

9.56 UPPER MOUNT BETHEL TOWNSHIP

This section presents the jurisdictional annex for Upper Mount Bethel Township.

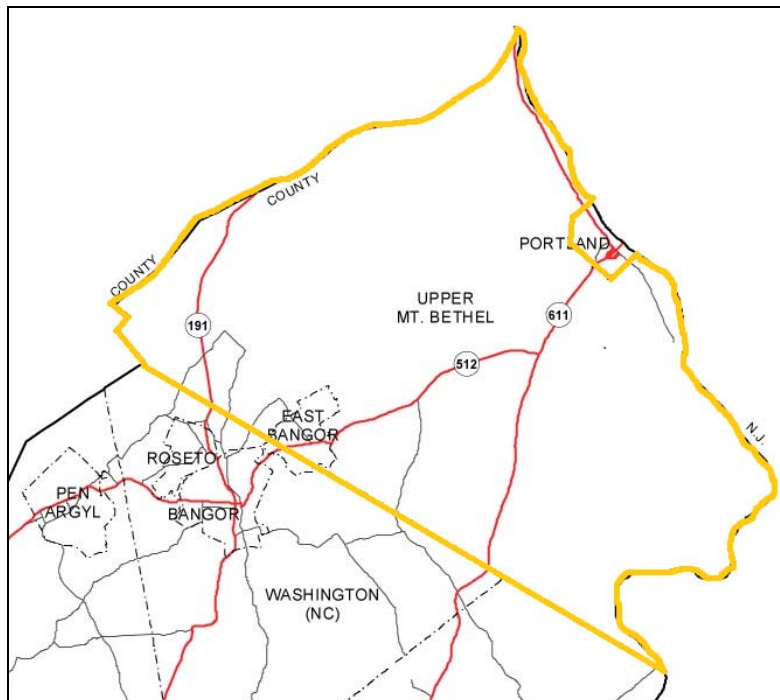
A. HAZARD MITIGATION PLAN POINT OF CONTACT

| Primary Point of Contact | | Alternate Point of Contact | |
|--------------------------|--|----------------------------|--|
| <u>Name</u> | Maureen Sterner | <u>Name</u> | Lindsey Manzi |
| <u>Title/Department</u> | Township Manager | <u>Title/</u> | Emergency Mgmt Coordinator/Road |
| <u>Address</u> | 387 Ye Olde Highway, PO Box 520, Mt. Bethel, PA 18343-5220 | <u>Department</u> | Department Asst. Foreman |
| <u>Telephone</u> | 570-897-6127 ext.26 | <u>Address</u> | 387 Ye Olde Highway, PO Box 520, Mt. Bethel, PA 18343-5220 |
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B. MUNICIPAL PROFILE

Upper Mount Bethel Township is located in the far northeast corner of Northampton County, sharing borders with Monroe County, PA, and with New Jersey. The township encompasses an area of 44.3 square miles, and has a population of 6,706 (2010 Census). As shown in Figure 1, neighboring municipalities include Washington Township and East Bangor (both in Northampton County) to the southwest; Lower Mount Bethel Township (Northampton County) to the south; Belvidere, NJ to the southeast; Portland Borough (Northampton County) and townships in the state of New Jersey to the east; and Delaware Water Gap, Stroud Township, and Hamilton Township (all of Monroe County, PA) to the north.

Figure 1



(Source: <http://www.lvpc.org/pdf/maps/baseMap-LehighNorthamptonCounties.pdf>)

Upper Mount Bethel Township is within the Delaware River Watershed, and is drained by the Delaware River, which forms its eastern boundary separating it from New Jersey. Jacoby Creek in the north of the township, and Allegheny Creek in the south-central part of the township are tributary to the Delaware River. Other creeks and minor waterways flow from the western part of the township into Martins Creek, also tributary to the Delaware further south. There are also a few bodies of standing water in the northern part of the township, including Minsi Lake and Echo Lake.

The township is intersected by three state highways. SR 191 runs north-south in the northwestern part of the township, connecting the Lehigh Valley to the Poconos in eastern Pennsylvania. SR 512 travels east-west paralleling railroad tracks through the center of the township as Mount Bethel Highway, and terminates at a “T” intersection with SR 611. SR 611 also crosses the township from the lower west to the mid-east, where it veers north paralleling the Delaware River as Delaware Drive.

B.1 Known or Anticipated Future Development

The following table summarizes major residential/commercial development and major infrastructure development that are identified for the next five (5) to ten (10) years in the municipality. Refer to the map at the end of this annex which illustrates the hazard areas within the municipality.

| Property Name | Type (Residential or Commercial) | Number of Structures | Location | Known Hazard Zone* | Description / Status |
|--|----------------------------------|--------------------------------|---|--------------------------|---|
| GenOn Property | TBD – zoned Heavy Industrial | TBD – 20+ parcels on 700 acres | Generally bounded by River Road, Rt. 611, Potomac Street, and Sunrise Blvd. | Not in NFIP SFHA | In progress – 1 st Phase completed Spring 2012 |
| Sithe Pa Holdings / McGill Environmental | Commercial | 1 | Pine Tree Lane and River Road | Portions may lie in SFHA | Compost Facility |

* Only location-specific hazard zones or vulnerabilities identified. With the exception of flood, wildfire, landslides, and land subsidence/sinkholes, all locations within the Lehigh Valley are exposed to the natural hazards addressed in this plan

C. NATURAL HAZARD EVENT HISTORY SPECIFIC TO UPPER MOUNT BETHEL TOWNSHIP

| Type of Event and Date | FEMA Disaster # (if applicable) | Local Damage and Losses |
|------------------------|---------------------------------|---|
| Hurricane Irene | DR-4025 | Road washouts, trees down. \$116,691 costs to Township. |
| | | |
| | | |
| | | |
| | | |

D. NATURAL HAZARD RISK/VULNERABILITY RISK RANKING

The following relative ranking of natural and non-natural hazard risks in this municipality was developed using PEMA's Risk Factor methodology described in Section 4, "Risk Assessment"

| HAZARD RISK | NATURAL HAZARDS | RISK ASSESSMENT CATEGORY | | | | | RISK FACTOR (RF) |
|-----------------|------------------------|--------------------------|--------|----------------|--------------|----------|------------------|
| | | PROBABILITY | IMPACT | SPATIAL EXTENT | WARNING TIME | DURATION | |
| HIGH | Winter Storm | 3 | 2 | 4 | 1 | 3 | 2.7 |
| | Flood | 3 | 2 | 2 | 3 | 3 | 2.5 |
| MODERATE | Radon Exposure | 4 | 1 | 2 | 1 | 4 | 2.4 |
| | Extreme Temperatures | 4 | 1 | 2 | 1 | 3 | 2.3 |
| | Drought | 2 | 1 | 4 | 1 | 4 | 2.2 |
| | Wildfire | 3 | 1 | 2 | 3 | 3 | 2.2 |
| | Hailstorm | 3 | 1 | 3 | 2 | 1 | 2.1 |
| | Wind, incl. Tornado | 1 | 3 | 2 | 4 | 1 | 2.1 |
| | Lightning | 4 | 1 | 1 | 2 | 1 | 2 |
| LOW | Earthquake | 1 | 1 | 4 | 4 | 1 | 1.9 |
| | Subsidence / Sinkholes | 2 | 1 | 2 | 2 | 1 | 1.6 |
| | Landslide | 1 | 1 | 1 | 4 | 1 | 1.3 |

| HAZARD RISK | MAN-MADE HAZARDS | RISK ASSESSMENT CATEGORY | | | | | RISK FACTOR (RF) |
|-----------------|--------------------------------------|--------------------------|--------|----------------|--------------|----------|------------------|
| | | PROBABILITY | IMPACT | SPATIAL EXTENT | WARNING TIME | DURATION | |
| HIGH | Fire (Urban/Structural) | 4 | 2 | 1 | 4 | 2 | 2.6 |
| | Environmental Hazard and | 3 | 2 | 2 | 4 | 3 | 2.6 |
| | Utility Interruption | 3 | 1 | 3 | 4 | 3 | 2.5 |
| MODERATE | Transportation Accident | 4 | 1 | 1 | 4 | 1 | 2.2 |
| | Dam Failure | 1 | 3 | 2 | 4 | 2 | 2.2 |
| | Mass Gathering and Civil Disturbance | 3 | 1 | 1 | 4 | 2 | 2 |
| LOW | Terrorism | 1 | 3 | 1 | 4 | 1 | 1.9 |
| | Building Collapse | 1 | 3 | 1 | 4 | 1 | 1.9 |
| | Nuclear Incident | 1 | 1 | 1 | 4 | 2 | 1.4 |
| | Levee Failure | 0 | 0 | 0 | 0 | 0 | 0 |

E. CAPABILITY ASSESSMENT

This section identifies the following capabilities of the local jurisdiction:

- Planning and Regulatory capability
- Administrative and Technical capability
- Fiscal capability
- Community classifications

E.1 Planning and Regulatory Capability

| Tool / Program | Status | | | Dept./Agency Responsible | Effect on Loss Reduction: + Support O Neutral - Hinder | Change Since Last Plan: + Positive - Negative | Comments |
|---|----------|-------------------------|-------------------|------------------------------------|---|---|--|
| | In Place | Date Adopted or Updated | Under Development | | | | |
| Hazard Mitigation Plan | X | 11/13/2006 | | Upper Mount Bethel Township (UMBT) | + | + | Progress report in 2008, completed one action. |
| Emergency Operations Plan | X | 11/08/2010 | | UMBT | + | + | |
| Disaster Recovery Plan | X | 11/08/2010 | | UMBT | + | + | |
| Evacuation Plan | X | 11/08/2010 | | UMBT | + | + | |
| Continuity of Operations Plan | X | 11/08/2010 | | UMBT | + | + | |
| NFIP | X | 03/26/2001 | | UMBT | + | N/A | |
| NFIP – Community Rating System | | | X | | | | |
| Floodplain Regulations (spec. NFIP Flood Damage Prevention Ordinance) | X | 03/26/2001 | | UMBT | + | N/A | Update to Zoning ordinance |
| Floodplain Management Plan | | | X | | | | |
| Zoning Regulations | X | 03/15/2004 | | | + | N/A | Updated 2012 |
| Subdivision Regulations | X | 11/26/2009 | | | + | + | |
| Comprehensive Land Use Plan | X | 07/09/2001 | | | + | N/A | |
| Open Space Management Plan (or Parks/Rec or Greenways Plan) | X | 03/2004; 03/2009 | | | + | + | Updated 2012 |
| Stormwater Management Plan / | X | 04/09/2007 | | | + | N/A | |

| Tool / Program | Status | | | Dept./Agency Responsible | Effect on Loss Reduction: + Support O Neutral - Hinder | Change Since Last Plan: + Positive - Negative | Comments |
|----------------------------------|----------|-------------------------|-------------------|--------------------------|---|---|----------|
| | In Place | Date Adopted or Updated | Under Development | | | | |
| Ordinance | | | | | | | |
| Natural Resource Protection Plan | X | 03/2009 | | | + | + | |
| Capital Improvement Plan | | | X | | | | |
| Economic Development Plan | | | X | | | | |
| Historic Preservation Plan | | | X | | | | |
| Farmland Preservation | X | 03/2009 | | | + | + | |
| Building Code | X | 06/14/2004 | | | + | N/A | |
| Fire Code | X | 06/14/2004 | | | + | N/A | |
| Firewise | | | X | | | | |
| Storm Ready | | | X | | | | |
| Other | | | | | | | |

E.2 Administrative and Technical Capability

| Staff/Personnel Resources | Yes | No | Department/Agency | Comments |
|--|-----|----|--|----------|
| Planners (with land use / land development knowledge) | X | | UMBT Planning Commission; Township Engineer | |
| Planners or engineers (with natural and/or human caused hazards knowledge) | X | | Township Engineer | |
| Engineers or professionals trained in building and/or infrastructure construction practices (includes building inspectors) | X | | Building Codes | |
| Emergency Manager | X | | Emergency Management | |
| NFIP Floodplain Administrator | X | | Zoning | |
| Land Surveyors | X | | Township Engineer | |
| Scientists or staff familiar with the hazards of the community | X | | Zoning; Road | |
| Personnel skilled in Geographic Information Systems (GIS) and/or FEMA's HAZUS program | X | | Zoning | |
| Grant writers or fiscal staff to handle large/complex grants | X | | Management; Bookkeeping | |
| Staff with expertise or training in Benefit-Cost Analysis | X | | Management; Bookkeeping | |
| Other | | | | |

E.3 Fiscal Capability

| Financial Resources | Yes | No | Department/Agency | Comments |
|---|-----|----|-------------------|----------|
| Capital Improvement Programming | X | | Management | |
| Community Development Block Grants (CDBG) | | X | | |
| Special Purpose Taxes | | X | | |
| Gas / Electric Utility Fees | | X | | |
| Water / Sewer Fees | | X | | |
| Stormwater Utility Fees | | X | | |
| Development Impact Fees | | X | | |
| General Obligation, Revenue, and/or Special Tax Bonds | X | | Management | |
| Partnering Arrangements or Intergovernmental Agreements | X | | Management; Road | |
| Other | | | | |

E.4 Community Classifications

| Program | Classification | Date Classified |
|--|----------------|-----------------|
| Community Rating System (CRS) | NP | N/A |
| Building Code Effectiveness Grading Schedule (BCEGS) | TBD | TBD |
| Public Protection | TBD | TBD |
| Storm Ready | NP | N/A |
| Firewise | NP | N/A |

N/A = Not applicable. NP = Not participating. TBD = To Be Determined.

The classifications listed above relate to the community's effectiveness in providing services that may impact its vulnerability to the natural 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 one (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 1000 feet of a creditable fire hydrant and is within 5 road miles of a recognized Fire Station. StormReady communities are better prepared to save lives from the onslaught of severe weather through advanced planning, education and awareness.

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/>

F. MITIGATION STRATEGY

F.1 Past Mitigation Activities/Efforts

The following table summarizes progress on the mitigation strategy identified by the Township in the 2006 plan.

| 2006 Initiative | | Status | Review Comments |
|--|---|-------------|---------------------------------|
| Description | Location | | |
| Relocate Sandy Shore Rd. to prevent further damage by Delaware River | vent further damage by Delaware River Sandy Shore Rd. off River Rd. | No Progress | Carried forward in 2012 update. |
| Install/replace/repair culvert | Creek Rd. at Fox Gap Rd. | No Progress | Carried forward in 2012 |



| | | | |
|---|-----------------------------------|-------------|---------------------------------|
| | | | update. |
| Install/replace/repair culvert | Area of 288 Slateford Rd. | No Progress | Carried forward in 2012 update. |
| Relocate drainage pipe - damage to roadway from water impingement | Riverton Rd. south of River Rd. | No Progress | Carried forward in 2012 update. |
| Install/replace/repair culvert | River Rd. area of Sandy Shore Rd. | No Progress | Carried forward in 2012 update. |
| Install/replace/repair culvert | TWP. Wide - damaged during IVAN | No Progress | Carried forward in 2012 update. |
| Debris control - Trim trees to control debris and power outages. | Township-wide | Continuous | Carried forward in 2012 update. |

Further details on mitigation activities completed in the Township include:

Structural Control Measures

Many of the culverts throughout the Township sustained damage during hurricanes in 2004, 2005 and 2011. The Township will need to replace culverts with larger ones to handle the increased water capacity. The Township has replaced 2 culverts – Blue Mountain Drive and Shady Lane, and replaced the culvert located on Creek Road at Fox Gap Road. The concrete work was completed right after Hurricane Ivan in 2006. The culvert will still need to be replaced with a larger culvert.

Pipe replacement is needed throughout the Township to maintain proper drainage and reroute from people or property.

The Township was able to build a stone wall on Ridge Road in 2011 (2100 Block) to divert stormwater from draining onto a residential property. This was a continual problem after each storm causing flooding in the homeowner's basement. Two catch basins were also replaced on Ridge Road to alleviate any further washouts.

Shady Lane sustained heavy damages by Hurricane Irene in 2011. 80 feet of pipe was replaced with larger pipe and the road raised by five feet to prevent further washouts. Hemlock Road (594 Block) had 140 feet of 18" pipe installed to divert water from flooding residents home and property. Two properties on Carolee Lane were washed out due to flooding from Irene. 40 feet of larger pipe and rip-rap were installed to accommodate storm water flooding.

Storm Drainage System

The Township will need new drainage systems for Slateford Road, Deer Run and Harvest Road to increase capacity for stormwater. The Township has completed some pipe work and engineering on the River Road area of Sandy Shore Road to help adequately handle current stormwater conditions.

F.2 Hazard Vulnerabilities Identified

It is estimated that in Upper Mt. Bethel Township, 401 residents live within the 1% annual chance flood area (NFIP Special Flood Hazard Area). Of the municipality's total land area, 6.6% is located within the 1% annual chance flood area. \$56,932,675 (4.3%) of the municipality's general building stock replacement cost value (structure and contents) is located within the 1% annual chance flood area.

There are 89 NFIP policies in the community. While there are 158 structures located within the 1% annual chance flood area, there are only 60 policies issued to property owners in the 1% annual chance flood area. FEMA has identified 17 Repetitive Loss (RL) including 6 Severe Repetitive Loss (SRL) properties in the municipality.

HAZUS-MH estimates that for a 1% annual chance flood, \$16,922,758 (1.3%) of the municipality's general building stock replacement cost value (structure and contents) will be damaged, 363 people may be displaced, 137 people may seek short-term sheltering, and an estimated 3197 tons of debris could be generated. HAZUS-MH estimates the following damage and loss of use to critical facilities in the community as a result of a 1% annual chance flood event:

Critical Facilities Located in the DFIRM 1% and 0.2% Flood Boundaries and Estimated Potential Damage from the 1% Flood Event

| Name | Type | Exposure | | Potential Loss from 1% Flood Event | | |
|---------------------------------------|--------------|----------|------------|------------------------------------|-----------------|--------------------------------|
| | | 1% Event | 0.2% Event | Structure Damage | Content Damages | Days to 100-Percent Functional |
| Doe Hollow Boat Access Ramp | User Defined | X | X | 91.0 | 100.0 | NA |
| Portland - Columbia Pedestrian Bridge | User Defined | X | X | 91.0 | 100.0 | NA |
| Bethany Home | Senior | | X | - | - | - |

Source: FEMA, 2004; FEMA, 2011; HAZUS-MH 2.1

Notes:

X = indicates the facility location as provided by Lehigh Valley is located in the DFIRM flood zone.

NA = HAZUS-MH 2.1 does not estimate the days to 100-percent functional for user-defined facilities.

- = There is no damage estimate either because the 0.2% annual chance flood event potential loss estimates were not run in HAZUS or HAZUS did not calculate potential loss estimates for some facilities located in the DFIRM flood hazard zone. This is because even though these facilities are located within the boundary of the flood depth grid generated by HAZUS the depth of flooding does not amount to any damages to the structure or contents according to the depth damage function used in HAZUS.

The following vulnerabilities have been identified by the community, within the risk assessment, or in other plan, reports and documents (e.g. FEMA Flood Insurance Studies, Act 167 Stormwater Management Plans):

- Buildings and infrastructure along the Delaware River and streams.

Please refer to the Hazard Profiles for additional vulnerability information relevant to this jurisdiction.

F.3 Hazard Mitigation Strategy

Note some of the identified mitigation initiatives in Table F 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.

| Action No. | Action | Mitigation Technique Category | Hazard(s) Addressed | Priority (H/M/L) | Estimated Cost | Potential Funding Sources | Lead Agency / Department | Implementation Schedule | Applies to New and/or Existing Structures* |
|------------|--|---|---------------------|------------------|----------------|---|-----------------------------------|-------------------------|--|
| 1 | Sandy Shore Drive Relocation (from 2006 plan) – Chronic flooding on Sandy Shore Drive off River Road will require the road to be relocated to prevent further damage by the Delaware River. | Structural Projects; Property Protection | Flood | Medium | High | FEMA Mitigation Grant Programs; municipal budget for cost share | UMBT Engineering and Public Works | Long Term DOF | Existing |
| 2 | Sandy Shore Drive and River Road Drainage Improvements (from 2006 plan) – Increase water management capacity with additional basins and larger piping to alleviate damage to two township roads and residents. | Structural Projects; Property Protection | Flood | Medium | High | FEMA Mitigation Grant Programs; municipal budget for cost share | UMBT Engineering and Public Works | Long Term DOF | Existing |
| 3 | Creek Road at Fox Gap Road Culvert Improvements (from 2006 plan) – Install a larger box culvert. | Structural Projects; Property Protection | Flood | Medium | Medium | FEMA Mitigation Grant Programs; municipal budget for cost share | UMBT Engineering and Public Works | Long Term DOF | Existing |
| 4 | Stormwater Improvements at 288 Slateford Road (from 2006 plan) – Increase pipe capacity to alleviate severe flooding that impacts two residents, PennDOT, Monroe County Rail Authority, Norfolk Southern | Structural Projects; Property Protection | Flood | Medium | Medium | FEMA Mitigation Grant Programs; municipal budget for cost share | UMBT Engineering and Public Works | Long Term DOF | Existing |

| Action No. | Action | Mitigation Technique Category | Hazard(s) Addressed | Priority (H/M/L) | Estimated Cost | Potential Funding Sources | Lead Agency / Department | Implementation Schedule | Applies to New and/or Existing Structures* |
|------------|---|---|-----------------------|------------------|----------------|--|-----------------------------------|-------------------------|--|
| | Rail, and UMBT. | | | | | | | | |
| 5 | Enhance tree management programs throughout the Township to control power outages and debris management. (from 2006 plan) | Property Protection; Natural Resource Management | Wind; Winter Storm | High | Medium | Municipal Budget | UMBT Public Works | Short Term | Existing |
| 6 | Riverton Road Drainage Relocation – relocated drainage pipe south of River Road that has resulted in significant road damage. | Structural Projects; Property Protection | Flood | Medium | Medium | FEMA Mitigation Grant Programs; municipal budget for cost share | UMBT Engineering and Public Works | Short Term | Existing |
| 7 | Carolee Road Drainage Improvements – install new inlet box, pipe and a longer retention basin to prevent further flooding of road and homes located along Carolee Lane. | Structural Projects; Property Protection | Flood | Medium | Medium | FEMA Mitigation Grant Programs; municipal budget for cost share | UMBT Engineering and Public Works | Short Term | Existing |
| 8 | Deer Run Lane Swale Improvements – install larger swale with rip-rap protection to alleviate washouts on Deer Run Lane, ¼ mile above Hemlock. | Structural Projects; Property Protection | Flood | Medium | Low | Municipal budget | UMBT Engineering and Public Works | Short Term | Existing |
| 9 | Quakerplain Road Culvert Improvements – Install box culvert to alleviate stormwater damage to Quakerplain Road below Persimmon Lane. | Structural Projects; Property Protection | Flood | Medium | Low | Municipal budget | UMBT Engineering and Public Works | Short Term | Existing |
| 10 | 1855 Ridge Road Flood Protection – Install new piping and two new inlet | Structural Projects; Property | Flood | Medium | Low | Municipal budget | UMBT Engineering and Public | Short Term | Existing |

| Action No. | Action | Mitigation Technique Category | Hazard(s) Addressed | Priority (H/M/L) | Estimated Cost | Potential Funding Sources | Lead Agency / Department | Implementation Schedule | Applies to New and/or Existing Structures* |
|------------|---|--|---------------------|------------------|----------------|--|--|-------------------------|--|
| | boxes to manage stormwater and mitigate flooding to properties along Ridge Road. | Protection | | | | | Works | | |
| 11 | National Park Drive Culvert Improvement – Install box culvert to manage stormwater and alleviate road damage. | Structural Projects; Property Protection | Flood | Medium | Medium | FEMA Mitigation Grant Programs; municipal budget for cost share | UMBT Engineering and Public Works | Short Term | Existing |
| 12 | <p>Retrofit structures located in hazard-prone areas to protect structures from future damage, with repetitive loss and severe repetitive loss properties as priority. Specifically identified is Kovar Lane (private road) that floods during significant flood events and prevents ingress/egress to residents.</p> <p>Phase 1: Identify appropriate candidates for retrofitting based on cost-effectiveness versus relocation.</p> <p>Phase 2: Where retrofitting is determined to be a viable option, work with property owners toward implementation of that action based on available funding from FEMA and local match availability.</p> | Property Protection | Flood | Medium-High* | High | FEMA Mitigation Grant Programs and local budget (or property owner) for cost share | Municipality (via Municipal Engineer/NFIP Floodplain Administrator) with support from PEMA, FEMA | Long Term DOF | Existing |

| Action No. | Action | Mitigation Technique Category | Hazard(s) Addressed | Priority (H/M/L) | Estimated Cost | Potential Funding Sources | Lead Agency / Department | Implementation Schedule | Applies to New and/or Existing Structures* |
|------------|---|-------------------------------|---------------------|------------------|----------------|--|--|-------------------------|--|
| 13 | <p>Purchase, or relocate structures located in hazard-prone areas to protect structures from future damage, with repetitive loss and severe repetitive loss properties as priority.</p> <p>Phase 1: Identify appropriate candidates for relocation based on cost-effectiveness versus retrofitting.</p> <p>Phase 2: Where relocation is determined to be a viable option, work with property owners toward implementation of that action based on available funding from FEMA and local match availability.</p> | Property Protection | Flood | Medium-High* | High | FEMA Mitigation Grant Programs and local budget (or property owner) for cost share | Municipality (via Municipal Engineer/NFIP Floodplain Administrator) with support from PEMA, FEMA | Long Term DOF | Existing |
| 14 | <p>Maintain compliance with and good-standing in the NFIP including adoption and enforcement of floodplain management requirements (e.g. regulating all new and substantially improved construction in Special Hazard Flood Areas), floodplain identification and mapping, and flood insurance outreach to the community.</p> <p>Further, continue to meet and/or exceed the minimum NFIP standards and criteria</p> | Property Protection | Flood | High | Low - Medium | Municipal Budget | Municipality (via Municipal Engineer/NFIP Floodplain Administrator) with support from PEMA, ISO FEMA | On-going | New & Existing |

| Action No. | Action | Mitigation Technique Category | Hazard(s) Addressed | Priority (H/M/L) | Estimated Cost | Potential Funding Sources | Lead Agency / Department | Implementation Schedule | Applies to New and/or Existing Structures* |
|------------|--|---------------------------------|-------------------------------|------------------|----------------|---------------------------|--|-------------------------|--|
| | through the following NFIP-related continued compliance actions identified below. | | | | | | | | |
| 15 | Conduct and facilitate community and public education and outreach for residents and businesses to include, but not be limited to, the following to promote and effect natural hazard risk reduction: <ul style="list-style-type: none"> • Provide and maintain links to the HMP website, and regularly post notices on the County/municipal homepage(s) referencing the HMP webpages. • Prepare and distribute informational letters to flood vulnerable property owners and neighborhood associations, explaining the availability of mitigation grant funding to mitigate their properties, and instructing them on how they can learn more and implement mitigation. • Use email notification systems and newsletters to better educate the public on flood insurance, the availability of mitigation grant funding, and personal natural hazard risk reduction measures. • Work with neighborhood associations, civic and business groups to disseminate information on flood insurance and the availability of mitigation grant funding. | | | | | | | | |
| | See above. | Public Education and Awareness | All Hazards | High | Low-Medium | Municipal Budget | Municipality with support from Planning Partners, PEMA, FEMA | Short Term | N/A |
| 16 | Begin the process to adopt higher regulatory standards to manage flood risk (i.e. increased freeboard, cumulative substantial damage/improvements) and sinkhole risk (e.g. carbonate bedrock standards). | Prevention | Flood; Subsidence / Sinkholes | High | Low | Municipal Budget | Municipality (via Municipal Engineer/NFIP Floodplain Administrator) with support from PEMA, FEMA | Short Term | New & Existing |
| 17 | Determine if a Community Assistance Visit (CAV) or Community Assistance Contact (CAC) is needed, and schedule if needed. | Prevention, Property Protection | Flood | Medium | Low | Municipal Budget | NFIP Floodplain Administrator with support from PADEP, PEMA, FEMA | Short Term | N/A |
| 18 | Have designated NFIP Floodplain Administrator (FPA) become a Certified Floodplain Manager through the ASFPM, and pursue | Public Education and Awareness | Flood | High | Low | Municipal Budget | NFIP Floodplain Administrator | Short Term | N/A |

| Action No. | Action | Mitigation Technique Category | Hazard(s) Addressed | Priority (H/M/L) | Estimated Cost | Potential Funding Sources | Lead Agency / Department | Implementation Schedule | Applies to New and/or Existing Structures* |
|------------|--|---|---------------------|------------------|--------------------------------|--|--|-------------------------|--|
| | relevant continuing education training such as FEMA Benefit-Cost Analysis. | | | | | | | | |
| 19 | Participate in the Community Rating System (CRS) to further manage flood risk and reduce flood insurance premiums for NFIP policyholders. This shall start with the submission to FEMA-DHS of a Letter of Intent to join CRS, followed by the completion and submission of an application to the program once the community's current compliance with the NFIP is established. | Prevention, Property Protection, Public Education and Awareness | Flood | Medium | Low | Municipal Budget | NFIP Floodplain Administrator with support from PADEP, PEMA, FEMA | Short Term | N/A |
| 20 | Archive elevation certificates | Public Education and Awareness | Flood | High | Low | Municipal Budget | NFIP Floodplain Administrator | On-going | N/A |
| 21 | Continue to support the implementation, monitoring, maintenance, and updating of this Plan, as defined in Section 7.0 | All Categories | All Hazards | High | Low – High (for 5-year update) | Municipal Budget, possibly FEMA Mitigation Grant Funding for 5-year update | Municipality (via mitigation planning point of contacts) with support from Planning Partners (through their Points of Contact), PEMA | On-going | New & Existing |
| 22 | Complete the ongoing updates of the Comprehensive Emergency Management Plans | Emergency Services | All Hazards | High | Low | Municipal Budget | Municipality with support from PEMA | On-going | New & Existing |

| Action No. | Action | Mitigation Technique Category | Hazard(s) Addressed | Priority (H/M/L) | Estimated Cost | Potential Funding Sources | Lead Agency / Department | Implementation Schedule | Applies to New and/or Existing Structures* |
|------------|---|--|---------------------|------------------|----------------|---|--|-------------------------|--|
| 23 | Create/enhance/ maintain mutual aid agreements with neighboring communities for continuity of operations. | Emergency Services | All Hazards | High | Low | Municipal Budget | Municipality with support from Surrounding municipalities and County | On-going | New & Existing |
| 24 | Identify and develop agreements with entities that can provide support with FEMA/PEMA paperwork after disasters; qualified damage assessment personnel – Improve post-disaster capabilities – damage assessment; FEMA/PEMA paperwork compilation, submissions, record-keeping | Public Education and Awareness, Emergency Services | All Hazards | Medium | Medium | Municipal Budget | Municipality with support from County, PEMA, FEMA | Short Term | N/A |
| 25 | Work with regional agencies (i.e. County and PEMA) to help develop damage assessment capabilities at the local level through such things as training programs, certification of qualified individuals (e.g. code officials, floodplain managers, engineers). | Public Education and Awareness, Emergency Services | All Hazards | Medium | Medium | Municipal Budget, FEMA HMA and HLS grant programs | Municipality with support from County, PEMA | Short/Long Term DOF | N/A |

Notes:

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

Costs:

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

Low = < \$10,000

Medium = \$10,000 to \$100,000

High = > \$100,000

Potential FEMA HMA Funding Sources:

PDM = Pre-Disaster Mitigation Grant Program



FMA = Flood Mitigation Assistance Grant Program
RFC = Repetitive Flood Claims Grant Program
SRL = Severe Repetitive Loss Grant Program
HMGP = Hazard Mitigation Grant Program

Timeline:

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

G. ANALYSIS OF MITIGATION ACTIONS

Municipal mitigation actions were evaluated and prioritized primarily using the PA STEEL methodology discussed in Section 6 of this plan. Per the cost-benefit weighted PA STEEL methodology, those actions receiving 20 or more favorable ratings were generally considered high-priority actions. However, other factors beyond the PA STEEL numeric ranking may have been considered by the municipality during project prioritization. For example, a project might be assigned a medium priority because of the uncertainty of a funding source, and could be changed to high once a funding source has been identified such as a grant.

| Mitigation Action | | PA STEEL CRITERIA CONSIDERATIONS | | | | | | | | | | | | | | | | | | | | Results | | | | |
|-------------------|---|----------------------------------|----------|--------------------|--------------------------|----------------------|---------------------------------|-----------------------|--------------------|-------------------|------------------------|---------------------|-------------------------------|--------------------------|------------------------|------------------------------|-------------------------------|---|----------------------------|-----------------|--------------------------|---------------------------|---|------------------------------|---|-----------------------|
| | | (+) Favorable | | | | | | (-) Less favorable | | | | | | (N) Not Applicable | | | | | | | | | | | | |
| | | P Political | | | A Administrative | | | S Social | | T Technical | | | E Economic | | | E Environmental | | | | | L Legal | | | SUMMARY (EQUAL WEIGHTING) | SUMMARY (BENEFITS & COSTS PRIORITIZED) | |
| Political Support | Local Champion | Public Support | Staffing | Funding Allocation | Maintenance / Operations | Community Acceptance | Effect on Segment of Population | Technically Feasible | Long-Term Solution | Secondary Impacts | Benefit of Action (x3) | Cost of Action (x3) | Contributes to Economic Goals | Outside Funding Required | Effect on Land / Water | Effect on Endangered Species | Effect on HAZMAT / Waste Site | Consistent w/ Community Environmental Goals | Consistent w/ Federal Laws | State Authority | Existing Local Authority | Potential Legal Challenge | | | | |
| 1 | Sandy Shore Drive Relocation | + | + | + | N | N | N | + | + | + | + | N | N | N | N | N | - | - | N | - | + | + | N | N | 9(+) 3(-) 11(N) | 9(+) 3(-) 11(N) |
| 2 | Sandy Shore Drive and River Road Drainage Improvement | + | + | + | + | - | + | + | + | + | + | N | + | + | N | + | + | N | N | + | + | + | + | - | 17(+) 2(-) 4(N) | 21(+) 2(-) 4(N) |
| 3 | Creek Road at Fox Gap Road Culvert Improvement | + | - | + | + | - | + | + | - | + | - | - | + | - | + | - | N | N | N | + | + | N | + | + | 12(+) 7(-) 4(N) | 14(+) 9(-) 4(N) |

SECTION 9.56: UPPER MOUNT BETHEL TOWNSHIP

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--------------------------|-----------------------------|
| 4 | Stormwater Improvements at 288 Slateford Road | + | + | + | + | - | + | + | + | + | + | N | + | + | N | + | - | - | N | - | + | N | + | - | 14(+) 5(-) 4(N) | 18(+) 5(-) 4(N) |
| 5 | Enhanced tree management programs | + | + | - | + | - | + | - | + | + | - | + | + | + | N | + | - | N | + | + | + | + | + | - | 15(+) 6(-) 2(N) | 19(+) 6(-) 2(N) |
| 6 | Riverton Road Drainage Relocation | + | + | + | + | - | + | + | + | + | + | N | + | + | N | + | + | N | N | + | + | + | + | - | 17 (+) 2 (-) 4 (N) | 21 (+) 2 (-) 4 (N) |
| 7 | Carolee Road Drainage Improvement | + | + | + | + | - | + | + | + | + | + | N | + | + | N | + | + | N | N | + | + | + | + | - | 17 (+) 2 (-) 4 (N) | 21 (+) 2 (-) 4 (N) |
| 8 | Deer Run Lane Swale Improvement | + | + | + | + | - | + | + | + | + | + | N | + | + | N | + | + | N | N | + | + | + | + | - | 17 (+) 2 (-) 4 (N) | 21 (+) 2 (-) 4 (N) |
| 9 | Quakerplain Road Culvert Improvement | + | - | + | + | - | + | + | - | + | - | - | + | - | + | - | N | N | N | + | + | N | + | + | 12(+) 7(-) 4(N) | 14(+) 9(-) 4(N) |
| 10 | 1855 Ridge Road Flood Protection | + | + | + | + | - | + | + | + | + | + | N | + | + | N | + | - | - | N | - | + | N | + | - | 14(+) 5(-) 4(N) | 18(+) 5(-) 4(N) |
| 11 | National Park Drive Culvert Improvement | + | - | + | + | - | + | + | - | + | - | - | + | - | + | - | N | N | N | + | + | N | + | + | 12(+) 7(-) 4(N) | 14(+) 9(-) 4(N) |
| 12 | Retrofit Vulnerable Properties | + | + | + | - | - | + | + | + | + | + | + | + | + | + | - | + | + | + | N | + | N | + | + | 18 (+) 3 (-) 2 (N) | 22 (+) 3 (-) 2 (N) |
| 13 | Acquire Vulnerable Properties | + | + | + | - | - | - | + | - | + | + | + | + | + | + | - | + | + | + | + | + | N | + | + | 17 (+) 5 (-) 1 (N) | 21 (+) 5 (-) 1 (N) |
| 14 | Maintain NFIP | + | + | + | + | + | - | + | + | + | + | + | + | + | + | + | + | + | N | + | + | N | + | - | 19 (+) 2 (-) | 23 (+) |



SECTION 9.56: UPPER MOUNT BETHEL TOWNSHIP

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--------------------------|--------------------------|--------------------------|
| | compliance | | | | | | | | | | | | | | | | | | | | | | | | 2 (N) | 2 (-) 2 (N) |
| 15 | Public Education and Outreach | + | + | + | + | + | + | + | + | + | + | + | + | + | + | N | N | N | N | N | N | + | + | 17 (+) 0 (-) 6 (N) | 21 (+) 0 (-) 6 (N) | |
| 16 | Higher Regulatory Standards | + | + | - | + | + | - | - | - | + | + | + | + | + | + | + | N | N | + | + | + | + | - | 16 (+) 5 (-) 2 (N) | 20 (+) 5 (-) 2 (N) | |
| 17 | Community Assistance Visit | + | + | + | + | + | - | + | + | + | N | N | + | + | + | N | N | N | N | + | N | + | - | 14 (+) 2 (-) 7 (N) | 18 (+) 2 (-) 7 (N) | |
| 18 | NFIP FPA become a Certified Floodplain Manager | + | + | + | + | - | + | + | + | + | N | + | + | + | + | N | N | N | N | N | N | + | + | 15 (+) 1 (-) 7 (N) | 19 (+) 1 (-) 7 (N) | |
| 19 | Join Community Rating System | + | + | + | + | - | - | + | + | + | + | + | + | + | + | + | N | + | + | N | + | + | + | 19 (+) 2 (-) 2 (N) | 23 (+) 2 (-) 2 (N) | |
| 20 | Archive Elevation Certificates | + | + | + | + | + | + | + | + | + | N | + | + | + | N | + | N | N | N | N | + | N | + | + | 16 (+) 0 (-) 7 (N) | 20 (+) 0 (-) 7 (N) |
| 21 | Support Plan Maintenance and Update | + | + | + | + | + | + | + | + | + | + | + | + | + | + | N | N | N | N | + | + | + | + | 19 (+) 0 (-) 4 (N) | 23 (+) 0 (-) 4 (N) | |
| 22 | Update CEMP | + | + | + | + | + | + | + | + | + | + | + | + | + | + | N | N | + | N | + | + | + | + | 20 (+) 0 (-) 3 (N) | 24 (+) 0 (-) 3 (N) | |
| 23 | Enhance Mutual Aid Agreements | + | + | + | + | + | + | + | + | + | + | + | + | + | + | N | N | + | N | + | N | + | + | 19 (+) 0 (-) 3 (N) | 23 (+) 0 (-) 3 (N) | |
| 24 | Identify Post-Disaster Capabilities | + | + | + | + | - | + | + | + | + | + | + | + | + | + | + | N | N | N | + | N | + | + | 18 (+) 1 (-) 4 (N) | 22 (+) 4 (-) 4 (N) | |



| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----|------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--------------------------|--------------------------|
| 25 | Develop Post-Disaster Capabilities | + | + | + | - | - | + | + | + | + | + | + | + | - | + | - | + | N | N | N | + | N | + | + | 15 (+) 4 (-) 4 (N) | 17 (+) 6 (-) 4 (N) |
|----|------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--------------------------|--------------------------|



H. FUTURE NEEDS TO BETTER UNDERSTAND RISK/VULNERABILITY

A more detailed flood loss analysis could be conducted on a structural level (versus the Census block analysis conducted for the HMP). The location of each building, details regarding the building (see additional data needed below) and the assessed or fair market value could be included in HAZUS-MH. The FEMA DFIRM boundaries, FEMA Flood Insurance Study detailed studies, base flood elevations and available Light Detection and Ranging (LiDAR) data or digital elevation models (DEM) could be used to generate a more accurate flood depth grid and then integrated into the HAZUS model. The flood depth-damage functions could be updated using the U.S. Army Corps of Engineer damage functions for residential building stock to better correlate HAZUS-MH results with FEMA benefit-cost analysis models. HAZUS-MH would then estimate more accurate potential losses per structure.

Additional data needed to perform the analysis described above:

- Specific building information – first-floor elevation (elevation certificates), number of stories, foundation type, basement, square footage, occupancy type, year built, type of construction etc.
- Assessed or fair market value of structure
- LiDAR or high resolution DEM

I. HAZARD AREA EXTENT AND LOCATION

A hazard area extent and location map has been generated and is provided below for Upper Mount Bethel Township to illustrate the probable areas impacted within Upper Mount Bethel Township. This map is based on the best available data at the time of the preparation of this Plan, and is 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 Upper Mount Bethel Township has significant exposure. Regional risk maps are provided in the hazard profiles within Section 4, Volume I of this Plan.

J. ADDITIONAL COMMENTS

No additional comments at this time.

