**Bethlehem Township, Northampton County Annex**

**Hazard Mitigation Plan Points-of-Contact**

|  |  |
| --- | --- |
| **Primary:** | **Alternate:** |
| Angela Kelly  Emergency Management Coordinator  4225 Easton Avenue, Bethlehem, PA 18020  610-814-6475  akelly@bethlehemtownship.org | Doug Bruce  Township Manager  4225 Easton Avenue, Bethlehem, PA 18020  610-814-6403  dbruce@bethlehemtownship.org |

**Municipal Profile**

Bethlehem Township is mainly a residential township with some agriculture, industrial, and commercial property and is located in the southeastern part of Northampton County. It encompasses an area of approximately 14.7 square miles and has a population of 25,868 (2020 Census). The township is bordered by Bethlehem City and Freemansburg Borough to the southwest; Hanover Township to the west; Lower Nazareth Township to the north; Palmer Township to the east; Easton to the southeast; and Lower Saucon Township to the south.

The Lehigh River forms the township’s southern border with Lower Saucon Township. The Monocacy Creek flows from Lower Nazareth Township south through the northwestern part of the township, and into Bethlehem City. Nancy Run creek also flows through the township, beginning in the central portion of the township and flowing south into the Lehigh River.

US Route 22 travels east-west through the northern part of the township. It has an interchange with PA Route 33, which runs north south through the eastern portion of the township, in the township’s northeast corner. PA Route 191 is another north-south roadway, found in the northwestern part of the township. Other major east-west roadways include Freemansburg Avenue in the south, and the William Penn Highway in the central portion of the township. A railroad operated by Norfolk Southern passes through the township’s northwest boundaries with roadway crossings at Christian Springs Road and Brodhead Road. Numerous types of goods transported include but are not limited to industrial products, chemicals, agriculture, construction products, coal, metals, paper, and clays.

Lehigh Valley Industrial Parks four (IV) and six (VI) are located in the township. LVIP IV is located on the northwest boundaries bordered by Lower Nazareth and Hanover Township’s and LVIP VI is located on the southeast portion of Bethlehem Township. Both industrial parks maintain properties of industrial manufacturing, factories, storage and distribution facilities as well as high hazard facilities with storage and manufacturing of reportable hazardous materials. Located on the southeast boundary is a hospital, cancer center, and medical office building owned and operated by St. Luke’s Health Network and has been operational since 2011.

**Municipal Participation**

1. Identify municipal stakeholders to be involved in the planning process such as, floodplain administrator, public works, emergency management, engineers, planners, etc., and include their specific role in the process.

|  |  |
| --- | --- |
| Angela Kelly, Emergency Coordinator, Fire Marshal  Role: EMC and Fire Marshal | Doug Bruce, Township Manager  Role: Committee Liaison |
| Richard Kanaskie, Public Works Director  Role: Public Works Director |  |

*\*please update as needed*

1. Identify community stakeholders such as; neighborhood groups, religious groups, major employers / businesses, etc., that will be informed and / or involved in the planning process and describe how they will be involved.

None

1. Describe how the public **will be engaged** in the current planning process (examples, newsletters, social media, etc.), **and how they were engaged** since the 2018 Hazard Mitigation Plan.

Current: We will utilize our newsletter and social media to engage the public in the planning process.

Past: Same

**Compliance with the National Flood Insurance Program (NFIP)**

| **Topic** | **Identify source of information, if different from the one listed.** | **Additional Comments** |
| --- | --- | --- |
| **1. Staff Resources** | | |
| Is the Community Floodplain Administrator (FPA) or NFIP Coordinator certified? | Community FPA | Yes |
| Is floodplain management an auxiliary function? | Community FPA | Yes |
| Provide an explanation of NFIP administration services (e.g., permit review, GGIS, education or outreach, inspections, engineering capability) | Community FPA | Permit to review and GIS mapping. |
| What are the barriers to running an effective NFIP program in the community, if any? | Community FPA | None |
| **2. Compliance History** | | |
| Is the community in good standing with the NFIP? | State NFIP Coordinator, FEMA NFIP Specialist, or community records | Yes |
| Are there any outstanding compliance issues (i.e., current violations)? |  | No |
| When was the most recent Community Assistance Visits (CAV) or Community Assistance Contact (CAC)? | March 7, 2022 | Unknown |
| Is a CAV or CAC scheduled or needed? |  | No |
| **3. Regulation** | | |
| When did the community enter the NFIP? | NFIP Community Status Book | No information of such on-hand. |
| Are the Flood Insurance Rate Maps (FIRMs) digital or paper?  How are residents assisted with mapping? | Community FPA | Maps are available in paper and on Township GIS systems via Township Website. |
| Do floodplain regulations meet or exceed FEMA or State minimum requirements?  If so, in what ways? | Community FPA | Floodplain Regulation should at least MEET State minimum requirements. The Township is looking to increase and update these regulations moving forward. |
| Describe the permitting process | Community FPA, State, FEMA NFIP | Permitting is conducted through the building, construction and zoning department for both zoning and UCC compliance. If site plan or land development are triggered, the Township Planning Department also intercedes. |
| **4. Insurance Summary** | | |
| How many NFIP policies are in the community? 59  What is the total premium and coverage? $60,371.58 | State NFIP Coordinator or  FEMA NFIP Specialist | No information of such on-hand. |
| How many claims have been paid in the community? What is the total amount of paid claims? How many substantial damage claims have there been? | FEMA NFIP or  Insurance Specialist | No information of such on-hand. |
| How many structures are exposed to flood risk within the community? | Community FPA or GIS Analyst | No information of such on-hand. |
| Describe any areas of flood risk with limited NFIP policy coverage | Community FPA or  FEMA Insurance Specialist | No information of such on-hand. |
| **5. Community Rating System (CRS)** | | |
| Does the community participate in CRS? | Community FPA, State, or FEMA NFIP | No. |
| If so, what is the community’s CRS Class Ranking? | Flood Insurance Manual (http://www.fema.gov/floodinsurancemanual.gov) | N/A |
| What categories and activities provide CRS points and how can the Class be improved? |  | N/A |
| Does the plan include CRS planning requirements? | Community FPA, FEMA CRS Coordinator, or ISO representative | N/A |

**Community Assets**

Community assets are defined to include anything that is important to the character as well as the function of a community, and can be described in four categories, they are; people, economy, natural environment and built environment. Please identify the community assets and location under each category.

1. **People**

* Concentrations of vulnerable populations such as the elderly, physically or mentally disabled, non-English speaking, and the medically or chemically dependent.

Country Meadows Retirement Home

Arden Courts – Old Orchard Health Care Center

Birches of Bethlehem (opening Spring 2024)

* Types of visiting populations where large numbers of people are concentrated such as visitors for special events and students.

Freedom High School, Bethlehem, PA

BASD Vo-Tech, Bethlehem, PA

Moravian Academy, Bethlehem, PA

Bethlehem Christian School, Bethlehem, PA

Miller Heights Elementary School, Bethlehem, PA

Farmersville Elementary School, Easton, PA

Northampton Community College (school and residence halls), Bethlehem, PA

Our Lady of Perpetual Help School, Easton, PA

Notre Dame High School, Easton, PA

Bethlehem Township Community Center, Bethlehem, PA

St. Luke’s Hospital – Anderson Campus, Easton, PA

1. **Economy**

* Major employers, primary economic sectors such as agriculture and commercial centers where losses would have a severe impact on the community.

Our economy is driven by its location, proximity to the 78, 33, and 22 highways. The biggest impact to our businesses would be the inability to access those transportation corridors.

1. **Natural Environment**

* Those areas / features that can provide protective functions that reduce the magnitude of hazard events such as, wetlands or riparian areas, and other environmental features important to protect.

Riparian areas of the Nancy Run Creek, Monocacy Creek, and the Lehigh River.

1. **Built Environment**

* Existing structures such as, concentrations of buildings that may be more vulnerable to hazards based on location, age, construction type and / or condition of use.

Any structures in the floodplain are of concern.

The oldest areas of construction in Bethlehem Township would be in the Heights and the Annex districts, adjacent to Bethlehem City and Freemansburg Borough. The Chetwin Terrace Neighborhood adjacent to Palmer Township is an older neighborhood that is also subject to flooding.

* Infrastructure systems such as water and wastewater facilities, power utilities, transportation systems, communication systems, energy pipelines and storage.

City of Bethlehem Water Tank

Easton Suburban Water Tank

Sanitary Sewer Pump Stations: Pump Station #1-12

* High potential loss facilities such as, dams, locations that house hazardous materials, military and / or civilian defense installations.

Two dams

* Critical facilities such as, hospitals, medical facilities, police and fires stations, emergency operations centers, shelters, schools and airports / heliports.

St. Luke’s Hospital – Anderson Campus, Easton, PA

Bethlehem Township Police Department, Bethlehem

Bethlehem Township Volunteer Fire and EMS, Bethlehem

Nancy Run Fire Company, Bethlehem

Bethlehem Township Public Works Building, Bethlehem

Bethlehem Township PPIS/BTMA Building, Bethlehem

* Cultural / historical resources such as, museums, parks, stadiums, etc.

The Janet Johnston and William D. Housenick Park, Bethlehem

D&L Trail and Canal (along the Lehigh River) and the Lock-Tender’s House

**Capability Assessment**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Capability** | * **Regulatory** * **Tools** * **Programs** | **Status** | | | **Department /**  **Agency**  **Responsible** | **Effect on Hazard Loss Reduction:**  **-Supports**  **-Neutral**  **-Hinders** | **Change since 2018 Plan?**  **+ Positive**  **- Negative** | **Has the 2018 Plan been integrated into the Regulatory Tool/Program? If so, how?** | **How can these capabilities be expanded and improved to reduce risk?** | **Additional Comments** |
| **In Place** | **Date Adopted or Updated** | **Under Development** |
| **1. Planning & Regulatory** | Comprehensive Plan | X | Updated 2017 |  | Township Administration / Planning Dept. | S |  |  |  |  |
| Capital Improvement Plan |  |  |  |  |  |  |  |  |  |
| Economic Development Plan |  |  |  |  |  |  |  |  |  |
| Continuity of Operations Plan |  |  |  |  |  |  |  |  |  |
| Stormwater Management Plan / Ordinance | X | Amended 2023 |  | Township Administration / Planning Dept. | S |  |  |  | Adopted 1988, Stormwater Management Committee, Stormwater Fee used for MS4 PRP and to mitigate current flooding issues |
| Open Space Management Plan (or Parks/Rec., Greenways Plan) | X | Amended 2014 |  | Township Administration / Planning Dept. | S |  |  |  | Adopted 1995 |
| Natural Resource Protection Plan |  |  |  |  |  |  |  |  |  |
| Transportation Plan |  |  |  |  |  |  |  |  |  |
| Historic Preservation Plan |  |  |  |  |  |  |  |  |  |
| Floodplain Management Plan | X | 1993 |  | Township Administration / Planning Dept. |  |  |  |  |  |
| Farmland Preservation |  |  |  |  |  |  |  |  |  |
| Evacuation Plan |  |  |  |  |  |  |  |  |  |
| Disaster Recovery Plan |  |  |  |  |  |  |  |  | Challenge in funding and staffing |
| Hazard Mitigation Plan | X | 2018 |  | Township Administration / Planning Dept. |  |  | N/A |  |  |
|  | Emergency Operations Plan | X | 4/2023 |  | Township Administration / Planning Dept. |  |  |  |  |  |
| Zoning Regulations | X | 2021 |  | Township Administration / Planning Dept. |  |  |  |  |  |
| Floodplain Regulations | X | 1993 |  | Township Administration / Planning Dept. |  |  |  |  | Currently 59 active NFIP policies (through 3.7.2022) in community |
| NFIP Participation | X | 1993 |  | Township Administration / Planning Dept. |  |  |  |  |  |
| Building Code | X | 2018 |  | Township Administration / Planning Dept. |  |  |  |  | Adopted 2018 IBC, 2018 IPMC, 2009 International Fire Code and plan to adopt updated one soon |
| Fire Code | X | 2009 |  | Township Administration / Planning Dept. |  |  |  |  |  |
| Other |  |  |  |  |  |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Capability** | * **Staff** * **Personnel** * **Resources** | **Yes** | **No** | **Department / Agency** | **Change since 2018 Plan?**  **+ Positive**  **- Negative** | **How can these capabilities be expanded and improved to reduce risk?** | **Additional Comments** |
| **2. Administrative & Technology** | Planners (with land use / land development knowledge) | X |  | Planning |  |  |  |
| Planners or engineers (with natural and / or human-caused hazards knowledge) | X |  | Planning / Public Works |  |  |  |
| Engineers or professionals trained in building and / or infrastructure construction practices (including building inspectors) | X |  | Planning / Engineering |  |  |  |
| Emergency Manager | X |  | Planning |  |  |  |
| Floodplain administrator / manager | X |  | Planning |  |  |  |
| Land surveyors | X |  | Engineering |  |  |  |
| Staff familiar with the hazards of the community | X |  | Planning / Public Works / Police |  |  |  |
| Personnel skilled in Geographical Information Systems (GIS) and / or FEMA’s HAZUS program | X |  | 3rd party |  |  |  |
| Grant writers or fiscal staff to handle large / complex grants | X |  | Administration / Planning / Public Works |  |  |  |
| Other |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Capability** | * **Staff** * **Personnel** * **Resources** | **Yes** | **No** | **Department / Agency** | **Change since 2018 Plan?**  **+ Positive**  **- Negative** | **How can these capabilities be expanded and improved to reduce risk?** | **Additional Comments** |
| **3. Financial Resources** | Capital improvement programming | X |  | Administrative / Planning / Finance |  |  |  |
| Community Development Block Grants (CDBG) |  |  |  |  |  |  |
| Special purposes taxes | X |  | Finance |  |  |  |
| Gas / Electricity utility fees |  |  |  |  |  |  |
| Water / Sewer fees | X |  | PPIS (Sewer) |  |  |  |
| Stormwater utility fees | X |  | BTMA | + |  | Implemented January 2022 |
| Development impact fees | X |  | Planning |  |  |  |
| General obligation, revenue, and / or special tax bonds | X |  | Finance |  |  |  |
| Partnering arrangements or intergovernmental agreements | X |  | Administrative / Legislative |  |  |  |
| Other | X |  |  |  |  | BRIC, FEMA PA for DR4506 |
| **4. Education & Outreach** | Firewise Communities Certification |  |  |  |  |  |  |
| StormReady Certification |  |  |  |  |  |  |
| Natural disaster or safety-related school programs |  |  |  |  |  |  |
| Ongoing public education or information programs such as, responsible water use, fire safety, household preparedness, and environmental education. | X |  | Administration / Planning / Public Works |  |  | Newsletters, website, handouts, public meeting on stormwater management and mitigation projects |
| Public-private partnership initiatives addressing disaster related issues. |  |  |  |  |  |  |
| Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc. | x |  | Public Works | + |  | Environmental Action Committee Summer 2022 |
| Other |  |  |  |  |  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Capability** |  | **Degree of Capability** | | | **Change since the 2018 Hazard Mitigation Plan?**  **If so, how?** | **Additional Comments** |
| **Limited** | **Moderate** | **High** |
| **5. Self – Assessment** | Planning and Regulatory |  |  | X |  |  |
| Administrative and Technical |  |  | X |  |  |
| Financial |  |  | X |  |  |
| Education and Outreach |  |  | X |  |  |

**Known or Anticipated Future Development / Redevelopment**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Development /**  **Property Name** | **Type of Development** | **Number of Structures** | **Location** | **Known Hazard Zone** | **Description / Status** |
| Traditions of America  at Green Pond | 55+ Residential Subdivision |  | Green Pond Road | Sinkholes, Stormwater | Tentative Plan Approval |
| Mill Creek Corporate Center | Office / business Campus |  | William Penn Highway  (behind Park and Ride) | Sinkholes, Stormwater | Phase 1 Preliminary Plan submitted and tabled. |
| Hope Road /  Chrin V7 Redevelopment | Mixed Service / Retail Village |  | Hope Road & William Penn Highway | Sinkholes, Stormwater | Sketch Plan Submitted with a Strong Developer Intent to Proceed. |
| Annunciation Greek  Orthodox Church | Church & Accessory Uses | 1 | Bethman Road & Church Road | Sinkholes, Stormwater | Township Prelim. / Final Conditional Approval |
| Freemansburg Square  Major Subdivision | Mixed Service / Retail Village |  | Freemansburg Avenue & University Drive | Sinkholes, Stormwater | Prelim. / Final Conditional Approval with an anticipated modification of plan forthcoming. |
| Hecktown Road  Business Park Lot 4 | Distribution Center / Logistics | 1 | Commerce Park Drive (shared development – LNT and BT) | Sinkholes, Stormwater | Administrative Review with Planning Commission |
| Nancy Run Estates  Phases 7, 8, 9, 10 | Residential Subdivision |  | New Road Network off Washington Street | Sinkholes, Stormwater & Nancy Run Flooding | Final Plans Approved by Township BOC |
| St. Luke’s University Healthcare Network  Anderson Campus | Medical Campus | Many | Freemansburg Avenue | Sinkholes, Stormwater | “Tower 2” Approved by Township BOC |

**Natural & Non-Natural Event History Specific to Bethlehem Township**

|  |  |  |
| --- | --- | --- |
| **Type of Event and Date(s)** | **FEMA Disaster #**  **(if applicable)** | **Local Damage(s) or Loss(es)** |
| Rain and flooding, June 2015 |  | Storm damages repaired by the municipality |
| Severe winter storm / snowstorm, January 22 - 23, 2016 | DR-4267-PA | FEMA money received for Public Works Overtime - $51,538 |
| Pennsylvania COVID-19 Pandemic – 1/2020 | DR-4506-PA | Emergency Protective measures to combat COVID-19 Pandemic. |
| Remnants of Hurricane Ida | DR-4618-PA | Assistance to eligible individuals and families affected by this disaster. |

**2018 Municipal Action Plan Status**

| **Existing Mitigation Action**  **(from 2018 Hazard Mitigation Plan)** | | **Status** | | | | | **Additional Comments** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **No Progress /**  **Unknown** | **In Progress** | **Continuous** | **Completed** | **Discontinued** |
| **1** | Stormwater management programs, mitigation efforts. |  | X | X |  |  | The Township has been engaged with a stormwater engineer to map the stormwater system, conduct a hydrological study, and make recommendations to the Commissioners on capital improvements. |
| **2** | Hazardous Materials Release, education, prevention, certification of emergency responders to control and mitigate hazardous materials releases. |  |  | X |  |  |  |
| **3** | Maintain compliance with and goodstanding 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. |  |  | X |  |  | Updated mitigation plan to include stormwater management projects that we hoped would be funded by FEMA. |
| **4** | 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:  Willow Park Road, LVIP four and six  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. |  | X |  |  |  |  |
| **5** | Continue to support the implementation, monitoring, maintenance, and updating of this Plan, as defined in Section 7.0. | X |  |  |  |  |  |
| **6** | Complete the ongoing updates of the  Comprehensive Emergency Management Plans. |  |  | X |  |  |  |
| **7** | Create/enhance/maintain mutual aid agreements with neighboring communities for continuity of operations. |  |  | X |  |  |  |
| **8** | Develop and maintain capabilities to process FEMA/PEMA paperwork after disasters; qualified damage assessment personnel – Improve post-disaster capabilities – damage assessment; FEMA/PEMA paperwork compilation, submissions, record keeping. |  |  | X |  |  |  |
| **9** | 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). |  |  | X |  |  |  |
| **10** | Walnut Street and 10th Street Drainage Issues: Incorporation of roadside swales along Walnut Street and Turner Street along with extension of existing 36” storm pipe to Nancy Run. This system was approximated with the goal of capturing and conveying the 25-year (4%) storm event. |  |  | X |  |  |  |
| **11** | Santee Road/Sunset Drive/Easton Avenue Drainage Issues: Initially Preferred Alternative – Add Detention Storage in North Hills Area of City and Township through expansion of peak flow rate control facilities (detention basins) and green infrastructure techniques, it would be feasible to greatly reduce the frequency and extent of flooding for the 25-year (4%) design storm by targeting areas within the Township and City for retrofit opportunities. The structural improvements needed to reduce flooding along Santee Road, Sunset Drive, Easton Avenue and Willow Park Road would include: 24.4 ac-ft. of upstream volume storage and 0.5 acres of bio retention (green infrastructure). |  |  | X |  |  |  |
| **12** | Blue Restaurant and ABE Salvage Drainage Issues  Alternative 1: This alternative involves replacing a trunk-line main in front of Blue Restaurant and creating a new conveyance down Farmersville Road directly to the Nancy Run. This system was approximated with the goal of capturing and conveying the 25 year (4%) storm event.  Alternative 2: This alternative involves decommissioning the existing pipe that runs through ABE salvage yard and implementing dual pipes along Farmersville Road. This system was approximated with the goal of capturing and conveying the 25 year (4%) storm event. |  |  | X |  |  |  |
| **13** | Willow Park Road Flooding Issues  Alternative 1: This alternative involves the establishment of flood protection barriers (shields) to protect properties, which are repetitively impacted by high flood stage events. This system was approximated with the goal of capturing and conveying the 25-year (4%) storm event.  Alternative 2: This alternative would involve the streambank restoration as a means of expanding the capacity of the watercourse within this area through floodplain improvements. This alternative would require purchase of private property; however, it would provide a high degree of sediment reduction credit, which could be thought of as an offsetting cost measure. This system was approximated with the goal of capturing and conveying the 25-year (4%) storm event. |  |  | X |  |  |  |
| **14** | Sculac Drive and Wilson Avenue Flooding  Alternative 1: (Initially Preferred Alternative) This alternative involves the extension of a culvert system to collect and convey runoff from a tributary of the Lehigh River. This conveyance system is proposed to include five structures and approximately 415 LF of 72” RCP. This system was sized to capture and convey the 100 Year (1%) storm event.  Alternative 2: (Value Engineering Option) This alternative follows the same design approach as alternative 1 but instead considers the use of structural steel plate corrugated metal pipe (CMP). This is presented as a value engineering option; however, it was not selected as an initially preferred alternative since the service life of a CMP collection header would not compare well to the service life of RCP. |  |  | X |  |  |  |
| **15** | Chetwin Terrace Drainage Issues  Alternative: 1 (Initially Preferred Alternative) This alternative involves the establishment of a stormwater collection system to collect and covey runoff within the Chetwin Terrace neighborhood. This system was approximated with the goal of capturing and conveying the 25-year (4% probability of exceedance) storm event.  Alternative 2: This alternative is similar to alternative 1. However in addition, would include opportunities for water quality reduction credits by utilization of a porous pipe system and implementation of rain gardens throughout Chetwin Terrace neighborhood. |  |  | X |  |  |  |
| **16** | William Penn Highway and Ohio Street Flooding Issues  Alternative 1: (Initially Preferred Alternative) This alternative considers the extension of a storm main and was sized to capture and convey the 25-year storm event. This alternative would require coordination with Northampton Country Club as permission and potential easements would be required from Northampton Country Club (to be conveyed to the Township). It is expected that this alternative would also benefit the Country Club, as their driving range would likely be better drained during typical rainfall events than it is currently.  Alternative 2: Same as the initially preferred alternative, however this alternative includes provisions for perforated piping and open bottom inlets to provide volume removal benefitting flood control and water quality (MS4/PRP) concerns. The geological makeup of this region of the Township includes many karst formations, which cause concern with sinkholes. Any area where infiltration is proposed should also include a detailed geological investigation. Consequently, the budget for this item has been increased to consider this investigation. |  |  | X |  |  |  |

**Notes:**

1. Actions not carried through to the 2023 Action Plan are so noted.
2. To maintain National Flood Insurance Program (NFIP) compliance, actions related to the NFIP were carried through to the 2023 Action Plan even if identified by the municipality as completed.

**2023 Mitigation Action Plan**

| **Mitigation Action** | | **Mitigation Action Category** | **Mitigation Technique Category** | **Hazard(s) Addressed** | **Priority**  **(H / M / L)** | **Estimated Cost** | **Potential Funding** | **Lead Agency / Department** | **Implementation Schedule** | **Applies to New and / or Existing Structures** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1** | Stormwater management programs, mitigation efforts. | 1 | Structure and  Infrastructure | Flood | Medium | High | Federal,  State,  County  Grant funding | Township Engineer | Short-term  (depending on funding) | New &  Existing |
| **2** | Hazardous Materials Release, education, prevention, certification of emergency responders to control and mitigate hazardous materials releases. | 23 | Education and  Awareness | All Hazards | High | Low | Federal,  State and  Local  Training  Programs | Emergency Services | Ongoing | New &  Existing |
| **3** | 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. | 3 | Local Plans and  Regulations | Flood | High | Low -  Medium | Municipal Budget | Municipality  (via Municipal  Engineer/NFIP Floodplain  Administrator) with support from PEMA,  ISO FEMA | Ongoing | New &  Existing |
| **4** | 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:  Willow Park Road, LVIP four and six  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. | 1 | Education and  Awareness | All Hazards | High | Low-  Medium | Municipal Budget | Municipality with support  from Planning Partners,  PEMA, FEMA | Short-term | N/A |
| **5** | Continue to support the implementation, monitoring, maintenance, and updating of this  Plan, as defined in Section 7.0. | 1 | 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 | Ongoing | New &  Existing |
| **6** | Complete the ongoing updates of the Comprehensive Emergency Management Plans. | 1 | Local Plans and  Regulations | All Hazards | Medium | Low | Municipal Budget | Municipality with support from PEMA | Ongoing | New &  Existing |
| **7** | Create/enhance/maintain mutual aid agreements with neighboring communities for continuity of operations. | 1 | All  Categories | All Hazards | Medium | Low | Municipal Budget | Municipality with support from  surrounding  municipalities and County | Ongoing | New &  Existing |
| **8** | Develop and maintain capabilities to process FEMA/PEMA paperwork after disasters; qualified damage assessment personnel – Improve post-disaster capabilities – damage assessment; FEMA/PEMA paperwork compilation, submissions, record keeping. | 12 | Education and  Awareness | All Hazards | Low | Medium | Municipal Budget | Municipality with support  from County,  PEMA, FEMA | Short-term | N/A |
| **9** | 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). | 1 | Education and  Awareness | All Hazards | Medium | Medium | Municipal  Budget,  FEMA  HMA grant programs | Municipality with support  from County,  PEMA | Short-, long-term (depending on funding) | N/A |
| **10** | Walnut Street and 10th Street Drainage Issues: Incorporation of roadside swales along Walnut Street and Turner Street along with extension of existing 36” storm pipe to Nancy Run. This system was approximated with the goal of capturing and conveying the 25-year (4%) storm event. | 15 | Structure and Infrastructure | Flooding | Medium | High | FEMA Mitigation Funding, Municipal Budget | Municipality with support | Short-Term | Existing |
| **11** | Santee Road/Sunset Drive/Easton Avenue Drainage Issues: Initially Preferred Alternative – Add Detention Storage in North Hills Area of City and Township through expansion of peak flow rate control facilities (detention basins) and green infrastructure techniques, it would be feasible to greatly reduce the frequency and extent of flooding for the 25-year (4%) design storm by targeting areas within the Township and City for retrofit opportunities. The structural improvements needed to reduce flooding along Santee Road, Sunset Drive, Easton Avenue and Willow Park Road would include: 24.4 ac-ft. of upstream volume storage and 0.5 acres of bio retention (green infrastructure). | 15 | Structure and Infrastructure | Flooding | Medium | High | FEMA Mitigation Funding, Municipal Budget | Municipality with support | Short-Term | Existing |
| **12** | Blue Restaurant and ABE Salvage Drainage Issues  Alternative 1: This alternative involves replacing a trunk-line main in front of Blue Restaurant and creating a new conveyance down Farmersville Road directly to the Nancy Run. This system was approximated with the goal of capturing and conveying the 25 year (4%) storm event.  Alternative 2: This alternative involves decommissioning the existing pipe that runs through ABE salvage yard and implementing dual pipes along Farmersville Road. This system was approximated with the goal of capturing and conveying the 25 year (4%) storm event. | 15 | Structure and Infrastructure | Flooding | Medium | High | FEMA Mitigation Funding, Municipal Budget | Municipality with support | Short-Term | Existing |
| **13** | Willow Park Road Flooding Issues  Alternative 1: This alternative involves the establishment of flood protection barriers (shields) to protect properties, which are repetitively impacted by high flood stage events. This system was approximated with the goal of capturing and conveying the 25-year (4%) storm event.  Alternative 2: This alternative would involve the streambank restoration as a means of expanding the capacity of the watercourse within this area through floodplain improvements. This alternative would require purchase of private property; however, it would provide a high degree of sediment reduction credit, which could be thought of as an offsetting cost measure. This system was approximated with the goal of capturing and conveying the 25-year (4%) storm event. | 15 | Structure and Infrastructure | Flooding | High | High | FEMA Mitigation Funding, Municipal Budget | Municipality with support | Long-Term | Existing |
| **14** | Sculac Drive and Wilson Avenue Flooding  Alternative 1: (Initially Preferred Alternative) This alternative involves the extension of a culvert system to collect and convey runoff from a tributary of the Lehigh River. This conveyance system is proposed to include five structures and approximately 415 LF of 72” RCP. This system was sized to capture and convey the 100 Year (1%) storm event.  Alternative 2: (Value Engineering Option) This alternative follows the same design approach as alternative 1 but instead considers the use of structural steel plate corrugated metal pipe (CMP). This is presented as a value engineering option; however, it was not selected as an initially preferred alternative since the service life of a CMP collection header would not compare well to the service life of RCP. | 15 | Structure and Infrastructure | Flooding | Medium | High | FEMA Mitigation Funding, Municipal Budget | Municipality with support | Short-Term | Existing |
| **15** | Chetwin Terrace Drainage Issues  Alternative: 1 (Initially Preferred Alternative) This alternative involves the establishment of a stormwater collection system to collect and covey runoff within the Chetwin Terrace neighborhood. This system was approximated with the goal of capturing and conveying the 25-year (4% probability of exceedance) storm event.  Alternative 2: This alternative is similar to alternative 1. However in addition, would include opportunities for water quality reduction credits by utilization of a porous pipe system and implementation of rain gardens throughout Chetwin Terrace neighborhood. | 15 | Structure and Infrastructure | Flooding | High | High | FEMA Mitigation Funding, Municipal Budget | Municipality with support | Long-Term | Existing |
| **16** | William Penn Highway and Ohio Street Flooding Issues  Alternative 1: (Initially Preferred Alternative) This alternative considers the extension of a storm main and was sized to capture and convey the 25-year storm event. This alternative would require coordination with Northampton Country Club as permission and potential easements would be required from Northampton Country Club (to be conveyed to the Township). It is expected that this alternative would also benefit the Country Club, as their driving range would likely be better drained during typical rainfall events than it is currently.  Alternative 2: Same as the initially preferred alternative, however this alternative includes provisions for perforated piping and open bottom inlets to provide volume removal benefitting flood control and water quality (MS4/PRP) concerns. The geological makeup of this region of the Township includes many karst formations, which cause concern with sinkholes. Any area where infiltration is proposed should also include a detailed geological investigation. Consequently, the budget for this item has been increased to consider this investigation. | 15 | Structure and Infrastructure | Flooding | Medium | High | FEMA Mitigation Funding, Municipal Budget | Municipality with support | Long-Term | Existing |
| **17** | Help communities upstream and downstream of the Rolling Greens Dam and communities that could be impacted by dam failure (e.g., loss of water for firefighting activities if they rely on a reservoir) to better understand their risk to be better prepared during an emergency. | 4 | Education & Awareness | Dam Failure, Flood | High | Low | N/A | Municipality with support | Ongoing | N/A |

**Notes:**

***Estimated Costs:***

* Where actual project costs have been reasonable 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.

***Potential Funding (FEMA HMA):***

* **BRIC =** Building Resilient Infrastructure andCommunities
* **FMA** = Flood Mitigation Assistance Grant Program
* **HMGP** = Hazard Mitigation Grant Program
* **HSGP** = Homeland Security Grant Program
* **EMPG** = Emergency Management Performance Grant

***Implementation Schedule:***

* **Short Term** = 1 to 5 years
* **Long Term** = 5 years or greater
* **DOF** = Depending on Funding

***Applies to New and/or Existing Structures:***

* **N/A** = Not Applicable