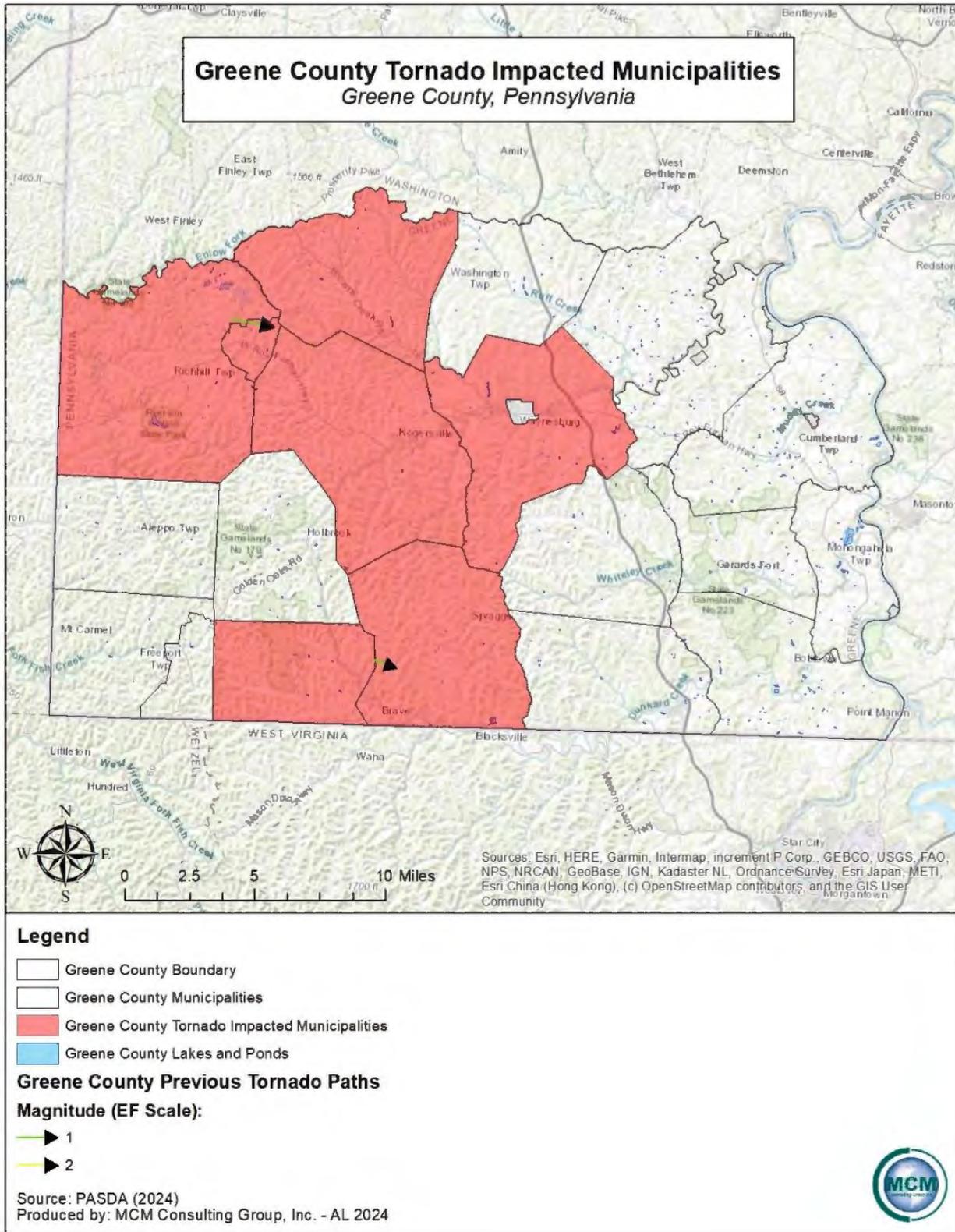


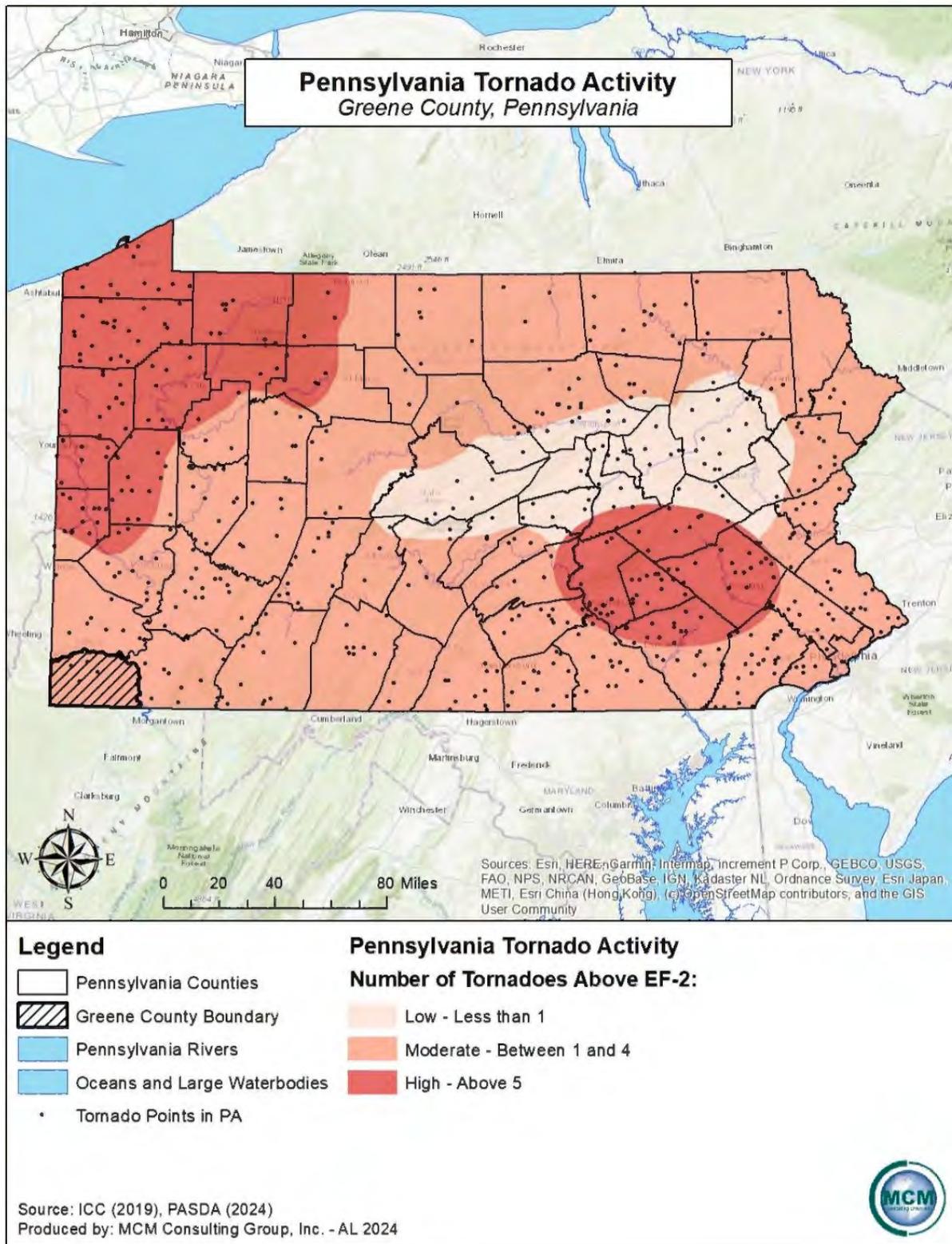
# Greene County, Pennsylvania 2025 Hazard Mitigation Plan

Figure 37 - Tornado Activity in Greene County



# Greene County, Pennsylvania 2025 Hazard Mitigation Plan

Figure 38 - Tornado Activity in Pennsylvania



## *Greene County, Pennsylvania* *2025 Hazard Mitigation Plan*

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### **4.3.12. Wildfire**

#### **4.3.12.1 Location and Extent**

The most prevalent causes of devastating wildfires are droughts, lightning strikes, arson, human carelessness, and in rare circumstances, spontaneous combustion. Most fires in Pennsylvania are caused by anthropogenic fires such as debris burns that spread and get out of control. A fire, started in somebody's backyard, could travel through dead grasses and weeds into bordering woodlands starting a wildfire. Major urban fires can cause significant property damage, loss of life, and residential or business displacement. While wildfires are a natural and essential part of many native Pennsylvania ecosystems (e.g., pitch pine and scrub oak woodlands), wildfires can also cause devastating damage if they are undetected and allowed to propagate unfettered.

Wildfires most often occur in less developed areas such as open fields, grass, dense brush, or forests where they can spread rapidly by feeding off of vegetation and combustible fuels.

Wildfires are most prevalent under prolonged dry and hot spells, or general drought conditions.

Forested areas make up 62.0% of Greene County, while agriculture makes up approximately 28.2% of the total land area, increasing the geographic extent of wildfire vulnerability in the county. Under dry conditions or droughts, wildfires have the potential to burn forests as well as croplands. For recreational enjoyment, the county boasts several local parks, one state park, and natural areas that include a series of trail systems – all of which are at risk for wildfires.

#### **4.3.12.2 Range of Magnitude**

Forested areas, croplands and properties that are at the interface between wild lands and human development are most at risk for being impacted by and causing wildfires. If an urban fire or wildfire is not contained, secondary impacts including power outages may result. Other negative impacts of wildfires can include death of people, livestock, fish, and wildlife, and destruction of valuable property, timber, forage, recreational and scenic values. Wildfires can also cause severe erosion, silting of stream beds and reservoirs, and flooding due to a loss of ground cover.

Almost all of the wildfires in the county occur in remote areas or areas away from residential structures. Unlike the wildland fires that occur in other parts of the country and affect vast areas of land and residential communities, most fires in Greene County are contained before they cause damage or extensive property loss. However, the county recognizes that wildfires of some magnitude will continue to occur in Greene County and will have more detrimental effects if development in and/or around the natural areas increases.

The United States Forest Service utilizes the Forest Fire Assessment System to classify the dangers of wildfire. *Table 48 – Wildland Fire Assessment System* identifies each threat classification and provides a description of the level.

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Table 48 - Wildland Fire Assessment System

<b>Wildland Fire Assessment System (U.S. Forest Service)</b>	
<b>Rank</b>	<b>Description</b>
<b>Low (L)</b>	Fuels do not ignite readily from small firebrands although a more intense heat source, such as lightning, may start fires in duff or punky wood. Fires in open cured grasslands may burn freely a few hours after rain, but woods fires spread slowly by creeping or smoldering and burn in irregular fingers. There is little danger of spotting.
<b>Moderate (M)</b>	Fires can start from most accidental causes, but with the exception of lightning fires in some areas, the number of starts is generally low. Fires in open cured grasslands will burn briskly and spread rapidly on windy days. Timber fires spread slowly to moderately fast. The average fire is of moderate intensity, although heavy concentrations of fuel, especially draped fuel, may burn hot. Short-distance spotting may occur but is not persistent. Fires are not likely to become serious and control is relatively easy.
<b>High (H)</b>	All fine dead fuels ignite readily, and fires start easily from most causes. Unattended brush and campfires are likely to escape. Fires spread rapidly and short-distance spotting is common. High intensity burning may develop on slopes or in concentrations of fine fuels. Fires may become serious and their control difficult unless they are attacked successfully while small.
<b>Very High (VH)</b>	Fires start easily from all causes and, immediately after ignition, spread rapidly and increase quickly in intensity. Spot fires are a constant danger. Fires burning in light fuels may quickly develop high intensity characteristics such as long-distance spotting and fire whirlwinds when they burn into heavier fuels.
<b>Extreme (E)</b>	Fires start quickly, spread furiously, and burn intensely. All fires are potentially serious. Development into high intensity burning will usually be faster and occur from smaller fires than in the very high fire danger class. Direct attack is rarely possible and may be dangerous except immediately after ignition. Fires that develop headway in heavy slash or in conifer stands may be unmanageable while the extreme burning condition lasts. Under these conditions the only effective and safe control action is on the flanks until the weather changes, or the fuel supply lessens.

### **4.3.12.3 Past Occurrences**

The Pennsylvania Department of Conservation and Natural Resources (DCNR) has an extensive history of reported wildfires in its state forestry system and districts. Greene County lies in the Forbes District (District 4). DCNR's Bureau of Forestry District 4 encompasses Allegheny,

## *Greene County, Pennsylvania 2025 Hazard Mitigation Plan*

Greene, Washington, Fayette, Westmoreland, and Somerset counties; however, all of the district's state forest land is found only in Fayette, Westmoreland, and Somerset counties. District 4 experiences historically small numbers of fires and burned acres per year, but the risk of wildfire to the county exists because of the size of the acreage of forest land. It is also true that, due to the many acres of farmland, forested areas, and open space in the county, under the right conditions the potential exists for a significant wildfire.

In 2023, there were a total of 140 fires in District 4 that were responsible for destroying 123.8 acres. District 4 reports the following twenty-three-year wildfire summary based on observed and reported wildfires. *Table 49 – Annual Summary of Wildfire Events* illustrates the number of acres burned in a certain number of fires for District 4 from the year 2000 through the year 2023.

*Table 49 - Annual Summary of Wildfire Events*

<b>Annual Summary of Wildfire Events District 4</b>				
<b>Year</b>	<b>Number of Fires</b>	<b>Frequency Increase or Decrease</b>	<b>Acres</b>	<b>Severity Increase or Decrease</b>
2000	33	-	94.9	-
2001	45	↑	359.6	↑
2002	21	↓	61.7	↓
2003	30	↑	123.0	↑
2004	10	↓	27.9	↓
2005	40	↑	947.5	↑
2006	55	↑	86.4	↓
2007	7	↓	7.6	↓
2008	21	↑	525.5	↑
2009	42	↑	187.2	↓
2010	30	↓	75.1	↓
2011	7	↓	20.8	↓
2012	24	↑	57.8	↑
2013	49	↑	99.0	↑
2014	104	↑	176.1	↑
2015	92	↓	169.9	↑
2016	85	↓	926.6	↑
2017	52	↓	74.8	↓
2018	50	↓	79.6	↑
2019	50	=	61.9	↓
2020	120	↑	168.0	↑
2021	140	↑	424.6	↑
2022	88	↓	157.8	↓
2023	140	↑	123.8	↓

Source: PA DCNR, 2024

## *Greene County, Pennsylvania 2025 Hazard Mitigation Plan*

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In recent years, the number of prescribed burns in Pennsylvania has been increasing. This corresponds to an understanding of the need for fire in many natural ecosystems and management strategies for reducing vulnerability to wildfire; it also improves hunting opportunities. In 2022 there were sixty-three prescribed burns in the commonwealth that were carried out by the Pennsylvania Department of Conservation and Natural Resources (DCNR). This number is up by seventeen prescribed burns from the total number of reported prescribed burns in 2021 by DCNR only with a total of forty-six. Data for years after 2022 were not available at the time of writing this plan. Also, at the time of the writing of this plan, DCNR had paused prescribed burns across the commonwealth and stopped publishing a running list of counties with burn bans, opting for a statewide burn ban list instead. Greene County was not listed on the statewide burn ban list, nor were any of its contiguous commonwealth counties.

### **4.3.12.4 Future Occurrence**

Annual occurrences of urban fires and wildfires in Greene County are expected. Urban fires are most often the result of human errors, outdated wiring and occasionally, malintent (arson). The occurrence of large scale and intense wildfires is somewhat unpredictable and highly dependent on environmental conditions and human response. Weather conditions play a major role in the occurrence of wildfires, so in the event of drought conditions, wildfire caution should be heightened. Any fire without the quick response or attention of firefighters, forestry personnel, or visitors to the forest, has the potential to become a wildfire. In the year 2024, a year of abnormally dry conditions for the county, the numbers in *Table 49 – Annual Summary of Wildfire Events* are expected to be higher.

Climate change is expected to bring an elongated wildfire season and more intense and long-burning fires (Pechony & Shindell, 2010). In some regions of the United States, this is a very real concern. Northern California has experienced unprecedented devastating wildfires and continues to experience these events in a yearly fashion. The fires that have been occurring in California are thought to be burning faster and hotter due to worsening drought conditions caused by increased climate change (Cvijanovic et al., 2017). Wildfire conditions in Pennsylvania are not nearly as severe as in Northern California, but the intensification is a signal that the changes brought by climate change are relevant to wildfires. In Pennsylvania, higher air temperatures and earlier warming in the spring are expected to continue, resulting in more wildfire prone conditions in the summer and fall (Shortle et al., 2015).

Climate change significantly influences wildfires by altering environmental conditions. Rising temperatures, prolonged droughts, and changes in precipitation patterns create drier landscapes, fostering the ignition and rapid spread of wildfires. Elevated temperatures contribute to increased evaporation, drying out vegetation and creating more fuel for fires. Altered precipitation patterns can lead to extended periods of drought, further desiccating ecosystems. Climate change also affects the timing and intensity of seasons, extending the fire-prone period.

## *Greene County, Pennsylvania 2025 Hazard Mitigation Plan*

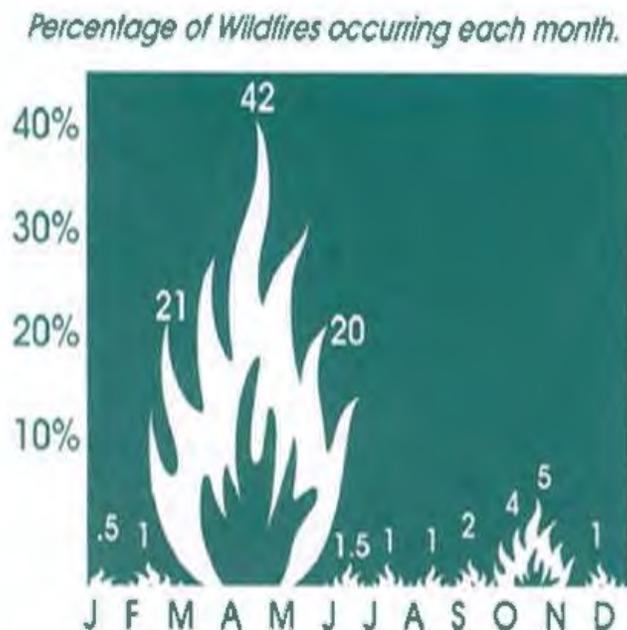
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### 4.3.12.5 Vulnerability Assessment

The size and impact of a wildfire depends on its location, climate conditions, and the response of firefighters. If the right conditions exist, these factors may often mitigate the effects of wildfires; however, during a drought, wildfires can be devastating. The highest risk for wildfires in Pennsylvania occurs during the spring (March to May) and the fall (October to November) months and 99% of all wildfires in Pennsylvania are caused by people. Approximately 83% of all Pennsylvania wildfires occur in the months outlined above. In the spring, bare trees allow sunlight to reach the forest floor, drying fallen leaves and other ground debris and increasing wildfire vulnerability. In the fall, the surplus of dried leaves is fuel for fires. Additionally, warming climate temperatures facilitate the expansion of pests and diseases that weaken trees, making forests more susceptible to ignition.

*Figure 39 – Seasonal Wildfire Percentages* shows the wildfire percentage occurrence during each month in Pennsylvania.

*Figure 39 - Seasonal Wildfire Percentages*



Firefighters and other first responders can encounter life-threatening situations due to forest and wildfires. Traffic accidents during a response and the impacts of fighting the fire once on scene are examples of first responder vulnerabilities. Firefighters call the area where homes and development meet and intermingle with undeveloped forests the Wildland Urban Interface or WUI. More than half of all wildfire ignitions in Pennsylvania occur within the WUI. People moving into the WUI often make choices that increase the potential for their homes to be destroyed by wildfire.

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The Wildland Urban Interface was nationally mapped by a United States Department of Agriculture Forest Service effort in 2015 that used data from 1990-2010 to develop a robust dataset that related housing density and vegetative density. The dataset provides a way to identify locations where larger numbers of people are living in or near natural areas that could be at risk in the event of a wildfire. The WUI defines two types of communities – interface and intermix. Intermix refers to areas where housing and wildland vegetation intermingle, and interface refers to areas where housing is in the vicinity of a large area of dense wildland vegetation. The WUI was the fastest-growing land use type in the United States between 1990 and 2010. Factors behind the growth include population shifts, expansion of cities into the wildlands, and the expansion of new vegetation growth. The primary cause has been the migration of people, not vegetation growth.

Pennsylvania is among the states with the largest WUI and the most housing units in a WUI designated area. Pennsylvanians desire the proximity of natural beauty in their daily lives, and the growth in WUI housing noted above illustrates this. *Figure 40 – Wildland Urban Interface* shows the extent of Greene County and the critical infrastructure facilities, functional needs facilities, and fire stations. Wildfire hazard is defined by conditions that affect wildfire ignition and/or behavior such as fuel, topography, and local weather. The many addressable structures in the Wildland Urban Interface and Intermix zones are broken up by assessed parcel use codes.

There are nine fire departments that serve Greene County, a list of which can be seen in *Figure 41 – Fire Station Locations*. Each fire department conducts its own schedule of in-house training sessions for its members. Other fire departments in contiguous counties are available via mutual aid.

The response of firefighters is integral to the containment of wildfires in the county. There is a potential for fire stations and services to close, which affects response to wildfire in Greene County. *Figure 41 – Fire Station Locations* illustrates the position of fire stations and the location of state game lands, state forests, and natural areas within Greene County. It is recommended that each municipality assess vulnerabilities to department closures by building a relationship with their local providers and planning accordingly for if a local service were to close.

As seen above in Section 4.3.12.4 climate change may increase the frequency of wildfires. With this potential increase in wildfires comes disruption of systems that humans rely upon for daily activities. The systems that wildfires most heavily impact include but are not limited to transportation, water supply, power, and communications. Wildfires can block off transportation routes directly or can impact visibility of transportation routes due to the intense smoke that can be produced and settle over roadways.

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As seen in the Community Profile of the county, *Table 3– Population Change in Greene County*, eighteen municipalities have seen a net population decrease from the 2010 decennial census to the 2020 decennial census. From this information, it can be speculated that these municipalities may have had decreased vulnerability to wildfires since 2010.

Unserved, underserved, and socially vulnerable populations within Greene County may be at an increased vulnerability to wildfires than other populations. This is because these populations may not have access to or the ability to relocate during wildfire events. Those that are unsheltered within Greene County have an increased vulnerability to wildfire events due to being openly exposed to the elements, such as bad air quality from the smoke that wildfires produce.

Greene County promotes fishing, hunting, camping, hiking, canoeing, and other outdoor activities. These land use events can increase the risk of wildfires starting. More than half of Greene County is made up of woodlands. Natural areas can be extremely vulnerable to wildfires within Greene County. Ecologically, these alter landscapes, compromising soil stability and disrupting ecosystems. Conditions of drought or invasive species that could damage forested areas can lead to wildfires. Wildfires can lead to devastation which can foster landslides and flash flood events. These events can destroy the forested terrain within the county and consume acres of traditional agricultural practices in a short amount of time. In addition to widespread burning that wildfires cause, these events also pollute the air within the county and surrounding areas, as well as waterways due to run off and the settling of the air pollution to ground level.

Wildfires may also rob a community of its historic and cultural treasures. There are many properties located in Greene County according to the National Register of Historic Places that may be at an increased vulnerability to wildfire. See the community profile section for a complete list.

### **Community lifeline facilities within the areas of high-density interface and high density intermix for Greene County include:**

- Greene County Courthouse
- James Parreco House
- McCracken Pharmacy
- Peters-Graham House
- Waynesburg Playground

### **Municipalities with higher wildfire risk due to areas of high-density interface or intermix:**

- Carmichaels Borough
- Center Township
- Cumberland Township
- Dunkard Township
- Franklin Township
- Greensboro Borough

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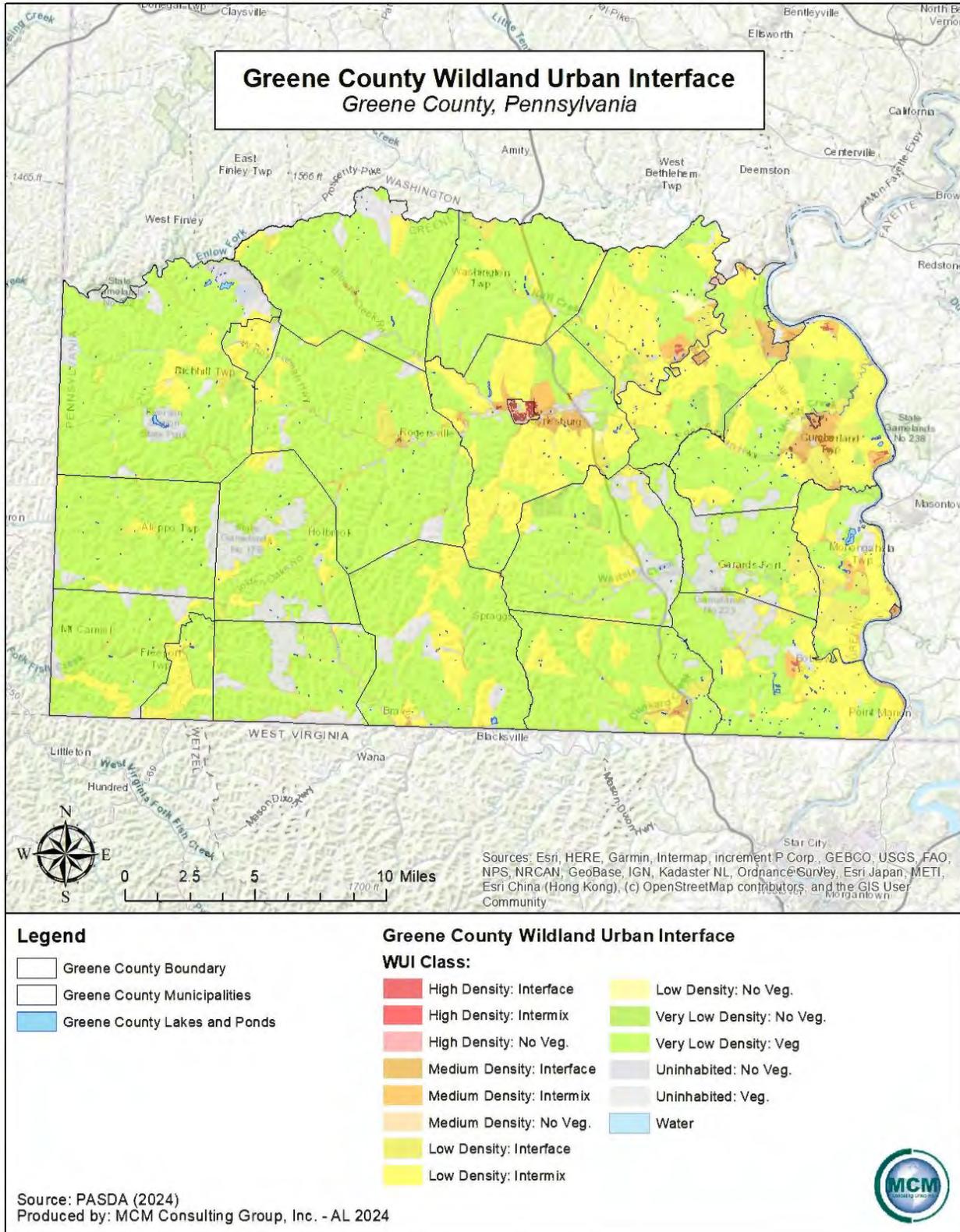
- Jackson Township
- Jefferson Borough
- Jefferson Township
- Monongahela Township
- Morgan Township
- Morris Township
- Perry Township
- Rices Landing Borough
- Richhill Township
- Wayne Township
- Waynesburg Borough
- Whiteley Township

### **Municipalities with lower wildfire risk due *no* areas of high-density interface or intermix:**

- Aleppo Township
- Clarksville Borough
- Freeport Township
- Gilmore Township
- Gray Township
- Greene Township
- Springhill Township
- Washington Township

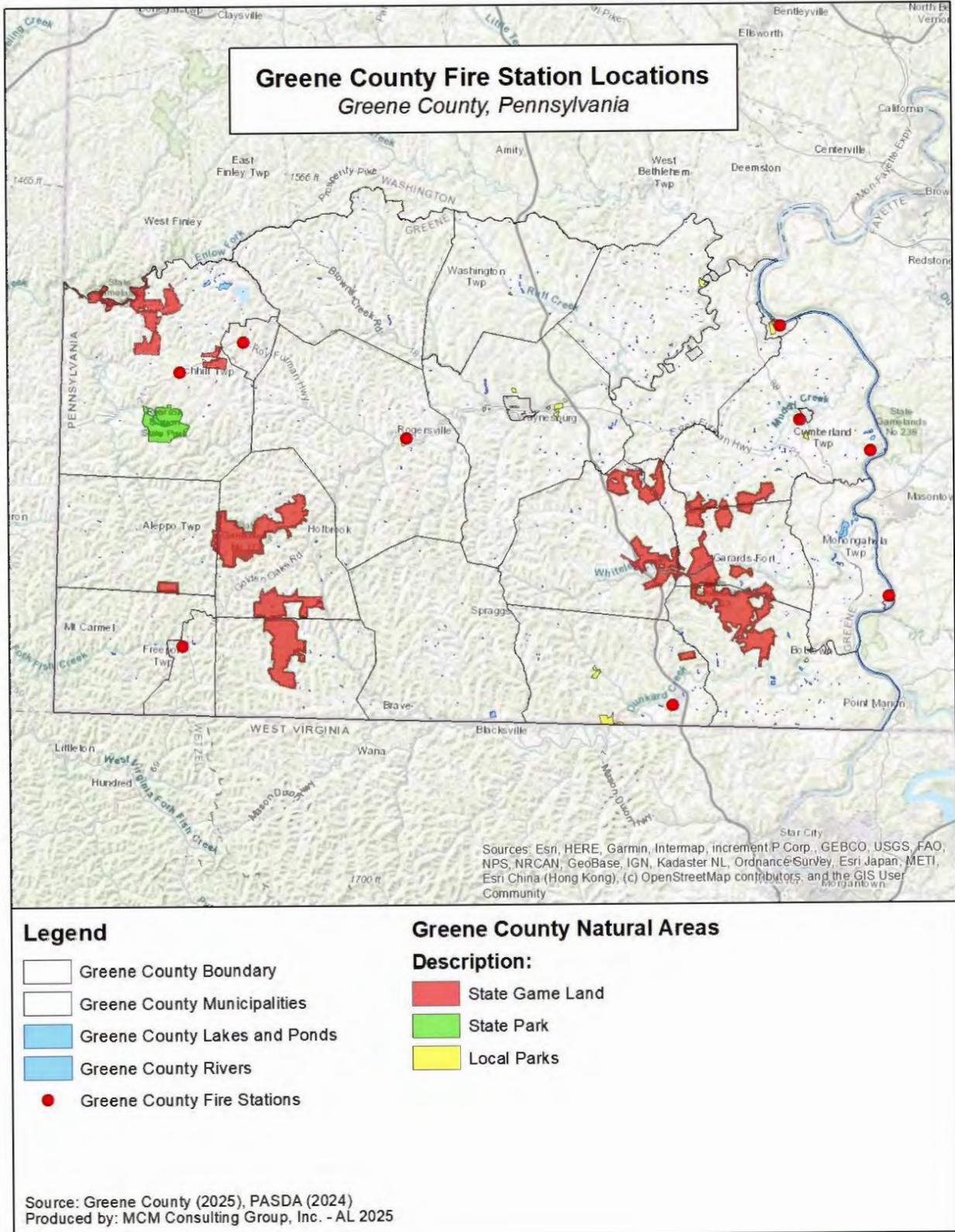
# Greene County, Pennsylvania 2025 Hazard Mitigation Plan

Figure 40 - Wildland Urban Interface



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Figure 41 - Fire Station Locations



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### **4.3.13. Winter Storm**

#### **4.3.13.1 Location and Extent**

Most severe winter storm hazards include heavy snow (snowstorms), blizzards, sleet, freezing rain, and ice storms. Since most extra-tropical cyclones (mid-Atlantic cyclones locally known as Northeasters or Nor'easters), generally take place during the winter weather months, these hazards have also been grouped as a type of severe winter weather storm. According to the Pennsylvania State Hazard Mitigation Plan (PA HMP), winter storms are frequent events for the Commonwealth and occur from late October until mid-April. These types of winter events or conditions are further defined below.

- **Heavy Snow:** According to the National Weather Service (NWS), heavy snow is generally snowfall accumulating to four inches or more in depth in twelve hours or less; or snowfall accumulating to six inches or more in depth in twenty-four hours or less. A snow squall is an intense but limited duration, period of moderate to heavy snowfall, also known as a snowstorm, accompanied by strong, gusty surface winds and possibly lightning.
- **Blizzard:** Blizzards are characterized by low temperatures, wind gusts of thirty-five miles per hour (mph) or more and falling and/or blowing snow that reduces visibility to 1/4-mile or less for an extended period of time (three or more hours).
- **Sleet of Freezing Rainstorm:** Sleet is defined as pellets of ice composed of frozen or mostly frozen raindrops or refrozen partially melted snowflakes. These pellets of ice usually bounce after hitting the ground and other hard surfaces. Freezing rain is rain that falls as a liquid but freezes into glaze upon contact with the ground.
- **Ice Storm:** An ice storm is used to describe occasions when damaging accumulations of ice are expected during freezing rain situations. Significant accumulations of ice pull down trees and utility lines resulting in loss of power and communication. These accumulations of ice make walking and driving extremely dangerous and can create extreme hazards to motorists and pedestrians.
- **Extra-Tropical Cyclone:** Sometimes called mid-latitude cyclones, are a group of cyclones defined as synoptic scale, low pressure, weather systems that occur in the middle latitudes of the Earth. These storms have neither tropical nor polar characteristics and are connected with fronts and horizontal gradients in temperature and dew point otherwise known as "baroclinic zones". Extra-tropical cyclones are everyday weather phenomena which, along with anticyclones, drive the weather over much of the Earth. These cyclones produce impacts ranging from cloudiness and mild showers to heavy gales and thunderstorms. Tropical cyclones often transform into extra-tropical cyclones at the end of their tropical existence, usually between 30° and 40° latitude, where there is insufficient force from upper-level shortwave troughs riding the westerlies (weather

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systems moving west to east) for the process of extra-tropical transition to begin. A shortwave trough is a disturbance in the mid or upper part of the atmosphere which induces upward motion ahead of it. During an extra-tropical transition, a cyclone begins to tilt back into the colder air mass with height, and the cyclone’s primary energy source converts from the release of latent heat from condensation to baroclinic processes.

### **4.3.13.2 Range of Magnitude**

The magnitude or severity of a severe winter storm depends on several factors including a region’s susceptibility to snowstorms, snowfall amounts, snowfall rates, wind speeds, temperatures, visibility, storm duration, topography, and time of occurrence during the day (e.g., weekday versus weekend), and time of season. The extent of a severe winter storm can be classified by meteorological measurements, such as those above, and by evaluating its societal impacts.

The Northeast Snowfall Impact Scale (NESIS) categorizes snowstorms in this manner. Unlike the Fujita Scale (tornado) and Saffir Simpson Scale (hurricanes), there is no widely used scale to classify snowstorms. NESIS was developed by Paul Kocin of The Weather Channel and Louis Uccellini of the National Weather Service and rank high impact, northeast snowstorms. These storms have large areas of ten-inch snowfall accumulations and greater. NESIS has five ranking categories: Notable (1), Significant (2), Major (3), Crippling (4), and Extreme (5). These ranking can be seen in *Table 50 – NESIS Winter Storm Rankings*. The index differs from other meteorological indices in that it uses population information in addition to meteorological measurements. Thus, NESIS gives an indication of a storm’s societal impacts. This scale was developed because of the impact of northeast snowstorms can have on the rest of the country in terms of transportation and economic impact.

*Table 50 - NESIS Winter Storm Rankings*

<b>NESIS Winter Storm Rankings</b>			
<b>Category</b>	<b>Description</b>	<b>NESIS Range</b>	<b>Definition</b>
1	Notable	1.0 – 2.49	These storms are notable for their large areas of 4-inch accumulations and small areas of 10-inch snowfall.
2	Significant	2.5 – 3.99	Includes storms that produce significant areas of greater than 10-inch snows while some include small areas of 20-inch snowfalls. A few cases may even include relatively small areas of very heavy snowfall accumulations (greater than 30 inches).

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<b>NESIS Winter Storm Rankings</b>			
<b>Category</b>	<b>Description</b>	<b>NESIS Range</b>	<b>Definition</b>
3	Major	4.0 – 5.99	This category encompasses the typical major Northeast snowstorm, with large areas of 10-inch snows (generally between 50 and 150 x 10 <sup>3</sup> mi <sup>2</sup> – roughly one to three times the size of New York State with significant areas of 20-inch accumulations.
4	Crippling	6.0 – 9.99	These storms consist of some of the most widespread, heavy snows of the sample and can be best described as crippling to the northeast U.S, with the impact to transportation and the economy felt throughout the United States. These storms encompass huge areas of 10-inch snowfalls, and each case is marked by large areas of 20-inch and greater snowfall.
5	Extreme	10+	The storms represent those with the most extreme snowfall distributions, blanketing large areas and populations with snowfalls greater than 10, 20, and 30 inches. These are only storms in which the 10-inch accumulations exceed 200 X 10 <sup>3</sup> mi <sup>2</sup> and affect more than 60 million people.
Source: Kocin and Uccellini, 2004			

The climate of Pennsylvania is marked by abundant snowfall. Winter weather can reach Pennsylvania as early as October and is usually in full force by late November with average winter temperatures between 20- and 40-degrees Fahrenheit. Greene County receives an average of about 30.1 inches of snowfall a year. Most areas of Greene County experience the effect of winter storms frequently. The general indication of the average annual snowfall map shows areas that are subject to a consistent risk for large quantities of snow. *Figure 42 - Pennsylvania Annual Snowfall 1981 – 2010* illustrates the long-term trends for snowfall accumulation in Pennsylvania over three decades.

**4.3.13.3 Past Occurrence**

*Figure 43 – Winter Storm Events by County in Pennsylvania* shows the number of winter storm events from 1950 – 2013 for the Commonwealth of Pennsylvania. *Table 52 – Greene County Winter Weather History* outlines the winter weather events that Greene County has experienced from 1950 to present. The table includes twenty-three winter weather events, fourteen heavy

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snow events, ten winter storms, and four ice storms. *Table 51 – Recent Annual Snowfall Estimates* show recent annual snowfall measurements as stated by NOAA. Overall, Greene County has experienced a decrease on the annual estimated average of snowfall. On average, the annual snowfall totals have decreased from 2020 to present.

*Table 51 - Recent Annual Snowfall Estimates*

<b>Recent Annual Snowfall Estimates</b>	
<b>Time Span</b>	<b>Snowfall Estimates (inches)</b>
1999-2000	15.3
2000-2001	19.5
2001-2002	12.3
2002-2003	46.5
2003-2004	18.6
2004-2005	23.2
2005-2006	10.0
2006-2007	30.8
2007-2008	21.6
2008-2009	24.7
2009-2010	70.7
2010-2011	26.7
2011-2012	M
2012-2013	M
2013-2014	35.8
2014-2015	10.0
2015-2016	27.4
2016-2017	1.9
2017-2018	14.0
2018-2019	22.9
2019-2020	8.7
2020-2021	35.9
2021-2022	25.2
2022-2023	5.5
Source: NOAA, 2024	
* "M" indicates missing data.	

*Table 52 - Greene County Winter Weather History*

<b>Greene County Winter Weather History</b>		
<b>Location</b>	<b>Date</b>	<b>Event Type</b>
Greene County	01/06/1996	Heavy Snow
Greene County	02/04/1998	Winter Storm
Greene County	01/02/1999	Winter Storm
Greene County	01/08/1999	Winter Storm
Greene County	01/13/1999	Winter Storm
Greene County	03/14/1999	Heavy Snow
Greene County	12/13/2000	Winter Storm
Greene County	01/20/2001	Heavy Snow

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<b>Greene County Winter Weather History</b>		
<b>Location</b>	<b>Date</b>	<b>Event Type</b>
Greene County	01/06/2002	Heavy Snow
Greene County	12/05/2002	Heavy Snow
Greene County	02/16/2003	Heavy Snow
Greene County	12/06/2003	Heavy Snow
Greene County	12/14/2003	Heavy Snow
Greene County	01/17/2004	Ice Storm
Greene County	02/05/2004	Ice Storm
Greene County	01/27/2009	Ice Storm
Greene County	12/18/2009	Heavy Snow
Greene County	02/05/2010	Heavy Snow
Greene County	01/20/2012	Ice Storm
Greene County	03/24/2013	Heavy Snow
Greene County	02/02/2014	Heavy Snow
Greene County	02/04/2014	Winter Storm
Greene County	03/02/2014	Winter Weather
Greene County	12/02/2014	Winter Weather
Greene County	03/04/2015	Heavy Snow
Greene County	01/22/2016	Heavy Snow
Greene County	01/05/2017	Winter Weather
Greene County	01/12/2018	Winter Weather
Greene County	11/14/2018	Winter Weather
Greene County	02/01/2019	Winter Weather
Greene County	02/20/2019	Winter Weather
Greene County	12/13/2019	Winter Weather
Greene County	02/07/2020	Winter Weather
Greene County	12/01/2020	Winter Weather
Greene County	12/16/2020	Winter Storm
Greene County	12/24/2020	Winter Weather
Greene County	02/01/2021	Winter Weather
Greene County	02/08/2021	Winter Weather
Greene County	02/10/2021	Winter Weather
Greene County	02/15/2021	Winter Weather
Greene County	01/06/2022	Winter Weather
Greene County	01/16/2022	Winter Storm
Greene County	01/24/2022	Winter Weather
Greene County	02/03/2022	Winter Storm
Greene County	03/11/2022	Winter Storm
Greene County	12/23/2022	Winter Weather
Greene County	12/18/2023	Winter Weather
Greene County	01/06/2024	Winter Weather
Greene County	01/18/2024	Winter Weather
Greene County	02/16/2024	Winter Weather
Greene County	02/24/2024	Winter Weather
Source: NOAA NCEI, 2024		

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### **4.3.13.4 Future Occurrence**

Winter storm hazards in Pennsylvania are guaranteed yearly since the state is located at a relatively high latitudes resulting in winter temperatures that range between 0- and 32-degrees Fahrenheit for a good deal of the fall through early spring season (later October until mid-April). In addition, the state is exposed to large quantities of moisture from both the Great Lakes and the Atlantic Ocean. While it is almost certain that a number of significant winter storms will occur during the winter and fall season, what is not easily determined is how many such storms will occur during that time frame. Based on historical snow related disaster declaration occurrences, the Commonwealth of Pennsylvania can expect a snowstorm of disaster declaration proportions, on average, once every three to five years. Similarly, for ice storms, based on historical disaster declarations, it is expected that on average, ice storms of disaster proportions will occur once every seven to ten years within the state.

Climate change could increase the intensity of winter storms in the northeastern United States and Greene County, Pennsylvania. With warmer air temperatures, more moisture will be held in the air, and if the temperatures on the ground are below freezing, this could result in more snow falling during a weather event like a winter storm. These events may become less frequent as the climate warms, but they could be more intense.

### **4.3.13.5 Vulnerability Assessment**

Severe winter storms are of significant concern to Greene County because of their frequency and magnitude in the region. Additionally, they are of significant concern due to the direct and indirect costs associated with these events; delays caused by the storms and impacts on the people and facilities of the region related to snow and ice removal, health problems, cascade effects such as utility failure and traffic accidents, and stress on community resources.

Every year, winter weather indirectly and deceptively kills hundreds of people in the United States, primarily from automobile accidents, over exertion, and exposure. Winter storms are often accompanied by strong winds creating blizzard conditions with blinding win-drive snow, drifting snow, extreme cold temperatures, and dangerous wind chill. They are considered deceptive killers because most deaths and other impacts or losses are indirectly related to the storm. Heavy accumulations of ice can bring down trees and powerlines, disabling electrical power and communications for days or weeks. Heavy snow can immobilize a region and paralyze a city, shutting down all air and rail transportation and disrupting medical and emergency services. The economic impact of winter weather each year is quite large, with costs for snow removal, damage, and loss of business in the millions each year. Heavy snow can immobilize and strand commuters as well as stopping the flow of supplies through an area or transportation corridor. In rural areas, homes and farms may be isolated for days and unprotected livestock may be lost. Bridges and overpasses are particularly dangerous because they freeze

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before other transportation surfaces. For the purposes of this Hazard Mitigation Plan, the entire population of Greene County (36,484 as of the 2020 U.S. Census Bureau, American Community Survey estimates) is exposed to severe winter storm events. The elderly are considered the most susceptible to this hazard due to their increased risk of injury and death from falls, overexertion, and or attempts to clear ice and snow. The elderly population is also more vulnerable to utility outages in winter, especially when they are paired with winter storm events. Vulnerable populations within Greene County may not have access to housing or their housing may be less able to withstand cold temperatures (e.g., homes with poor insulation and heating supply). The unsheltered populations of an area are at most risk to winter storm events.

The table below illustrates the number of citizens per municipality under the age of five or over the age of sixty-five years of age who are at an increased vulnerability to winter storms, and cascading hazards from winter storms:

*Table 53 - Population per Municipality under 5 Years or 65 Years or Older*

<b>Population per Municipality under 5 Years or 65 Years or Older</b>				
<b>Municipality</b>	<b>Number of People under 5 years of age</b>	<b>Percent of Population (%)</b>	<b>Number of People 65 years or older</b>	<b>Percent of Population (%)</b>
Aleppo Township	63	12.0	91	17.4
Carmichaels Borough	17	3.7	57	12.3
Center Township	65	5.8	165	14.7
Clarksville Borough	2	1.0	37	17.8
Cumberland Township	308	4.8	1338	21.0
Dunkard Township	187	8.0	422	18.1
Franklin Township	186	2.7	1543	22.2
Freeport Township	6	2.5	36	15.0
Gilmore Township	16	7.2	54	24.4
Gray Township	6	4.3	22	15.6
Greene Township	14	2.80	75	14.80
Greensboro Borough	21	5.80	47	13.00
Jackson Township	11	2.30	56	11.70
Jefferson Borough	7	2.90	41	16.90
Jefferson Township	68	2.90	566	24.50
Monongahela Township	99	7.10	293	21.10
Morgan Township	85	4.20	367	18.20
Morris Township	27	4.40	137	22.30
Perry Township	34	2.60	269	20.90
Rices Landing Borough	40	8.30	53	11.00
Richhill Township	30	3.80	123	15.60
Springhill Township	12	5.10	62	26.50
Washington Township	32	3.30	315	32.70
Wayne Township	66	6.50	219	21.40
Waynesburg Borough	318	8.00	568	14.40
Whiteley Township	28	5.10	99	17.90

Source: United States Census Bureau (USCB), American Community Survey (ACS), 2022

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Approximately 4.9% of the total population of Greene County is under the age of five years old and approximately 19.7% of the total population is sixty-five years old or older. In total, 24.6% of the population is at an increased risk from exposure to winter storm events and cascading hazards.

The entire general building stock inventory in Greene County is exposed and vulnerable to the severe winter storm hazard. In general, structural impacts include damage to roof and building frames, rather than building content. There was no historical information available that identified property damages within Greene County due to a single severe winter storm event. Current modeling tools are not available to estimate specific losses for this hazard. All of the historic and cultural properties in Greene County are at similar vulnerability to severe winter storms. The properties include, but are not limited to, the Alexander V. Boughner House, John Corbley Farm, John Minor Crawford House, William Crawford House, William Cree House, Glassworks-Core House, Glassworks-Gabler House, Greene Academy, Greene Hills Farm, Greensboro Public School, Hamilton-Ely Farmstead, Hanna Hall, Charles Grant Heasley House, Hughes House, James Jones House, Miller Hall, James Parreco House, Peters-Graham House, W.A. Young and Sons Foundry and Machine Shop. The cultural aspects of Greene County, including two museums are also at an increased vulnerability to winter storms. These two museums are the Paul R. Stewart Museum at Waynesburg University and the Greene County Historical Society, and both are in Waynesburg Borough.

A specific area that is vulnerable to the severe winter storm hazard is the floodplain. At risk general building stock and infrastructure in floodplains are present in the flood profile due to snow and ice melting. Generally, losses from flooding associated with severe winter storms should be less than those associated with a 100-year or 500-year flood.

Full functionality of critical facilities such as police, fire, and medical facilities is essential for response during and after a severe winter storm event. These critical facility structures are largely constructed of concrete and masonry; therefore, they should only suffer minimal structural damage from severe winter storm events. Backup power is recommended critical infrastructure and facilities due to the potential for power interruption. Infrastructure at risk for this hazard includes roadways that could be damaged due to the application of salt and intermittent freezing and warming conditions that can damage roads over time. Severe snowfall requires infrastructure to clear roadways and alert citizens to dangerous conditions. In spring, this type of roadway damage must be repaired. Additionally, freezing rain and ice storms impact utilities (i.e., power lines and overhead utility wires) causing power outages for hundreds to thousands of residents.

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The cost of snow and ice removal and repair of roads from the freeze/thaw process can drain local financial resources. However, because severe winter storms are a regular occurrence in this area, Greene County is generally well-prepared for snow and ice removal each season.

Winter storm vulnerability is going to increase in Greene County when climate change is considered. As mentioned above in Section 4.3.13.4, climate change is expected to increase the intensity of winter storms. With warmer air temperatures, more moisture will be held in the air, and if temperatures on the ground rapidly decrease, or fall below freezing, this could result in more snow falling during a weather event like a winter storm. These events may become less frequent as the global temperatures increase, but they could become more intense.

As seen in *Table 3 – Population Change in Greene County*, eight municipalities have seen a net population increase from the 2010 census to the 2020 census, according to the U.S. Census Bureau, American Community Survey estimates. The impact that a winter storm can have on these municipalities will vary. Municipalities with an increase in population could have more resources available as well as personnel to mitigate the impacts that a winter storm can bring to one's community. A municipality that experienced a population decrease may not have these resources or personnel available to prepare for and mitigate against an impending winter storm. Adversely, municipalities with an increase in population could experience a more significant impact simply because they have more individuals being impacted compared to a smaller municipality. All municipalities within Greene County are at the same level of risk to winter storms, but the direct and indirect impacts and vulnerability will vary by municipality.

Vulnerable, or underserved, populations within Greene County may not have access to housing or their housing may be less able to withstand cold temperatures (e.g., homes with poor insulation and heating supply). The unsheltered populations of an area are at the highest vulnerability to winter storm events. Individuals who are also in poverty, based on information provided in the United States Census are more likely to have issues meeting economic requirements for utility bills in the winter as well. All of these populations can be considered socially vulnerable or communities that have unmet needs.

Land use and major developments will have negligible impacts on the vulnerability of Greene County to winter storm events. Land use may impact the response capabilities of Greene County in a winter storm event, but changes in that land use will not increase the vulnerability. Greene County has significant capabilities to respond to winter storm events. Major development in the county will need to be planned to allow for winter storm response, including size and makeup of transportation routes, and location of snow removal areas.

Winter storms may also negatively impact the natural resources in Greene County. According to the Pennsylvania Department of Transportation, 446,991 tons of salt were used in the commonwealth, including Greene County, during the 2022 through 2023 winter storm weather

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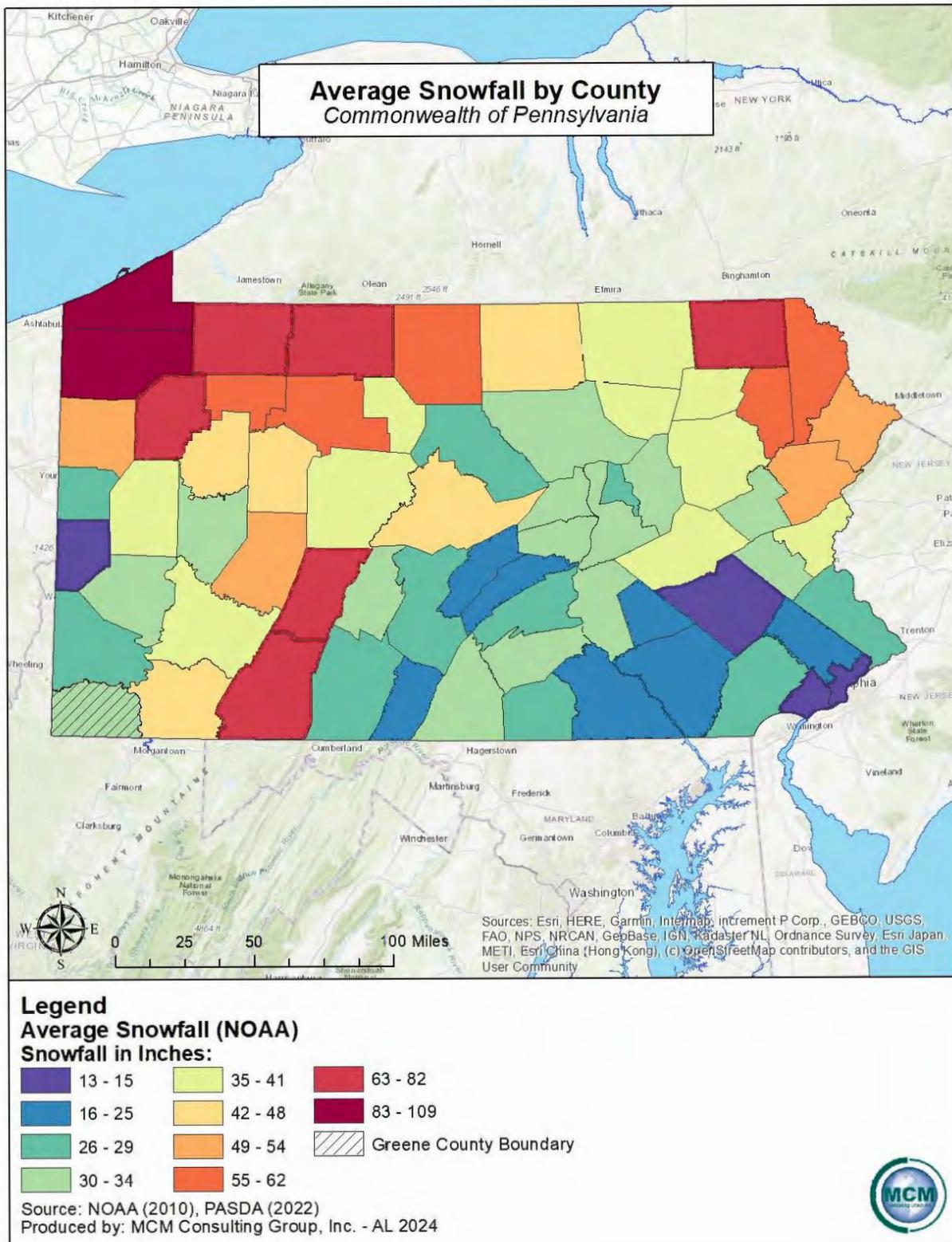
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season. Although the use of salt and other anti-skid materials protect life safety by improving roadway conditions, there can also be unintended consequences. When salt used on roadways permeates the surrounding soil, it can infiltrate groundwater and contaminate wells. Hence, any groundwater sources near roadways, in Greene County, may be vulnerable to degradation.

Roadway salt can also pose a risk to freshwater aquatic life near to the routes of transportation treated with the minerals. Salt that makes its way into soil or freshwater becomes a persistent hazard, damaging plants and wildlife that are not adapted to coexist with high salinity. Its persistent nature is due to a lack of any known biological system that can remove it from the environment in which it exists. Although it may be diluted with water, such a treatment would not be sufficient in isolation, and some intervention would likely be necessary to extract the salt from the environment which it pollutes.

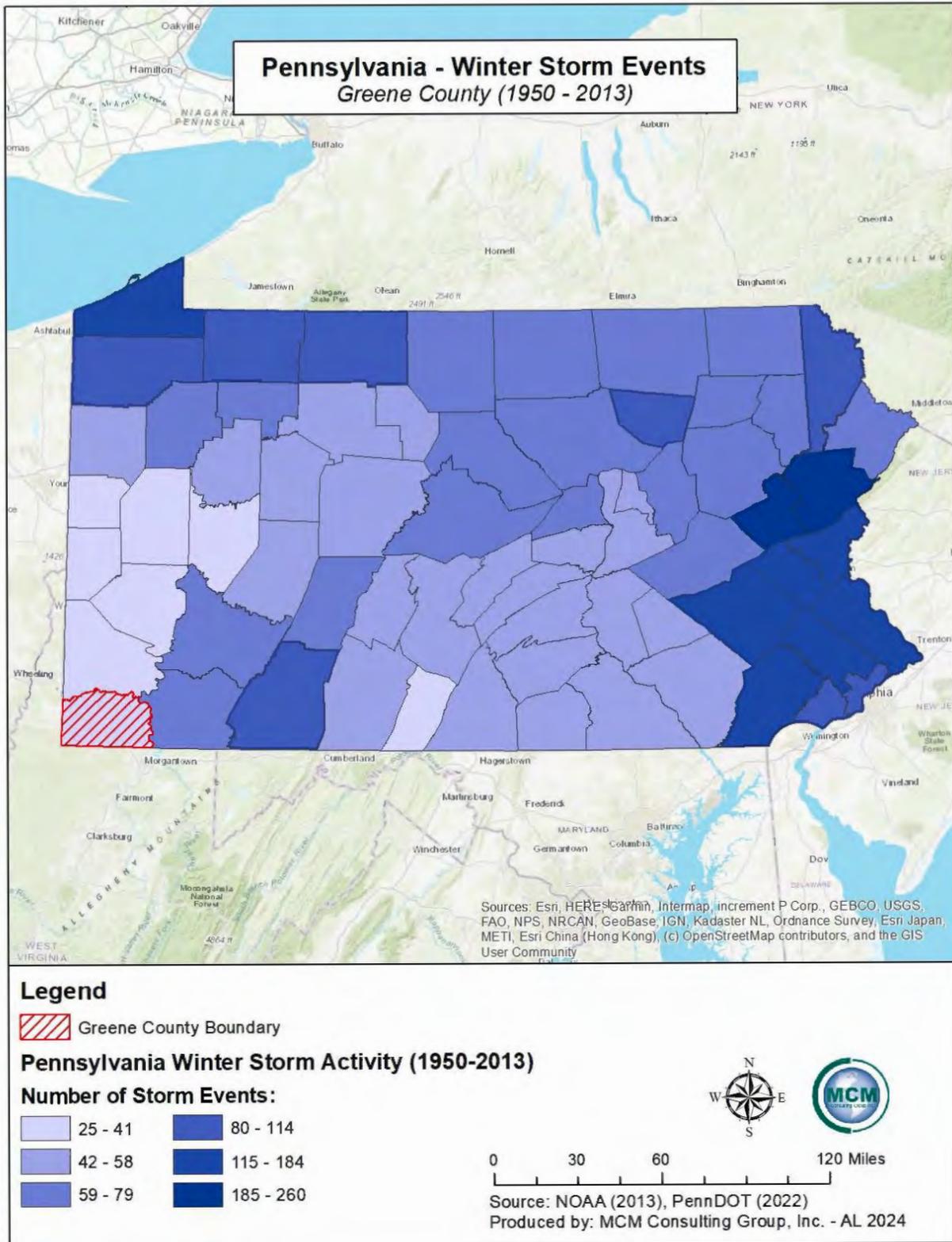
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Figure 42 - Pennsylvania Annual Snowfall 1981 – 2010



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Figure 43 - Winter Storm Events by County in Pennsylvania



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### **4.3.14. Building/Structural Collapse/Blighted Properties**

#### **4.3.14.1 Location and Extent**

The presence of blighted properties in Greene County is a nuisance for both residents and visitors to the county on a year-round basis. Blighted properties include areas of the county where the infrastructure is damaged and aging beyond occupation, habitation, and/or commercial use.

Blighted properties are described by the Pennsylvania State Statute 1945 Act 385 as:

1. Any premises which because of physical condition or use is regarded as a public nuisance by common law or has been declared a public in accordance with the local housing, building, plumbing, fire, and related codes.
2. Any premises which because of physical condition, use, or occupancy is considered an attractive nuisance to children, including but not limited to abandoned wells, shafts, basements, excavations, and unsafe fences or structures.
3. Any dwelling which because it is dilapidated, unsanitary, unsafe, vermin-infested, or lacking in the facilities and equipment required by the housing code of the municipality, has been designated by the department responsible for enforcement of the code as unfit for human habitation.
4. Any structure which is a fire hazard or is otherwise dangerous to the safety of persons or property.
5. Any structure from which the utilities, plumbing, heating, sewage, or other facilities have been disconnected, destroyed, removed, or rendered ineffective so that the property is unfit for its intended use.
6. Any vacant or unimproved lot or parcel of ground in a predominantly built-up neighborhood, which by reason neglect or lack of maintenance has become a place for the accumulation of trash or debris, or a haven for rodents or other vermin.
7. Any unoccupied property which has been tax delinquent for a period of two years prior to the effective date of Pennsylvania State Statute 1945 Act 385 or local municipality regulations and those in the future having a two-year tax delinquency.
8. Any property which is vacant but not tax delinquent, which has not been rehabilitated within one year of the receipt of notice to rehabilitate from the appropriate code enforcement agency.
9. Any abandoned property.

#### **4.3.14.2 Range of Magnitude**

Greene County has many blighted properties that are located in urban environments, including Waynesburg Borough. Most of the blighted properties in Greene County are unsecured and

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highly unsafe due to one or more of the following issues: structure rot, infestation from vermin including but not limited to rats, mice, and insects, and occupation by squatters. These properties can create a risk for the county because they are unsafe for occupation and future construction.

### **4.3.14.3 Past Occurrence**

The number of blighted properties in Greene County has increased in recent years. Some properties that are blighted in Greene County have been demolished by the county itself. With recent market trends in real estate, many vacant buildings in Greene County are sold prior to them being blighted.

### **4.3.14.4 Future Occurrence**

Blighted properties in Greene County will continue to increase unless blighted property procedures are put into practice at the county and local levels. With the requisite policies put into place the number of blighted properties in Greene County is liable to decrease.

### **4.3.14.5 Vulnerability Assessment**

Blighted properties are a significant concern when the health and safety of the citizens of Greene County are impacted. Blighted properties, while being an eye sore, are also a threat to the health and safety of individuals. Buildings that are blighted often can be unsafe due to building materials exposed to the environment or to unintentional consumption by humans. Buildings that have utilized asbestos in construction can become a major health hazard if the building is not maintained, the asbestos exposed, and people breath in those particles because the property has become abandoned and blighted. Another large health issue is mold in blighted properties and buildings. After a property becomes blighted, the functional systems that prevent mold from growing and spreading are often rendered useless, thus facilitating the growth of harmful mold and fungi that pose a threat to human health.

Just as blighted properties can adversely affect the health and safety of humans, it can also hurt the environment of an area. The leaching of building materials from an open or fallen property into water features, such as streams and creeks, can damage the wildlife in a water feature and hurt the public supply of drinking water. As mentioned above, asbestos is a large concern if the blighted property is of older construction. Also, potential chemicals from a blighted property, like paints and oils, can make their way into water tables, streams, and creeks, thus polluting the water features.

Blighted properties also offer shelter for animals and vermin that may not be able to find a home, and an area for breeding in the wild. This can result in the spread of rats and other pests in an area with a large concentration of blighted properties. Along with the accumulation of pests like

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rats, there is also a high chance of that area also attracting vermin like cockroaches. The increase in vermin can also pose a threat to human health, as vermin and pests can carry diseases which can be contracted due to close contact.

Blight can also adversely affect the infrastructure and its ability to function if the blighted properties in Greene County are adjacent to or near critical facilities and functional needs facilities. If a blighted property abuts a critical facility, it may be best for that structure to be torn down so that potential negative effects from the blighted property do not cause damage or limit the function of the critical facility.

Finally, blighted properties can be a problem for tourism and attract new residents to Greene County. If blighted properties fester in the county, people who travel to Greene County for pleasure, whether that be for summer vacations or seasonal hunting, might reconsider that travel due to the presence of blighted properties.

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### **4.3.15. Civil Disturbance**

#### **4.3.15.1 Location and Extent**

Civil disturbance refers to mass acts of disobedience where participants can become hostile to authority and there is a threat to maintaining public safety and order. Such disturbances can often be forms of protest in the face of socio-political problems. Riots have not been frequent occurrences throughout the history of the Commonwealth, however when they occur, they can cause significant property damage, injury and even loss of life. The scale and scope of civil disturbance events varies widely. Government facilities, local landmarks, prisons, and universities are common sites where crowds and mobs may gather.

Criminal activity refers to all criminality, including enemy attack, sabotage, physical or information break of security, workplace or school violence, harassment, discrimination, and other crimes. Criminal activity is a very broad hazard category and similar to civil disturbance, the scale and scope of incidents or events vary widely.

#### **4.3.15.2 Range of Magnitude**

Civil disturbances can take the form of small gatherings or large groups blocking or impeding access to a building or disrupting normal activities by generating noise and intimidating people. They can range from a peaceful sit-in to a full-scale riot, in which a mob burns or otherwise destroys property and terrorizes individuals. Even in its more passive forms, a group that blocks roadways, sidewalks, or buildings interferes with public order. There are two types of large gatherings typically associated with civil disturbances: a crowd and a mob. A crowd may be defined as a casual, temporary collection of people without a strong, cohesive relationship. Crowds can be classified into four categories:

- **Casual Crowd:** A casual crowd is merely a group of people who happen to be in the same place at the same time. Violent conduct does not occur.
- **Cohesive Crowd:** A cohesive crowd consists of members who are involved in some type of unified behavior. Members of this group are involved in some type of common activity, such as worshipping, dancing, or watching a sporting event. Although they may have intense internal discipline, they require substantial provocation to arouse to action.
- **Expressive Crowd:** An expressive crowd is one held together by a common commitment or purpose. Although they may not be formally organized, they are assembled as an expression of common sentiment or frustration. Members wish to be seen as a formidable influence. One of the best examples of this type is a group assembled to protest.
- **Aggressive Crowd:** An aggressive crowd is comprised of individuals who have assembled for a specific purpose. This crowd often has leaders who attempt to arouse the members or motivate them to action. Members are noisy and threatening and will taunt

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authorities. They may be more impulsive and emotional and require only minimal stimulation to arouse violence. Examples of this type of crowd could include demonstrators and strikers, though not all demonstrators and strikers are aggressive.

A mob can be defined as a large disorderly crowd or throng. Mobs are usually emotional, loud, tumultuous, violent, and lawless. Similar to crowds, mobs have different levels of commitment and can be classified into four categories:

- **Aggressive Mob:** An aggressive mob is one that attacks, riots, and terrorizes. The object of violence may be a person, property, or both. An aggressive mob is distinguished from an aggressive crowd only by lawless activity. Examples of aggressive mobs are the inmate mobs in prisons and jails, mobs that act out their frustrations after political defeat, or violent mobs at political protests or rallies.
- **Escape Mob:** An escape mob are those groups which attempt to flee from something such as a fire, bomb, flood, or other catastrophe. Members of escape mobs are generally difficult to control and can be characterized by unreasonable terror.
- **Acquisitive Mob:** An acquisitive mob is one motivated by a desire to acquire something. Riots caused by other factors often turn into looting sprees. This mob exploits a lack of control by authorities in safeguarding property.
- **Expressive Mob:** An expressive mob is one that expresses fervor or revelry following some sporting event, religious activity, or celebration. Members experience a release of pent-up emotions in highly charged situations.

In the event of a significant civil disturbance or criminal activity incident, local government operations and the delivery of services in the community may experience short-term disruptions. The greatest secondary effect is the impact on the economic and financial conditions of the affected community, particularly in relation to the property, facilities, and infrastructure damaged as a result of the disturbance. More serious acts of vandalism may result in limited power failure or hazardous material spills, leading to a possible public health emergency. Altered traffic patterns may increase the probability of a transportation accident.

Greene County's greatest likelihood for civil disturbance is in Waynesburg Borough, the county seat. Citizens, property, and infrastructure could be affected if a large-scale disorder were to take place. Typically, government facilities, landmarks, prisons, and universities are common sites where crowds or mobs may gather. Greene County is home to three universities and post-secondary education centers, including: Green County Career & Technology Center, Penn State Extension, and Waynesburg University.

### **4.3.15.3 Past Occurrence**

The county has not experienced any *significant* civil disturbance events.

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Following the death of African American George Floyd in Minneapolis, Minnesota in May 2020 at the hands of law enforcement, civil unrest erupted across the nation. A Proclamation of Disaster Emergency was established by the Governor’s Office for the entire Commonwealth of Pennsylvania on April 15, 2021. This gave the Pennsylvania Emergency Management Agency Director command and control of the statewide emergency operations and directed all agencies and departments to utilize all resources and personnel to cope with the magnitude and severity of the event.

### **4.3.15.4 Future Occurrence**

While unlikely, civil disturbances may occur in Greene County, and it is difficult to accurately predict the probability of future occurrence for civil disturbance events over the long-term. However, *Table 54 - Civil Disturbance Events Reported to PEMA 2018-2023*, depicts the range of potential civil disturbances in Pennsylvania and gives the county some background for consideration of future occurrences.

*Table 54 - Civil Disturbance Events Reported to PEMA 2018-2023*

<b>Table 4.3.18-4 Civil Disturbance Events Reported to PEMA-KC, 2018- 2023 (PEMA, 2023).</b>						
<b>EVENT TYPE</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023*</b>
Demonstration	4	2	35	14	10	1
Juvenile Detention Center	7	0	0	0	0	0
Prison Disturbance	0	1	5	3	2	0
Detainee Escape	0	0	0	0	0	0
Protest	8	17	172	42	16	7
Large gathering	8	4	16	3	7	1
Riot	0	0	4	0	1	0
School Threat	0	0	0	0	0	0
Assault	0	0	0	0	0	0
Gun/Bomb Incident	0	0	0	0	0	0
Work Stoppage	0	0	0	0	2	0
Other	1	13	28	29	13	1
<b>Civil Disorder - totals</b>	<b>28</b>	<b>37</b>	<b>260</b>	<b>101</b>	<b>51</b>	<b>10</b>

*\*Events totaled through April 2023*

According to the Pennsylvania State Hazard Mitigation Plan, from 2018 to 2023, the commonwealth experienced an average of eighty-one civil disturbance events each year. While that number is relatively low and the occurrences in Greene County are rare, the local planning team (LPT) decided civil disturbance should be regarded as a low-risk hazard due to the limited community political friction within Greene County.

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### **4.3.15.5 Vulnerability Assessment**

Climate change has the potential to increase Greene County's vulnerability to civil disturbances, and disturbance events. Intense weather events and weather patterns can lead to riots and civil disturbance in areas that are directly impacted. For example, an extreme heat or drought event, that could become more common from climate change, could cause residents to seek water and resources, and create a conflict from increased competition for resources.

All municipalities in Greene County can be vulnerable to civil disturbance and criminal activity; however, the anticipated impact from such events is minimal. These events may be sparked for varying reasons and the seriousness of the event may well be exacerbated by how authorities handle the crowd. At the writing of this plan, the political temperature of the country as a whole continues to run high, making this hazard vulnerability one for consistent monitoring by public safety officials.

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### **4.3.16. Dam Failure**

#### **4.3.16.1 Location and Extent**

##### **Dams**

A dam restricts the flow of water or underground streams and often creates reservoirs for water storage. The reservoirs created by these barriers not only suppress floods but also provide water for activities such as irrigation, human consumption, industrial use aquaculture, and navigability.

Dam failures occur usually as a secondary effect of massive amounts of rainfall and flooding, causing too much water to enter the spillway system. This type of failure occurs with little to no warning. Spring thaws, severe thunderstorms, and heavy rainfall are also contributing factors to potential dam failures. Depending on the size of the body of water where the dam is constructed, additional water may come from distant upstream locations. Water contributions may also come from dam failures in adjoining counties that are along the same riverine or water features.

FEMA considers the following to be the most frequent causes of dam failures:

- Overtopping caused by floods that exceed the capacity of the dam
- Deliberate acts of sabotage
- Structural failure of materials used in dam construction
- Movement and/or failure of the foundation supporting the dam
- Settlement and cracking of concrete or embankment dams
- Piping and internal erosion of soil in embankment dams
- Inadequate maintenance and upkeep

Poor engineering or poor maintenance may also cause dam failure. The Pennsylvania Department of Environmental Protection (PA DEP) and the United States Army Corps of Engineers (USACE) awards permits for dams and also share inspection responsibilities. Inspection results are characterized as either safe or unsafe.

The National Inventory of Dams (NID) is a registry that captures information about structures that are greater than or equal to 25 feet in height or impound 50-acre-feet or more of water (an acre-foot is equal to 325,851 gallons of water); it includes structures above 6 feet in height where failure would potentially cause damage downstream. The dams are classified in terms of hazard potential as “High”, “Significant”, or “Low”, with high-hazard dams requiring emergency action plans (EAPS) There are twenty-five high-hazard and thirteen low-hazard dams in Greene County that are both publicly and privately owned and are registered with the USACE in the NID. There are also fourteen dams with a hazard classification as significant. Of the twenty-five high hazard dams in Greene County, twenty-four of those require an emergency action plan. *Table 56 – Greene County Dam Inventory* illustrates the dams located in Greene County. *Table 55 – High-*

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*Hazard Dams Municipal Summary* summarizes the high-hazard dams in Greene County by municipality. The municipalities not listed do not have high-hazard dams.

*Table 55 - High-Hazard Dams Municipality Summary*

<b>High-Hazard Dams – Municipal Summary (PA DEP)</b>	
<b>Municipality</b>	<b>Number of High-Hazard Dams</b>
Franklin Township	7
Gilmore Township	1
Morris Township	1
Richhill Township	14
Whiteley Township	2
<b>Total:</b>	<b>25</b>
Source: NID, 2024	

*Table 56 - Greene County Dam Inventory*

<b>Greene County Dams</b>							
<b>Dam Name</b>	<b>River</b>	<b>Owner Name</b>	<b>Year Completed</b>	<b>Dam Height (feet)</b>	<b>Drainage Area (acres)</b>	<b>Hazard</b>	<b>EAP</b>
Acid Mine Water Pond	N/A	Consolidation Coal Company	N/A	45	N/A	L	NR
Area <sup>3</sup> / <sub>4</sub> Lower Sed Pong	Tributary Enlow Fork	Consol PA Coal Company, LLC.	2004	35	0.71	L	NR
Augustine	Tributary Jersey Run	Jim and Holly Augustine	N/A	14	0.4	S	N
Bailey Mine Area No. 3 Saddle A	Talley Run	Consol PA Coal Co. LLC.	2014	67	0.34	H	Y
Bailey Mine Area No. 3 Saddle B	Fletcher Run	Consol PA Coal Co. LLC.	2014	27	0.34	H	Y
Bailey Mine Area No. 3 Saddle C	Fletcher Run	Consol PA Coal Co. LLC.	2014	37	0.34	H	Y
Bailey Mine Area No. 3 Saddle D	Grinnage Run	Consol PA Coal Co. LLC.	2014	32	0.34	H	Y
Bailey Mine Area No. 3 Slurry	Tributary Enlow Fork	Consol PA Coal Co. LLC.	2014	337	0.34	H	Y

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<b>Greene County Dams</b>							
<b>Dam Name</b>	<b>River</b>	<b>Owner Name</b>	<b>Year Completed</b>	<b>Dam Height (feet)</b>	<b>Drainage Area (acres)</b>	<b>Hazard</b>	<b>EAP</b>
Bailey Mine Area No. 6 Sed Pond	Tributary Owens Run	Consol PA Coal Co. LLC.	N/A	58	0.16	H	Y
Bailey Mine Fresh Water Imp.	Tributary Talley Run	Consol PA Coal Co. LLC.	1984	164	0.15	H	Y
Bailey Mine Slurry Impoundment	Talley Run	Consol PA Coal Co. LLC.	1984	315	0.3	H	Y
Bailey No. 1 South Saddle Dike	Owens Run	Consol PA Coal Co. LLC.	2004	55	0.3	L	Y
Bailey No. 8 Slurry Impoundment	Tributary Boothe Run	Consol PA Coal Co. LLC.	N/A	317	0.3	H	Y
Bailey No. 5 West Saddle	Tributary Owens Run	Consol PA Coal Co. LLC.	N/A	68	0.91	H	Y
Bailey No. 5 Sedimentation Pond	Owens Run	Consol PA Coal Co. LLC.	N/A	60	1.22	H	Y
Bailey No. 8 Sediment Pond	Boothe Run	Consol PA Coal Co. LLC.	N/A	53	0.88	H	Y
Bailey Sediment Pond No. 1	Tributary Talley Run	Consol PA Coal Co. LLC.	N/A	32	0.15	H	Y
Bailey Sediment Pond No. 2	Tributary Enlow Fork	Consol PA Coal Co. LLC.	N/A	39	0.39	H	Y
Blacksville #1 Freshwater Imp.	Tributary Dunkard Creek	CNX Water Assets, LLC.	1974	20	1.21	S	Y
Browns	Browns Run	Morgan Township Supervisors	1919	25	2.2	L	NR
Colvin Sedimentation Pond	Tributary Whiteley Creek	Consol Mining Company, LLC.	1980	43	0.3	S	Y

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<b>Greene County Dams</b>							
<b>Dam Name</b>	<b>River</b>	<b>Owner Name</b>	<b>Year Completed</b>	<b>Dam Height (feet)</b>	<b>Drainage Area (acres)</b>	<b>Hazard</b>	<b>EAP</b>
Cumberland No. 1 Sed. Pond	Tributary Whiteley Creek	Cumberland Contura, LLC.	1985	25	0.2	S	Y
Cumberland No. 1 Slurry Pond 1	Tributary Whiteley Creek	Cumberland Contura, LLC.	1984	380	0.08	H	Y
Cumberland No. 2 Sediment Pond	Tributary Whiteley Creek	Cumberland Contura, LLC.	2003	11.75	0.27	S	Y
Cumberland No. 2 Slurry Pond	Tributary Whiteley Creek	Cumberland Contura, LLC.	N/A	370	0.2	H	Y
Diamond Lake	Tributary Ruff Creek	John C. McNay	N/A	35	0.154	L	NR
Emerald No. 1 Back Valley Western	Tributary Tenmile Creek	Emerald Contura, LLC.	N/A	90	0.101	H	Y
Emerald No. 1 Main Valley Eastern	Tributary Smith Creek	Emerald Contura, LLC.	N/A	310	0.16	H	Y
Emerald No. 1 Sed Pond 11	Tributary Smith Creek	Emerald Contura, LLC.	N/A	25	0.27	H	Y
Emerald No. 2 Back Valley Western	Tributary South Fork Tenmile Creek	Emerald Contura, LLC.	N/A	90	0.17	H	Y
Emerald No. 2 Main Valley Eastern	Tributary Smith Creek	Emerald Contura, LLC.	N/A	270	0.17	H	Y
Emerald No. 2 Sed Pond 1	Tributary Smith Creek	Emerald Contura, LLC.	N/A	17.9	0.23	H	Y
Grays Landing Lock and Dam	Monongahela River	CELRP	1995	N/A	4460	S	Y
Hatfield Ferry Sedimentation Pond	Tributary Little Whiteley Creek	Allegheny Energy Supply Co. LLC.	N/A	25	0.18	S	Y

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<b>Greene County Dams</b>							
<b>Dam Name</b>	<b>River</b>	<b>Owner Name</b>	<b>Year Completed</b>	<b>Dam Height (feet)</b>	<b>Drainage Area (acres)</b>	<b>Hazard</b>	<b>EAP</b>
Hughes Hollow Slurry Impoundment	Hughes Run	Robert D. Moore	N/A	245	0.131	H	Y
Jewell Pond	Tributary Laurel Run	Jerry Jewell	N/A	15	0.25	S	N
Leonard George	Tributary Dunkard Creek	Leonard George	2001	50	0.15	L	NR
Lewis	Goose Run	George Lewis	N/A	20	0.41	S	N
Lovingood	Tributary Toms Run	Consolidation Coal Company	N/A	30	0.45	L	NR
Mt. Morris Sportsmen's Association	Watkins Run	Mount Morris Sportsmen's Association	N/A	19.5	0.23	S	Y
Neely	Tributary Bissett Run	John Neely	N/A	30	0.25	L	NR
Nello L. Teer Co.	Tributary South Fork Tenmile Creek	Beaver East, Inc.	1980	18	0.2	S	Y
Pegs Run Slurry Impoundment	Pegs Run	Peg Run Coal Company, Inc.	1983	39	0.2	L	NR
Point Marion Lock and Dam	Monongahela River	CELRP	1959	N/A	2715	S	Y
Rastoka	Tributary Dyers Fork	Albert Rastoka	N/A	18	0.23	S	N
Robena Pond Np. 6	Tributary Whiteley Creek	Consol Mining Company, LLC.	1980	115	0.1	L	NR
Robena Slurry Pond No. 4	Tributary Whiteley Creek	Consol Mining Company, LLC.	1955	135	0.69	L	NR
Rohania	Tributary Coal Lick Run	Rohanna Iron & Metal Inc.	N/A	14	0.89	S	N

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<b>Greene County Dams</b>							
<b>Dam Name</b>	<b>River</b>	<b>Owner Name</b>	<b>Year Completed</b>	<b>Dam Height (feet)</b>	<b>Drainage Area (acres)</b>	<b>Hazard</b>	<b>EAP</b>
Ryerson Station	North Fork Dunkard Fork	DCNR	1960	42	25.9	H	N
Slurry Pond No. 1	N/A	Consolidation Coal Company	N/A	90	N/A	L	NR
Waynesburg Lakes	Tributary Ruff Creek	John C. McNay	N/A	26	0.3	L	NR
Wisecarver	Wisecarver Run	Southwestern PA Water Authority	1931	34.5	3.9	H	Y

Source: NID, 2024  
 Note: The following letters in the table: H, L, S, NR, N, and Y represent the following. H indicates “High”, L indicates “Low”, S indicates “Significant”, NR indicates “Not Required”, N indicates “No”, and Y indicates “Yes.”

The Pennsylvania Department of Environmental Protection defines a high-hazard dam as “Any dam so located as to endanger populated areas downstream by its failure.” High-hazard dams receive two inspections each year, once by a professional engineer on behalf of the owner and once by a PA DEP inspector (DEP, 2008).

### **Levees**

Levee failures have the potential to place large numbers of people and property at risk. Unlike dams, levees are built parallel to a river or another body of water to protect the population and structures behind it from risks of damage during a flooding event. Levees do not serve a purpose beyond flood protection, unlike dams, which can serve to store water or generate energy in addition to protecting areas from flooding. The National Levee Database (NLD), like its counterpart of the National Inventory of Dams (NID), is maintained by the USACE and tracks levees across the United States. Greene County is home to one levee section, which is detailed in *Table 57 – Greene County Levee Inventory*.

*Table 57 - Greene County Levee Inventory*

<b>Greene County Levee Inventory</b>				
<b>Levee Name</b>	<b>Flood Source</b>	<b>Levee Type</b>	<b>Levee Bank Side</b>	<b>Levee Length (miles)</b>
Freeport – Right Bank Pennsylvania Fork Fish Creek	Fork Fish Creek	Earthen	Right descending bank	0.45

Source: NLD, 2024

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### **4.3.16.2 Range of Magnitude**

#### **Dams**

Dam failures can pose a serious threat to communities located downstream from major dams. The impact of a dam failure is dependent on the volume of water impounded by the dam and the amount of population or assets located downstream. Catastrophic failures are characterized by the sudden, rapid, and uncontrolled release of impounded water from a dammed impoundment or water body. *Figure 44 – Greene County Dams* shows the location of dams within Greene County as well as their hazard designation.

#### **Levees**

Levee failure can be caused by a number of factors, and they can also cause catastrophic effects. Damage to the area beyond a levee, if it fails, could be more significant than if the levee was not present. Levees are designed to provide a specific level of protection, so flooding events could overtop the levees if these events exceeded the levee specifications. Additionally, levees can also fail if they are allowed to deteriorate or decay. Regular maintenance of levees is critical. *Figure 45 – Greene County Levee Locations* illustrates areas protected by the Greene County levee systems. The figure following *Figure 45 – Greene County Levee Locations* illustrates areas around Freeport Township that are protected by levees. The figure is *Figure 46 – Greene County Levee Location - Freeport*.

A levee failure or breach causes flooding in landward areas adjacent to the structure. The failure of a levee or other flood protection structure could be devastating, depending on the level of flooding for which structure is designed and the amount of landward development present. Large volumes of water may be moving at high velocities, potentially causing severe damage to buildings, infrastructure, trees, and other large objects. Levee failures are generally worse when they occur abruptly with little warning and result in deep, fast moving water through highly developed areas.

### **4.3.16.3 Past Occurrence**

#### **Dams**

There have been no past occurrences of dam failure or major incidence occurring at the locations of dams within Greene County. Smaller incidences have occurred but have not had significant impacts in the county.

There have been a few historically destructive dam failures in Pennsylvania over the course of the past two hundred years. The most destructive dam failure in United States history took place in Johnstown, Pennsylvania (Cambria County) in 1889, claiming 2,209 lives. Another significant dam failure took place in Austin, Pennsylvania (Potter County) in 1911, claiming seventy-eight

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lives. Similarly, a dam failure in West Taylor Township, Pennsylvania (Cambria County) claimed the lives of forty people when the Laurel Run Dam, No. 2 failed during the Johnstown Flood in the early morning hours of July 20th, 1977.

### **Levees**

The National Levee Database (NLD) lists no occurrence of levee failures or major incidents occurring in Greene County.

Some of the worst levee failures in the history of the United States have occurred in the American South, along parts of the Mississippi River delta. Levee failures in New Orleans, Louisiana during Hurricane Katrina from August 23 to August 31, 2005 resulted in an enormous amount of property damage and loss of lives. There were approximately fifty-three levee failures in constructed levees around the City of New Orleans. Hurricane Katrina precipitated the creation of more strict levee requirements for inspection and construction on the local, state, and federal level.

#### **4.3.16.4 Future Occurrence**

### **Dams**

Although dam failures can occur at any time, given the right circumstances, the likelihood of a dam failure in Greene County is considered to be unlikely.

The presence of structural integrity and inspection programs significantly reduces the potential for major dam failure events to occur. The PA DEP inventories and regulates all the dams that meet or exceed the following criteria (PA, DEP, 2008):

- Impound water from a drainage area of greater than 100 acres
- Have a maximum water depth greater than 15 feet
- Have a maximum storage capacity of 50 acre-feet or greater

The construction, operation, maintenance, and abandonment of dams is reviewed and monitored by the PA DEP Division of Dam Safety. Dams are evaluated based on those categories such as slope stability, undermining seepage, and spillway adequacy. With more strict construction and design procedures in place, the future occurrence of a dam failure is increasingly small. The new procedures and rules protect public safety and both public and private property. Newly constructed dams are thoroughly examined by professional engineers to prevent future dam failure events.

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### Levees

Although levee failures can occur at any time, given the right circumstances, the future occurrence of levee failures in Greene County can be considered unlikely. Most levees are designed to meet a specified level of flooding. While FEMA focuses on mapping levees that will reduce the risk of a 1% annual chance flood, other levees may be designed to protect against both smaller and larger floods.

### 4.3.16.5 Vulnerability Assessment

#### Dams

Property and populations located downstream from any dams are vulnerable to dam failures. The Pennsylvania Code (§105.91 Classification of dams and reservoirs) classifies doth dams by size and the amount of life loss and economic loss expected in a failure event. *Table 58 – Dam Classification* displays the dam classification guide for the Commonwealth of Pennsylvania. Although the size of a dam may result in varying impacts, the hazard potential classification of category one dams is a more important indicator, since that will indicate the level of potential substantial loss of life and excessive economic loss.

*Table 58 - Dam Classification*

Dam Classification (PA Code 1980)		
Dam Size Classification		
Class	Impoundment Storage (Acre-Feet)	Dam Height (Feet)
<b>A</b>	Equal to or greater than 50,000	Equal to or greater than 100
<b>B</b>	Less than 50,000 but greater than 1,000	Less than 100 but greater than 40
<b>C</b>	Equal to or less than 1,000	Equal to or less than 40
Dam Damage Classification		
Category	Loss of Life	Economic Loss
<b>1</b>	Substantial	Excessive
<b>2</b>	Few	Appreciable
<b>3</b>	None Expected	Minimal

Dam failures can cause significant environmental effects, as the resulting flood from a dam failure is likely to disperse debris and hazardous materials downstream that can damage local ecosystems. Debris carried downstream can block roads, cause traffic accidents, disrupt traffic patterns, and delay the delivery of essential services along major traffic corridors. Debris flow

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can also cause landslides along steep slopes and embankments with low slope stability. The economic and financial impact from damage and recovery ranges from minimal to severe, depending on the magnitude of damage and scale of failure event.

Emergency action plans are developed by the owners of high-hazard dams. These plans are then disseminated to first responders and other planning partners within the county. Vulnerable populations are those residents and businesses located downstream from a high-hazard dam within the inundation area. The emergency action plan identifies a call list to notify downstream at-risk populations. Emergency action plan exercises are held every five to seven years depending on local policy.

The characteristics of the twenty-five high-hazard dams in Greene County vary greatly. The Grays Landing Lock and Dam has the largest drainage area with a total of 4,460 acres. The dams that were constructed most recently are the Bailey Mine Area No. 3 Slurry Dam, the Bailey Mine Area No. 3 Saddle A, the Bailey Mine Area No. 3 Saddle B, the Bailey Mine Area No. 3 Saddle C, and the Bailey Mine Area No. 3 Saddle D which were constructed in 2014. The dam that is the oldest in the county is Browns Dam, which was constructed in 1919. The Cumberland No. 1 Slurry Pond 1 Dam is the tallest in the county with a height of 380 feet. Consol PA Coal Company, LLC. owns the largest number of dams in Greene County with a total of sixteen dams. The dams in Greene County are owned by a mix of public and private owners and vary in almost every aspect. The county dams are distributed relatively evenly throughout the county and municipalities, with an even mix of high and low hazard dams in the municipalities.

The failure or partial failure of a High-Hazard Potential Dam can have impacts that affect many different jurisdictions across Greene County and counties adjacent to Greene County. A failure at any of the dams in Greene County would result in some inundation in at least those municipalities adjacent to the dam in question. A more comprehensive examination of risk inundation areas from High-Hazard Potential Dams can be conducted in future iterations of the Greene County Hazard Mitigation Plan. This dataset was not readily accessible at the time of this writing. However, each of this municipalities that could be affected by the failure of a High-Hazard Potential Dam could result in the inundation of police stations and fire departments, critical infrastructure facilities, and community lifeline locations like medical facilities, power and energy facilities, and schools, nursing homes, and senior care and long term care facilities.

Greene County is at risk when high-hazard potential dams are considered. There are three types of risk related to high-hazard potential dams, and they are listed below in *Table 59 – High-Hazard Potential Dams Risk Type*:

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Table 59 - High-Hazard Potential Dams Risk Type

High-Hazard Potential Dams Risk Types	
Type of Risk	Description
<b>Incremental Risk</b>	The risk (likelihood and consequences) to the pool area and downstream floodplain occupants that can be attributed to the presence of the dam should the dam breach prior or subsequent to overtopping, or undergo component malfunction or misoperation, where the consequences considered are over and above those that would occur without dam breach. The consequences typically are due to downstream inundation, but loss of the pool can result in significant consequences in the pool area upstream of the dam.
<b>Non-Breach Risk</b>	The risk in the reservoir pool area and affected downstream floodplain due to ‘normal’ dam operation of the dam (e.g., large spillway flows within the design capacity that exceed channel capacity) or ‘overtopping of the dam without breaching’ scenarios.
<b>Residual Risk</b>	The risk that remains after all mitigation actions and risk reduction actions have been completed. With respect to dams, FEMA defines residual risk as “risk remaining at any time” (FEMA, 2015, p A-2). It is the risk that remains after decisions related to a specific dam safety issue are made and prudent actions have been taken to address the risk. It is the remote risk associated with a condition that was judged to not be a credible dam safety issue.
Source: “Rehabilitation of High Hazard Potential Dams Grant Program Guidance,” June 2020	

At this time, insufficient information is available to conduct a substantive analysis of incremental, non-breach and residual risk relative to Greene County’s high hazard potential dams. However, it is acknowledged that incremental risk is “the risk (likelihood and consequences) to the pool area and downstream floodplain occupants that can be attributed to the presence of the dam should the dam breach prior or subsequent to overtopping, or undergo component malfunction or misoperation, where the consequences considered are over and above those that would occur without dam breach;” non-breach risk is “the risk in the reservoir pool area and affected downstream floodplain due to ‘normal’ dam operation of the dam (e.g., large spillway flows within the design capacity that exceed channel capacity) or ‘overtopping of the dam without breaching’ scenarios;” and residual risk) is “the risk that remains after decisions related to a specific dam safety issue are made and prudent actions have been taken to address the risk. It is the remote risk associated with a condition that was judged to not be a credible dam safety issue” (FEMA, 2020 Rehabilitation of High Hazard Potential Dams Grant Program Guidance).

The risk of high-hazard potential dams in Greene County is present but at the time of this writing, there is insufficient data to identify in exact detail the vulnerable populations and assets in inundation areas for the high-hazard potential dams. The areas downstream from the high-hazard potential dams are more vulnerable to inundation than areas that are upstream from said dams. There are current datasets to address high-hazard potential dam impacts in greater detail,

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but these datasets are still in development from the Pennsylvania Department of Environmental Protection, Pennsylvania Emergency Management Agency, the United States Army Corp of Engineers, and the Federal Emergency Management Agency.

Specifically, vector GIS boundary data for dam inundation areas would allow for more comprehensive damage overlays and damage analysis. Vector GIS information would allow for inundation areas to be mapped along with community lifelines and critical facilities to see what specific facilities could be impacted by a failure at a high-hazard potential dam, including type and use of those facilities impacted. This inundation data could also lead to greater analysis on the construction type of the buildings impacted, including what materials are used for building and what the physical characteristics of the buildings are made of that may be impacted. While useful for vulnerability assessment, these datasets would have to be carefully regulated in regard to access to ensure that no unauthorized individuals or organizations have the ability to see or use the data. Dam inundation maps could also be used if GIS boundary data is not available or able to be released.

Once these datasets have been published and inundation data is easier to acquire, this information will be used to develop more detailed risk assessments and vulnerability assessments for dam failure at the high-hazard potential dams. Continued collaboration with state and federal partners will occur to ensure that any data created or made available is utilized for vulnerability assessment for high-hazard potential dams.

Although there are data limitations to take into account in regard to high-hazard potential dams in Greene County, some open source, nationally available data can be integrated into this vulnerability assessment. One of those tools is the Resilience Analysis and Planning Tool (RAPT), administered by FEMA. This tool can overlay areas of interest around certain features to determine what types of populations are within certain distances of those features. In the table below, a 2-mile distance was calculated around each high-hazard dam in Greene County. Those locations were then used to determine how many people or households are vulnerable to a dam failure based strictly on distance. Some of the indicators used for this analysis were total population, households with vehicles, households with limited English and population living in mobile homes.

*Table 60 - Greene County High-Hazard Dam Vulnerability Data*

<b>High-Hazard Dam Vulnerability Data</b>				
<b>Dam</b>	<b>Total Population</b>	<b>Households without a vehicle</b>	<b>Households with limited English</b>	<b>Population Living in Mobile Homes</b>
Bailey Mine Area No. 3 Saddle A	312	14	0	62
Bailey Mine Area No. 3 Saddle B	304	13	0	60

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<b>High-Hazard Dam Vulnerability Data</b>				
<b>Dam</b>	<b>Total Population</b>	<b>Households without a vehicle</b>	<b>Households with limited English</b>	<b>Population Living in Mobile Homes</b>
Bailey Mine Area No. 3 Saddle C	298	14	0	60
Bailey Mine Area No. 3 Saddle D	293	14	0	60
Bailey Mine Area No. 3 Slurry	342	17	0	69
Bailey Mine Area No. 6 Sed Pond	222	9	0	44
Bailey Mine Fresh Water Imp	273	9	0	54
Bailey Mine Slurry Impoundment	278	11	0	55
Bailey Mine No. 5 Slurry Impoundment	215	8	0	43
Bailey Mine No. 5 West Saddle	234	9	0	46
Bailey Mine No. 5 Sedimentation Pond	221	9	0	45
Bailey Mine No. 8 Sediment Pond	420	18	0	82
Bailey Sediment Pond No. 1	283	10	0	56
Bailey Sediment Pond No. 2	288	10	0	56
Cumberland No. 1 Slurry Pond 1	592	28	0	131
Cumberland No. 2 Slurry Pond	584	28	0	130
Emerald No. 1 Back Valley Western	4,512	437	0	152
Emerald No. 1 Main Valley Eastern	4,582	440	0	156
Emerald No. 1 Sed Pond 11	4,655	442	0	157
Emerald No. 2 Back Valley Eastern	4,304	417	0	147
Emerald No. 2 Main Valley Eastern	4,459	432	0	150
Emerald No. 2 Sed Pond 1	4,601	440	0	156

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High-Hazard Dam Vulnerability Data				
Dam	Total Population	Households without a vehicle	Households with limited English	Population Living in Mobile Homes
Hughes Hollow Slurry Impoundment	347	11	0	88
Ryerson Station	218	9	0	44
Wisecarver	4,549	436	0	157
<b>Total</b>	<b>37,386</b>	<b>3,285</b>	<b>0</b>	<b>2,260</b>

Source: RAPT, ACS, 2017-2021, Table B08201, Table S1602, and Table DP04

An analysis was also conducted for high priority infrastructure within 2-miles of high-hazard dams in Greene County. There were no law enforcement locations within 2 miles of the dams. The information in the table below illustrates which infrastructure was located in that vulnerability zone.

Table 61 - Greene County High-Hazard Dam Vulnerability Data - Infrastructure

High-Hazard Dam Vulnerability Data – Infrastructure				
Dam	Hospitals	Nursing Homes	Fire Stations	Public Schools
Bailey Mine Area No. 3 Saddle A	0	0	0	0
Bailey Mine Area No. 3 Saddle B	0	0	0	0
Bailey Mine Area No. 3 Saddle C	0	0	0	0
Bailey Mine Area No. 3 Saddle D	0	0	0	0
Bailey Mine Area No. 3 Slurry	0	0	0	0
Bailey Mine Area No. 6 Sed Pond	0	0	0	0
Bailey Mine Fresh Water Imp	0	0	0	0
Bailey Mine Slurry Impoundment	0	0	0	0
Bailey Mine No. 5 Slurry Impoundment	0	0	0	0
Bailey Mine No. 5 West Saddle	0	0	0	0
Bailey Mine No. 5 Sedimentation Pond	0	0	0	0

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<b>High-Hazard Dam Vulnerability Data – Infrastructure</b>				
<b>Dam</b>	<b>Hospitals</b>	<b>Nursing Homes</b>	<b>Fire Stations</b>	<b>Public Schools</b>
Bailey Mine No. 8 Sediment Pond	0	0	0	0
Bailey Sediment Pond No. 1	0	0	0	0
Bailey Sediment Pond No. 2	0	0	0	0
Cumberland No. 1 Slurry Pond 1	0	0	0	0
Cumberland No. 2 Slurry Pond	0	0	0	0
Emerald No. 1 Back Valley Western	1	0	1	1
Emerald No. 1 Main Valley Eastern	1	0	1	1
Emerald No. 1 Sed Pond 11	1	0	1	1
Emerald No. 2 Back Valley Eastern	1	0	1	1
Emerald No. 2 Main Valley Eastern	1	0	1	1
Emerald No. 2 Sed Pond 1	1	0	1	1
Hughes Hollow Slurry Impoundment	0	0	1	0
Ryerson Station	0	0	1	0
Wisecarver	1	0	1	1
Source: RAPT, Homeland Infrastructure Foundation-Level Data, 2024				

The table below provides more information on infrastructure within 2 miles of high-hazard dams.

*Table 62 - Greene County High-Hazard Dam Vulnerability Data - Infrastructure Names*

<b>High-Hazard Dam Vulnerability Data – Infrastructure Names</b>	
<b>Dam</b>	<b>Infrastructure Details</b>
Bailey Mine Area No. 3 Saddle A	N/A
Bailey Mine Area No. 3 Saddle B	N/A
Bailey Mine Area No. 3 Saddle C	N/A
Bailey Mine Area No. 3 Saddle D	N/A
Bailey Mine Area No. 3 Slurry	N/A
Bailey Mine Area No. 6 Sed Pond	N/A
Bailey Mine Fresh Water Imp	N/A
Bailey Mine Slurry Impoundment	N/A
Bailey Mine No. 5 Slurry Impoundment	N/A

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High-Hazard Dam Vulnerability Data – Infrastructure Names	
Dam	Infrastructure Details
Bailey Mine No. 5 West Saddle	N/A
Bailey Mine No. 5 Sedimentation Pond	N/A
Bailey Mine No. 8 Sediment Pond	N/A
Bailey Sediment Pond No. 1	N/A
Bailey Sediment Pond No. 2	N/A
Cumberland No. 1 Slurry Pond 1	N/A
Cumberland No. 2 Slurry Pond	N/A
Emerald No. 1 Back Valley Western	Fire Station: Name not found Public School: Miller Middle School Hospitals: Washington Health System - Greene
Emerald No. 1 Main Valley Eastern	Fire Station: Name not found Public School: Miller Middle School Hospitals: Washington Health System - Greene
Emerald No. 1 Sed Pond 11	Fire Station: Name not found Public School: Miller Middle School Hospitals: Washington Health System - Greene
Emerald No. 2 Back Valley Eastern	Fire Station: Name not found Public School: Miller Middle School Hospitals: Washington Health System - Greene
Emerald No. 2 Main Valley Eastern	Fire Station: Name not found Public School: Miller Middle School Hospitals: Washington Health System - Greene
Emerald No. 2 Sed Pond 1	Fire Station: Name not found Public School: Miller Middle School Hospitals: Washington Health System - Greene
Hughes Hollow Slurry Impoundment	Fire Station: Name not found
Ryerson Station	Fire Station: Name not found
Wisecarver	Fire Station: Name not found Public School: Miller Middle School Hospitals: Washington Health System - Greene
Source: RAPT, Homeland Infrastructure Foundation-Level Data, 2024	

### **Reconciling Pennsylvania Department of Environmental Protection and United States Army Corp of Engineers Hazard Classifications for Dams**

As of the writing on this hazard mitigation plan, there are currently two classification systems for hazard potential from both the Pennsylvania Department of Environmental Protections (PA DEP) and the United States Army Corp of Engineers (USACE), specifically the National Inventory of Dams. With this in mind, an effort was made following guidance from PEMA to compare hazard classifications, review the need for analysis, and assign dam prioritization scores.

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PEMA has outlined the process for reconciling the differences in the information in the document titled ‘Dam Risk Prioritization Methodology’. This document outlines that the PA DEP uses a system of classifying dams based on both their impoundment storage and the potential impact to loss of life and economic loss. This classification method utilizes both a letter and number. For example, a dam with impoundment equal or less than 1,000 and with no expected loss of life and minimal damage to private or public property would be assigned a value of C-4.

These classification codes can be found in the tables below:

<b>PA DEP Dam Classification System - Impoundment</b>		
<b>Class</b>	<b>Impoundment Storage</b>	<b>Dam Height (Feet)</b>
A	Equal or greater than 50,000	Equal to or greater than 100
B	Less than 50,000 but greater than 1,000	Less than 100 but greater than 40
C	Equal to or less than 1,000	Equal to or less than 40

<b>PA DEP Dam Classification System - Impact</b>		
<b>Category</b>	<b>Loss of Life</b>	<b>Economic Loss</b>
1	Substantial (numerous homes or small businesses, or a large business or school)	Excessive such as extensive residential, commercial, or agricultural damage, or substantial public inconvenience.
2	Few (a small number of homes or small businesses)	Appreciable such as limited residential, commercial, or agricultural damage, or moderate public inconvenience.
3	None expected (No permanent structures for human habitation or employment)	Significant damage to private or public property and short duration public inconvenience such as damage to storage facilities or loss of critical stream crossings.
4	None expected (No permanent structures for human habitation or employment)	Minimal damage to private or public property and no significant public inconvenience.

The documentation from PEMA and the PA DEP outlines that dams that have a hazard classification of high with the PA DEP classification and a classification of high with the USACE must be updated with a dam prioritization score. The rubric form outlining this information is found in a table provided by the PA DEP and PEMA. This classification rubric is below.

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Category	Degree of Risk		
	Level	Criteria	Value
<b>Probability of Failure based on Condition Rating</b>	Unlikely for failure	Condition rating of dam is <b>Satisfactory</b> . No existing or potential dam safety deficiencies are recognized. Acceptable performance is expected under all loading conditions (static, hydrologic, seismic) in accordance with the minimum applicable state or federal regulatory criteria or tolerable risk guidelines.	1
	Possible for failure	Condition rating of dam is <b>Fair</b> . No existing dam safety deficiencies are recognized for normal operating conditions. Rare or extreme hydrologic and/or seismic events may result in a dam safety deficiency. Risk may be in the range to take further action.	2
	Likely for failure	Condition rating of dam is <b>Poor</b> . A dam safety deficiency is recognized for normal operating conditions which may realistically occur. Remedial action is necessary. <b>POOR</b> may also be used when uncertainties exist as to critical analysis parameters which identify a potential dam safety deficiency. Investigations and studies are necessary	3
	Highly likely for failure	Condition rating of dam is <b>Unsatisfactory/ N/A</b> . A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution. Or the dam has not been inspected, is not under state jurisdiction, or has been inspected but, for whatever reason, has not been rated.	4
<b>Impact</b>	Minor	<b>10% or less</b> of population and structures of affected municipalities are within the inundation area. Only <b>minor property damage</b> and minimal disruption on quality of life. <b>Temporary shutdown</b> of critical facilities.	1
	Limited	<b>More than 10%</b> of population and structures of affected municipalities are within the inundation area. <b>More than 10%</b> of properties in affected area are <b>damaged or destroyed</b> . Minor injuries only. Complete shutdown of critical facilities for <b>more than one day</b> .	2
	Critical	<b>More than 25%</b> of population and structures of affected municipalities are within the inundation area. <b>More than 25%</b> of properties in the affected area are <b>damaged or destroyed</b> . Complete shutdown of critical facilities for <b>more than one week</b> .	3

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Category	Degree of Risk		
	Level	Criteria	Value
	Catastrophic	<b>50% or higher</b> of population and structures of affected municipalities are within the inundation area. High number of <b>deaths/injuries possible. More Than 50%</b> of property in the affected area are <b>damaged or destroyed</b> . Complete shutdown of critical facilities for <b>30 Days or more</b> .	4
Complexity	Mild	<b>Single jurisdiction</b> affected and uses its <b>local emergency response agencies</b> .	1
	Moderate	<b>Multiple jurisdictions affected</b> and response agencies require <b>mutual aid support</b> .	2
	High	<b>Multiple jurisdictions</b> that require <b>county coordination</b> .	3
	Very High	<b>Multiple jurisdictions and counties</b> that require <b>Commonwealth coordination</b> .	4

Source: PEMA, PA DEP, 2025

**Dam Risk Prioritization Calculation**  
**Dam Risk Prioritization Score = Probability x (Impact + Complexity)**

PEMA Dam Risk Prioritization Score	
<b>Low Priority</b>	The dam is not considered a “high hazard” dam by PA DEP or a “high-hazard potential” dam by the USACE
<b>Medium Priority</b>	This dam is considered a “high-hazard” dam by PA DEP but is not considered a “high-hazard potential dam by the USACE. -or- The dam is considered a “high-hazard” dam by PA DEP and is considered a “high-hazard potential” dam by the USACE, and receives a Dam Risk Prioritization score of less than 17.
<b>High Priority</b>	The dam is considered a “high-hazard” dam by PA DEP and is considered a “high-hazard potential” dam by the USACE, and receives a Dam Risk Prioritization score of 17 or more.

Source: PEMA, 2025

With this in mind, Greene County reviewed the dams included in the National Inventory of Dams (NID) and the PA DEP dam classifications and determined that twenty-five dams needed prioritization scores. The prioritization scoring for the twenty-five dams can be found below:

**Greene County, Pennsylvania  
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<b>PEMA Dam Classification</b>				
<b>Dam Name</b>	<b>Probability</b>	<b>Impact</b>	<b>Complexity</b>	<b>Dam Risk Value</b>
Bailey Mine Fresh Water Imp	1	3	4	7
Bailey Mine Slurry Impoundment	1	3	4	7
Bailey Sediment Pond No 1	1	3	4	7
Bailey Sediment Pond No 2	1	3	4	7
Bailey Mine Area No. 3 Saddle A	1	3	4	7
Bailey Mine Area No. 3 Saddle B	1	3	4	7
Bailey Mine Area No. 3 Saddle C	1	3	4	7
Bailey Mine Area No. 3 Saddle D	1	3	4	7
Bailey Mine Area No. 3 Slurry	1	3	4	7
Bailey No. 5 Sedimentation Pond	1	3	4	7
Bailey No 8 Slurry Impoundment	4	3	4	28
Bailey No 5 West Saddle	1	3	4	7
Bailey Mine Area No. 6 Sed Pond	1	3	4	7
Bailey No. 8 Sediment Pond	1	3	4	7
Cumberland No. 1 Slurry Pond 1	1	1	4	5
Cumberland No. 2 Slurry Pond	1	1	4	5
Emerald No. 1 Back Valley Western	1	2	3	5
Emerald No. 2 Back Valley Western	1	2	3	5
Emerald No. 1 Main Valley Eastern	1	2	3	5
Emerald No. 2 Main Valley Eastern	1	2	3	5
Emerald No. 1 Sed Pond 11	1	1	2	3
Emerald No.2 Sed Pond 1	1	1	2	3
Hughes Hollow Slurry Impoundment	1	3	4	7
Ryerson Station	4	1	1	8
Wisecarver	1	2	2	4
Note: Probability scores are directly related to the USACE NID condition assessments. Satisfactory condition assessments have been assigned a value of 1, fair condition assessments have been assigned a value of 2, poor condition assessments have been assigned a value of 3, and unsatisfactory/N/A condition assessments have been assigned a score of 4.				

Finally, this information was combined into a matrix for Greene County. This information can be found in the table below.

<b>PEMA Dam Classification</b>				
<b>Dam Name</b>	<b>Owner Name</b>	<b>PA DEP Classification</b>	<b>USACE Classification</b>	<b>PEMA Dam Prioritization</b>
Acid Mine Water Pond	Consolidation Coal Company	N/A	L	N/A
Augustine	Jim and Holly Augustine	N/A	S	N/A
Area 3/4 Lower Sed Pond	Consol Pa Coal Co LLC	C-4	L	N/A

***Greene County, Pennsylvania  
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<b>PEMA Dam Classification</b>				
<b>Dam Name</b>	<b>Owner Name</b>	<b>PA DEP Classification</b>	<b>USACE Classification</b>	<b>PEMA Dam Prioritization</b>
Area 3/4 Upper Sed Pond	Consol Pa Coal Co LLC	C-4	N/A	N/A
Bailey Mine Fresh Water Imp	Consol Pa Coal Co LLC	A-1	H	Medium
Bailey Mine Slurry Impoundment	Consol Pa Coal Co LLC	A-1	H	Medium
Bailey No 1 South Saddle Dike	Consol Pa Coal Co LLC	B-4	L	N/A
Bailey Sediment Pond No 1	Consol Pa Coal Co LLC	C-1	H	Medium
Bailey Sediment Pond No 2	Consol Pa Coal Co LLC	C-1	H	Medium
Bailey Mine Area No. 3 Saddle A	Consol Pa Coal Co LLC	B-1	H	Medium
Bailey Mine Area No. 3 Saddle B	Consol Pa Coal Co LLC	B-1	H	Medium
Bailey Mine Area No. 3 Saddle C	Consol Pa Coal Co LLC	B-1	H	Medium
Bailey Mine Area No. 3 Saddle D	Consol Pa Coal Co LLC	B-1	H	Medium
Bailey Mine Area No. 3 Slurry	Consol Pa Coal Co LLC	A-1	H	Medium
Bailey No. 5 Sedimentation Pond	Consol Pa Coal Co LLC	B-1	H	Medium
Bailey No 5 Slurry Impoundment	Consol Pa Coal Co LLC	A-1	N/A	N/A
Bailey No 5 West Saddle	Consol Pa Coal Co LLC	B-1	H	Medium
Bailey Mine Area No. 6 Sed Pond	Consol Pa Coal Co LLC	B-1	H	Medium
Bailey No. 8 Slurry Impoundment	Consol Pa Coal Co LLC	A-1	H	Medium
Bailey No. 8 Sediment Pond	Consol Pa Coal Co LLC	B-1	H	High
Blacksville #1 Freshwater Imp	Cnx Water Assets, LLC	C-3	S	N/A
Browns	Morgan Township Supervisors	C-4	L	N/A
Colvin Sedimentation Pond	Consol Mining Company LLC	B-3	S	N/A

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<b>PEMA Dam Classification</b>				
<b>Dam Name</b>	<b>Owner Name</b>	<b>PA DEP Classification</b>	<b>USACE Classification</b>	<b>PEMA Dam Prioritization</b>
Cosgray	Equitrans Inc	C-4	N/A	N/A
Cumberland No 1 Sed Pond	Cumberland Contura LLC	C-3	S	N/A
Cumberland No. 1 Slurry Pond 1	Iron Cumberland LLC	A-1	H	Medium
Cumberland No. 2 Sediment Pond.	Cumberland Contura LLC	C-3	S	N/A
Cumberland No. 2 Slurry Pond	Iron Cumberland LLC	A-1	H	Medium
Diamond Lake	John C. McNay	C-4	L	N/A
Dry Tavern Sportsman's Club	Dry Tavern Sportsman's Club	C-4	N/A	N/A
Emerald Lake	John C. McNay	C-4	N/A	N/A
Emerald No. 1 Back Valley Western	Emerald Contura LLC	B-1	H	Medium
Emerald No. 2 Back Valley Western	Emerald Contura LLC	A-1	H	Medium
Emerald No. 1 Main Valley Eastern	Iron Emerald LLC	A-1	H	Medium
Emerald No. 2 Main Valley Eastern	Iron Emerald LLC	A-1	H	Medium
Emerald No. 1 Sed Pond 11	Iron Emerald LLC	C-1	H	Medium
Emerald No.2 Sed Pond 1	Iron Emerald LLC	C-1	H	Medium
Grays Landing Lock & Dam	Coe Pittsburgh District	C-1	S	N/A
Hatfield Ferry Sedimentation Pond	Lawrenceville Acquisition, LLC	C-3	S	N/A
Hatfield Ferry WWT Lagoon	Firstenergy Generation, LLC	C-4	N/A	N/A
Hughes Hollow Slurry Impoundment	The Monongalia County Coal Company	A-1	H	Medium
Intake	Southwestern Pa Water Authority	C-4	N/A	N/A
Jewell Pond	Jerry Jewell	C-3	S	N/A

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<b>PEMA Dam Classification</b>				
<b>Dam Name</b>	<b>Owner Name</b>	<b>PA DEP Classification</b>	<b>USACE Classification</b>	<b>PEMA Dam Prioritization</b>
Kirby Fresh Water Impoundment	Consolidation Coal Company	C-4	N/A	N/A
Leonard George	Leonard George	C-4	L	N/A
Lewis	George Lewis	C-4	S	N/A
Lovingood	Consolidation Coal Company	C-4	L	N/A
Mt. Morris Sportsmen's Association	Mount Morris Sportsmen's Association	C-3	S	N/A
Neely	John Neely	C-4	L	N/A
Nello L Teer Co	Three Rivers Mgmt., Inc.	C-3	S	N/A
Pegs Run Slurry Impoundment	Peg Run Coal Company, Inc.	C-4	L	N/A
Point Mason Lock and Dam	CELRP	N/A	S	N/A
Pumping Station (Upper)	Anderson Copper and Brass Company	C-4	N/A	N/A
Rastoka	Albert Rastoka	C-3	S	N/A
Robena Pond No 6	Consol Mining Company LLC	A-4	L	N/A
Robena Slurry Pond No 4	Consol Mining Company LLC	A-4	L	N/A
Rohanna	Rohanna Iron & Metal Inc.	C-3	S	N/A
Ryerson Station	DCNR - Bureau of State Parks	B-1	H	Medium
Slurry Pond No. 1	Consolidation Coal Company	N/A	L	N/A
Unnamed	1st Nat'l Bank of Washington	C-4	N/A	N/A
Waynesburg Lakes	John C. McNay	C-4	L	N/A
Wisecarver	Southwestern Pa Water Authority	C-1	H	Medium
<p>Note: Any entry with a 'N/A' in the USACE column indicates that that dam is noted only in the information provided by PA DEP, and not the United States Army Corps of Engineer's National Inventory of Dams (NID). *Denotes that this dam is listed twice in the PA DEP data</p>				

## *Greene County, Pennsylvania 2025 Hazard Mitigation Plan*

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### **Levees**

There is only one levee section in Greene County and that levee is the Freeport – Right Bank Pennsylvania Fork Fish Creek. This levee is approximately 0.45 miles in length and is located in Freeport Township.

The entire leveed areas for Greene County protect a total of twenty-eight structures within the county. Also protected is one facility point in Greene County. This analysis includes community lifeline facilities (municipal buildings, hospitals, police/fire/EMS, schools, childcare centers, and nursing/care homes) facilities. The point located in the leveed area is the New Freeport Volunteer Fire Company. Each levee in Greene County is a mainline levee and protects along a variety land features. A failure of levee in the urban areas in Greene County would be catastrophic to life and property.

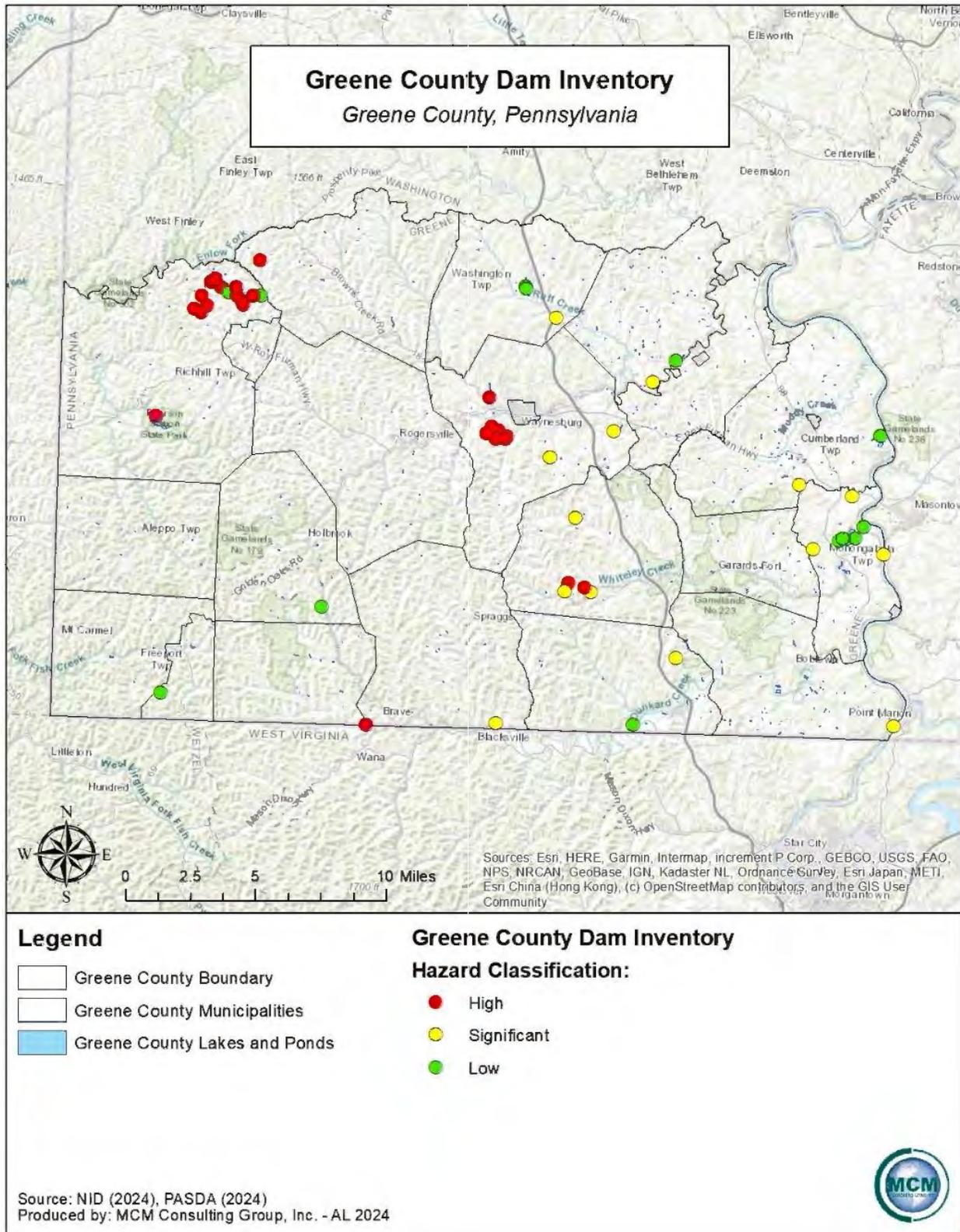
There are a large number of community lifeline facilities within the levee protection areas for the levees around Greene County. *Table 63 – Number of Vulnerable Structures within Leveed Areas* shows the number of addressable structures and facility type points in the largest levee protection areas within Greene County based on NLD information from 2024. The features included in the table are particularly vulnerable to levee failure because they are protected by the system. Should the levee systems fail, the structures would be at an increased risk by their flood sources.

*Table 63 - Number of Vulnerable Structure within Leveed Areas*

<b>Number of Vulnerable Structures within Leveed Areas</b>		
<b>Leveed Area Name</b>	<b>Addressable Structures in Leveed Area</b>	<b>Facility Type Points in Leveed Area</b>
Freeport – Right Bank Pennsylvania Fork Fish Creek	28	1
<b>Totals:</b>	<b>28</b>	<b>1</b>

# Greene County, Pennsylvania 2025 Hazard Mitigation Plan

Figure 44 - Greene County Dams



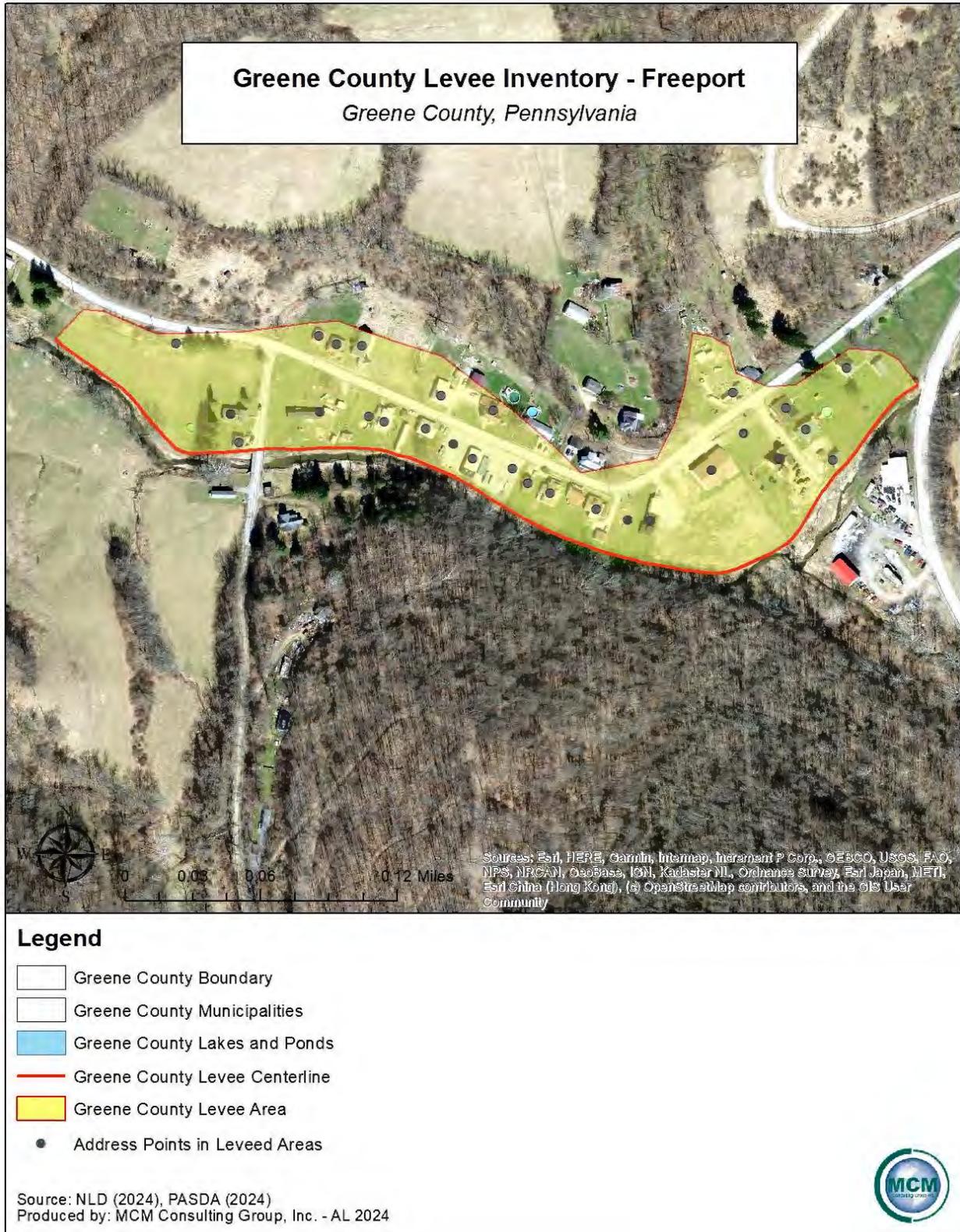
# Greene County, Pennsylvania 2025 Hazard Mitigation Plan

Figure 45 - Greene County Levee Locations



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Figure 46 - Greene County Levee Location – Freeport



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### **4.3.17. Environmental Hazards**

#### **4.3.17.1 Location and Extent**

##### Transportation

Environmental hazards are most commonly due to hazardous materials incidents occurring when such materials are manufactured, used, stored, or transported. Most hazardous materials incidents are unintentional, however hazardous materials could also be released in a criminal or terrorist act. A release, whether it is intentional or accidental, can result in injury or death and may contaminate air, water and/or soils. Hazardous materials incidents can be generally broken down into the subcategories of transportation and fixed facility. This section will focus on environmental hazards and how they relate to transportation of hazardous materials.

Tanker trucks, tractor trailers, and rail cars often are used to transport hazardous materials. When there are transportation incidents involving these types of vehicles, hazardous materials can be released in significant quantities. *Figure 48 – Environmental Hazard Transportation Vulnerability* shows major transportation routes through Greene County, including I-79, US 19, PA 18, PA 21, PA 88, PA 188, PA 218, PA 221, PA 231.

##### Fixed Facility

Hazardous materials incidents can be broken down into the subcategories of transportation and fixed facility. This section of the report focuses on environmental hazardous materials at fixed facilities.

In Pennsylvania, facilities that use, manufacture, or store hazardous materials must comply with Title III of the federal Superfund Amendments and Reauthorization Act (SARA), and the Commonwealth's reporting requirements under the Hazardous Materials Emergency Planning and Response Act (1990-165), as amended. At the time of preparing this plan, SARA data was not readily accessible. Information regarding the number of SARA facilities and their respective locations was unavailable, due to data limitation no mapping has been developed for hazardous material locations in Greene County.

Fixed facilities are also monitored by the Environmental Protection Agency (EPA). The EPA has identified hazardous materials sites, not regulated by SARA Title III, and are known as Toxic Releases Inventory (TRI) sites. Facilities which employ ten or more full-time employees, and which manufacture or process more than 25,000 pounds (or use more than 10,000 pounds) of any SARA Section 313-listed toxic chemical in the course of a calendar year are required to report TRI information to the EPA. The EPA is the federal enforcement agency responsible for SARA Title III and PEMA classifications. As of 2024, there are two TRI facilities in Greene County.

Oil and gas extraction facilities can also be sources of hazardous material release. Most wells in the county are active, but there are also many inactive and abandoned wells. *Figure 47 – Oil &*

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*Gas Well Locations* shows the location of all oil and gas wells in the county along with their proximity to surface waters.

### **4.3.17.2 Range of Magnitude**

#### Transportation

While often accidental, releases can occur because of human carelessness, intentional acts, or natural hazards. When caused by natural hazards, environmental hazards are known as secondary events. Hazardous materials can include toxic chemicals, radioactive materials, infectious substances, or hazardous waste. Such releases can affect nearby populations and contaminate critical or sensitive environmental areas.

Hazardous material release can contaminate air, water, and soil, and can possibly cause injuries, poisonings, or deaths. Hazardous materials fall into nine hazards classes. These hazard classes are as follows:

- Class #1: Explosives
- Class #2: Gases (flammable, non-flammable, non-toxic, and toxic)
- Class #3: Flammable and Combustible Liquids
- Class #4: Flammable Solids (spontaneously combustible and dangerous when wet materials/water reactive substances)
- Class #5: Oxidizing substances and organic peroxides
- Class #6: Toxic Substances and Infectious Substances
- Class #7: Radioactive Materials
- Class #8: Corrosive Substances
- Class #9: Miscellaneous Hazardous Materials / Substances

All nine hazard classes can be found in transportation incidences.

#### Fixed Facility

All nine hazard classes can be found at fixed facilities. Certain conditions can exacerbate release incidents, and these events include fixed facilities:

- Micrometeorological effects of buildings and terrain which alters the dispersion of hazardous materials.
- Proximity to surface water and ground water resources.
- Compliance with applicable codes (e.g., building or fire codes) and maintenance failures (e.g., fire protection and containment features can substantially increase the damage to the facility itself and to surrounding buildings).

The type of material released, distance, and related response time of emergency responders also significantly impact severity and scope of hazardous material releases and clean-up efforts.

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Areas most proximal to the release are usually at the greatest level of risk, but depending on the material, a release can travel great distances or remain present in the environment for long periods of time (centuries or millennia for some radioactive materials) resulting in chronic and extensive impacts on people and the environment.

Oil and gas well drilling can have a variety of effects on the environment. Abandoned oil and gas wells, not properly plugged can contaminate groundwater and consequently drinking water wells. Surface water and soil are sometimes polluted by brine, a salty wastewater product of oil and gas well drilling, and from oil spills occurring at the drilling site or from a pipeline breach. A pipeline breach or an accidental dispersal can spoil public drinking water supplies and can be particularly detrimental to vegetation and aquatic animals, making water safety an important factor in oil and gas extraction. In some cases, associated with hydraulic fracturing (fracking), methane has been found contaminating drinking water in surrounding areas.

Natural gas fires occur when natural gas is ignited at the well site. Often, these fires erupt during drilling when a spark from machinery or equipment ignites the gas. The initial explosion and resulting flames have the potential to seriously injure or kill individuals in the immediate area. These fires are often difficult to extinguish due to the intensity of the flame and the abundant fuel source.

### **4.3.17.3 Past Occurrence**

#### **Transportation**

In the past, deaths have resulted from a fuel oil truck fire. More recent events are recorded in the WebEOC and county reporting software and are summarized in *Table 64 – Hazardous Material Incidents*. Transportation accidents that involved hazardous materials were included in the table below.

*Table 64 - Hazardous Material Incidents*

<b>Hazardous Material Incidents</b>		
<b>Municipality</b>	<b>Date</b>	<b>Event</b>
Franklin Township	10/30/2018	Natural gas release
Gilmore Township	10/26/2018	Natural gas release
Whitley Township	10/29/2028	Natural gas release
Greene Township	10/31/2018	Gas blow off
Whiteley Township	10/30/2018	Gas well blown down
Morgan Township	10/31/2018	Gas explosion
Clarksville Borough	10/31/2018	Natural gas release
Center Township	10/30/2018	Well Flare
Springhill Township	11/09/2018	Natural gas link break
Washington Township	11/14/2018	Gas line blown down
Center Township	11/14/2018	Natural gas incident

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Hazardous Material Incidents		
Municipality	Date	Event
Waynesburg Borough	12/07/2018	Chemical Spill
Whitley Township	03/05/2019	Pipeline Break
Aleppo Township	03/08/2019	Natural gas release
Richill Township	03/29/2019	Chemical spill
Franklin Township	04/03/2019	Radioactive device recovered
Cumberland Township	04/04/2019	Fuel leak
Franklin Township	04/04/2019	Propane tank fire
Gilmore Township	06/24/2019	Natural gas release
Clarksville Borough	07/09/2019	Natural gas release
Richhill Township	08/26/2019	Oil on roadway
Franklin Township	08/20/2019	Natural gas release
Wayne Township	09/08/2019	Gas line rupture
Dunkard Township	02/20/2020	Natural gas release
Morgan Township	03/16/2020	Natural gas release
Whiteley Township	03/27/2020	Truck fuel leak
Washington Township	04/17/2020	Chemical spill
Wayne Township	05/16/2020	Unknown fluid dump
Freeport Township	05/26/2020	Gas line leak
Waynesburg Borough	05/14/2020	Chemical spill
Greene Township	06/30/2020	Natural gas release
Freeport Township	07/01/2020	Gas line hit
Morgan Township	07/03/2020	Natural gas release
Jackson Township	08/10/2020	Truck with hydraulic spill
Cumberland Township	08/14/2020	Chemical spill in river
Waynesburg Borough	08/18/2020	Natural gas link stuck
Jefferson Township	09/18/2020	Gas line leak
Cumberland Township	10/02/2020	Natural gas tank release
Franklin Township	10/07/2020	Line valve struck
Franklin Township	10/28/2020	Diesel fuel on roadway
Whiteley Township	11/23/2020	Gas blow off
Morris Township	12/05/2020	Gas well compressor station explosion
Rices Landing Borough	12/08/2020	Gas line struck
Whiteley Township	01/24/2021	Natural gas release
Jackson Township	01/26/2021	Chemical spill
Whiteley Township	01/31/2021	Gas blow off
Whiteley Township	02/22/2021	Gas well flaring
Franklin Township	02/25/2021	Diesel fuel spill
Morgan Township	02/27/2021	Pipeline break
Cumberland Township	03/03/2021	Natural gas release
Waynesburg Brough	03/23/2021	Narcotics in vehicle w/ officer exposure
Franklin Township	03/30/2021	Natural gas release

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Hazardous Material Incidents		
Municipality	Date	Event
Wayne Township	03/30/2021	Gas line leak
Whiteley Township	04/09/2021	Tank fuel leak
Springhill Township	05/06/2021	Natural gas flare
Franklin Township	05/11/2021	Natural gas release
Cumberland Township	05/18/2021	Natural gas release
Springhill Township	05/31/2021	Gas well flaring
Aleppo Township	06/14/2021	Equipment rollover
Franklin Township	06/16/2021	Natural gas release
Cumberland Township	06/17/2021	Natural gas release
Franklin Township	06/18/2021	Natural gas release
Washington Township	04/05/2021	Possible chemical spill
Franklin Township	06/29/2021	Natural gas release
Franklin Township	07/01/2021	Natural gas release
Wayne Township	07/21/2021	Natural gas release
Richhill Township	07/21/2021	Natural gas release
SpringHill Township	07/26/2021	Gas well flare
Springhill Township	08/04/2021	Gas well flare
Springhill Township	08/18/2021	Gas well flare
Springhill Township	08/18/2021	Natural gas flaring
Wayne Township	08/11/2021	Natural gas flaring
Center Township	08/30/2021	Natural gas flaring
Franklin Township	08/31/2021	Natural gas flaring
Whiteley Township	09/04/2021	Natural gas flaring
Morris Township	09/08/2021	Natural gas flaring
Morris Township	09/08/2021	Natural gas flaring
Morris Township	09/09/2021	Natural gas flaring
Franklin Township	09/28/2021	Natural gas flaring
Wayne Township	10/06/2021	Natural gas flaring
Morris Township	10/06/2021	Natural gas flaring
Jefferson Township	10/25/2021	Natural gas flaring
Whiteley Township	11/10/2021	Well flaring
Whiteley Township	11/28/2021	Natural gas flaring
Center Township	12/01/2021	Pipeline blow down
Greene Township	12/23/2021	Flaring gas well
Whiteley Township	12/27/2021	Flaring
Whiteley Township	01/06/2022	Gas well flaring
Richhill Township	01/10/2022	Chemical spill
Waynesburg Borough	01/26/2022	Fuel additive spill
Waynesburg Borough	02/07/2022	Brine Spill
Wayne Township	03/09/2022	Gas well flaring
Whiteley Township	03/28/2022	Natural gas pipeline blow down
Richhill Township	03/29/2022	Natural gas release

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<b>Hazardous Material Incidents</b>		
<b>Municipality</b>	<b>Date</b>	<b>Event</b>
Washington Township	03/28/2022	Tanker will spill
Richhill Township	03/28/2022	Well flaring
Jackson Township	04/22/2022	Natural gas release
Franklin Township	04/28/2022	Natural gas release
Cumberland Township	04/30/2022	Natural gas release
Jackson Township	04/30/2022	Natural gas release
Franklin Township	05/05/2022	Natural gas release
Morris Township	05/05/2022	Natural gas line struck
Aleppo Township	05/17/2022	Gas blow off
Franklin Township	05/17/2022	Natural gas release
Whiteley Township	05/17/2022	Natural gas release
Jackson Township	05/22/2022	Well site flare
Franklin Township	05/31/2022	Gas blow down
Franklin Township	06/01/2022	Natural gas release
Franklin Township	06/03/2022	Natural gas release
Franklin Township	06/06/2022	Natural gas release
Franklin Township	06/07/2022	Natural gas release
Franklin Township	06/13/2022	Natural gas release
Springhill Township	06/13/2022	Gas blow off
Franklin Township	06/17/2022	Venting natural gas
Cumberland Township	06/14/2022	Human waste in storm drain
Richhill Township	06/23/2022	Natural gas well flare
Springhill Township	06/22/2022	Gas well flare
Jackson Township	07/04/2022	Well flare
Monongahela Township	07/14/2022	Natural gas release
Springhill Township	07/05/2022	Gas flare
Washington Township	07/19/2022	Natural gas release
Washington Township	07/21/2022	Natural gas release
Springhill Township	07/23/2022	Gas well flaring
Aleppo Township	08/02/2022	Gas well flaring
Washington Township	08/10/2022	Natural gas release
Aleppo Township	08/09/2022	Flaring
Washington Township	08/16/2022	Natural gas release pipeline
Aleppo Township	08/16/2022	Well flare
Freeport Township	08/26/2022	Chemical release
Aleppo Township	08/23/2022	Gas well flaring
Center Township	09/07/2022	Natural gas release
Center Township	09/08/2022	Natural gas release
Jefferson Township	09/12/2022	Natural gas release
Aleppo Township	09/12/2022	Well pad flaring
Washington Township	09/28/2022	Diesel spill fuel
Center Township	09/28/2022	Natural gas release

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Hazardous Material Incidents		
Municipality	Date	Event
Dunkard Township	10/03/2022	Gas line struck
Franklin Township	10/07/2022	Natural gas release
Center Township	10/10/2022	Venting of natural gas
Springhill Township	10/06/2022	Gas well flare
Franklin Township	10/14/2022	Gas well flare
Franklin Township	10/28/2022	Gas well flaring
Franklin Township	11/10/2022	Natural gas release
Clarksville Brough	11/17/2022	Gas leak
Franklin Township	11/17/2022	Natural gas release
Morris Township	12/12/2022	Natural gas release
Franklin Township	12/12/2022	Natural gas release
Dunkard Township	12/31/2022	Diesel fuel spill
Whiteley Township	01/30/2023	Pipeline blow down
Franklin Township	02/01/2023	Natural gas release
Morris Township	01/29/2023	Gas well flaring
Greene Township	02/14/2023	Natural gas release
Morris Township	02/08/2023	Flaring
Franklin Township	03/16/2023	Gas release with flame
Franklin Township	03/20/2023	Pipeline blow down
Wayne Township	03/20/2023	Tire/plastic fire
Franklin Township	03/22/2023	Natural gas release
Whiteley Township	03/23/2023	Brine water leak
Richhill Township	04/13/2023	Brine water spill
Jefferson Township	04/12/2023	Gas blow off
Franklin Township	04/18/2023	Natural gas blow off
Center Township	04/21/2023	Fuel spill
Richhill Township	05/03/2023	Gas well flaring
Aleppo Township	06/01/2023	Well pad flaring
Wayne Township	06/05/2023	Natural gas line break
Franklin Township	06/05/2023	Venting natural gas
Richhill Township	06/11/2023	Chemical spill
Aleppo Township	06/11/2023	Gas well flaring
Aleppo Township	06/19/2023	Well Flare
Richhill Township	07/10/2023	Natural gas release
Franklin Township	07/13/2023	Natural gas release
Morris Township	09/12/2023	Venting natural gas
Freeport Township	09/12/2023	Ruptured natural gas line
Morris Township	09/18/2023	Purging natural gas pipeline
Wayne Township	10/02/2023	Flaring
Wayne Township	10/10/2023	Well pad flaring
Wayne Township	10/23/2023	Gas well flaring
Center Township	11/07/2023	Natural gas release

***Greene County, Pennsylvania  
2025 Hazard Mitigation Plan***

<b>Hazardous Material Incidents</b>		
<b>Municipality</b>	<b>Date</b>	<b>Event</b>
Center Township	11/09/2023	Natural gas release
Wayne Township	11/29/2023	Gas well flaring
Waynesburg Borough	01/03/2024	Live WWII Mortar explosion
Gilmore Township	01/07/2024	Flaring
Center Township	01/12/2024	Ruptured fuel tank
Richhill Township	01/28/2024	Gas well flaring
Richhill Township	02/02/2024	Gas well flaring
Center Township	02/02/2024	Gas well flaring
Wayne Township	02/10/2024	Natural gas well flaring
Franklin Township	02/09/2024	Release of natural gas
Wayne Township	02/17/2024	Natural gas release
Center Township	02/28/2024	Natural gas release
Whiteley Township	03/12/2024	Diesel fuel spill
Richhill Township	04/03/2024	Natural gas release
Morris Township	04/09/2024	Gas well flaring
Morris Township	04/15/2024	Natural gas venting
Dunkard Township	04/20/2024	Pipeline break
Jefferson Township	05/07/2024	Natural gas release
Franklin Township	05/13/2024	Natural gas release
Morris Township	06/04/2024	Natural gas release
Gilmore Township	06/21/2024	Gas well drilling and flaring
Greene Township	06/23/2024	Gas vent pipe flaring
Gilmore Township	06/27/2024	Natural gas release
Gilmore Township	07/18/2024	Natural gas release
Dunkard Township	06/01/2024	Natural gas release
Gilmore Township	07/24/2024	Natural gas release
Springhill Township	09/04/2024	Propane gas flaring
Franklin Township	09/30/2024	Natural gas release
Center Township	10/18/2024	Natural gas release
Center Township	11/07/2024	Natural gas release
Franklin Township	11/22/2024	Natural gas release
Gilmore Township	11/21/2024	Gas well flaring
Springhill Township	12/20/2024	Propane flaring
Gilmore Township	12/29/2024	Natural gas flaring
Source: WebEOC, County Reporting System, 2024		

Hazardous materials can be transported by air, sea, and land (over the road or through pipelines). Transportation accidents along roadways is a regular occurrence and a large number of hazardous materials are transported by roadway every day.

## *Greene County, Pennsylvania 2025 Hazard Mitigation Plan*

### Fixed Facility

There have been several hazardous material incidents in Greene County in the past, but few of those events have been related to fixed facilities in the county. More recent events are recorded in WebEOC and county reporting software and are summarized in *Table 64 – Hazardous Material Incidents*.

The EPA tracks the management of hazardous materials in facilities that handle significant amounts of hazardous materials. The two TRI facilities in Greene County as of 2024 are summarized in *Table 65 – TRI Facilities*. Production-related waste managed is a collective term to refer to how much of a chemical is recycled, combusted for energy recovery, treated for destruction, or disposed of, or otherwise released on and off site.

*Table 65 - TRI Facilities*

<b>Toxic Release Inventory Facilities</b>				
<b>Name</b>	<b>Address</b>	<b>Industry Sector</b>	<b>Chemical</b>	<b>Production-related Waste Managed (lbs)</b>
Anderson Fittings	103 Chestnut Street, Brave Pennsylvania 15316	332- Fabricated Metals	Copper, Copper compounds, Lead, Nitrate compounds, Nitric acid, Zinc compounds.	1,338,038 lbs.
Morgantown Technical Services, Inc.	303 Meadow Ridge Road, Mount Morris Pennsylvania 15349	999- Other	Ethylene glycol	2,886 lbs.
Source: EPA, 2024				

As of September 2024, Greene County is home to 1,561 active natural gas wells.

### **4.3.17.4 Future Occurrence**

#### Transportation

While many incidents involving hazardous material releases have occurred in Greene County in the past, they are generally difficult to predict. The nature of traffic accidents is that there is little to no warning for their occurrence, and they can have disastrous results. An occurrence is largely dependent upon the accidental or intentional actions of a person or group.

## *Greene County, Pennsylvania* *2025 Hazard Mitigation Plan*

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### Fixed Facility

Hazardous material release incidents are generally difficult to predict, but the presence of such dangerous materials warrants preparation for accidental or intentional release events. Emergency response agencies in Greene County should be prepared to handle the types of hazardous materials housed and used the SARA Title III facilities, TRI facilities, and oil and gas wells that are located within the county. The Federal Superfund Amendments and Reauthorization Act (SARA) is also known as the Emergency Planning and Community Right-to-Know Act (EPCRA), and the Local Emergency Planning Committees (LEPCs) are designed by EPCRA to ensure that state and local communities are prepared to respond to potential chemical accidents.

### **4.3.17.5 Vulnerability Assessment**

#### Transportation

Quick response to transportation accidents involving hazardous materials minimizes the volume and concentration of hazardous materials that are transported and dispersed through the air, water, and soil. Every municipality within Greene County is vulnerable to a hazardous materials incident caused along a transportation route. These incidents can occur along highways, railways, and pipelines. *Figure 48 – Environmental Hazard Transportation Vulnerability Map* identified the 2,000-foot hazard corridor for all major highways in Greene County. *Figure 49 – Annual Truck Traffic Percentages* identifies the annual truck traffic percentages for all the roadways in Greene County.

#### Fixed Facility

Populations, critical infrastructure, and natural habitats within 1.5 miles of SARA Title III and Toxic Release Inventory sites are vulnerable to hazardous material incidents.

Private water suppliers such as domestic drinking water wells in the vicinity of oil and gas wells are at risk of contamination from brine and other pollutants, including methane, which can pose a fire and explosive hazard. Ideally, vulnerability of private drinking well owners would be established by comparing the distance of drinking water wells to known oil and gas well locations, but this extensive detailed data is not readily available. Private drinking water is largely unregulated and information on these wells is voluntarily submitted to the Pennsylvania Topographic and Geologic Survey by water well drillers, and the existing data is largely incomplete and/or not completely accurate. Center Township contains the most oil and gas wells, and Richhill Township contains the most drinking water wells, *Table 66 – Oil and Gas Wells & Drinking Water Wells* illustrates the type of well and the local domestic drinking water wells for each municipality.

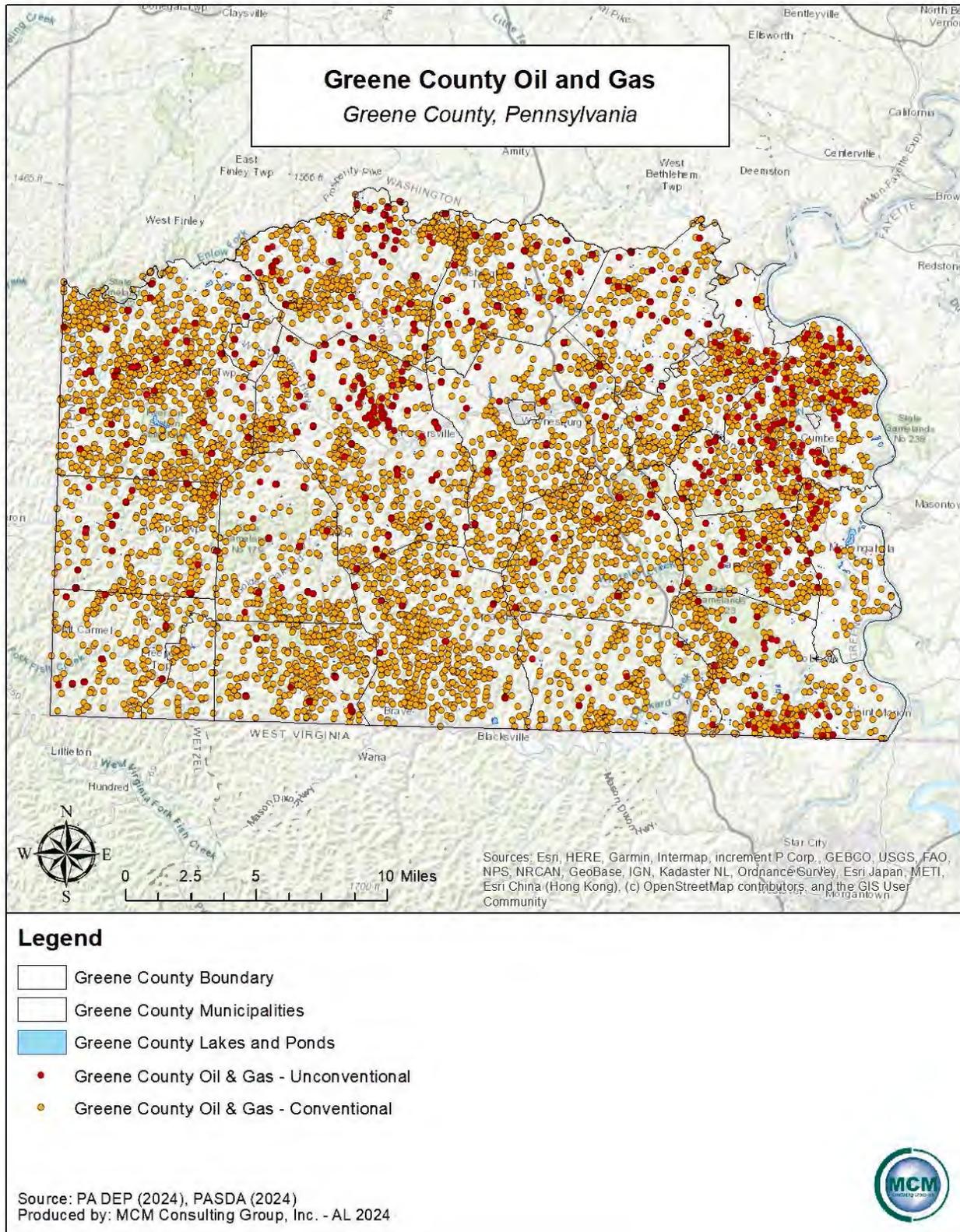
## *Greene County, Pennsylvania 2025 Hazard Mitigation Plan*

Table 66 - Oil and Gas Wells & Drinking Water Wells

<b>Oil &amp; Gas Wells in Greene County (2024)</b>					
<b>Municipality</b>	<b>Type of Well</b>				<b>Domestic Drinking Water Wells</b>
	<b>Active</b>	<b>Abandoned</b>	<b>Inactive</b>	<b>Proposed</b>	
Aleppo Township	67	1	0	0	50
Carmichaels Borough	0	0	0	0	3
Center Township	241	0	11	0	86
Clarksville Borough	0	0	0	0	2
Cumberland Township	121	0	0	0	43
Dunkard Township	54	0	0	0	1
Franklin Township	104	0	1	0	113
Freeport Township	0	0	0	0	15
Gilmore Township	18	0	2	0	25
Gray Township	20	0	0	0	12
Greene Township	44	0	0	0	16
Greensboro Borough	0	0	0	0	0
Jackson Township	59	0	0	0	41
Jefferson Borough	0	0	0	0	0
Jefferson Township	63	1	0	0	31
Monongahela Township	17	0	0	0	3
Morgan Township	111	0	0	0	90
Morris Township	158	3	8	0	57
Perry Township	1	0	0	0	25
Rices Landing Borough	0	0	0	0	0
Richhill Township	175	0	1	0	157
Springhill Township	42	0	0	0	22
Washington Township	157	0	0	0	70
Wayne Township	39	0	0	0	43
Waynesburg Borough	0	0	0	0	3
Whiteley Township	75	0	0	0	50
<b>Total:</b>					
Source: PA DEP, 2024					

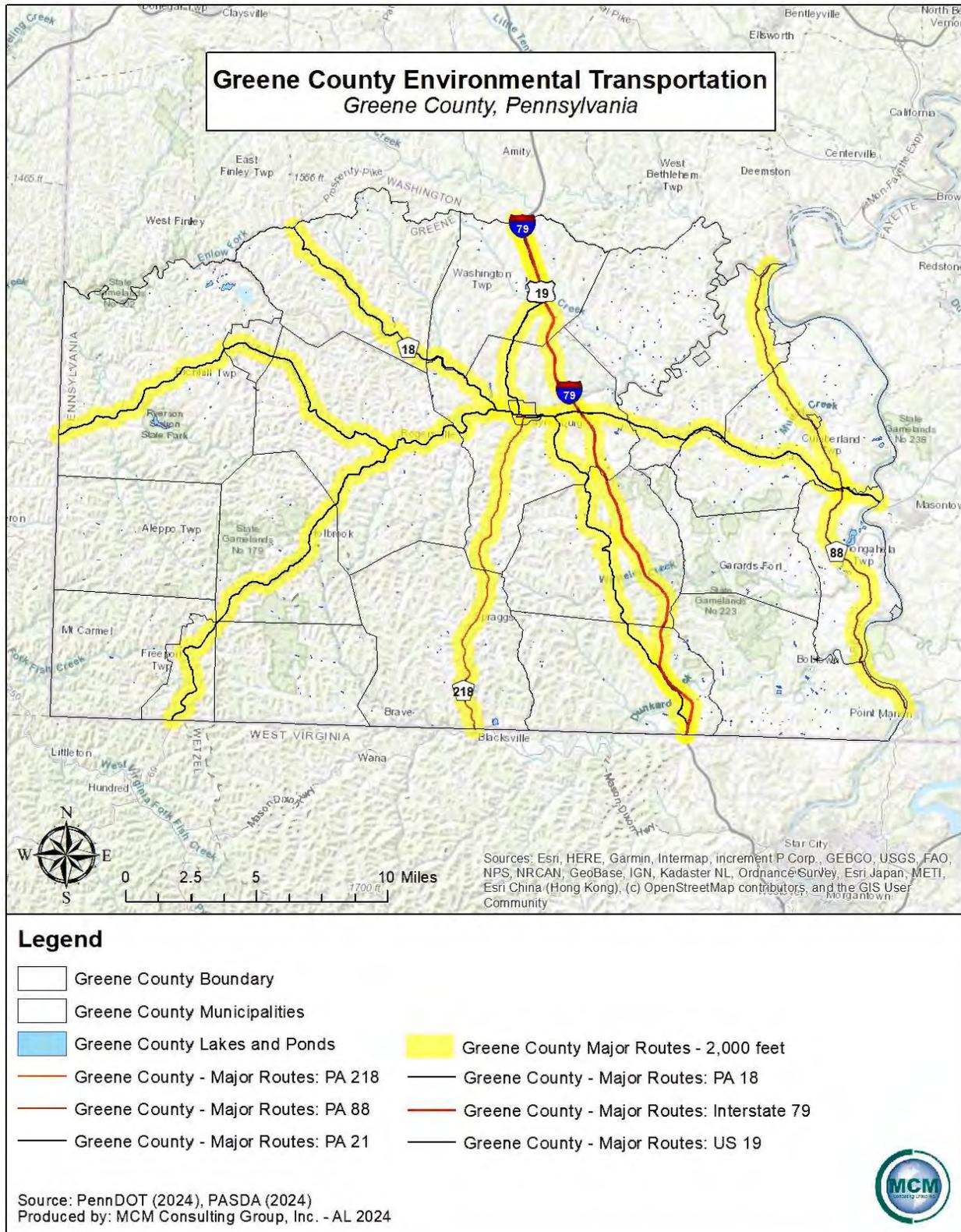
# Greene County, Pennsylvania 2025 Hazard Mitigation Plan

Figure 47 - Oil and Gas Well Locations



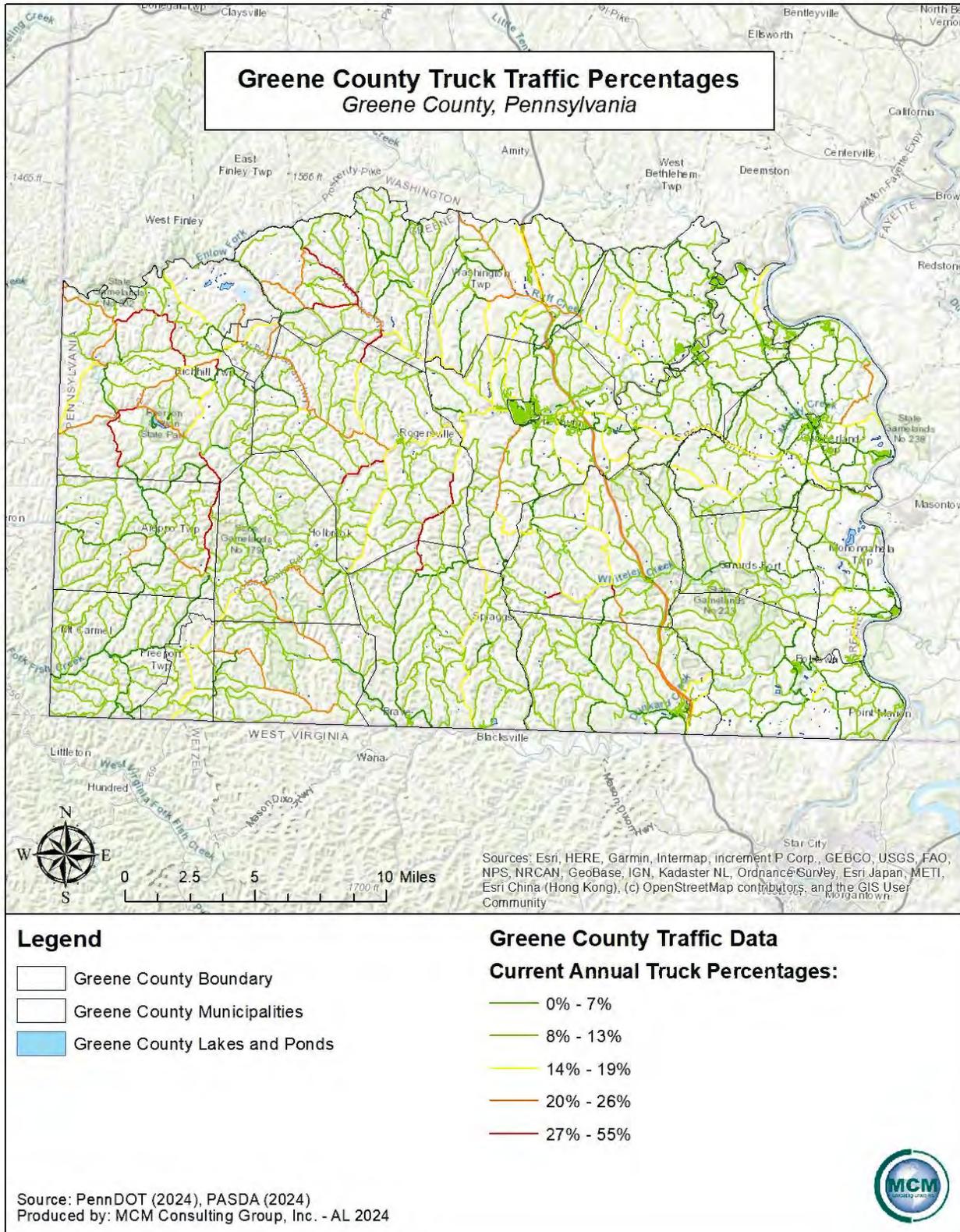
# Greene County, Pennsylvania 2025 Hazard Mitigation Plan

Figure 48 - Environmental Hazard Transportation Vulnerability



# Greene County, Pennsylvania 2025 Hazard Mitigation Plan

Figure 49 - Annual Truck Traffic Percentages



## *Greene County, Pennsylvania 2025 Hazard Mitigation Plan*

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### **4.3.18. Substance Use Disorder**

#### **4.3.18.1 Location and Extent**

Substance Use Disorder (SUD) is a chronic condition characterized by compulsive drug or alcohol use despite the harmful consequences. According to the American Addiction Centers substance use disorder affects brain function and behavior, leading to an inability to control substance intake (Fuller 2023). Symptoms include intense cravings, tolerance, withdrawal symptoms, and continued use despite negative effects on health, relationships, and responsibilities. Substance use disorder can impact anyone regardless of age, gender, or background, and often requires comprehensive treatment involving therapy, medication, and support to achieve recovery.

Substance use disorder escalates into opioid addiction through a progression that often starts with the legitimate medical use of prescription opioids for pain relief. Over time, individuals may develop a tolerance, requiring larger doses for the same effect. This can evolve into physical dependence, where the body experiences withdrawal symptoms without the drug. Psychological factors, such as seeking relief from stress, trauma, or co-occurring mental health disorders, may compel individuals to continue using opioids despite negative consequences. Eventually, the compulsive need to use opioids takes over, characterized by addiction, where obtaining and using the drug becomes a central focus of life.

According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) ten classes of substance use disorder exist. These substances use related mental illnesses are alcohol use disorder, cannabis use disorder, phencyclidine use disorder, other hallucinogen use disorder that differ from phencyclidine, inhalant use disorder, opioid use disorder, sedative, hypnotic or anxiolytic use disorder and lastly stimulant use disorder which accompanies cocaine or methamphetamine.

Pennsylvania and the United States at large have been experiencing a substance use disorder epidemic which can lead to opioid drug abuse. According to the Pennsylvania Department of Health, the opioid overdose epidemic is the worst public health crisis in Pennsylvania. It affects Pennsylvanians across the state, from big cities to rural communities.

Opioids, mainly synthetic opioids (other than methadone), are currently the main driver of drug overdose deaths. According to the Center for Disease Control and Prevention (CDC), 72.9% of opioid-involved overdose deaths involved synthetic opioids. Opioid addiction occurs when an individual becomes physically dependent on opioids. Opioids are a class of drug that reduces pain by interacting with receptors on nerve cells in the body and brain. The use of opioids is a broad term and includes opiates, which are drugs naturally extracted from certain types of poppy plants, and narcotics. Opioids can also be synthetically made to emulate opium. Opioid drugs are

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highly addictive and typically result in increasing numbers of overdose deaths both prescribed (e.g. fentanyl) and illicit (e.g. heroin) opioids. Overdose deaths from opioids occur when a large dose slows breathing, which can occur when opioids are combined with alcohol or antianxiety drugs. While generally prescribed with good intentions, opioids can be over-prescribed, resulting in addiction.

According to the Drug Enforcement Administration (DEA), opioids come in various forms such as tablets, capsules, skin patches, powder, chunks in various colors from white to brown/black, liquid form for oral or injection use, syrups, suppositories, and lollipops. The Centers for Disease Control and Prevention (CDC) defines the following as the three most common types of opioids:

- **Prescription Opioids:** Opioid medication prescribed by doctors for pain treatment. These can be synthetic oxycodone (OxyContin), hydrocodone (Vicodin), or natural (morphine).
- **Fentanyl:** A powerful synthetic opioid that is 50 to 100 times more powerful than morphine and used for treating severe pain; illegally made and distributed fentanyl is becoming more prevalent.
- **Heroin:** An illegal natural opioid processed from morphine which is becoming more commonly used in the United States.

Opioids are highly addictive. They block the body's ability to feel pain and can create a sense of euphoria. Additionally, individuals often build a tolerance to opioids, which can lead to misuse and overdose.

While other addictive substances such as methamphetamines and alcohol can be problematic for the health of individuals in Greene County, this profile focuses on opioid drugs and the substance use disorder epidemic. The opioid crisis along with substance use disorder was declared to be a public health emergency on October 26, 2017. While the declaration provides validation for the scope and severity of the problem, it was not accompanied by any release of funding for mitigating actions. On January 10, 2018, Governor Tom Wolf declared the opioid epidemic to be a statewide public health disaster emergency for Pennsylvania. The declaration is intended to enhance response and increase access to treatment.

### **4.3.18.2 Range of Magnitude**

Substance use disorder may lead to a narcotic addiction which could lead to an overdose and can sometimes be fatal. The most dangerous side effect of an overdose can include depressed breathing. Lack of oxygen to the brain causes permanent brain damage, leading to organ failure, and eventually death. Signs and symptoms include respiratory depression, drowsiness, disorientation, pinpoint pupils, and clammy skin. Substance use dependency can also be passed from mother to child in the womb. This condition, known as neonatal abstinence syndrome, has

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increased five-fold, according to the National Institute on Drug Abuse (NIDA). This results in an annual estimate of 22,000 babies born in the United States with this condition.

### **4.3.18.3 Past Occurrence**

In 2023, there was an estimated total of 107,543 drug-related overdose deaths in the United States. This is the highest number of overdose deaths ever recorded in a 12-month period, according to the recent provisional data from the CDC. *Table 67 – Drug Overdose Mortality in Greene County* shows death rates and deaths per month in Greene County from 2015 to 2022. From the years 2021 to 2022, Greene County has experienced an increase in death rates from drug overdose. The most common age group for opioid abuse in Greene County is the 35-44 years of age demographic. In Greene County the overdose rate of males is greater than the overdose rate of females. Whites have the highest total rate of overdose deaths in Greene County. The most used opioids in Greene County are fentanyl, heroin, cocaine, benzodiazepines, and Rx opioids. Data sets for 2023 were not available at the time of writing this plan.

*Table 67 - Drug Overdose Mortality in Greene County*

<b>Drug Overdose Mortality in Greene County</b>	
<b>Year</b>	<b>Deaths Per Year</b>
2015	14
2016	19
2017	13
2018	9
2019	17
2020	12
2021	21
2022	19

*Table 68 - Drugs Present in 2020 Pennsylvania Overdose Deaths*

<b>Drugs Present in 2020 PA Overdose Deaths (DEA, 2020)</b>	
<b>Drug Category</b>	<b>Percent Reported Among 2020 Decedents</b>
Cannabis	25%
Cocaine	20%
Heroin	15%
Fentanyl	14%
Methamphetamine	10%
Prescription Opioids	5.5%
Cathinones	5.5%
Benzodiazepines	5%

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### **4.3.18.4 Future Occurrence**

Both Greene County, and Pennsylvania as a whole, have seen a steady rise in substance use disorder and the use of opioids over the last several years, with drug-related death rates increasing at a high percentage. Substance use disorder is a pressing issue in Pennsylvania, with far-reaching implications for public health, safety, and the well-being of individuals. Future occurrences of substance use and opioid addiction are unclear as the state moves forward with overdose prevention initiatives through the use of Naloxone, alternative pain treatments, improvement of tools for families and first responders, and expansion of treatment access. The Pennsylvania government has taken various approaches to help with the prevention of mass future occurrences across the Commonwealth. To help prevent future drug abuse and protect individual health among communities in Pennsylvania, the Pennsylvania's Prescription Drug Monitoring Program (PA DMP) collects information on all filled prescriptions for controlled substances. This information helps health care providers safely prescribe controlled substances and helps patients get correct treatment. The PA DMP also has drug take-back boxes located in the counties for an easy, convenient location where anyone can dispose of their unused, expired, or unwanted prescriptions to help lower potential drug overuse. In Greene County, there are four drug take-back boxes located throughout the county. The drug take-back box locations include Carmichaels Borough and Waynesburg Borough.

In the event of an opioid overdose, death can sometimes be prevented with the use of the drug naloxone. The former Pennsylvania Secretary of Health, Dr. Rachel Levine, in 2020, signed updated standing order prescriptions of naloxone. Naloxone is a medication that can reverse an overdose that is caused by an opioid drug (i.e., prescription pain medication or heroin). Naloxone is used to block the effects of opioids and is sold under the brand name of Narcan. When administered during an overdose, naloxone blocks the effects of opioids on the brain and restores breathing within two to eight minutes. Naloxone has been used safely by medical professionals for more than forty years and its only function is to reverse the effects of opioids on the brain and respiratory system in order to prevent death. Also, with the January 10, 2018 disaster declaration, emergency medical technicians (EMTs) are now allowed to leave naloxone behind at a scene of a recent overdose further increasing the distribution and accessibility of the lifesaving medication. According to a study published in September 2018, drug users reported that users often have multiple overdoses in the course of their drug use, and availability of naloxone has saved many lives. While the introduction of naloxone has been a significant benefit to the fight against opioid abuse, efforts to prevent future overdoses are still underway. Naloxone is another way to reduce future occurrences of the opioid epidemic from occurring in Greene County. According to the National Library of Medicines, supervised injection sites can provide disordered substance users with a secure location to reduce the risk of overdose, while also weaning them off of addictive substances.

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Opioid drugs have been a problematic and addictive method for patients to deal with pain. Employing alternative approaches to pain management could prevent patients from ever being introduced to addictive opioids, especially considering the most common overdose drugs in Greene County have been prescription opioids. A possible alternative pain treatment comes from hemp extracted cannabidiol, or CBD. Unlike THC (the psychoactive constituent of cannabis), CBD is non-psychoactive and does not have the same intoxicating effect as THC; however, CBD can provide relief from pain, inflammation, anxiety, and even psychosis. CBD is legal without a prescription throughout the United States of America.

### **4.3.18.5 Vulnerability Assessment**

Opioid overdoses have resulted in many tragic deaths in Pennsylvania and many people have been affected by the epidemic through the loss of either a family member, a close friend, or member of their community. Substance use disorder is a direct detriment to the personal wellbeing of addicts, a burden to their families and communities, and a strain to the emergency response system that cares for overdose victims. In general, jurisdictions that are more densely populated are more vulnerable to opioid addiction threats as access to the drugs increases. However, rural communities in general experience larger per-capita opioid-related deaths. Jurisdictional losses in the opioid addiction crisis stem from lost wages, productivity, and resources rather than losses to buildings or land. Many counties across the Commonwealth, including Greene County, have seen an increase of time and resources devoted to the opioid epidemic as overdose and response increase.

While Substance use disorder and opioid addiction is often viewed as a criminal problem, it can also be viewed as a chronic disease. This paradigm shift moves away from faulting the abuser and incentivizing quick cures, to viewing the abuser as a patient and working towards long-term management of the disease. In general, it is important to consider alternative approaches to pain treatment.

According to the National Institute of Mental Health, substance use disorder often stems from underlying mental health issues such as depression, anxiety, trauma, or unresolved psychological struggles. Individuals may turn to substances as a coping mechanism to alleviate emotional pain or distress. However, prolonged substance abuse can exacerbate mental health symptoms and lead to a vicious cycle of dependency. Additionally, genetic predispositions and environmental factors can also contribute to the development of both substances use disorders and mental health disorders (National Institute of Mental Health, 2023).

The vulnerability in the county depends on the number of additional risk factors on the vulnerable population such as genetic, psychological, and environmental factors that play a role in addiction. The known risk factors of opioid misuse and addiction include poverty, unemployment, family and/or personal history of substance abuse, history of criminal activity,

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history of severe depression or anxiety, and prior drug/alcohol rehabilitation. In addition, women have a unique set of risk factors for opioid addiction. Women are more likely than men to have diagnosed chronic pain. Compared with men, women are also more likely to be prescribed opioid medications, to be given higher doses, and to use opioids for longer periods of time. Women may also have biological tendencies to become dependent on prescription pain relievers more quickly than men. Therefore, if the county were to have a population with a great amount of these risk factors, the county would be very vulnerable to the opioid epidemic.

The COVID-19 pandemic and its periods of quarantine caused vulnerability in opioid users throughout Greene County. It is likely that the emergence of COVID-19 and subsequent disruptions in health care and social safety nets combined with social and economic stressors has fueled the opioid epidemic. The COVID-19 pandemic challenged vulnerable populations, including those with opioid use disorders. The opioid epidemic and COVID-19 pandemic intersected and presented unprecedented challenges for families and communities. Opioid use affects respiratory and pulmonary health which may make those with opioid use disorders more susceptible to COVID-19. In addition, chronic respiratory disease is already known to increase overdose mortality risk among people taking opioids, and decreased lung capacity from COVID-19 could lead to similar health effects. Secondary impacts from the COVID-19 pandemic included disruption of treatment and recovery services, limited access to mental health services and peer support, disrupted routines, loss of work, and increased stress which led to increased opioid use and risk of relapse for those in recovery. Additionally, the pandemic took away the attention from the media, from legislators, and from public health agencies that was being focused on the opioid crisis. According to the National Library of Medicine the opioid epidemic in Pennsylvania increased 475% from 2010 to 2019.

Risk factors may arise from indirect factors including housing instability and incarceration. Those with substance use disorder and opioid use disorders are potentially at a higher risk for housing insecurity, homelessness, and incarceration. Congregate living facilities such as homeless shelters, jails, and prisons are high-risk environments for virus transmission, and there are challenges in implementing recommendations from the CDC such as social distancing and quarantine.

Additionally, first responders and medical personnel are also a vulnerable population when dealing with the substance use disorder and opioid epidemic. First responders face exposure risk due to an increase in emergency calls due to an increase in the crisis, particularly to synthetic fentanyl. Fentanyl and related substances are hazardous materials, which cause the environment and the people around the substance to be vulnerable. Unintentional fentanyl contact can impact first responders and others that are in close proximity to the opioid user. Depending on the potency of the drug, it can take as little as a few milligrams of fentanyl to cause fatal health complications, the equivalent of a few grains of sand. There have been several reports nationally

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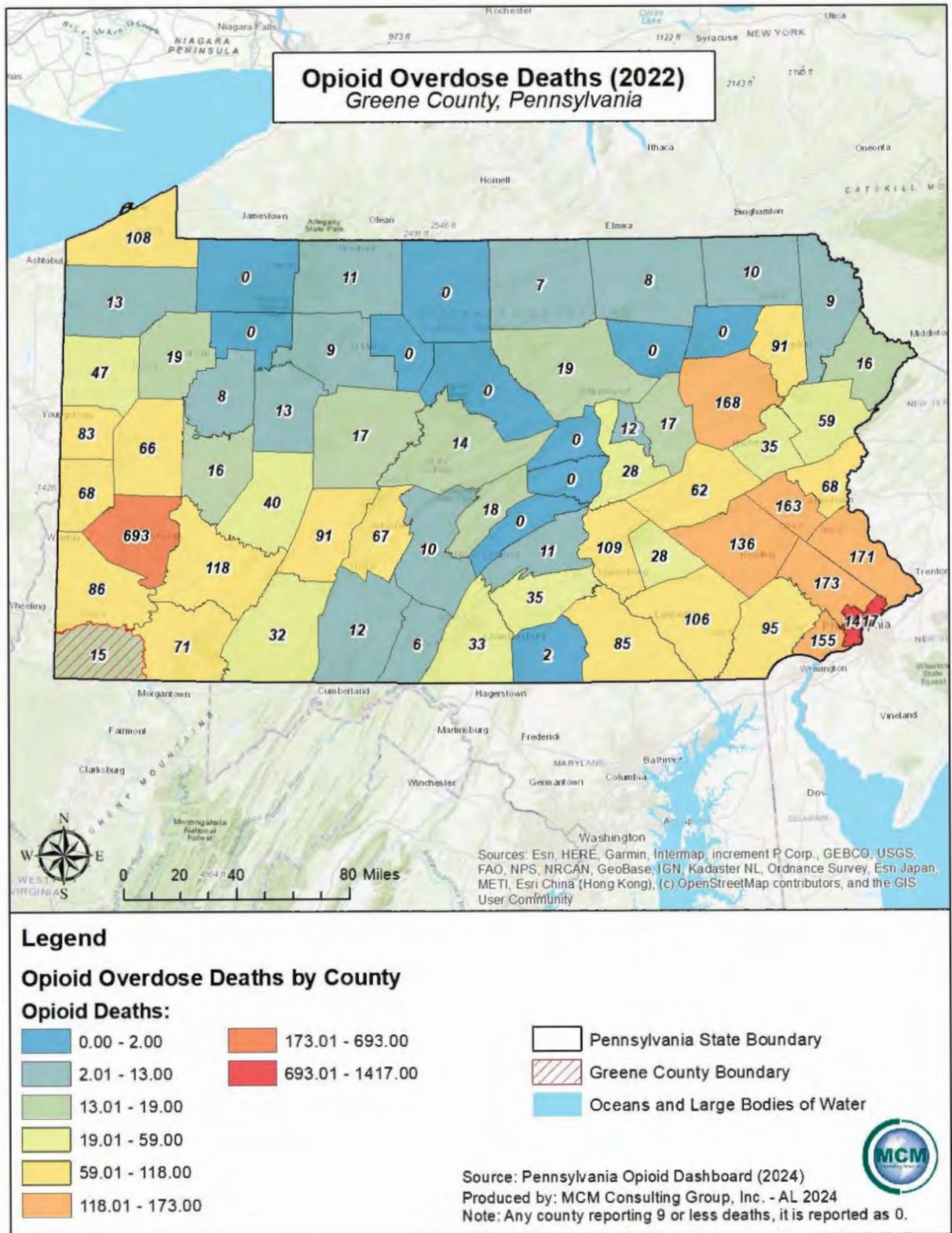
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of first responders accidentally overdosing on fentanyl through brief skin contact or the drug becoming airborne. It is best for first responders to remain wary to avoid any potential exposure. The American College of Medical Toxicology (ACMT) and the American Academy of Clinical Toxicology (AACT) suggest that nitrile gloves provide sufficient protection for handling fentanyl, and for “exceptional circumstances where the drug particles or droplets suspended in the air, an N95 respirator provides sufficient protection”. Other environmental structures such as streams, rivers, and lakes have been known to contain traces of opioids and other drugs within them. These traces come from excreted human urine and feces, or improper disposal of medications. The Environmental Protection Agency (EPA) suggests that while the risks of pharmaceuticals found in wastewater, ambient water, and drinking water are low, further research is needed. A worst-case scenario with substance use in Greene County would be a high number of overdoses among residents and insufficient first responder personnel and material resources.

*Figure 50 – Opioid Overdose Deaths in Pennsylvania 2022 and Figure 51 – Opioid Overdose Deaths in Pennsylvania 2023* illustrate the number of deaths per county in the Commonwealth of Pennsylvania.

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Figure 50 - Opioid Overdose Deaths in Pennsylvania 2022





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### **4.3.19. Terrorism/Cyberterrorism**

#### **4.3.19.1 Location and Extent**

Following several serious international and domestic terrorist incidents during the 1990s and early 2000s, citizens across the United States paid increased attention to the potential for deliberate, harmful actions of individuals or groups. The term “terrorism” refers to intentional, criminal, malicious acts. The functional definition of terrorism can be interpreted in many ways. Officially, terrorism is defined in the Code of Federal Regulations as “...the unlawful use of force and violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives.” (28 CFR §0.85)

Cyberterrorism is the unlawful use of force and violence over technological methods to cause harm to financial security, identity information, personal information, and attacking personal computers, mobile phones, gaming systems, and other Bluetooth or wirelessly connected devices. Cyberterrorism can be just as damaging to infrastructure as conventional terrorism, due to the large amount of business that is carried out over the internet, through wirelessly connected devices, or from employees of companies working remotely.

The Federal Bureau of Investigations (FBI) further characterizes terrorism as either domestic or international, depending on the origin, base, and objectives of the terrorist organization. Often, the origin of the terrorist or person causing the hazard is far less relevant to mitigation planning than the hazard itself and the consequences. However, it is important to consider that the prevalence of homegrown violent extremists (HVEs) has increased in recent years, with individuals able to become radicalized on the internet. In a speech on August 29, 2018, addressed to the 11<sup>th</sup> annual Utah National Security and Anti-Terrorism Conference, FBI Director Christopher Wray describes HVEs as “the primary terrorist threat to the homeland here today, without question.”

Community lifeline facilities are either in the public or private sector that provide essential products and/or services to the general public. Community lifeline facilities are often necessary to preserve the welfare and quality of life in the county, or fulfill important public safety, emergency response, and/or disaster recovery functions. Community lifeline facilities identified in the county are hospitals and health care facilities, schools, childcare centers, fire stations, police departments, municipal buildings, and hazardous waste facilities. In addition to critical facilities, the county contains at risk populations that should be factored into a vulnerability assessment. These populations include not only the residents and workforce in the county, but also the tourists that visit the area on a daily basis, those that are traveling through the county on any major highway and marginalized groups such as LGBTQ persons and racial, religious, or other minorities.

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Potential targets include:

- Commercial facilities
- Family planning clinics/organizations associated with controversial issues
- Education facilities
- Events attracting large amounts of people
- Places of worship
- Industrial facilities, especially those utilizing large quantities of hazardous materials
- Transportation infrastructure
- Historical sites
- Cultural sites
- Government facilities

### **4.3.19.2 Range of Magnitude**

Terrorism may include use of Weapons of Mass Destruction (WMD) (including chemical, biological, radiological, nuclear, and explosive weapons) which include arson, incendiary, explosive, armed attacks, industrial sabotage, intentional release of hazardous materials, and cyberterrorism. Within these general categories, there are many variations. There is a wide variety of agents and ways for them to be disseminated, particularly in the case of biological and chemical weapons.

Terrorist methods can take many forms including:

- Active assailant
- Agri-terrorism
- Arson/incendiary attack
- Armed attack
- Assassination
- Biological agent
- Chemical agent
- Cyberterrorism
- Conventional bomb or bomb threat
- Hijackings
- Release of hazardous materials
- Kidnapping
- Nuclear bomb
- Radiological agent

Active assailant incidents and threats can disrupt the learning atmosphere in schools, interfere with worship services, cause traffic to be re-routed, and use taxpayer assets by deploying police,

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EMS and/or fire units. Greene County has five school districts (public schools K through 12<sup>th</sup> grade) that include eleven primary, secondary, and high schools. There are three post-secondary schools located in Greene County.

The areas along major transportation routes can be susceptible to forms of public transit terrorist attacks. More populated areas of the county, including the county seat of Waynesburg Borough can be susceptible to chemical, biological, radiological, nuclear, or explosive (CBRNE) events due to the concentration and density of residential communities and government activity and buildings. Secondary effects from CBRNE incidents can be damaging as well. Mass evacuations could result in congestion of roadways and possibly result in breakdown of civil order, further exacerbating the situation. Government operations may be disrupted due to the need to displace or operate under reduced capacity. Radiation fallout, hazardous chemical introduction into the groundwater or biologic/germ agents can cause long-term environmental damage.

Cyberterrorism is becoming increasingly prevalent. Cyberterrorism can be defined as activities intended to damage or disrupt vital computer systems. These acts can range from taking control of a host website to using networked resources to directly cause destruction and harm. Protection of databases and infrastructure are the main goals for a safe cyber environment. Cyber terrorists can be difficult to identify because the internet provides a meeting place for individuals from various parts of the world. Individuals or groups planning a cyber-attack are not organized in a traditional manner, as they are able to effectively communicate over long distances without delay. The largest cyberterrorism threat to institutions comes from any processes that are networked or controlled via computers.

Ransomware continues to be the leading threat, with Maze ransomware accounting for nearly half of all known cases in 2020. Cybercriminals have increasingly begun to steal proprietary – and sometimes embarrassing – data before encrypting it. The cybercriminal will then threaten to publicly release the stolen files if the victims do not provide financial transactions.

### **4.3.19.3 Past Occurrence**

In February of 2024, Pennsylvania was hit with a statewide court agency cyberattack that resulted in the online systems being disabled. The federal government lead cyber security agency the U.S. Department of Homeland Security and the F.B.I. investigated the attack and it was ruled a “denial of service attack.” Cyberterrorism events are becoming more common in areas of local government, and these include counties near Greene County, PA.

Significant international terrorism incidents in the United States include the World Trade Center bombing in 1993, the bombing of the Murrow Building in Oklahoma City in 1995, and the September 11<sup>th</sup>, 2001, attacks on the World Trade Center and the Pentagon. One of the aircrafts hijacked in the September 11<sup>th</sup> attacks crash landed in Somerset County, Pennsylvania before it

## *Greene County, Pennsylvania 2025 Hazard Mitigation Plan*

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reached its intended target. While fatalities and destruction at the intended target were avoided, all passengers on the flight perished.

While the largest scale terrorist incidents have often had international stimuli, many other incidents are caused by home grown actors who may have become radicalized through hate groups either in person or via the internet, and who may struggle with mental health issues. Hate groups such as the Ku Klux Klan (KKK), Aryan Nation, the New Black Panther Party, and more recently, the Alt-Right, Antifa, anarcho-communists, Proud Boys, plus conspiracy theorist believers/promoters such as QAnon, have been part of domestic terrorism in different forms. During the May 2020 George Floyd protests, anti-police individuals associated with one or more of the groups created incendiary devices to burn down the Minneapolis Third Precinct. On January 6, 2021, individuals associated with one or more of the groups, stormed the United States Capitol to disrupt the certification of the 2020 presidential election, resulting in five deaths and evacuation of Congress.

### Active Shooters

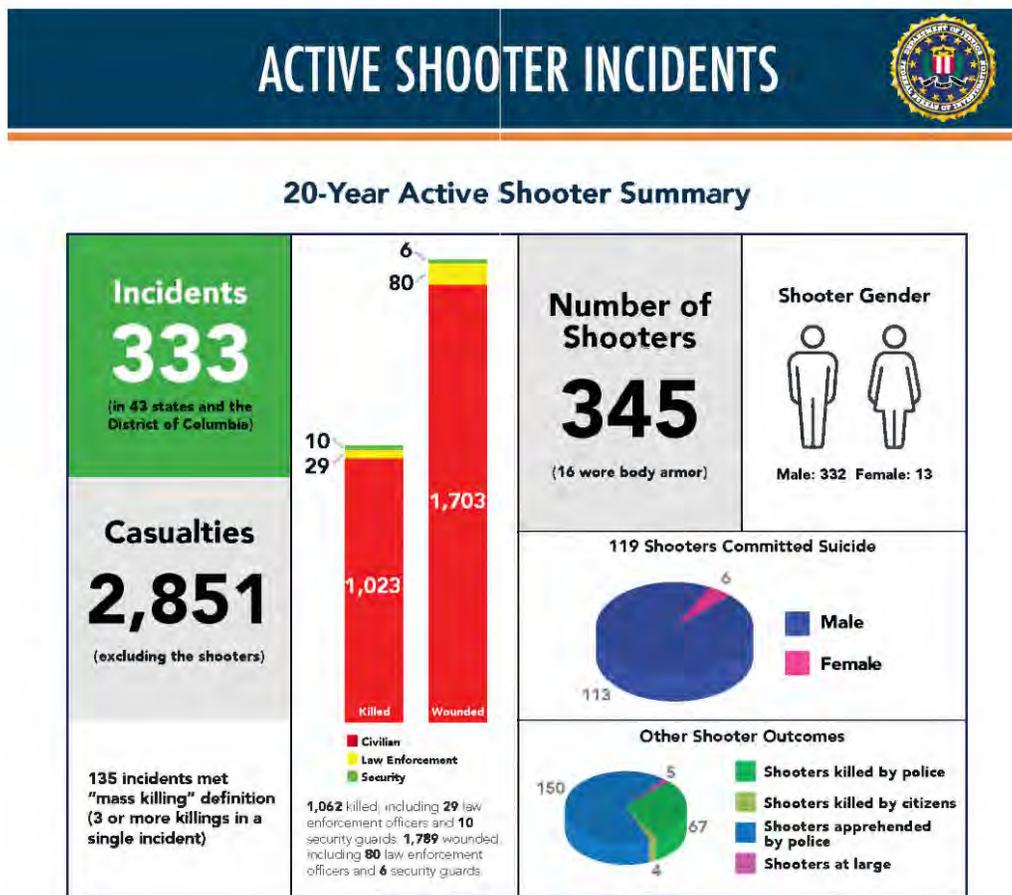
An active assailant (shooter), as defined by the U.S. Department of Homeland Security, is an individual actively engaged in killing or attempting to kill people in a confined area, in most cases, active shooters use firearms and there is not necessarily a pattern or method to their selection of victims. Throughout the year in 2023, there were a total of at least 656 mass shooting incidents in the United States according to the Gun Violence Archive. Often these shooters are HVEs. Two significant events have occurred in Pennsylvania in recent history: one occurred on October 27, 2018, when eleven people were killed by a gunman in the Pittsburgh neighborhood of Squirrel Hill; the gunman was a homegrown violent extremist and attacked the congregation of the Tree of Life Synagogue in a shooting that targeted the Jewish population and was fueled by the gunman's anti-Semitic, anti-immigrant, and anti-refugee sentiments. Another event occurred in January of 2019, where a gunman killed two people and permanently injured one inside P.J. Harrigan's bar in State College and later killed a homeowner and himself. One of the most tragic recent active shooters occurred in Uvalde, Texas, where an armored and masked gunman entered the Robb Elementary School on May 24, 2022 and killed nineteen students and two teachers. Another active shooter event occurred on November 22, 2022 when an employee at a Walmart in Chesapeake, Virginia entered the breakroom of the Chesapeake Walmart and killed six individuals before taking his own life.

Other active shooter events in the United States in recent years include Virginia Tech (April 2007), Sandy Hook Elementary School (December 2012), San Bernardino, California (December 2015), an Aurora, Colorado movie theater (July 2012) a church in Charleston, South Carolina (June 2015). An *Active Shooter Incidents 20-Year Review* by the FBI concluded that there has been a significant recent increase in frequency of active shooter incidents, and that most shooters

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were male. The report documents data from all the incidents, including location, commercial environments, educational environments, open spaces, military and other government properties, residential locations, houses of worship, and health care facilities (FBI, 2021). *Figure 52 – Active Shooter Incidents – 20 Year Active Shooter Summary* is one page from the report that illustrates a numerical breakdown of shooting events for those twenty years. *Figure 53 – Education Environments* shows two more summary pages from the report that detail active shooter statistics in educational environments.

Figure 52 - Active Shooter Incidents - 20 Year Active Shooter Summary



Incidents: 333 (in 43 states and the District of Columbia). Total casualties: 2,851 (excluding the shooters). 135 incidents met "mass killing" definition (3 or more killings in a single incident). Killed: 1,062 (including 1,023 civilians, 29 law enforcement officers and 10 security guards). Wounded: 1,789 (including 1,703 civilians, 80 law enforcement officers, and 6 security guards). Number of shooters: 345 (16 wore body armor). Shooter gender: 332 male, 13 female. 119 shooters committed suicide (113 male, 6 female). Other shooter outcomes: 67 killed by police, 4 killed by citizens, 150 apprehended by police, 4 at large.

# Greene County, Pennsylvania 2025 Hazard Mitigation Plan

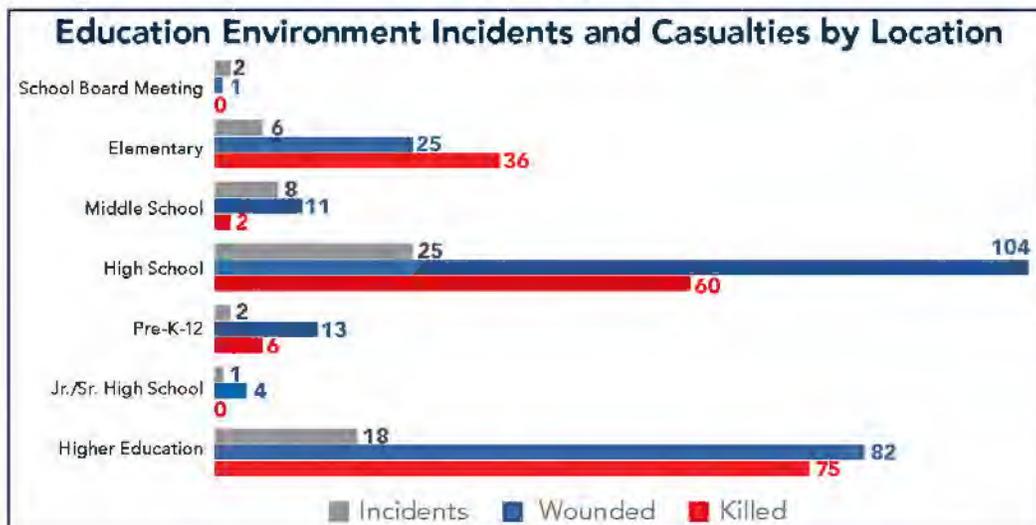
Figure 53 - Education Environments

## ACTIVE SHOOTER INCIDENTS

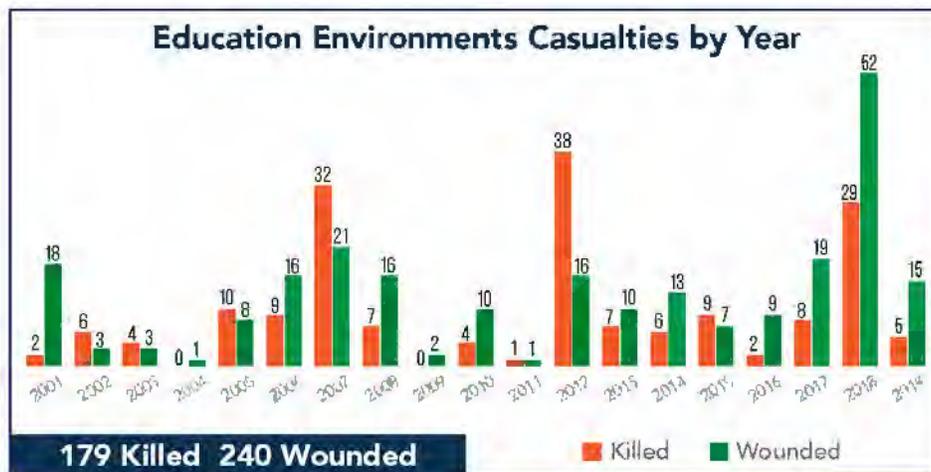
### Education Environments

#### Quick Look:

Sixty-two incidents occurred in public and private educational settings, defined as schools covering pre-kindergarten to 12th grade, institutes of higher education, and school board meetings.



Education Environment Incidents and Casualties by Location: School Board Meeting (2 incidents, 1 wounded, 0 killed); Elementary (6 incidents, 25 wounded, 36 killed); Middle School (8 incidents, 11 wounded, 2 killed); High School (25 incidents, 104 wounded, 60 killed); Pre-K-12 (2 incidents, 13 wounded, 6 killed); Jr./Sr. High School (1 incident, 4 wounded, 0 killed); Higher Education (18 incidents, 82 wounded, 75 killed)



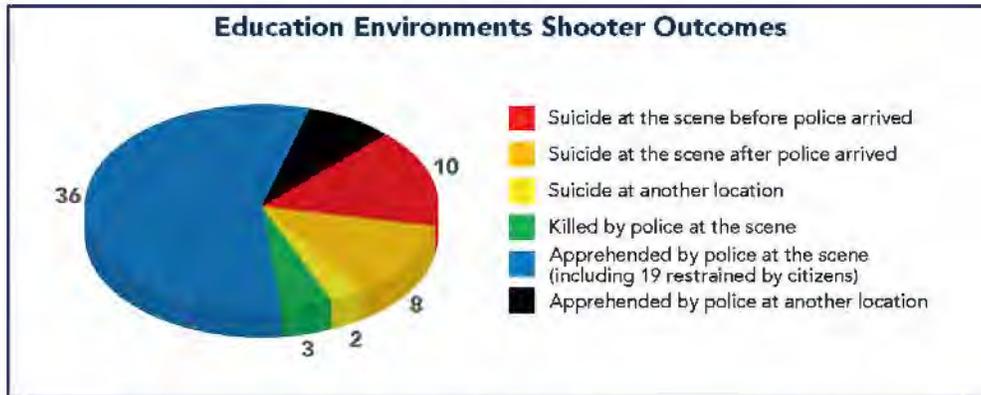
Education Environments Casualties by Year: 2001 (2 killed, 18 wounded); 2002 (6 killed, 3 wounded); 2003 (4 killed, 3 wounded); 2004 (0 killed, 1 wounded); 2005 (10 killed, 8 wounded); 2006 (9 killed, 16 wounded); 2007 (32 killed, 21 wounded); 2008 (7 killed, 16 wounded); 2009 (0 killed, 2 wounded); 2010 (4 killed, 10 wounded); 2011 (1 killed, 1 wounded); 2012 (38 killed, 16 wounded); 2013 (7 killed, 10 wounded); 2014 (6 killed, 13 wounded); 2015 (9 killed, 7 wounded); 2016 (2 killed, 9 wounded); 2017 (8 killed, 19 wounded); 2018 (29 killed, 62 wounded); 2019 (5 killed, 15 wounded)

Active Shooter Incidents 20-Year Review, 2000-2019

# ACTIVE SHOOTER INCIDENTS

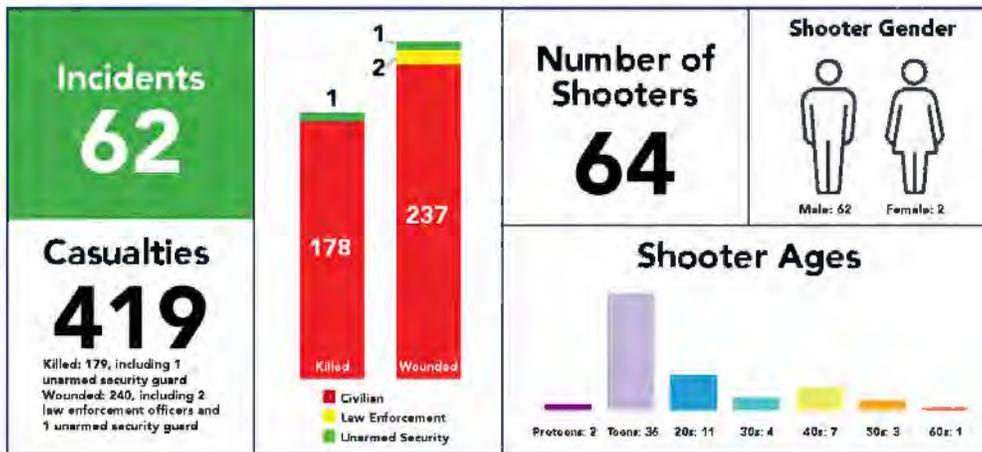


## Education Environments



Education Environments Shooter Outcomes: Suicide at the scene before police arrived (10); Suicide at the scene after police arrived (8); Suicide at another location (7); Killed by police at the scene (3); Apprehended by police at the scene (including 19 restrained by citizens) (36); Apprehended by police at another location (5).

## Key Findings:



Incidents: 62. Total casualties: 419. Killed: 179 (including 178 civilians and 1 unarmed security guard). Wounded: 240 (including 237 civilians, 2 law enforcement officers, and 1 unarmed security guard). Number of shooters: 64. Shooter gender: 62 male, 2 female. Shooter ages: Preteens (2); Teens (36); 20s (11); 30s (4); 40s (7); 50s (3); 60s (1).

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The complete report may be found here: <https://www.fbi.gov/file-repository/active-shooter-incidents-20-year-review-2000-2019-060121.pdf/view>.

### Cyber-Threats

While Greene County has not been the target of any critical cyber terrorist events, the county has seen multiple security breaches due to online phishing and other scams.

One hack attack took down the largest fuel pipeline in the U.S. and led to massive gasoline shortages; it was the result of a single compromised password. Hackers gained entry into the networks of Colonial Pipeline Company on April 29, 2021 through a virtual private network account, which allowed employees to remotely access the company's computer network. On May 7, 2021, a ransom of \$4.4 million was demanded by the hackers, causing Colonial to shut down the entire supply line, immediately prompting temporary gasoline shortages and panic buying up and down the East Coast. The hackers, who were an affiliate of a Russian-linked cybercrime group known as *DarkSide*, were paid the ransom. The hackers also stole nearly 100 gigabytes of data from Colonial Pipeline and threatened to leak it if the ransom was not paid, according to Bloomberg News.

Then, in early June 2021, JBS, the world's largest meat company by sales, paid an \$11 million ransom to cybercriminals who temporarily knocked out plants that process roughly one-fifth of the nation's meat supply. The ransom payment, in bitcoin, was made to shield JBS meat plants from further disruption and to limit the potential impact on restaurants, grocery stores and farmers that rely on JBS, according to the company.

The attack on JBS was part of a wave of incursions using ransomware, in which companies are hit with demands for multimillion-dollar payments to regain control of their operating systems. The attacks show how hackers have shifted from targeting data-rich companies such as retailers, banks and insurers to essential-service providers such as hospitals, transport operators and food companies.

#### **4.3.19.4 Future Occurrence**

The likelihood of Greene County being a primary target for a major international terrorist attack is small and unlikely. More likely terrorist activity in Greene County includes bomb threats or other incidents at schools. Greene County has five districts consisting of eleven public schools. Several private schools and colleges/universities are also located in Greene County. These locations are considered soft targets and may be vulnerable, especially to domestic incidents.

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### **4.3.19.5 Vulnerability Assessment**

Greene County should stay prepared for terroristic events. The existence of industrial commerce, interstate highways and freight railroad activity create soft targets that could be used to interfere with the focus of day-to-day life that the county experiences. It is important to note that the use of and exposure to biological agents can remain unknown for several days until the infected person(s), livestock, or crops begin to experience symptoms or show damages. Often such agents are contagious, and the infected person(s) must be quarantined, livestock culled, and/or crops destroyed.

Although previous events have not resulted in what are considered to be significant terrorist attacks, the severity of a future incident cannot be predicted with a total level of certainty. One of the major concerns with agroterrorism is that acts can be carried out with minimal planning, effort, or expense.

Acronis, a global technology company that develops on-premises and cloud software for backup, disaster recovery, and secure file sync and share and data access, issues an annual threat scape report on cybercrime. Entitled *The Acronis Cyberthreats Report*, it contains an in-depth review of the current threat landscape and projections for the coming year. Based on the protection and security challenges that were amplified by the shift to remote work during the COVID-19 pandemic, Acronis warns aggressive cybercrime activities will continue as criminals pivot their attacks from data encryption to data exfiltration.

The major points illustrated in the report are as follows:

- Attacks against remote workers will increase due to the movement of workers to less secure working areas.
- Ransomware will look for new victims and will become more automated.
- Legacy IT and technical solutions will struggle to keep pace with ransomware and cybercrime attacks.

According to a study carried out on the data sourced from the Federal Bureau of Investigation, Pennsylvania is ranked second worst among states when it comes to handling cyber-attacks. The study made by Information Network Associates – an international security consulting company – says an increase of 25% was witnessed in cyber-attacks between 2016 and 2017. This illustrates the amount of preparation that must occur in the commonwealth so that it can better respond to potential cybercrime attacks.

The probability of terrorist activity is more difficult to quantify than some other hazards. Instead of considering the likelihood of occurrence, vulnerability is assessed in terms of specific assets. By identifying potentially at-risk terrorist targets in communities, planning efforts can be put in place to reduce the risk of attack. Planning should work towards identifying potentially at-risk

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critical infrastructure and functional needs facilities in the community, prioritizing those assets and locations, and identifying their vulnerabilities relative to known potential threats.

All communities in Greene County are vulnerable on some level, directly or indirectly, to a terrorist attack. However, communities with schools and government infrastructure like the county seat, should be considered more likely to attract terrorist activity.

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### **4.3.20. Transportation Accidents**

#### **4.3.20.1 Location and Extent**

Transportation accidents are defined as accidents involving highway, air, and rail travel. These incidents are collectively the costliest of all hazards in the Commonwealth in terms of lives lost, injuries, and economic losses. The sheer number of roadways, coupled with the high volume of traffic, creates the potential for serious accidents along the roads and bridges. In Greene County there are 392 state-maintained and ninety-one locally maintained bridges, according to PennDOT. Major transportation routes in Greene County include Interstate 79 and U.S. Route 19. Other state routes are also present in the county including PA Routes 18, 21, 88, 188, 218, and 221. *Figure 54 – Major Transportation Routes* shows the major transportation systems in Greene County.

Greene County has one public airport: the Greene County Airport, and there are multiple public airports in surrounding counties. There exists a potential for air transportation accidents to occur due to the number of commercial air traffic that flies over the county every day. However, a five-mile radius around each airport can be considered a high-risk area since most aviation incidents occur near take-off and landing sites.

There are several freight and passenger rail lines in Greene County. The railroad companies that operate within Greene County, include the Norfolk Southern Railway, Consolidation Coal Company, Cyprus – Cumberland Resources, and the Cumberland Mine Railroad. With the ability of these railroads for interchanging with other companies, goods can be transported virtually anywhere via rail from Greene County. Rail transportation accidents are generally classified as one of these three types:

- Derailment – an accident on a railway in which a train leaves the rails.
- Collision – an accident in which a train strikes something such as another train or highway motor vehicle.
- Other – accidents caused by other circumstances like obstructions on rails, fire, or explosion.

Rail transportation is divided into two major categories: freight and passenger. Each category can be subdivided according to carrier type: major carrier and local/regional carriers. Rail accidents can occur anywhere along the miles of rail located in Greene County.

There are over 2,500 active oil and gas wells located in Greene County. Pipeline infrastructure is seen throughout the county. There are approximately sixteen major pipeline companies that transport hazardous materials in and through Greene County. Of these sixteen major pipeline companies, twelve are for natural gas only; two are for natural gas and propane; one is for natural

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gas and NGL; and one is for natural gas and petroleum. *Figure 57 – Utility Pipelines Vulnerability* shows the various pipelines that run through Greene County.

### **4.3.20.2 Range of Magnitude**

Significant passenger vehicle, air, and rail transportation accidents can result in a wide range of outcomes, from damage solely to property, to serious injury or even death. Most motor vehicle crashes in Pennsylvania are non-fatal, but PennDOT estimates that every hour nine people are injured in a car crash, and every seven hours someone dies because of a car crash. Most fatal crashes occur in May and June, but the highest number of crashes overall occurs in October, November, and December. Inclement weather, high traffic volumes, and high speeds increase the risk for automobile accidents.

Railway and roadway accidents have the potential to result in hazardous materials release. Railroad accidents occur with less frequency than highway accidents. However, when these types of incidents occur, they often cause extensive property damage and have the potential to cause serious injuries or deaths.

A worst-case scenario for a transportation accident impacting the county would occur if an accident resulted in a hazardous material spill near the intersection of I-79 and PA-21 near Waynesburg Borough. This is a central location for Greene County and a major route to enter the county seat of Waynesburg. This route is also the only major entrance from West Virginia into Pennsylvania through Greene County. Waynesburg Borough is the county seat and home to many government offices, business, and residents. While it has approximately 3,975 residents as of the 2020 census, Waynesburg is also the home to Waynesburg University, which has roughly 1,400 students. Such an event could constitute an immediate health hazard to the population and require evacuation.

### **4.3.20.3 Past Occurrence**

*Table 69 – PennDOT Crash Report for Greene County* shows crash statistics recorded by the Pennsylvania Department of Transportation between 2010 and 2023. Reports for 2024 were not available at the time of this report. The year 2018 had the most total crashes with 440 crashes in Greene County while 2022 had the fewest total crashes with 313. The number of total crashes has decreased from 2018 to 2022, with a slight increase in total accidents being seen in 2023 with 348 documented crashes. The most recent crash involving both trains and vehicles occurred in 2022 with a one crash happening in the county that resulted in no fatalities.

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Table 69 - PennDOT Crash Report for Greene County

<b>PennDOT Crash Report for Greene County</b>								
<b>Year</b>	<b>Vehicle accidents for Greene County</b>				<b>Vehicle Accident Deaths for Greene County</b>			<b>Train/Trolley with Motor Vehicle Crashes/Fatalities</b>
	<b>Total</b>	<b>Fatal Accidents</b>	<b>Injury Crashes</b>	<b>Property Damage Only</b>	<b>Total Vehicle Accident Fatalities</b>	<b>Alcohol-Related Fatalities</b>	<b>Pedestrian Fatalities</b>	
2010	387	6	199	182	7	2	1	0
2011	397	9	196	192	9	4	0	0
2012	411	12	209	190	16	3	1	0
2013	367	8	152	207	8	0	0	0
2014	382	11	173	198	12	3	0	0
2015	387	6	162	219	6	2	0	0
2016	370	5	129	236	5	0	0	1/0
2017	344	9	131	204	9	1	0	0
2018	440	8	178	254	9	4	0	0
2019	420	11	152	257	15	10	0	0
2020	397	2	127	168	2	2	0	0
2021	320	3	117	200	3	1	1	0
2022	313	3	132	178	3	2	0	1/0
2023	348	0	150	198	0	0	0	0

### 4.3.20.4 Future Occurrence

Greene County’s population has decreased over the last decade, so it can be assumed that local traffic has decreased slightly as well. However, with the increasing volume of goods and trucking through the county, transportation accidents will continue to occur routinely. Hazardous material release through transportation accidents is difficult to predict but can be assumed to happen in future events as well. The U.S. Census Bureau reports the mean travel time to work for those aged 16 plus is approximately twenty-four minutes. Automobile accidents occur frequently, and typically occur more frequently than rail or aviation accidents. In the case of highway accidents, PennDOT has enacted measures to reduce the number of highway transportation accidents through programs such as the Pennsylvania Highway Safety Corridor. In this program, PennDOT designates sections of highway where traffic citation fines are doubled in the hopes that higher fines will deter unsafe driving and reduce accidents. Transportation accidents are impossible to predict accurately; however, areas prone to these hazards can be located, quantified through analysis of historical records, and plotted on countywide and municipal base maps.

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### **4.3.20.5 Vulnerability Assessment**

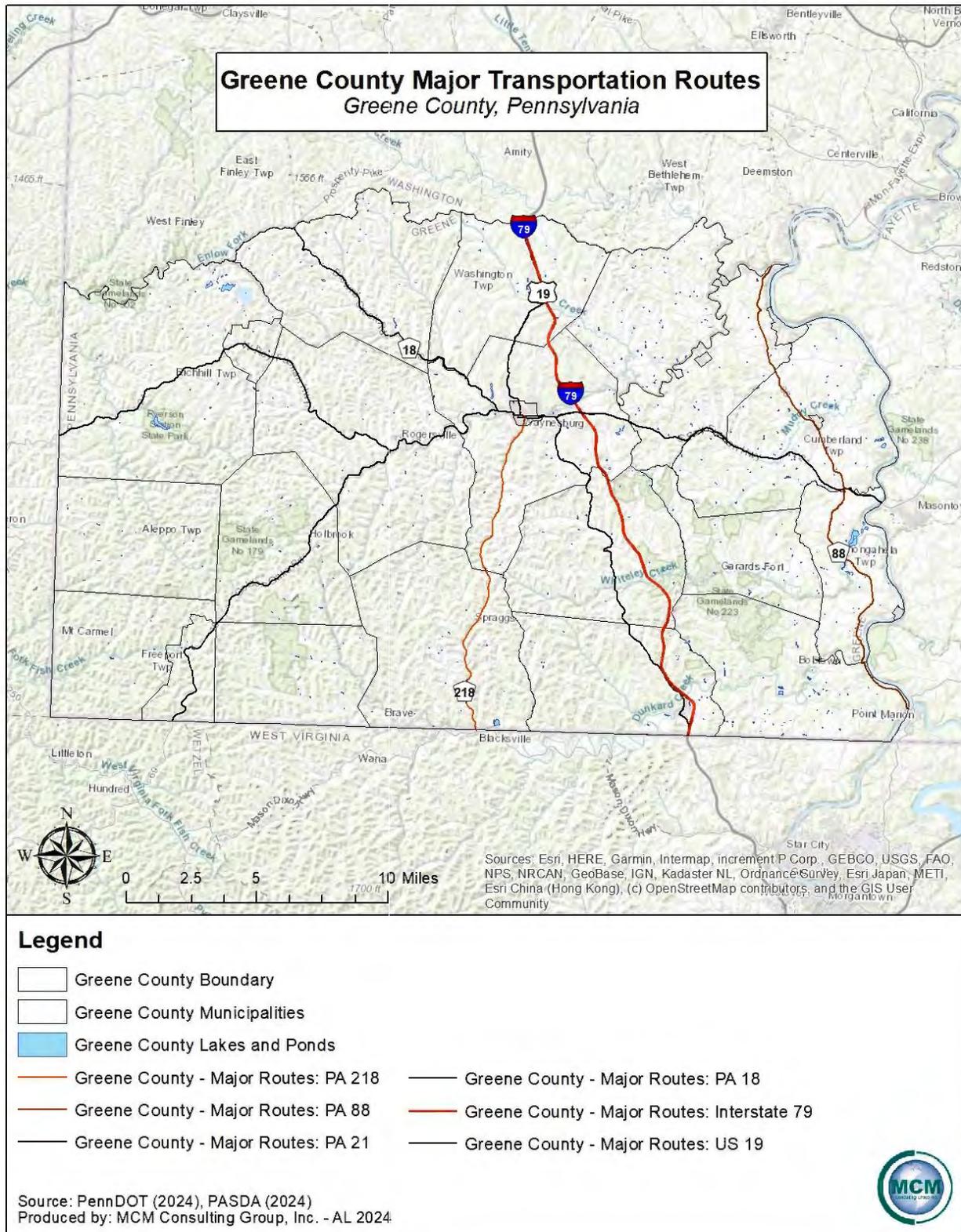
A transportation accident can occur anywhere in Greene County. However, severe accidents are more likely to occur on the county's major highways due to the heavier traffic volumes which make highways extremely vulnerable. The vulnerability for accidents on either highway, railway, or aviation, are directly related to the population and traffic density within the county. The vulnerability increases if there are hazardous materials involved. Hazards associated with causing transportation accidents can include natural hazards that affect the environment, such as winter storms or heavy rains that cause slippery roadways or mud slides, to windstorms or tornadoes that cause high-profile vehicles or train cars to topple over. Loss of roadway use, and public transportation services would affect commuters, employment, delivery of critical municipal and emergency services, and day-to-day operations within the county.

With highway accidents, there is an added vulnerability that stems from the age and upkeep of bridges throughout the county. Unrepaired, deficient bridges may be more likely to break, thus leading to highway transportation damages or deaths. 13.04% of Greene County bridges are in poor condition, indicating a vulnerability to transportation accidents, while 51.76% remain in fair condition, and 35.20% are in good condition in Greene County.

Studying traffic and potential transportation accident patterns could provide information on vulnerability of specific road segments and nearby populations. Increased understanding of the types of hazardous materials transported through the county will also support mitigation efforts. Maintaining a record of these frequently transported materials can facilitate development of preparatory measures for response to a release. *Figure 56 – Average Daily Traffic on Major Highway Vulnerability* identifies all major highways and railroads within Greene County.

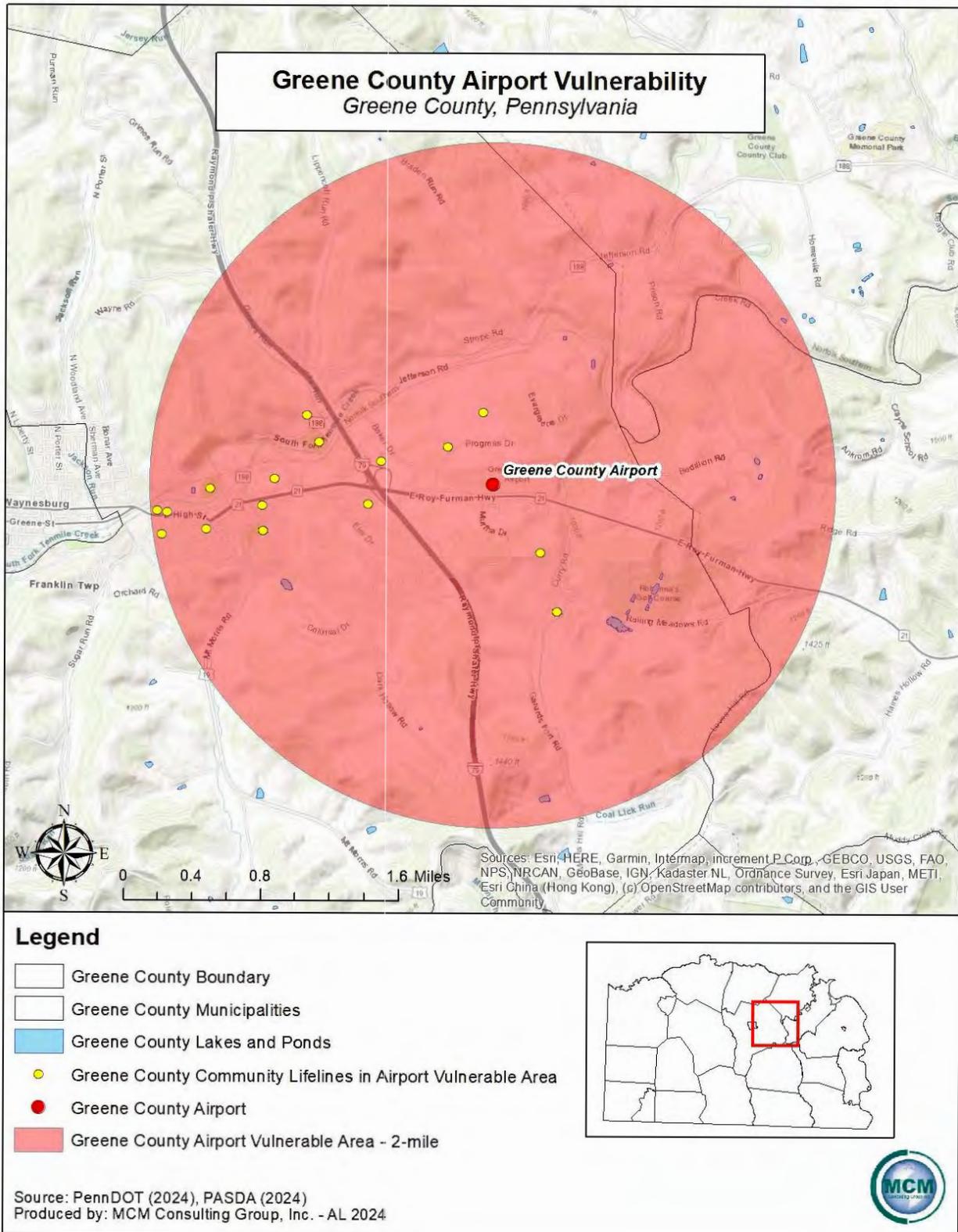
# Greene County, Pennsylvania 2025 Hazard Mitigation Plan

Figure 54 - Major Transportation Routes



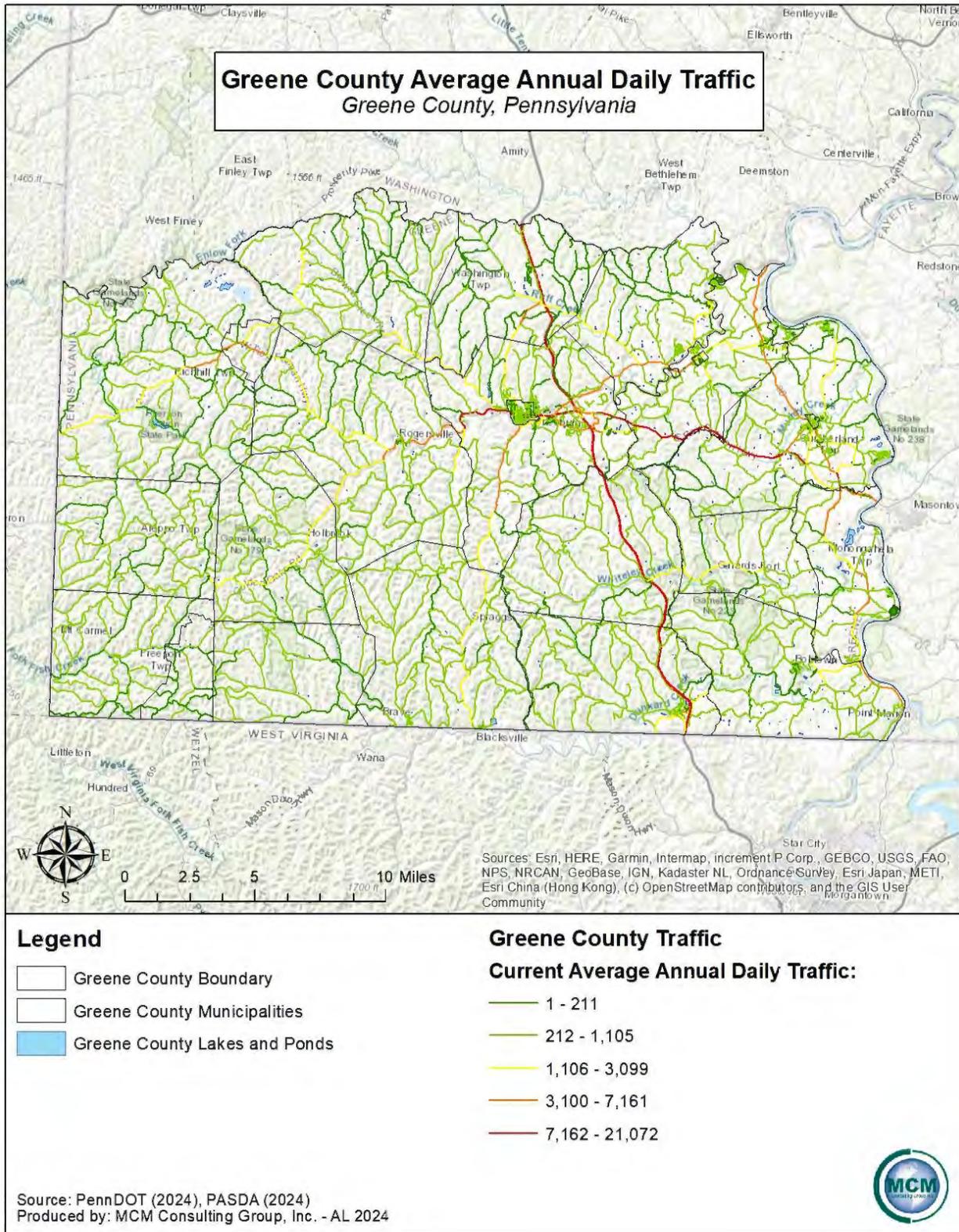
# Greene County, Pennsylvania 2025 Hazard Mitigation Plan

Figure 55 - Airports and Vulnerability Zones



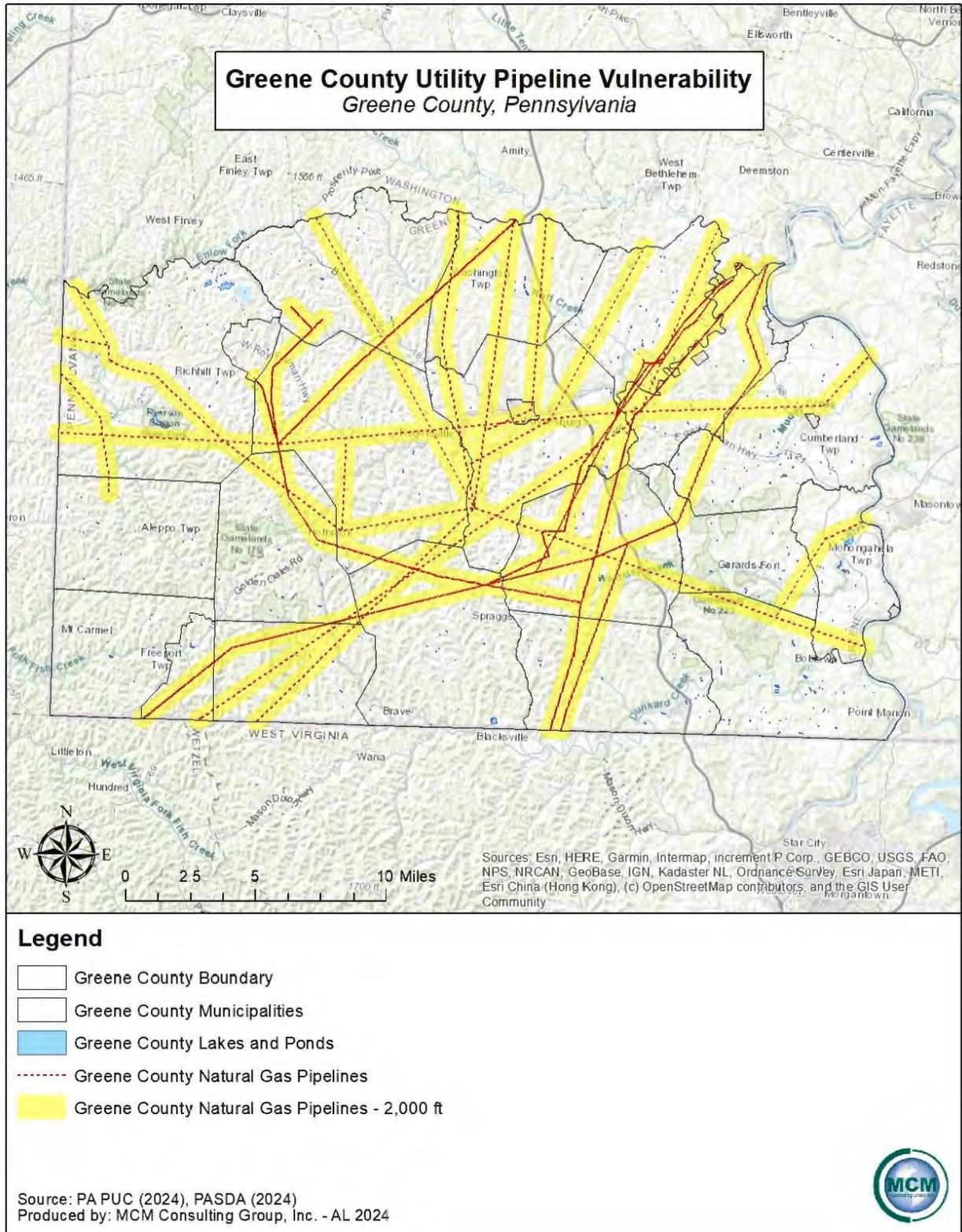
# Greene County, Pennsylvania 2025 Hazard Mitigation Plan

Figure 56 - Average Daily Traffic on Major Highway Vulnerability



# Greene County, Pennsylvania 2025 Hazard Mitigation Plan

Figure 57 - Utility Pipelines Vulnerability



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### **4.3.21. Urban Fire and Explosion**

#### **4.3.21.1 Location and Extent**

Urban fire and explosion hazards incorporate vehicle and building / structure fires, as well as overpressure ruptures, overheat explosions, or other explosions that do not ignite. Statewide, this hazard is most problematic in the denser, and more urbanized areas, occurring most often in residential structures (US Fire Administration, 2009). Urban fires can more easily spread from building to building in denser urban areas.

According to the U.S. Census Bureau, 2020 U.S. Census, Greene County has approximately 16,138 housing units. Buildings that were constructed fifty or more years ago are at a higher risk of urban fires due to improvement in fire safety engineering practices. Nearly 30.7% of all structures in Greene County were built before 1940, with a majority of housing units built before 1969.

Fires can start from numerous causes including human errors or electrical malfunctions. Most fires are small and have little impact on the greater community other than possibly increasing insurance rates. Oftentimes large urban fires are the result of other hazards such as storms, droughts, transportation accidents, hazardous material spills, arson, or terrorism.

Natural gas exploration and extraction sites can be associated with fires and explosion events. Well flares regularly burn off excess gas, and if improperly managed, such activities can be dangerous for the surrounding areas.

#### **4.3.21.2 Range of Magnitude**

Urban fires can occur in any populated area, and fires affecting one structure happen quite often. Urban fires are most threatening when the fire can rapidly spread from one structure to another. County Name is largely rural/semi-rural and does not have significant expanses of dense population.

Damages from fire and explosions ranges from minor smoke inhalation and/or water damage to the destruction of buildings. A worst-case scenario for any fire and or explosion would be in injuries and/or death of the occupants of the structures and the potential of injury or death of firefighters.

There are economic consequences related to a fire and explosion hazard, including:

- Loss in wages due to temporarily or permanently closed businesses
- Destruction and damage to business and personal assets
- Loss of tax base
- Recovery costs
- Loss related to the ability of public, private, and non-profit entities to provide post-incident relief.

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The secondary effects of urban fire and explosion events relate to the ability of public, private, and non-profit entities to provide post-incident relief. Human services agencies (community support programs, health and medical services, public assistance programs and social services) can be affected by urban fire and explosion events. Effects include causing physical damage to facilities and equipment, disruption of emergency communications, loss of health and medical facilities and supplies, and an overwhelming load of victims who are suffering from the effects of the urban fire, including loss of their home or place of business.

### **4.3.21.3 Past Occurrence**

From 1910 to 1990, the Commonwealth of Pennsylvania experienced 13 major fires in suburban and urban settings, and 10 of them occurred after 1980. Between 1978 and 1982, the average number of deaths per fire was 2.7. After October 1990, the average number of deaths per fire decreased. Greene County utilizes a database system called WebEOC to track incidents within the county. *Table 70 - Urban Fire Occurrence* reflects that data and the major fires and explosions that have occurred in Greene County since the year 2000.

*Table 70 - Urban Fire Occurrence*

Greene County Fire Occurrences		
Location	Date	Event
Washington Township	10/19/2024	Residential Structure Fire
Richhill Township	05/20/2024	Reported Chemical Fire
Dunkard Township	03/09/2024	Structure Fire
Wayne Township	03/20/2023	Tire Fire
Dunkard Township	11/19/2022	Structure Fire
Monongahela Township	10/15/2022	Commercial Structure Fire
Franklin Township	10/08/2022	Residential Structure Fire
Waynesburg Borough	07/26/2022	Structure Fire
Cumberland Township	06/17/2022	Residential Structure Fire
Cumberland Township	04/23/2022	Residential Structure Fire
Springhill Township	12/17/2021	Structure Fire
Morgan Township	11/19/2021	Electric Transformer Fire
Dunkard Township	07/29/2021	Commercial Structure Fire
Jefferson Township	04/18/2021	Commercial Structure Fire
Franklin Township	03/24/2021	Structure Fire
Greene Township	03/06/2021	Residential Structure Fire
Greene Township	02/12/2021	Structure Fire
Franklin Township	12/17/2020	Commercial Structure Fire
Waynesburg Borough	12/10/2020	Structure Fire
Cumberland Township	12/04/2020	Structure Fire
Wayne Township	12/01/2020	Fire
Freeport Township	10/08/2020	Oil Well Fire
Monongahela Township	07/04/2020	Structure Fires

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<b>Greene County Fire Occurrences</b>		
<b>Location</b>	<b>Date</b>	<b>Event</b>
Jefferson Township	06/26/2020	Structure Fire
Whiteley Township	06/30/2019	Fire
Morgan Township	08/01/2019	Structure Fire
Franklin Township	05/27/2019	Commercial Structure Fire
Monongahela Township	10/19/2019	Fire
Waynesburg Borough	02/18/2019	Structure Fire
Franklin Township	02/12/2019	Commercial Structure Fire
Franklin Township	02/07/2019	Fire
Richhill Township	01/30/2019	Structure Fire
Waynesburg Borough	01/23/2019	Structure Fire
Cumberland Township	01/18/2019	Structure Fire
Morgan Township	10/31/2018	Structure Fire
Greene Township	11/19/2018	Structure Fire
Source: Greene County Reporting System, 2024		

As of October 2024, there were 2,871 active natural gas wells in Greene County (PA DEP, 2024). These locations should be closely monitored, and safety protocols should be strictly adhered to in order to avoid explosions and starting fires.

#### **4.3.21.4 Future Occurrence**

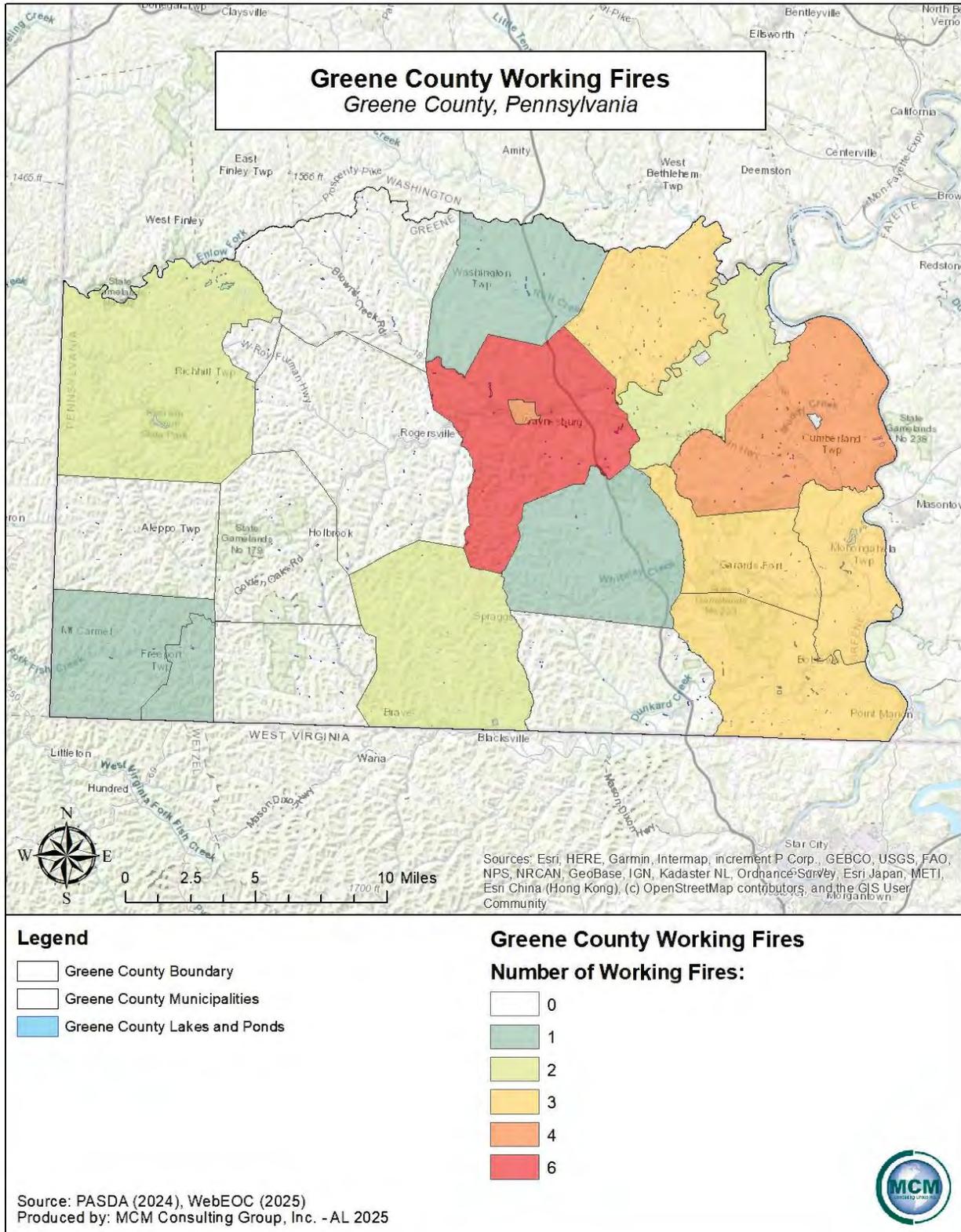
Small urban fires occur regularly and usually cause little damage. Areas with greater population and an increased rate of population density are at greater risk for future urban fires and explosions. The more urban areas of Greene County include Waynesburg Borough, Carmichaels Borough, Clarksville Borough, and Jefferson Township. Any new construction must comply with PA Department of Labor’s statewide uniform construction codes. One requirement in the construction codes is automatic sprinkler requirements for buildings other than one- and two-family dwellings. In most cases, this requirement will contain fires to the point of origin.

#### **4.3.21.5 Vulnerability Assessment**

Fire and explosion vulnerability greatly depends on the vulnerability of other hazards. Most fires result from the secondary effect of another hazard. The probability of a fire or explosion occurring increases with population and economic growth. The natural gas industry and exploration is active and growing in Greene County, and with it comes greater risk for fire and explosion. Urban fire risk also increases as the use of wood burning and kerosene space heaters increases. The elderly (those 65 years and older) tend to be more vulnerable to structure fires than other age groups, and often experience the highest number of deaths per fire. Older structures are more vulnerable to urban fire, and fires can spread faster to each other in areas with higher concentrations of housing. Potential secondary effects of urban fires include utility interruption and hazardous material spills. The following map *Figure 58 - Greene County Working Fires* identifies previous fires as well as which of those resulted in fatalities.

# Greene County, Pennsylvania 2025 Hazard Mitigation Plan

Figure 58 - Greene County Working Fires



## *Greene County, Pennsylvania 2025 Hazard Mitigation Plan*

### **4.3.22. Utility Interruption**

#### **4.3.22.1 Location and Extent**

Utility interruptions can occur from an internal system failure or as a secondary impact of another hazard, such as windstorm, winter storm, extreme temperatures, or a traffic accident. Strong adverse weather conditions and storms can cause widespread disruptions in electric and telecommunications service due to power lines being brought down by falling tree branches across a region. Strong heat waves may result in rolling blackouts where power may not be available for an extended period, impacting air conditioning across a region. Space weather, specifically solar flares, can also pose a threat to utility service across the globe. Although uncommon, the northeastern seaboard and the north central regions of the United States are particularly susceptible to this hazard.

The age of utility infrastructure also plays a role in interruptions, causing longer periods of outages in a larger area. Natural gas, water, telecommunications, and electric capabilities can all experience disruptions. Worker strikes at power generation facilities have also been known to cause minor and temporary power outages and failures. Other causes for minor power outages include but are not limited to vehicle accidents and wire destruction due to animals or wildlife. Outages can also be caused by blown transformers or tripped circuit breakers in the electric system. Major power outages typically occur on a regional scale and can last both short term and long term.

The list of utility providers in Greene County is shown in *Table 71 – Greene County Utility Providers*.

*Table 71 - Greene County Utility Providers*

<b>Greene County Utility Providers</b>	
<b>Utility Type</b>	<b>Name of Utility Provider</b>
Electricity	CO Monongahela Power Co., The Potomac Edison Co., West Penn Power Co.
Telephone/9-1-1/Wireless	Windstream Pennsylvania, LLC, West Side Telecommunications
Natural Gas	Atlas Energy Co, CNX Gas, Columbia Gas Transmission, Dominion Gas, EQT Corporation, Greene County Gas & Oil Co
Water	Carmichaels Water Authority, Southwestern Pennsylvania Water Authority
Source: PA Public Utility Commission, 2022	

#### **4.3.22.2 Range of Magnitude**

Utility interruptions do not typically lead to large-scale problems by themselves. Typically, human casualties are not a direct result from outages. Many utility interruptions occur during storms or other severe weather events, and they can have secondary consequences. Typical

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secondary effects from a power outage can include a delay in emergency response and those services arriving in timely manner. A lack of potable drinking water can also become a major issue for areas impacted by utility interruptions.

### Electricity:

Interruptions or power failures could have the following impacts:

- Public safety concerns
- Food spoilage
- Loss of heating or air conditioning
- Basement flooding due to sump pump failure
- Loss of indoor lighting
- Loss of internet service
- Stopped and stalled elevators
- Direct economic impact from retail settings

Of all the above listed impacts, the loss of heating or air conditioning poses the greatest risk to the elderly and very young populations during times of extreme temperature. Prolonged power outages also pose a risk to residents that rely on home-based medical equipment such as home-supply oxygen units. Some of the issues that are listed above can be considered more of a nuisance than a hazard, such as food spoilage due to long-term electrical outages. However, significant damage or harm can occur depending on the population affected, the duration, and the severity of the outage.

A worst-case scenario for the utility interruptions would be a county-wide power outage during winter months, forcing the evacuation of vulnerable populations to facilities outside of the county or to warming shelters within the county.

### Fuel:

Interruptions of the transportation of gas and other products used for fuel can lead to a loss of heating and manufacturing capabilities. This can adversely affect the economic stability of a region and the production of needed products for consumption.

### Telecommunications:

Interruptions to telecommunications systems include impacts to the 9-1-1 capabilities of a region, telephone, and internet service. The greatest risk in losing this utility to interruption is the risk of an emergency not being able to be reported to a public safety answering point (PSAP). Extensive loss of telephone and internet service can be detrimental to government, businesses, and to residents. With much of the country now dependent on wireless networks, signal interruptions can cause a large issue for people who are utilizing wireless telecommunications

## *Greene County, Pennsylvania 2025 Hazard Mitigation Plan*

for work. There are also many concerns regarding safety and internet security due to the increase in people working over wireless networks that occurred during the COVID-19 pandemic. These interruptions and issues can be detrimental for the Greene County workforce.

### **4.3.22.3 Past Occurrence**

Minor utility interruptions occur annually in Greene County and occur most often in conjunction with winter weather and/or windstorms. Greene County utilizes a database system called WebEOC to track incidents within the county. *Table 72 – Utility Interruptions in Greene County* illustrates the number of interruptions to electric, natural gas, telecommunications, and water services between 2019 and 2024.

*Table 72 - Utility Interruptions in Greene County*

<b>Utility Interruptions in Greene County</b>		
<b>Date</b>	<b>Event</b>	<b>Location</b>
10/27/2024	Water shortage/outage	Dunkard Township
05/13/2024	Water service line rupture	Franklin Township
04/20/2024	Natural gas pipeline break	Dunkard Township
04/16/2024	Down power lines	Morgan Township
04/03/2024	Ruptured natural gas line	Richhill Township
03/11/2024	Natural gas line break	Jackson Township
09/12/2023	Ruptured natural gas line	Freeport Township
06/05/2023	Natural gas line break	Wayne Township
01/04/2023	Water shortage/outage	Dunkard Township
10/03/2022	4" gas line struck	Dunkard Township
05/05/2022	Natural gas line struck	Morris Township
08/19/2021	Tower outage	Greene County
08/02/2021	Natural gas leak	Morris Township
07/01/2021	Water main break	Jefferson Township
06/28/2021	Down telephone pole	Wayne Township
03/30/2021	Natural gas leak	Wayne Township
02/27/2021	Natural gas leak	Morgan Township
01/20/2021	911 phone outage	Greene County
12/08/2020	1" natural gas line struck	Rices Landing Borough
10/12/2020	Power surge	Greene County
09/29/2020	911 phone outage	Greene County
09/18/2020	Natural gas leak	Jefferson Township
08/18/2020	Natural gas line struck	Waynesburg Borough
07/03/2020	Natural gas line sheared	Morgan Township
07/01/2020	Natural gas line struck	Freeport Township
07/26/2019	Utility Emergency	Jefferson Township
05/26/2020	Natural gas leak	Freeport Township
05/20/2020	Natural gas leak	Wayne Township

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<b>Utility Interruptions in Greene County</b>		
<b>Date</b>	<b>Event</b>	<b>Location</b>
05/13/2020	Water shortage/outage	Wayne Township
02/18/2020	Phone/communications outage	Franklin Township
05/06/2019	Utility Emergency	Monongahela Township
11/06/2019	Natural gas leak	Franklin Township
10/29/2019	Water shortage/outage	Monongahela Township
10/10/2019	Power Outage	Franklin Township
10/01/2029	Gas line struck	Franklin Township
09/14/2019	Power Outage	Perry Township
07/29/2019	Power substation on fire	Whiteley Township
06/28/2019	Water shortage/outage	Greensboro Borough
03/26/2019	Utility Emergency	Washington Township
02/25/2019	Power Outage	Greene County
02/24/2019	Phone/communications outage	Greene County

Source: Greene County WebEOC, 2025

The Pennsylvania Public Utility Commission tracks the reliability of electric distribution companies (EDC) and outages. *Table 73 – 2018 Winter Storms Riley and Quinn Power Outages* by EDC compares the customers affected by power outage in Pennsylvania during these storm events and compares the to statistics from Nika from 2014 and Sandy from 2012. Some of the EDCs were not impacted by Winter Storm Quinn. PP&L customers experienced power outages for a duration of eight days with Winter Storm Quinn and Winter Storm Riley, whereas during Sandy in 2012, the duration was nine days. Nika in 2014 had a duration of just over three days.

*Table 73 - 2018 Winter Storms Riley and Quinn Power Outages*

<b>2018 Winter Storms Riley and Quinn Power Outages</b>			
<b>Electric Distribution Company</b>	<b>Customers affected by storms Riley and Quinn 2018 (Percentage of total customers)</b>	<b>Customers affected by Nika 2014 (Percentage of total customer)</b>	<b>Customers affected by Sandy 2012 (Percentage of total customers)</b>
Met-Ed	272,928 (49.22%)	144,000 (26.00%)	298,300 (54.00%)
PECO	794,969 (46.76%)	723,681 (42.00%)	845,703 (54.20%)
Penelec	90,856 (15.61%)	N/A	96,847 (16.40%)
PCLP	2,101 (47.44%)	N/A	4,487 (100.00%)
PP&L	261,341 (18.67%)	92,283 (7.00%)	523, 936 (37.50%)
<b>Total:</b>	<b>1,422,195</b>	<b>959,964</b>	<b>1,769,273</b>

Source: Winter Storm Riley and Quinn Report 2019

Other past significant events of utility interruptions in the United States occur on a regional basis and can have varied effects related to number of impacted customers. A large water treatment

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plant failure occurred in Jackson, Mississippi in August of 2022 after flooding impacted the treatment facility. The city of Jackson was left without safe drinking water for close to two months until the water was deemed safe and potable in October of 2022. This event stood out as a large scale failure of community lifelines and utilities. This event also opened discussions related to equity in infrastructure repairs, as the repairs took a significant amount of time in a vulnerable socio-economic area. An attack on an electrical grid and power substations in North Carolina in December of 2022 left almost 45,000 people without power and reliant heat during the cold temperatures of January.

### **4.3.22.4 Future Occurrence**

Utility Interruptions are difficult to predict, and minor interruptions may occur several times a year to all utilities. Even so, utility interruptions occur more frequently as a secondary factor to severe weather events or transportation accidents.

Space weather is getting more attention as an infrastructure risk due in part to a March 2020 report by the United States Geological Survey (USGS). The report noted that geomagnetic storms caused by the dynamic action of the Sun and solar wind on the space environment surrounding the Earth can generate electric fields in the Earth's crust and mantle. These electric fields can interfere with the operation of grounded electric power-grid systems. Geomagnetic storms occur only occasionally, but when sufficiently energetic they can produce blackouts on a large scale.

As utility infrastructure ages, interruption events could occur more frequently if the maintenance of the infrastructure is not maintained. Utility providers can reduce Greene County's vulnerability to power outages by implementing improvement plans for utility infrastructure. Total replacement is not a feasible solution to the issue, but compromises can be reached to ensure that the new and old equipment along a utility line can work together efficiently.

Utility interruptions could see direct impacts based on climate change in Greene County. Prolonged heat waves caused by climate change could stress a power grid that was not specifically designed for increased heat exposure. Increased intensity of winter storms is of particular concern for the Commonwealth of Pennsylvania, as power outages can occur from lines being brought down by ice and snow.

### **4.3.22.5 Vulnerability Assessment**

Resources such as electricity, communications, gas, and water supply are critical to ensure the health, safety, and general welfare of the citizenry. *Figure 59 – Greene County Utilities* illustrates the approximate locations of service lines and pipelines throughout Greene County.

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Power outages can cause even greater detriment to at-risk and vulnerable populations, such as elderly (e.g., supplemental oxygen power needs) or those with functional and access needs to consider. All critical infrastructure is vulnerable to the effects of a power surge. The probability of a large-scale, extended utility failure is low; however, small-scale failures lasting short periods of time occur annually.

Long-term care facilities, senior centers, hospitals, and emergency medical facilities are all vulnerable to utility interruptions. Often back-up power generators are used at these facilities to offset electrical needs during extreme hot or cold temperature events. However, these back-up power generators must be maintained, and fuel supplies must be secured in advance of the utility interruption to ensure a seamless transition from the everyday, grid power source to the emergency generator. When officials consider maintenance and supplies for a facility, long-term use of back-up generators should be planned.

### Electricity:

Severe weather is one of the largest causes of power loss. The electric power grid infrastructure can be damaged by snow, ice, high winds, lightning, flooding, falling tree limbs, and vehicle accidents involving utility poles. Small animals can also cause minor power outages by climbing along the lines and shorting out the system.

Causes of a regional scale power outage or failure could be from infrastructure failure, sabotage, human error, or worker strikes. Community lifeline facilities are vulnerable to utility interruptions, especially the loss of power. The establishment of reliable backup power at these facilities is extremely important to provide continued support of the health, safety, and well-being of Greene County residents and visitors.

The occurrence of severe weather related utility interruptions will increase due to climate change in the Commonwealth of Pennsylvania and the United States as a whole. Climate change will cause weather to become more severe on a more frequent basis.

### Water:

Water distribution can be affected in three ways.

- The amount of water available (depends on nature)
- The quality of the water (depends on human responsibility)
- The viability of the physical components of the distribution system

Well contamination or water shortages due to drought could pose a high vulnerability to local water distribution. Drought events will continue to occur more frequently as climate change alters that available amount of ground water for consumption. This will result in greater well shortages and water utility interruptions for citizens that have well water.

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Water contamination can occur naturally, by human error, or intentionally. Releases of manure and milk into the water supply can cause contamination. Overflows from sewage systems and lagoons on farms can also cause contamination of groundwater and drinking water. There are times when accidental spills and releases of hazardous materials contaminate water supplies, thereby, water supplies along transportation routes may be affected.

### Gas and Liquid Pipelines:

Interruptions to natural gas distribution lines could be affected by:

- Deterioration of line and facilities
- Puncturing the distribution lines by humans (either intentional or accidental)
- Coastal or winter storms
- Extreme heat or cold events
- Transportation accidents

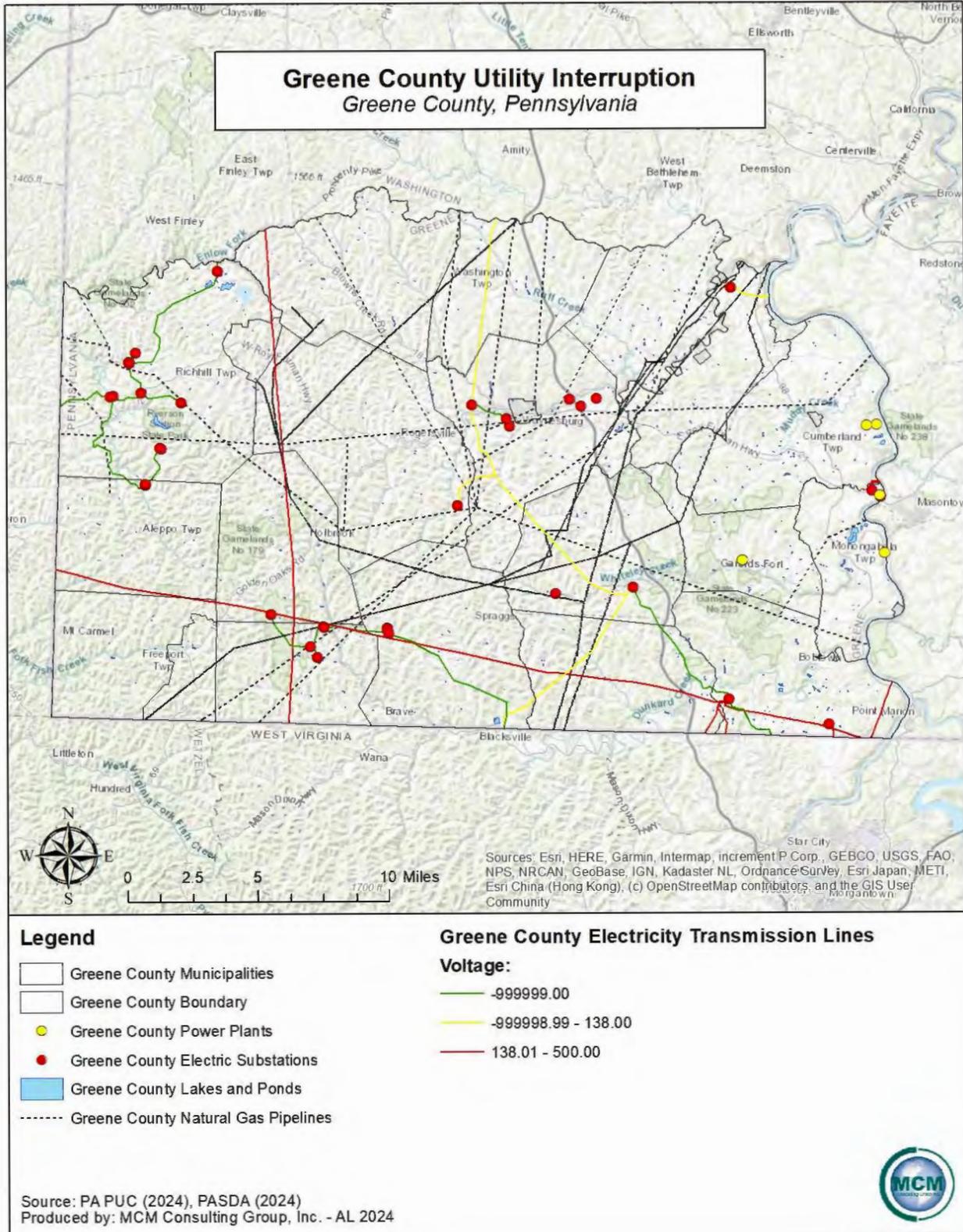
### Communications:

Interruptions in communications could be caused as a secondary effect of storms or high winds, infrastructure failure, or by humans (intentional or accidental). A loss of communications by emergency services would be devastating to the population of Greene County if 9-1-1 calls could not be received, or if emergency units could not be dispatched properly and/or timely.

No data regarding economic impacts from utility interruptions in Greene County are available. However, utility interruptions can cause economic impacts stemming from lost income, spoiled food and other goods, costs to the owners or operators of the utility facilities, and costs to government and community service groups.

# Greene County, Pennsylvania 2025 Hazard Mitigation Plan

Figure 59 - Greene County Utilities



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## **4.4. Hazard Vulnerability Summary**

### **4.4.1. Methodology**

Ranking hazards helps communities set goals and priorities for mitigation based on their vulnerabilities. A risk factor (RF) is a tool used to measure the degree of risk for identified hazards in a particular planning area. The RF can also assist local community officials in ranking and prioritizing hazards that pose the most significant threat to a planning area based on a variety of factors deemed important by the planning team and other stakeholders involved in the hazard mitigation planning process. The RF system relies mainly on historical data, local knowledge, general consensus from the planning team and information collected through development of the hazard profiles included in Section 4.3. The RF approach produces numerical values that allow identified hazards to be ranked against one another; the higher the RF value, the greater the hazard risk.

RF values were obtained by assigning varying degrees of risk to five categories for each of the hazards profiled in the HMP update. Those categories include *probability, impact, spatial extent, warning time and duration*. Each degree of risk was assigned a value ranging from one to four. The weighting factor agreed upon by the planning team is shown in *Table 74 – Risk Factor Approach Summary*. To calculate the RF value for a given hazard, the assigned risk value for each category was multiplied by the weighting factor. The sum of all five categories equals the final RF value, as demonstrated in the following example equation:

*Table 74 - Risk Factor Approach Summary*

Risk Factor Value =

$$[(\text{Probability} \times .30) + (\text{Impact} \times .30) + (\text{Spatial Extent} \times .20) + (\text{Warning Time} \times .10) + (\text{Duration} \times .10)]$$

*Table 75 – Risk Factor Approach Summary Continued* summarizes each of the five categories used for calculating a RF for each hazard. According to the weighting scheme applied, the highest possible RF value is 4.0.

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Table 75 - Risk Factor Approach Summary Continued

Summary of Risk Factor Approach Used to Rank Hazard Risk.					
RISK ASSESSMENT CATEGORY	DEGREE OF RISK			WEIGHT VALUE	
	LEVEL	CRITERIA	INDEX		
<b>PROBABILITY</b> <i>What is the likelihood of a hazard event occurring in a given year?</i>	UNLIKELY	LESS THAN 1% ANNUAL PROBABILITY	1	30%	
	POSSIBLE	BETWEEN 1 & 10% ANNUAL PROBABILITY	2		
	LIKELY	BETWEEN 10 & 100% ANNUAL PROBABILITY	3		
	HIGHLY LIKELY	100% ANNUAL PROBABILITY	4		
<b>IMPACT</b> <i>In terms of injuries, damage, or death, would you anticipate impacts to be minor, limited, critical, or catastrophic when a significant hazard event occurs?</i>	MINOR	VERY FEW INJURIES, IF ANY. ONLY MINOR PROPERTY DAMAGE & MINIMAL DISRUPTION ON QUALITY OF LIFE. TEMPORARY SHUTDOWN OF CRITICAL FACILITIES.	1	30%	
	LIMITED	MINOR INJURIES ONLY. MORE THAN 10% OF PROPERTY IN AFFECTED AREA DAMAGED OR DESTROYED. COMPLETE SHUTDOWN OF CRITICAL FACILITIES FOR MORE THAN ONE DAY.	2		
	CRITICAL	MULTIPLE DEATHS/INJURIES POSSIBLE. MORE THAN 25% OF PROPERTY IN AFFECTED AREA DAMAGED OR DESTROYED. COMPLETE SHUTDOWN OF CRITICAL FACILITIES FOR MORE THAN ONE WEEK.	3		
	CATASTROPHIC	HIGH NUMBER OF DEATHS/INJURIES POSSIBLE. MORE THAN 50% OF PROPERTY IN AFFECTED AREA DAMAGED OR DESTROYED. COMPLETE SHUTDOWN OF CRITICAL FACILITIES FOR 30 DAYS OR MORE.	4		
<b>SPATIAL EXTENT</b> <i>How large of an area could be impacted by a hazard event? Are impacts localized or regional?</i>	NEGLIGIBLE	LESS THAN 1% OF AREA AFFECTED	1	20%	
	SMALL	BETWEEN 1 & 10% OF AREA AFFECTED	2		
	MODERATE	BETWEEN 10 & 50% OF AREA AFFECTED	3		
	LARGE	BETWEEN 50 & 100% OF AREA AFFECTED	4		
<b>WARNING TIME</b> <i>Is there usually some lead time associated with the hazard event? Have warning measures been implemented?</i>	MORE THAN 24 HRS	SELF-DEFINED	(NOTE: Levels of warning time and criteria that define them may be adjusted based on hazard addressed.)	1	10%
	12 TO 24 HRS	SELF-DEFINED		2	
	6 TO 12 HRS	SELF-DEFINED		3	
	LESS THAN 6 HRS	SELF-DEFINED		4	
<b>DURATION</b> <i>How long does the hazard event usually last?</i>	LESS THAN 6 HRS	SELF-DEFINED	(NOTE: Levels of warning time and criteria that define them may be adjusted based on hazard addressed.)	1	10%
	LESS THAN 24 HRS	SELF-DEFINED		2	
	LESS THAN 1 WEEK	SELF-DEFINED		3	
	MORE THAN 1 WEEK	SELF-DEFINED		4	

## Greene County, Pennsylvania 2025 Hazard Mitigation Plan

### 4.4.2. Ranking Results

Using the methodology described in Section 4.4.1, *Table 76 – Risk Factor Assessment* lists the risk factor calculated for each of the twenty-two potential hazards identified in the 2025 HMP. Hazards identified as *high* risk have risk factors greater than 2.5. Risk factors ranging from 2.0 to 2.4 were deemed *moderate* risk hazards. Hazards with risk factors 1.9 and less are considered *low* risk.

Table 76 - Risk Factor Assessment

Greene County Hazard Ranking Based on Risk Factor Assessment Methodology							
Hazard Risk	Hazard Natural (N) or Human Caused (H)	RISK ASSESSMENT CATEGORY					RISK FACTOR (RF)
		Probability	Impact	Spatial Extent	Warning Time	Duration	
<b>HIGH</b>	Utility Interruption	4	3	4	4	4	<b>3.7</b>
	Environmental Hazards – Transportation	4	3	3	4	4	<b>3.5</b>
	Flash Flood	4	3	3	4	3	<b>3.4</b>
	Pandemic and Infectious Disease	3	4	4	1	4	<b>3.4</b>
	Cyberterrorism	2	4	4	4	4	<b>3.4</b>
	Substance Use Disorder	4	3	4	4	1	<b>3.4</b>
	Extreme Temperature	4	3	4	1	3	<b>3.3</b>
	Fire and Explosion	4	3	2	4	4	<b>3.3</b>
	Transportation Accident	4	3	2	4	2	<b>3.1</b>
	Windstorm	4	2	3	4	2	<b>3</b>
	Winter Storm	4	2	4	1	3	<b>3</b>
	Landslide	4	2	2	4	4	<b>3</b>
	Environmental Hazards – Fixed Facility	4	2	2	4	4	<b>3</b>
	Drought	3	2	4	1	4	<b>2.8</b>
	Invasive Species	4	1	4	1	4	<b>2.8</b>
	Blighted Properties	4	2	2	1	4	<b>2.7</b>
	Hurricane, Tropical Storm	3	2	4	1	2	<b>2.6</b>
	Flood	3	2	2	3	3	<b>2.5</b>
	Tornado	4	1	2	4	2	<b>2.5</b>
<b>MODERATE</b>	Building and Structure Collapse	3	2	1	4	2	<b>2.3</b>
	Levee Failure	2	2	2	4	3	<b>2.3</b>
	Earthquake	2	1	4	4	1	<b>2.2</b>
	Wildfire	4	1	1	4	1	<b>2.2</b>

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<b>Greene County Hazard Ranking Based on Risk Factor Assessment Methodology</b>							
Hazard Risk	Hazard Natural (N) or Human Caused (H)	RISK ASSESSMENT CATEGORY					RISK FACTOR (RF)
		Probability	Impact	Spatial Extent	Warning Time	Duration	
	Terrorism	4	1	1	4	1	<b>2.2</b>
	Radon Exposure	3	1	2	1	4	<b>2.1</b>
	Ice Jam	2	1	2	4	3	<b>2</b>
<b>LOW</b>	Subsidence, Sinkhole	3	1	2	2	1	<b>1.9</b>
	Dam Failure	1	2	2	4	2	<b>1.9</b>
	Civil Disturbance	2	1	1	2	1	<b>1.4</b>

Based on these results, there are nineteen high risk hazards, seven moderate risk hazards, and three low risk hazards in Greene County. Mitigation actions were developed for all high, moderate, and low risk hazards (see section 6.4). The threat posed to life and property for moderate and high-risk hazards is considered significant enough to warrant the need for establishing hazard-specific mitigation actions. Mitigation actions related to future public outreach and emergency service activities are identified to address low risk hazard events.

A risk assessment result for the entire county does not mean that each municipality is at the same amount of risk to each hazard. *Table 77 – Countywide Risk Factor Assessment* shows the different municipalities in Greene County and their corresponding risk factor and if it equal to the score that was assigned to the county as a whole. This table was developed by the consultant based on the findings in the hazard profiles located in sections 4.3.1 through 4.3.22.

## Greene County, Pennsylvania 2025 Hazard Mitigation Plan

Table 77 - Countywide Risk Factor

Calculated Countywide Risk Factor by Hazard and Comparative Jurisdictional Risk									
IDENTIFIED HAZARD AND CORRESPONDING COUNTYWIDE RISK FACTOR									
JURISDICTION	Utility Interruption	Environmental Hazards - Transportation	Flash Flood	Pandemic and Infectious Disease	Cyberterrorism	Substance Use Disorder	Extreme Temperature	Fire and Explosion	Transportation Accident
	3.7	3.5	3.4	3.4	3.4	3.4	3.3	3.3	3.1
Aleppo Township	=	=	=	=	=	=	=	=	=
Carmichaels Borough	=	=	=	=	=	=	=	=	=
Center Township	=	=	=	=	=	=	=	=	=
Clarksville Borough	=	=	=	=	=	=	=	=	=
Cumberland Township	=	=	=	=	=	=	=	=	=
Dunkard Township	1.2	2.1	2.3	2.7	1.8	2.1	1.7	1.1	2.1
Franklin Township	=	=	=	=	=	=	=	=	=
Freeport Township	=	=	=	=	=	=	=	=	=
Gilmore Township	=	=	=	=	=	=	=	=	=
Gray Township	3.7	3.5	3.4	3.4	3.4	2.9	3.3	3.3	3.1
Greene Township	=	=	=	=	=	=	=	=	=
Greensboro Borough	=	=	=	=	=	=	=	=	=
Jackson Township	=	=	=	=	=	=	=	=	=
Jefferson Borough	=	=	=	=	=	=	=	=	=
Jefferson Township	=	=	=	=	=	=	=	=	=
Monongahela Township	=	=	=	=	=	=	=	=	=
Morgan Township	=	=	=	=	=	=	=	=	=
Morris Township	=	=	=	=	=	=	=	=	=
Perry Township	2.5	2.5	3.0	2.1	1.8	2.6	3.4	2.0	2.5
Rices Landing Borough	=	=	=	=	=	=	=	=	=
Richhill Township	=	=	=	=	=	=	=	=	=
Springhill Township	=	=	=	=	=	=	=	=	=
Washington Township	=	=	=	=	=	=	=	=	=
Wayne Township	=	=	=	=	=	=	=	=	=
Waynesburg Borough	3.1	2.2	2.8	3.4	2.1	2.4	1.9	2.5	2.8
Whiteley Township	=	=	=	=	=	=	=	=	=

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Calculated Countywide Risk Factor by Hazard and Comparative Jurisdictional Risk									
IDENTIFIED HAZARD AND CORRESPONDING COUNTYWIDE RISK FACTOR									
JURISDICTION	Windstorm	Winter Storm	Landslide	Environmental Hazards – Fixed Facility	Drought	Invasive Species	Blighted Properties	Hurricane/ Tropical Storm	Flood
	3.0	3.0	3.0	3.0	2.8	2.8	2.7	2.6	2.5
Aleppo Township	=	=	=	=	=	=	=	=	=
Carmichaels Borough	=	=	=	=	=	=	=	=	=
Center Township	=	=	=	=	=	=	=	=	=
Clarksville Borough	=	=	=	=	=	=	=	=	=
Cumberland Township	=	=	=	=	=	=	=	=	=
Dunkard Township	2.1	2.3	2.1	2.1	1.5	2.0	2.0	2.1	2.2
Franklin Township	=	=	=	=	=	=	=	=	=
Freeport Township	=	=	=	=	=	=	=	=	=
Gilmore Township	=	=	=	=	=	=	=	=	=
Gray Township	3.0	3.0	2.7	3.0	2.8	2.8	2.7	2.3	3.0
Greene Township	=	=	=	=	=	=	=	=	=
Greensboro Borough	=	=	=	=	=	=	=	=	=
Jackson Township	=	=	=	=	=	=	=	=	=
Jefferson Borough	=	=	=	=	=	=	=	=	=
Jefferson Township	=	=	=	=	=	=	=	=	=
Monongahela Township	=	=	=	=	=	=	=	=	=
Morgan Township	=	=	=	=	=	=	=	=	=
Morris Township	=	=	=	=	=	=	=	=	=
Perry Township	2.2	2.8	2.1	1.5	2.8	1.8	2.1	1.0	3.1
Rices Landing Borough	=	=	=	=	=	=	=	=	=
Richhill Township	=	=	=	=	=	=	=	=	=
Springhill Township	=	=	=	=	=	=	=	=	=
Washington Township	=	=	=	=	=	=	=	=	=
Wayne Township	=	=	=	=	=	=	=	=	=
Waynesburg Borough	2.3	3.0	2.9	2.5	2.2	2.8	1.6	2.6	2.4
Whiteley Township	=	=	=	=	=	=	=	=	=

## Greene County, Pennsylvania 2025 Hazard Mitigation Plan

Calculated Countywide Risk Factor by Hazard and Comparative Jurisdictional Risk									
IDENTIFIED HAZARD AND CORRESPONDING COUNTYWIDE RISK FACTOR									
JURISDICTION	Tornado	Building and Structure Collapse	Levee Failure	Earthquake	Wildfire	Terrorism	Radon Exposure	Ice Jam	Subsidence and Sinkhole
	2.5	2.3	2.3	2.2	2.2	2.2	2.1	2.0	1.9
Aleppo Township	=	=	=	=	=	=	=	=	=
Carmichaels Borough	=	=	=	=	=	=	=	=	=
Center Township	=	=	=	=	=	=	=	=	=
Clarksville Borough	=	=	=	=	=	=	=	=	=
Cumberland Township	=	=	=	=	=	=	=	=	=
Dunkard Township	2.1	2.1	1.8	1.3	2.1	2.1	2.1	2.1	2.1
Franklin Township	=	=	=	=	=	=	=	=	=
Freeport Township	=	=	=	=	=	=	=	=	=
Gilmore Township	=	=	=	=	=	=	=	=	=
Gray Township	2.5	2.3	1.4	2.2	2.5	2.2	2.1	2.0	2.7
Greene Township	=	=	=	=	=	=	=	=	=
Greensboro Borough	=	=	=	=	=	=	=	=	=
Jackson Township	=	=	=	=	=	=	=	=	=
Jefferson Borough	=	=	=	=	=	=	=	=	=
Jefferson Township	=	=	=	=	=	=	=	=	=
Monongahela Township	=	=	=	=	=	=	=	=	=
Morgan Township	=	=	=	=	=	=	=	=	=
Morris Township	=	=	=	=	=	=	=	=	=
Perry Township	2.6	2.1	1.0	2.0	2.3	3.1	1.2	1.6	1.8
Rices Landing Borough	=	=	=	=	=	=	=	=	=
Richhill Township	=	=	=	=	=	=	=	=	=
Springhill Township	=	=	=	=	=	=	=	=	=
Washington Township	=	=	=	=	=	=	=	=	=
Wayne Township	=	=	=	=	=	=	=	=	=
Waynesburg Borough	2.1	1.3	1.0	2.2	2.3	2.0	2.1	1.2	1.9
Whiteley Township	=	=	=	=	=	=	=	=	=

**Greene County, Pennsylvania  
2025 Hazard Mitigation Plan**

Calculated Countywide Risk Factor by Hazard and Comparative Jurisdictional Risk		
IDENTIFIED HAZARD AND CORRESPONDING COUNTYWIDE RISK FACTOR		
JURISDICTION	Dam Failure	Civil Disturbance
	1.9	1.4
Aleppo Township	=	=
Carmichaels Borough	=	=
Center Township	=	=
Clarksville Borough	=	=
Cumberland Township	=	=
Dunkard Township	2.0	1.5
Franklin Township	=	=
Freeport Township	=	=
Gilmore Township	=	=
Gray Township	1.4	1.4
Greene Township	=	=
Greensboro Borough	=	=
Jackson Township	=	=
Jefferson Borough	=	=
Jefferson Township	=	=
Monongahela Township	=	=
Morgan Township	=	=
Morris Township	=	=
Perry Township	2.1	1.8
Rices Landing Borough	=	=
Richhill Township	=	=
Springhill Township	=	=
Washington Township	=	=
Wayne Township	=	=
Waynesburg Borough	1.9	2.1
Whiteley Township	=	=

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### **4.4.3. Potential Loss Estimates**

Based on various kinds of available data, potential loss estimates were established for flooding. Estimates provided in this section are based on HAZUS-MH, version MR4, geospatial analysis, and previous events. Estimates are considered *potential* in that they generally represent losses that could occur in a countywide hazard scenario. In events that are localized, losses may be lower, while regional events could yield higher losses.

Potential loss estimates have four basic components, including:

Replacement Value: Current cost of returning an asset to its pre-damaged condition, using present-day cost of labor and materials.

Content Loss: Value of building's contents, typically measured as a percentage of the building replacement value.

Functional Loss: The value of a building's use or function that would be lost if it were damaged or closed.

Displacement Cost: The dollar amount required for relocation of the function (business or service) to another structure following a hazard event.

#### **Flooding Loss Estimation:**

Flooding is a high-risk natural hazard in Greene County. The estimation of potential loss in this assessment focuses on the monetary damage that could result from flooding. The potential property loss was determined for each municipality and for the entire county. The quantity of commercial and residential structures in each Greene County municipality is outlined in section 4.3.4 of the flooding hazard profile.

MCM Consulting Group, Inc. conducted a countywide flood study using the Hazards U.S. Multi-Hazard (HAZUS-MH) software that is provided by the Federal Emergency Management Agency. This software is a standardized loss estimation software deriving economic loss, building damage, content damage and other economic impacts that can be used in local flood mitigation planning activities.

Using HAZUS-MH, total building-related losses from a 1%-annual-chance flood in Greene County are estimated to equal \$83.81 million with 34.21% of that coming from residential homes. Total economic loss, including replacement value, content loss, functional loss, and displacement cost, from a countywide 1%-annual-chance flood are estimated to equal \$154.68 million.

### **4.4.4. Future Development and Vulnerability**

The 2020 census population for Greene County is 36,484 which is 2,519 fewer than the 2010 census according to the U.S. Census Bureau, American Community Survey estimates. There was an overall decrease of 6.64% in population based on the data. Eight municipalities have seen

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population increases while the remaining eighteen had decreases in the period between 2010 and 2020 as seen in *Table 78 – 2010 – 2020 Population Change*.

*Table 78 - 2010 – 2020 Population Change*

<b>Population Change in Greene County from 2010-2020</b>			
<b>Municipality</b>	<b>2010 Census</b>	<b>2020 Census</b>	<b>Percent of Change 2010-2020</b>
Aleppo Township	564	557	-1.24%
Carmichaels Borough	461	481	4.34%
Center Township	1,202	1,276	6.16%
Clarksville Borough	271	199	-26.57%
Cumberland Township	6,620	6,225	-5.97%
Dunkard Township	2,315	2,122	-8.34%
Franklin Township	7259	6874	-5.30%
Freeport Township	249	216	-13.25%
Gilmore Township	221	232	4.98%
Gray Township	245	133	-45.71%
Greene Township	492	538	9.35%
Greensboro Borough	262	387	47.71%
Jackson Township	451	623	38.14%
Jefferson Borough	288	266	-7.64%
Jefferson Township	2,575	2,194	-14.80%
Monongahela Township	1,563	1,638	4.80%
Morgan Township	2,675	2,068	-22.69%
Morris Township	826	791	-4.24%
Perry Township	1391	1352	-2.80%
Rices Landing Borough	477	600	25.79%
Richhill Township	860	821	-4.53%
Springhill Township	387	225	-41.86%
Washington Township	1,160	936	-19.31%
Wayne Township	1246	1108	-11.08%
Waynesburg Borough	4,177	3,975	-4.84%
Whiteley Township	766	647	-15.54%

Source: United States Census Bureau, American Community Survey (2010 and 2020)

The 2020 census estimates indicates that there are approximately 16,787 housing units in Greene County, Pennsylvania. Of those, 86.4% of the structures are occupied-housing units. The county-wide population changes indicate a potential alteration to overall hazard vulnerability. Municipalities that undergo widespread population reductions may have more difficulty meeting personnel demands than would expanding jurisdictions. However, certain municipalities experienced significant resident increases and, thus, may be more vulnerable to certain hazards

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due to development and residential growth. Although expanding population zones may be especially vulnerable to hazards outlined in section 4.3 of this hazard mitigation plan update, natural and human caused hazards could potentially occur at any time regardless of population change. The Greene County Hazard Mitigation Local Planning Team will conduct annual reviews of this plan and the impacts all hazards have on the county and new development every year and within a time frame after a disaster or major emergency.

## **5. Capability Assessment**

### **5.1. Update Process Summary**

The capability assessment is an evaluation of Greene County’s governmental structure, political framework, legal jurisdiction, fiscal status, policies and programs, regulations, ordinances, and resource availability. Each category is evaluated for its strengths and weaknesses in responding to, preparing for, and mitigating the effects of the profiled hazards. A capability assessment is an integral part of the hazard mitigation planning process. Here, the county and municipalities identify, review, and analyze what they are currently doing to reduce losses and identify the framework necessary to implement new mitigation actions. This information will help the county and municipalities evaluate alternative mitigation actions and address shortfalls in the mitigation plan.

A capabilities assessment survey was provided to the municipalities during the planning process at meetings held with Greene County officials. These meetings were designed to seek input from the key county and municipal stakeholders on legal, fiscal, technical, and administrative capabilities of all jurisdictions. As such, the capabilities assessment helps guide the implementation of mitigation projects and will help evaluate the effectiveness of existing mitigation measures, policies, plans, practices, and programs.

Throughout the planning process, the mitigation local planning team considered the county’s twenty-six municipalities. Pennsylvania municipalities have their own governing bodies, pass, and enforce their own ordinances and regulations, purchase equipment and manage their own resources, including critical infrastructure. Therefore, these capability assessments consider the various characteristics and capabilities of municipalities under study.

The evaluation of the following categories – political framework, legal jurisdictions, fiscal status, policies and programs and regulations and ordinances – allows the mitigation planning team to determine the viability of certain mitigation actions. The capability assessment analyzes what Greene County, and its municipalities have the capacity to do and provides an understanding of what must be changed to mitigate loss.

Greene County has several resources it can access to implement hazard mitigation initiatives including emergency response measures, local planning and regulatory tools, administrative assistance and technical expertise, fiscal capabilities and participation in local, regional, state, and federal programs. The presence of these resources enables community resiliency through actions taken before, during, and after a hazardous event. While the capability assessment serves as a good instrument for identifying local capabilities, it also provides a means for recognizing gaps and weaknesses that can be resolved through future mitigation actions. The results of this assessment lend critical information for developing an effective mitigation strategy.

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### **5.2. Capability Assessment Findings**

Twenty-two of the twenty-six municipalities in Greene County completed and submitted a capability assessment survey. The results of the survey were collected, aggregated, and analyzed.

Each plan participant has some ability to expand and improve upon their administrative and technical capabilities following this plan update and during an update process. The municipalities of Greene County could improve upon these capabilities by first reviewing the capability assessment forms submitted during this update process and identifying areas of growth based off of these forms. A comprehensive review is within the power of each municipality of Greene County to see what departments, commissions, boards, and staff they have available to assist in each aspect of capability assessments. Each municipality, as a plan participant, should assess if they have the ability to improve in these areas during an annual review process or during the next hazard mitigation plan update. The plan participants should also review their ability to improve the financial capabilities by reviewing funding and funding sources, and researching other funding sources for hazard mitigation processes. Each plan participant can improve their education and outreach capabilities by increasing public event participation and education events that they attend in the county.

#### **5.2.1. Planning and Regulatory Capability**

Municipalities have the authority to govern more restrictively than state and county minimum requirements as long as they are compliant with all criteria established in the Pennsylvania Municipalities Planning Code (MPC) and their respective municipal codes. Municipalities can develop their own policies and programs and implement their own rules and regulations to protect and serve their residents. Local policies and programs are typically identified in a comprehensive plan, implemented through a local ordinance, and enforced by the governmental body or its appointee.

Municipalities regulate land use via the adoption and enforcement of zoning, subdivision, land development, building codes, building permits, floodplain management and/or stormwater management ordinances. When effectively prepared and administered, these regulations can lead to an opportunity for hazard mitigation. For example, the National Flood Insurance Program (NFIP) established minimum floodplain management criteria, and adoption of the Pennsylvania Floodplain Management Act (Act 166 of 1978) established even higher floodplain management standards. A municipality must adopt and enforce these minimum criteria to be eligible for participation in the NFIP. Municipalities have the option of adopting a single-purpose ordinance or incorporating these provisions into their zoning, subdivision, and land development, or building codes; thereby mitigating the potential impacts of local flooding. This capability assessment details the existing Greene County and municipal legal capabilities to mitigate the profiled hazards. It identifies the county and the municipal existing planning documents and their

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hazard mitigation potential. Hazard mitigation recommendations are, in part, based on the information contained in the assessment.

### **Building Codes**

Building codes are important in mitigation because they are developed for a region of the country in respect to the hazards that exist in that area. Consequently, structures that are built according to applicable codes are inherently resistant to many hazards, such as intense winds, floods, and earthquakes; and can help mitigate regional hazards, such as wildfires. In 2003, Pennsylvania implemented the Uniform Construction Code (UCC) (Act 45), a comprehensive building code that establishes minimum regulations for most new construction, including additions and renovations to existing structures.

The code applies to almost all buildings, excluding manufactured and industrialized housing (which are covered by other laws), agricultural buildings, and certain utility and miscellaneous buildings. The UCC requires builders to use materials and methods that have been professionally evaluated for quality and safety, as well as inspections to ensure compliance.

The initial election period, during which all of Pennsylvania's 2,565 municipalities were allowed to decide whether the UCC would be administered and enforced locally, officially closed on August 7, 2004. The codes adopted for use under the UCC are the 2003 International Codes issued by the International Code Council (ICC). Supplements to the 2003 codes have been adopted for use over the years since.

If a municipality has "opted in", all UCC enforcement is local, except where municipal (or third party) code officials lack the certification necessary to approve plans and inspect commercial construction for compliance with UCC accessibility requirements. If a municipality has "opted-out", the Pennsylvania Department of Labor and Industry is responsible for all commercial code enforcement in that municipality; and all residential construction is inspected by independent third-party agencies selected by the owner. The department also has sole jurisdiction for all state-owned buildings no matter where they are located. Historical buildings may be exempt from such inspections and Act 45 provides quasi-exclusion from UCC requirements.

The municipalities in Greene County adhere to the standards of the Pennsylvania Uniform Code (Act 45). All twenty-six of the municipalities in Greene County have opted-in on building code enforcement and use their own code enforcement.

### **Zoning Ordinance**

Article VI of the Municipalities Planning Code (MPC) authorizes municipalities to prepare and enact zoning to regulate land use. Its regulations can apply to the permitted use of land, the height and bulk of structures, the percentage of a lot that may be occupied by buildings and other impervious surfaces, yard setbacks, the density of development, the height and size of signs, and

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the parking regulations. A zoning ordinance has two parts, including the zoning map that delineates zoning districts and the text that sets forth the regulations that apply to each district.

### **Subdivision Ordinance**

Subdivision and land development ordinances include regulations to control the layout of streets, the planning lots and the provision of utilities and other site improvements. The objectives of subdivision and land development ordinance are to coordinate street patterns, to assure adequate utilities and other improvements are provided in a manner that will not pollute streams, wells and/or soils, to reduce traffic congestions, and to provide sound design standards as a guide to developers, the elected officials, planning commissions, and other municipal officials. Article V of the Municipality Planning Code authorizes municipalities to prepare and enact a subdivision and land development ordinance. Subdivision and land development ordinances provide for the division and improvement of land. Of the twenty-six municipalities in Greene County, some have subdivision/land use ordinances, some have zoning regulations – some have both and some have neither. There are currently eight municipalities that have zoning regulations in place and six municipalities that have a subdivision/land use ordinance (Greene County Planning Commission, January 2025).

### **Stormwater Management Plan/Stormwater Ordinance**

The proper management of storm water runoff can improve conditions and decrease the chance of flooding. Pennsylvania's Storm Water Management Act (Act 167) confers on counties the responsibility for development of watershed plans. The Act specifies that counties must complete their watershed storm water plans within two years following the promulgation of these guidelines by the Pennsylvania Department of Environmental Protection (PA DEP), which may grant an extension of time for any county for the preparation and adoption of plans. Counties must prepare the watershed plans in consultation with municipalities and residents. This is to be accomplished through the establishment of a watershed plan advisory committee. The counties must also establish a mechanism to periodically review and revise watershed plans. Plan revisions must be done every five years or sooner, if necessary.

Municipalities have an obligation to implement the criteria and standards developed in each watershed storm water management plan by amending or adopting laws and regulation for land use and development. The implementation of storm water management criteria and standards at the local level are necessary since municipalities are responsible for local land use decisions and planning. The degree of detail in the ordinance depends on the extent of existing and projected land development. The watershed storm water management plan is designed to aid the municipality in setting standards for the land uses it has proposed. Municipalities within rapidly developing watersheds will benefit from the watershed storm water management plan and will use the information for sound land use considerations. A major goal of the watershed plan and the attendant municipal regulations is to prevent future drainage problems and avoid the

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aggravation of existing problems. All municipalities in Greene County have adopted the county's stormwater management plan.

### **Comprehensive Plan**

A comprehensive plan is a policy document that states objectives and guides the future growth and physical development of a municipality. The comprehensive plan is a blueprint for housing, transportation, community facilities, utilities, and land use. It examines how the past led to the present and charts the community's future path. The Pennsylvania Municipalities Code (MPC Act 247 of 1968, as reauthorized and amended) requires counties to prepare and maintain a county comprehensive plan. In addition, the MPC requires counties to update the comprehensive plan every ten years.

Regarding hazard mitigation planning, Section 301.a(2) of the Municipality Planning Code requires comprehensive plans to include a plan for land use, which, among other provisions, suggests that the plan consider floodplains and other areas of special hazards and other similar uses. The MPC also requires comprehensive plans to include a plan for community facilities and services that recommends considering storm drainage and floodplain management.

Greene County last updated its comprehensive plan in 2020. There were no municipalities involved in the last comprehensive plan update, but the plan covers all of Greene County per the Commissioners Vision (Greene County Planning Commission, January 2025). Article III of the MPC enables municipalities to prepare a comprehensive plan: however, development of a comprehensive plan is voluntary.

### **Capital Improvements Plan**

The capital improvements plan is a multi-year policy guide that identifies needed capital projects and is used to coordinate the financing and timing of public improvements. Capital improvements relate to streets, storm water systems, water distribution, sewage treatment, and other major public facilities. A capital improvements plan should be prepared by the respective county's planning department and should include a capital budget. This budget identifies the highest priority projects recommended for funding in the next annual budget. The capital improvements plan is dynamic and can be tailored to specific circumstances.

### **Participation in the National Flood Insurance Program (NFIP)**

Floodplain management is the operation of programs or activities that may consist of both corrective and preventative measures for reducing flood damage, including but not limited to such things as emergency preparedness plans, flood control works, and flood plain management regulations. The Pennsylvania Floodplain Management Act (Act 166) require every municipality identified by the Federal Emergency Management Agency (FEMA) to participate in the National Flood Insurance Program and permits all municipalities to adopt floodplain management

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regulations. It is in the interest of all property owners in the floodplain to keep development and land usage within the scope of the floodplain regulations for their community. This helps keep insurance rates low and ensures that the risk of flood damage is not increased by property development.

The Pennsylvania Emergency Management Agency (PEMA) was appointed by legislation in September 2021 to coordinate the Commonwealth NFIP and employ the State NFIP Coordinator. For many years prior, these roles were held by the Pennsylvania Department of Community and Economic Development (DCED), which still offers support to communities through its Floodplain Mitigation Program. PEMA provides communities, based on CFR Title 44, Section 60.3 level of regulations, with a suggested ordinance document to assist municipalities in meeting the minimum requirements of the NFIP along with the Pennsylvania Flood Plain Management Act (Act 166). These suggested or model ordinances contain provisions that are more restrictive than state and federal requirements. Suggested provisions include, but are not limited to, the below.

1. Prohibiting manufactured homes in the floodway
2. Prohibiting manufactured homes within the area measured fifty feet landward from the top-of-bank of any watercourse within a special flood hazard area
3. Special requirements for recreational vehicles within the special flood hazard area
4. Special requirement for accessory structure
5. Prohibiting new construction and development within the area measured fifty feet landward from the top-of-bank of any watercourse within a special flood hazard area
6. Providing the county conservation district an opportunity to review and comment on all applications and plans for any proposed construction or development in any identified floodplain area

Act 166 mandates municipal participation in, and compliance with, the NFIP. It also establishes higher regulatory standards for new or substantially improved structures which are used for the production or storage of dangerous materials (as defined by Act 166) by prohibiting them in the floodway. Additionally, Act 166 established the requirement that a special permit be obtained prior to any construction or expansion of any manufactured home park, hospital, nursing home, jail and prison if said structure is located within a special flood hazard area.

The NFIP's Community Rating System (CRS) provides discounts on flood insurance premiums in those communities that establish floodplain management programs that go beyond NFIP minimum requirements. Under the CRS, communities receive credit for more restrictive regulations, acquisition, relocation, or flood-proofing of flood prone buildings, preservation of open space, and other measures that reduce flood damages or protect the natural resources and functions of floodplains.

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The CRS was implemented in 1990 to recognize and encourage community floodplain management activities that exceed the minimum NFIP standards. Section 541 of the 1994 Act amends Section 1315 of the 1968 Act to codify the Community Rating System in the NFIP. The section also expands the CRS goals to specifically include incentives to reduce the risk of flood-related erosion and to encourage measures that protect natural and beneficial floodplain functions. These goals have been incorporated into the CRS and communities now receive credit toward premium reductions for activities that contribute to them.

Under the Community Rating System, flood insurance premium rates are adjusted to reflect the reduced flood risk resulting from community activities that meet a minimum of three of the following CRS goals.

1. Reduce flood losses
2. Protect public health and safety
3. Reduce damage to property
4. Prevent increases in flood damage from new construction
5. Reduce the risk of erosion damage
6. Protect natural and beneficial floodplain functions
7. Facilitate accurate insurance rating
8. Promote the awareness of flood insurance

There are ten Community Rating System classes. Class 1 requires the most credit points and gives the largest premium reduction; class 10 receives no premium reduction. CRS premium discounts on flood insurance range from 5% for Class 9 communities up to 45% for Class 1 communities. The CRS recognizes eighteen credible activities, organized under four categories: Public Information, Mapping and Regulations, Flood Damage Reduction, and Flood Preparedness.

FEMA Region III makes available to communities an ordinance review checklist which lists required provisions for floodplain management ordinances. This checklist helps communities develop an effective floodplain management ordinance that meets federal requirements for participation in the NFIP. FEMA provides communities, based on their 44 CFR 60.3 level of regulations, with a suggested ordinance document to assist municipalities in meeting the minimum requirements of the NFIP and the Pennsylvania Flood Plain Management Act (Act 166). Act 166 mandates municipal participation in and compliance with the NFIP. It also established higher regulatory standards for hazardous materials and high-risk land uses. As new Digital Flood Insurance Rate Maps (DFIRMs) are published, the Pennsylvania State NFIP Coordinator at DCED works with communities to ensure the timely and successful adoption of an updated floodplain management ordinance by reviewing and providing feedback on existing and draft ordinances.

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According to the State NFIP Coordinator, all of Greene County's twenty-six municipalities have floodplain regulations in place that meet requirements set forth by the NFIP. Currently, no municipalities have completed or started to complete the CRS program. Additional research will be conducted on the CRS program and mitigation actions will be developed in support of the CRS.

To spread awareness as well as capture participation levels, all municipalities were instructed to complete an NFIP survey provided by the Federal Emergency Management Agency. In total, eleven municipalities submitted a complete NFIP survey. These surveys can be found in Appendix C of this plan.

The following information outlines floodplain ordinances from jurisdictions in Greene County that have not submitted NFIP surveys during this hazard mitigation planning process.

### **Additional National Flood Insurance Program and Floodplain Management Information:**

#### **Carmichaels Borough:**

The floodplain management ordinance for Carmichaels Borough was not available for review during this hazard mitigation plan update. The floodplain administrator designee for Carmichaels Borough is Carmichaels Borough.

#### **Center Township:**

The floodplain management ordinance for Center Township is called "*Township of Center Ordinance No. 2-2015.*" This floodplain ordinance was adopted in 2015 and is the most up to date ordinance for the township. There is significant discussion on floodplain ordinances in section 5.02 identifying information on the development and building of construction near the floodplain. Also discussed in that section are items related to substantially damaged and substantially improved structures. Section 5.03 discusses specific information on design and construction standards. Section 5.02 outlines restrictions for structures located and constructed in floodplain. Local commitments and requirements of the National Flood Insurance Program will be managed by a municipal flood plain manager, a flood plain management coordinator, or the designee for the township. Specific information on more items for Center Township can be found with the Greene County Planning Commission. The floodplain administrator designee for Center Township is Dawn Horr.

#### **Clarksville Borough:**

The floodplain management ordinance for Clarksville Borough was not available for review during this hazard mitigation plan update. The floodplain administrator designee for Clarksville Borough is Jason Dikun.

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### **Dunkard Township:**

The floodplain management ordinance for Dunkard Township was not available for review during this hazard mitigation plan update. The floodplain administrator designee for Dunkard Township is McMillen Engineering.

### **Gilmore Township:**

The floodplain management ordinance for Gilmore Township was not available for review during this hazard mitigation plan update. The floodplain administrator designee for Gilmore Township is Richard Kerch.

### **Gray Township:**

The floodplain management ordinance for Gray Township was not available for review during this hazard mitigation plan update. The floodplain administrator designee for Gray Township is Constance Bloom.

### **Greene Township:**

The floodplain management ordinance for Greene Township is from Title XIII of the Greene Township, PA Code of Ordinances. This floodplain ordinance was adopted on August 4<sup>th</sup>, 2015, and is the most up to date ordinance for the township. There is significant discussion on floodplain ordinances in Chapter 151 identifying information on the development and building of construction near the floodplain. Also discussed in that section are items related to substantially damaged and substantially improved structures. Section 151.080 discusses specific information on design and construction standards. Section 151.096 outlines restrictions for structures located and constructed in floodplain. Local commitments and requirements of the National Flood Insurance Program will be managed by a municipal flood plain manager, a flood plain management coordinator, or the designee for the township. Specific information on more items for Greene Township can be found with the Greene County Planning Commission. The floodplain administrator designee for Greene Township is Allan Spaw.

### **Greensboro Borough:**

The floodplain management ordinance for Greensboro Borough was not available for review during this hazard mitigation plan update. The floodplain administrator designee for Greensboro Borough is Mark Gordon.

### **Jackson Township:**

The floodplain management ordinance for Jackson Township was not available for review during this hazard mitigation plan update. The floodplain administrator designee for Jackson Township is Jonathan Crawford.

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### **Jefferson Borough:**

The floodplain management ordinance for Jefferson Borough was not available for review during this hazard mitigation plan update. The floodplain administrator designee for Jefferson Borough is Relda Litten.

### **Morgan Township:**

The floodplain management ordinance for Morgan Township was not available for review during this hazard mitigation plan update. The floodplain administrator designee for Morgan Township is K2 Engineering.

### **Morris Township:**

The floodplain management ordinance for Morris Township was not available for review during this hazard mitigation plan update. The floodplain administrator designee for Morris Township is the Building Underwriters.

### **Washington Township:**

The floodplain management ordinance for Washington Township was not available for review during this hazard mitigation plan update. The floodplain administrator designee for Washington Township is Walter Stout.

### **Whiteley Township:**

The floodplain management ordinance for Whiteley Township was not available for review during this hazard mitigation plan update. The floodplain administrator designee for Whiteley Township is Janice Carroll.

Each community within Greene County should identify their procedures for substantial improvement and substantial damage implementation in their floodplain management ordinance. This is a concern for local municipalities and plan participants if they are unable to locate their floodplain management ordinance is located, nor understand its contents. Each municipality may have different processes and procedures in place for substantial improvement and substantial damage following an event. Floodplain management ordinance maintenance, access, and implementation can be a challenge for municipalities and local governments, and this also relates to the availability of information on SI/SD.

During this hazard mitigation plan update, a previous National Flood Insurance Program (NFIP) survey was used. This document was utilized and distributed to the municipalities prior to the “Checking In on the NFIP” document being provided to MCM Consulting Group, Inc. The “Checking In on the NFIP” document was not distributed to municipalities, so they did not have two separate versions of the NFIP survey. This new document will be used for future hazard mitigation plan development in Greene County.

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The following table outlines the Greene County municipality floodplain administrator designees or representative. This information was retrieved from the Pennsylvania Department of Community and Economic Development at the following website: <https://dced.pa.gov/local-government/municipal-statistics/municipalities/> or [https://apps.dced.pa.gov/munstats-public/ReportInformation2.aspx?report=LocalOfficial\\_Excel](https://apps.dced.pa.gov/munstats-public/ReportInformation2.aspx?report=LocalOfficial_Excel)

*Table 79 - Greene County Municipal Floodplain Administrator Designees*

<b>Greene County Municipal Floodplain Administrator Designees</b>		
<b>Municipality Name</b>	<b>Position Title</b>	<b>Name or Agency</b>
Aleppo Township	Floodplain Administrator	Lisa Moore
Carmichaels Borough	Floodplain Administrator	Carmichaels Borough
Center Township	Floodplain Administrator	Dawn Horr
Clarksville Borough	Floodplain Administrator	Jason Dikun
Cumberland Township	Floodplain Administrator	Brian Sokol
Dunkard Township	Floodplain Administrator	McMillen Engineering
Franklin Township	Floodplain Administrator	Steve Coss
Freeport Township	Floodplain Administrator	Guy Hostutler
Gilmore Township	Floodplain Administrator	Richard Kerch
Gray Township	Floodplain Administrator	Constance Bloom
Greene Township	Floodplain Administrator	Allan Spaw
Greensboro Borough	Floodplain Administrator	Mark Gordon
Jackson Township	Floodplain Administrator	Jonathan Crawford
Jefferson Borough	Floodplain Administrator	Relda Litten
Jefferson Township	Floodplain Administrator	Kimberly Cottle
Monongahela Township	Floodplain Administrator	William Monahan
Morgan Townshp	Floodplain Administrator	K2 Engineering
Morris Township	Floodplain Administrator	Building Underrwriters
Perry Township	Floodplain Administrator	Ronald Howard
Rices Landing Borough	Floodplain Administrator	Scott Durr
Richhill Township	Floodplain Administrator	Thomas Chess III
Springhill Township	Floodplain Administrator	Richard Debolt
Washington Township	Floodplain Administrator	Walter Stout
Wayne Township	Floodplain Administrator	K2 Engineering
Waynesburg Borough	Floodplain Administrator	Athena Bowman
Whiteley Township	Floodplain Administrator	Janice Carroll

### **5.2.2. Administrative and Technical Capability**

There are six boroughs and twenty townships within Greene County. Each of these municipalities conducts its daily operations and provides various community services according

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to local needs and limitations. Some of these municipalities have formed cooperative agreements and work jointly with their neighboring municipalities to provide services such as police protection, fire and emergency response, infrastructure maintenance, and water supply management. Other municipalities choose to operate independently and provide such services internally. Municipalities vary in staff size, resource availability, fiscal status, service provision, constituent population, overall size, and vulnerability to the profile hazards. Technical capability relates to an adequacy of knowledge and technical expertise of local government employees or the ability to contract resources for this expertise in order to effectively execute mitigation activities. Common examples of skill sets, and technical personnel needed for hazard mitigation include: planners with knowledge of land development and management practices, engineers or professionals trained in construction practices related to buildings and/or infrastructure (e.g. building inspectors), planners or engineers with an understanding of natural and/or human caused hazards, emergency managers, floodplain managers, land surveyors, scientists familiar with hazards in the community, staff with education of expertise to assess community vulnerability to hazards, personnel skilled in geographic information systems, resource development staff or grant writers, fiscal staff to handle complex grant application processes.

### **County Planning Commission**

In Pennsylvania, planning responsibilities traditionally have been delegated to each county and local municipality through the Municipalities Planning Code (MPC). A planning agency acts as an advisor to the governing body on matters of community growth and development. A governing body may appoint individuals to serve as legal or engineering advisors to the planning agency. In addition to the duties and responsibilities authorized by Article II of the MPC, a governing body may, by ordinance, delegate approval authority to a planning agency for subdivision and land development applications. A governing body has considerable flexibility, not only as to which powers and duties are assigned to a planning agency, but also what form an agency will possess. A governing body can create a planning commission, a planning department, or both. The Greene County Planning Commission assists all municipalities in the county as needed.

### **Municipal Engineer**

A municipal engineer performs duties as directed in the areas of construction, reconstruction, maintenance and repair of streets, roads, pavements, sanitary sewers, bridges, culverts, and other engineering work. The municipal engineer prepares plans, specifications and estimates of the work undertaken by the township. Most municipalities in Greene County have a municipal engineer under contract to perform these duties.

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### **Personnel Skilled in GIS or FEMA HAZUS Software**

A geographic information system (GIS) is an integrated, computer-based system designed to capture, store, edit, analyze, and display geographic information. Some examples of uses for GIS technology in local government are land records management, land use planning, infrastructure management, and natural resources planning. A GIS automates existing operations such as map production and maintenance, saving a great deal of time and money. The GIS also includes information about map features such as the capacity of a municipal water supply or the acres of public land. Greene County GIS is maintained through the Planning and Community Development Department. Greene County GIS works with all county departments and manages, maintains, and develops GIS data when requested. GIS data is an important tool to use in hazard mitigation planning and is instrumental in assessing the risk of municipalities to various hazards.

### **Emergency Management Coordinator**

Emergency management is a comprehensive, integrated program of mitigation, preparedness, response, and recovery for emergencies/disasters of any kind. No public or private entity is immune to disasters and no single segment of society can meet the complex needs of a major emergency or disaster on its own. Hence, the National Preparedness Goal of 2011 also defines what it means for the whole community to be prepared for all types of disasters and emergencies and lists five mission areas which support preparedness: prevention, protection, mitigation, response, and recovery – doubling the emphasis on mitigation activities in an emergency management program.

The Pennsylvania Emergency Management Services Code (PA Title 35) requires Greene County and its municipalities to have an emergency management coordinator.

The Greene County Emergency Management Agency coordinates countywide emergency management efforts. Each municipality has a designated local emergency management coordinator who possesses a unique knowledge of the impact hazardous events have on their community.

A municipal emergency management coordinator is responsible for emergency management – preparedness, response, recovery, and mitigation within his/her respective authority having jurisdiction (AHJ). The responsibilities of the emergency management coordinator are outlined in PA Title 35 §7633.

- Prepare and maintain a current disaster emergency management plan
- Establish, equip, and staff an emergency operations center
- Provide individual and organizational training programs
- Organize and coordinate all locally available manpower, materials, supplies, equipment, and services necessary for disaster emergency readiness, response, and recovery

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- Adopt and implement precautionary measures to mitigate the anticipated effects of a disaster
- Cooperate and coordinate with any public and private agency or entity
- Provide prompt information regarding local disaster emergencies to appropriate commonwealth and local officials or agencies and the public
- Participate in all tests, drills, and exercises, including remedial drills and exercises scheduled by the agency or by the federal government

PA Title 35 requires that all municipalities in the Commonwealth have a local emergency operations plan (EOP) which is updated every two years. All of the twenty-six municipalities in Greene County have adopted the county EOP. The notification and resource section of the plan was developed individually by each municipality.

### **Federal Agency Assistance**

There are many federal agencies that can provide technical assistance for mitigation activities, and these include, but are not limited to:

- United States Army Corps of Engineers (USACE)
- Department of Housing and Urban Development (HUD)
- Department of Agriculture (DOA)
- Economic Development Administration
- Emergency Management Institute (EMI)
- Environmental Protection Agency (EPA)
- Federal Emergency Management Agency (FEMA)
- Small Business Administration (SBA)

### **State Agency Assistance**

There are many commonwealth agencies that can provide technical assistance for mitigation activities, and these include but are not limited to:

- Pennsylvania Emergency Management Agency (PEMA)
- Pennsylvania Department of Community and Economic Development
- Pennsylvania Department of Conservation and Natural Resources
- Pennsylvania Department of Environmental Protection

### **Existing Limitations**

Funding has been identified as the largest limitation for a municipality to complete mitigation activities. The acquisition of grants is the best way to augment this process the municipalities. The county and municipality representatives will need to rely on regional, state, and federal

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partnerships for future financial assistance. Development of intra-county regional partnerships and intra-municipality regional partnerships will bolster this process.

### **5.2.3. Financial Capability**

Fiscal capability is significant to the implementation of hazard mitigation activities. Every jurisdiction must operate within the constraints of limited financial resources. The decision and capacity to implement mitigation-related activities is often strongly dependent on the presence of financial resources. While some mitigation actions are less costly than others, it is important that money is available locally to implement policies and projects. Financial resources are particularly important if communities are trying to take advantage of state or federal mitigation grant funding opportunities that require local-match contributions. The following information pertains to various financial assistance programs relevant to hazard mitigation.

#### **State and Federal Grants**

During the 1960s and 1970s state and federal grants-in-aid were available to finance many municipal programs, including streets, water and sewer facilities, airports, parks, and playgrounds. During the early 1980s, there was a significant change in federal policy, based on rising deficits and a political philosophy that encouraged states and local governments to raise their own revenues for capital programs. The result has been a growing interest in “creative financing”.

Grant programs that may be utilized to accomplish hazard mitigation objectives include the: Pennsylvania Department of Community and Economic Development Community Development Block Grant (CDBG); Land Use Planning and Technical Assistance (LUPTAP); Shared Municipal Services (SMS); Community Revitalization (CR) and Floodplain Land Use Assistance Programs; the PA DEP’s Growing Greener; Act 167 Stormwater Management; Source Water Protection; and Flood Protection Programs. The Flood Protection Programs include the PA DCNR’s Community Conservation Partnership Program, PEMA’s Pre-Disaster Mitigation (PDM) Grant, Flood Mitigation Assistance Grant Programs (FMA), and Hazard Mitigation Grant Program.

Below are some of the other state programs that may provide financial support for mitigation activities:

- DCED Flood Mitigation Program
- DCED H2O PA Flood Control Projects
- DCED H2O PA High Hazard Unsafe Dam Projects
- DCED H2O PA Water Supply, Sanitary Sewer and Storm Water Projects
- DCED PA Small Water and Sewer
- DCNR Community Conservation Partnerships Program

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- DCNR Pennsylvania Heritage Areas Program
- DCNR Pennsylvania Recreational Trails Program
- DCNR Land and Water Conservation Fund

Below are some of the federal programs that may provide financial support for mitigation activities:

- FEMA Community Assistance Program – State Support Services Element (CAP-SSSE)
- FEMA Community Disaster Loan Program
- FEMA Community Rating System
- FEMA Emergency Management Performance Grants (EMPG)
- FEMA Environmental Planning and Historic Preservation Program (EHP)
- FEMA Flood Mitigation Assistance Program
- FEMA Hazard Mitigation Grant Program (HMGP)
- FEMA Individuals and Households Program (IHAP)
- FEMA National Dam Safety Program
- FEMA National Flood Insurance Program
- FEMA Pre-Disaster Mitigation Program
- FEMA Public Assistance Program (PA)
- FEMA Regional Catastrophic Preparedness Grant Program
- FEMA Repetitive Flood Claims Program (RFC)
- FEMA Severe Repetitive Loss Grant Program
- USACE Continuing Authorities Program
- USACE Flood Plain Management Services Program (FPMS)
- USACE Inspection of Completed Works Program (ICW)
- USACE National Levee Safety Program
- USACE Planning Assistance to States
- USACE Rehabilitation and Inspection Program (RIP)

### **Capital Improvement Financing**

Because most of the capital investments involve the outlay of substantial funds, local governments can seldom pay for these facilities through annual appropriations in the annual operating budget. Therefore, numerous techniques have evolved to enable local government to pay for capital improvements over a time period exceeding one year. Public finance literature and state laws governing local government finance classify techniques that are used to finance capital improvements. The techniques include revenue bonds, lease-purchase, authorities and special district, current revenue (pay-as-you-go); reserve funds; and tax increment financing. Most municipalities have very limited local tax funds for capital projects. Grants and other funding are always priorities.

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### **Indebtedness through General Obligation Bonds**

Some projects may be financed with general obligation bonds. With this method, the jurisdiction's taxing power is pledged to pay interest and principal to retire debt. General obligation bonds can be sold to finance permanent types of improvements, such as schools, municipal buildings, parks, and recreational facilities. Voter approval for this may be required.

### **Municipal Authorities**

Municipal authorities are most often used when major capital investments are required. In addition to sewage treatment, municipal authorities have been formed for water supply, airports, bus transit systems, swimming pools, and other purposes. Joint authorities have the power to receive grants, borrow money, and operate revenue generating programs. Municipal authorities are authorized to sell bonds, acquire property, sign contracts, and take similar actions. Authorities are governed by authority board members, who are appointed by the elected officials of the member municipalities.

### **Sewer Authorities**

Sewer authorities include multi-purpose authorities with sewer projects. They sell bonds to finance acquisition of existing systems for construction, extension, or system improvement. Sewer authority operating revenues originate from user fees. The fee frequently is based on the amount of water consumed and payment is enforced by the ability to terminate service by the imposition of liens against real estate. In areas with no public water supply, flat rate charges are calculated on average use per dwelling unit.

### **Water Authorities**

Water authorities are multi-purpose authorities with water projects, many of which operate both water and sewer systems. The financing of water systems for lease back to the municipality is one of the principal activities of the local government facilities' financing authorities. An operating water authority issues bonds to purchase existing facilities to construct, extend, or improve a system. The primary source of revenue is user fees based on metered usage. The cost of construction or extending water supply lines can be funded by special assessments against abutting property owners. Tapping fees also help fund water system capital costs. Water utilities are also directly operated by municipal governments and by privately owned public utilities regulated by the Pennsylvania Public Utility Commission. The Pennsylvania Department of Environmental Protection has a program to assist with consolidating small water systems to make system upgrades more cost effective.

### **U.S. Department of Agriculture Circuit Riding Program (Engineer)**

The Circuit Riding Program is an example of intergovernmental cooperation. This program offers municipalities the ability to join to accomplish a common goal. The circuit rider is a

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municipal engineer who serves several small municipalities simultaneously. These are municipalities that may be too small to hire a professional engineer for their own operations yet need the skills and expertise the engineer offers. Municipalities can jointly obtain what no one municipality could obtain on its own.

### **5.2.4. Education and Outreach**

The Greene County Emergency Management Agency conducts public outreach at public events to update the citizens and visitors of the county on natural and human-caused hazards. The county conservation district also conducts outreach on various activities and projects in the county.

Educational activities that directly impact hazard mitigation in Greene County predominantly revolve around the first responders. Providing fire, medical, search and rescue training, and education enhances the response and recovery capabilities of response agencies in the county. Newly appointed emergency management coordinators are trained in both duties and responsibilities and damage assessment – which includes a discussion on mitigation; this training can be translated into teaching municipal employees or local emergency services to assist them during a disaster.

The county also has several websites and social media accounts that can educate residents about hazard mitigation and risk while also communicating information in the event of a disaster:

**Greene County Emergency Management Agency Website:**

<https://www.co.greene.pa.us/departement-emergency-management-agency>

**Greene County GIS and Mapping Website:** <https://greenecountypa.gov/gis>

Greene County GIS has a website that provides education and outreach capability, particularly with the county map viewer, which could be updated to include hazard mitigation data. The websites of the Greene County Emergency Management Agency and the Greene County Department of Planning and Community Development also post information to educate residents, particularly in disaster preparedness, floodplain management, and zoning requirements. The Greene County Department of Planning and Community Development currently provides access to planning documents and educational brochures about the benefits of planning and helpful guides. The DES also holds quarterly Local Emergency Planning Committee (LEPC) meetings that are open to the public, which serve as another means to conduct outreach and educate the public about hazard mitigation.

Education and outreach on the NFIP are necessary. With new regulations in flood-plain management, updated digital flood insurance rate maps and new rates for insurance policies, education, and outreach on the NFIP would assist the program. The Greene County Local Planning Team will identify actions necessary to complete this.

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### **5.2.5. Plan Integration**

Plan integration recognizes that hazard mitigation is most effective when it works in efficient coordination with other plans, regulations, and programs. Plan integration promotes safe, resilient growth, effective management, an overall reduction of risk, by ensuring that the goals and actions established in the Hazard Mitigation Plan are included in the comprehensive planning efforts so they can affect future land use and development. Some of the most important areas of planning and regulatory capabilities which hazard mitigation goals and actions should be integrated include comprehensive plans, the hazard mitigation plans from all surrounding or encompassing areas, EOPs, building codes, floodplain ordinances, subdivision, land development ordinances, stormwater management plans and ordinances, and zoning ordinances. All of these tools provide mechanisms for the implementation of adopted mitigation strategies.

### **Greene County Comprehensive Plan**

#### **Overview**

Comprehensive plans establish the overall vision, goals, and objectives for a community's growth. The Greene County Comprehensive Plan was adopted by the Greene County Commissioners on March 19, 2020. The plan is a collaborative effort between the municipalities and Greene County and contains both regional priorities and action plans for each county in the region. The plan establishes countywide goals and objectives, describes environmental and demographic characteristics, identifies potential capital improvement projects, and inventories existing planning initiatives and tools in the county.

As part of the update process, the goals and objectives in the 2020 Comprehensive Plan were reviewed, and those that are currently supportive of hazard mitigation goals and principles were identified. The plan also identified opportunities to integrate goals and objectives from the 2018 Hazard Mitigation Plan and the 2025 HMP Update into the next update of the comprehensive plan.

#### **Recommendations for Continued and Future Integration**

As discussed, many of the goals and objectives outlined in the Greene County Comprehensive Plan are related to the hazard mitigation risks and goals established in the HMP. Several could be revised to include updated information from this HMP. Additionally, the comprehensive plan can identify the places of higher vulnerability that are identified in this plan for all the high-risk hazards, and include objectives aimed at reducing the risk to these vulnerable areas. For example, an objective of the comprehensive plan could be to encourage elevation and flood proofing of structures in the Special Flood Hazard Area (SFHA) by seeking Flood Mitigation Assistance (FMA) grants and strictly enforcing floodplain management ordinances in certain communities (See Section 4.3.3 for Flooding and Flash Flooding information). Similarly, an objective for communities that are most vulnerable to subsidence and land failure could be to

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educate property owners about mine subsidence, associated risks, and actions to take in the event of an emergency. These types of objectives could also be created for medium-risk hazards when appropriate.

Another key opportunity for further integration of hazard mitigation into planning and regulatory tools is to incorporate hazard mitigation goals and objectives into the future Greene County Comprehensive Plan update. The Greene County Comprehensive Plan also ties into the Greene County Hazard Mitigation Plan when mitigation strategy is considered. The mitigation principles outlined in this hazard mitigation plan are used and reviewed in long-range planning throughout Greene County.

### **Integration of Hazard Mitigation into Local Mechanisms**

Integration of hazard mitigation principles into local mechanisms can be efficient for Greene County. With twenty-six municipalities, local mitigation mechanisms can directly interface with the Greene County HMP. These potential integration items include municipal comprehensive plans, municipal flood plans, or development plans for transportation and community resources. The municipalities should review the completed HMP and utilize items identified in the risk assessment, mitigation strategy, and capability assessment sections. Previously, hazard mitigation information from the Greene County plans has been integrated into other planning mechanisms. All municipalities can also utilize portions of the hazard mitigation plan into their planning mechanisms, but this can be completed under the authority of Greene County. These planning mechanisms could include comprehensive plans, flood plans, or development plans for transportation. Previous successful mitigation and plan integration has occurred in the development of comprehensive plans at the local level and this information and integration should continue through the formal update process of all plans in Greene County.

Further discussion on plan integration can be found in section 7.3 of this hazard mitigation plan.

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## 6. Mitigation Strategy

### 6.1. Update Process Summary

Mitigation goals are general guidelines that explain what the county wants to achieve. Goals are usually expressed as broad policy statements representing desired long-term results. Mitigation objectives describe strategies or implementation steps to attain the identified goals. Objectives are more specific statements than goals; the described steps are usually measurable and can have a defined completion date. There were four goals, and fourteen objectives identified in the 2018 hazard mitigation plan. The 2025 Greene County Hazard Mitigation Plan Update has five goals and eighteen objectives. Objectives have been added and arranged to associate them with the most appropriate goal. These changes are noted in *Table 80 – 2018 Mitigation Goals and Objectives Review*. These reviews are based on the five-year hazard mitigation plan review worksheet, which includes a survey on existing goals and objectives completed by the local planning team. Municipal officials then provided feedback on the changes to the goals and objectives via a mitigation strategy update meeting. Copies of these meetings and all documentation associated with the meetings are in Appendix C.

Actions provide more detailed descriptions of specific work tasks to help the county, and its municipalities achieve prescribed goals and objectives. There were twenty-seven actions identified in the 2018 mitigation strategy. A review of the 2018 mitigation actions was completed by the local planning team. The results of this review are identified in *Table 81 – 2018 Mitigation Actions Review*. Actions were evaluated by the local planning team with the intent of carrying over any actions that were not started or continuous for the next five years.

*Table 80 - 2018 Mitigation Goals and Objectives Review*

<b>Greene County 2018 Mitigation Goals and Objectives</b>		
<b>Goal/Objective</b>	<b>Description</b>	<b>Comment</b>
<b>Goal 1</b>	<b>Reduce the level of risk and potential impact from natural and human-caused hazards.</b>	<b>2025 Review Comment:</b> No comment.
Objective 1.1	Increase coordination, prioritization, and funding availability to address areas and structures subject to repetitive loss and repetitive flooding.	<b>2025 Review Comment:</b> No comment.
Objective 1.2	Identify project opportunities and implement projects to reduce the impacts of all hazards.	<b>2025 Review Comment:</b> No comment.
Objective 1.3	Coordinate efforts with municipalities and the Commonwealth to obtain financial assistance and support for mitigating hazards.	<b>2025 Review Comment:</b> No comment.

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<b>Greene County 2018 Mitigation Goals and Objectives</b>		
<b>Goal/Objective</b>	<b>Description</b>	<b>Comment</b>
Objective 1.4	Review and integrate hazard mitigation principles into applicable comprehensive documents or programs.	<b>2025 Review Comment:</b> No comment
Objective 1.5	Decrease or eliminate new construction and development in high hazard areas.	<b>2025 Review Comment:</b> “Encourage municipalities to regulate construction and development in applicable hazard areas.”
<b>Goal 2</b>	<b>Increase the level of capabilities to protect life safety, public property and private property from natural and human-caused hazards.</b>	<b>2025 Review Comment:</b> No comment.
Objective 2.1	Develop and update emergency plans to decrease the impact of hazards.	<b>2025 Review Comment:</b> No comment.
Objective 2.2	Exercise plans to identify strengths and areas for improvement.	<b>2025 Review Comment:</b> No comment.
Objective 2.3	Maintain current and develop new regulations to decrease the impact of hazards.	<b>2025 Review Comment:</b> No comment.
Objective 2.4	Provide training to elected and appointed officials on all hazard planning response.	<b>2025 Review Comment:</b> No comment.
<b>Goal 3</b>	<b>Protect existing natural resources and open space, including parks and wetlands.</b>	<b>2025 Review Comment:</b> No comment.
Objective 3.1	Protect natural resources through the implementation of cost effective and technically feasible mitigation projects.	<b>2025 Review Comment:</b> No comment.
Objective 3.2	Protect natural resources through the implementation of recreation planning and storm water management planning.	<b>2025 Review Comment:</b> No comment.
<b>Goal 4</b>	<b>Continue to provide public awareness and understanding of natural and human-caused hazard risks, preparedness, and mitigation.</b>	<b>2025 Review Comment:</b> No comment.
Objective 4.1	Provide public outreach/education regarding the updated Hazard Mitigation Plan and mitigation action implementation.	<b>2025 Review Comment:</b> No comment.

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Greene County 2018 Mitigation Goals and Objectives		
Goal/Objective	Description	Comment
Objective 4.2	Utilize all media outlets including social media to disseminate information about hazard mitigation.	<b>2025 Review Comment:</b> No comment.
Objective 4.3	Disseminate information about all hazards identified in the 2018 Greene County Hazard Mitigation Plan to decrease vulnerability.	<b>2025 Review Comment:</b> Update to 2025.

Table 81 - 2018 Mitigation Actions Review

Greene County Mitigation Actions Review Worksheet						
Existing Mitigation Actions  (2018 HMP)	Status					Review Comments
	No Progress/ Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
<b>1.1.1</b> Target and prioritize at risk structures for acquisition, relocation, elevation, demolition/reconstruction countywide, completing Hazard Mitigation Opportunity Forms when applicable, and meet with homeowners on the benefits of mitigation.			X			<b>2025 Review Comment:</b> No comment.
<b>1.1.2</b> Identify and repair areas affected by flooding due to poor drainage and stormwater runoff conditions.			X			<b>2025 Review Comment:</b> No comment.
<b>1.2.1</b> Vegetate barren landslide prone areas particularly through tree planting initiatives.	X					<b>2025 Review Comment:</b> Status unknown.
<b>1.2.2</b> Identify and remove the dead ash trees from municipal and state right of ways.	X					<b>2025 Review Comment:</b> Status unknown.

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<b>Greene County Mitigation Actions Review Worksheet</b>						
<i>Existing Mitigation Actions</i>  (2018 HMP)	<i>Status</i>					<i>Review Comments</i>
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
<b>1.3.1</b> Identify funding opportunities to correct and mitigate landslide prone areas and affected roads.			X			<b>2025 Review Comment:</b> No comment.
<b>1.3.2</b> Utilize and increase awareness of the County Conservation District's Dirt and Gravel Roads Program.			X			<b>2025 Review Comment:</b> No comment.
<b>1.4.1</b> Integrate hazard mitigation principles and data into the Greene County Comprehensive Plan.	X					<b>2025 Review Comment:</b> This would apply to future comp plan updates.
<b>1.4.2</b> Integrate hazard mitigation principles and data into the Greene County Storm Water Management Plan.					X	<b>2025 Review Comment:</b> There is no storm water management plan. (Act 167)
<b>2.1.1</b> Ensure dam plans are kept up to date.			X			<b>2025 Review Comment:</b> No comment.
<b>2.1.2</b> Make dam evacuation plans available to downstream communities when available.			X			<b>2025 Review Comment:</b> No comment.
<b>2.1.3</b> Conduct a countywide commodity flow study to identify hazardous materials transported in Greene County.		X				<b>2025 Review Comment:</b> No comment.
<b>2.1.4</b> Identify landslide prone areas in which public safety is at risk.			X			<b>2025 Review Comment:</b> No comment.

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<b>Greene County Mitigation Actions Review Worksheet</b>						
<i>Existing Mitigation Actions (2018 HMP)</i>	<i>Status</i>					<i>Review Comments</i>
	<b>No Progress/ Unknown</b>	<b>In Progress/ Not Yet Complete</b>	<b>Continuous</b>	<b>Completed</b>	<b>Discontinued</b>	
<b>2.2.1</b> Encourage participation by various disciplines in Greene County and conduct the annual weather preparedness exercise with conjunction with the Pennsylvania Emergency Management Agency.			X			<b>2025 Review Comment:</b> Change to “in conjunction with.”
<b>2.3.1</b> Maintain floodplain management ordinances and update as needed in the future to ensure that all municipal ordinances meet the minimum requirements.			X			<b>2025 Review Comment:</b> No comment.
<b>2.3.2</b> Maintain open communication and coordination between dam owners, municipalities, and County and ensure that dam plans are up to date.			X			<b>2025 Review Comment:</b> No comment.
<b>2.4.1</b> Increase awareness of and participation in FEMA’s Community Rating System (CRS) Program in cooperation with DCED.			X			<b>2025 Review Comment:</b> No comment.
<b>2.4.2</b> Coordinate training classes for first responders on opioid drugs to ensure their safety during the response to emergency calls.			X			<b>2025 Review Comment:</b> No comment.
<b>3.2.1</b> Maintain and update as needed the adopted Act 167 Stormwater Management Plan.					X	<b>2025 Review Comment:</b> This is no longer applicable. It was never adopted.

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<b>Greene County Mitigation Actions Review Worksheet</b>						
<i>Existing Mitigation Actions</i>  (2018 HMP)	<i>Status</i>					<i>Review Comments</i>
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
<b>4.1.1</b> Notify the public of HMSC annual HMP review and update by issuing a press release.			X			<b>2025 Review Comment:</b> No comment.
<b>4.2.1</b> Promote awareness of designated shelters.			X			<b>2025 Review Comment:</b> No comment.
<b>4.2.2</b> Conduct public education and outreach on the National Flood Insurance Program to ensure all property and business owners of Greene County are familiar with the program and how it can assist them.			X			<b>2025 Review Comment:</b> No comment.
<b>4.3.1</b> Develop and implement a radon exposure prevention program.			X			<b>2025 Review Comment:</b> No comment.
<b>4.3.2</b> Distribute information to vulnerable communities identified in the Subsidence profile during Association of Township Officials meeting about PA DEP Mine Subsidence Insurance coverage, availability and rates for residential and nonresidential property.			X			<b>2025 Review Comment:</b> No comment.
<b>4.3.3</b> Distribute information on HUD Wind Zone III anchorage recommendations for manufactured homes to manufactured home park owners and individual owners as new permits are obtained.			X			<b>2025 Review Comment:</b> No comment.

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<b>Greene County Mitigation Actions Review Worksheet</b>						
<i>Existing Mitigation Actions (2018 HMP)</i>	<i>Status</i>					<i>Review Comments</i>
	No Progress/ Unknown	In Progress/ Not Yet Complete	Continuous	Completed	Discontinued	
<b>4.3.4</b> Conduct outreach to educate the public about invasive species located in Greene County and how to decrease or eliminate the impact from them.			X			<b>2025 Review Comment:</b> No comment.
<b>4.3.5</b> Partner with other local agencies to provide public education and outreach on the opioid epidemic and where addicts can find assistance.			X			<b>2025 Review Comment:</b> No comment.
<b>4.3.6</b> Provide public education on the move of overhead utilities to underground to decrease outages.			X			<b>2025 Review Comment:</b> Change action verbiage to focus on partnering with West Penn for this education.

**6.2. Mitigation Goals and Objectives**

Based on results of the goals and objectives evaluation exercise and input from the local planning team, a list of five goals and eighteen corresponding objectives were developed. *Table 82 – 2025 Goals and Objectives* details the mitigation goals and objectives established for the 2025 Greene County Hazard Mitigation Plan.

*Table 82 - 2025 Goals and Objectives*

<b>Greene County 2025 Goals and Objective</b>	
<b>Goal/Objective</b>	<b>Description</b>
<b>Goal 1</b>	<b>Reduce the level of risk and potential impact from natural and human-caused hazards.</b>
Objective 1.1	Increase coordination, prioritization, and funding availability to address areas and structures subject to repetitive loss and repetitive flooding.

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<b>Greene County 2025 Goals and Objective</b>	
<b>Goal/Objective</b>	<b>Description</b>
Objective 1.2	Identify project opportunities and implement projects to reduce the impacts of all hazards.
Objective 1.3	Coordinate efforts with municipalities and the Commonwealth to obtain financial assistance and support for mitigating hazards.
Objective 1.4	Review and integrate hazard mitigation principles into applicable comprehensive documents or programs.
Objective 1.5	Increase coordination, prioritization, and funding availability to address areas and structures subject to repetitive loss and repetitive flooding.
Objective 1.6	Encourage municipalities to regulate construction and development in applicable hazard areas.
<b>Goal 2</b>	<b>Increase the level of capabilities to protect life safety, public property and private property from natural and human-caused hazards.</b>
Objective 2.1	Develop and update emergency plans to decrease the impact of hazards.
Objective 2.2	Exercise plans to identify strengths and areas for improvement.
Objective 2.3	Maintain current and develop new regulations to decrease the impact of hazards.
Objective 2.4	Provide training to elected and appointed officials on all hazard planning response.
<b>Goal 3</b>	<b>Protect existing natural resources and open space, including parks and wetlands.</b>
Objective 3.1	Protect natural resources through the implementation of cost effective and technically feasible mitigation projects.
Objective 3.2	Protect natural resources through the implementation of recreation planning and storm water management planning.
<b>Goal 4</b>	<b>Continue to provide public awareness and understanding of natural and human-caused hazard risks, preparedness, and mitigation.</b>
Objective 4.1	Provide public outreach/education regarding the updated Hazard Mitigation Plan and mitigation action implementation.
Objective 4.2	Utilize all media outlets including social media to disseminate information about hazard mitigation.
Objective 4.3	Disseminate information about all hazards identified in the 2018 Greene County Hazard Mitigation Plan to decrease vulnerability.
<b>Goal 5</b>	<b>Participate in FEMA’s High-Hazard Potential Dam Program (HHPD).</b>
New Objective 5.1	Educate all stakeholders regarding FEMA’s HHPD program.

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Greene County 2025 Goals and Objective	
Goal/Objective	Description
New Objective 5.2	Reduce long-term vulnerabilities from eligible high-hazard potential dams that pose an unacceptable risk to the public.
New Objective 5.3	Identify, by area, locations that could potentially be impacted by FEMA’s HHPD program.

Goal 5 and objective 5.1, objective 5.2, and objective 5.3 relate to multiple mitigation actions in *Table 84 – 2025 Mitigation Action Plan*. Action 5.1.1 relates to objective 5.1, action 5.2.1, 5.2.2, 5.2.3, 5.2.4, 5.2.5, and 5.2.6 relates to objective 5.2, and action 5.3.1 relates to objective 5.3 for HHPD. All eight of the mitigation actions are covered by goal 5 of the goals and objectives for the 2025 Hazard Mitigation Plan. These mitigations reduce the vulnerability of county populations and structures by educating the public on the HHPD program, enhancing local policies and procedures for HHPD planning, and digitizing dam inundation areas for future analysis and prevention of losses.

### **6.3. Identification and Analysis of Mitigation Techniques**

This section includes an overview of alternative mitigation actions based on the goals and objectives identified in Section 6.2. There are four general mitigation strategy techniques to reduce hazard risks.

- Planning and regulations
- Structure and infrastructure
- Natural systems protection
- Education and awareness

**Planning and Regulations:** These actions include government authorities, policies or codes that influence the way land and buildings are developed and built. The following are some examples.

- Comprehensive plans
- Land use ordinances
- Subdivision regulations
- Development review
- Building codes and enforcement
- National Flood Insurance Program and Community Rating System
- Capital improvement programs
- Open space preservation
- Stormwater management regulations and master plans

The planning and regulations technique will protect and reduce the impact of specific hazards on new and existing buildings by improving building code standards and regulating new and renovation construction. The improved building codes will decrease the impact of risk hazards. Subdivision and land development enhancements will also augment this process. Ensuring that

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municipalities participate in the National Flood Insurance Program and encourage participation in the Community Rating System will decrease the impact as well.

**Structure and infrastructure implementation:** These actions involve modifying existing structures and infrastructure or constructing new structures to reduce hazard vulnerability. The following are examples:

- Acquisitions and elevations of structures in flood prone areas
- Utility undergrounding
- Structural retrofits
- Floodwalls and retaining walls
- Detention and retention structures
- Culverts
- Safe rooms

Structure and infrastructure implementation is a technique that removes or diverts the hazard from structure or protects the structure from a specific hazard. The new or renovated structures are therefore protected or have a reduced impact of hazards.

**Natural Systems Protection:** These are actions that minimize damage and losses and also preserve or restore the functions of natural systems. They include the following:

- Erosion and sediment control
- Stream corridor restoration
- Forest management
- Conservation easements
- Wetland restoration and preservation

Natural resource protection techniques allow for the natural resource to be used to protect or lessen the impact on new or renovated structures through the management of these resources. Utilization and implementation of the examples above will protect new and existing buildings and infrastructure.

**Education and Awareness:** These are actions to inform and educate citizens, elected officials and property owners about hazards and potential ways to mitigate them and may also include participation in national programs. Examples of these techniques include the following:

- Radio and television spots
- Websites with maps and information
- Real estate disclosure
- Provide information and training
- NFIP outreach
- StormReady
- Firewise communities

The education and awareness technique will protect and reduce the impact of specific hazards on new and existing buildings through education of citizens and property owners on the impacts that specific hazards could have on new or renovated structures. This information will allow the

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owner to make appropriate changes or enhancements that will lessen or eliminate the impacts of hazards.

*Table 83 – Mitigation Strategy Technique Matrix* provides a matrix identifying the mitigation techniques used for all low, moderate, and high-risk hazards in the county. The specific actions associated with these techniques are included in *Table 84 – 2025 Mitigation Action Plan*.

*Table 83 - Mitigation Strategy Technique Matrix*

<b>Greene County Mitigation Strategy Technique Matrix</b>				
<b>Hazard</b>	<b>MITIGATION TECHNIQUE</b>			
	<b>Planning and Regulations</b>	<b>Structure and Infrastructure</b>	<b>Natural Systems Protection</b>	<b>Education and Awareness</b>
Drought	X			X
Earthquake	X			X
Extreme Temperatures	X			X
Flood, Flash Flood, and Ice Jam	X	X		X
Hurricane and Tropical Storms	X			X
Invasive Species	X	X		X
Landslides	X	X		X
Pandemic, Epidemic, Endemic, and Infectious Disease	X			X
Radon Exposure	X			X
Subsidence and Sinkhole	X			X
Tornado and Windstorm	X			X
Wildfire	X			X
Winter Storms	X			X
Blighted Properties/Structure and Building Collapse	X			X
Civil Disturbance	X			X
Dam/Levee Failure	X	X	X	X
Environmental Hazards	X			X
Substance Use Disorder	X			X
Terrorism and Cyberterrorism	X			X
Transportation Accidents	X	X		X
Urban Fire and Explosion	X			X
Utility Interruptions	X	X		X

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### **6.4. Mitigation Action Plan**

The Greene County Hazard Mitigation Local Planning Team (LPT) immediately began work on the mitigation strategy section of the 2025 hazard mitigation plan (HMP) update after the risk assessment section was completed. The LPT started this section by reviewing the 2018 HMP mitigation strategy section. A review of the previous goals, objectives, actions, and project opportunities documented in the 2018 HMP was conducted. The next step the LPT completed was the brainstorming of possible new actions based on new identified risks. The LPT compiled all this information for presentations to the municipalities.

MCM Consulting Group, Inc. completed municipality meetings at various time periods via virtual platforms or in-person meetings. During all these meetings, an overview of mitigation strategy was presented, and the municipalities were informed that they needed to have at least one hazard-related mitigation action for their municipality. All municipalities were invited to attend these meetings. Municipalities that were not able to attend conference calls were contacted individually.

The municipalities were notified of draft mitigation actions and encouraged to provide new mitigation actions that could be incorporated into the plan. Municipalities were provided copies of their previously submitted mitigation opportunity forms and asked to determine if the projects were still valid. Municipalities were solicited for new project opportunities as well. All agendas, sign-in sheets, and other support information from these meetings is included in Appendix C.

Mitigation measures for the 2025 Greene County HMP are listed in the mitigation action plan. *Table 84 – 2025 Mitigation Action Plan* is the 2025 Greene County Mitigation Action Plan. This plan outlines mitigation actions and projects that comprise a strategy for Greene County. The action plan includes actions, a benefit and cost prioritization, a schedule for implementation, any funding sources to complete the action, a responsible agency or department and an estimated cost. All benefit and cost analysis were completed using the Pennsylvania Emergency Management Agency recommended analysis tool. The completed analysis is in Appendix H. *Table 84 – 2025 Mitigation Action Plan* is a matrix that identifies the county and/or municipalities responsible for mitigation actions in the new mitigation action plan. *Table 85 – Municipal Hazard Mitigation Actions Checklist* shows which actions tie to specific municipalities for responsibilities. *Table 86 – Objective to Action Checklist* shows that each mitigation objective has a mitigation action item related to it. *Table 87 – Actions Tied to Hazards* illustrates the specific actions that are tied to each hazard outlined in the hazard mitigation plan.

Funding acronym definitions:

FMA: Flood Mitigation Assistance Grant Program, administered by the Federal Emergency Management Agency

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HMGP:	Hazard Mitigation Grant Program, administered by the Federal Emergency Management Agency
EMPG:	Emergency Management Performance Grant, administered by the Federal Emergency Management Agency
HSGP:	Homeland Security Grant Program, administered by the Federal Emergency Management Agency
HMEP:	Hazardous Material Emergency Planning Grant, administered by the Pennsylvania Emergency Management Agency
HMRF:	Hazardous Material Response Fund, administered by the Pennsylvania Emergency Management Agency
HMERP:	Hazard Mitigation Emergency Response Program administered by the Pennsylvania Emergency Management Agency
HHPD:	Rehabilitation of High-Hazard Potential Dams Grant Program, administered by the Federal Emergency Management Agency

### **Evaluate and Prioritize Mitigation Actions**

#### **Mitigation Action Evaluation:**

Evaluating mitigation actions involves judging each action against certain criteria to determine whether it can be executed. The feasibility of each mitigation action is evaluated using the ten evaluation criteria set forth in the Mitigation Action Evaluation methodology as outlined in the Commonwealth of Pennsylvania's All-Hazard Mitigation Planning, Standard Operating Guide. The methodology solicits input on whether each action is highly effective or feasible and ineffective or not feasible for the criteria. These criteria are listed below and aid in determining the feasibility of implementing one action over another.

- Life Safety: Will the action be effective in promoting public safety?
- Property Protection: Will the action be effective in protecting public or private property?
- Technical: How effective will the action be in avoiding or reducing future losses?
- Political: Does the action have public and political support?
- Legal: Does the community have the authority to implement the proposed measure?
- Environmental: Will the action provide environmental benefits, and will it comply with local, state, and federal environmental regulations?
- Social: Will the action be acceptable by the community, or will it cause any one segment of the population to be treated unfairly?

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- Administrative: Is there adequate staffing and funding available to implement the action in a timely manner?
- Local Champion: Is there local support for the action to help ensure its completion?
- Other Community Objectives: Does the action address any current or future community objectives either through municipal planning or community goals?

To evaluate the mitigation actions, each action is identified as highly effective or feasible, ineffective, or not favorable and has no cost or benefit. For each criterion, the prioritization methodology assigns a “+” if the action is highly effective or feasible, a “-“ if the action was ineffective or not feasible, and a “N” if no cost of benefit could be associated with the suggested action or the action was no applicable to the criteria.

### **Mitigation Action Prioritization:**

Actions should be compared with one another to determine a ranking or priority by applying the multi-objective mitigation action prioritization criteria. Scores are assigned to each criterion using the following weighted, multi-objective mitigation action prioritization criteria:

- Effectiveness (weight: 20% of score): The extent to which an action reduces the vulnerability of people and property.
- Efficiency (weight: 30% of score): The extent to which time, effort, and cost is well used as a means of reducing vulnerability.
- Multi-Hazard Mitigation (weight: 20% of score): The action reduces vulnerability for more than one hazard.
- Address High Risk Hazard (weight: 15% of score): The action reduces vulnerability for people and property from a hazard identified as high risk.
- Address Critical Communications/Critical Infrastructure (weight: 15% of score): The action pertains to the maintenance of critical functions and structures such as transportation, supply chain management, and data circuits, etc.

Scores of 1, 2, or 3 are assigned for each multi-objective mitigation action prioritization criterion where 1 is a low score and 3 is a high score. Actions are prioritized using the cumulative score assigned to each. Each mitigation action is given a priority ranking (Low, Medium, and High) based on the following:

- Low Priority: 1.0 – 1.8
- Medium Priority: 1.9 – 2.4
- High Priority: 2.5 – 3.0

The cumulative results of the prioritization of mitigation actions are identified in the mitigation action evaluation and prioritization tool. The results for the mitigation action evaluation and prioritization are in Appendix H of this plan.

## Greene County, Pennsylvania 2025 Hazard Mitigation Plan

Table 84 - 2025 Mitigation Action Plan

Greene County 2025 Mitigation Action Plan									
Action Number	Mitigation Actions		Hazard Vulnerability	Prioritization			Implementation		
	Category	Description / Action Items		High	Medium	Low	Schedule	Funding	Local Champion
1.1.1	Planning and Regulation	Target and prioritize at risk structures for acquisition, relocation, elevation, demolition/reconstruction countywide, completing Hazard Mitigation Opportunity Forms when applicable, and meet with homeowners on the benefits of mitigation.	Flood and Flash Flood		X		2025-2030	Local, HMGP	Greene County Municipal Representatives
1.1.2	Structure and Infrastructure	Identify and repair areas affected by flooding due to poor drainage and stormwater runoff conditions.	Flood and Flash Flood	X			2025-2030	Local, HMGP	Greene County Municipal Representatives
1.2.1	Education and Awareness	Educate property owners on the benefits of vegetating barren landslide prone areas, particularly through tree planting initiatives.	Landslide		X		2025-2030	Local, HMGP	Greene County Conservation District Director
1.2.2	Structure and Infrastructure	Identify and remove dead trees from municipal and state right of ways.	Invasive Species, Transportation Accidents, and Utility Interruptions	X			2025-2030	Local, HMGP	Greene County Municipal Representatives

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Greene County 2025 Mitigation Action Plan									
Action Number	Mitigation Actions		Hazard Vulnerability	Prioritization			Implementation		
	Category	Description / Action Items		High	Medium	Low	Schedule	Funding	Local Champion
1.3.1	Structure and Infrastructure	Identify funding opportunities to correct and mitigate landslide prone areas and affected roads.	Landslide and Transportation Accidents		X		2025-2030	Local	Greene County Municipal Representatives  Penn DOT District Manager
1.3.2	Planning and Infrastructure	Utilize and increase awareness of the County Conservation District's Dirt and Gravel Roads Program.	Environmental Hazards		X		2025-2030	Local	Greene County Conservation District Director
1.3.3	Planning and Regulations	Examine the feasibility of developing a blighted properties list and investigate funding sources for the identified structures.	Blighted Properties			X	2025-2030	Local	Greene County Redevelopment Authority Housing Specialist
1.4.1	Planning and Regulations	The Greene County Planning Department and the Greene County Emergency Management Agency will coordinate planning of the anticipated 2030 comprehensive plan update and the 2030 HMP.	All Hazards	X			2025-2030	Local	Greene County Planning Department Director  Greene County EMA Director
1.5.1	Planning and Regulations	Identify repetitive loss properties, businesses, and infrastructure that do not have flood insurance through the NFIP.	Flood and Flash Flood		X		2025-2030	Local, FMA	Greene County LPT Members

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Greene County 2025 Mitigation Action Plan									
Action Number	Mitigation Actions		Hazard Vulnerability	Prioritization			Implementation		
	Category	Description / Action Items		High	Medium	Low	Schedule	Funding	Local Champion
1.6.1	Planning and Regulations	Discuss the development of the municipal regulations regarding high-risk hazards during the 5-year HMP update and annual review.	All Hazards		X		2025-2030	Local, HMGP	Greene County Municipal Representatives  Greene County EMA Director
1.6.2	Planning and Regulations	Each participating municipality will confirm adoption of its NFIP floodplain management ordinances, confirm its FIRM adoption date, and identify its SI/SD implementation procedures from the floodplain ordinances. Each municipality will then incorporate the above information into their next HMP update.	Flood, Flash Flood			X	2025-2030	Local	Greene County Municipal Representatives
2.1.1	Planning and Regulations	Ensure dam plans are kept up to date.	Dam Failure		X		2025-2030	Local, HHPD	Greene County Dam Owners
2.1.2	Education and Awareness	Make dam evacuation plans available to downstream communities when available.	Dam Failure			X	2025-2030	Local, HMGP, HHPD	Greene County Dam Owners
2.1.3	Planning and Regulations	Conduct a countywide commodity flow study to identify hazardous materials transported in Greene County.	Environmental Hazards and Transportation Accidents		X		2025-2030	Local, HMEP, Act 165 Funds	Greene County LEPC

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Greene County 2025 Mitigation Action Plan									
Action Number	Mitigation Actions		Hazard Vulnerability	Prioritization			Implementation		
	Category	Description / Action Items		High	Medium	Low	Schedule	Funding	Local Champion
2.1.4	Planning and Regulations	Identify landslide prone areas in which public safety is at risk.	Landslide		X		2025-2030	Local	Greene County Municipal Representatives  Greene County Planning Department Director  Greene County EMA Director
2.2.1	Planning and Regulations	Encourage participation by various disciplines in Greene County and conduct the annual weather preparedness exercise in conjunction with the Pennsylvania Emergency Management Agency.	Extreme Temperature, Windstorm, Winter Storm, Drought, Invasive Species, Hurricane, Tropical Storm, Flood, Flash Flood, Tornado, Earthquake, Wildfire, and Ice Jam Flood		X		2025-2030	Local, EMPG	Greene County EMA Director

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Greene County 2025 Mitigation Action Plan									
Action Number	Mitigation Actions		Hazard Vulnerability	Prioritization			Implementation		
	Category	Description / Action Items		High	Medium	Low	Schedule	Funding	Local Champion
2.3.1	Planning and Regulations	Maintain floodplain management ordinances and update as needed in the future to ensure that all municipal ordinances meet the minimum requirements.	Flood and Flash Flood		X		2025-2030	Local, FMA	Greene County Municipal Representatives
2.3.2	Planning and Regulations	Maintain open communication and coordination between dam owners, municipalities, and County and ensure that dam plans are up to date.	Dam Failure		X		2025-2030	Local	Greene County EMA Director Greene County Dam Owners
2.4.1	Planning and Regulation	Increase awareness of, and participation in, FEMA's Community Rating System (CRS) Program in cooperation with DCED.	Flood and Flash Flood		X		2025-2030	Local, FMA	Greene County Municipal Association
2.4.2	Education and Awareness	Coordinate training classes for first responders on opioid drugs to ensure their safety during the response to emergency calls.	Substance Use Disorder			X	2025-2030	Local, EMPG	Greene County Drug and Alcohol Program Leaders Greene County Drug Task Force Coordinator

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Greene County 2025 Mitigation Action Plan									
Action Number	Mitigation Actions		Hazard Vulnerability	Prioritization			Implementation		
	Category	Description / Action Items		High	Medium	Low	Schedule	Funding	Local Champion
3.1.1	Planning and Regulation	Encourage municipalities to submit and review project opportunities during five-year HMP updates and annual reviews.	All hazards		X		2025-2030	Local	Greene County Municipal Representatives  Greene County EMA Director
3.2.1	Structure and Infrastructure	Greene County will continue development of the Wisecarver Dam recreation area.	Flood and Flash Flood			X	2025-2030	Local, HHPD	Greene County Planning Department Director
3.2.2	Structure and Infrastructure	Waynesburg Borough will develop rain gardens.	Flood and Flash Flood		X		2025-2030	Local	Waynesburg Borough Council
3.2.3	Planning and Regulation	Research and review Act 167 funding opportunities.	Flood and Flash Flood		X		2025-2030	Local	Greene County Planning Department Director
4.1.1	Education and Awareness	Notify the public, and all stakeholders, about the annual HMP review and update by issuing a press release.	All Hazards		X		2025-2030	Local, EMPG	Greene County LPT Members  Greene County EMA Director
4.2.1	Education and Awareness	Promote awareness of designated shelters.	All Hazards		X		2025-2030	Local, EMPG	Greene County EMA Director

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Greene County 2025 Mitigation Action Plan									
Action Number	Mitigation Actions		Hazard Vulnerability	Prioritization			Implementation		
	Category	Description / Action Items		High	Medium	Low	Schedule	Funding	Local Champion
4.2.2	Education and Awareness	Conduct public education and outreach on the National Flood Insurance Program to ensure all property and business owners of Greene County are familiar with the program and how it can assist them.	Flood and Flash Flood		X		2025-2030	Local, EMPG	Greene County LPT Members  Greene County EMA Director
4.2.3	Education and Awareness	Make education opportunities available regarding land use, permitting, and building codes.	All Hazards			X	2025-2030	Local	Greene County Municipal Representatives  Greene County Conservation District
4.2.4	Education and Awareness	Continue to provide Lyme Disease and West Nile Virus awareness and prevention information as appropriate.	Pandemic and Infectious Disease			X	2025-2030	Local, HMGP	Greene County Conservation District Director
4.2.5	Education and Awareness	Continue to conduct monitoring for West Nile Virus, Lyme Disease, and Powassan Virus.	Pandemic and Infectious Disease			X	2025-2030	Local, HMGP	Greene County Conservation District Director

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Greene County 2025 Mitigation Action Plan									
Action Number	Mitigation Actions		Hazard Vulnerability	Prioritization			Implementation		
	Category	Description / Action Items		High	Medium	Low	Schedule	Funding	Local Champion
4.2.6	Education and Awareness	Maintain the educational opportunities included as part of the fire prevention week.	Fire and Explosion		X		2025-2030	Local	Greene County EMA Director Greene County Commissioners Greene County Fire Association Members
4.2.7	Education and Awareness	Conduct annual fire prevention and safety presentations, for children, with the Waynesburg-Franklin Township owned fire prevention trailer.	Fire and Explosion		X		2025-2030	Local	Waynesburg-Franklin Township Fire Department Members

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Greene County 2025 Mitigation Action Plan									
Action Number	Mitigation Actions		Hazard Vulnerability	Prioritization			Implementation		
	Category	Description / Action Items		High	Medium	Low	Schedule	Funding	Local Champion
4.2.8	Education and Awareness	Conduct annual emergency service training programs such as EMS, essential firefighting, and hazardous materials.	Emergency Services and Environmental Hazards		X		2025-2030	Local	Greene County Career and Technology Center Representatives  Greene County Fireman's Association Members  Jefferson Volunteer Fire Department Members  Waynesburg-Franklin Township Fire Department Members  Carmichaels Fire Department Members  Greene County EMA Director

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Greene County 2025 Mitigation Action Plan									
Action Number	Mitigation Actions		Hazard Vulnerability	Prioritization			Implementation		
	Category	Description / Action Items		High	Medium	Low	Schedule	Funding	Local Champion
4.2.9	Education and Awareness	Promote 811 (call before you dig) awareness.	Fire and Explosion, Utility Interruption, and Environmental Hazards		X		2025-2030	Local	Greene County EMA Director
4.3.1	Education and Awareness	Develop and implement a radon exposure prevention program.	Radon Exposure			X	2025-2030	Local, HMGP	Greene County EMA Director  Greene County Planning and Community Development Director
4.3.2	Education and Awareness	Distribute information to vulnerable communities identified in the subsidence profile during Association of Township Officials meeting about PA DEP mine subsidence insurance coverage, availability, and rates for residential and nonresidential property.	Subsidence and Sinkhole			X	2025-2030	Local	Greene County EMA Director  Greene County Municipal Representatives  PA DEP Mine Subsidence Division

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Greene County 2025 Mitigation Action Plan									
Action Number	Mitigation Actions		Hazard Vulnerability	Prioritization			Implementation		
	Category	Description / Action Items		High	Medium	Low	Schedule	Funding	Local Champion
4.3.3	Education and Awareness	Distribute information on HUD Wind Zone III anchorage recommendations for manufactured homes to manufactured home park owners and individual owners as new permits are obtained.	Tornado and Windstorm		X		2025-2030	Local, HMGP	Greene County Planning and Community Development Department Director
4.3.4	Education and Awareness	Conduct outreach to educate the public about invasive species located in Greene County and how to decrease or eliminate the impact from them.	Invasive Species			X	2025-2030	Local, HMGP	Greene County Conservation District Director
4.3.5	Education and Awareness	Partner with other local agencies to provide public education and outreach on the opioid epidemic and where addicts can find assistance.	Substance Use Disorder			X	2025-2030	Local, EMPG	Greene County Drug Task Force Coordinator  Greene County EMA Director
4.3.6	Education and Awareness	Coordinate with FirstEnergy to provide public education on transferring overhead utilities to underground options, to decrease outages.	Utility Interruptions, Hurricane and Tropical Storm, Tornado, and Windstorm		X		2025-2030	Local, EMPG	Greene County EMA Director  Greene County Planning Department Director

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Greene County 2025 Mitigation Action Plan									
Action Number	Mitigation Actions		Hazard Vulnerability	Prioritization			Implementation		
	Category	Description / Action Items		High	Medium	Low	Schedule	Funding	Local Champion
5.1.1	Education and Awareness	Distribute educational materials about the HHPD program to municipalities, communities, and county residents.	Dam Failure			X	2025-2030	Local, HHPD	Greene County EMA Director  Greene County GIS Representative
5.2.1	Education and Awareness	Provide education on local mitigation policies and programs that address high-hazard potential dams to municipalities and county residents.	Dam Failure		X		2025-2030	Local, HHPD	Greene County EMA Director  Greene County GIS Representative
5.2.2	Planning and Regulations	Ensure continued collaboration with both private and public dam owners, to ensure that their input is included in the local planning team, and the planning process for continued hazard mitigation planning.	Dam Failure			X	2025-2030	Local, HHPD	Greene County EMA Director  Greene County LPT Members

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Greene County 2025 Mitigation Action Plan									
Action Number	Mitigation Actions		Hazard Vulnerability	Prioritization			Implementation		
	Category	Description / Action Items		High	Medium	Low	Schedule	Funding	Local Champion
5.2.3	Natural Systems Protection	Research the feasibility of installing flood protection measures in areas around Greene County that would be adversely impacted by flooding from a high-hazard potential dam failure, including natural spaces, local parks, and outdoor areas.	Dam Failure		X		2025-2030	Local, HHPD	Greene County EMA Director  Greene County Conservation District Director
5.2.4	Structure and Infrastructure	If funding becomes available, perform acquisitions, elevations, relocations, and foundation stabilization on homes and structures within areas of potential impact from a failure of a high-hazard potential dam in Greene County.	Dam Failure		X		2025-2030	Local, HHPD	Greene County EMA Director  Greene County Conservation District Director  Greene County LPT Members

**Greene County, Pennsylvania  
2025 Hazard Mitigation Plan**

Greene County 2025 Mitigation Action Plan									
Action Number	Mitigation Actions		Hazard Vulnerability	Prioritization			Implementation		
	Category	Description / Action Items		High	Medium	Low	Schedule	Funding	Local Champion
5.2.5	Structure and Infrastructure	Review the early warning systems in place for dams in Greene County. If no early warning systems are in place, research the feasibility of constructing or implementing those systems.	Dam Failure		X		2025-2030	Local, HHPD	Greene County EMA Director  Greene County LPT Members
5.2.6	Planning and Regulations	Review or develop evacuation plans for the Greene high-hazard dams.	Dam Failure		X		2025-2030	Local, HHPD	Greene County EMA Director  Greene County LPT Members
5.3.1	Education and Awareness	Acquire or maintain digitized dam inundation GIS polygons to determine at risk populations for dams designated high-hazard potential dams by FEMA.	Dam Failure		X		2025-2030	Local, HHPD	Greene County EMA Director  Greene County GIS Representative

## Greene County, Pennsylvania 2025 Hazard Mitigation Plan

Table 85 - Municipal Hazard Mitigation Actions Checklist

<b>Municipal Hazard Mitigation Actions Checklist</b>													
<b>Municipality</b>	<b>1.1.1</b>	<b>1.1.2</b>	<b>1.2.1</b>	<b>1.2.2</b>	<b>1.3.1</b>	<b>1.3.2</b>	<b>1.3.3</b>	<b>1.4.1</b>	<b>1.5.1</b>	<b>1.6.1</b>	<b>1.6.2</b>	<b>2.1.1</b>	<b>2.1.2</b>
Aleppo Township	X	X		X	X					X	X		
Carmichaels Borough	X	X		X	X					X	X		
Center Township	X	X		X	X					X	X		
Clarksville Borough	X	X		X	X					X	X		
Cumberland Township	X	X		X	X					X	X		
Dunkard Township	X	X		X	X					X	X		
Franklin Township	X	X		X	X					X	X		
Freeport Township	X	X		X	X					X	X		
Gilmore Township	X	X		X	X					X	X		
Gray Township	X	X		X	X					X	X		
Greene Township	X	X		X	X					X	X		
Greensboro Borough	X	X		X	X					X	X		
Jackson Township	X	X		X	X					X	X		
Jefferson Borough	X	X		X	X					X	X		
Jefferson Township	X	X		X	X					X	X		
Monongahela Township	X	X		X	X					X	X		
Morgan Township	X	X		X	X					X	X		
Morris Township	X	X		X	X					X	X		
Perry Township	X	X		X	X					X	X		
Rices Landing Borough	X	X		X	X					X	X		
Richhill Township	X	X		X	X					X	X		
Springhill Township	X	X		X	X					X	X		
Washington Township	X	X		X	X					X	X		
Wayne Township	X	X		X	X					X	X		

## Greene County, Pennsylvania 2025 Hazard Mitigation Plan

Municipal Hazard Mitigation Actions Checklist													
Municipality	1.1.1	1.1.2	1.2.1	1.2.2	1.3.1	1.3.2	1.3.3	1.4.1	1.5.1	1.6.1	1.6.2	2.1.1	2.1.2
Waynesburg Borough	X	X		X	X					X	X		
Whiteley Township	X	X		X	X					X	X		
Greene County			X			X	X	X	X	X		X	X

Municipal Hazard Mitigation Actions Checklist												
Municipality	2.1.3	2.1.4	2.2.1	2.3.1	2.3.2	2.4.1	2.4.2	3.1.1	3.2.1	3.2.2	3.2.3	
Aleppo Township		X		X		X		X				
Carmichaels Borough		X		X		X		X				
Center Township		X		X		X		X				
Clarksville Borough		X		X		X		X				
Cumberland Township		X		X		X		X				
Dunkard Township		X		X		X		X				
Franklin Township		X		X		X		X				
Freeport Township		X		X		X		X				
Gilmore Township		X		X		X		X				
Gray Township		X		X		X		X				
Greene Township		X		X		X		X				
Greensboro Borough		X		X		X		X				
Jackson Township		X		X		X		X				
Jefferson Borough		X		X		X		X				
Jefferson Township		X		X		X		X				
Monongahela Township		X		X		X		X				
Morgan Township		X		X		X		X				
Morris Township		X		X		X		X				
Perry Township		X		X		X		X				
Rices Landing Borough		X		X		X		X				
Richhill Township		X		X		X		X				
Springhill Township		X		X		X		X				
Washington Township		X		X		X		X				
Wayne Township		X		X		X		X				
Waynesburg Borough		X		X		X		X		X		
Whiteley Township		X		X		X		X				
Greene County	X	X	X		X		X	X	X		X	

Municipal Hazard Mitigation Actions Checklist												
Municipality	4.1.1	4.2.1	4.2.2	4.2.3	4.2.4	4.2.5	4.2.6	4.2.7	4.2.8	4.2.9	4.3.1	4.3.2
Aleppo Township				X								X
Carmichaels Borough				X					X			X
Center Township				X								X
Clarksville Borough				X								X
Cumberland Township				X								X
Dunkard Township				X								X

## Greene County, Pennsylvania 2025 Hazard Mitigation Plan

Municipal Hazard Mitigation Actions Checklist												
Municipality	4.1.1	4.2.1	4.2.2	4.2.3	4.2.4	4.2.5	4.2.6	4.2.7	4.2.8	4.2.9	4.3.1	4.3.2
Franklin Township				X				X	X			X
Freeport Township				X								X
Gilmore Township				X								X
Gray Township				X								X
Greene Township				X								X
Greensboro Borough				X								X
Jackson Township				X								X
Jefferson Borough				X								X
Jefferson Township				X					X			X
Monongahela Township				X								X
Morgan Township				X								X
Morris Township				X								X
Perry Township				X								X
Rices Landing Borough				X								X
Richhill Township				X								X
Springhill Township				X								X
Washington Township				X								X
Wayne Township				X								X
Waynesburg Borough				X				X	X			X
Whiteley Township				X								X
Greene County	X	X	X	X	X	X	X		X	X	X	X

Municipal Hazard Mitigation Actions Checklist												
Municipality	4.3.3	4.3.4	4.3.5	4.3.6	5.1.1	5.2.1	5.2.2	5.2.3	5.2.4	5.2.5	5.2.6	5.3.1
Aleppo Township												
Carmichaels Borough												
Center Township												
Clarksville Borough												
Cumberland Township												
Dunkard Township												
Franklin Township												
Freeport Township												
Gilmore Township												
Gray Township												
Greene Township												
Greensboro Borough												
Jackson Township												

## Greene County, Pennsylvania 2025 Hazard Mitigation Plan

Municipal Hazard Mitigation Actions Checklist												
Municipality	4.3.3	4.3.4	4.3.5	4.3.6	5.1.1	5.2.1	5.2.2	5.2.3	5.2.4	5.2.5	5.2.6	5.3.1
Jefferson Borough												
Jefferson Township												
Monongahela Township												
Morgan Township												
Morris Township												
Perry Township												
Rices Landing Borough												
Richhill Township												
Springhill Township												
Washington Township												
Wayne Township												
Waynesburg Borough												
Whiteley Township												
<i>Greene County</i>	X	X	X	X	X	X	X	X	X	X	X	X

Table 86 - Objective to Action Checklist

Objective	Number of Actions
Objective 1.1	2
Objective 1.2	2
Objective 1.3	3
Objective 1.4	1
Objective 1.5	1
Objective 1.6	2
Objective 2.1	4
Objective 2.2	1
Objective 2.3	2
Objective 2.4	2
Objective 3.1	1
Objective 3.2	3
Objective 4.1	1
Objective 4.2	9
Objective 4.3	6
Objective 5.1	1
Objective 5.2	6
Objective 5.3	1

Table 87 - Actions Tied to Hazard

**Greene County, Pennsylvania  
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Actions Tied to Hazard	
Hazard	Actions Related
<b>Natural Hazards</b>	
Drought	1.4.1, 1.6.1, 2.2.1, 3.1.1, 4.1.1, 4.2.1, 4.2.3
Earthquake	1.4.1, 1.6.1, 2.2.1, 3.1.1, 4.1.1, 4.2.1, 4.2.3
Extreme Temperatures	1.4.1, 1.6.1, 2.2.1, 3.1.1, 4.1.1, 4.2.1, 4.2.3
Flood	1.1.1, 1.1.2, 1.4.1, 1.5.1, 1.6.1, 1.6.2, 2.2.1, 2.3.1, 2.4.1, 3.1.1, 3.2.1, 3.2.2, 3.2.3, 4.1.1, 4.2.1, 4.2.2, 4.2.3
Flash Flooding	1.1.1, 1.1.2, 1.4.1, 1.5.1, 1.6.1, 1.6.2, 2.2.1, 2.3.1, 2.4.1, 3.1.1, 3.2.1, 3.2.2, 3.2.3, 4.1.1, 4.2.1, 4.2.2, 4.2.3
Ice Jam	1.4.1, 1.6.1, 2.2.1, 3.1.1, 4.1.1, 4.2.1, 4.2.3
Hurricane and Tropical Storm	1.4.1, 1.6.1, 2.2.1, 3.1.1, 4.1.1, 4.2.1, 4.2.3, 4.3.6
Invasive Species	1.2.2, 1.4.1, 1.6.1, 2.2.1, 3.1.1, 4.1.1, 4.2.1, 4.2.3, 4.3.4
Landslides	1.2.1, 1.3.1, 1.4.1, 1.6.1, 2.1.4, 3.1.1, 4.1.1, 4.2.1, 4.2.3
Pandemic, Epidemic, Endemic, and Infectious Disease	1.4.1, 1.6.1, 3.1.1, 4.1.1, 4.2.1, 4.2.3, 4.2.4, 4.2.5
Radon Exposure	1.4.1, 1.6.1, 3.1.1, 4.1.1, 4.2.1, 4.2.3, 4.3.1
Subsidence and Sinkhole	1.4.1, 1.6.1, 3.1.1, 4.1.1, 4.2.1, 4.2.3, 4.3.2
Tornado and Windstorm	1.4.1, 1.6.1, 2.2.1, 3.1.1, 4.1.1, 4.2.1, 4.2.3, 4.3.3, 4.3.6
Wildfire	1.4.1, 1.6.1, 2.2.1, 3.1.1, 4.1.1, 4.2.1, 4.2.3
Winter Storm	1.4.1, 1.6.1, 2.2.1, 3.1.1, 4.1.1, 4.2.1, 4.2.3
<b>Human-Caused Hazards</b>	
Blighted Properties/ Structure and Building Collapse	1.3.3, 1.4.1, 1.6.1, 3.1.1, 4.1.1, 4.2.1, 4.2.3
Civil Disturbance	1.4.1, 1.6.1, 3.1.1, 4.1.1, 4.2.1, 4.2.3
Dam/Levee Failure	1.4.1, 1.6.1, 2.1.1, 2.1.2, 2.3.2, 3.1.1, 4.1.1, 4.2.1, 4.2.3, 5.1.1, 5.2.1, 5.2.2, 5.2.3, 5.2.4, 5.2.5, 5.2.6, 5.3.1
Environmental Hazards	1.3.2, 1.4.1, 1.6.1, 2.1.3, 3.1.1, 4.1.1, 4.2.1, 4.2.3, 4.2.8, 4.2.9
Substance Use Disorder	1.4.1, 1.6.1, 2.4.2, 3.1.1, 4.1.1, 4.2.1, 4.2.3, 4.3.5
Terrorism and Cyberterrorism	1.4.1, 1.6.1, 3.1.1, 4.1.1, 4.2.1, 4.2.3

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<b>Actions Tied to Hazard</b>	
<b>Hazard</b>	<b>Actions Related</b>
Transportation Accidents	1.2.2, 1.3.1, 1.4.1, 1.6.1, 2.1.3, 3.1.1, 4.1.1, 4.2.1, 4.2.3
Urban Fire and Explosion	1.4.1, 1.6.1, 3.1.1, 4.1.1, 4.2.1, 4.2.3, 4.2.6, 4.2.7, 4.2.9
Utility Interruptions	1.2.2, 1.4.1, 1.6.1, 3.1.1, 4.1.1, 4.2.1, 4.2.3, 4.2.9, 4.3.6

## **7. Plan Maintenance**

### **7.1. Update Process Summary**

Monitoring, evaluating, and updating this plan is critical to maintaining its value and success in Greene County's hazard mitigation efforts. Ensuring effective implementation of mitigation activities paves the way for continued momentum in the planning process and gives direction for the future. This section explains who will be responsible for maintenance activities and what those responsibilities entail. It also provides a methodology and schedule of maintenance activities including a description of how the public will be involved on a continued basis. This HMP update also defines the municipalities' role in updating and evaluating the plan. Finally, the 2025 HMP update encourages continued public involvement and how this plan may be integrated into other planning mechanisms in the county.

### **7.2. Monitoring, Evaluating and Updating the Plan**

Hazard mitigation planning in Greene County is the responsibility of all levels of government (i.e., county, and local), as well as the citizens of the county. The Greene County Local Planning Team will be responsible for maintaining this multi-jurisdictional HMP. The local planning team will meet annually and follow each emergency declaration to review the plan. The Greene County Emergency Management Agency Director will be the primary individual responsible for reviewing and updating the plan at least once every five years. Every municipality that has adopted this plan will also be afforded the opportunity to provide updated information or information specific to hazards encountered during an emergency or disaster. Each review process will ensure that the hazard vulnerability and risk analysis reflect the current conditions of the county, that the capabilities assessment accurately reflects local circumstances and that the hazard mitigation strategies are updated based on the county's damage assessment reports and local mitigation project priorities. The HMP must be updated on a five-year cycle. An updated HMP must be completed and approved by the end of the five-year period. The monitoring, evaluating, and updating of the plan every five years will rely heavily on the outcomes of the annual HMP planning team meetings.

The Greene County Local Planning Team will complete a hazard mitigation progress report to evaluate the status and accuracy of the multi-jurisdictional HMP and record the local planning team's review process. The annual plan review will be distributed to appropriate representatives at both PEMA and FEMA. The following items will be completed during the annual review and reporting process:

- Review the risk assessment section and identify occurrences of hazards within the last year. Identify date, time, damage, fatalities, and other specific information of the events. Also identify any new hazards that have occurred or increased risk with the county.

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- Complete a review and update of the capability assessment section. Identify any capability weaknesses since the last review. The capability assessment surveys from the previous hazard mitigation plan will be reviewed and new capability assessment forms can be distributed to the municipalities during the annual review process.
- Complete a review of the mitigation strategy section. Review the goals and objectives identified in the 2025 HMP and determine if any updates are needed. Provide all mitigation actions and opportunities to the county and municipalities that are applicable. Have all entities complete an action review matrix and document all results in the report. Also, add any new actions that are identified. Complete a review of each mitigation opportunity and identify the status of each opportunity on the opportunity review spreadsheet. All information will be included in the annual review report.

The Greene County Emergency Management Agency will maintain a copy of these records and place them in Appendix I of this plan. Greene County will continue to work with all municipalities regarding hazard mitigation projects, especially those municipalities that did not submit projects for inclusion in this plan.

The Greene County local planning team should also be reviewed annually to address any changes to the membership that may have occurred over the past calendar year. The LPT can be expanded and updated with new stakeholders to address potential changes in guidance by the Commonwealth of Pennsylvania and the Federal Emergency Management Agency.

### **7.3. Continued Public Involvement**

The Greene County Emergency Management Agency will ensure that the 2025 Greene County Hazard Mitigation Plan is posted and maintained on the Greene County website and will continue to encourage public review and comment on the plan. The Greene County website that the plan will be located at is as follows: <https://greenecountypa.gov/Department-Emergency-Management-Agency>

The public will have access to the 2025 Greene County HMP through their local municipal office, the Greene County Emergency Management Agency, or the Greene County Department of Planning and Community Development. Information on upcoming events related to the HMP or solicitation for comments will be announced via newsletters, newspapers, mailings, and the county website.

The citizens of Greene County are encouraged to submit their comments to elected officials and/or members of the Greene County HMP Local Planning Team. To promote public participation, the Greene County Local Planning Team will post a public comment form as well as the Hazard Mitigation Project Opportunity Form on the county's website. These forms will offer the public various opportunities to supply their comments and observations. All comments

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received will be maintained and considered by the Greene County Hazard Mitigation Planning Team.

Once the Greene County 2025 Hazard Mitigation Plan is adopted by the Greene County Board of County Commissioners, the plan will be disseminated to various county agencies and local municipalities that develop and implement specific plans and ordinances. Each participating municipality will be responsible for implementing the specific recommendations in section 5.2.5, plan integration, of the capability assessment into their local planning documents including comprehensive plans, zoning ordinances, land development, and subdivision regulations. Whenever possible, the Greene County Emergency Management Agency will serve as a liaison to assist with these integrations and updates. As discussed above in section 7.2, progress on multi-jurisdictional plan integration will be addressed as part of the annual review conducted by the Greene County Local Planning Team.

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## **8. Plan Adoption**

### **8.1. Resolutions**

In accordance with federal and state requirements, the governing bodies of each participating jurisdiction must review and adopt by resolution, the 2025 Greene County Hazard Mitigation Plan. Copies of the adopting resolutions are included in this plan in Appendix J. FEMA Region III in Philadelphia, Pennsylvania is the final approval authority for the Hazard Mitigation Plan. PEMA also reviews the plan before submission to FEMA.

## **9. Appendices**

<b>APPENDIX A:</b>	<b>References</b>
<b>APPENDIX B:</b>	<b>FEMA Local Mitigation Review Tool</b>
<b>APPENDIX C:</b>	<b>Meetings and Support Documents</b>
<b>APPENDIX D:</b>	<b>Municipal Flood Maps</b>
<b>APPENDIX E:</b>	<b>Critical and Community Lifeline Facilities</b>
<b>APPENDIX F:</b>	<b>2025 HAZUS Reports</b>
<b>APPENDIX G:</b>	<b>2025 Mitigation Project Opportunities</b>
<b>APPENDIX H:</b>	<b>2025 Mitigation Action Evaluation &amp; Prioritization</b>
<b>APPENDIX I:</b>	<b>Annual Review Documentation</b>
<b>APPENDIX J</b>	<b>Greene County &amp; Municipal Adoption Resolutions</b>