	0	-1	0	1	1	0	1	1	0	7	High

Note: Refer to Section 6 which contains the guidance on conducting the prioritization of mitigation actions.



9.32.7 Future Needs To Better Understand Risk/Vulnerability

None at this time.

9.32.8 Hazard Area Extent and Location

Hazard area extent and location maps have been generated for the Township of Pequannock that illustrate the probable areas impacted within the municipality. These maps are based on the best available data at the time of the preparation of this plan, and are considered to be adequate for planning purposes. Maps have only been generated for those hazards that can be clearly identified using mapping techniques and technologies, and for which the Township of Pequannock has significant exposure. These maps are illustrated in the hazard profiles within Section 5.4, Volume I of this Plan.

9.32.9 Additional Comments

None at this time.



Figure 9.32-1. Township of Pequannock Hazard Area Extent and Location Map 1

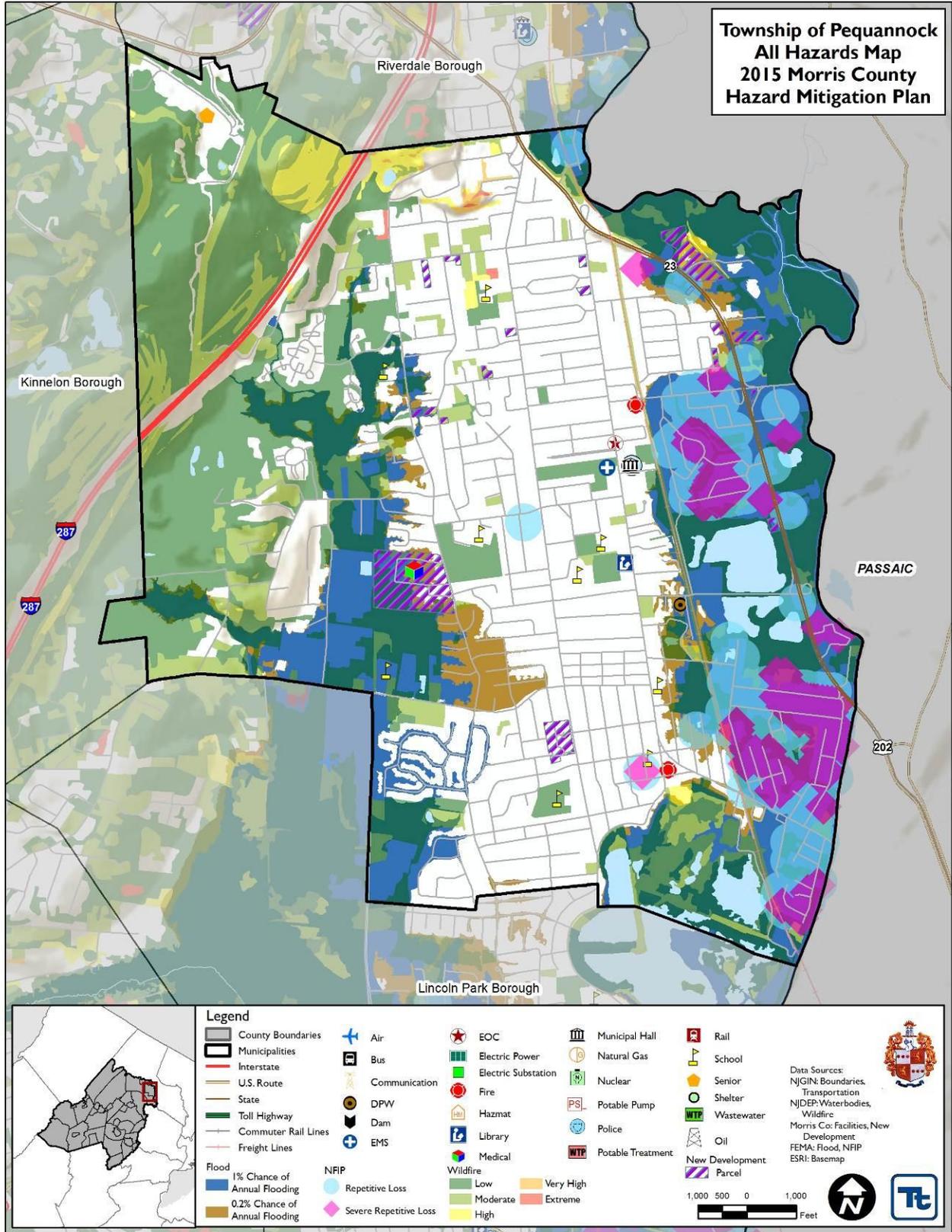
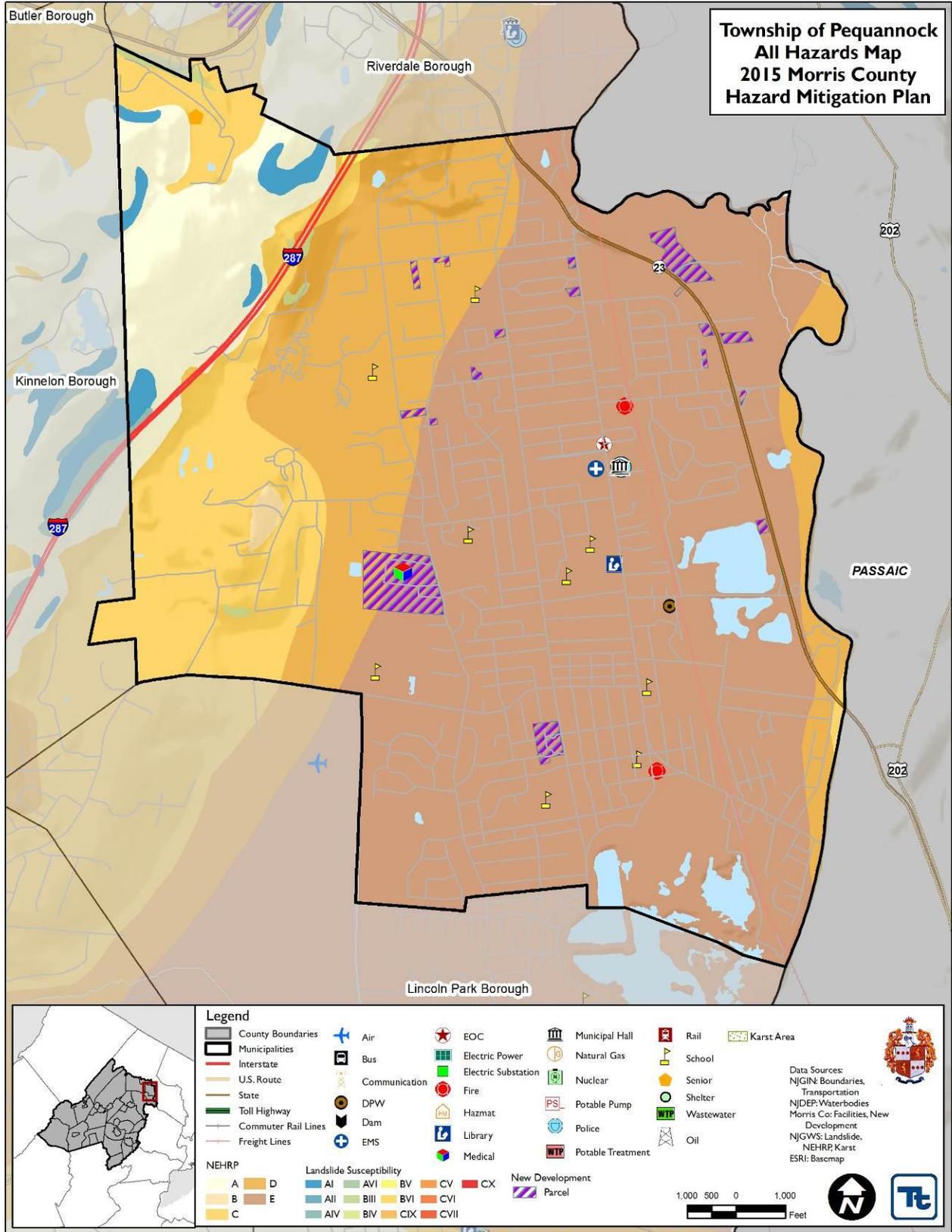




Figure 9.32-2. Township of Pequannock Hazard Area Extent and Location Map 2





Action Number: TPQ-3
 Mitigation Action/Initiative: Elevation/acquisition of properties

Assessing the Risk	
Hazard(s) addressed:	Flood
Specific problem being mitigated:	Flooding of properties located on Pequannock Avenue, Roosevelt Street, Village Road, and Voorhees Place and surrounding areas.
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	1. Elevation/acquisition of properties
	2. Do nothing – current problem continues
	3. No other feasible options were identified for this action
Action/Project Intended for Implementation	
Description of Selected Action/Project	Elevate/acquire 75 repetitive loss properties located on Pequannock Avenue, Roosevelt Street, Village Road, and Voorhees Place areas.
Action/Project Category	SIP
Goals/Objectives Met	3
Applies to existing and/or new development; or not applicable	Existing
Benefits (losses avoided)	High
Estimated Cost	High
Priority*	High
Plan for Implementation	
Responsible/Lead Agency/Department	Township OEM
Local Planning Mechanism	Emergency Management
Potential Funding Sources	HMA Grants, FMA
Timeline for Completion	Short Term / DOF
Reporting on Progress <i>(Do not complete – this will be used for the 2020 Update)</i>	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:

* Refer to results of Prioritization (page 2)



Action Number: TPQ-3

Mitigation Action/Initiative: Elevation/acquisition of properties

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	0	
Property Protection	1	
Cost-Effectiveness	1	
Technical	1	
Political	1	
Legal	1	
Fiscal	0	
Environmental	1	
Social	1	
Administrative	1	
Multi-Hazard	0	
Timeline	1	
Local Champion	1	
Other Community Objectives	1	
Total	11	
Priority (High/Med/Low)	High	



Action Number: TPQ-7

Mitigation Action/Initiative: Forest restoration on buyout/demolished properties

Assessing the Risk	
Hazard(s) addressed:	Flood
Specific problem being mitigated:	Loss of natural systems, riverbank stabilization, on buyout parcels where structures were demolished.
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	1. Plant riparian friendly trees
	2. Plant grasses: Too susceptible to flood damage and erosion
	3. No action: Bad habitat, susceptible to future damage
Action/Project Intended for Implementation	
Description of Selected Action/Project	Plant approximately 10 acres of riparian friendly trees
Action/Project Category	NRP
Goals/Objectives Met	G-4: Prevention, maintain stream banks, stormwater and water quality functionality, riparian corridor and floodplain
Applies to existing and/or new development; or not applicable	N/A
Benefits (losses avoided)	High
Estimated Cost	High
Priority*	High
Plan for Implementation	
Responsible/Lead Agency/Department	Township Engineer
Local Planning Mechanism	Open Space Plan
Potential Funding Sources	Clean Water Grants, Flood Protection Grants
Timeline for Completion	Short Term / DOF
Reporting on Progress <i>(Do not complete - this will be used for the 2020 Update)</i>	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:

* Refer to results of Prioritization (page 2)



Action Number: TPQ-7

Mitigation Action/Initiative: Forest restoration on buyout/demolished properties

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	0	
Property Protection	1	Improves channel effectiveness
Cost-Effectiveness	1	Potential for multiple funding options
Technical	1	No design or permitting required, long term benefits
Political	1	Satisfies open space, tree commission, river walk supporters
Legal	0	
Fiscal	-1	Funding is required
Environmental	1	Primary beneficiary
Social	1	Adds to the aesthetics of lower income neighborhoods
Administrative	1	Several volunteer groups available
Multi-Hazard	0	
Timeline	1	
Local Champion	1	
Other Community Objectives	1	Satisfies open space, tree commission, river walk supporters, Becomes an outreach project with public involvement and positive media support
Total	9	
Priority (High/Med/Low)	High	



Action Number: TPQ-8
Mitigation Action/Initiative: Banding/Identification of High Water Marks

Assessing the Risk	
Hazard(s) addressed:	Flood
Specific problem being mitigated:	Flood Risk (increase flood risk awareness)
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	1. Banding/Identification/Posting of High Water Marks
	2. Provide signage
	3. No Action: Relaxed awareness leads to non-preparedness
Action/Project Intended for Implementation	
Description of Selected Action/Project	Banding High Water Marks
Action/Project Category	EAP
Goals/Objectives Met	G-1 Improve public awareness, increase communication, “Know Your Line: Be Flood Aware”
Applies to existing and/or new development; or not applicable	Existing and Future
Benefits (losses avoided)	High
Estimated Cost	High
Priority*	High
Plan for Implementation	
Responsible/Lead Agency/Department	Township Engineer
Local Planning Mechanism	Flood Control Advisory Committee
Potential Funding Sources	Local
Timeline for Completion	Short Term / DOF
Reporting on Progress <i>(Do not complete – this will be used for the 2020 Update)</i>	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:

* Refer to results of Prioritization (page 2)



Action Number: TPQ-8

Mitigation Action/Initiative: Banding/Identification of High Water Marks

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	0	
Property Protection	1	Provides valuable information for property protection
Cost-Effectiveness	1	Relatively low cost
Technical	1	No design or permitting required, long term benefits
Political	0	Many will be happy, but others may not want potential buyers to see flood Level
Legal	0	
Fiscal	1	Relatively low cost
Environmental	0	
Social	1	Spans all socioeconomic classifications
Administrative	1	Several volunteer groups available
Multi-Hazard	0	
Timeline	1	
Local Champion	1	
Other Community Objectives	1	Specifically identified in the CRS manual for credit
Total	9	
Priority (High/Med/Low)	High	



Action Number: TPQ-9
 Mitigation Action/Initiative: Woodland Lake Sluice Gate

Assessing the Risk	
Hazard(s) addressed:	Flood
Specific problem being mitigated:	Flooding of area including roadway (Route 23)
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	1. Install automated sluice gate 2. Remove dam, empty lake: unreasonable, environmental ramifications 3. No Action: provides for a lost opportunity
Action/Project Intended for Implementation	
Description of Selected Action/Project	Install an automated sluice gate allowing that lake to be lowered in advance of major storm events. Allows additional flood storage for waters overtopping Route 23. Route 23 acts as a flood barrier to a certain elevation
Action/Project Category	SIP
Goals/Objectives Met	G-3
Applies to existing and/or new development; or not applicable	New and Existing
Benefits (losses avoided)	High
Estimated Cost	High
Priority*	High
Plan for Implementation	
Responsible/Lead Agency/Department	Township Engineer
Local Planning Mechanism	Flood Control Advisory Committee
Potential Funding Sources	HMA Grants, FMA, HMGP
Timeline for Completion	Short Term / DOF
Reporting on Progress (Do not complete - this will be used for the 2020 Update)	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:

* Refer to results of Prioritization (page 2)



Action Number: TPQ-9

Mitigation Action/Initiative: Woodland Lake Sluice Gate

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Protects residential property and roads
Property Protection	1	Lowers storm event high water elevation
Cost-Effectiveness	0	Tangible savings unknown
Technical	1	Provides long term benefits
Political	1	Is currently supported
Legal	0	
Fiscal	-1	Funding required
Environmental	0	
Social	0	
Administrative	1	Managed by Department of Public Works
Multi-Hazard	0	
Timeline	1	Could be completed within 5 years
Local Champion	1	Governing Body
Other Community Objectives	1	
Total	7	
Priority (High/Med/Low)	Medium	



Action Number: TPQ-10
 Mitigation Action/Initiative: Install Conveyance System

Assessing the Risk	
Hazard(s) addressed:	Flood
Specific problem being mitigated:	Flooding of properties in Village area.
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	1. Install weir or pipe network with backflow preventer: Allows flow of flood waters away from occupied areas 2. Install pumping systems to evacuate water back to flooded source 3. No Action: Provides no flood relief.
Action/Project Intended for Implementation	
Description of Selected Action/Project	Install conveyance system from the Village to Woodland Lake creating a flow destination for rising flood waters.
Action/Project Category	SIP
Goals/Objectives Met	G-4
Applies to existing and/or new development; or not applicable	Existing
Benefits (losses avoided)	High
Estimated Cost	High
Priority*	High
Plan for Implementation	
Responsible/Lead Agency/Department	Township Engineer
Local Planning Mechanism	Flood Control Advisory Committee
Potential Funding Sources	HMA Grants, FMA
Timeline for Completion	Short Term / DOF
Reporting on Progress <i>(Do not complete - this will be used for the 2020 Update)</i>	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:

* Refer to results of Prioritization (page 2)



Action Number: TPQ-10

Mitigation Action/Initiative: Install Conveyance System

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Protects residential property and roads
Property Protection	1	Lowers storm event high water elevation
Cost-Effectiveness	1	Reduces repetitive losses
Technical	1	Provides long term benefits
Political	1	Project currently supported
Legal	0	
Fiscal	-1	Funding required
Environmental	0	
Social	0	
Administrative	1	Managed by Department of Public Works
Multi-Hazard	0	
Timeline	1	Could be completed within 5 years
Local Champion	1	Governing Body
Other Community Objectives	1	
Total	8	
Priority (High/Med/Low)	High	



Action Number: TPQ-11
 Mitigation Action/Initiative: Portable Cofferdam Protection

Assessing the Risk	
Hazard(s) addressed:	Flood
Specific problem being mitigated:	Flood waters entering certain areas of Township.
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	1. Purchase portable cofferdams for rapid deployment
	2. Install levees or eco-walls: Cost prohibitive
	3. No Action: Provides no flood relief
Action/Project Intended for Implementation	
Description of Selected Action/Project	Purchase and plan for a series of well placed portable cofferdams which can protect neighborhoods from flooding up to 5' above that neighborhoods BFE
Action/Project Category	SIP
Goals/Objectives Met	G-4
Applies to existing and/or new development; or not applicable	Existing
Benefits (losses avoided)	High
Estimated Cost	High
Priority*	Medium
Plan for Implementation	
Responsible/Lead Agency/Department	Township Engineer
Local Planning Mechanism	Flood Control Advisory Committee
Potential Funding Sources	HMA Grants, FMA
Timeline for Completion	Long Term / DOF
Reporting on Progress (Do not complete - this will be used for the 2020 Update)	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:

* Refer to results of Prioritization (page 2)



Action Number: TPQ-11

Mitigation Action/Initiative: Portable Cofferdam Protection

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Protects residential property and roads
Property Protection	1	Eliminates most repetitive losses for 300 dwellings
Cost-Effectiveness	1	Eliminates losses at a cost of 20,000 per dwelling
Technical	1	Provides long term benefits, portable for use in other neighborhoods
Political	0	
Legal	0	
Fiscal	-1	Funding required
Environmental	0	
Social	1	Can be located based on projected flood elevation. Maximum is 5'
Administrative	1	Managed by Department of Public Works
Multi-Hazard	0	
Timeline	1	Could be completed within 5 years
Local Champion	1	Governing Body
Other Community Objectives	1	
Total	8	
Priority (High/Med/Low)	Medium	



Action Number: TPQ-12
 Mitigation Action/Initiative: Infiltration Ordinance for Minor Development

Assessing the Risk	
Hazard(s) addressed:	Flood
Specific problem being mitigated:	Update ordinances to require the infiltration of 3" of stormwater for all increases in impervious area.
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	1. No Action: Provides no flood relief 2. Require <u>all</u> impervious areas be infiltrated: Overly costly 3. Infiltrate 3" of stormwater, covers the majority of storms
Action/Project Intended for Implementation	
Description of Selected Action/Project	All applications that increase impervious area, including minor development and single family dwellings, must infiltrate 3" of stormwater
Action/Project Category	Local Regulation (LPR)
Goals/Objectives Met	G-4 Opportunity to decrease stormwater flow to streams
Applies to existing, future, or not applicable	Applied to future construction
Benefits (losses avoided)	Provides site specific stormwater storage, lowers flow to streams
Estimated Cost	Low - \$3,000 administrative cost
Priority*	Medium
Plan for Implementation	
Responsible Organization	Township Engineer
Local Planning Mechanism	Planning Board
Potential Funding Sources	Local
Timeline for Completion	Short Term
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:

* Refer to results of Prioritization (page 2)



Action Number:

TPQ-12

Mitigation Action/Initiative:

Infiltration Ordinance for Minor Development

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Protects residential property and roads
Property Protection	1	Has cumulative benefits
Cost-Effectiveness	1	Low cost
Technical	1	Provides long term cumulative benefits
Political	0	
Legal	0	
Fiscal	1	Low cost
Environmental	1	Recharges the aquifer
Social	0	
Administrative	1	Managed by planning Department
Multi-Hazard	0	
Timeline	1	Could be completed within 5 years
Agency Champion	1	Township Engineer
Other Community Objectives	1	Supports resilient communities, clean water, aquifer recharge
Total	10	
Priority (High/Med/Low)	Medium	



Action Number: TPQ-13
Mitigation Action/Initiative: Publish a Comprehensive Doc. – Pre, Post, and in Storm Activities

Assessing the Risk	
Hazard(s) addressed:	Flood
Specific problem being mitigated:	Provides comprehensive information to property owners
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	4. Use of internet only: Limits audience
	5. Hold outreach meetings: Limits attendance, time consuming
	6. Provide comprehensive document, paper and internet
Action/Project Intended for Implementation	
Description of Selected Action/Project	Publish a comprehensive document addressing pre, post and in-storm actions. Also identify mitigation opportunities.
Action/Project Category	Education and Awareness Program (EAP)
Goals/Objectives Met	G-1 Improve education and outreach; Identifies specific pre and post event actions; Addresses multiple hazards
Applies to existing, future, or not applicable	Existing and new
Benefits (losses avoided)	Provides easily accessible information, comprehensive, necessary contact s and support services
Estimated Cost	Medium - \$15,000 to \$20,000
Priority*	Medium
Plan for Implementation	
Responsible Organization	Township Planner
Local Planning Mechanism	Governing Body
Potential Funding Sources	Grant funding with local cost share
Timeline for Completion	Short Term DOF
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:

* Refer to results of Prioritization (page 2)



Action Number: TPQ-13
Mitigation Action/Initiative: Publish a Comprehensive Doc. – Pre, Post, and in Storm Activities

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Provides critical information
Property Protection	1	Allows proper preparedness and mitigation
Cost-Effectiveness	1	Relatively low cost per dwelling
Technical	1	Provides long term benefits
Political	1	Has current support
Legal	0	
Fiscal	1	Potential local funding, sponsors
Environmental	0	
Social	1	Assists all socioeconomic classifications
Administrative	1	Managed by planning Department
Multi-Hazard	1	Addresses multiple types of hazards
Timeline	1	Could be completed within 5 years
Agency Champion	1	Township Planner
Other Community Objectives	1	Public outreach, community wide, CRS credit
Total	12	
Priority (High/Med/Low)	Medium	



Action Number: TPQ-14
 Mitigation Action/Initiative: Provide Training to Expedite NFIP Claims

Assessing the Risk	
Hazard(s) addressed:	Severe Storms, Flood
Specific problem being mitigated:	Expedite Substantial Damage Estimating
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	1. Substantial Damage Estimator training for additional staff 2. Purchase field data collectors to gather and process results 3. Develop a damage/manpower evaluation strategy
Action/Project Intended for Implementation	
Description of Selected Action/Project	All of the above actions are required to assist over 800 homeowners after a major event. Action: Purchase, standardize, train staff with current technology necessary to assist the public in expediting the NFIP claims process.
Action/Project Category	Education and Awareness Program (EAP)
Goals/Objectives Met	G-2 Improve data collection, use, and sharing to reduce the impact of hazards,
Applies to existing, future, or not applicable	Existing
Benefits (losses avoided)	Assists in claim processing to allow residents to return to their homes in the shortest possible time frame.
Estimated Cost	Low - \$7,500 to \$10,000
Priority*	High
Plan for Implementation	
Responsible Organization	Construction/Planning Department
Local Planning Mechanism	Emergency Operating Plan
Potential Funding Sources	Grant funding with local cost share
Timeline for Completion	Short Term DOF
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:

* Refer to results of Prioritization (page 2)



Action Number:

TPQ-14

Mitigation Action/Initiative:

Provide Training to Expedite NFIP Claims

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Provides critical post event support
Property Protection	1	Allows safe return to dwellings
Cost-Effectiveness	1	Relatively low cost per dwelling
Technical	1	Provides long term efficiencies
Political	1	Has current support
Legal	0	
Fiscal	1	Potential local funding
Environmental	0	
Social	1	Assists all socioeconomic classifications
Administrative	1	Managed by Existing Staff
Multi-Hazard	1	Addresses multiple types of hazards
Timeline	1	Could be completed within 5 years
Agency Champion	1	Township Construction Official
Other Community Objectives	1	Public outreach, community wide, CRS credit
Total	12	
Priority (High/Med/Low)	High	



Action Number: TPQ-15
 Mitigation Action/Initiative: Property Elevation Action Plan

Assessing the Risk	
Hazard(s) addressed:	Flood
Specific problem being mitigated:	Create needs assessment and priority property list to elevate SRL & RL properties 3' above BFE, financial analysis
Evaluation of Potential Actions/Projects	
Actions/Projects Considered (name of project and reason for not selecting):	<ol style="list-style-type: none"> 1. No Action: Most property owners cannot elevate 2. Identify all properties for elevation; Not efficient use of funding 3. Develop a comprehensive plan for best mitigation strategies
Action/Project Intended for Implementation	
Description of Selected Action/Project	Develop a matrix identifying the properties where elevating the dwelling provides the maximum return on the investment of public funding.
Action/Project Category	Education and Awareness Program (EAP)
Goals/Objectives Met	G-3 Improve the Township's opportunities to implement elevating the most vulnerable SRL & RL properties
Applies to existing, future, or not applicable	Applied to future flood events
Benefits (losses avoided)	Removes the risk associated with current SRL & RL properties from flood damage. Significantly lowers NPIP claims.
Estimated Cost	Medium - \$75,000 to \$100,000
Priority*	High
Plan for Implementation	
Responsible Organization	Construction/Planning Department
Local Planning Mechanism	Governing Body
Potential Funding Sources	Grant funding with local cost share
Timeline for Completion	Short Term DOF
Reporting on Progress	
Date of Status Report/ Report of Progress	Date: Progress on Action/Project:

* Refer to results of Prioritization (page 2)



Action Number: TPQ-15

Mitigation Action/Initiative: Property Elevation Action Plan

Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate
Life Safety	1	Reduces the risk of flood damage within living space.
Property Protection	1	Allows safe return to dwellings with minimal damage
Cost-Effectiveness	0	Cost is offset by future insurance savings
Technical	1	Provides long term efficiencies
Political	1	Has current support
Legal	0	
Fiscal	-1	Grant Funding with local cost share
Environmental	0	
Social	1	Assists all socioeconomic classifications
Administrative	1	Managed by Existing Staff
Multi-Hazard	0	
Timeline	1	Could be completed within 5 years
Agency Champion	1	Township Manager
Other Community Objectives	0	
Total	7	
Priority (High/Med/Low)	High	