

## Regional Hazard Resiliency Plan

Original Plan drafted by the Nurture Nature Center, June 2024

Content adapted by <insert municipality name>, <insert date changes were made>

### About This Plan

This Regional Hazard Resiliency Plan was prepared by Nurture Nature Center (NNC) as part of the CREATE Resilience Research and Community Learning Hub, a grant-funded program (2022-2024) focused on research, learning and improving local response to climate and weather-related hazards and environmental risks in the Lehigh Valley. The CREATE Hub project is funded through the Community Funding Program, supported by Representative Susan Wild's office and administered through NOAA under award number NA22SEC4690012.

This plan is informed by the Lehigh Valley Hazard Mitigation Plan, scientific research on hazard and climate impacts in Pennsylvania, and input from partnering municipalities, including feedback from local residents as well as municipal staff and officials. It addresses hazards and actions to build resilience that are generally relevant to the Lehigh Valley region as a whole. We have included appendices for a number of our partnering municipalities that adapt the plan to their specific context by providing additional localized hazard impacts and planned resiliency actions. We encourage other communities to similarly use this plan as a starting point and adapt it to meet their needs.

*Note: Nurture Nature Center shared the original resiliency plan content in June 2024, and it was made available for local municipalities to adopt or adapt as needed, independently of NNC. Any subsequent changes or additions to the plan (after June 2024) may not reflect the views of NNC.*

*The original June 2024 plan was prepared by the Nurture Nature Center, Inc. under award NA22SEC4690012 from the Environmental Literacy Program of the National Oceanic and Atmospheric Administration (NOAA), U.S. Department of Commerce. The statements, findings, conclusions, and recommendations are those of the author(s) and do not necessarily reflect the views of NOAA or the U.S. Department of Commerce.*

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## Introduction

The rich history of the Lehigh Valley region is shaped by its landscape: lush farmland, mountainous regions, magnificent rivers, and dense forested areas rest next to historic urban areas, bringing dynamic ecosystems and economies alike. These landscapes create the basis for home, culture, and community. Nevertheless, the region also faces serious risk from a range of natural hazards, including flooding, extreme temperatures, winter storms, and more. Looking forward, climate change, continued development pressures, and growing population will intensify the ways many of these hazards continue to affect those who live and work here.

The region's Lehigh Valley [Hazard Mitigation Plan](#) (LV HMP), developed by the Northampton and Lehigh County Emergency Management Services organizations alongside local municipalities, provides technical information about our hazards and hazard responses. This Regional Resiliency Plan builds on the momentum of the LV HMP to proactively consider how to plan and act toward creating more resilient communities.

Resilience is defined in many ways - from the simplest idea of “bouncing back” after a major hazard event to more nuanced understandings of building communities with preparation, flexibility, connectivity (both physical and social), and mitigation strategies as core planning directives. This plan takes a view of resiliency beyond bouncing back to the status quo, envisioning a community where all populations are thriving that takes proactive rather than reactive action to improve preparation and response to the hazards we face. In addition, this plan recognizes that many actions that support resilience have co-benefits and can support the broader social, economic, and environmental wellbeing of our communities.

## Our Approach

This plan addresses flooding, extreme heat, weather-related hazards, environment-related hazards, and human-centered hazards, identifying **goals**, **action steps**, and **assets** that can be leveraged to build resilience to each type of hazard. Outlining the hazards builds awareness and understanding of *the challenges we face*. From there, our approach to resilience focuses on *the resources we have* as a community (assets) that we can draw on in our response to those challenges to plan *a shared path to take* (goals and actions) toward resilience.

Goals and Actions	<b>Goals</b> describe the outcomes we intend to bring about in a particular time frame. <b>Actions</b> are the specific steps and programs needed to reach those desired outcomes. For example, a goal might be something like “reduce the quantity and speed of stormwater runoff during heavy rains,” while things like “start a public education campaign about the benefits of green space” or “apply for grants to plant trees and shrubs in areas that experience heavy runoff” are actions.
Community Assets	<b>Assets</b> can include a wide range of resources, from individuals’ skills to important institutions to elements of the physical environment. The U.S. Climate Resilience Toolkit defines assets as “the people, places, and services that your community agrees are important to protect.” Assets

	provide resources and community strength to build resilience to hazards.
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This plan considers many different assets that are relevant to each hazard our community faces, including:

- Government Services - municipal buildings, plans and ordinances, fire/police/EMS, public works, etc.
- Infrastructure - bridges, transportation, flood control structures, recycling centers, etc.
- Economic - banks, businesses, major employers, etc.
- Natural - recreation areas, open space, ecosystems, etc.
- Health - medical facilities, food system, mental health services, etc.
- Social and Cultural - museums, nonprofit organizations, community events, places of worship, etc.
- Educational - schools, libraries, science/nature centers, online resources, community knowledge
- Housing - apartments, houses, shelters, housing communities, etc.
- Community - community leaders, activists/concerned citizens, neighborhood associations, etc.

## Flooding

### *Description of Hazard*

Flooding is “the most significant natural hazard in the Lehigh Valley.”<sup>1</sup> Our region experiences both riverine flooding in areas along the Delaware or Lehigh rivers and flash flooding on smaller creeks and streams and in some urban environments without adequate stormwater infrastructure. Riverine flooding occurs when a river overflows its banks because of excess water flowing down the river. This can be caused by high-intensity rainfall from tropical systems; persistent, heavy precipitation events; rapid snowmelt; and ice dams. Flooding along larger rivers like the Delaware and Lehigh can usually be forecast a day or more in advance, and will cause a rise and peak in water level that will last from hours to days before receding. Flash flooding occurs more suddenly, typically as a result of heavy rainfall, hurricanes, thunderstorms, or debris or ice jams. These events can release large amounts of water rapidly (in less than six hours), resulting in a sudden rush of water or rise in water level.

### *Local Impacts*

In the past 10 years (2013-2023), Northampton County has reported 30 days with significant flood and flash flood events.<sup>2</sup> On average, these flood events cause nearly \$4 million in property damage and \$37,000 in crop damage each year.<sup>3</sup> The severity of each event varies, and Northampton County has had 5 FEMA Flood Disaster declarations, reflecting especially damaging events that require federal assistance for recovery. Flood events can result in property damage and loss, threats to public health, streambank erosion, disruption to

<sup>1</sup> Lehigh Valley Hazard Mitigation Plan 2024. p. 106.  
<https://ncem-pa.org/wp-content/uploads/2024/02/2024-Lehigh-Valley-HMP.pdf>

<sup>2</sup> NOAA National Centers for Environmental Information (NCEI) <https://www.ncdc.noaa.gov/stormevents/>

<sup>3</sup> Lehigh Valley Hazard Mitigation Plan 2024. p. 129.  
<https://ncem-pa.org/wp-content/uploads/2024/02/2024-Lehigh-Valley-HMP.pdf>

businesses and households, temporary loss of electricity and running water, disrupted transportation routes, and even loss of life.

#### *Future Projections*

Pennsylvania's 2021 Climate Impacts Assessment finds that "flooding is currently the highest-risk hazard facing Pennsylvania, and flood risks are projected to increase" as a result of climate change.<sup>4</sup> Pennsylvania, and the entire Northeast region, are projected to become warmer and wetter in future decades, continuing trends that we have already started to see in the past century.<sup>5, 6</sup> More intense rainfall events with more precipitation in shorter periods of time are likely to occur more frequently. By midcentury, Pennsylvania is projected to have 15 days of "very heavy" precipitation, increased from 12 days on average from 1971-2000.<sup>7</sup> Storms bringing 2, 3, or even 5+ inches of precipitation at once will become more common. Those types of intense bursts of precipitation are especially likely to cause flooding. Development can add to flood risk during intense rain events due to increased impervious surfaces. When rain is not diverted by trees or absorbed by natural landscapes, it runs very quickly off of pavement or buildings and into waterways, raising water levels.



In June of 2006, much of the Lehigh Valley experienced extreme flooding as a result of a prolonged rainfall event. *Photos courtesy of Heather Fischer, Portland Borough.*

#### Goals to Build Resiliency to Flooding

1. Establish a municipal vision for flood prevention
2. Reduce runoff during heavy precipitation events
3. Protect development near waterways during heavy precipitation events
4. Prevent development in floodplains and other flood prone areas
5. Increase land's absorption of water during heavy precipitation events
6. Increase the community's awareness of flooding risk - especially new residents as people continue to move to this region

<sup>4</sup> <https://www.dep.pa.gov/Citizens/climate/Pages/impacts.aspx>

<sup>5</sup> <https://nca2023.globalchange.gov/chapter/21/>

<sup>6</sup>

[https://crt-climate-explorer.nemac.org/climate\\_graphs/?city=Northampton%2BCounty%2C+PA&county=Northampton%2BCounty&area-id=42095&fips=42095&zoom=7&lat=40.7749283&lon=-75.294569&id=pcpn](https://crt-climate-explorer.nemac.org/climate_graphs/?city=Northampton%2BCounty%2C+PA&county=Northampton%2BCounty&area-id=42095&fips=42095&zoom=7&lat=40.7749283&lon=-75.294569&id=pcpn)

<sup>7</sup> <https://www.dep.pa.gov/Citizens/climate/Pages/impacts.aspx> page 52.

7. Equip all community members with tools to protect themselves during flooding events

Action Steps Linked to Goals

Action	Goal(s) Addressed	Assets Leveraged	In HMP?
Create municipal plans and participate in regional planning	1	<ul style="list-style-type: none"> <li>• Municipal capacity (staff, elected officials, engineering, etc.)</li> <li>• Partners and regional resources (ex. Lehigh Valley Planning Commission, Northampton County EMS)</li> </ul>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> In part
Increase natural flood control	2, 3, 5	<ul style="list-style-type: none"> <li>• Natural and green spaces (parks, riparian zones, farmland/community gardens)</li> <li>• Green infrastructure (rain gardens, green roofs, bioswales)</li> <li>• Policies/ordinances (e.g., require a certain amount of natural flood control with new development)</li> <li>• Watershed organizations</li> <li>• Watershed Friendly PA Certification (<a href="https://extension.psu.edu/programs/watershed-stewards/watershed-friendly-pa">https://extension.psu.edu/programs/watershed-stewards/watershed-friendly-pa</a>)</li> </ul>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> In part
Reduce impervious surfaces	2, 5	<ul style="list-style-type: none"> <li>• Policies/ordinances (e.g., set maximum area of impervious surface with new development)</li> <li>• Large institutions (schools, businesses, hospitals, etc.) with parking lots or large buildings that could be made pervious or green</li> </ul>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> In part
Work with county, state, and federal partners to purchase or relocate structures in flood-prone areas	1, 3, 4	<ul style="list-style-type: none"> <li>• County EMS, PEMA, FEMA</li> <li>• Funding sources</li> <li>• Long-term plans for land-use and hazard mitigation</li> <li>• Hydrology expertise at local colleges, universities, engineering firms, etc.</li> <li>• Flood risk information, inundation mapping, etc.</li> </ul>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> In part
Construct physical structures to protect from flooding	3	<ul style="list-style-type: none"> <li>• Regional, state, and/or federal grants and funding sources</li> <li>• Existing levees, dikes, other</li> </ul>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

		<ul style="list-style-type: none"> <li>water infrastructure</li> <li>Hydrology expertise at local colleges, universities, engineering firms, etc.</li> </ul>	<input type="checkbox"/> In part
Draft and implement local regulations, ordinances, and codes	3, 4	<ul style="list-style-type: none"> <li>Municipal capacity (staff, elected officials, engineering, etc.)</li> <li>Model ordinances</li> <li>Regional, state, and federal hazard mitigation guidance</li> </ul>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> In part
Elevate critical infrastructure	3	<ul style="list-style-type: none"> <li>Regional, state, and/or federal grants and funding sources</li> <li>Evacuation shelters, generators</li> <li>Emergency Services (Police/Fire/EMT/National Guard)</li> </ul>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> In part
Communicate risk and impacts to communities before, during, and after flood events	6, 7	<ul style="list-style-type: none"> <li>Community organizations</li> <li>Evacuation Shelters</li> <li>Emergency Services (Police/Fire/EMT/National Guard)</li> <li>Local businesses</li> <li>Local news/radio/other media</li> <li>Forecasting and flood risk information (FEMA flood maps, National Weather Service Flood Inundation Maps, Middle Atlantic River Forecast Center, Philadelphia/Mt. Holly Weather Forecast Office)</li> </ul>	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> In part
Consider strategies for reaching all populations, particularly new residents who may not be as familiar with the region's hazards or its resources	6, 7	<ul style="list-style-type: none"> <li>Real estate offices</li> <li>Local news/radio/other media</li> <li>Organizations providing social services</li> <li>Community schools</li> <li>Organizations that work with communities in languages other than English</li> <li>Community leaders and neighborhood groups</li> </ul>	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> In part

**Extreme Heat**

*Description of Hazard*



Extreme heat “often results in the highest number of annual deaths of all weather-related hazards”.<sup>8</sup> It is defined as prolonged periods of at least 2-3 days of high temperatures above 90°F plus high humidity.<sup>9</sup> Urban areas with minimal vegetation frequently experience a condition called the “heat island effect” where the prevalence of concrete and asphalt contributes to temperatures higher than surrounding vegetated areas. Exposure to high temperatures can have detrimental human health impacts including heat exhaustion, heat stroke, and death. Children, the elderly, and individuals with chronic illnesses are at a higher risk. Beyond human health impacts, extreme heat events can affect local infrastructure like the electrical grid as well as agricultural systems.<sup>10</sup>

#### *Local Impacts*

In July, the hottest month of the year in the Lehigh Valley, high temperatures are typically in the high-70/mid-80°F range, so extended periods of high temperatures above 90°F present an anomaly that puts pressure on infrastructure, natural systems, and humans who are exposed to the heat.<sup>11</sup> The highest recorded temperature in the Lehigh Valley was 105°F in 1966. In the 1996-2023 period, the Lehigh Valley experienced 196 extreme heat events that tragically led to 11 fatalities and 75 injuries.<sup>12</sup>

#### *Future Projections*

The number and extent of extreme heat days is expected to increase in the Lehigh Valley in the future. According to the 2021 Pennsylvania Climate Impacts Assessment, the state is anticipated to experience an average annual temperature increase of 5.9°F from the historical baseline. This is expected to lead to more frequent occurrences of extreme heat that meet the 2-3 day duration plus high temperatures above 90°F plus high humidity benchmark. It is projected that the state will move from a baseline of 5 annual extreme heat days on average to 37 plus increase the number of days reaching 95°F and even 100°F.<sup>13</sup>

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<sup>8</sup> Lehigh Valley Hazard Mitigation Plan 2024. p. 92.

<https://ncem-pa.org/wp-content/uploads/2024/02/2024-Lehigh-Valley-HMP.pdf>

<sup>9</sup> Ready.Gov – Heat. Retrieved on 04/03/2024 from: <https://www.ready.gov/heat>

<sup>10</sup> Lehigh Valley Hazard Mitigation Plan 2024. p. 91-92.

<https://ncem-pa.org/wp-content/uploads/2024/02/2024-Lehigh-Valley-HMP.pdf>

<sup>11</sup> National Centers for Environmental Information. “Dataset Search,” 2024.

<https://www.ncei.noaa.gov/access/search/dataset-search>

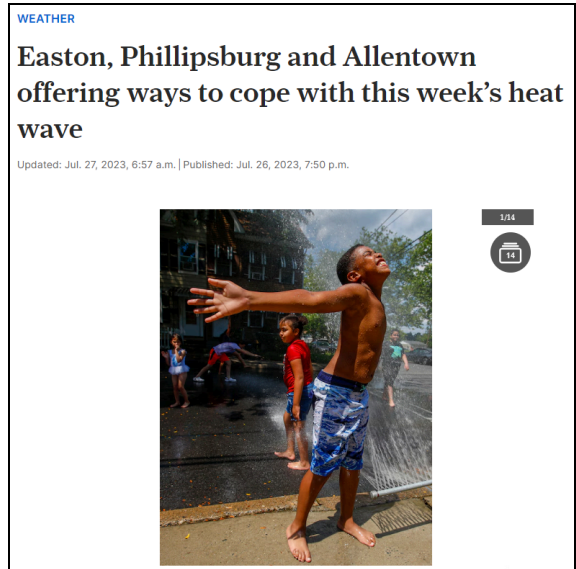
<sup>12</sup> National Centers for Environmental Information. “Storm Events Database.” ncdc.noaa.gov.

<https://www.ncdc.noaa.gov/stormevents/>

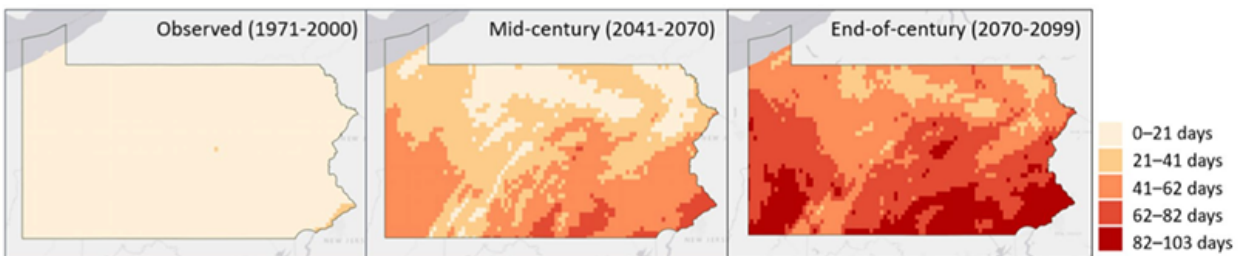
<sup>13</sup> Pennsylvania Department of Environmental Protection. “Pennsylvania Climate Impacts Assessment 2021.”

[https://files.dep.state.pa.us/Energy/Office%20of%20Energy%20and%20Technology/OETDPortalFiles/Climate%20Change%20Advisory%20Committee/2021/2-23-21/2021\\_Impacts\\_Assessment\\_Final\\_2-09-21\\_clean.pdf](https://files.dep.state.pa.us/Energy/Office%20of%20Energy%20and%20Technology/OETDPortalFiles/Climate%20Change%20Advisory%20Committee/2021/2-23-21/2021_Impacts_Assessment_Final_2-09-21_clean.pdf)





Temperatures soared in the Lehigh Valley in summer 2023 with highs in the mid-90s for multiple days in a row. Cities responded by operating cooling centers, opening fire hydrants, and warning residents about heat-related health risks. *Image from Lehigh Valley Live*<sup>14</sup>



Observed and projected annual days with temperatures above 90°F<sup>15</sup>

### Goals to Build Resiliency to Extreme Heat:

1. Improve public health outcomes during extreme heat events
2. Reduce building temperatures during extreme heat events
3. Reduce air temperatures in developed areas during extreme heat events
4. Increase the community's awareness of extreme heat risk - especially new residents as people continue to move to this region
5. Equip all community members with tools to protect themselves during extreme heat events

<sup>14</sup>

<https://www.lehighvalleylive.com/weather/2023/07/easton-phillipsburg-offering-ways-to-cope-with-this-weeks-heat-wave.html>

<sup>15</sup> Pennsylvania Department of Environmental Protection. "Pennsylvania Climate Impacts Assessment 2021." pg. x.

[https://files.dep.state.pa.us/Energy/Office%20of%20Energy%20and%20Technology/OETDPortalFiles/Climate%20Change%20Advisory%20Committee/2021/2-23-21/2021\\_Impacts\\_Assessment\\_Final\\_2-09-21\\_clean.pdf](https://files.dep.state.pa.us/Energy/Office%20of%20Energy%20and%20Technology/OETDPortalFiles/Climate%20Change%20Advisory%20Committee/2021/2-23-21/2021_Impacts_Assessment_Final_2-09-21_clean.pdf)

Action Steps Linked to Goals

Action	Goal(s) Addressed	Assets Leveraged	In HMP?
Establish public cooling centers	1	<ul style="list-style-type: none"> <li>Existing public spaces (e.g., libraries, schools, places of worship, municipal buildings)</li> </ul>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> In part
Install green or cool roofs on municipal buildings, and encourage residents and businesses to do the same	2, 3	<ul style="list-style-type: none"> <li>Municipal buildings</li> <li>Policies/ordinances (e.g., Require green/cool roof installation with new development)</li> </ul>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> In part
Install cool pavement on municipal properties, and encourage residents and businesses to do the same	3	<ul style="list-style-type: none"> <li>Municipal properties</li> <li>Policies/ordinances (e.g., Require cool pavement installation with new development)</li> </ul>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> In part
Increase tree cover and vegetation in highly developed areas	2, 3	<ul style="list-style-type: none"> <li>Municipal Parks Department</li> <li>Municipal properties, including parks and open space</li> <li>Local environmental organizations</li> <li>Local volunteer groups</li> <li>Policies/ordinances (e.g., Require a certain amount of tree cover with new development)</li> </ul>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> In part
Open public pools and select fire hydrants on extreme heat days	1	<ul style="list-style-type: none"> <li>Municipal properties, including public pools</li> <li>Fire Department</li> </ul>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> In part
Communicate risk and impacts, and preparedness actions to communities before, during, and after extreme heat events	4, 5	<ul style="list-style-type: none"> <li>Community organizations</li> <li>Neighborhood groups (may facilitate neighbor check-ins, especially for elderly residents)</li> <li>Medical facilities and providers</li> <li>Emergency Services (Police/Fire/EMT/National Guard)</li> <li>Local businesses</li> <li>Local news/radio/other media</li> <li>Forecasting and extreme heat risk information (Philadelphia/Mt. Holly Weather Forecast Office)</li> </ul>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> In part

Create program to help low income residents obtain air conditioning units	5	<ul style="list-style-type: none"> <li>Community organizations</li> <li>Regional, state, and/or federal grants and funding sources</li> </ul>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> In part
Consider strategies for reaching all populations, particularly new residents who may not be as familiar with the region's hazards or its resources	4, 5	<ul style="list-style-type: none"> <li>Real estate offices</li> <li>Local news/radio/other media</li> <li>Organizations providing social services</li> <li>Community schools</li> <li>Organizations that work with communities in languages other than English</li> <li>Community leaders and neighborhood groups</li> </ul>	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> In part

**Other Weather-Related Hazards**

*Description of Hazards*

- Wind - Intense winds can occur as part of tornadoes, severe thunderstorms, winter storms, or coastal storms.<sup>16</sup> Wind can damage homes and other buildings as well as cause downed trees, power outages, and transportation disruptions.
- Winter Storms - Our region experiences winter storms that can bring freezing temperatures, high winds, and precipitation including snow, sleet, or freezing rain. This type of weather can disrupt transportation, increase risk of hypothermia and frostbite, lead to carbon monoxide poisoning from generators or heating systems, cause power outages, and cause property damage.
- Drought - Drought occurs when there is an ongoing lack of precipitation, usually for a season or more. It threatens drinking water supply, water-dependent industries like farming, recreation, and the environment. In addition, drought can exacerbate other hazards like wildfires, flash floods, and landslides.<sup>17</sup>
- Hailstorms - Hailstorms occur when precipitation freezes in the atmosphere before falling to earth as balls or irregularly shaped pieces of ice. Hail can damage homes, vehicles, or crops and injure people and animals. Hailstorms also occur along with other severe storm hazards such as lightning, wind, or flash flooding.
- Lightning Strikes - Lightning results from a rapid discharge of electricity from built-up positive and negative charges within a thunderstorm. Lightning strikes can damage power lines, cell towers, and buildings and additionally have the potential to spark fires. While it is relatively rare for humans to be struck by lightning, when it does occur it is often fatal or results in serious injuries.

*Local Impacts*

<sup>16</sup> LV HMP. 2024. Page 44. <https://ncem-pa.org/wp-content/uploads/2024/02/2024-Lehigh-Valley-HMP.pdf>  
<sup>17</sup> LV HMP. 2024. Page 45. <https://ncem-pa.org/wp-content/uploads/2024/02/2024-Lehigh-Valley-HMP.pdf>

Our region experiences a variety of weather-related hazards, including all of the hazards described above. The incidence and severity of impacts varies by specific hazard - for example, damage from lightning occurred only twice in Northampton County from 2018-2023 while a few minor hailstorm events are recorded every year,<sup>18</sup> and lightning strikes often affect a single building or individual while storms or drought can affect a large area. Specific impacts of extreme weather often include power outages, transportation disruptions, property damage, and risks to lives and public health.

#### *Future Projections*

Climate change will affect the weather our region experiences, including the frequency and intensity of many weather-related hazards. Drought and lightning strikes are both expected to increase - drought as a result of less regular precipitation (though precipitation events may be more extreme when they do occur), and lightning as a result of a warmer and wetter atmosphere generating more thunderstorm activity.<sup>19,20</sup> Winter storms, on the other hand, are projected to occur less frequently as temperatures rise.<sup>21</sup> The risks of high winds and hailstorms are not projected to change, though both may accompany more intense or frequent storms.<sup>22</sup>



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<sup>18</sup> LV HMP. 2024. Pages 133, 156.

<https://ncem-pa.org/wp-content/uploads/2024/02/2024-Lehigh-Valley-HMP.pdf>

<sup>19</sup> Pennsylvania Climate Impacts Assessment 2021. Page ix.

<https://greenport.pa.gov/elibrary//GetDocument?docId=3667348&DocName=PENNSYLVANIA%20CLIMATE%20IMPACTS%20ASSESSMENT%202021.PDF>

<sup>20</sup> LV HMP. 2024. Page 157.

<https://ncem-pa.org/wp-content/uploads/2024/02/2024-Lehigh-Valley-HMP.pdf>

<sup>21</sup> Pennsylvania Climate Impacts Assessment 2021. Page 24.

<https://greenport.pa.gov/elibrary//GetDocument?docId=3667348&DocName=PENNSYLVANIA%20CLIMATE%20IMPACTS%20ASSESSMENT%202021.PDF>

<sup>22</sup> LV HMP. 2024. Page 205.

<https://ncem-pa.org/wp-content/uploads/2024/02/2024-Lehigh-Valley-HMP.pdf>

The Lehigh Valley saw a major winter storm in February 2024, with some areas seeing half a foot or more of snowfall.<sup>23</sup> Just a few days later, wind gusts of 50 mph slammed the region and damaged power lines and trees.<sup>24</sup>

Goals to Build Resiliency to Other Weather-Related Hazards:

1. Enhance communication before, during, and after hazard events (Nixle, Code Red, municipal websites/social media, etc.)
2. Increase awareness and preparedness among all residents - especially new residents as people continue to move to this region (public hazard education, community preparedness events, etc.)
3. Ensure critical functions and economic activities can continue during drought without threatening water supply for other users.
4. Ensure all residents have warm and safe shelter
5. Reduce car accidents and transportation disruptions
6. Improve resiliency of power lines/resiliency to power outages

Action Steps Linked to Goals

Action	Goal(s) Addressed	Hazard(s) Addressed	Assets Leveraged	In HMP?
Communicate risk, impacts, and preparedness actions to communities before, during, and after extreme weather events	1, 2, 5	Wind Winter storms Drought Hailstorms Lightning	<ul style="list-style-type: none"> <li>• Nixle, Code Red, similar services</li> <li>• Municipal websites and social media</li> <li>• Community organizations</li> <li>• Medical facilities and providers</li> <li>• Emergency Services (Police/Fire/EMT/National Guard)</li> <li>• Local businesses</li> <li>• Local news/radio/other media</li> <li>• Forecasting and extreme weather information (Philadelphia/Mt. Holly Weather Forecast Office)</li> </ul>	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> In part

<sup>23</sup>

<https://www.lehighvalleylive.com/weather/2024/02/lehigh-valley-weather-expect-5-to-9-inches-of-snow-latest-updates-on-shifting-forecast.html>

<sup>24</sup>

<https://www.lehighvalleylive.com/weather/2024/03/thousands-without-power-in-lehigh-valley-as-wind-gusts-expected-to-reach-50-mph.html>

Host one or more events to proactively increase community hazard awareness and preparedness, focusing on reaching new residents or those who may not typically connect with these resources	2	Wind Winter storms Drought Hailstorms Lightning	<ul style="list-style-type: none"> <li>Community organizations</li> <li>K-12 schools</li> <li>Medical facilities and providers</li> <li>Emergency Services (Police/Fire/EMT/National Guard)</li> <li>Local businesses</li> </ul>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> In part
Make informational materials addressing hazards available digitally and physically to residents, in multiple languages when appropriate	2	Wind Winter storms Drought Hailstorms Lightning	<ul style="list-style-type: none"> <li>Municipal websites and social media</li> <li>NOAA, NWS, Ready.gov</li> <li>Community organizations</li> <li>Example: NNC-developed informational hazard cards <a href="https://nurturenaturecenter.org/wp-content/uploads/2020/09/Hazard-Cards-FINALinks.pdf">https://nurturenaturecenter.org/wp-content/uploads/2020/09/Hazard-Cards-FINALinks.pdf</a></li> </ul>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> In part
Work with major water users (agriculture, industry, large institutions) to establish a plan to reduce water use during periods of drought	3	Drought	<ul style="list-style-type: none"> <li>Farmland/agriculture</li> <li>Large institutions (hospitals, schools, large businesses)</li> <li>Municipal and regional planning</li> </ul>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> In part
Establish new emergency shelter locations or promote existing ones	4	Wind Winter storms Hailstorms Lightning	<ul style="list-style-type: none"> <li>Schools, community centers, fire stations, municipal buildings</li> <li>Emergency Services (Police/Fire/EMT/National Guard)</li> </ul>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> In part
Assess residents' need for support in home/property maintenance and	4, 6	Wind Winter storms Lightning	<ul style="list-style-type: none"> <li>Local tree care companies</li> <li>Shade tree commissions, local</li> </ul>	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> In part

improvements to reduce the risk of downed trees and damage			<ul style="list-style-type: none"> <li>forester</li> <li>Municipal public works personnel/equipment</li> <li>HOAs, neighborhood groups</li> </ul>	
Work with utility companies, homeowners, and other relevant entities to prune/maintain trees along roads and power lines	5, 6	<ul style="list-style-type: none"> <li>Wind</li> <li>Winter storms</li> <li>Lightning</li> </ul>	<ul style="list-style-type: none"> <li>Utility companies</li> <li>Municipal public works personnel/equipment</li> </ul>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> In part
Assess which roads/intersections see the most accidents during winter storms and consider signage, increased plowing, or other safety improvements	5	<ul style="list-style-type: none"> <li>Winter storms</li> </ul>	<ul style="list-style-type: none"> <li>PennDOT</li> <li>Emergency Services (Police/Fire/EMT/National Guard)</li> <li>Municipal public works personnel/equipment</li> </ul>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> In part

**Other Environment-Related Hazards**

*Description of Hazards*

- Radon - Radon is a naturally occurring, gaseous radioactive element that is odorless, tasteless, and colorless. It is produced from the decay of other radioactive elements found in soils and rocks. People exposed to radon in high concentrations and over long periods of time are at a much higher risk of health issues such as lung cancer.<sup>25</sup>
- Wildfire - Wildfires spread through vegetated areas with limited development but may intersect with structures near the wildland-urban interface. They can be caused by natural events such as a lightning strike, downed power lines, or human behaviors. Wildfires are most common during periods of drought.<sup>26</sup>
- Invasive species - Invasive species are any non-native species (not typically found in an area) that outcompete native plant/animal populations for resources. Historically, invasive species have been spread accidentally or on purpose in well-intended efforts to create habitat, prevent soil erosion, or eradicate a pest. Invasive plants threaten the homes of native Pennsylvania animals and insects and choke out the native plants they rely on.

<sup>25</sup> LV HMP. 2024. Page 176.  
<https://ncem-pa.org/wp-content/uploads/2024/02/2024-Lehigh-Valley-HMP.pdf>

<sup>26</sup> LV HMP. 2024. Page 191.  
<https://ncem-pa.org/wp-content/uploads/2024/02/2024-Lehigh-Valley-HMP.pdf>



- Sinkholes/subsidence - A sinkhole is a subsidence feature resulting from the downward movement of surface material into a subsurface void. Sinkholes come in many shapes and sizes, and although caused by naturally occurring processes such as dissolution of limestone, their formation can be accelerated by human activities, such as by pumpage and drainage of groundwater.
- Landslides - A landslide is when debris, rock, or earth moves downslope. Landslides can be caused by either natural events like extreme rainfall or human interventions like hillside development. When landslides occur, they can cause extensive damage to infrastructure, buildings, and people, and it can take extended periods of time to stabilize the ground and clean up the debris.<sup>27</sup>

### *Local Impacts*

These other environment-related hazards impact communities in the Lehigh Valley. Pennsylvania and the Lehigh Valley have a high baseline level of radon because of the rock formations in the area, especially the Reading Prong.<sup>28</sup> Residents will need to continue to monitor radon levels in indoor spaces and take mitigation steps if reading levels exceed the 4 pCi/L EPA action threshold. While most wildfires in the region burn small areas, approximately 31% of the Lehigh Valley is within the wildland-urban interface, so structures in those areas are at a higher risk of wildfire damage.<sup>29</sup> Invasive species live throughout the area, including Multiflora Rose, Japanese Barberry, Garlic Mustard, Bush Honeysuckle, Autumn Olive, Japanese Knotweed, Tree of Heaven, and the notorious Spotted Lanternfly. The majority of the municipalities in the Lehigh Valley are vulnerable to sinkholes because they sit on limestone formations, including Bath Borough, Bushkill Township, East Allen Township, Hanover Township, Palmer Township, Portland Borough, and Upper Nazareth Township.<sup>30</sup> Landslides have occurred periodically throughout the area, with notable events including a 2007 mudslide in Hanover Township<sup>31</sup> and a late 2022 rockslide near Portland Borough that has kept route 611 closed for over a year to date.

### *Future Projections*

All of the hazards in this section are expected to present enhanced risks in the future, whether due to local changes to the climate, increased development, or both. Continued development in the area could disturb rocks with high radon concentrations, so continual monitoring will remain necessary in buildings. The rock disturbances will also increase the risk of sinkholes, and when those disturbances are in hilly areas, the likelihood of landslides also increases. Large precipitation events are expected to increase landslide risk as well.

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<sup>27</sup> LV HMP. 2024. Page 149.

<https://ncem-pa.org/wp-content/uploads/2024/02/2024-Lehigh-Valley-HMP.pdf>

<sup>28</sup> Casey, Joan A., Elizabeth L. Ogburn, Sara G. Rasmussen, Jennifer K. Irving, Jonathan Pollak, Paul A. Locke, and Brian S. Schwartz. "Predictors of Indoor Radon Concentrations in Pennsylvania, 1989–2013." *Environmental Health Perspectives* 123, no. 11 (November 2015): 1130–37.

<https://doi.org/10.1289/ehp.1409014>

<sup>29</sup> LV HMP. 2024. Page 193.

<https://ncem-pa.org/wp-content/uploads/2024/02/2024-Lehigh-Valley-HMP.pdf>

<sup>30</sup> LV HMP. 2024. Page 185-186.

<https://ncem-pa.org/wp-content/uploads/2024/02/2024-Lehigh-Valley-HMP.pdf>

<sup>31</sup> LV HMP. 2024. Page 151.

<https://ncem-pa.org/wp-content/uploads/2024/02/2024-Lehigh-Valley-HMP.pdf>

Development paired with changes to weather patterns including increased lightning strikes and drought conditions will increase the risk of wildfires over time. Climate change is also expanding the ranges of many invasive species that now have more favorable weather conditions. These hazards can also compound one another. For instance, invasive forest insect ranges are expanding with warmer weather, and as the insects kill more trees they also increase the amount of fuel available for wildfires.<sup>32</sup>



Palmer Township has experienced several sinkholes along Main Street in recent years after big precipitation events.<sup>33</sup>

Goals to Build Resiliency to Other Environment-Related Hazards:

1. Enhance communication before, during, and after hazard events (Nixle, Code Red, municipal websites/social media, etc.)
2. Increase awareness and preparedness for all residents - especially new residents as people continue to move to this region (public hazard education, community preparedness events, etc.)
3. Protect ecosystems and prioritize native species in those ecosystems
4. Ensure proper maintenance of critical infrastructure
5. Protect people and reduce damage to property due to shifting ground events
6. Increase community preparedness to fire events

Action Steps Linked to Goals

Action	Goal(s) Addressed	Hazard(s) Addressed	Assets Leveraged	In HMP?
Communicate risk and impacts to communities of	1, 2	Invasive species, Radon	<ul style="list-style-type: none"> <li>● Municipal websites and social media</li> </ul>	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> In part

<sup>32</sup> LV HMP. 2024. Page 196-197.

<https://ncem-pa.org/wp-content/uploads/2024/02/2024-Lehigh-Valley-HMP.pdf>

<sup>33</sup>

[https://www.wfmz.com/news/area/lehighvalley/sinkhole-in-palmer-twp-wont-be-fully-repaired-until-next-week/article\\_561a1046-ed1f-11ee-91e2-ef6996628158.html](https://www.wfmz.com/news/area/lehighvalley/sinkhole-in-palmer-twp-wont-be-fully-repaired-until-next-week/article_561a1046-ed1f-11ee-91e2-ef6996628158.html)

<p><u>ongoing</u> hazards and provide action steps</p>			<ul style="list-style-type: none"> <li>● Community organizations</li> <li>● Medical facilities and providers</li> <li>● Wildlife management</li> <li>● Foresters and botanists</li> <li>● Emergency Services (Police/Fire/EMT/National Guard)</li> <li>● Local businesses</li> <li>● Local news/radio/other media</li> </ul>	
<p>Communicate risk and impacts to communities <u>before, during, and after</u> a hazard event</p>	<p>1, 2</p>	<p>Landslides, Sinkholes/ Subsidence, Wildfire</p>	<ul style="list-style-type: none"> <li>● Nixle, Code Red, similar services</li> <li>● Municipal websites and social media</li> <li>● Community organizations</li> <li>● Medical facilities and providers</li> <li>● Emergency Services (Police/Fire/EMT/National Guard)</li> <li>● Local businesses</li> <li>● Local news/radio/other media</li> <li>● Forecasting and extreme weather information (Philadelphia/Mt. Holly Weather Forecast Office)</li> </ul>	<p> <input type="checkbox"/> Yes  <input type="checkbox"/> No  <input checked="" type="checkbox"/> In part </p>
<p>Provide information and other resources to help households and businesses prepare for hazards (e.g., insurance requirements, radon tests), with multilingual</p>	<p>1, 2</p>	<p>Radon, Sinkholes/ Subsidence, Wildfire</p>	<ul style="list-style-type: none"> <li>● Municipal websites and social media</li> <li>● Community organizations</li> <li>● Local businesses</li> <li>● Local news/radio/other media</li> </ul>	<p> <input type="checkbox"/> Yes  <input type="checkbox"/> No  <input checked="" type="checkbox"/> In part </p>

materials when appropriate			<ul style="list-style-type: none"> <li>• National Radon Program Services</li> <li>• Example: NNC-developed informational hazard cards <a href="https://nurturenaturecenter.org/wp-content/uploads/2020/09/Hazard-Cards-FINALLinks.pdf">https://nurturenaturecenter.org/wp-content/uploads/2020/09/Hazard-Cards-FINALLinks.pdf</a></li> </ul>	
Develop and implement control plans for invasive species	3	Invasive species	<ul style="list-style-type: none"> <li>• Department of Natural Resources</li> <li>• Department of Agriculture</li> <li>• Governor’s Invasive Species Council</li> <li>• Municipal Parks Department</li> </ul>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> In part
Monitor and upgrade underground water mains to prevent leakage	4, 5	Sinkholes/ Subsidence	<ul style="list-style-type: none"> <li>• Municipal public works</li> <li>• Local water authority</li> </ul>	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> In part
Improve water drainage or add support structures in areas vulnerable to landslides	4, 5	Landslides	<ul style="list-style-type: none"> <li>• Municipal public works</li> <li>• Local water authority</li> <li>• Municipal Parks Department</li> <li>• Local assessors</li> </ul>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> In part
Take additional fire safety precautions on municipal properties, and encourage residents and businesses to protect structures in the wildland-urban interface and in areas with high building stock	2, 6	Wildfire	<ul style="list-style-type: none"> <li>• Fire Department</li> <li>• Local businesses</li> <li>• Municipal properties</li> <li>• Zoning, ordinances, and codes for new development</li> <li>• Municipal websites and social media</li> <li>• Community</li> </ul>	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> In part

			organizations	
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## Human-Centered Hazards

### *Description of Hazards*

- Pandemic - Pandemics are widespread outbreaks of disease that can quickly spread to large populations, including illnesses like influenza, West Nile virus, Lyme disease, and COVID-19.<sup>34</sup> While they can vary greatly in severity, pandemics threaten human health and can disrupt economic activity and essential services as well.
- Land-use changes - The Lehigh Valley is projected to add nearly 100,000 new residents (a 14.4% population increase) between 2023 and 2050.<sup>35</sup> Housing, industrial, and commercial growth will all continue, often replacing open space or farmland, particularly along the region’s major roadways. In particular, many municipalities have seen new and prospective warehouse development, with a range of implications for traffic, air quality, noise, economic development, and employment.
- Air Quality Issues - Pollutants such as ozone and particle pollution result from traffic, industrial activity and construction, wildfires, and other sources. Poor air quality can cause eye, lung, and throat irritation, difficulty breathing, lung cancer, worsened asthma, and other adverse health effects, especially for babies and children, older people, those who work outdoors, and those with preexisting health conditions.<sup>36</sup>
- Water Quality Issues - Water quality is threatened by both “point source” pollution, which comes from a single identifiable source or site, and nonpoint source pollution, which includes pollutants picked up as precipitation travels through the landscape and eventually to a body of water. Excess fertilizers, oil and toxic chemicals, sediment from erosion or construction sites, salt, pet waste, detergents, and more can all contribute to nonpoint source water pollution.<sup>37</sup> Poor water quality can be extremely detrimental to natural ecosystems and threatens drinking water supply and recreation opportunities.

### *Local Impacts*

Like many communities, the Lehigh Valley was significantly affected by the COVID-19 pandemic, with 213,713 reported cases and 2,693 reported deaths in Lehigh and Northampton counties between March 1, 2020 and June 15, 2023. Given the region’s environment, we also have large populations of mosquitoes and ticks which can carry other infectious diseases like West Nile virus or Lyme disease.<sup>38</sup>

<sup>34</sup> LV HMP. 2024. Page 159-160.

<https://ncem-pa.org/wp-content/uploads/2024/02/2024-Lehigh-Valley-HMP.pdf>

<sup>35</sup> LVPC 2023 Future LV The Regional Plan. November 2023.

[https://drive.google.com/file/d/12oez71k4EV1c2npS-Su6liTT0cZLvl\\_h/view](https://drive.google.com/file/d/12oez71k4EV1c2npS-Su6liTT0cZLvl_h/view)

<sup>36</sup> Center for Disease Control and Prevention. Air Quality. September 2023.

<https://www.cdc.gov/air/default.htm>

<sup>37</sup> U.S. Environmental Protection Agency

<sup>38</sup> LV HMP. 2024. Page 159-160.

<https://ncem-pa.org/wp-content/uploads/2024/02/2024-Lehigh-Valley-HMP.pdf>

Rapid development in the Lehigh Valley has intensified the impacts of the three remaining hazards - land-use change, air quality issues, and water quality issues due to reduced open/green space, increased traffic, and increased industrial activity.

### *Future Projections*

While the future risk of pandemic is difficult to predict, COVID-19 demonstrated the need to be able to respond in the face of an unanticipated and emerging threat. Less widespread or severe disease-related events are likely to occur more regularly, such as tick-borne diseases or influenza.<sup>39</sup>

Development patterns and population growth are expected to continue their upward trajectory, overlapping with climate change impacts to increase the risk of water and air quality issues. For example, ground-level ozone is produced by car exhaust, which will increase with population and traffic, and is made worse by warmer weather, which will occur more often as a result of climate change. The Lehigh Valley Planning Commission and many local municipal councils and planning bodies are working to ensure that continued land use change protects and preserves existing natural and green spaces and farmland.



Warehouse development is occurring at high rates across the Lehigh Valley fueled by increases in online shopping. Many of these new developments are springing up quickly without adequate infrastructure adjustments made to account for increased traffic and heavy vehicles on the roads. Local rivers are also struggling. As a result of inadequate planning and pollution from

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<sup>39</sup> LV HMP. 2024. Page 170.  
<https://ncem-pa.org/wp-content/uploads/2024/02/2024-Lehigh-Valley-HMP.pdf>



new warehouse facilities, the Lehigh River was recently added to the list of most endangered rivers in the U.S.<sup>40</sup> *Photo courtesy of Michael Stokes, Flickr<sup>41</sup>*

Goals to Build Resiliency to Other Environment-related Hazards:

1. Increase awareness and preparedness for all residents - especially new residents as people continue to move to this region (public hazard education, community preparedness events, etc.)
2. Improve public health outcomes during hazard events
3. Assist all segments of the community in identifying their role in building resiliency
4. Consider environmental, economic, and social aspects of proposed development to minimize negative impacts and improve community outcomes

Action Steps Linked to Goals

Action	Goal(s) Addressed	Hazard(s) Addressed	Assets Leveraged	In HMP?
Communicate risk, impacts, and preparedness actions to communities before, during, and after human-centered hazards, with multilingual/translated materials when relevant	1	Pandemic, Land-use Changes, Air Quality, Water Quality	<ul style="list-style-type: none"> <li>• Nixle, Code Red, similar services</li> <li>• Municipal websites and social media</li> <li>• Community organizations</li> <li>• Medical facilities and providers</li> <li>• Emergency Services (Police/Fire/EMT/National Guard)</li> <li>• Local businesses</li> <li>• Local news/radio/other media</li> </ul>	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> In part
Provide up-to-date pandemic resources including about the latest science, case numbers, closures/restrictions, and best	1, 2	Pandemic	<ul style="list-style-type: none"> <li>• Health Department, CDC</li> <li>• Nixle, Code Red, similar services</li> <li>• Municipal websites and social media</li> </ul>	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> In part

<sup>40</sup>

<https://www.americanrivers.org/media-item/lehigh-river-named-among-americas-most-endangered-rivers-of-2023/>

<sup>41</sup>

<https://flickr.com/photos/138425397@N05/50001322571/in/photolist-2jbrRbt-89e8Cn-2mVCPZn-dM262H-2kTg3zf-2iBRYg6-2iBQAye-2jVPc41-2jbrRq6-2jVPbnB-tpD82U-nWCkQ5-nWC2w3-5TXBMU-2j62veN-o-e43E1-odX8J3-hsLCP-odPCJF-nWCfoo-FwzsrB-2jGem8P-2ZTAWM-nWC3cw-nWC6T9-2jP1cwj-kpkJHF-o212Ns-LLjpBL-ofTGPX-A1q2bh-2kREgzy-nWD2ZT-nWCeZ7-qWKPzb-pxsf35-UZttp2-qZonUs-odPBeg-2kTgvCw-2aJST3V-nWBPy5-odWUsU-odPHjc-odPrft-nWDGn-2gtLEQi-oe7Eyn-oe7tig-UK9wyh>



practices			<ul style="list-style-type: none"> <li>• Community organizations</li> <li>• Medical facilities and providers</li> <li>• Emergency Services (Police/Fire/EMT/National Guard)</li> <li>• Local businesses</li> <li>• Local news/radio/other media</li> </ul>	
Increase local medical capacity during emergencies	2	Pandemic, Air Quality	<ul style="list-style-type: none"> <li>• Health Department</li> <li>• Medical facilities and providers</li> </ul>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> In part
Encourage residents, businesses, and farmers to identify sources of pollution they produce that runoff into local waterways	1, 3	Water Quality	<ul style="list-style-type: none"> <li>• Local Extension agents</li> <li>• Stormwater Management</li> <li>• Municipal websites and social media</li> <li>• Community organizations</li> <li>• Local news/radio/other media</li> </ul>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> In part
Create guidance for recreation and fishing in local waterways during poor water quality events	1, 2	Water Quality	<ul style="list-style-type: none"> <li>• Policies/ordinances (e.g., local recreational swimming areas closed when water quality reading reaches set pollutant level)</li> <li>• Department of Natural Resources</li> <li>• Parks Department</li> </ul>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> In part
Create municipal plans for outdoor workers and events during poor air quality events	1, 2	Air Quality	<ul style="list-style-type: none"> <li>• Policies/ordinances (e.g., no large outdoor events permitted when air quality reading reaches set pollutant level)</li> <li>• Labor organizations</li> </ul>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> In part

			<ul style="list-style-type: none"> <li>Local businesses</li> </ul>	
Implement guidance for new development related to roadways, trees and vegetation, and waterways	4	Land-use Changes, Water Quality	<ul style="list-style-type: none"> <li>Policies/ordinances (e.g., set maximum area of impervious surface with new development)</li> <li>Department of Transportation</li> <li>Watershed and environmental organizations</li> </ul>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> In part
Create mutually-beneficial partnerships with developers	4	Land-use Changes	<ul style="list-style-type: none"> <li>Community organizations</li> <li>Parks Department</li> <li>Public Works</li> <li>Local business councils</li> </ul>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> In part

**Next Steps/Implementation**

The assets, goals, and actions above illustrate the existing resources in place and how those might be leveraged to mitigate hazards and increase climate resilience. Next, an implementation plan is needed to operationalize the actions. Within an implementation plan, it is important to identify the following for each action:

- Estimated costs and whether those are one-time or recurring
- Potential funding sources
- Level of collaboration needed
- Relevant stakeholders
- Needs for translation, targeted outreach, or other measures to ensure equity
- The individual, office, or organization taking the lead
- Overlap and coordination with other local plans and efforts
- Intermediate and final deliverables
- Measures of success
- Projected timeline for implementation
- Strategies for maintenance after implementation
- Prioritization compared to other actions
- Monitoring and updating strategies

Once completed, the implementation plan should provide a clear roadmap to leveraging assets to achieve community goals by taking action. To ensure that progress continues after the action steps initially prioritized in this plan are implemented and to adapt to hazards as they change over time, it is recommended that this plan be revisited and updated annually.

**Conclusion**

Understanding our region's unique hazards; how they will be affected by climate change, development, and other patterns; and the unique assets we can utilize to respond are the initial steps in developing an effective plan to enhance our resiliency. As outlined in this plan, the actions that can contribute to resiliency are varied and require collaboration throughout the community. Building resilience is an ongoing process that needs the involvement of individual citizens, businesses, local government, community organizations, and state and national partners.

## MUNICIPAL ANNEXES

*Note: Each of the municipal annexes below takes a slightly different approach to outlining the important local information needed to address hazards and build resiliency. The types of information provided and level of detail may vary depending on the municipality's other preexisting plan documents, municipal structure and capacity, previous experience with hazards and resiliency planning, and other factors.*

### East Allen/Bath:

<https://docs.google.com/document/d/1h1j2iubjMDGiyYYFaUYuY4c-TQpPmQYf5hNpTc6LX8M/edit>

### Overview of Municipalities

East Allen Township is located in the western part of Northampton County. The origins of East Allen Township date back to 1728 when the Craig family moved north from near current day Philadelphia to what is now East Allen Township, establishing the "Craig settlement," and then later moving north near the Monoquasy (Monacacy) valley, settling in 1737 what is now known as Bath. East Allen is predominantly farmland, with some residential development in the southern portion of the township. The Borough of Bath is mostly residential with a mix of small businesses.

### Existing Plans

#### East Allen Township:

- River Central Multi-Municipal Comprehensive Plan: <http://www.planrivercentral.org/>
- Comprehensive Plan: [https://www.eatwp.org/sites/g/files/vyhlf6636/f/uploads/comprehensive\\_plans\\_-\\_uncategorized\\_-\\_2016\\_-\\_2016\\_east\\_allen\\_township\\_comprehensive\\_plan.pdf](https://www.eatwp.org/sites/g/files/vyhlf6636/f/uploads/comprehensive_plans_-_uncategorized_-_2016_-_2016_east_allen_township_comprehensive_plan.pdf)
- Capital Improvement Plan
- Continuity of Operations Plan
- Open Space Management Plan
- Natural Resources Protection Plan
- Disaster Recovery Plan
- Emergency Operations Plan
- Evacuation Plan

#### Borough of Bath:

- Nazareth Area Multi-Municipal Plan: <https://nazplan.org/>
- Capital Improvement Plan
- Disaster Recovery Plan
- Emergency Operations Plan
- Evacuation Plan
- Historic Preservation Plan: <https://bathborough.org/borough-of-bath-historic-preservation>

*Hazards, Assets, Goals, and Actions*

<b>Municipality</b>	<b>Hazard</b>	<b>Assets</b>	<b>Short-Term Goal</b>	<b>Action Step</b>	<b>In HMP?</b>	<b>In the Regional Plan?</b>
East Allen	Flooding	Fire Department	Conduct Study to determine mitigation activities to alleviate flooding in the area where Monocacy Creek crosses Route 512	Acquire funding	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> In part	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> In part
Bath	Flooding	Fire Department	Purchase, or relocate structures located in hazard- prone areas	Acquire funding	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> In part	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> In part

Sinkholes/subsidence and land use changes and warehouse development were also identified as hazards for East Allen/Bath. Water quality and air quality issues were not viewed as hazards of concern.

## **Bushkill Township**

### *Overview of Municipality*

Bushkill Township is located on the northern end of Northampton County and has a population of approximately 9,000. The Township is approximately 25 square miles large and does not include a lot of business or industry. Historically it was a farming community and a lot of agricultural land still exists throughout the township. There is also a lot of forested area that includes streams, wetlands, and vernal ponds. The Appalachian Mountain is the northern border of the township.

Flooding has been the most frequent concern in our community. Bushkill Creek and Sobers Run flow through a large portion of our Township. The “Penny Hole” in Bushkill Creek on W Douglasville Rd is an area of frequent flooding. Currently, no organization or physical location in the community serves as a designated resiliency hub.

### *Existing Plans*

Nazareth Area Multi-Municipal Plan: <https://nazplan.org/>

Open Space Plan: <https://bushkilltownship.com/forms/openspaceplan.pdf>

Emergency Operation Plan

Bushkill Creek Act 167 Plan: <https://ecode360.com/31944511>

Monocacy Creek Act 167 Plan: <https://ecode360.com/31950589>

### *Existing Ordinances*

Zoning Ordinance Article 9 Natural Resource Protection, Bushkill’s Subdivision and Land Development Ordinance, has several provisions for sustainability and natural resource protection. There are specific Floodplain Requirements, Requirements for Stormwater Management to be installed for all new development, Native Trees/Shrubs to be included in landscape plans, and an approved list of Native Species to be planted.

Hazards, Assets, Goals, and Actions

Hazard	Assets	Future Vulnerability Change	Goals (Short-Term ST/Long-Term LT)	Action Steps	In HMP?	In the Regional Plan?
Flooding	Floodplain Ordinance, appointed Floodplain Manager, Official Map with "Proposed Greenway Areas" to be preserved including a 150 foot buffer along all waterways	Flooding will increase; Risk to structures and residents will decrease due to land preservation efforts and the floodplain ordinance	Acquire more Conservation Easements to protect the "Proposed Greenway" along waterways within the township (ST)	Contact landowners with significant stream frontage and ask if they would be interested in placing a Conservation Easement on their property	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> In part	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> In part
			Allow preserved "Greenway Area" to naturalize, providing a natural vegetated buffer for flood control and erosion control (LT)	Apply for funding to revegetate/naturalize preserved properties with stream frontage	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> In part	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> In part
			Replace all undersized infrastructure to prevent clogging during heavy precipitation events (LT)	Apply for funding to replace undersized and deteriorating stormwater and stream culvert infrastructure	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> In part	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> In part
Invasive Species	Kenneth Butz Elementary School to teach students about invasive species, how to ID them, and why they are bad; Documentation displayed at the Township Owned Preserves and Trails	More invasive species will spread onto properties over time	Reduce spread of Mile-A-Minute and Canada Thistle in township owned parks, preserves, and trails (ST)	Hire a certified pesticide applicator to treat properties where these invasive species are present	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> In part	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> In part
			Continued treatment to these properties and expanded education concerning invasive species and the problems they pose (LT)	Work with the local schools, Penn State Extension, and Northampton County for educational outreach on invasive species	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> In part	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> In part



Pandemics	Fire Company and Bushkill Township's Emergency Management Coordinator	Expected to increase in frequency as global population increases	Keep a designated Emergency Management Coordinator appointed for the township to educate Township staff about any potential pandemics and what to do during these pandemics; Township staff will communicate with the public (ST)	Keep the Township Emergency Management Coordinator active in Board of Supervisor meetings and regular check-ins	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> In part	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> In part
			Use township planning to sustainably develop Bushkill Township; Limit high density development to certain areas and plan for a more rural area in the remainder of the Township (LT)	Bushkill Township EAC, Board of Supervisors, and Open Space Coordinator will work with the Planning and Zoning departments to ensure sustainable development	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> In part	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> In part
Wildfires	Government buildings and the local fire department can help with education and outreach, warning when there is a burn ban, and treatment of potential wildfires	Increase due to more extreme weather	Alert residents and visitors when there is a burn ban and educate residents about the dangers of wildfires (ST)	Utilize the Township newsletter, website, and display board at the fire department to relay outreach messages to the public	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> In part	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> In part
			Have a well-funded and supported local fire department available to treat potential wildfires (LT)	Support the fire department by attending events and advertising for their events	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> In part	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> In part

Land Use Changes and Warehouse Development	Township Municipal Office and Staff; Land preservation initiatives	Limited remaining land for warehouse development; Land use change will occur as farming becomes less prevalent and the farms are sold to developers	Continue land preservation efforts and education (ST)	Continue outreach and education to residents regarding land preservation and Conservation Easements; Reach out via mail and Township Newsletter	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> In part	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> In part
			Continue Land Preservation through Bushkill Township's Open Space Program and education and outreach to residents regarding the benefits of land preservation (LT)	Continue using the Open Space Program and Open Space Program funds to preserve properties that include sensitive natural resources throughout the Township; Educate residents on these sensitive natural resources and the value of clean water	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> In part	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> In part

Wind, winter storms, extreme heat/heat waves, drought, radon exposure, hailstorms, sinkholes/subsidence, and air quality issues are not considered hazards of concern.

### *Next Steps*

Personnel involved: Bushkill Township Staff, EAC, Board of Supervisors, and Emergency Management Coordinator

Funding/other resources: Grant funding will be needed for some actions. Bushkill Township staff will be responsible for applying for grant funding.

Prioritization: The most urgent action will be to address any undersized and deteriorating stormwater infrastructure and to address deteriorating stream culverts. This work has already begun and we have secured some grant funding to address these issues. The next action is to continue preserving properties through Bushkill Township's Open Space program.

Measures of success: Progress will be tracked by completing projects that grant funding was applied for. Bushkill Township also keeps track of how many acres of property are preserved each year. There is no set goal for preservation, but any land preserved helps towards resiliency from these hazards.

## **Palmer Township**

### *Overview of Municipality*

Palmer Township is a suburban township located in the central-east portion of Northampton County, Pennsylvania. It encompasses an area of 10.7 square miles. Palmer Municipal Fire Department (PMFD) is a combination department with 42 active volunteer firefighters and one paid Commissioner. The Department provides fire and emergency service response to Palmer Township and operates out of 2 stations. We provide automatic aid to Plainfield Township, Lower Nazareth Township, and Bethlehem Township.

The Lehigh River is the Township's southern border and the Bushkill Creek forms the eastern border. A walk/bike trail extends from the Southwest along the Lehigh River and it continues along the Eastern border following the Bushkill Creek. The Schoeneck Creek also traverses the northern portion of the Township. Flooding has been a problem along the Bushkill and Schoeneck Creeks as well as poor drainage and low terrain areas during significant storm events. Sinkholes have also been an issue in the Township.

Columbia Gas has a natural gas line that runs through the Township. Met Ed has two substations located in Palmer Township. We have Palmer Park Mall and 25th Street Shopping Center within our district. Amazon.com, UPS, LuLu, II-VI, XPO Logistics, and Werner Trucking operate large industrial/commercial facilities in our area. We have about 500 acres of woodlands.

US Rt. 22 traverses east-west across the Township. PA Rt. 248 travels southeast and interchanges with US Rt. 22. An interchange at Main Street and Rt. 33 is a critical transfer hub for Interstate travel of commercial hauling and transportation. It has spiked an increase in industrial development and an increase in tractor trailer traffic. Amazon.com, UPS, and XPO Logistics have several trailers per hour. A new housing development with 142 single family homes will be completed in Fall 2022. There has also been a shift from single family dwelling to multifamily dwelling with the construction of apartment complexes three to four stories in height.

The area is strategically located 90 miles west of NYC and even closer to prosperous and busy areas in NJ. Many families from the NY Metropolitan area have moved to Palmer Township as our population has risen 28.5% since 2000, 6.6% since 2010. We have a moderate climate, but cool air trapped in the valleys can cause frequent freezing rain.

Our area has had a steep 13.9% drop in home values over the past six years while the property tax on our homeowners has soared to \$18.15 per thousand, which is 33.3% above U.S. norms. 42.34% of our homes were built prior to 1970. 22.05% of our population is under age 18. 20.2% are over the age of 65. 42.25% are either under age 18 or over 65 which is a risk for our emergency responders and generally poor contributors to our tax base.

### *Experiences with Hazards*

Over the last ten years, Palmer Township has experienced several severe weather events. These include:

- Tropical Storm Ida
- Tropical Storm Isaias
- Winter Storm Pax
- Winter Storm Gail
- Winter Storm Orlena

- Rain event July 16, 2023

With the major flooding from Tropical Storm Isaias, Palmer Township secured funding assistance from FEMA/PEMA for hazard mitigation efforts. The \$325,000 grant award was used to investigate the existing storm water system and plan mitigation efforts to reduce the flooding experienced in our most flood prone areas. The study was completed in Fall 2023, and in January 2024 a three-phase construction plan was presented to reduce the impact of severe weather events.

#### *Designated Resiliency Hub*

We currently use the Municipal Building located at 3 Weller Place as a “hub” to obtain resiliency planning and information. In addition, the Township Emergency Management Coordinator has several resources on resiliency.

#### *Existing Plans*

Flooding Mitigation Plan (in development)

Long-Term Comprehensive Plan: <https://palmertwp.com/comprehensive-plan.html>

Open Space Management Plan: [https://palmertwp.com/forms/open\\_space\\_2020.pdf](https://palmertwp.com/forms/open_space_2020.pdf)

Transportation Plan

Disaster Recovery Plan

Emergency Operations Plan

In addition to those listed above, Palmer Township has a Hazard Mitigation Plan and Continuity of Operations Plan. These plans are not currently available online. The Hazard Mitigation Plan is in the final stages of the mandatory 5-year review and update process. This review and update process is a coordinated effort of Northampton and Lehigh County municipalities.

#### *Hazards, Assets, Goals, and Actions*

Palmer Township’s goals and planned actions related to building resilience to hazards are included in their Municipal Annex to the 2024 Lehigh Valley Hazard Mitigation Plan.<sup>42</sup> These include actions to:

- Maintain compliance with the National Flood Insurance Program (NFIP)
- Reduce damage and losses from flooding
- Conduct and facilitate community and public education and outreach
- Update zoning and SALDO regulations to align with other municipal plans
- Install generators at critical facilities (municipal building, community center)
- Install underground stormwater culvert system

Further detail about specific actions can be found in the Municipal Annex document.

The Municipal Annex also outlines community assets to protect from hazard events and leverage in building resiliency. These include:

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<sup>42</sup> <https://ncem-pa.org/2024-mitigation-plan/>

<b>Vulnerable Populations</b>	Grandview Apartments Easton Skilled Nursing Center (2600 Northampton Street)
<b>Large Crowds/Gatherings</b>	Palmer Community Day Event - annually in August at Fairview Park Easton High School Bonfire Special Event - annually, day before Thanksgiving Charles Chrin Community Center Palmer Park Mall St. Janes Church Easton Area High School Palmer Elementary School Tracy Elementary School Easton Area Academy Multiple township-wide athletic fields
<b>Major Employers</b>	Amazon Fulfillment Center XPO Logistics Majestic Athletic HCR Manor Care Raub's Farm UPS Township Government 25th Street Shopping Center Palmer Town Center - Giant, Home Depot William Penn Plaza MCS Industries Palmer Park Mall Easton Area School District Grainger
<b>Natural/Green Infrastructure</b>	Riparian Area at Mill Race Park Lehigh River Shad Ladders Multiple Retention Ponds Natural Wetlands behind Suburban EMS Easton Area High School Riparian Area and Pond Entire Bike Trail System (access for first responders)
<b>Vulnerable Buildings</b>	Easton Area Academy Nazareth Borough Municipal Authority GJ Mills Apartments (serious flooding) Art's Toy Manufacturing (vacant) Palmer Business Park Hess Wood Recycling Pallet Express Blue Easel Tower Products
<b>Critical Infrastructure</b>	State Route 22 Met ED Power Plant Sub Stations

	<p>State Route 33  Natural Gas Transmission Pipelines (several)  Dam at Bushkill Creek (Penn Pump Park)  Dam at Bushkill Creek (next to the Crayola building)</p>
<p><b>Critical Emergency Services/Shelter</b></p>	<p>Fire Department  Suburban EMS  Easton Area High School  Palmer Elementary School  Easton Area Academy  Police Department  Palmer Township Municipal Building  Charles Chrin Community Center-shelter  Tracy Elementary School</p>
<p><b>Cultural and Historical Resources</b></p>	<p>Briarcliffe Park  Howard Lane Park  Labarre Park  Penn Pump Park  Stephens Street Park  Palmer Community Library  Blue Easel  Seip House  Fairview Park  Keystone Park  Old Orchard Park  Village at Mill Race Park  1818 Tavern  Seinsville Inn</p>



## **Portland Borough**

<https://docs.google.com/document/d/1F7838Cx4ipWMtYqoK64lCy-cqDlqwBzEipFJ6lLta38/edit>

### *Overview of Municipality*

Portland is a borough in Northampton County, Pennsylvania. Our population was 494 at the 2020 census and the economy of Portland, PA employs 180 people. According to the most recent ACS, the racial composition of Portland was: White: 95.21%, Two or more races: 3.14%, Black or African American: 0.33%, Other race: 1.32%. Businesses in the center of town include Janet's Jems Thrift Shoppe, Alexandra and Nicolay Chocolate, Port2Flavors, Fuhrer's, Tobacco Shop, Edge of the Woods, Portland Auto Repair, The Bar (personal training), Portland Antiques & Collectibles, Dunkin Donuts. Portland's biggest asset is considered its close proximity to the Delaware River and is often marketed as a "river town."

Portland has struggled with flooding on several occasions in its history. In general, the flooding that the Borough has experienced comes from the storm drains and when the river levels get too high by Jacoby Creek. Unlike traditional riverine flooding, officials note that the river does not come over the banks but rather backs up and has been observed coming backwards up and out of the storm drains near the intersection of Delaware Avenue and State Street, ultimately crossing the bank of the creek by the site of the current Dunkin location, and spreading across the downtown. Hurricane Ivan in September 2004, by contrast, resulted from approximately 7 inches of rain which caused flash flooding on the Jacoby Creek and then river flooding through the normal paths a few days later."

### *Experiences with Hazards*

Historic Crests (<https://water.weather.gov/ahps2/hydrograph.php?wfo=phi&gage=bvbn4>)

- (1) 30.21 ft on 08/19/1955
- (2) 28.60 ft on 10/10/1903
- (3) 27.24 ft on 04/04/2005
- (4) 27.16 ft on 06/29/2006
- (5) 25.00 ft on 03/19/1936

### *Designated Resiliency Hub*

Portland Borough does not currently have a physical location for a resiliency hub, but there may be an opportunity for one in the municipal building.

### *Existing Plans*

Our Borough received the Community Plan of the Year in 2014 from the Lehigh Valley Planning Commission for our Comprehensive Plan.

To view: [Resolution 2014-7](#)

To view the: [Comprehensive Plan](#)

To view the maps:

[Community Facilities & Utilities Map](#)

[Existing Land Use Map](#)

[Geology Map](#)

[Natural Features Map](#)

[Regional Map](#)

[Transportation Map](#)

Emergency Operations Plan

The Borough is currently working with the Northampton County Emergency Management to meet the requirements for the 5-year required update of the by-county Lehigh Valley Hazard Mitigation Plan.

*Hazards, Assets, Goals, and Actions*

<b>Hazard</b>	<b>Assets</b>	<b>Future Vulnerability Change</b>	<b>Goals (Short-Term ST/Long-Term LT)</b>	<b>Action Steps</b>	<b>In HMP?</b>	<b>In the Regional Plan?</b>
Flooding	Portland Municipal Building (206 Division St), Portland - Upper Mt. Bethel Food Pantry PUMP (111 State St), Portland Hook & Ladder No. 1, Refiner's Fire Ministry, September 11th National Memorial Trail (on-road & multi-use trail via walking bridge), Delaware River	Portland has experienced an increase in non-English speaking residents, new businesses opening and the encouragement of new businesses opening in flood-prone areas; Flooding will continue to have a significant impact	Create a plan for the Borough and the residents for how to react to a possible flooding situation, including providing contact information with household details for emergency alerts, places to go to seek shelter, contact lists, supplies to have on hand, etc. (ST)	Consult with Portland Emergency Management Team to create a plan to develop a current emergency contact list	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> In part	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> In part
			There are 90 properties in Portland that have greater than a 26% chance of being severely affected by flooding over the next 30 years, which is 36% of all properties in Portland; Provide specific efforts to make and steps to take once the water crests at the danger level to protect people and property (LT)	Write and pass an ordinance requiring natural infrastructure on new development projects in high-risk flooding areas; Apply for grants that would limit the ability of flooding to even occur	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> In part	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> In part
Sinkholes/ Subsidence	Government Services / grants; Improved storm drainage	Decreased risk as upgrade storm drainage systems; Increased risk from weather-related hazards	Dedicate more time, resources, and matching funds to securing grants like we did in 2023 to improve our storm drainage (ST)	Our intention is to dedicate funding toward a grant writer to identify and submit these grant opportunities	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> In part	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> In part
			Develop a program to help residents identify sinkholes on their property and provide access to resources to recover quickly (LT)	Assign program creation to one of the Council committees	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> In part	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> In part

Invasive species, winter storms, extreme heat and heat waves, drought, pandemics, radon exposure, wildfires, landslides, and land use changes and warehouse development are not considered hazards of concern. Although Portland Borough does not experience air quality issues now, it is anticipated that it will become an increasing issue as nearby development is completed and the tractor trailer traffic and idling increases substantially.