

Potter County 2024 Hazard Mitigation Plan



Prepared for:

Potter County Department of
Emergency Services

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Certification of Annual Review Meetings

YEAR	DATE OF MEETING	PUBLIC OUTREACH ADDRESSED? *	SIGNATURE
2024			
2025			
2026			
2027			
2028			

**Confirm yes here annually and describe on record of change page.*

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Record of Changes

DATE	DESCRIPTION OF CHANGE MADE, MITIGATION ACTION COMPLETED, OR PUBLIC OUTREACH PERFORMED	CHANGE MADE BY (PRINT NAME)	CHANGE MADE BY (SIGNATURE)

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Acronyms

AACT:	American Academy of Clinical Toxicology
ACHA:	American College Health Association
ACMT:	American College of Medical Toxicology
AHJ:	Authority Having Jurisdiction
AMD:	Acid Mine Drainage
ANSI:	American National Standards Institute
ASAM:	American Society of Addiction Medicine
ASHRAE:	American Society of Heating, Refrigerating, and Air-Conditioning Engineers
ASIRT:	Association for Safe International Road Travel
BFE:	Base Flood Elevation
CBRNE:	Chemical, Biological, Radiological, Nuclear, or Explosive
CDC:	Centers for Disease Control and Prevention
CERT:	Community Emergency Response Team
CFR:	Code of Federal Regulations
CFS:	Commodity Flow Study
CHSN:	College Health Surveillance Network
CCIDRAP:	Center for Infectious Disease Research and Policy
CRS:	Community Rating System
DCNR:	Department of Conservation and Natural Resources
DDAP:	Department of Drug and Alcohol Programs
DEA:	Drug Enforcement Administration
DFIRM:	Digital Flood Insurance Rate Map
DMA:	Disaster Mitigation Act
DPS:	Department of Public Safety
EF:	Enhanced Fujita
EIA:	Energy Information Administration
EMA:	Emergency Management Agency
EMPG:	Emergency Management Performance Grant

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EMS:	Emergency Medical Services
EOP:	Emergency Operations Plan
EPA:	Environmental Protection Agency
EPCRA:	Emergency Planning and Community Right-To-Know Act
EPZ:	Emergency Planning Zone
FBI:	Federal Bureau of Investigations
FEMA:	Federal Emergency Management Agency
FMA:	Flood Mitigation Assistance Grant Program
FRA:	Federal Railroad Association
GIS:	Geographic Information Systems/Sciences
HAZUS:	Hazards U.S. Software
HMA:	Hazard Mitigation Assistance
HMEP:	Hazardous Material Emergency Planning Grant
HMGP:	Hazard Mitigation Grant Planning
HMP:	Hazard Mitigation Plan
HMRF:	Hazardous Material Response Fund
HSCA:	Hazardous Sites Cleanup Act
HSGP:	Homeland Security Grant Program
HVE:	Homegrown Violent Extremist
ICC:	International Code Council
IES:	Illuminating Engineering Society
LEPC:	Local Emergency Planning Committee
LGTBQ:	Lesbian, Gay, Bisexual, Trans & Queer
LPT:	Local Planning Team
MAT:	Medication-Assisted Treatment
MPC:	Municipalities Planning Code
NARM:	Notification and Resource Manual
NAS:	Neonatal Abstinence Syndrome
NCDC:	National Climatic Data Center
NCEI:	National Centers for Environmental Information

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NFIP:	National Flood Insurance Program
NFPA:	National Fire Protection Association
NIH:	National Institute of Health
NLD:	National Levee Database
NOAA:	National Oceanic and Atmospheric Administration
NTP:	Narcotic Treatment Program
NWS:	National Weather Service
OIH:	Opioid-Induced Hyperalgesia
ODU:	Opioid Use Disorder
PA DCED:	Pennsylvania Department of Community and Economic Development
PA DEP:	Pennsylvania Department of Environmental Protection
PA DOA:	Pennsylvania Department of Agriculture
PA GWIS:	Pennsylvania Groundwater Information System
PA HART:	Pennsylvania Helicopter Aquatic Rescue Team
PAWNVCP:	Pennsylvania West Nile Virus Control Program
PDMP:	Prescription Drug Monitoring Program
PDSI:	Palmer Drought Severity Index
PEMA:	Pennsylvania Emergency Management Agency
PennDOT:	Pennsylvania Department of Transportation
PHMSA:	Pipeline and Hazardous Materials Safety Administration
PISC:	Pennsylvania Invasive Species Council
POD:	Points of Dispensing
PWSA:	Public Water Service Area
RF:	Risk Factor
SARA:	Superfund Amendments and Reauthorization Act
SC:	Steering Committee
SFHA:	Special Flood Hazard Area
TRI:	Toxic Release Inventory
UCC:	Uniform Construction Code

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US HHS: United States Department of Health and Human Services
USACE: United States Army Corp of Engineers
USDA: United States Department of Agriculture
USDA FS: United States Department of Agriculture Forest Service
USGS: United States Geological Survey
WL: Working Level
WMD: Weapon of Mass Destruction
WUI: Wildland Urban Interface

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Executive Summary

Mitigation is the effort to reduce loss of life and property by lessening the impact of disasters. Hazard mitigation focuses attention and resources on county and municipal policies and actions that will produce successive benefits over time. State and local governments engage in hazard mitigation planning to identify risks and vulnerabilities associated with natural as well as human-caused hazards and develop long-term strategies for protecting people and property from future hazard events. Mitigation plans are key to breaking the cycle of disaster damage, reconstruction, and repeated damage. This plan represents the work of citizens, elected and appointed government officials, business leaders, and volunteer and nonprofit groups to protect community assets, preserve the economic viability of the community, and save lives.

In 2023, the Potter County Department of Emergency Services contracted the services of a consulting agency to revise and update the Potter County Hazard Mitigation Plan. The plan was successfully updated in accordance with the requirements set forth by PEMA and FEMA. The updated Potter County Hazard Mitigation Plan was adopted by the Potter County Commissioners in 2024. All thirty municipalities adopted the 2019 Potter County Hazard Mitigation Plan as the municipal hazard mitigation plan, and it is anticipated that all participating municipalities will adopt the 2024 Potter County Hazard Mitigation Plan Update.

The Potter County Commissioners secured a grant to complete the 2024 update to the Potter County Hazard Mitigation Plan. MCM Consulting Group, Inc. was hired to assist the county with the update of the plan. The planning kick-off meeting was conducted on June 27, 2023.

The planning process for the 2024 Potter County Hazard Mitigation Plan Update consisted of the following:

- Identification and prioritization of the hazards that may affect the county and its municipalities.
- Assessment of the county's and municipalities' vulnerability to these hazards.
- Identification of the mitigation actions and projects that can reduce that vulnerability.
- Development of a strategy for implementing the actions and projects, including identifying the agency(ies) responsible for that implementation.

Throughout the planning process, the general public was given the opportunity to comment on the existing HMP and provide suggestions for the updated version. Due to COVID-19, public meetings were conducted via an online survey to provide residents an opportunity to provide input on the HMP. Several meetings were held in person with a virtual option, and participants were invited to submit surveys and other documents via an online survey.

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The following hazards were identified by the local planning team as presenting the highest risk to the county and its municipalities:

Natural hazards:

- Drought
- Earthquake
- Flooding, Flash Flooding, Ice Jam Flooding
- Hurricane and Tropical Storm
- Invasive Species
- Landslide
- Pandemic, Epidemic, and Infectious Disease
- Radon Exposure
- Subsidence/Sinkhole
- Tornado/Windstorm
- Wildfire
- Winter Storm

Human-caused hazards:

- Blighted Properties
- Civil Disturbance
- Dam Failure
- *Emergency Services
- Environmental Hazards / Hazardous Materials
- Nuclear Incident
- Opioid Epidemic
- Terrorism/Cyberterrorism Incidents
- Transportation Accidents
- Urban Fire and Explosion
- Utility Interruption

A total of twenty-eight hazards have been identified in the 2024 Potter County Hazard Mitigation Plan. A total of nineteen identified hazards were listed in the previous 2019 plan update. The new hazards include civil disturbance, emergency services, terrorism/cyberterrorism, urban fire/explosion, and blighted properties.

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To mitigate against the effects of these hazards, the local planning team identified the following goals for hazard mitigation over the next five years:

- Reduce potential injury/death and damage to existing community assets due to floods, flash floods, and ice jams.
- Reduce potential injury/death and damage to community assets due to all hazards.
- Promote disaster-resistant future development.
- Promote hazard mitigation as a public value in recognition of its importance to the health, safety, and welfare of the population.
- Improve response and recovery capabilities.
- Protect critical infrastructure.

Mitigation actions are specific projects and activities that help achieve goals. A total of sixty-five actions were developed for this plan update as they pertain to hazards identified by the local planning team. The 2019 Potter County Hazard Mitigation Plan consisted of thirty-four total actions. The individual objectives and actions that will be implemented are shown in Section 6.4. Each municipality was provided the opportunity to submit new project opportunity forms for this update. Project opportunity forms for the 2019 HMP update were not readily available for review during the writing of this plan. A total of thirty-two project opportunities were submitted for this plan update.

The 2024 Potter County Hazard Mitigation Plan is the cornerstone to reducing Potter County's vulnerability to disasters. It is the commitment to reducing risks from hazards and serves as a guide for decision makers as they commit resources to reducing the effects of hazards. Hazard mitigation is the only phase of emergency management specifically dedicated to breaking the cycle of damage, reconstruction, and repeated damage.

The 2024 Potter County Hazard Mitigation Plan is a living document that reflects ongoing hazard mitigation activities and requires monitoring, evaluating, and updating to ensure the mitigation actions are implemented. To facilitate the hazard mitigation planning process and adhere to regulatory requirements, the plan will be reviewed annually, and any major revisions will be incorporated into the five-year update.

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1. Introduction

1.1. Background

The Potter County Board of Commissioners, in response to the Disaster Mitigation Act of 2000 (DMA 2000), organized a countywide hazard mitigation planning effort to prepare, adopt, and implement a multi-jurisdictional Hazard Mitigation Plan (HMP) for Potter County and all of its twenty-eight municipalities. The Potter County Department of Emergency Services was charged by the County Board of Commissioners to prepare the 2024 plan. The 2019 HMP has been utilized and maintained during the five-year life cycle.

The Potter County Commissioners were successful in securing hazard mitigation grant funding to update the county hazard mitigation plan. The pre-disaster mitigation grant funding was administered by the Pennsylvania Emergency Management Agency and provided to Potter County as a sub-grantee. The Potter County Commissioners assigned the Potter County Department of Emergency Services with the primary responsibility to update the hazard mitigation plan. MCM Consulting Group, Inc. was selected to complete the update of the HMP. A local hazard mitigation planning team was developed comprised of government leaders and citizens from Potter County. This updated HMP will provide another solid foundation for the Potter County Hazard Mitigation Program.

Hazard mitigation describes sustained actions taken to prevent or minimize long-term risks to life and property from hazards and to create successive benefits over time. Pre-disaster mitigation actions are taken in advance of a hazard event and are essential to breaking the disaster cycles of damage, reconstruction, and repeated damage. With careful selection, successful mitigation actions are cost-effective means of reducing risk of loss over the long term.

Hazard mitigation planning has the potential to produce long-term and recurring benefits. A core assumption of mitigation is that current dollars invested in mitigation practices will significantly reduce the demand for future dollars by lessening the amount needed for recovery, repair, and reconstruction. These mitigation practices will also enable local residents, businesses, and industries to reestablish themselves in the wake of a disaster, getting the economy back on track sooner with less interruption.

1.2. Purpose

The purpose of this all-hazard mitigation plan (HMP) is:

- Protect life, safety, and property by reducing the potential for future damages and economic losses that result from hazards.

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- Qualify for additional grant funding, in both the pre-disaster and the post-disaster environment.
- Speed recovery and redevelopment following future disaster events.
- Demonstrate a firm local commitment to hazard mitigation principles.
- Comply with both state and federal legislative requirements for local hazard mitigation plans.

1.3. Scope

This Potter County Multi-Jurisdictional Hazard Mitigation Plan serves as a framework for saving lives, protecting assets, and preserving the economic viability of the thirty municipalities in Potter County. The HMP outlines actions designed to address and reduce the impact of a full range of natural hazards facing Potter County, including drought, earthquakes, flooding, hailstorms, tornadoes, hurricanes/tropical storms, invasive species, landslides, lightning strike, pandemic, radon exposure, wildfire, and severe winter weather. Human-caused hazards such as dam failure, environmental hazards, levee failure, nuclear incidents, transportation accidents, utility interruptions, civil disturbance, emergency services shortage, terrorism/cyberterrorism, urban fire/explosion, and blighted properties also addressed.

A multi-jurisdictional planning approach was utilized for the Potter County HMP update, thereby eliminating the need for each municipality to develop its own approach to hazard mitigation projects, common mitigation goals and objectives, and an evaluation of a broad capabilities assessment examining policies and regulations throughout the county and its municipalities.

1.4. Authority and References

Authority for this plan originates from the following federal sources:

- Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C., Section 322, as amended
- Code of Federal Regulations (CFR), Title 44, Parts 201 and 206
- Disaster Mitigation Act of 2000, Public Law 106-390, as amended.
- National Flood Insurance Act of 1968, as amended, 42 U.S.C. 4001 et seq.

Authority for this plan originates from the following Commonwealth of Pennsylvania sources:

- Pennsylvania Emergency Management Services Code. Title 35, Pa C.S. Section 101
- Pennsylvania Municipalities Planning Code of 1968, Act 247 as reenacted and amended by Act 170 of 1988.
- Pennsylvania Stormwater Management Act of October 4, 1978. P.L. 864, No. 167

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The following Federal Emergency Management Agency (FEMA) guides and reference documents were used to prepare this document:

- FEMA 386-1: Getting Started. September 2002
- FEMA 386-2: Understanding Your Risks: Identifying Hazards and Estimating Losses. August 2001
- FEMA 386-3: Developing the Mitigation Plan. April 2003
- FEMA 386-4: Bringing the Plan to Life. August 2003
- FEMA 386-5: Using Benefit-Cost Review in Mitigation Planning. May 2007
- FEMA 386-6: Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning. May 2005
- FEMA 386-7: Integrating Manmade Hazards into Mitigation Planning. September 2003
- FEMA 386-8: Multijurisdictional Mitigation Planning. August 2006
- FEMA 386-9: Using the Hazard Mitigation Plan to Prepare Successful Mitigation Projects. August 2008
- FEMA Local Multi-Hazard Mitigation Planning Guidance. July 1, 2008
- FEMA National Fire Incident Reporting System 5.0: Complete Reference Guide. January 2008
- FEMA Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards. January 2013
- FEMA Rehabilitation of High Hazard Potential Dams: Grant Program Guidance, June 2020

The following Pennsylvania Emergency Management Agency (PEMA) guides and reference documents were used to prepare this document:

- PEMA: Hazard Mitigation Planning Made Easy!
- PEMA Mitigation Ideas: Potential Mitigation Measures by Hazard Type: A Mitigation Planning Tool for Communities. March 6, 2009
- PEMA: All-Hazard Mitigation Planning Standard Operating Guide, 2020.

The following document produced by the National Fire Protection Association (NFPA) provided additional guidance for updating this plan:

- NFPA 1600: Standard on Disaster/Emergency Management and Business Continuity Programs. 2011

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2. Community Profile

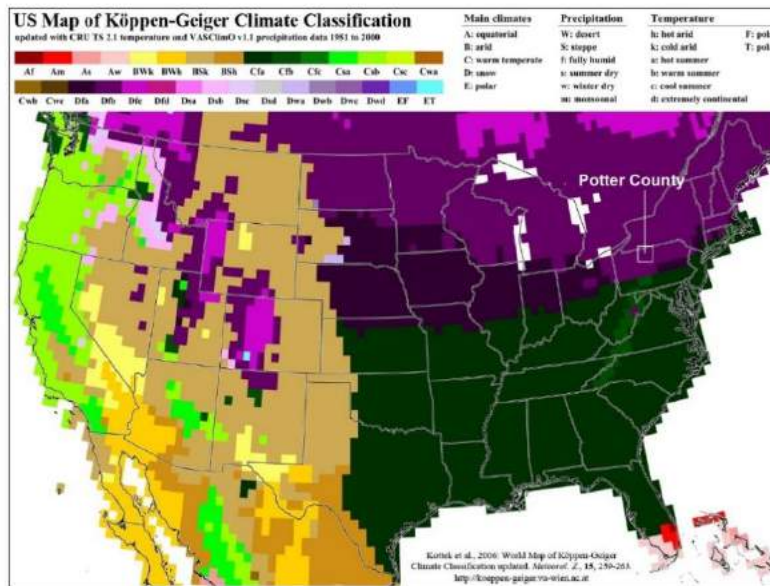
2.1. Geography and the Environment

Potter County covers approximately 1,082 square miles and is situated in north-central Pennsylvania. The county is bordered by McKean County in the west, by New York State to the north, by Tioga County to the east, by Lycoming County to the southeast, Cameron County to the southwest, and by Clinton County to the south. Potter County lies within two physiographic provinces of Pennsylvania—the Appalachian Plateaus and the Ridge and Valley Province. The division between the two provinces is marked by the Allegheny Front, which trends along a northeast-southwest axis, northwest of the town of Lock Haven. The county is the 63rd ranked county in terms of population within the Commonwealth of Pennsylvania. There is a total of 1,081.3 square miles of land and 0.2 square miles of water.

Potter County presents a wide range of topographic features. The surface ranges from almost level on plateaus and in valleys, to rolling and hilly in other areas. Elevations in the county range from a high of 2,582 feet near Bailey Hill to the northwest to a low of 1,004 feet at Sinnemahoning State Park.

The Köppen-Geiger Climate Areas map classifies Potter County, and the rest of Pennsylvania, as Humid Continental, which can be seen in *Figure 1 – Köppen-Geiger Climate Map*. While the counties of Pennsylvania share many weather similarities, there are also a few unique characteristics to the area.

Figure 1 - Köppen-Geiger Climate Map



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According to current data, the climate in Potter County is temperate, being characterized by moderately hot summers and moderately severe winters. In winter, the average temperature is 31.33°F and the average daily minimum temperature is 16.33°F. In summer, the average temperature is 67.07°F and the average daily maximum temperature is 80.36°F. The average amount of snowfall each winter is 57.96 inches.

River and stream valleys dominate the landscape of Potter County as well as ridge lines and rolling hills. Potter County has the only Triple Continental Divide east of the Mississippi River. The three major rivers the summit gives rise to are the Allegheny River, the Genesee River, and the Pine Creek-Susquehanna. The Allegheny River flows into the Ohio River, Mississippi River, and the Gulf of Mexico. The Genesee River flows into Lake Ontario, the St. Lawrence River, and the North Atlantic Ocean. The Pine Creek-Susquehanna flows into the Chesapeake Bay and Atlantic Ocean.

Potter County is comprised of eight watersheds. *Figure 1 – Potter County Watersheds* shows watershed information from the Susquehanna Conservancy and the Ohio River Basin, published by PASDA:

Table 1 - Potter County Watersheds

Watersheds in Potter County
Cowanesque River
First Fork Sinnemahoning Creek
Kettle Creek
Portage Creek
Pine Creek
Upper Pine Creek
West Branch Pine Creek
Young Womans Creek

2.2. Community Facts

On March 26th, 1804 Potter County was established from a northwest section of Lycoming County and named after James Potter, a general in the American Revolution. It was attached to Lycoming County until September 1826 when it then attached to McKean County until September 1, 1835 when it was formally organized. Coudersport, the county seat, is a borough in Potter County that was laid out in 1835 and incorporated as a borough in 1848. The most

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populous municipalities in Potter County are Coudersport Borough, Harrison Township, Roulette Township, and Shinglehouse Borough.

The following boroughs and townships are located in Potter County:

- Boroughs: Austin, Coudersport, Galeton, Oswayo, Shinglehouse, Ulysses
- Townships: Abbott, Allegany, Bingham, Clara, Eulalia, Genesee, Harrison, Hebron, Hector, Homer, Keating, Oswayo, Pike, Pleasant Valley, Portage, Roulette, Sharon, Stewardson, Summit, Sweden, Sylvania, Ulysses, West Branch, Wharton

Table 2 – Historic and Cultural Places in Potter County illustrates the historical and cultural resources in the county borders and includes sites, buildings, and historical districts. *Figure 5 – Potter County Historical Sites* illustrates the same information.

Table 2 - Historic and Cultural Places in Potter County

Historical and Cultural Places in Potter County	
Name:	Description:
Austin Dam	The Austin Dam is also known as the Bayless Dam. Austin Dam is located in Austin, Pennsylvania. This dam was built in 1909, and was operated by the Bayless Pulp and Paper Company. Austin Dam was the largest dam of its type in PA of its time, but it had significant destruction in 1911. It later resulted in an out of commission status. Austin Dam was added to the U.S National Register of Historic Places on January 15 th , 1987.
Cherry Springs Picnic Pavilion	Cherry Spring Picnic Pavilion is located in West Branch Township inside Cherry Springs State Park. Cherry Spring Picnic Pavilion was built in 1933 by the Civilian Conservation Corps. Cherry Springs Pavilion was added to the U.S National Register of Historic Places on May 11 th , 1987.
Coudersport and Port Allegany Railroad Station	Coudersport and Port Allegany Railroad Station is also known as the “Coudersport Depot”. This railroad station is in Coudersport, Pennsylvania and was built in 1899 but did not open until January 1900. This rail station was abandoned in 1970 and placed into the U.S National Register of Historic Places on November 21 st , 1976.

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Historical and Cultural Places in Potter County	
Name:	Description:
Coudersport Historic District	Coudersport Historic District is a historic district in Coudersport, Pennsylvania which is the County seat for Potter County. This district encompasses seventy-three contributing buildings that include the courthouse, Park United Methodist Church, Presbyterian Church, the Old hickory Tavern, and the Coudersport Consistory. Coudersport Historic District was added to the U.S National Register of Historic Places on February 24 th , 1975.
Potter County Court House	Potter County Courthouse is the primary government building of Potter County. Potter County Courthouse was built in 1851 and was completed in 1853. The Potter County Courthouse was added to the U.S National Register of Historic Places on February 24 th , 1975.

2.3. Population and Demographics

The total population for Potter County is 16,396 based on 2020 United States Census Bureau. The total change in population for Potter County from 2010 to 2020 was a decrease of 1,061 and a change of -6.08%. The most populous municipality is Coudersport Borough. The municipalities in the county that had the largest percentage of decrease from 2010 to 2020 were Portage Township (-29.95%), Oswayo Township (-19.43%), Austin Borough (-14.23%), and Galeton Borough (-13.84%). The municipalities that had the highest percentage of increase for the period from 2010 to 2020 were Wharton Township (+18.18%), Eulalia Township (+2.25%), West Branch Township (+2.03%), Sylvania Township (+1.30%), and Ulysses Township (+1.26%). *Table 3 – Population Change in Potter County* illustrates the trends and data from United States Census Bureau. These figures are based off data from the United States Census Bureau in 2020. *Figure 6 – Potter County Population Density* illustrates the average population density values per census track in the various municipalities of Potter County.

Table 3 - Population Change in Potter County

Population Change in Potter County from 2010-2020			
Municipality	2010 Census	2020 Census	Percent of Change 2010-2020
Abbott Township	242	228	-5.79%
Alleghany Township	422	397	-5.92%
Austin Borough	562	482	-14.23%

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Population Change in Potter County from 2010-2020			
Municipality	2010 Census	2020 Census	Percent of Change 2010-2020
Bingham Township	684	619	-9.50%
Clara Township	199	177	-11.05%
Coudersport Borough	2,546	2,381	-6.48%
Eulalia Township	889	909	+2.25%
Galeton Borough	1,149	990	-13.84%
Genesee Township	799	726	-9.14%
Harrison Township	1,037	1,022	-1.45%
Hebron Township	589	591	+0.34%
Hector Township	386	343	-11.14%
Homer Township	437	438	+0.23%
Keating Township	312	286	-8.33%
Oswayo Brough	139	134	-3.59%
Oswayo Township	278	224	-19.43%
Pike Township	324	325	+0.31%
Pleasant Valley Township	86	78	-9.30%
Portage Township	228	162	-29.95%
Roulette Township	1,197	1,099	-8.18%
Sharon Township	866	784	-9.46%
Shinglehouse Borough	1,127	1,103	-2.12%
Sweden Township	872	867	-0.58%
Sylvania Township	77	78	+1.30%
Ulysses Borough	621	599	-3.54%
Ulysses Township	635	643	+1.26%
West Branch Township	393	401	+2.03%
Wharton Township	99	117	+18.18%
Source: United States Census Bureau (2023), 2020 Census Data			

There are approximately 12,345 housing units in Potter County, Pennsylvania. Of these housing units, there are an estimated 7,052 housing units that are occupied. There are 6,385 households within the county, with an average family size of 3.12 persons. Married couples make up a plurality of households in the county 54.0%. The estimated owner-occupied housing rate of Potter County is 78.7%. The median value of the owner-occupied housing units in Potter County from 2017 to 2021 is \$117,000.00. The median monthly owner’s costs for a structure with a mortgage was \$1,104.00 and the median monthly owner’s costs for a structure without a mortgage was \$444.00. The median gross rent for rental properties in Potter County was \$688.00 for the same date range.

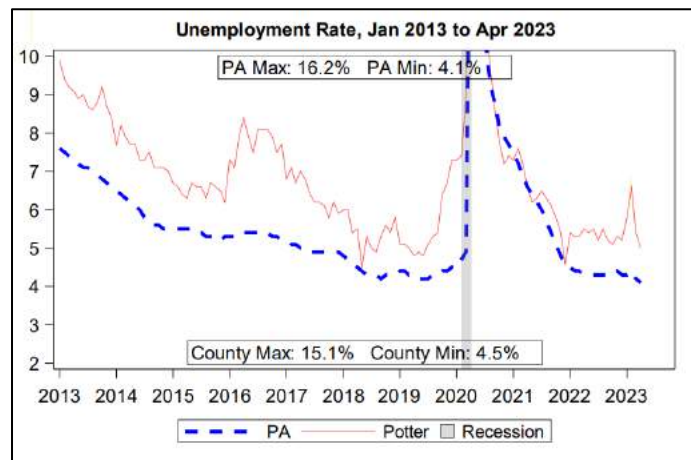
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The racial composition of the county is 97.4% White, 0.7% Black or African American, 1.6% Hispanic or Latino, 0.4% American Indian and Alaska Native, 0.5% Asian, 0% native Hawaiian and other Pacific Islander, and 1.1% two or more races. The median age of Potter County is 47.4 years of age, which is higher than the median age of Pennsylvania at 40.9 years of age and the national median of 38.1 years of age. The percentage of Potter County under the age of 5 years old is 5.1%, between the ages of 18 and 64 years old is 55.3%, and aged 65 years old and older is 24%.

The median household income for households in Potter County is \$50,944.00 and the poverty rate of Potter County is 16.1% of the total population. The poverty rate for the Commonwealth of Pennsylvania as a whole is 12.1%. There are approximately 1,291 veterans in Potter County. The median veteran income in Potter County as of 2020 was \$32,103.00, with 10.3% of Potter County veterans living below the poverty level. The veteran unemployment rate in the county was approximately 9.2%.

The Covid-19 Pandemic created an increase in unemployment and interruptions in employment throughout the United States, to include Pennsylvania and Potter County. According to Pennsylvania Department of Labor and Industry data, there was a large spike in unemployment both across the Commonwealth and Potter County. At the height of the Covid-19 Pandemic in the spring of 2020, the unemployment rate for Potter County hit (9.1%) of the working population of the county. That is lower than the peak unemployment percentage for Pennsylvania, which peaked at 16.5% of the working population of the entire state. *Table 4 – Unemployment Rate Jan. 2013 to Apr. 2023* illustrates the trend and large spike in unemployment. The unemployment rate for Potter County in April 2023 was 4.5%, which roughly accounted for 300 working age adults (ages 16 to 65). The total estimated workforce for Potter County was 6,900 working age adults (ages 16 to 65) in April 2023.

Table 4 - Unemployment Rate Jan. 2013 to Apr. 2023



Source: Pennsylvania Department of Labor & Industry

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Potter County’s leading industries are healthcare, manufacturing, education, and commercial transportation. The primary employment providers within Potter County are displayed below in *Table 5 – Potter County Top Employers*.

Table 5 - Potter County Top Employers

Potter County Top Employers (Excluding State Employers)	
Ranking	Company
1	Charles Cole Memorial Hospital
2	Morris Compressors Inc
3	Zito Media
4	Cole Care Inc
5	Coudersport Area School District
6	Northern Potter School District
7	Sweden Valley Manor
8	Truck-Lite Co LLC
9	Potter County Commissioners
10	Ram Forest Products Inc
Source: Pennsylvania Department of Labor & Industry, 2022	

The top employers’ data was obtained through the Pennsylvania Department of Labor and Industry, Center for Workforce Information and Analysis. This data only provided a list of employers, their ranking, and North American Industry Classification System (NAICS) descriptions. *Table 6 – Quarterly Census of Employment and Wages, 2022 Annual Averages in Potter County* only calls out how many locations per NAICS description and total number of employees.

Table 6 - Quarterly Census of Employment and Wages, 2022 Annual Averages in Potter County

Quarterly Census of Employment and Wages, 2022 Annual Averages in Potter County					
NAICS	Description	Number of Locations	Number of Employees	Employment Percentage (%)	Average Wages (\$)
11	Agriculture, Forestry, Fishing, and Hunting	19	142	2.9	\$37,307.00
21	Mining, Quarrying, and Oil & Gas	3	13	0.3	\$38,908.00
22	Utilities	2	ND	ND	ND
23	Construction	25	218	4.4	\$57,039.00

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Quarterly Census of Employment and Wages, 2022 Annual Averages in Potter County					
NAICS	Description	Number of Locations	Number of Employees	Employment Percentage (%)	Average Wages (\$)
31-33	Manufacturing	20	624	12.6	\$51,475.00
42	Wholesale Trade	15	257	5.2	\$45,612.00
44-45	Retail Trade	56	482	9.7	\$27,911.00
48-49	Transportation and Warehousing	39	389	7.8	\$71,779.00
51	Information	15	315	6.4	\$56,352.00
52	Finance and Insurance	15	75	1.5	\$57,809.00
53	Real Estate, Rental, and Leasing	5	10	0.2	\$18,061.00
54	Professional and Technical Services	26	174	3.5	\$62,545.00
55	Management of Companies and Enterprises	1	ND	ND	ND
56	Administrative and Waste Services	11	77	1.6	\$35,419.00
61	Educational Services	14	ND	ND	ND
62	Healthcare and Social Assistance	86	885	17.8	\$57,360.00
71	Arts, Entertainment, and Recreation	4	ND	ND	ND
72	Accommodation and Food Services	43	322	6.5	\$14,200.00
81	Other Services (Except Public Administration)	29	99	2.0	\$19,127.00
92	Public Administration	42	358	7.2	\$37,796.00
-	Total, All Industries	467	4,960	100	\$736,377.00

Source: PA DLI, 2023, NAICS (North American Industry Classification System)

2.4. Land Use and Development

Potter County is composed of thirty municipalities, which include:

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- Twenty-four townships
- Six boroughs

The majority of acreage in Potter County is forested, while approximately 58% of the acreage is agriculture. Potter County has a total acreage of 434,596 acres in the Bay watershed. Potter County is mostly made up of natural land which consists of forest, streams, and wetlands. Croplands make up the majority of the agriculture in Potter County.

Potter County has approximately 434,596 acres of total land area, and 128 acres of water area, with a population per square mile of fifteen persons based on 2020 data estimates. Forested areas make up 36% of the county, while Agriculture makes up approximately 58% of the total land area in Potter County, and high density urban, low density urban, water, transitional, resource extraction, quarries, and wetlands each account for 6% of the land area.

2.5. Data Sources

The following data sources were used during the update process:

- United States Census Bureau.
- National Climatic Data Center (NCDC).
- National Oceanic and Atmospheric Administration (NOAA).
- Pennsylvania Department of Conservation and Natural Resources (PA DCNR).
- Pennsylvania Department of Environmental Protection (PA DEP).
- Pennsylvania Department of Labor and Industry (PA DLI).
- Pennsylvania Groundwater Information System (PaGWIS).
- Pennsylvania Emergency Incident Reporting System. (PEIRS)
- Pennsylvania Emergency Management Agency (PEMA).
- Potter County Comprehensive Plan 2020.

The countywide Digital Flood Insurance Rate Maps (DFIRM) were used for all flood risk analysis and estimation of loss. The Potter County DFIRMs were approved and effective in 2013. The DFIRM database provides flood frequency and elevation information used in the flood hazard risk assessment. Other Potter County GIS datasets including road centerlines, structures, and municipalities were utilized in conjunction with the DFIRM data.

In order to assess the vulnerability of different jurisdictions to the hazards, data on past occurrences of damaging weather events was compiled. A large number of natural-hazard events were gathered from the National Climatic Data Center (NCDC) database. The NCDC is a division of the United States Department of Commerce’s National Oceanic and Atmospheric Administration (NOAA). Information on hazard events is compiled by the NCDC from data gathered by the National Weather Service (NWS), another division of NOAA. The data is then presented by the NCDC as tabular data that can be queried in the United States Storm Events database, which “documents the occurrences of storms and other significant weather phenomena

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having sufficient intensity to cause loss of life, injuries, significant property damage, and/or disruption to commerce” (NOAA, 2006). The classification of storm events in the database is based off of data collected from around the United States and the Commonwealth of Pennsylvania, so the data may not be filed under the correct storm category due to user input error. The reason for this data issue results from some storm events falling under multiple categories, including but not limited to winter storm, ice storm, tornado, hurricane / tropical storm, flooding, and flash flooding. Many of the events listed in the United States Storm Events database can fall under multiple of these categories. In an effort to include a comprehensive list of prior storm events for Potter County, search queries with multiple storm classifications were conducted for each hazard.

Throughout the risk and vulnerability assessment included in Section 4 of this Hazard Mitigation Plan, descriptions of limited data indicate some areas in which the county and the municipalities can improve their ability to identify vulnerable structures and improve loss estimates. As the county and municipal governments work to increase their overall technical capacity and implement comprehensive planning goals, they will also attempt to improve the ability to identify areas of increased vulnerability.

This hazard mitigation plan evaluates the vulnerability of the county’s community lifelines. For the purposes of this plan, critical infrastructure facilities are those entities that are essential to the health, welfare, and safety of the community. This includes but is not limited to airports, emergency medical service (EMS) stations, communication facilities and towers, day care centers and preschools, fire departments, hospitals and medical facilities, police departments, schools, and senior living facilities. The locations of these facilities were provided by the Potter County GIS Department.

Geographic Information Systems (GIS) Data

GIS data was utilized in risk assessment, estimation of loss and the development of map products for the hazard mitigation plan update. A foundation of data was available from the Potter County GIS Department. Some of the utilized data was downloaded from the Pennsylvania Spatial Data Access (PASDA). A large portion of the plan utilizes census data from the United States Census Bureau, but the 2020 census data collection and dissemination was disrupted due to the COVID-19 Pandemic in 2020 and 2021.

The Potter County GIS Department provided the following layers for use in the development of hazard profiles and hazard profile mapping for the 2024 Hazard Mitigation Plan Update:

- EMS agencies (word document)
- Fire departments (word document)
- Police departments (word document)
- Road centerlines

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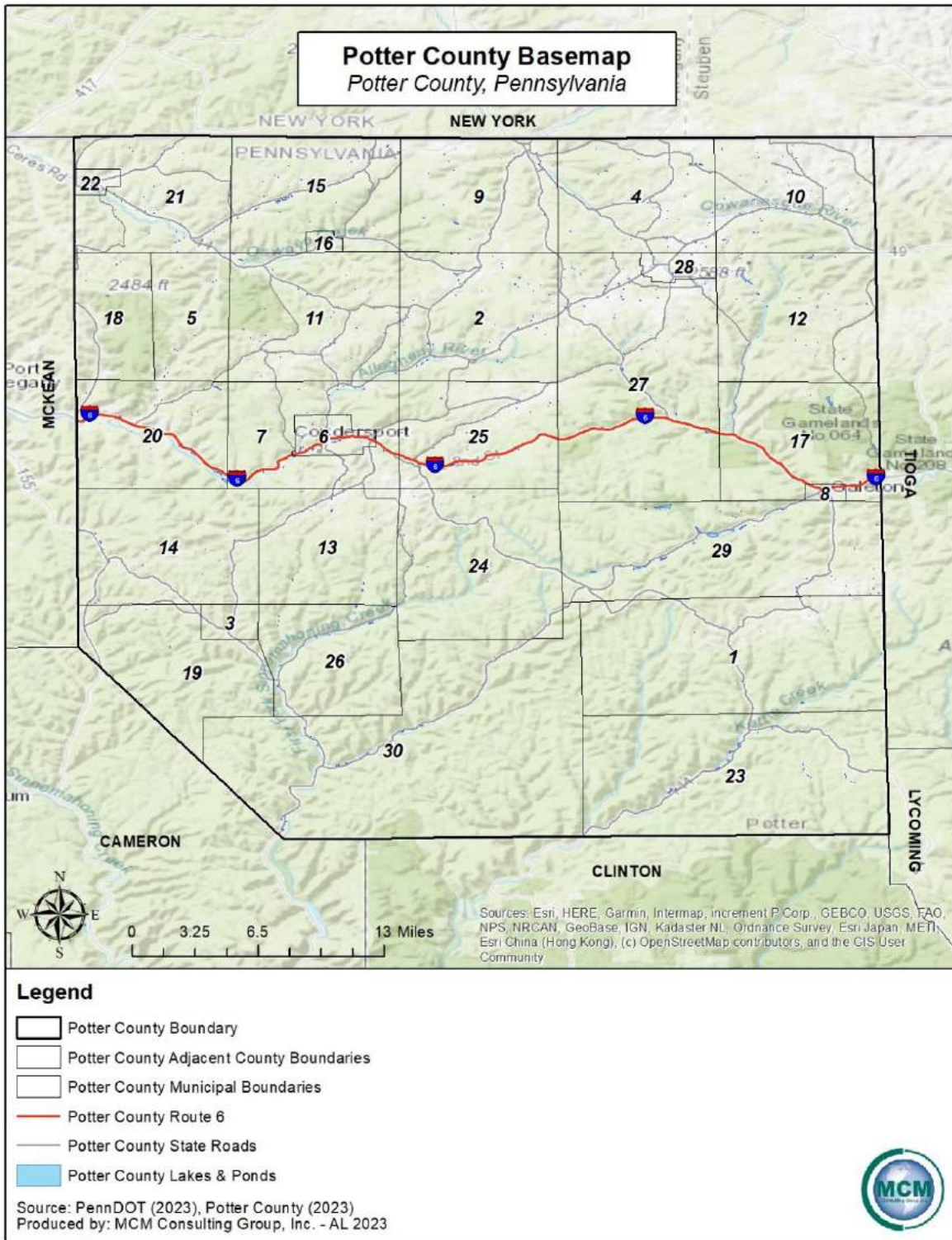
- Structure points
- SARA facilities (excel document)

The following GIS Data layers were developed for use in the 2024 Hazard Mitigation Plan Update:

- Addresses in slope areas
- Community lifeline facilities
- Conventional wells
- EMS agencies (geocoded)
- Electricity transmission lines
- Electricity substations
- Fire departments (geocoded)
- Land use
- National Register of Historic Places data
- Police departments (geocoded)
- Power plants
- Public water supply area
- Rail lines
- Slope areas
- Tornado impacted municipalities
- Toxic release inventory (TRI) locations
- Traffic data
- Unconventional wells
- Watersheds (large and small)

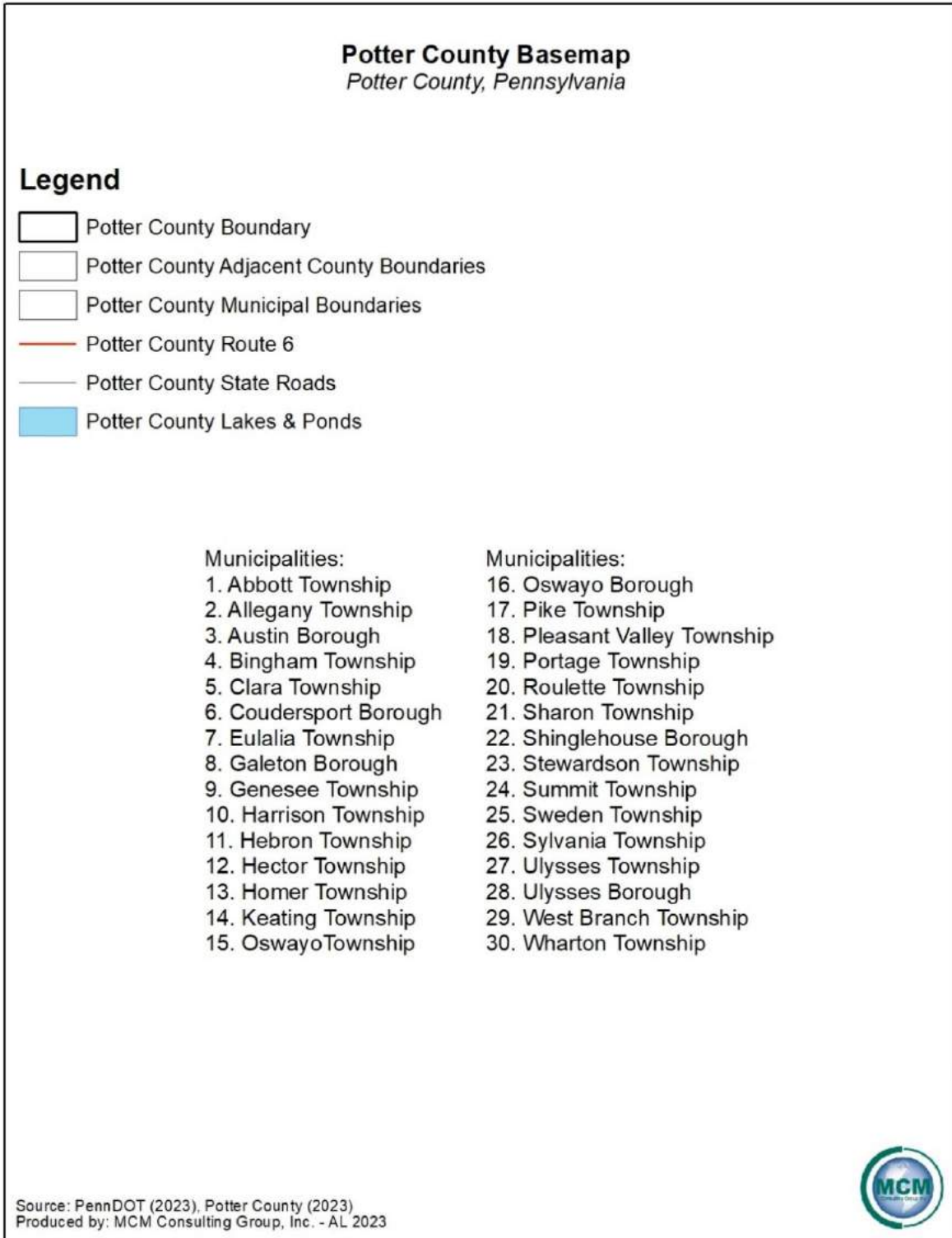
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Figure 2 - Potter County Basemap



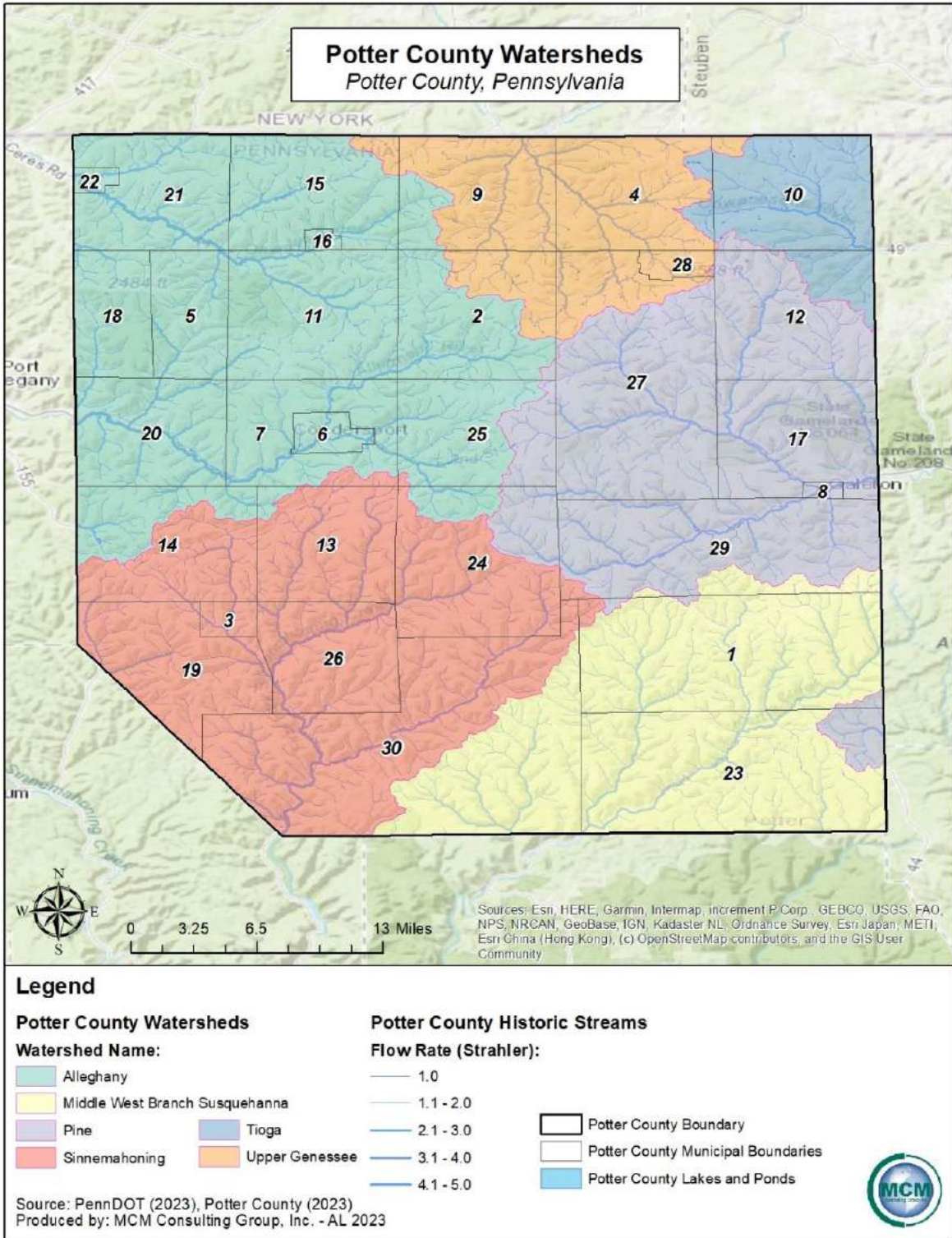
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Figure 3 - Potter County Basemap - Page 2



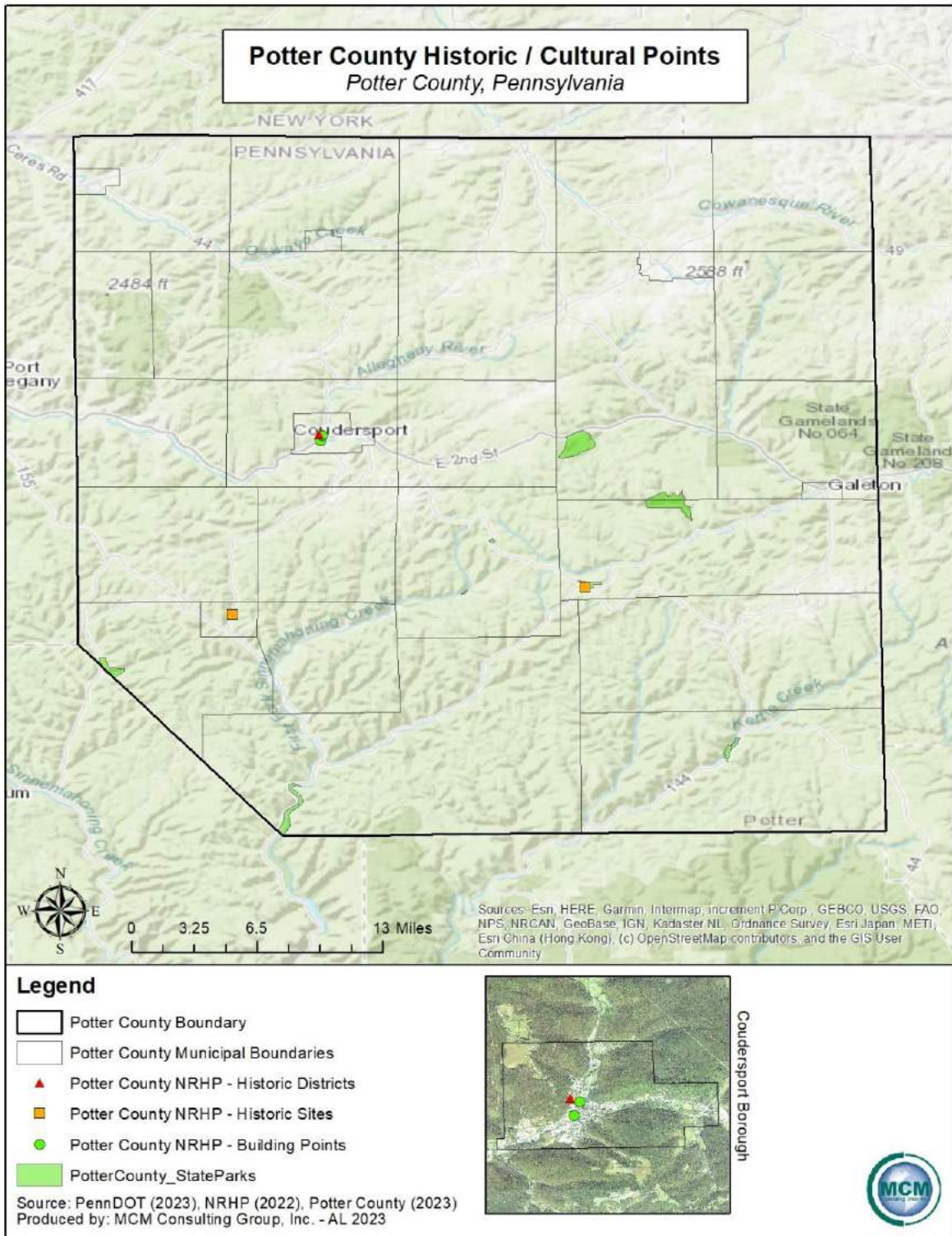
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Figure 4 - Potter County Watersheds



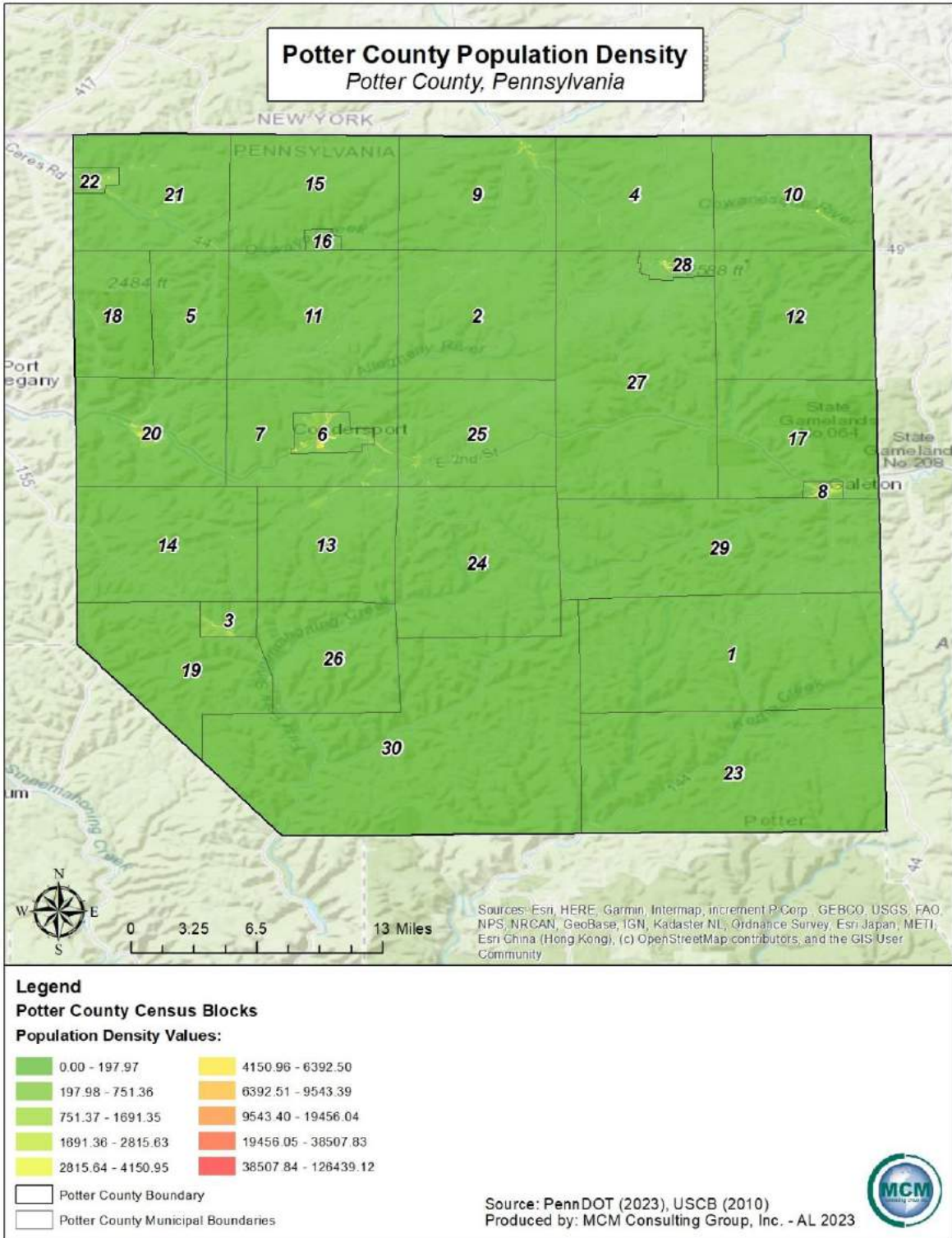
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Figure 5 - Potter County Historical Sites



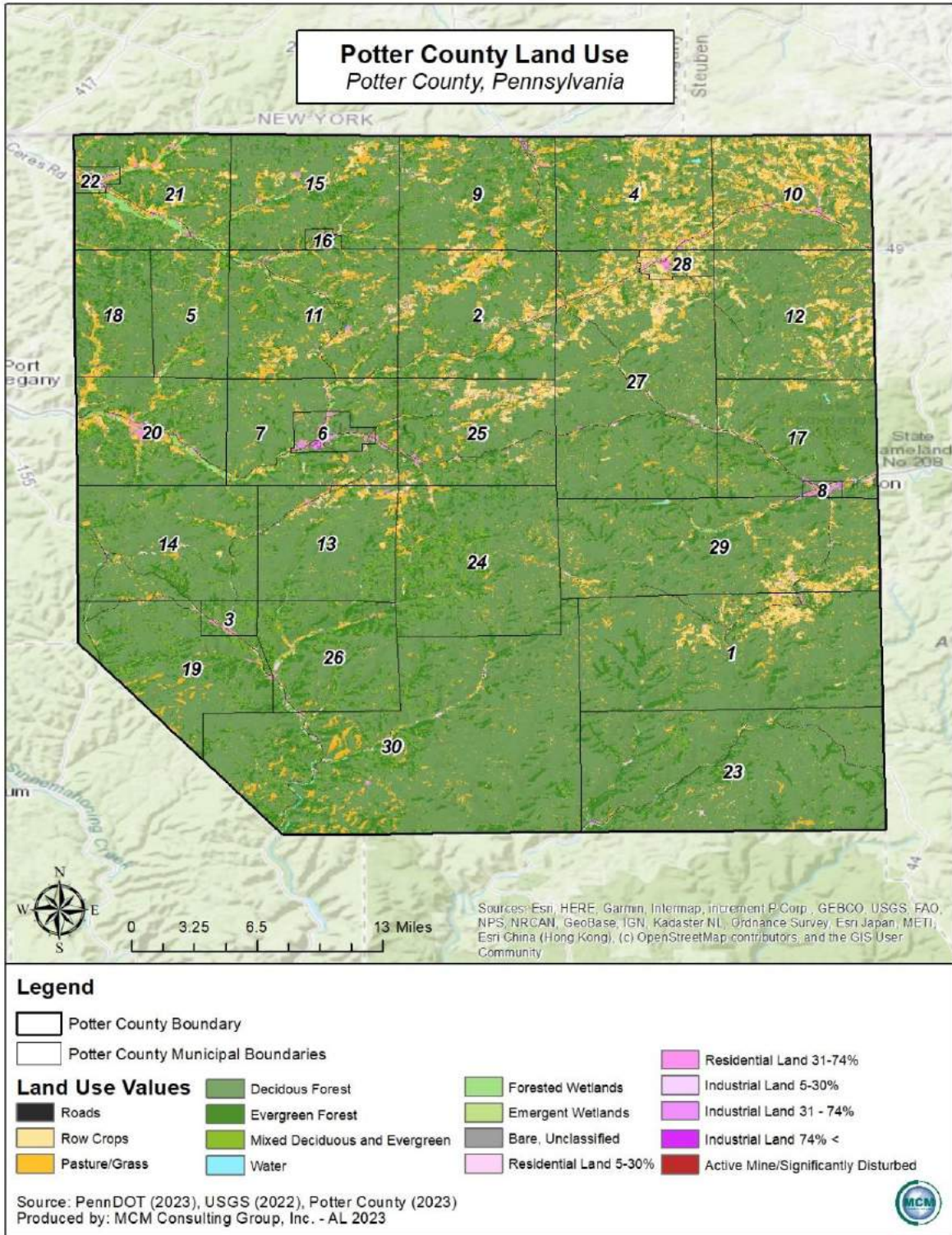
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Figure 6 - Potter County Population Density



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Figure 7 - Potter County Land Use



3. Planning Process

3.1. Update Process and Participation Summary

The Potter County Hazard Mitigation Plan update began April 26, 2023. The Potter County Commissioners were able to secure a hazard mitigation grant to start the process. The Potter County Department of Emergency Services was identified as the lead agency for the Potter County Hazard Mitigation Plan update. The planning process involved a variety of key decision makers and stakeholders within Potter County. Potter County immediately determined that the utilization of a contracted consulting agency would be necessary to assist with the plan update process. MCM Consulting Group, Inc. was selected as the contracted consulting agency to complete the update of the hazard mitigation plan. The core hazard mitigation team, which was referred to as the steering committee, included officials from the Potter County Department of Emergency Services and MCM Consulting Group, Inc. (MCM).

The process was developed around the requirements laid out in the Federal Emergency Management Agency (FEMA) Local Hazard Mitigation Crosswalk, referenced throughout this plan, as well as numerous other guidance documents including, but not limited to, Pennsylvania's All-Hazard Mitigation Standard Operating Guide, FEMA's State and Local Mitigation Planning How-to Guide series of documents (FEMA 386-series), and the National Fire Protection Association (NFPA) 1600 Standard on Disaster/Emergency Management and Business Continuity Programs.

MCM Consulting Group, Inc. assisted Potter County Department of Emergency Services in coordinating and leading public involvement meetings, local planning team meetings, analysis, and the writing of the updated HMP. The Potter County Local Planning Team (LPT) worked closely with MCM in the writing and review of the HMP. MCM conducted project meetings and local planning team meetings throughout the update process. Due to COVID-19, meetings were held with the option to attend virtually. Meeting agendas, meeting minutes and sign-in sheets were developed and maintained for each meeting conducted by MCM. These documents are detailed in Appendix C of this plan.

Public meetings with local elected officials were held, as well as work sessions and in-progress review meetings with the Potter County Local Planning Team and staff. At each of the public meetings, respecting the importance of local knowledge, municipal officials were strongly encouraged to submit hazard mitigation project opportunity forms, complete their respective portions of the capability's assessment and review, and eventually adopt the county hazard mitigation plan. Potter County will continue to work with all local municipalities to collect local hazard mitigation project opportunities.

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The HMP planning process consisted of:

- Applying for and receiving a hazard mitigation planning grant (HMPG) to fund the planning project.
- Announcing the initiative via press releases and postings on the county website.
- Involving elected and appointed county and municipal officials in a series of meetings, training sessions, and workshops.
- Identifying capabilities and reviewed the information with the municipalities.
- Identifying hazards.
- Assessment of risk and analyzing vulnerabilities.
- Identifying mitigation strategies, goals, and objectives.
- Developing an implementation plan.
- Announcing completion via press releases and postings on the county website.
- Plan adoption at a public meeting of the Potter County Board of Commissioners.
- Plan submission to FEMA and PEMA.

The 2024 Potter County HMP was completed December 31st, 2024. The 2024 plan follows an outline developed by PEMA which provides a standardized format for all local HMPs in the Commonwealth of Pennsylvania. The 2024 HMP format is consistent with the PEMA recommended format. The 2024 Potter County HMP combined dam failure and levee failure profiles; and has added additional hazard profiles to the HMP, and these additional profiles increased the subsections in section 4.3 of the HMP.

3.2. The Planning Team

The 2024 Potter County Hazard Mitigation Plan update was led by the Potter County Steering Committee. The Potter County Steering Committee provided guidance and leadership for the overall project. The steering committee assisted MCM Consulting Group, Inc. with dissemination of information and administrative tasks. *Table 7 – Steering Committee* outlines the individuals that comprised this team.

Table 7 - Steering Committee

Potter County Hazard Mitigation Plan Update Steering Committee		
Name	Organization	Position
Glenn Dunn	Potter County EMA	Director
Kathleen Brooks	Potter County DES	Administrative Assistant
Michael Rearick	MCM Consulting Group, Inc.	Director of Operations
Adam Leister	MCM Consulting Group, Inc.	Senior GIS Consultant
Daniel Becker	MCM Consulting Group, Inc.	Consultant

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Potter County Hazard Mitigation Plan Update Steering Committee		
Name	Organization	Position
Valerie Zents	MCM Consulting Group, Inc.	Senior Consultant
Alyssa Rusnock	MCM Consulting Group, Inc.	Project Coordinator
Ashley Thoirs-Lawrence	MCM Consulting Group, Inc.	Project Coordinator

In order to represent the county, the Potter County Steering Committee developed a diversified list of potential local planning team (LPT) members. Members that participated in the 2018 hazard mitigation plan were highly encouraged to join the 2024 team. The steering committee then provided invitations to the prospective members and provided a description of duties to serve on the LPT. The invitations for members of the LPT were disseminated by the Potter County Department of Emergency Services utilizing letters, email, and telephone calls. The LPT worked throughout the process to plan and hold meetings, collect information, and conduct public outreach.

The stakeholders listed in *Table 8 – Local Planning Team* served on the 2024 Potter County Hazard Mitigation Local Planning Team, actively participated in the planning process by attending meetings, completing assessments, surveys, and worksheets and/or submitting comments. All potential local planning team members were presented with an email invitation prior to the local planning team kickoff meeting on 06/27/2023. Those invitation letters for the local planning team are included in Appendix C – Support Documentation of this hazard mitigation plan update.

Individuals representing local interests in dams were presented with the opportunity to participate in the local planning team. Emails were sent to officials involved in the ownership of dams. Increased participation for representatives for socially vulnerable and unserved populations in Potter County is a goal for the next planning period, and mitigation actions can be found in section 6.4.

Table 8 - Local Planning Team

Potter County Hazard Mitigation Plan Local Planning Team			
Name	Organization	Position	Invitation Date (via Email)
Kathleen Brooks	Potter County DES	Administrative Assistant	05/02/2023
Jason Childs	Potter County Conservation	Manager	05/02/2023
Pete Dibiase	Potter County GIS	GIS Tech	05/02/2023
Glenn Dunn	Potter County EMA	Director	05/02/2023

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Potter County Hazard Mitigation Plan Local Planning Team			
Name	Organization	Position	Invitation Date (via Email)
Glenn Dunn II	PCLD	Resource Conservationist	05/02/2023
Richard Duzick	PCHRA	Deputy Director	05/02/2023
Sheila Gabreski	Penn State Extension	Office Manager	05/02/2023
Patricia Galeotti	UPMC Cole	ED Coordinator	05/02/2023
Lynn Grupp	Eulalia Township	Supervisor	05/02/2023
Nancy Grupp	Potter County	Commissioner	05/02/2023
Barry Hayman	Potter County	Commissioner	05/02/2023
Will Hunt	Potter County Planning	Director	05/02/2023
Martin Kim	Cameron County EMA	Director	05/02/2023
Kal Logue	Potter County Community Development	Community Development	05/02/2023
Matt McCullough	FEMA	Community Planner	05/02/2023
Tom Mears	PA DEP	Emergency Manager	05/02/2023
Luke Mentzer	PA Game Commission	State Game Warden	05/02/2023
Tadd Ostroski	Hebron Township	Chairman EMC	05/02/2023
Marc Popchak	Bureau of Forestry	Assistant District Forester	05/02/2023
Gerard Rettger	McKean County EMA	Coordinator	05/02/2023
Andrew Dubots	Coudersport Borough	Mayor	05/02/2023
Steven Mehl	Clara Township	Supervisor	05/02/2023
Eric Allenbaugh	Bureau of Forestry	Assistant District Forester	05/02/2023

3.3. Meetings and Documentation

Meetings with local elected officials and the local planning team were held as needed. At each of the meetings, municipal officials were strongly encouraged to submit hazard mitigation project opportunity forms, complete their respective portions of the capability assessment, review and eventually adopt the multi-jurisdictional HMP. *Table 9 – HMP Process Timeline* lists the meetings held during the HMP planning process, which organizations and municipalities attended and the topic that was discussed at each meeting. All meeting agendas, sign-in sheets, presentation slides, and other documentation is in Appendix C.

The draft plan was made available for public review on January 2, 2024. The draft was advertised on Potter County’s social media page and was made available digitally on the Potter County website at:

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<https://pottercountypa.net/post.php?pid=24>

The public comment period remained open until February 2, 2024. All public comments were submitted via an online survey or in writing to Glenn Dunn the Potter County Emergency Management Agency Director. Public commenting was available during the public comment period via a Survey Monkey link that was advertised on the county website and social media pages. No public comments were received for this planning period, so no comments are included in Appendix C of this hazard mitigation plan update.

Table 9 - HMP Process Timeline

Potter County HMP Process Timeline		
Date	Meeting	Description
04/26/2023	Potter County Hazard Mitigation Steering Committee Kickoff Meeting	Meeting was used to determine individuals to invite to the local planning team and to review the draft project schedule.
06/27/2023	Potter County HMP Local Planning Team Kickoff Meeting	Meeting was used to review the project schedule and discuss roles and responsibilities for the hazard mitigation plan. Initial worksheets were introduced and reviewed (Hazard ID, capability assessments, project opportunity, and NFIP survey).
06/27/2023	Municipality Kickoff Meetings	Meeting was used to review the project schedule and discuss roles and responsibilities for the hazard mitigation plan at the municipal level. Initial worksheets were introduced and reviewed (Hazard ID, capability assessment, project opportunity, and NFIP survey).
07/18/2023	Local Planning Team Meeting - Risk Assessment	Meeting was used to discuss the results of the initial documentation request. Selection of hazards for the 2024 hazard mitigation plan was conducted. Risk factor scores were also updated based on changing conditions in Potter County since the 2019 HMP.

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Potter County HMP Process Timeline		
Date	Meeting	Description
08/15/2023	Local Planning Meeting - Team Mitigation Strategy	Meeting was used to review the initial documentation. The 2019 goals and objectives, mitigation actions, and mitigation project opportunities were also reviewed and discussed. 2024 mitigation strategy goals and objectives, and mitigation strategy actions were also discussed.
08/15/2023	Municipality Meeting - Mitigation Opportunity	The current schedule of the update process was reviewed as well as the initial worksheets and survey responses (capability assessments, hazard identification and risk evaluation, and NFIP). 2019 project opportunities were discussed. 2024 project opportunity forms were reviewed, including examples, form development and submission. 2024 mitigation action ideas were also discussed.
09/12/2023	Local Planning Team Meeting - Mitigation Strategy	The 2024 mitigation goals and objectives were finalized with the local planning team. Also, the 2024 mitigation actions and mitigation action plan were developed with the LPT.
09/26/2023	Local Planning Team Meeting - Mitigation Strategy	The 2024 mitigation actions were reviewed and updated based on LPT information and input. Also, the current worksheet submission status was reviewed with the LPT. The remaining municipalities that needed to submit paperwork were reviewed and an engagement plan was developed.
09/26/2023	Public Meeting - Risk Assessment Review	The risk assessment section of the 2024 hazard mitigation plan was reviewed with the public.
01/02/2024	Public Meeting - Draft Plan Presentation	The draft hazard mitigation plan was reviewed with the public.

3.4. Public and Stakeholder Participation

Potter County engaged numerous stakeholders and encouraged public participation during the HMP update process. Advertisements for public meetings were completed utilizing the local newspaper and the Potter County website. Copies of those advertisements are in Appendix C.

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Municipalities and other county entities were invited to participate in various meetings and encouraged to review and update various worksheets and surveys. Copies of all meeting agendas, meeting minutes and sign-in sheets are located in Appendix C. Worksheets and surveys completed by the municipalities and other stakeholders are located in appendices of this plan update as well. Municipalities were also encouraged to review hazard mitigation related items with other constituents located in the municipality like businesses, academia, private and nonprofit interests.

The tools listed below were distributed with meeting invitations, provided directly to municipalities for completion and return to the Potter County Department of Emergency Services or at meetings to solicit information, data, and comments from both local municipalities and other key stakeholders. Responses to these worksheets and surveys are available for review at the Potter County Department of Emergency Services.

1. **Risk Assessment Hazard Identification and Risk Evaluation Worksheet:** Capitalizes on local knowledge to evaluate the change in the frequency of occurrence, magnitude, or impact and/or geographic extent of existing hazards and allows communities to evaluate hazards not previously profiled using the Pennsylvania Standard List of Hazards.
2. **Capability Assessment Survey:** Collects information on local planning, regulatory, administrative, technical, fiscal, and political capabilities that can be included in the countywide mitigation strategy.
3. **Municipal Project Opportunity Forms and Mitigation Actions:** Copies of the 2019 mitigation opportunity forms that were included in the current HMP were provided to the municipalities for review and amendment. These opportunities are located in Appendix G. The previous mitigation actions were provided and reviewed at update meetings. New 2024 municipal project opportunity forms are included as well, located in Appendix G.

In an effort to capture public input, the Potter County LPT held in person meetings and offered on-line surveys. Members of the public were also encouraged to contact Potter County Department of Emergency Services or MCM Consulting Group, Inc. with any comments or questions regarding this update. Any public comment that was received during public meetings or during the draft review of the plan were documented and included in the plan. Copies of newspaper public meeting notices, website posted public notices, and other correspondence are included in Appendix C of this plan.

Potter County invited all contiguous counties to review the 2024 draft hazard mitigation plan. A letter was sent to the emergency management coordinator in Cameron, Clinton, Lycoming, McKean, and Tioga counties in Pennsylvania, on January 5th, 2024. Copies of these letters are included in Appendix C – Support Documentation.

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3.5. Multi-Jurisdictional Planning

Potter County used an open, public process to prepare this HMP. Meetings and letters to municipal officials were conducted to inform and educate them about hazard mitigation planning and its local requirements. Municipal officials provided information related to existing codes and ordinances, the risk and impacts of known hazards on local infrastructure and critical facilities and recommendations for related mitigation opportunities. The pinnacle to the municipal involvement process was the adoption of the final plan. *Table 10 – Municipality Worksheets, Surveys, and Forms Participation* reflects the municipalities participation by completing worksheets, surveys, and forms.

Table 10 - Municipality Worksheets, Surveys, and Forms Participation

Potter County HMP Worksheets, Surveys, and Forms Participation				
Municipality	Capability Assessment Survey	Risk Assessment Hazard Identification and Risk Evaluation Worksheet	NFIP	Hazard Mitigation Opportunity Form Review and Updates
Abbott Township	X	X	X	X
Allegany Township	X	X	X	
Austin Borough	X	X	X	X
Bingham Township	X	X	X	
Clara Township	X	X	X	
Coudersport Borough	X	X	X	
Eulalia Township	X	X	X	X
Galeton Borough	X	X	X	
Genesee Township	X	X	X	
Harrison Township	X	X	X	X
Hebron Township	X	X	X	X
Hector Township	X	X	X	
Homer Township	X	X	X	X
Keating Township	X	X	X	
Oswayo Borough	X	X	X	X
Oswayo Township	X	X	X	
Pike Township	X	X	X	X
Pleasant Valley Township	X	X	X	X
Portage Township	X	X	X	
Roulette Township	X	X	X	
Sharon Township	X	X	X	
Shinglehouse Borough	X	X	X	

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Potter County HMP Worksheets, Surveys, and Forms Participation				
Municipality	Capability Assessment Survey	Risk Assessment Hazard Identification and Risk Evaluation Worksheet	NFIP	Hazard Mitigation Opportunity Form Review and Updates
Stewardson Township	X	X	X	
Summit Township	X	X	X	X
Sweden Township	X	X	X	
Sylvania Township	X	X	X	
Ulysses Borough	X	X	X	
Ulysses Township	X	X	X	
West Branch Township	X	X	X	X
Wharton Township	X	X	X	

The majority of the thirty municipalities within Potter County adopted the 2018 Potter County Hazard Mitigation Plan as the municipal hazard mitigation plan. The goal of the Potter County Local Planning Team is to have 100% participation by municipalities in adopting the 2024 Potter County Hazard Mitigation Plan.

The table above was completed with the most accurate information available at the time of the writing of this Hazard Mitigation Plan Update. Since the writing of this plan, some of the municipalities listed above have provided information to Potter County which updates their participation status.

4. Risk Assessment

4.1. Update Process Summary

A key component to reducing future loss is to first have a clear understanding of what the current risks are and what steps may be taken to lessen their threat. The development of the risk assessment is a critical first step in the entire mitigation process, as it is an organized and coordinated way of assessing potential hazards and risks. The risk assessment identifies the effects of both natural and human-caused hazards and describes each hazard in terms of its frequency, severity, and county impact. Numerous hazards were identified as part of the process.

A risk assessment evaluates threats associated with a specific hazard and is defined by probability and frequency of occurrence, magnitude, severity, exposure, and consequences. The Potter County risk assessment provides in-depth knowledge of the hazards and vulnerabilities that affect Potter County and its municipalities. This document uses an all-hazards approach when evaluating the hazards that affect the county and the associated risks and impacts each hazard presents.

This risk assessment provides the basic information necessary to develop effective hazard mitigation/prevention strategies. Moreover, this document provides the foundation for the Potter County Emergency Operations Plan (EOP), local EOPs and other public and private emergency management plans.

The Potter County risk assessment is not a static document, but rather, is a biennial review requiring periodic updates. Potential future hazards include changing technology, new facilities and infrastructure, dynamic development patterns and demographic and socioeconomic changes into or out of hazard areas. By contrast, old hazards, such as brownfields and landfills, may pose new threats as county conditions evolve.

Using the best information available and geographic information systems (GIS) technologies, the county can objectively analyze its hazards and vulnerabilities. Assessing past events is limited by the number of occurrences, scope and changing circumstances. For example, ever-changing development patterns in Pennsylvania have a dynamic impact on traffic patterns, population density and distribution, storm water runoff and other related factors. Therefore, limiting the risk assessment to past events is myopic and inadequate.

The Potter County Local Planning Team (LPT) reviewed and assessed the change in risk for all natural and human-caused hazards identified in the 2019 hazard mitigation plan. The mitigation planning team then identified hazards that were outlined within the Pennsylvania Hazard Mitigation Plan but not included in the 2019 Potter County Hazard Mitigation Plan that could

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impact Potter County. The team utilized the hazard identification and risk evaluation worksheet that was provided by the Pennsylvania Emergency Management Agency.

The Potter County Steering Committee met with municipalities and provided guidance on how to complete the municipal hazard identification and risk evaluation worksheet. All of the municipalities in Potter County returned a completed worksheet. This information was combined with the county information to develop an overall list of hazards that would need to be profiled.

Once the natural and human-caused hazards were identified and profiled, the local planning team then completed a vulnerability assessment for each hazard. An inventory of vulnerable assets was completed utilizing GIS data and local planning team knowledge. The team used the most recent Potter County assessment data to estimate loss to particular hazards. Risk factor was then assessed to each of the twenty-eight hazards utilizing the hazard prioritization matrix. This assessment allows the county and its municipalities to focus on and prioritize local mitigation efforts on areas that are most likely to be damaged or require early response to a hazard event.

4.2. Hazard Identification

4.2.1. Presidential and Gubernatorial Disaster Declarations

Table 11 – Presidential & Gubernatorial Disaster Declaration contains a list of all Presidential and Gubernatorial disaster declarations that have affected Potter County and its municipalities from 1955 through 2022, according to the Pennsylvania Emergency Management Agency.

Table 11 - Presidential & Gubernatorial Disaster Declaration

Presidential Disaster Declarations and Gubernatorial Declarations and Proclamations		
Date	Hazard Event	Action
January, 1966	Heavy Snow	Gubernatorial Declaration
February, 1972	Heavy Snow	Gubernatorial Declaration
June, 1972	Flood (Agnes)	Presidential Disaster Declaration
February, 1974	Civil Disturbance – Trucker Strike	Gubernatorial Declaration
September, 1975	Flood (Eloise)	Presidential Disaster Declaration
January, 1977	Snowstorm	Presidential Declaration
January, 1978	Heavy Snow	Gubernatorial Declaration
February, 1978	Blizzard	Gubernatorial Declaration
July, 1991	Drought	Gubernatorial Declaration
March, 1993	Blizzard	Presidential Emergency Declaration
January, 1994	Severe Winter Storms	Presidential Disaster Declaration

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Presidential Disaster Declarations and Gubernatorial Declarations and Proclamations		
Date	Hazard Event	Action
September, 1995	Drought	Gubernatorial Declaration
January, 1996	Flooding	Presidential Disaster Declaration
January, 1996	Severe Winter Storms	Presidential Disaster Declaration
July, 1999	Drought	Gubernatorial Declaration
September, 1999	Hurricane Floyd	Presidential Disaster Declaration
September, 2004	Tropical Depression Ivan	Presidential Disaster Declaration
September, 2005	Hurricane Katrina	Presidential Emergency Declaration
June, 2006	Flooding	Presidential Proclamation of Emergency
September, 2006	Tropical Depression Ernesto	Gubernatorial Proclamation of Emergency
February, 2007	Severe Winter Storm	Gubernatorial Proclamation of Emergency
April, 2007	Severe Winter Storm	Gubernatorial Proclamation of Emergency
January, 2011	Severe Winter Storm	Gubernatorial Proclamation of Emergency – All counties
August, 2011	Tropical Storm Irene/Lee	Gubernatorial Proclamation of Emergency – All counties
April, 2012	Spring Winter Storms	Gubernatorial Proclamation of Emergency – All counties
October, 2012	Hurricane Sandy	Presidential Emergency Declaration
January, 2018	Opioid Crisis	Gubernatorial Proclamation of Emergency – All counties
August, 2018	Severe Weather	Gubernatorial Proclamation of Emergency – All counties
January, 2019	Severe Winter Event	Gubernatorial Proclamation of Emergency
March, 2020	COVID-19 Pandemic	Presidential Proclamation of Emergency
March, 2020	COVID-19 Pandemic	Presidential Disaster Declaration
March, 2020	COVID-19 Pandemic	Gubernatorial Proclamation of Emergency
December, 2020	Severe Winter Event	Gubernatorial Proclamation of Emergency

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Presidential Disaster Declarations and Gubernatorial Declarations and Proclamations		
Date	Hazard Event	Action
February, 2021	Severe Winter Event	Gubernatorial Proclamation of Emergency
April, 2021	Civil Disturbance	Gubernatorial Proclamation of Emergency
August, 2021	Hurricane Ida	Gubernatorial Proclamation of Emergency
Source: Pennsylvania Emergency Management Agency and Federal Emergency Management Agency, 2023		

4.2.2. Summary of Hazards

The Potter County LPT was provided with the Pennsylvania standard list of hazards to be considered for evaluation in the 2024 HMP Update. Following a review of the hazards considered in the 2019 HMP and the standard list of hazards, the local planning team decided that the 2024 plan should identify, profile, and analyze twenty-eight hazards. These twenty-eight hazards include all of the hazards profiled in the 2019 plan. The list below contains the hazards that have the potential to impact Potter County as identified through previous risk assessments, the Potter County Hazard Vulnerability Analysis and input from those who participated in the 2024 HMP update. Hazard profiles are included in Section 4.3 for each of these hazards.

Identified Natural Hazards

Drought

Drought is defined as a deficiency of precipitation experienced over an extended period of time, usually a season or more. Droughts increase the risk of other hazards, like wildfires, flash floods, and landslides or debris flows. This hazard is of particular concern in Pennsylvania due to the prevalence of farming and other water-dependent industries, water dependent recreation uses, and residents who depend on wells for drinking water.

Earthquake

An earthquake is the motion or trembling of the ground produced by sudden displacement of rock usually within the upper 10-20 miles of the Earth's crust. Earthquakes result from crustal strain, volcanism, landslides, or the collapse of underground caverns. Earthquakes can affect hundreds of thousands of square miles, cause damage to property measured in the tens of billions of dollars, result in loss of life and injury to hundreds of thousands of persons and disrupt the social and economic functioning of the affected area.

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Flooding, Flash Flooding, and Ice Jam Flooding

Flooding is the temporary condition of partial or complete inundation of normally dry land, and it is the most frequent and costly of all-natural hazards in Pennsylvania. Flash flooding is usually a result of heavy localized precipitation falling in a short time period over a given location, often along mountain streams and in urban areas where much of the ground is covered by impervious surfaces. Winter flooding can include ice jams which occur when warm temperatures and heavy rain cause snow to melt rapidly. Snow melt combined with heavy rains can cause frozen rivers to swell, which breaks the ice layer on top of a river. The ice layer often breaks into large chunks, which float downstream, piling up in narrow passages and near other obstructions such as bridges and dams.

Hailstorm

Hailstorms occur when ice crystals form within a low-pressure front due to the rapid rise of warm air into the upper atmosphere and the subsequent cooling of the air mass. Frozen droplets gradually accumulate on the ice crystals until, having developed sufficient weight, they fall as precipitation in the form of balls or irregularly shaped masses of ice greater than 0.75 inches in diameter. Hailstorms can cause significant damage to homes, vehicles, livestock, and people.

Hurricane/Tropical Storm

Hurricanes, tropical storms, and nor'easters are classified as cyclones and are any closed circulation developing around a low-pressure center in which the winds rotate counterclockwise (in the Northern Hemisphere) and whose diameter averages 10-30 miles across. Potential threats from hurricanes include powerful winds, heavy rainfall, storm surges, coastal and inland flooding, rip currents, tornadoes, and landslides. The Atlantic hurricane season runs from June 1 to November 30.

Invasive Species

An invasive species is a species that is not indigenous to the ecosystem under consideration and whose introduction causes or is likely to cause economic, environmental, or human harm. These species can be any type of organism: plant, fish, invertebrate, mammal, bird, disease, or pathogen.

Landslide

In a landslide, masses of rock, earth or debris move down a slope. Landslides can be caused by a variety of factors, including earthquakes, storms, fire, and human modification of land. Areas that are prone to landslide hazards include previous landslide areas, areas on or at the base of

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slopes, areas in or at the base of drainage hollows, developed hillsides with leach field septic systems, and areas recently burned by forest or brush fires.

Pandemic and Infectious Disease

A pandemic is a global outbreak of disease that occurs when a new virus emerges in the human population, spreading easily in a sustained manner, and causing serious illness. An epidemic describes a smaller scale infectious outbreak, within a region or population, that emerges at a disproportionate rate. Infectious disease outbreaks may be widely dispersed geographically, impact large numbers of the population, and could arrive in waves lasting several months at a time.

Radon Exposure

Radon is a radioactive gas produced by the breakdown of uranium in soil and rock that can lead to lung cancer in people exposed over a long period of time. Most exposure comes from breathing in radon gas that enters homes and buildings through foundation cracks and other openings. According to the DEP, approximately 40% of Pennsylvania homes have elevated radon levels.

Tornadoes/Windstorm

A tornado is a narrow, violently rotating column of air that extends from the base of a thunderstorm to the ground. About 1,250 tornadoes hit the U.S. each year, with about sixteen hitting Pennsylvania. Damaging winds exceeding 50-60 miles per hour can occur during tornadoes, severe thunderstorms, winter storms, or coastal storms. These winds can have severe impacts on buildings, pulling off the roof covering, roof deck, or wall siding and pushing or pulling off the windows.

Wildfire

A wildfire is an unplanned fire that burns in a natural area. Wildfires can cause injuries or death and can ruin homes in their path. Wildfires can be caused by humans or lightning, and can happen anytime, though the risk increases in period of little rain. In Pennsylvania, 98% of wildfires are caused by people.

Winter Storm

A winter storm is a storm in which the main types of precipitation are snow, sleet, or freezing rain. A winter storm can range from a moderate snowfall or ice event over a period of a few hours to blizzard conditions with wind-driven snow that lasts for several days. Most deaths from winter storms are not directly related to the storm itself, but result from traffic accidents on icy

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roads, medical emergencies while shoveling snow, or hypothermia from prolonged exposure to cold.

Identified Human Caused Hazards

Building/Structural Collapse/Blighted Properties

Buildings and other engineered structures, including bridges, may collapse if their structural integrity is compromised, especially due to effects from other natural or human-made hazards. Older buildings or structures, structures that are not built to standard codes, or structures that have been weakened are more susceptible to be affected by these hazards.

Civil Disturbance

A civil disturbance is defined by FEMA as a civil unrest activity (such as a demonstration, riot, or strike) that disrupts a community and requires intervention to maintain public safety.

Dam Failure

Dam failure is the uncontrolled release of water (and any associated wastes) from a dam. This hazard often results from a combination of natural and human causes, and can follow other hazards such as hurricanes, earthquakes, and landslides. The consequences of dam failures can include property and environmental damage and loss of life.

Emergency Services

Emergency medical services (EMS) and fire department services play a crucial role in the emergency response system, and the functionality of these emergency services directly impacts many of the other hazard profiles in this report. Both EMS and fire services face challenges from lack of funding and lower rates of volunteerism.

Environmental Hazards/Hazardous Materials

Environmental hazards are hazards that pose threats to the natural environment, the built environment and public safety through the diffusion of harmful substances, materials, or products. Environmental hazards include the following:

- Hazardous material releases: at fixed facilities or as such materials are in transit and including toxic chemicals, infectious substances, biohazardous waste and any materials that are explosive, corrosive, flammable, or radioactive (PL 1990-165, § 207(e)).

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- Air or Water Pollution; the release of harmful chemical and waste materials into water bodies or the atmosphere, for example (National Institute of Health Sciences, July 2009; Environmental Protection Agency, Natural Disaster PSAs, 2009).
- Superfund Facilities: hazards originating from abandoned hazardous waste sites listed on the National Priorities List (Environmental Protection Agency, National Priorities List, 2009).
- Manure Spills: involving the release of stored or transported agricultural waste, for example (Environmental Protection Agency, Environmental Impacts of..., 1998).
- Product Defect or Contamination; highly flammable or otherwise unsafe consumer products and dangerous foods (Consumer Product Safety Commission, 2003).

Hazardous material releases can contaminate air, water, and soils and have the potential to cause injury or death. Dispersion can take place rapidly when transported by water and wind. While often accidental, releases can occur as a result of human carelessness, intentional acts, or natural hazards. When caused by natural hazards, these incidents are known as secondary events.

Levee Failure

A levee is a human-made structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control, or divert the flow of water to provide protection from temporary flooding (FEMA, 2016). A levee failure or breach occurs when a levee fails to prevent flooding on the landside of the levee. The consequences of a sudden levee failure can be catastrophic, with the resulting flooding causing loss of life, emergency evacuations, and significant property damage.

Nuclear Incidents

Nuclear explosions can cause significant damage and casualties from blast, heat, and radiation. The primary concern following a nuclear accident or nuclear attack is the extent of radiation, inhalation, and ingestion of radioactive isotopes which can cause acute health effects (e.g. death, burns, severe impairment), chronic health effects (e.g. cancer), and psychological effects.

Terrorism/Cyberterrorism Incidents

Terrorism is use of force or violence against persons or property with the intent to intimidate or coerce. Acts of terrorism include threats of terrorism; assassinations; kidnappings; hijackings; bomb scares and bombings; cyber-attacks (computer-based); and the use of chemical, biological, nuclear, and radiological weapons. Cyber-attacks have become an increasingly pressing concern. Cyberterrorism refers to acts of terrorism committed using computers, networks, and the internet.

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The most widely cited definition comes from Denning's Testimony before the Special Oversight Panel on Terrorism: "Cyberterrorism...is generally understood to mean unlawful attacks and threats of attack against computers, networks, and the information stored therein when done to intimidate or coerce a government or its people in furtherance of political or social objectives. Further, to qualify as cyberterrorism, an attack should result in violence against persons or property, or at least cause enough harm to generate fear".

Transportation Accidents

Transportation accidents are technological hazards involving the nation's system of land, sea, and air transportation infrastructure. A flaw or breakdown in any component of this system can and often does result in a major disaster involving loss of life, injuries, property and environmental damage, and economic consequences.

Urban Fire and Explosions

Urban fires and explosions include those fires and explosions that occur within urban, or developed, regions, and often pose an increased threat due to their tendency to easily spread to neighboring structures. The effects may be minor or severe and include injury, loss of life, property damage, and residential or economic disruption/displacement.

Utility Interruption

Utility interruption hazards are hazards that impair the functioning of important utilities in the energy, telecommunications and public works and information network sectors. Utility interruption hazards include the following:

- Geomagnetic Storms; including temporary disturbances of the Earth's magnetic field resulting in disruptions of communication, navigation, and satellite systems (National Research Council et al., 1986).
- Fuel or Resource Shortage; resulting from supply chain breaks or secondary to other hazard events, for example.
- Electromagnetic Pulse; originating from an explosion or fluctuating magnetic field and causing damaging current surges in electrical and electronic systems (Institute for Telecommunications Sciences, 1996).
- Information Technology Failure; due to software bugs, viruses, or improper use (Rainer Jr., et al, 1991).
- Ancillary Support Equipment; electrical generating, transmission, system-control, and distribution-system equipment for the energy industry (Hirst & Kirby, 1996).

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- Public Works Failure; damage to or failure of highways, flood control systems, deep-water ports and harbors, public buildings, bridges, dams, for example (United States Senate Committee on Environment and Public Works, 2009).
- Telecommunications System Failure; Damage to data transfer, communications, and processing equipment, for example (FEMA, 1997)
- Transmission Facility or Linear Utility Accident; liquefied natural gas leakages, explosions, facility problems, for example (United States Department of Energy, 2005)
- Major Energy, Power, Utility Failure; interruptions of generation and distribution, power outages, for example (United States Department of Energy, 2000).

4.2.3. Climate Change

Impacts of Climate Change on Identified Hazards

Humans have become the dominant species on Earth and our society and influence is globalized. Human activity such as the large-scale consumption of fossil fuels and de-forestation has caused atmospheric carbon dioxide concentrations to significantly increase and a notable diversity of species to go extinct. The result is rapid climate change unparalleled in Earth's history and an extinction event approaching the level of a mass extinction (Barnosky et al., 2011; Wake & Vredenburg, 2008). The corresponding rise of average atmospheric temperatures is intensifying many natural hazards, and further threatening biodiversity. The effects of climate change on these hazards are expected to intensify over time as temperatures continue to rise, so it is prudent to be aware of how climate change is impacting natural hazards.

The most obvious change is in regard to extreme temperature. As average atmospheric temperatures rise, extreme high temperatures become more threatening, with record high temperatures outnumbering record low temperatures 2:1 in recent years. As climate change intensifies, it is expected that the risk of extreme heat will be amplified whereas the risk of extreme cold will be attenuated. Some studies show increased insect activities during a similar rapid warming event in Earth's history. Other studies make projections that with the warming temperatures and lower annual precipitation that are expected with climate change, there will be an expansion of the suitable climate for mosquitos, potentially increasing the risk of infectious disease.

Climate change is likely to increase the risk of droughts (Section 4.3.1). Higher average temperatures mean that more precipitation will fall as rain rather than snow, snow will melt earlier in the spring, and evaporation and transpiration will increase. Along with the prospect of

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decreased annual precipitation, the risk of hydrological and agricultural drought is expected to increase (Sheffield & Wood, 2008). Correspondingly this will impact wildfires. Drought is accompanied by drier soils and forests, resulting in an elongated wildfire season and more intense and long-burning wildfires (Pechony & Shindell, 2010). However, the Southwest United States is at a greater risk of this increased drought and wildfire activity than Potter County in the Eastern United States.

While it may seem counterintuitive considering the increased risk of drought, there is also an increased risk of flooding associated with climate change (Section 4.3.3). Warmer temperatures mean more precipitation will fall as rain rather than snow. Combined with the fact that warmer air holds more moisture, the result is heavier and more intense rainfalls and dam and levee failures. Similarly, winter storms are expected to become more intense, if possibly less frequent. Climate change is also expected to result in more intense hurricanes and tropical storms. With the rise of atmospheric temperatures, ocean surface temperatures are rising, resulting in warmer and more moist conditions where tropical storms develop (Stott et al., 2010). A warmer ocean stores more energy and is capable of fueling stronger storms. It is projected that the Atlantic hurricane season is elongating, and there will be more category 4 and 5 hurricanes than before (Trenberth, 2010).

Climate change is contributing to the introduction of new invasive species (Section 4.3.5). As maximum and minimum seasonal temperatures change, non-native species are able to establish themselves in previously inhospitable climates where they have a competitive advantage. This may shift the dominance of ecosystems in the favor of non-native species, contributing to species loss and the risk of extinction.

This type of sudden global change is novel to humanity. Despite the myriad of well thought out research, there is still much uncertainty surrounding the future of the Earth. All signs point to the intensification of the hazards mentioned above, especially if human society and individuals do not make swift and significant changes combat species losses.

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4.3. Hazard Profiles

4.3.1. Drought

4.3.1.1 Location and Extent

While Pennsylvania is generally more water-rich than many U.S. states, the commonwealth may experience drought conditions intermittently throughout the calendar year. A drought is broadly defined as a time period of prolonged dryness that contributes to the depletion of ground and surface water. Droughts are regional climatic events, so when such an event occurs in Potter County, impacts are not restricted to the county and are often more widespread. The spatial extent of the impacted area can range from localized areas in Pennsylvania to the entire Mid-Atlantic region.

There are three types of droughts:

Meteorological Drought – A deficiency of moisture in the atmosphere compared to average conditions. Meteorological drought is defined by the duration of the deficit and degree of dryness and is often associated with below average rainfall. Depending on the severity of the drought, it may or may not have a significant impact on agriculture and the water supply.

Agricultural Drought – A drought inhibiting the growth of crops, due to a moisture deficiency in the soil. Agricultural drought is linked to meteorological and hydrologic drought.

Hydrologic Drought – A prolonged period without rainfall that has an adverse effect on streams, lakes, and groundwater levels, potentially impacting agriculture.

Droughts are often the leading contributing factor to wildfires, as they leave areas with little to no moisture.

4.3.1.2 Range of Magnitude

The average annual precipitation of 44.27 inches (rain) occurs primarily during the spring and summer months. This value is derived from averaging ten years of mean annual precipitation data for Potter County. Rural farming areas of Potter County are most at risk when a drought occurs. A drought can create a significant financial burden for the community. Approximately 99% of Potter County farms are family-owned and operated. Additionally, 47% of the county farmland use is devoted to crop cultivation and 11% to livestock and poultry. Wildfires are often the most severe secondary effect associated with drought. Wildfires can devastate wooded and agricultural areas, structures near high wildfire loads, and farm production facilities, and threaten natural resources. Prolonged drought conditions can have a lasting impact on the economy and can cause major ecological changes, such as increases in scrub growth, flash flooding, and soil erosion.

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Long-term water shortages during severe drought conditions can have a significant impact on agribusiness, public utilities, and other industries reliant on water for production services. Potter County also has a growing agritourism business that would be threatened by long-term drought.

Local municipalities may, with the approval of the Pennsylvania Emergency Management Council, implement local water rationing. These individual water rationing plans, authorized through provisions of 4 PA code Chapter 120, will require specific limits on individual water consumption to achieve significant reductions in use. Under mandatory water usage restrictions imposed by the commonwealth and/or local municipalities, procedures are provided for granting of variances to consider individual hardships and economic dislocations. *Table 12 – Drought Preparation Phases* shows the FEMA-defined levels of drought severity along with suggested actions, requests, and goals.

Table 12 - Drought Preparation Phases

Drought Preparation Phases				
Phase	General Activity	Actions	Request	Goal
Drought Watch	Early stages of planning and alert for drought possibility.	Increased water monitoring, awareness, and preparation for response among government agencies, public water suppliers, water users, and the public.	Voluntary water conservation.	Reduce water use by 5%.
Drought Warning	Coordinate a response to imminent drought conditions and potential water shortages.	Reduce shortages – relieve stressed sources, develop new sources if needed.	Continue voluntary water conservation, impose mandatory water use restrictions if needed.	Reduce water use by 10 – 15%.
Drought Emergency	Management of operations to regulate all available resources and respond to emergency.	Support essential and high priority water uses and avoid unnecessary uses.	Possible restrictions on all nonessential water uses.	Reduced water use by 15%.
Source: Pennsylvania Department of Environmental Protection, 2017				

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The commonwealth uses five parameters to assess drought conditions:

- Stream flows (compared to benchmark records)
- Precipitation (measured as the departure from normal, thirty-year average precipitation)
- Reservoir storage levels in a variety of locations such as three New York City reservoirs in the upper Delaware River Basin
- Groundwater elevations in a number of counties (comparing to past month, past year, and historic records)
- Soil moisture via the Palmer Drought Index as seen in *Table 13 – Palmer Drought Severity Index*, which is a soil moisture algorithm calibrated for relatively homogenous regions which measures dryness based on recent precipitation and temperature.

Table 13 - Palmer Drought Severity Index

Palmer Drought Severity Index (PDSI)	
Severity Category	PDSI Value
Extremely Wet	4.0 or more
Very Wet	3.0 to 3.99
Moderately Wet	2.0 to 2.99
Slightly Wet	1.0 to 1.99
Incipient Dry Spell	0.5 to 0.99
Near Normal	0.49 to -0.49
Incipient Dry Spell	-0.5 to -0.99
Mild Drought	-1.0 to -1.99
Moderate Drought	-2.0 to -2.99
Severe Drought	-3.0 to -3.99
Extreme Drought	-4.0 or less

The effects of a drought can be far-reaching both economically and environmentally. Economic impacts include reduced productivity of aquatic resources, mandatory water use restrictions, well failures, cutbacks in industrial production, agricultural losses, and limited recreational opportunities. Environmental impacts of drought include the following: *Table 14 – Economic and Environmental Impacts of Drought Events* qualifies the potential economic and environmental impacts from a drought event.

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Table 14 - Economic and Environmental Impacts of Drought Events

Economic and Environmental Impacts of Drought Events	
Economic	Environmental
<ul style="list-style-type: none"> - Reduced productivity of aquatic resources - Mandatory water use restrictions - Well failures - Cutbacks in industrial production - Agricultural losses - Limited recreational opportunities 	<ul style="list-style-type: none"> - Hydrologic effects - Adverse effects on animal populations - Damage to plant communities - Increased number and severity of fires - Reduced soil quality - Air quality effects - Loss of quality in landscape

4.3.1.3 Past Occurrence

The Pennsylvania Department of Environmental Protection (PA DEP) maintains the most comprehensive data on drought occurrences across the commonwealth. Descriptions of drought status categories (i.e., watch, warning, and emergency) are included in the “Range of Magnitude” section above. The declared drought status from 1980 to 2021 is shown in *Table 15 – Past Drought Events in Potter County*.

The National Oceanic and Atmospheric Administration (NOAA) has archived records showing extreme droughts for the commonwealth in 1931 and a prolonged event in the 1960s as seen in *Figure 8 – Pennsylvania Palmer Drought Index 1900 – 1999*.

Based on the county’s more recent disaster history and other drought occurrence data, the worst drought event in Potter County occurred in the summer of 1999. Extended dry weather spurred Governor Thomas Ridge to declare a drought emergency in fifty-five counties. During this event, precipitation deficits for that summer averaged five to seven inches below normal; the Susquehanna River hit record low flows, streams were dry, and many wells were depleted. Crop damage losses totaled over \$500 million statewide, and those losses equated to 70% to 100% of crop production. There were additional losses from the decline of milk production. Also, the state asked municipal and private water suppliers to restrict local water use.

Table 15 - Past Drought Events in Potter County

Past Drought Events in Potter County			
Start Date	End Date	Drought Status	Event Duration (Days)
11/18/1980	04/20/1982	Emergency	518
04/26/1985	07/29/1985	Watch	94
07/29/1985	10/22/1985	Watch	85
10/22/1985	10/29/1985	Watch	7
10/29/1985	12/19/1985	Watch	51

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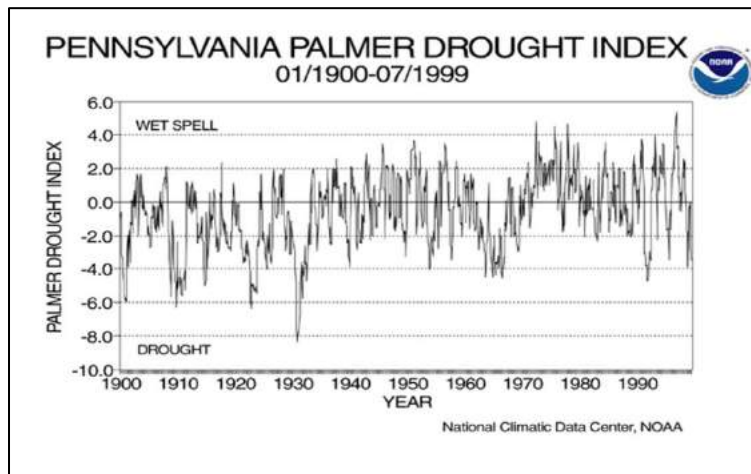
Past Drought Events in Potter County			
Start Date	End Date	Drought Status	Event Duration (Days)
07/07/1988	08/24/1988	Watch	48
08/24/1988	12/12/1988	Warning	110
03/03/1989	05/15/1989	Watch	73
06/28/1991	07/24/1991	Warning	26
07/24/1991	08/16/1991	Emergency	23
08/16/1991	09/13/1991	Emergency	28
09/13/1991	10/21/1991	Emergency	38
10/21/1991	01/16/1992	Emergency	87
01/17/1992	04/20/1992	Emergency	94
04/20/1992	06/23/1992	Warning	64
06/23/1992	09/11/1992	Watch	80
09/01/1995	09/20/1995	Warning	19
09/20/1995	11/08/1995	Emergency	49
11/08/1995	12/18/1995	Emergency	40
07/17/1997	10/27/1997	Watch	102
10/27/1997	11/13/1997	Watch	17
12/02/1998	12/08/1998	Watch	6
12/08/1998	12/14/1998	Warning	6
12/14/1998	12/16/1998	Warning	2
12/16/1998	01/15/1999	Warning	30
01/15/1999	03/15/1999	Warning	59
03/15/1999	06/10/1999	Watch	87
06/10/1999	06/18/1999	Warning	8
06/18/1999	07/20/1999	Warning	32
07/20/1999	09/30/1999	Emergency	72
09/30/1999	12/16/1999	Warning	77
12/16/1999	02/25/2000	Warning	71
02/25/2000	05/05/2000	Watch	70
08/24/2001	11/06/2001	Watch	74
11/06/2001	12/05/2001	Watch	29
12/05/2001	02/12/2002	Watch	69
02/12/2002	05/13/2002	Watch	90
09/05/2002	11/07/2002	Watch	63
11/07/2002	12/19/2002	Watch	42
04/11/2006	06/30/2006	Watch	80
08/06/2007	09/05/2007	Watch	30
08/05/2007	10/02/2007	Watch	58
10/05/2007	01/11/2008	Watch	98

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Past Drought Events in Potter County			
Start Date	End Date	Drought Status	Event Duration (Days)
01/11/2008	02/15/2008	Watch	35
11/07/2008	01/26/2009	Watch	80
09/16/2010	11/10/2010	Watch	55
08/05/2011	09/02/2011	Warning	28
09/02/2011	10/12/2011	Watch	40
03/24/2015	06/17/2015	Watch	85
06/17/2015	07/10/2015	Watch	23
08/02/2016	09/06/2016	Warning	35
09/06/2016	11/03/2016	Warning	58
08/21/2020	09/10/2020	Watch	20
09/10/2020	09/30/2020	Warning	20
09/30/2020	10/28/2020	Warning	28
10/28/2020	11/17/2020	Warning	20
11/17/2020	01/07/2021	Warning	51
08/31/2022	10/17/2022	Watch	47
10/17/2022	12/08/2022	Watch	52
12/08/2022	01/20/2023	Watch	43
06/15/2023	Ongoing	Watch	Ongoing

Source: Pennsylvania Department of Environmental Protection, 2023
 **Gubernatorial Disaster Declaration

Figure 8 - Pennsylvania Palmer Drought Index 1900 – 1999



The warmest July on record in Pennsylvania occurred in 2020, and sixteen counties entered Drought Watch status on August 21 of that year. In June 2021, dry conditions were again

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affecting the commonwealth. *Figure 11 – U.S. Drought Monitor, Pennsylvania* illustrates the conditions of drought in Pennsylvania at the time of the report.

4.3.1.4 Future Occurrence

It is difficult to forecast the exact severity and frequency of future drought events. Climate change will lead to increased uncertainty and extremity of climate events. Potter County has experienced severe drought between 5% to 10% of the time between 1895 and 1995 as seen in *Figure 9 – Palmer Drought Severity Index*. This report can be used to make a rough estimate of the future probability of drought in Potter County, although it does not account for changes introduced by climate change. Drought conditions are expected to become more severe with climate change, as evaporation and transpiration will increase with higher temperatures.

Figure 9 - Palmer Drought Severity Index

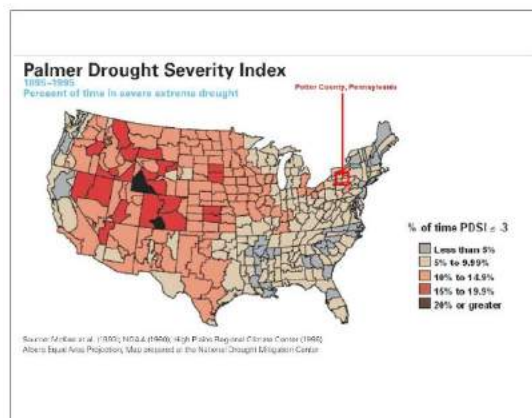
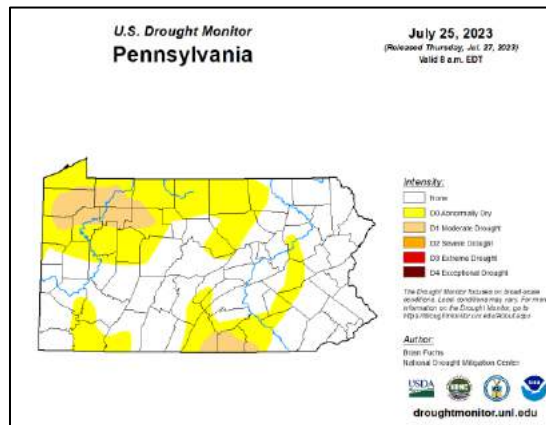


Figure 10 – Current Drought Index for Pennsylvania below shows that Potter County is currently in normal conditions.

Figure 10 - Current Drought Index for Pennsylvania



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The potential for a drought to occur in Potter County is high. Given the frequency of drought watches issued for Potter County and its municipalities, the county can reasonably expect to be under a drought watch at least once per year. While some form of drought condition frequently exists in Potter County, the impact depends on the duration of the event, severity of conditions, and area affected. The map above shows that Potter County, and most of Pennsylvania, is currently (and most often) in normal (non-drought) conditions.

As stated above in Section 4.2.3, climate change will have an effect on the frequency of droughts in the future. As global temperatures rise, weather patterns will change, increasing the number of dry days an area experiences. This could result in more drought periods for a local or regional area. Droughts could also become longer in duration, compared with pre-climate change patterns.

4.3.1.5 Vulnerability Assessment

The magnitude of drought vulnerability depends on the duration and area of impact. However, other factors contribute to the severity of a drought. Unseasonably high temperatures, prolonged winds, and low humidity can heighten the impact of a drought.

Extended periods of drought can lead to lowered stream levels, altering the delicate balance of riverine ecosystems. Certain tree species are susceptible to fungal infections during prolonged periods of soil moisture deficit. Fall droughts pose a particular threat because groundwater levels are typically at their lowest following the height of the summer growing season.

There are many hazards that can be considered cascading hazards related to drought events. Wildfire is the most severe cascading hazard effect associated with drought. Wildfires can devastate wooded and agricultural areas, threatening natural resources and farm production facilities. With drought events, water infiltration into the ground becomes more difficult. This lack of infiltration can result in flash flooding events in areas of steep slopes, canyons, and rolling hills. A loss of vegetation from a drought can also increase the occurrence of landslides in areas of steep slopes with loose packed soil profiles. A discussion on the county's vulnerability to wildfire, flash floods, and landslides can be found in Section 4.3.11.5, 4.3.3.5, and 4.3.6.5 respectively.

Droughts can have adverse effects on farms and other water-dependent industries resulting in local economic loss. Areas of extensive agriculture use are particularly vulnerable to drought; 97,780 acres of Potter County, or roughly 14% of the 692,480 acres total land acreage, make up farmland (United States Department of Agriculture [USDA], 2017 Census). The total number of farms for Potter County is 447 and the average acreage for farms in Potter County is 219 acres. Potter County ranks 39th of sixty-seven counties in the commonwealth for agricultural

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production, totaling over \$39.23 million annually. Agricultural production from crops, including nursery and greenhouse crops, accounts for more than \$10.7 million in commerce annually. Production from livestock, poultry, and their products accounts for \$28.5 million annually. The livestock that has the greatest potential to be impacted are the cattle and calves in Potter County and the poultry involved in egg production, or layers. There are approximately 14,857 cattle and calves and 2,062 layer chickens. Acreage for farming has increased since the 2012 USDA Census when there was a reported total of 96,689 farming and drought vulnerable acres. Information for an updated agricultural census will be released during the next planning period.

Potter County also has 879 domestic wells and five irrigation wells that would be adversely impacted by drought events. This impact would lead to lower water levels for at least 879 households and potentially five large farms. This well information was obtained by using the PA GEOCODE application to find well information from 01/01/2000 and 10/01/2023.

Additionally, emergency services can be adversely impacted by drought as a cascading hazard. Local fire departments often utilize ponds, creeks, and streams for water onboard fire apparatus. With low water levels in waterbodies, responders may be unable to draft enough water to efficiently respond to and extinguish a fire. Also, with an increased number of potential wildfires due to drought conditions, agencies may not have the personnel to efficiently respond to all fires in a timely manner.

A map of properties with tillable agricultural land use, forestry, and other land in the county vulnerable to drought is shown below in *Figure 12 – Drought-Vulnerable Land Use*.

All of the properties in Potter County that are part of the National Register of Historic Places have the same vulnerability to drought. No one property has a greater risk than the others, but each of the historic and cultural properties is vulnerable at some level.

Municipalities with high risk due to drought in Potter County:

- Abbott Township
- Allegany Township
- Austin Borough
- Bingham Township
- Clara Township
- Coudersport Borough
- Eulalia Township
- Galeton Borough
- Genesse Township
- Harrison Township
- Hebron Township
- Hector Township
- Homer Township
- Keating Township
- Oswayo Borough
- Oswayo Township
- Pike Township
- Pleasant Valley Township
- Portage Township
- Roulette Township

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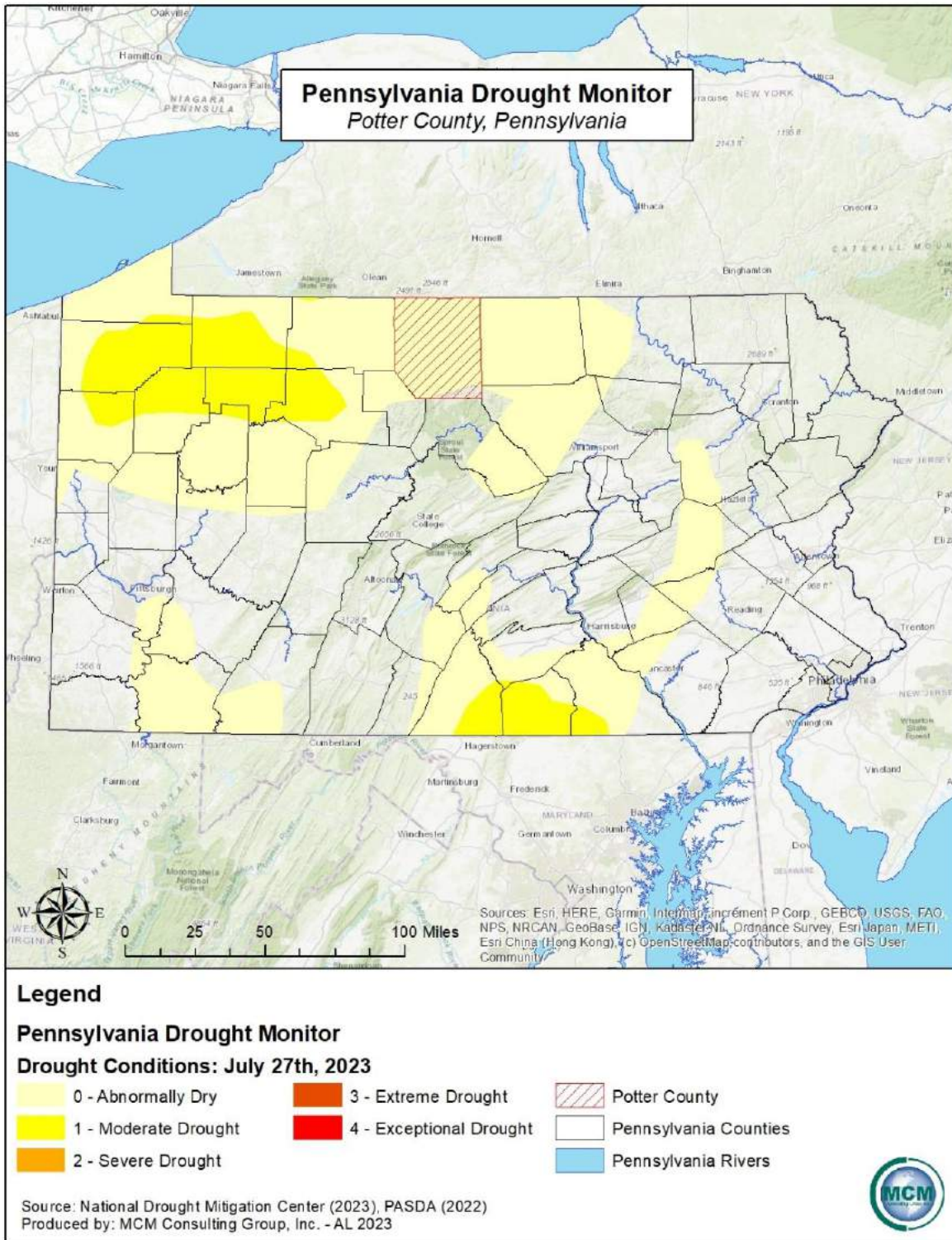
- Sharon Township
- Shinglehouse Borough
- Stewardson Township
- Summit Township
- Sweden Township
- Sylvania Township
- Ulysses Borough
- Ulysses Township
- West Branch Township
- Wharton Township

Drought in Potter County can have an adverse effect on land use, especially forested areas. Over 90% of the land cover in Potter County is forested areas to include deciduous, evergreen mixed deciduous and evergreen, forested wetlands, and emergent wetlands. There are three state game lands, and one state forest that make up a large portion of the county. Long periods of drought can increase the potential for wildfires and invasive species that could damage these forested areas. Economic benefits through the provision of wood products would also be affected.

As seen in *Table 3 – Population Change in Potter County*, twenty-two of the municipalities in Potter County have experienced a population loss since the previous decennial census in 2010. However, eight municipalities saw minor total population growth over the same period. Based on this information, it can be speculated that these eight municipalities may have an increased risk to drought conditions, since 2010, due to the increase in population.

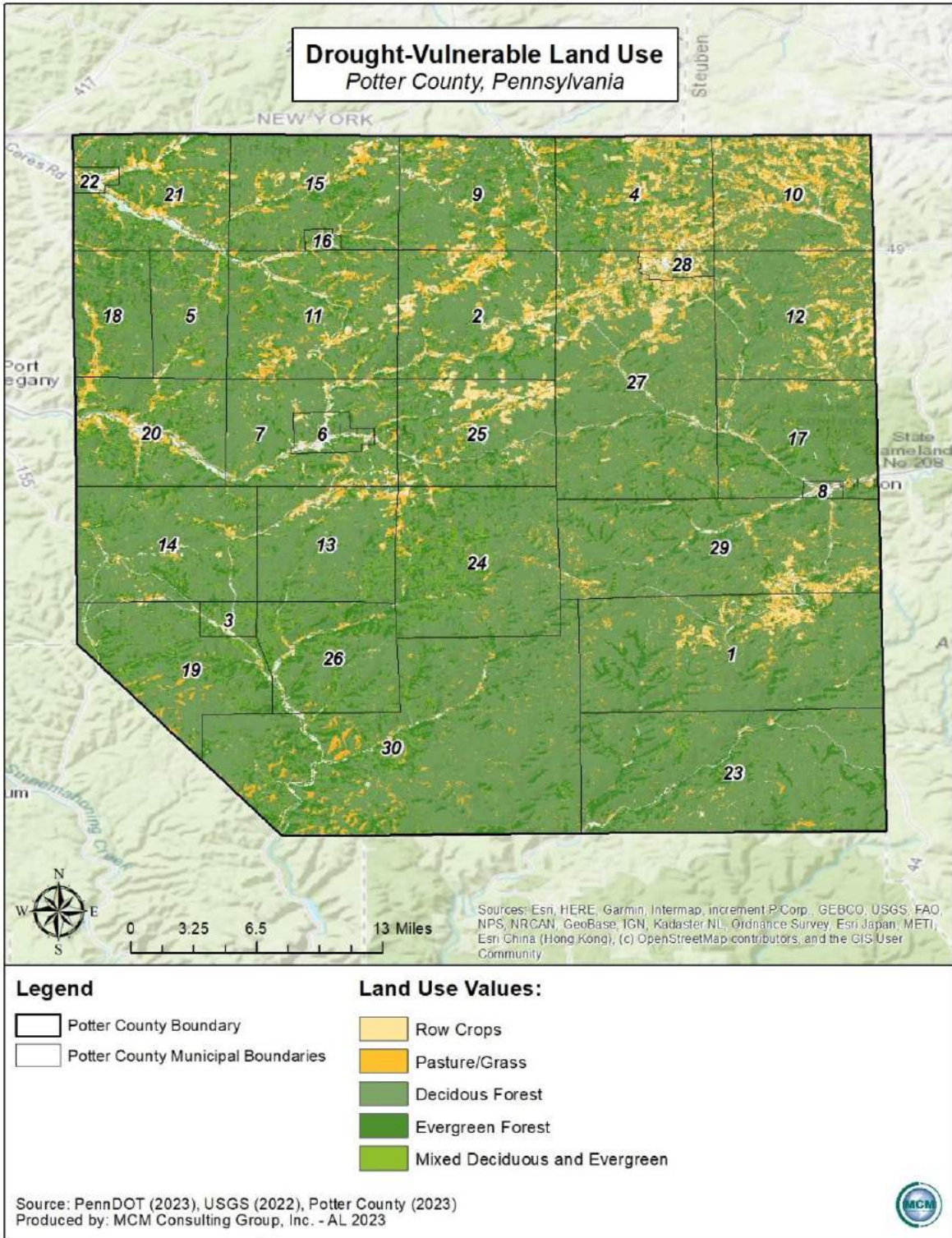
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Figure 11 - U.S. Drought Monitor, Pennsylvania



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Figure 12 - Drought-Vulnerable Land Use



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4.3.2. Earthquake

4.3.2.1 Location and Extent

An earthquake is sudden movement of the earth’s surface caused by the release of stress accumulated within or along the edge of the earth’s tectonic plates, a volcanic eruption, or by a human induced explosion (DCNR, 2007). Earthquake events in Pennsylvania, including Potter County, are usually mild events, impacting areas no greater than sixty miles in diameter from the epicenter. A majority of earthquakes occur along boundaries between tectonic plates, and some earthquakes occur at faults on the interior of plates. Today, Eastern North America, including Potter County, Pennsylvania, is far from the nearest plate boundary. That plate boundary is the Mid-Atlantic Ridge and is approximately 2,000 miles to the east, under the Atlantic Ocean. The Ramapo Fault System runs through New York, New Jersey, and eastern Pennsylvania (See *Figure 13 – Ramapo Fault System*). This fault system is associated with some small earthquakes, and it is thought unlikely to produce significant disruption.

Figure 13 - Ramapo Fault System



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When the supercontinent of Pangaea broke apart about 200 million years ago, the Atlantic Ocean began to form. Since then, many faults have developed. Locating all the faults would be an ideal approach to identifying the region’s earthquake hazard; however, many of the fault lines in this region have no seismicity associated with them. The best way to determine earthquake history for Potter County is to conduct a probabilistic earthquake-hazard analysis with the earthquakes that have already happened in and around the county. (See *Figure 14 – Pennsylvania Earthquake Hazard Zones*). Nevertheless, the United States Geological Survey (USGS) indicates that Potter County has a low earthquake risk, and no historical earthquake events have occurred.

Natural gas extraction of the Marcellus/Utica Shale formation (see *Figure 15 - Pennsylvania Oil and Gas Geology*) has occurred in many regions of the commonwealth, but eastern and southeastern Pennsylvania are not among them. Hydraulic fracturing, or fracking, is used to extract the gas, and the process is thought to lead to an increase in seismic activity (Meyer, 2016).

However, fracking does not appear to be linked to the increased rate of magnitude three and larger earthquakes (USGS 2014). In recent years, permits for extraction of the natural gas and oil in the commonwealth have been issued by the Pennsylvania Department of Environmental Protection, and 376 records of issued permits for gas extraction or injection wells were found from 2010 to present for Potter County at the writing of this plan.

4.3.2.2 Range of Magnitude

Earthquakes result in the propagation of seismic waves, which are detected using seismographs. These seismograph results are measured using the Richter Scale, an open-ended logarithmic scale that describes the energy release of an earthquake. *Table 16 – Richter Scale* summarizes Richter Scale magnitudes as they relate to the spatial extent of impacted areas. The Modified Mercalli Intensity Scale (*Table 17 – Modified Mercalli Intensity Scale*) is an alternative measure of earthquake intensity that is scaled by the impacts of the earthquake event. Earthquakes have many secondary impacts, including disrupting critical facilities, transportation routes, public water supplies and other utilities.

Table 16 - Richter Scale

Richter Scale	
Richter Magnitude	Earthquake Effects
Less than 3.5	Not generally felt but recorded.
3.5-5.4	Often felt, but rarely causes damage.

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Richter Scale	
Richter Magnitude	Earthquake Effects
Under 6.0	At most, slight damage to well-designed buildings; can cause major damage to poorly constructed buildings over small regions.
6.1-6.9	Can be destructive in areas where people live up to about 100 kilometers across.
7.0-7.9	Major earthquake; can cause serious damage over large areas.
8.0 or greater	Great earthquake; can cause serious damage in areas several hundred kilometers across.

Table 17 - Modified Mercalli Intensity Scale

Modified Mercalli Intensity Scale			
Scale	Intensity	Earthquake Effects	Richter Scale Magnitude
I	Instrumental	Detected only on seismographs.	<4.2
II	Feeble	Some people feel it.	
III	Slight	Felt by people resting, like a truck rumbling by.	
IV	Moderate	Felt by people walking.	
V	Slightly Strong	Sleepers awake; church bells ring.	<4.8
VI	Strong	Trees sway; suspended objects swing; objects fall off shelves.	<5.4
VII	Very Strong	Mild alarm, walls crack, plaster falls.	<6.1
VIII	Destructive	Moving cars uncontrollable, masonry fractures, poorly constructed buildings damaged.	<6.9
IX	Ruinous	Some houses collapse, ground cracks, pipes break open.	
X	Disastrous	Ground cracks profusely, many buildings destroyed, liquefaction and landslides widespread.	<7.3

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Modified Mercalli Intensity Scale			
Scale	Intensity	Earthquake Effects	Richter Scale Magnitude
XI	Very Disastrous	Most buildings and bridges collapse, roads, railways, pipes, and cables destroyed, general triggering of other hazards.	<8.1
XII	Catastrophic	Total destruction, trees fall, ground rises and falls in waves.	>8.1

4.3.2.3 Past Occurrence

According to USGS, no known earthquakes have had an epicenter within Potter County since 1724, before which local seismology cannot be known. However, several seismic events that occurred outside the county boundary may have been felt in the region.

On August 23, 2011, a 5.9 earthquake occurred in Virginia, and a 2.2 earthquake shook Reading, Pennsylvania (Berks County), on July 19, 2019. Further, a 3.4 earthquake struck Mifflintown (Juniata County) on June 13, 2019, and Bolivar (Westmoreland County) experienced a 2.9 event on October 6, 2020. Parts of the county may have experienced some of the shock waves from these minor earthquakes and others that have occurred around the region, most notably New Jersey. The strongest recorded earthquake in Pennsylvania history (5.2) occurred on September 25, 1998 in northwestern Pennsylvania and is known as the Pymatuning Earthquake for its epicenter near Pymatuning Lake. The effects of the earthquake were felt across the commonwealth and were blamed for many wells in the region near the epicenter losing their water, while new springs appeared, and old wells reemerged. A three-month data range revealed 120 dry household-supply wells on the ridge of Jamestown and Greenville, Pennsylvania. Declines of up to 100 feet were observed on a ridge where at least eighty of the wells resided. The degree of the damage varied. Some of the wells lost all power or could barely hold their yields and some of the water in wells turned black or began to smell of sulfur.

The most likely impetus of the wells drying was due to an increase in hydraulic conductivity of shale rock under this area caused by the earthquake. The quake affected the existing faults and created new faults in the shale. This created more permeability for the water to leak down from the hilltops on the ridge down to the valleys following the contours of the Meadville shale.

Because the effects of large earthquakes can be felt hundreds of miles away, the historical earthquake epicenters near Potter County are shown below at *Figure 16 – Pennsylvania*

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Earthquake Activity. A wider depiction of earthquake occurrences in the northeastern United States may be found here: <https://earthquake.usgs.gov/earthquakes/map/?extent=14.26438,-141.32813&extent=56.51102,-48.60352>

4.3.2.4 Future Occurrence

Earthquake activity and intensities are difficult to predict, but a probabilistic analysis of prior earthquakes can assist in gauging the likelihood of future occurrences. *Figure 14 – Earthquake Hazard Zones* shows that Potter County is in a low hazard zone for earthquake activity according to the USGS (2014), suggesting a low probability of earthquake occurrence. However, according to the USGS, there has been a recent trend increasing the frequency of magnitude three and larger earthquakes in the central and eastern U.S. (*Table 18 – Recent Earthquake Trends in Northeastern United States*). This uptick in seismicity may be due to hydraulic fracturing activities, and specifically occurs due to wastewater from the fracking process being injected into the earth (Meyer, 2016). Recent studies have moved towards being able to predict such induced seismicity by looking at uplift after injections, but more work needs to be done to confirm uplift as a reliable indicator of induced seismicity (Shirzei et al., 2016). It is important to note that seismicity can occur even after wells become inactive and injection rates decline (Shirzaei et al., 2016).

Isostatic Rebound is a hypothesis for earthquake occurrence that has been conceptualized for many years, according to Charles Scharnberger, a retired professor of geology at Millersville University, who monitors the seismic station there. Scharnberger said Pennsylvania earthquakes are somewhat of a mystery, but they could have something to do with the westward shift of the North American tectonic plate. Though the plates meet in California, where most of the seismic activity occurs, that movement still causes stress, squeezing and pressure along the entire length of the plate, reverberating as far back as the East Coast. A 3.4 earthquake like the one in Mifflintown, Juniata County in 2019 is in the medium range for Pennsylvania and may occur every couple of years. According to the USGS, this was the strongest earthquake felt or originating in Pennsylvania that year. It was followed by a 1.3 aftershock.

The chances of a devastating earthquake are low, but do exist, according to Scharnberger, His calculations on the probability of a severe earthquake based on the historic record indicate it is about a one in 200 chance in any given year.

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Table 18 - Recent Earthquake Trends in Northeastern United States

Earthquake Trends in Northeastern U.S.	
Year	Number of Magnitude 3+ Earthquakes
2015	0
2016	3
2017	4
2018	0
2019	5
2020	3
Source: USGS, 2020	

Climate change has the potential to increase the earthquake activity felt in the United States, including in Potter County. Although not a direct cause of earthquakes, climate change can worsen droughts and their duration. Droughts can exacerbate the fault lines in an area, resulting in a greater potential for seismology events. During droughts, groundwater is also increasingly pumped, which could cause changes in fault areas. This effect is more common on the west coast of the United States, but with climate change, these impacts can become more common across the country and the world.

4.3.2.5 Vulnerability Assessment

According to the U.S. Geological Society Earthquake Hazards Program, an earthquake hazard is anything associated with an earthquake that may affect a resident’s normal activities. For Potter County, this could include surface faulting, ground shaking, landslides, liquefaction, dried or rejuvenated water wells, tectonic deformation, and seiches (sloshing of a closed body of water from earthquake shaking).

Earthquakes usually occur without warning and can impact areas a great distance from their point of origin (epicenter). Ground shaking is the greatest risk to building damage within Potter County. Risk to public safety and loss of life from an earthquake is dependent upon the severity and proximity of the event. Injury or death to those inside buildings, or people walking below building ornamentation and chimneys is a higher risk to Potter County’s general public during an earthquake. Infrastructure is more at risk on the east coast than the west coast because its buildings are older.

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Potter County has a small number of historic and cultural properties that could be adversely impacted by earthquakes. There are two buildings in Potter County that are registered with the National Register of Historic Places. These locations are the Coudersport and Port Allegany Railroad Station (brick construction) and the Potter County Courthouse (masonry construction).

There is also one historic district in Potter County; the Coudersport Historic District. This district contains roughly seventy buildings that are considered historic in nature because of their design, use, and preservation. This area is centered around the Potter County Courthouse and includes many buildings in the downtown area of Coudersport. This area could see increased vulnerability because of construction practices at the time.

There are 714 bridges published by the Pennsylvania Department of Transportation that could be damaged and made unusable by a major earthquake event. These locations are evenly distributed throughout the county and damage to any of them would be detrimental to transportation and emergency response in Potter County.

Municipalities with high risk due to earthquake:

- Abbott Township
- Allegany Township
- Austin Borough
- Bingham Township
- Clara Township
- Coudersport Borough
- Eulalia Township
- Galeton Borough
- Genesse Township
- Harrison Township
- Hebron Township
- Hector Township
- Homer Township
- Keating Township
- Oswayo Borough
- Oswayo Township
- Pike Township
- Pleasant Valley Township
- Portage Township
- Roulette Township
- Sharon Township
- Shinglehouse Borough
- Stewardson Township
- Summit Township
- Sweden Township
- Sylvania Township
- Ulysses Borough
- Ulysses Township
- West Branch Township
- Wharton Township

As seen in *Table 3 – Population Change in Potter County*, twenty-two of the municipalities in Potter County have experienced a population loss since the previous decennial census in 2010. However, eight municipalities saw minor total population growth over the same period. Based on this information, it can be speculated that these eight municipalities may have an increased risk

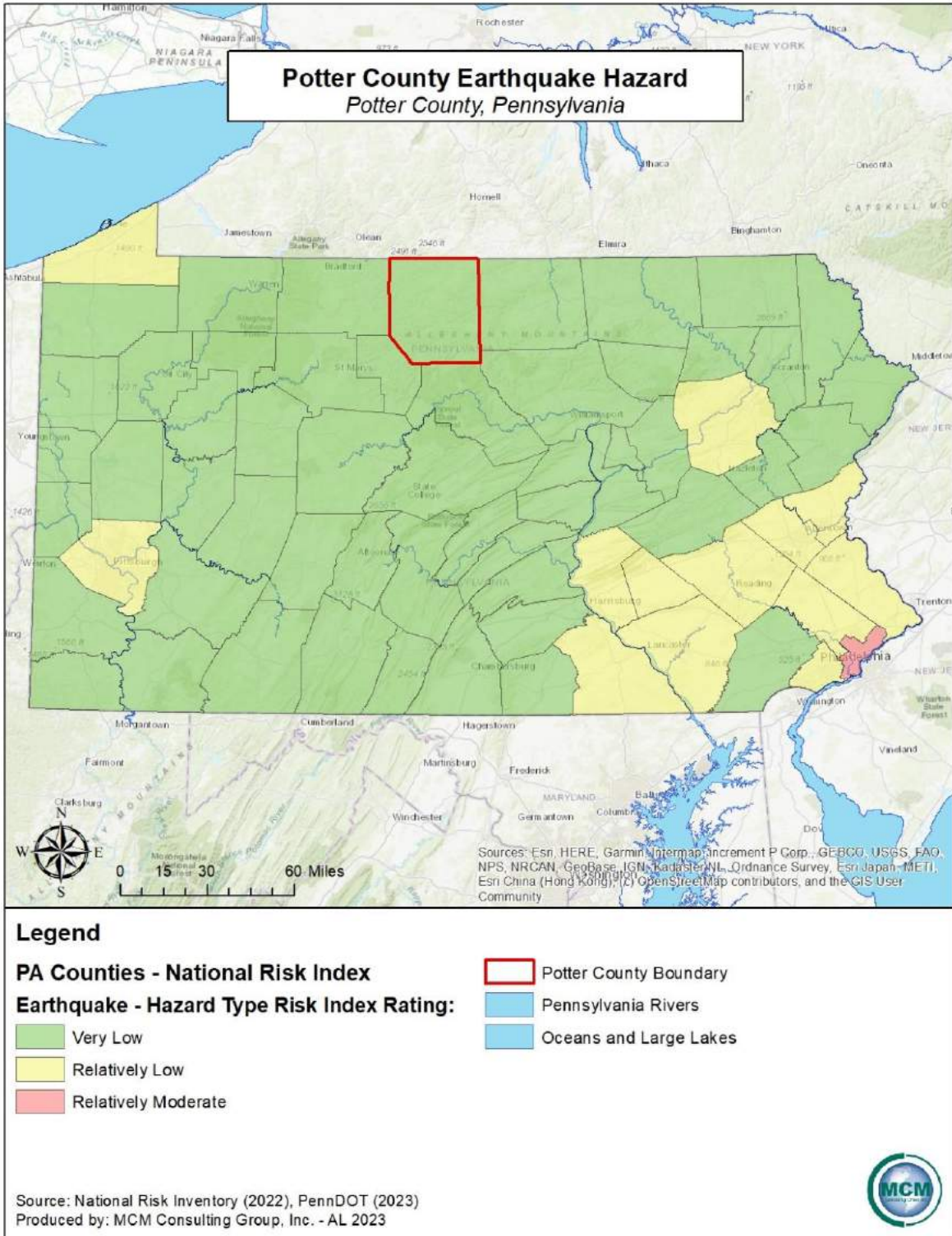
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of earthquakes due to the increase in population; however, all municipalities would have a risk of earthquakes.

Land use may factor into the potential impact of earthquakes for municipalities that have had a population change with increased building construction. With eight municipalities seeing minor population increases between 2010 and 2020, these has not been major increases in residential construction within Potter County.

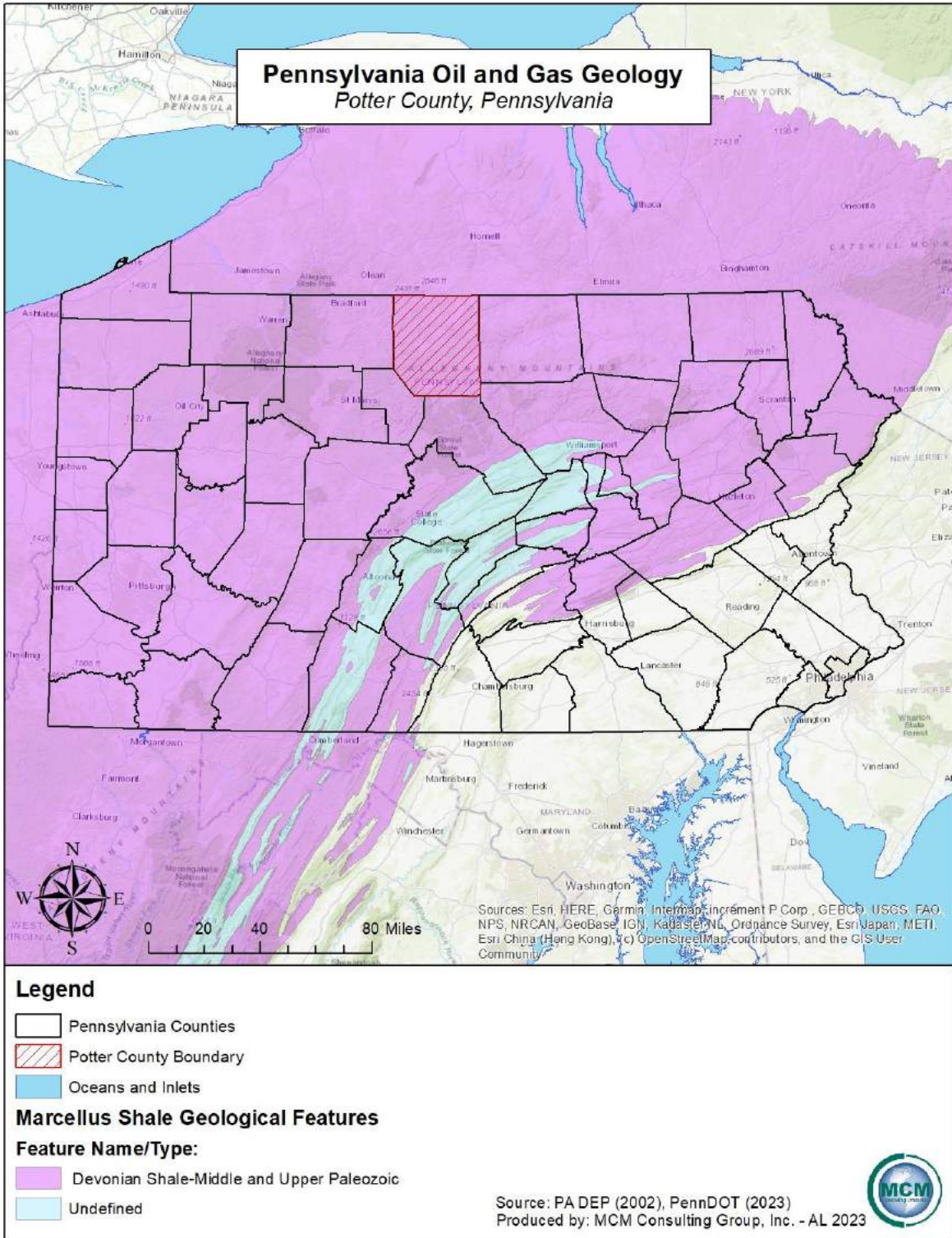
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Figure 14 - Pennsylvania Earthquake Hazard Zones



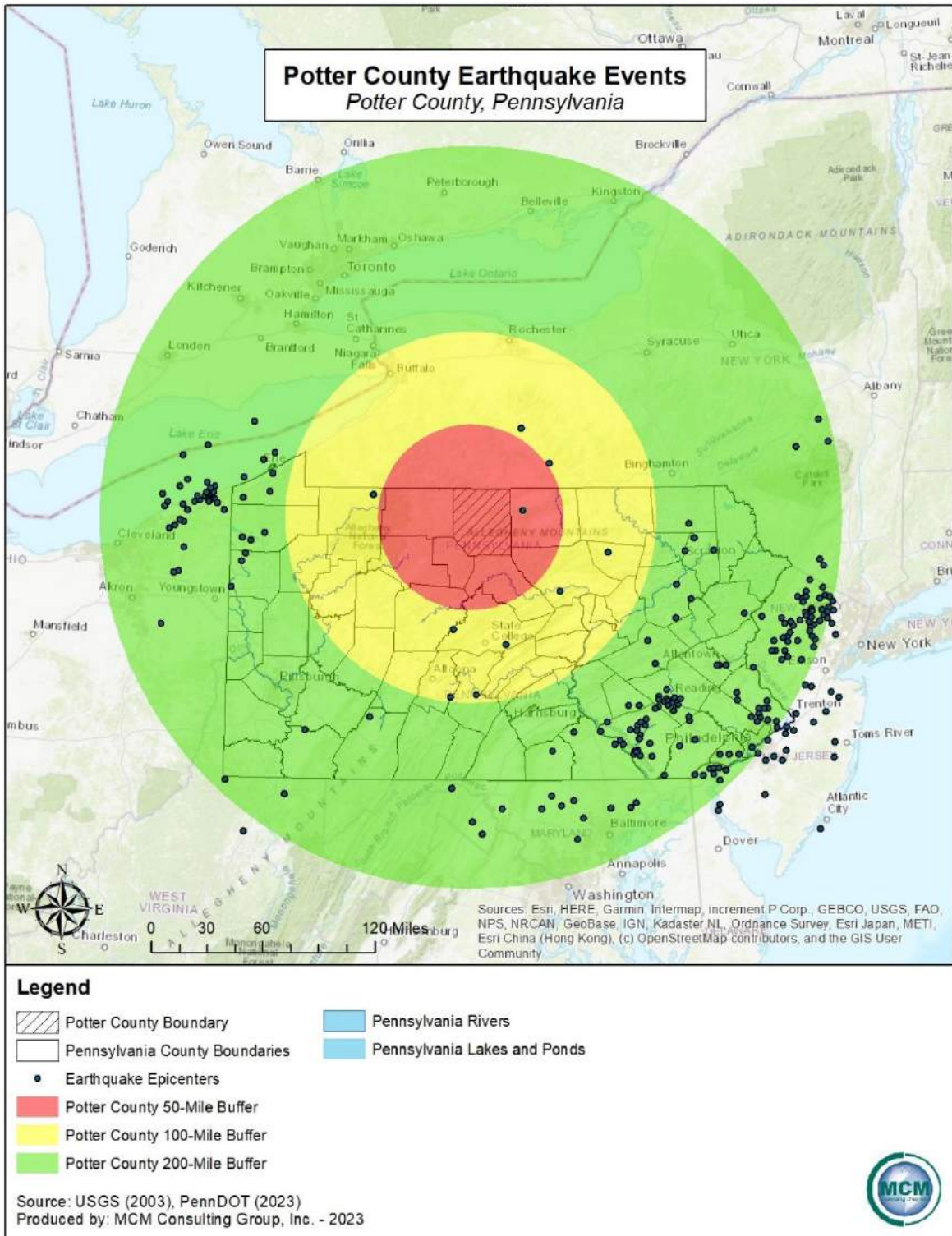
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Figure 15 - Pennsylvania Oil and Gas Geology



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Figure 16 - Pennsylvania Earthquake Activity



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4.3.3. Flooding, Flash Flooding, and Ice Jam Flooding

4.3.3.1 Location and Extent

Flooding is the temporary condition of partial or complete inundation on normally dry land and it is the most frequent and costly of all hazards in Pennsylvania. Flooding events are generally the result of excessive precipitation. General flooding is typically experienced when precipitation occurs over a given river basin for an extended period. Flash flooding is usually the result of heavy, localized precipitation falling in a short period of time over a given location, often in mountain streams and mountainous regions, and in urban areas where much of the ground is covered in impervious surfaces. Flash floods are relatively common in Potter County and the severity of those flood events is dependent upon a combination of creek, stream, and river basin topography and physiography, hydrology, precipitation, and weather patterns. Present soil conditions, the degree of vegetative clearing, and the presence of impervious cover must also be considered when determining the severity of a flood or flood event.

Winter flooding can include ice jams, which occur when warm temperatures and heavy rain cause snow to melt rapidly. Snow melt combined with heavy rains can cause frozen rivers to swell, which breaks the ice layer on top of a river. The ice layer often breaks into large chunks, which float downstream, piling up in narrow passages and near other obstructions such as bridges and dams. All forms of flooding can damage infrastructure.

Floodplains are lowlands adjacent to rivers, streams, and creeks that are subject to recurring floods. The size of the floodplain is described by the recurrence interval of a given flood event. Flood recurrence intervals are explained in more detail in section 4.3.3.4. However, in assessing the potential spatial extent of flooding, it is important to know that a floodplain associated with a flood that has a 10% chance of occurring in a given year is smaller than a floodplain associated with a flood that has a 0.2% chance of occurring.

The National Flood Insurance Program (NFIP) publishes digital flood insurance rate maps (DFIRMs). These maps identify the 1% annual chance of flood area. The special flood hazard area (SFHA) and base flood elevations (BFE) are developed from the 1% annual chance flood event as seen in *Figure 17 – Flooding and Floodplain Diagram*. Structure located within the SFHA have a 26% chance of flooding in a thirty-year period. The SFHA serves as the primary regulatory boundary used by FEMA, the Commonwealth of Pennsylvania, and the Potter County local government. Federal floodplain management regulations and mandatory flood insurance purchase requirements apply to the following high-risk special flood hazard areas in *Table 19 – Flood Hazard High Risk Zones*. Appendix D of this hazard mitigation plan includes a flooding vulnerability map for each municipality in Potter County with vulnerable structures and community lifeline facilities identified using the most current DFIRM data for Potter County.

Past flooding events have been primarily caused by heavy rains, which cause small creeks and streams to overflow their banks, often leading to road closures. Flooding poses a threat to

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community lifeline facilities, agricultural areas, and those who reside or conduct business in the floodplain. The most significant hazard exists for facilities in the floodplain that process, use, or store hazardous materials. A flood could potentially release and transport hazardous materials throughout the area. Most flood damage to a property and structure located in the floodplain is caused by water exposure to the interior, high velocity water, and debris flow.

Figure 17 - Flooding and Floodplain Diagram

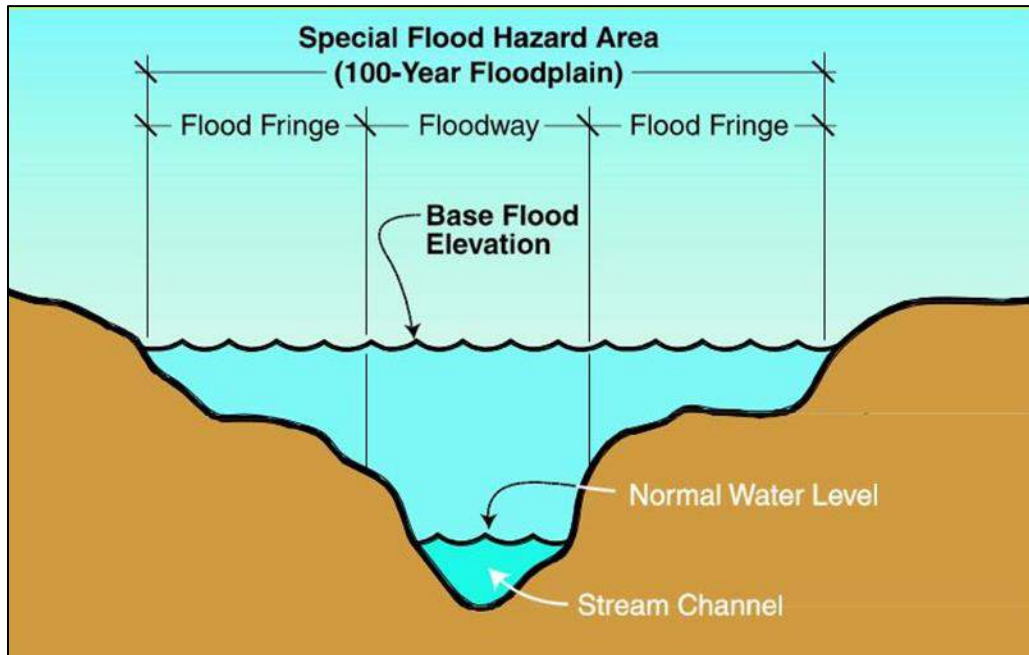


Table 19 - Flood Hazard High Risk Zones

Flood Hazard High Risk Zones	
Zone	Description
A	Areas subject to inundation by the 1% annual chance flood event. Because detailed hydraulic analysis has not been performed, no base flood elevations or flood depths are shown.
AE	Areas subject to inundation by the 1% annual chance flood event determined by detailed methods. BFEs are shown within these zones.
AH	Areas subject to inundation by the 1% annual chance shallow flooding (usually areas of ponding) where average depths are 1 – 3 feet. BFEs derived from detailed hydraulic analysis are shown in this zone.
AO	Areas subject to inundation by the 1% annual chance shallow flooding (usually sheet flow on sloping terrain) where average depths are 1 – 3 feet. Average flood depths derived from detailed hydraulic analysis are shown within this zone.

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Flood Hazard High Risk Zones	
Zone	Description
AR	Areas that result from the decertification of a previously accredited flood protection system that is determined to be in the process of being restored to provide base flood protection.
Source: FEMA, 2017	

4.3.3.2 Range of Magnitude

The Allegheny River basin and the Susquehanna River basin has caused significant flooding in Potter County, specifically on the following streams, creeks, and their tributaries:

- Allegheny River
 - Baker Creek
 - Card Creek
 - Fishing Creek
 - Mill Creek
 - Trout Brook
- Pine Creek
 - Genesee Forks
 - Nine Mile Run

Several factors determine the severity of floods, including rainfall intensity and duration, topography, ground cover, and the rate of snowmelt. Water runoff is greater in areas with steep slopes and little to no vegetative ground cover. The mountainous terrain of Potter County can cause more severe floods as runoff reaches receiving water bodies more rapidly over steep terrain. This is of particular concern for areas along steep slopes and on the edges of valleys throughout Potter County.

Urbanization typically results in the replacement of vegetative ground cover with impermeable surfaces like asphalt and concrete, increasing the volume of surface runoff and stormwater, particularly in areas with poorly planned stormwater drainage systems. A large amount of rainfall over a short time span can cause flash flood events. Flash floods can occur very quickly and with little warning. A flash flood can also be deadly because of the rapid rise in water levels and devastating flow velocities. The more developed areas in the county can be easily susceptible to flash floods because of the significant presence of impervious surfaces, such as streets, sidewalks, parking lots, and driveways. Additionally, small amounts of rain can cause floods in locations where the soil is still frozen, saturated from a previous wet period or if the area is largely covered in impermeable surfaces such as parking lots, paved roadways, and other developed areas. The county occasionally experiences intense rainfall from tropical storms in later summer and early fall, which can potentially cause flooding as well.

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Severe flooding can cause injuries and deaths and can have long-term impacts on the health and safety of citizens. Severe flooding can also result in significant property damage, potentially disrupting the regular function of community lifeline facilities and can have widespread negative effects on local economies. Industrial, commercial, and public infrastructure facilities can become inundated with flood waters, threatening the continuity of government and business. The vulnerable populations must be identified and located in flooding situations, as they are often home bound. Mobile homes and manufactured structures are especially vulnerable to high water levels. Flooding can have significant environmental impacts when the flood water release and/or transport hazardous materials.

Severe flooding also comes with secondary effects that could have long lasting impacts on the population, economy, and infrastructure within Potter County. Power failures are the most common secondary effect associated with flooding. Coupled with a shortage of critical services and supplies, power failures could cause a public health emergency. Community lifelines, such as sewage and water treatment facilities, can fail, causing sewage overflows and the contamination of groundwater and drinking water. Flooding also has the potential to trigger other hazards, such as landslides, hazardous material spills, and dam failures.

The maximum threat of flooding for Potter County is estimated by looking at the potential loss data and repetitive loss data, both analyzed in the risk assessment section of the hazard mitigation plan. In these cases, the severity and frequency of damage can result in permanent population displacement, and business may close if they are unable to recover from the disaster.

Estimation of potential loss is completed through FEMA’s HAZUS software, A level two HAZUS scenario was performed for the entirety of Potter County. The FEMA Global Flood Risk Report and other reports generated by the software at the end of the scenario were utilized to estimate the amount of damage and loss from a flood. The total building loss for a 100-year flood based on a HAZUS level two scenario is displayed in *Table 20 – HAZUS Building Economic Loss Figures*. The total business interruption vales occurring from a proposed 100-year flood based on FEMA HAZUS data is illustrated in *Table 21 – HAZUS Business Interruption Economic Loss Figures*. *Figure 18 – Loss by Occupancy Type* illustrates the breakdown of economic losses by either residential, commercial, industrial, or other use type.

Table 20 - HAZUS Building Loss Figures

HAZUS Building Economic Loss Figures					
	Residential	Commercial	Industrial	Other	Total
Building:	\$38,840,000.00	\$13,530,000.00	\$2,180,000.00	\$2,270,000.00	\$56,820,000.00
Content:	\$19,080,000.00	\$35,720,000.00	\$4,800,000.00	\$11,480,000.00	\$71,080,000.00
Inventory:	\$0.00	\$350,000.00	\$860,000.00	\$50,000.00	\$1,260,000.00
Subtotal:	\$57,920,000.00	\$49,600,000.00	\$7,840,000.00	\$13,800,000.00	\$129,160,000.00

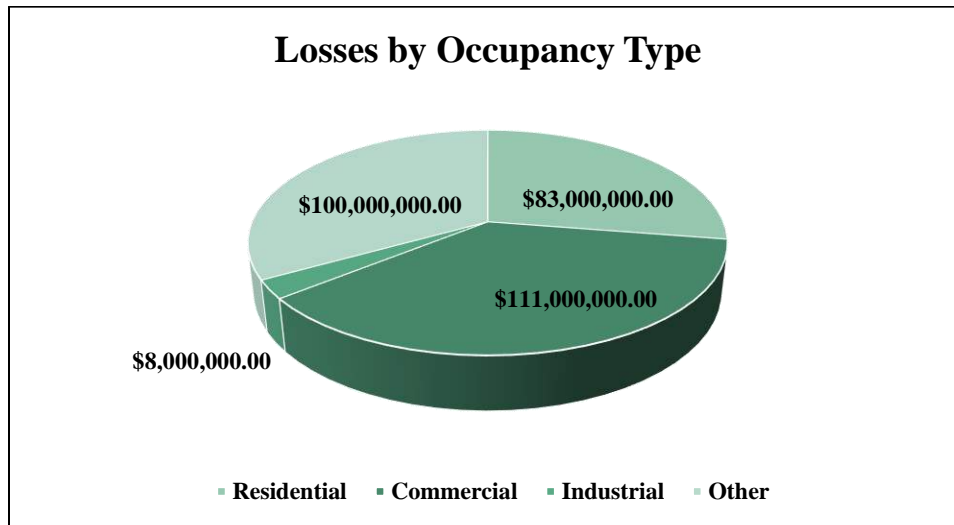
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HAZUS Building Economic Loss Figures					
	Residential	Commercial	Industrial	Other	Total
Source: HAZUS, 2023					

Table 21 - HAZUS Business Interruption Economic Loss

HAZUS Business Interruption Economic Loss Figures					
	Residential	Commercial	Industrial	Other	Total
Income:	\$890,000.00	\$20,350,000.00	\$110,000.00	\$3,490,000.00	\$24,840,000.00
Relocation:	\$16,870,000.00	\$7,910,000.00	\$90,000.00	\$2,210,000.00	\$27,080,000.00
Rental Income:	\$5,670,000.00	\$2,480,000.00	\$20,000.00	\$270,000.00	\$8,440,000.00
Wage:	\$2,110,000.00	\$30,390,000.00	\$180,000.00	\$80,160,000.00	\$112,840,000.00
Subtotal:	\$25,540,000.00	\$61,130,000.00	\$400,000.00	\$86,130,000.00	\$173,200,000.00
Source: HAZUS, 2023					

Figure 18 - Loss by Occupancy Type



Although floods can cause deaths, injuries, and damage to property, they are naturally occurring events that benefit riparian systems which have not been disrupted by human actions. Such benefits include groundwater recharge and the introduction of nutrient rich sediments which improves soil fertility. However, human development often disrupts natural riparian buffers by changing land use and land cover, and the introduction of chemical or biological contaminants that often accompany human presence and can contaminate habitats after flood events.

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4.3.3.3 Past Occurrence

Potter County has experienced numerous flooding, flash flooding, and ice jam events in the past. The flooding and flash flooding were caused by a variety of heavy storms, inclement weather, tropical storms, and other issues. A summary of recent flood event history for Potter County from November 1993 to July 2023 is found in *Table 22 – Past Flood and Flash Flood Events*. Details of each event can be found in NOAA’s National Center for Environmental Information (NCEI) database. Additional data was also acquired by examining Potter County’s WebEOC information from 2018 to 2023.

Table 22 - Past Flood and Flash Flood Events

Past Flood and Flash Flood Events			
Event Location	Event Date	Event Type	Property Damage Estimate
Countywide	11/27/1993	Flood	\$0.00
Countywide	08/18/1994	Flash Flood	\$50,000.00
Countywide	01/20/1995	Small Stream Flooding	\$0.00
Countywide	10/01/1995	Flood	\$0.00
Countywide	10/21/1995	Flash Flood	\$0.00
Countywide	10/21/1995	Flood	\$0.00
Countywide	01/19/1996	Flash Flood	\$0.00
Countywide	01/19/1996	Flood	\$0.00
Colesburg	02/20/1996	Flash Flood	\$0.00
Coudersport	04/30/1996	Flash Flood	\$0.00
Coudersport	05/11/1996	Flash Flood	\$0.00
Countywide	01/08/1998	Flash Flood	\$0.00
Genesee	06/23/1998	Flash Flood	\$0.00
Coudersport	11/19/2003	Flash Flood	\$0.00
Countywide	11/19/2003	Flood	\$0.00
Countywide	09/17/2004	Flood	\$50,000,000.00
Austin	07/21/2006	Flash Flood	\$0.00
Roulette	03/15/2007	Flood	\$0.00
Genesee and Roulette	02/06/2008	Flood	\$0.00
Walton	08/12/2009	Flash Flood	\$0.00
Genesee	01/25/2010	Flood	\$0.00
Shinglehouse	12/01/2010	Flood	\$800,000.00
Roulette	12/01/2010	Flood	\$305,000.00
Shinglehouse	09/11/2013	Flash Flood	\$0.00
Crystal	07/04/2018	Flash Flood	\$0.00

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Past Flood and Flash Flood Events			
Event Location	Event Date	Event Type	Property Damage Estimate
North Bingham	07/16/2018	Flash Flood	\$0.00
		Total:	\$51,155,000.00
Source: NCEI NOAA, 2023			
*Property Damage Values are estimated and are not exact figures. Data from NCEI and WebEOC			
**Property damage is listed as \$0.00, but there may have been damage from that event that was not reported.			

The National Flood Insurance Program (NFIP) identifies properties that frequently experience flooding. Repetitive loss properties are structures insured under the NFIP which have had at least two paid flood losses of more than \$1,000 over any ten-year period since 1978. The hazard mitigation assistance (HMA) definition of a repetitive loss property is a structure covered by a contract for flood insurance made available under the NFIP that has incurred flood-related damage on two occasions, in which the cost of repair, on average, equaled or exceeded 25% of the market value of the structure at the time of each such flood event; and at the time of the second incidence of flood-related damage, the contract for flood insurance contains increased cost of compliance coverage. *Table 23 – Repetitive Loss Properties* illustrates the communities that have repetitive loss properties, the total building payments, the contents payments, and the number of losses and properties. There are two repetitive loss properties and one severe repetitive loss property in Potter County. *Table 24 – Summary of Type of Repetitive Loss Properties by Municipality* illustrates the breakdown of type of repetitive loss properties in Potter County.

A property is considered a severe repetitive loss property either when there are at least four losses each exceeding \$5,000 or when there are two or more losses where the building payments exceed the property value. *Table 25 – Severe Repetitive Loss Properties* illustrates the communities within Potter County that have severe repetitive loss properties, the total building payments, the contents payments, and the number of losses and properties. The data used in the table is based on data provided by PEMA.

Most municipalities in Potter County participate in the NFIP. Information of each participating municipality can be found in *Table 26 – Municipal NFIP Participation*.

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Table 23 - Repetitive Loss Properties

Repetitive Loss Properties						
Community Name	Community Number	Cumulative Building Payment	Cumulative Contents Payment	Sum of Total Paid	Losses	Properties
Coudersport Borough	420761	\$11,660.60	\$0.00	\$11,660.60	2	1
Sharon Township	421987	\$10,882.79	\$11,295.90	\$22,178.69	2	1
Total:		\$22,543.39	\$11,295.90	\$33,839.29	4	2

Source: FEMA, 2023

Table 24 - Summary of Type of Repetitive Loss Properties by Municipality

Summary of Type of Repetitive Loss Properties by Municipality					
Municipality	Type				
	Non-Residential	2-4 Family	Single Family	Condo	Other Residential
Austin Borough	1	0	0	0	0
Coudersport Borough	0	0	1	0	0
Sharon Township	0	0	1	0	0

Source: FEMA, 2023

Table 25 - Severe Repetitive Loss Properties

Severe Repetitive Loss Properties						
Community Name	Community Number	Cumulative Building Payments	Cumulative Contents Payments	Sum of Total Paid	Losses	Properties
Austin Borough	420760	\$108,358.34	\$16,947.28	\$125,305.60	4	1
Total:		\$108,358.34	\$16,947.28	\$125,305.60	4	1

Source: FEMA, 2023

Table 26 - Municipal NFIP Participation

Municipal Participation in the National Flood Insurance Program	
Municipal Name	Community Number
Austin Borough	420761

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Municipal Participation in the National Flood Insurance Program	
Municipal Name	Community Number
Coudersport Borough	421987
Sharon Township	420760
Source: FEMA, 2023	

4.3.3.4 Future Occurrence

Flooding is a frequent problem throughout the Commonwealth of Pennsylvania. Potter County will certainly be impacted by flooding events in the future, as Potter County experiences some degree of flooding annually. The threat of flooding is compounded in the late winter and early spring months, as melting snow can overflow streams, creeks, and tributaries, increasing the amount of groundwater, clogging stormwater culverts and bridge openings. The NFIP recognizes the 1% annual chance flood, also known as the base flood of a one-hundred-year flood, as the standard for identifying properties subject to federal flood insurance purchase requirements. A 1% annual chance flood is a flood which has a 1% chance of occurring in a given year or is likely once every one-hundred years. The digital flood insurance maps (DFIRMs) are used to identify areas subject to the 1% annual chance of flooding.

A property’s vulnerability to a flood is dependent upon its location in the floodplain. Properties along the banks of a waterway are the most vulnerable. The property within the floodplain is broken into sections depending on its distance from the waterway. The ten-year flood zone has a 10% chance of being flooded every year. However, this label does not mean that this area cannot flood more than once every ten years. This label simply designates the probability of a flood of this magnitude every year. Further away from this area is the fifty-year floodplain. This area includes all of the ten-year floodplain plus additional property. The probability of a flood of this magnitude occurring during a one-year period is 2%. A summary of flood probability is shown in *Table 27 – Flood Probability Summary*.

Table 27 - Flood Probability Summary

Flood Probability Summary	
Flood Recurrence Intervals	Annual Chance of Occurrence
10-year	10.00%
50-year	2.00%
100-year	1.00%
500-year	0.20%

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Flood Probability Summary	
Flood Recurrence Intervals	Annual Chance of Occurrence
Source: FEMA, 2009	

The future occurrences of flooding, flash flooding, and ice jam flooding in Potter County are expected to increase due to the rate of climate change in the Commonwealth of Pennsylvania, and the world. Climate change will include ocean temperature rise, which will result in more intense hurricane and tropical storm season in the Atlantic Ocean. This intensity could result in an increase in the number of hurricanes and tropical storms that could impact Pennsylvania and Potter County. These hurricanes and tropical storms could result in a large volume of precipitation occurring over a short period of time, resulting in a flood or flash flood event. It is important to note that these impacts are the secondary result of other hazards, increased by climate change, that could result in flooding events.

4.3.3.5 Vulnerability Assessment

Riverine and Stream Flooding

Potter County is vulnerable to stream and river flooding on an annual basis. Flooding puts the entire population at some level of risk, whether through flooding of homes, businesses, places of employment, roadways, sewers, and water infrastructure. Flooding can cause significant power outages and poor road conditions that can lead to heightened transportation accident risk.

County community lifelines are the most vulnerable buildings and services when riverine and stream flooding is considered. Community lifeline facilities are facilities that, if damaged, would present an immediate threat to life, public health, and safety. Facilities that use and store hazardous materials pose a potential threat to the environment during flooding events if flooding causes a leak, inundation, or equipment failure. Appendix D of this hazard mitigation plan includes a flooding vulnerability map for each municipality in Potter County, with vulnerable structures and community lifeline facilities that are located within the special flood hazard area.

Table 28 – Expected Damage to Essential Facilities (HAZUS) illustrates the estimated damage levels to certain essential facilities based on classifications in the HAZUS General Building Stock. There are seven facilities that are estimated to be at least moderately damaged by a 100-year flooding event in the HAZUS Level Two scenario that was completed for Potter County. Of those, five of those facilities will undergo a loss of use. Three fire stations will experience a loss of use, as well as one police station within the county. This flooding scenario will not impact the hospital. Also, one school will experience enough damage to result in loss of use and the education of the students would need to be moved to another location until such a time that

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repairs can be completed. Plans for such an event, and the damage that would result to essential facilities, must be put in place to successfully mitigate the potential disruption to community lifeline facilities.

Table 28 - Expected Damage to Essential Facilities (HAZUS)

Expected Damage to Essential Facilities				
Classification	Number of Facilities			
	Total:	At Least Moderate:	At Least Substantial:	Loss of Use:
Emergency Operations Center	1	0	0	0
Fire Stations	11	3	0	3
Hospitals	1	0	0	0
Police Stations	7	2	0	1
Schools	14	2	0	1

Table 29 - County Structures Within Special Flood Hazard Area shows the number of site structure address points within the Special Flood Hazard Area as well as the community lifeline facilities. This information was compiled using the Special Flood Hazard Area and GIS data provided by the Potter County GIS Department.

Table 29 - County Structures Within Special Flood Hazard Area

County Structures Within Special Flood Hazard Area		
Municipality	Site Structure Address Points Within Flood Area	Community Lifelines within Flood Area
Abbott Township	42	0
Allegany Township	2	0
Austin Borough	81	2
Bingham Township	15	0
Clara Township	9	0
Coudersport Borough	499	4
Eulalia Township	33	1
Galeton Borough	51	4
Genesee Township	113	0
Harrison Township	70	0
Hebron Township	17	0
Hector Township	13	0
Homer Township	7	0
Keating Township	9	0

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County Structures Within Special Flood Hazard Area		
Municipality	Site Structure Address Points Within Flood Area	Community Lifelines within Flood Area
Oswayo Borough	13	0
Oswayo Township	5	0
Pike Township	48	1
Pleasant Valley Township	4	0
Portage Township	44	0
Roulette Township	273	2
Sharon Township	88	0
Shinglehouse Borough	24	0
Stewardson Township	92	2
Summit Township	15	0
Sweden Township	36	0
Sylvania Township	95	0
Ulysses Borough	13	0
Ulysses Township	84	0
West Branch Township	88	0
Wharton Township	223	0
Totals:	2,106	16

Table 30 – *Community Lifeline Facilities Additional Information* illustrates the additional information including name, the municipality, and the type of facility for each community lifeline facility that falls within the Special Flood Hazard Area for Potter County. This information was compiled using Potter County’s GIS information with the assistance of the Potter County GIS Department.

Table 30 - *Community Lifeline Facilities Additional Information*

Community Lifeline Facilities Additional Information		
Type of Facility:	Facility Name:	Municipality:
Community Lifelines		
EMS Agency	Austin Volunteer Fire Company, Inc. - EMS	Austin Borough
Fire Department	Austin Volunteer Fire Company, Inc. – Fire	
Electric Substation	Electric Substation – Potter 7	Coudersport Borough
Fire Department	Coudersport Volunteer Fire Company	
Grocery Store	Hershey Farms Market	
Grocery Store	Shop’n Save	

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Community Lifeline Facilities Additional Information		
Type of Facility:	Facility Name:	Municipality:
Electric Substation	Electric Substation – Potter 6	Eulalia Township
EMS Agency	Gale Hose Ambulance	Galeton Borough
Gas Station	Kwik Fill	
Health Clinic	Galeton Health Center	
TRI Facility	Chattanooga Labeling Systems	
TRI Facility	Catalus Corp.	Pike Township
Fire Department	Roulette Chemical Engine Company	Roulette Township
Government Assistance	Potter County Human Services	
EMS Agency	Kettle Creek Ambulance	Stewardson Township
Fire Department	Kettle Creek Hose Company	

In addition to the items listed above, there is one property in the Special Flood Hazard that is registered with the National Register of Historic Places (NRHP) for Potter County. This location is the Potter County Courthouse, which was added to the NRHP on February 24, 1975. This property is at an increased risk of flooding due to its location.

Flash Flooding

Flash flooding is a common occurrence in Potter County and can occur anywhere in the county. A large portion of flash flooding occurs in populated areas that have increased impervious ground cover. During the risk assessment process, numerous resources were utilized to determine flash flooding locations in Potter County. Municipalities were asked to identify locations within the municipality that were prone to frequent flash flooding. The National Climatic Data Center was also queried to determine flash flood vulnerable areas. This data reflected in *Table 22 – Past Flood and Flash Flood Events* above.

Locations that are identified as vulnerable to flash flooding in Potter County are as follows:

- Coudersport Borough
- Genesee Township
- Shinglehouse Borough

Although the above locations were identified as vulnerable areas in Potter County, they are not the only locations that are vulnerable to flash flooding. The Potter County Hazard Mitigation Team will continue to work with municipalities to identify vulnerable flash flooding locations and identify vulnerable populations and community lifelines.

Municipalities with an increased risk of flooding, flash flooding, and ice jam flooding (due to the Special Flood Hazard Area):

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- Abbott Township
- Allegany Township
- Austin Borough
- Bingham Township
- Clara Township
- Coudersport Borough
- Eulalia Township
- Galeton Borough
- Genesse Township
- Harrison Township
- Hebron Township
- Hector Township
- Homer Township
- Keating Township
- Oswayo Borough
- Oswayo Township
- Pike Township
- Pleasant Valley Township
- Portage Township
- Roulette Township
- Sharon Township
- Shinglehouse Borough
- Stewardson Township
- Summit Township
- Sweden Township
- Sylvania Township
- Ulysses Borough
- Ulysses Township
- West Branch Township
- Wharton Township

Land use, in the form of a built environment, such as residential expansion, can cause flooding, flash flooding, and ice jam flooding impact severity to increase. Impact severity increases because as the built environment expands and becomes more complex, the impact the event will have on that areas also increase. This is due to an influx of people, infrastructure, and critical infrastructure or community lifelines in harm's way.

Impacts of flooding, flash flooding, and ice jam flooding can also be increased by population change in Potter County. Eight municipalities in Potter County have experienced population growth between the 2010 and 2020 U.S. decennial censuses. This can be seen in *Table 3 – Population Change in Potter County*. These municipalities are Eulalia Township, Hebron Township, Homer Township, Pike Township, Sylvania Township, Ulysses Township, West Branch Township, and Wharton Township.

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4.3.4. Hurricane and Tropical Storm

4.3.4.1 Location and Extent

Potter County does not have any open-ocean coastline areas. However, the impacts from coastal storms such as tropical storms and hurricanes can expand inland. Tropical depressions are cyclones with maximum sustained winds of less than 39 miles per hour (mph). The system becomes a tropical storm when the maximum sustained winds reach between 39 and 74 miles per hour. When wind speeds exceed 74 mph, the system is considered a hurricane. Tropical storms impacting Potter County develop in tropical or sub-tropical waters found in the Atlantic Ocean, Caribbean Sea, or Gulf of Mexico. Another type of tropical storms is the nor'easter, which is a large cyclone that rotates clockwise and is typically associated with the Atlantic Ocean and the East Coast of the United States between North Carolina and Massachusetts. The name nor'easter comes from the direction that the strongest winds typically blow from the cyclone.

While Potter County is located about 260 miles inland of the East Coast of the United States, tropical storms can track inland and cause heavy rainfall and strong winds. Potter County is located inland of the East Coast region, designated by FEMA, as being Hurricane-Susceptible (see *Figure 19 – Pennsylvania Wind Zones*). Potter County falls within wind zone II as shown in *Figure 19 – Pennsylvania Wind Zones*. Zone II for Potter County suggests that shelters and critical facilities should be able to withstand winds that range up to 200 MPH. Tropical storms and hurricanes are regional and seasonal events that can impact very large areas that are hundreds to thousands of miles across over the life of the storm. Hurricane and tropical storm seasons are typically from June to November. All communities within Potter County are equally subject to the impacts of hurricanes and tropical storms that track near the county. Areas in Potter County which are subject to flooding, wind, and winter storm damage are particularly vulnerable.

4.3.4.2 Range of Magnitude

The impact tropical storm or hurricane events have on an area is typically measured in terms of wind speed. Flood damage results from intense precipitation and wind, typically from coastal storms, which impact L. Expected damage from hurricane force winds is measured using the Saffir-Simpson Scale (*Table 31 – Saffir-Simpson Scale*). The Saffir-Simpson Scale categorizes hurricane intensity linearly based upon maximum sustained winds, barometric pressure, and storm surge potential. Categories three, four, and five are classified as “major” hurricanes, but category one and two storms can contain potential significant storm surge. Category one storms result in very dangerous winds with some damage, while category two storms result in extremely dangerous winds with extensive damage. Category three storms result in devastating damage and

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category four/five storms result in catastrophic damage. Although major hurricanes comprise only 20% of all tropical cyclones making landfall, they account for over 70% of the damage in the United States. While hurricanes can cause high winds and associated impacts, it is also important to recognize the potential for flooding events during hurricanes, tropical storms, and nor'easters. In Potter County wind impacts from tropical events include downed trees and utility poles to cause utility interruptions. Mobile homes, because they may not be well-anchored, have a greater potential to be impacted by high winds. Additionally, these storms can produce high volumes of rainfall that cause flash flooding which can be followed by stream and riverine flooding. The risk assessment and associated impact for flooding events is included in Section 4.3.3.

Table 31 - Saffir-Simpson Scale

Saffir-Simpson Hurricane Scale		
Category	Wind Speed	
	mph	knots
5	≥156	≥135
4	131-155	114-134
3	111-130	96-113
2	96-110	84-95
1	74-95	65-83
Non-Hurricane Classifications		
Tropical Storm	39-73	34-64
Tropical Depression	0-38	0-33

4.3.4.3 Past Occurrence

Table 32 – History of Coastal Storms Impacting Potter County lists all coastal storms that have impacted Potter County from 1876 to 2021 *Figure 20 – Historic Tropical Storms/Hurricanes in Pennsylvania* identifies some past hurricanes that had an inland path through Pennsylvania.

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Hurricane Agnes was a severe coastal storm event in June 1972 that impacted Potter County after making first landfall as a hurricane near Florida, Agnes weakened and exited back into the Atlantic off the North Carolina coast. The storm moved along the coast and made a second landfall near New York City as a tropical storm and merged with an extra-tropical low-pressure system over Pennsylvania. This brought extremely heavy rains to Pennsylvania that caused major flooding. Pennsylvania incurred \$2.8 billion in damages. There were fifty storm related deaths statewide. However, in Potter County, the most significant effects of Hurricane Agnes were due to business outages. Agnes was only a category one hurricane but dropped more than fifteen inches of rain in the northeastern United States. Pennsylvania received the greatest amount of flood damage.

Hurricane Irene and Tropical Storm Lee impacted and caused damage to Potter County. Although they were separate events, Hurricane Irene and Tropical Storm Lee together caused significant rainfall in Potter County due to how close the events took place. First, Tropical Storm Lee caused significant flooding in the central and eastern counties in Pennsylvania with wind damage that caused utility outages for 1-2 days. Then, Hurricane Irene caused additional flooding with utility interruptions from 5-8 days. Many flooding events took place in the county during this time.

Hurricane Sandy was another coastal storm event that caused significant damage to Potter County. Sandy caused significant wind damage and utility interruptions for multiple days. Hurricane Sandy ranks among the most damaging coastal storms to ever impact Potter County. In Potter County more than half of the people, or more than fifty percent of the county’s population, were without power for an extended period. The estimated storm-recovery costs total is about \$750,000.00 which includes all labor, housing, materials/equipment, and feeding expanded 24/7 staffing for longer than a week.

Table 32 - History of Coastal Storms Impacting Potter County

History of Coastal Storms Impacting Potter County	
Year	Name
1876	Hurricane Unnamed
1896	Hurricane Unnamed
1928	Hurricane Unnamed
1933	Hurricane Unnamed
1955	Hurricane Connie
1979	Hurricane Fredric
1999	Hurricane Dennis

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History of Coastal Storms Impacting Potter County	
Year	Name
2004	Hurricane Frances
2006	Hurricane Ernesto
2012	Hurricane Sandy
2017	Hurricane Nate
2018	Hurricane Florence
2021	Tropical Storm Fred

4.3.4.4 Future Occurrence

Although hurricanes and tropical storms can cause flood events consistent with 100 and 500-year flood levels, the probability of occurrence of hurricanes and tropical storms is measured relative to wind speed. *Table 33 – Annual Probability of Wind Speeds* shows the annual probability of winds that reach the strength of tropical storms and hurricanes in Potter County and the surrounding areas based on a sample period of forty-six years. According to FEMA, there is a moderate probability each year that Potter County will experience winds from coastal storms that could cause minimal to moderate damage (*Table 33 – Annual Probability of Wind Speeds*). The potential future impacts from a tropical storm or hurricane will be approximately 91.59%. The probability of winds exceeding 118 mph is less than 1% annually.

Table 33 - Annual Probability of Wind Speeds

Annual Probability of Wind Speeds		
Wind Speed (mph)	Saffir-Simpson Scale	Annual Probability of Occurrence (%)
45-77	Tropical Storms// Category 1 Hurricane	91.59
78-118	Category 1 to 2 Hurricanes	8.32
119-138	Category 3 to 4 Hurricanes	.0766
139-163	Category 4 to 5 Hurricanes	.0086
164-194	Category 5 Hurricanes	.00054
195+	Category 5 Hurricanes	.00001
Source: FEMA, 2000		

There has been an increase in North Atlantic hurricane activity since the 1970s with locations of peak intensity tropical cyclones migrating poleward coinciding with tropics expansion. An index potential hurricane destructiveness suggests an increase over the past thirty years. Variability in tropical cyclone activity in the Atlantic is due to natural variability in ocean circulation, volcanic

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eruptions, and Saharan dust, as well as climate change resulting from greenhouse gases and sulfate aerosols.

Climate change is causing atmospheric temperatures to rise, which corresponds to a rise in ocean surface temperatures, resulting in warmer and moister conditions where tropical storms develop. However, the relationship between climate change and hurricanes can be complex due to the many other factors that are associated with hurricane development which include wind shear and air pollution. Warmer oceans store more energy and are capable of fueling stronger storms and it is projected that Atlantic hurricanes will become more intense and produce more precipitation as ocean surface temperatures rise. The storms associated with tropical storms/hurricanes can also linger around for a longer period of time in a given place due to the climate change which enhances destructive impacts in the future. Other possible connections of hurricanes in near future related to climate change are the length of hurricane season and seeing more hurricanes earlier or later than usual hurricane season. There are expected to be more category four and five hurricanes in the Atlantic and the hurricane season may be elongated, all which impact the future of Potter County.

4.3.4.5 Vulnerability Assessment

The impacts of climate change are tangible and hazardous realities. Tropical storms tracking nearby Potter County can not only cause high winds, but also heavy rains to occur. A vulnerability assessment for hurricanes and tropical storms focusses on the impacts of flooding and severe winds. Flooding associated from hurricanes/tropical storms can occur in areas throughout Potter County which can cause damage to buildings and infrastructure. The assessment for flood-related vulnerability is addressed in Section 4.3.3.5 and a discussion of wind related vulnerability is addressed in Section 4.3.10.5. Due to the impact of hurricanes and tropical storms, the vulnerability for Potter County is high. Potential economic losses could include direct building loss and business interruption. Direct building loss is direct damage to any building or structure. Business interruption includes relocation, employee wage loss, expenses, income loss, etc. Potter County vulnerability level is high for direct building loss. The total direct building loss amount for Potter County equates to \$41 million. The total business interruption value for Potter County equates to \$28 million. Therefore, the vulnerability of direct building loss and business interruption is high.

As seen in *Table 3 – Population Change in Potter County*, twenty-two of the municipalities in Potter County have experienced a population loss since the previous decennial census in 2010. However, eight municipalities saw minor, total population growth over the same period. Based on this information, it can be speculated that these eight municipalities may have an increased risk of hurricane and tropical storm conditions, since 2010, due to the increase in population.

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Land use is a factor that has the potential to impact hurricane and tropical storm severity. Land use, in the form of a built environment, such as residential expansion, can cause tornado impact severity to increase. Impact severity increases because as the built environment expands and becomes more complex, the impact the event will have on that area also increases since there is an influx of people, infrastructure, and critical infrastructure in harm's way.

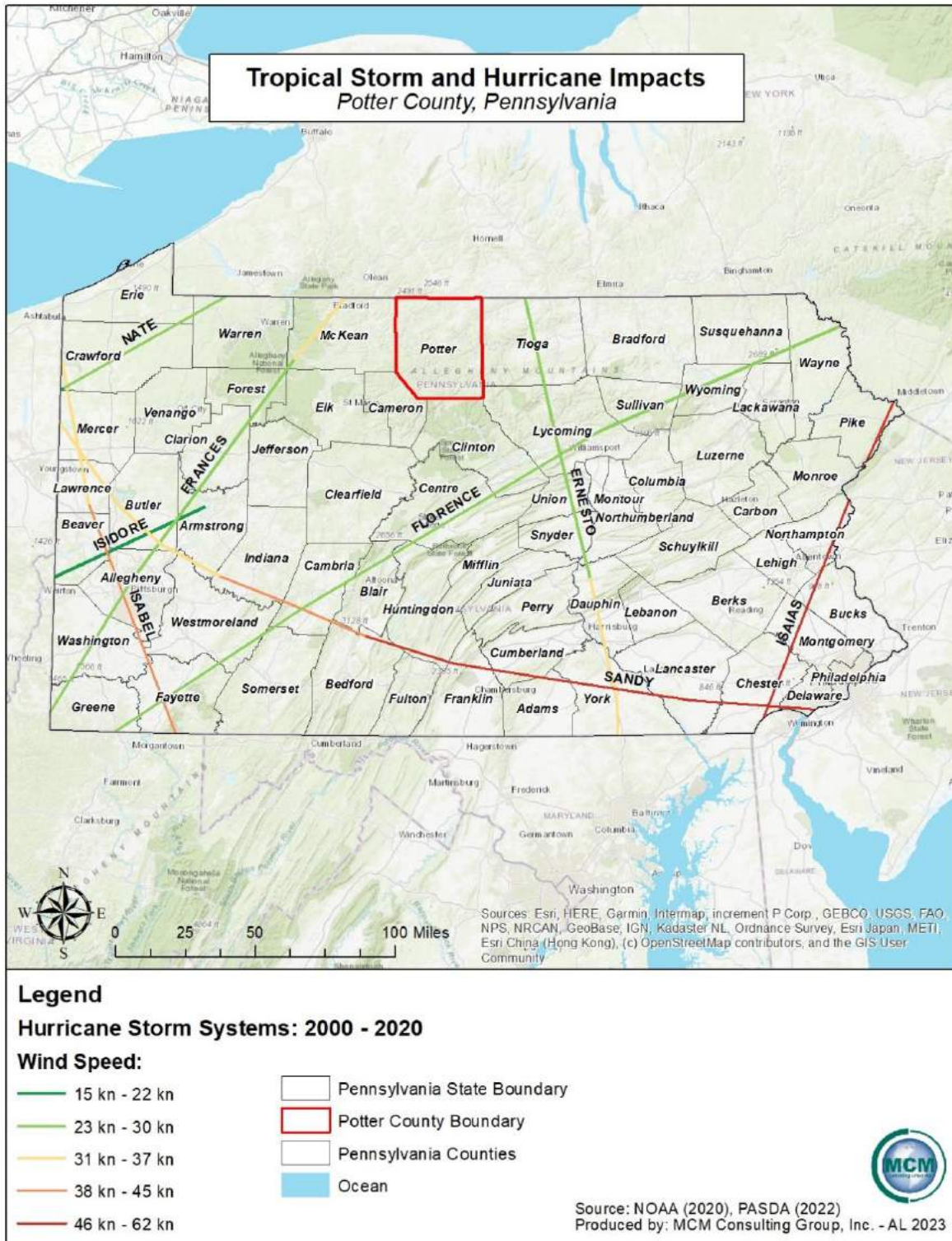
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Figure 19 - Pennsylvania Wind Zones



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Figure 20 - Historic Tropical Storms/Hurricanes in Pennsylvania



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4.3.5. Invasive Species

4.3.5.1 Location and Extent

An invasive species is a species that is not indigenous to a given ecosystem and that, when introduced to a non-native environment, tends to thrive. The spread of an invasive species often alters ecosystems, which can cause environmental and economic harm and pose a threat to human health. Often, an invasive species spreads and reproduces quickly. Invasive species are not limited to organisms that come from a foreign country. Invasive species can come from a different region in the United States. The main instigator of invasive species is human activity. Either intentionally or unintentionally, other species may accompany people when they travel, introducing the stowaway species to a novel ecosystem. In a foreign ecosystem, a transported species may thrive, potentially restructuring the ecosystem and threatening its health. Common pathways for invasive species introduction to Pennsylvania include but are not limited to:

- Contamination of internationally traded products
- Hull fouling
- Ship ballast water release
- Discarded live fish bait
- Intentional release
- Escape from cultivation
- Movement of soil, compost, wood, vehicles or other materials and equipment
- Unregulated sale of organisms
- Smuggling activities
- Hobby trading or specimen trading

The Governor's Invasive Species Council of Pennsylvania (PISC), the lead organization for invasive species threats, recognizes two types of invasive species: Aquatic and Terrestrial.

Aquatic Invasive Species (AIS) are nonnative invertebrates, fishes, aquatic plants, and microbes that threaten the diversity or abundance of native species, the ecological stability of the infested waters, human health and safety, or commercial, agriculture, or recreational activities dependent on such waters.

Terrestrial Invasive Species (TIS) are nonnative plants, vertebrates, arthropods, or pathogens that complete their lifecycle on land instead of in an aquatic environment and whose introduction does or is likely to cause economic/environmental damage or harm to human health.

The location and extent of invasive threats is dependent on the preferred habitat of the species, as well as the species' ease of movement and establishment. For example, kudzu vine is an

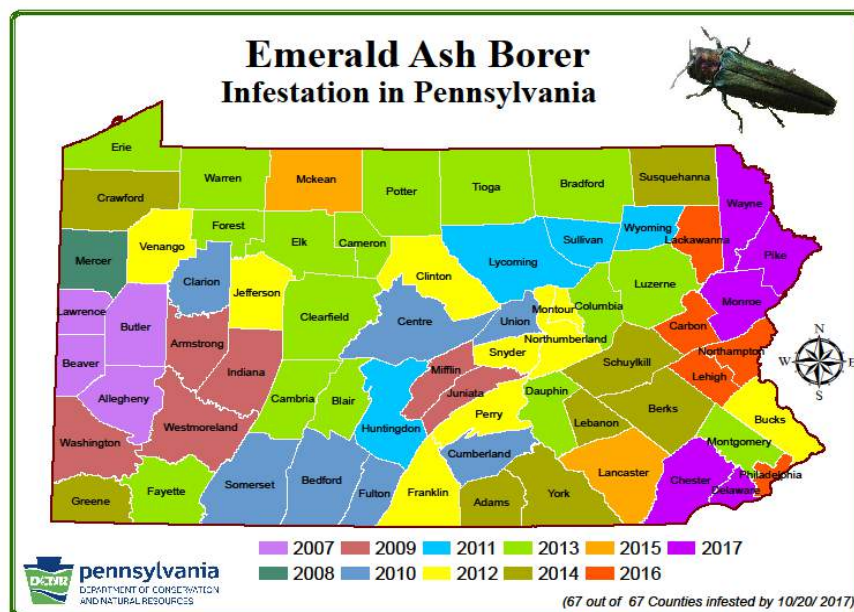
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aggressive vascular plant. With wide ecological parameters and ease of spread, the vine is a more widespread invasive species threat. Other species' spread, such as the spotted lantern fly, has been limited by state agency activity. First discovered in Berks County in 2014, the spotted lantern fly was placed under a quarantine by the Pennsylvania Department of Agriculture in thirteen counties. *Table 34 - Prevalent Invasive Species* lists invasive species that have been found in Potter County.

4.3.5.2 Range of Magnitude

The magnitude of invasive species threats ranges from nuisance to widespread killer. Some invasive species are not considered agricultural pests, and do not harm humans or cause significant ecological problems. For example, Brown Marmorated Stink Bugs are not considered to be agricultural pests and do not harm humans. Other invasive species can have many negative impacts and cause significant changes in the composition of ecosystems. For example, the Emerald Ash Borer creates a 99% mortality rate in any ash tree it infects. The aggressive nature of many invasive species can cause significant reductions in biodiversity by crowding out native species. This can affect the health of individual host organisms as well as the overall well-being of the affected ecosystem. An example of a worst-case scenario for invasive species in Pennsylvania is the Emerald Ash Borer in Potter County and the surrounding region (see *Figure 21 - Emerald Ash Borer Infestation in Pennsylvania*).

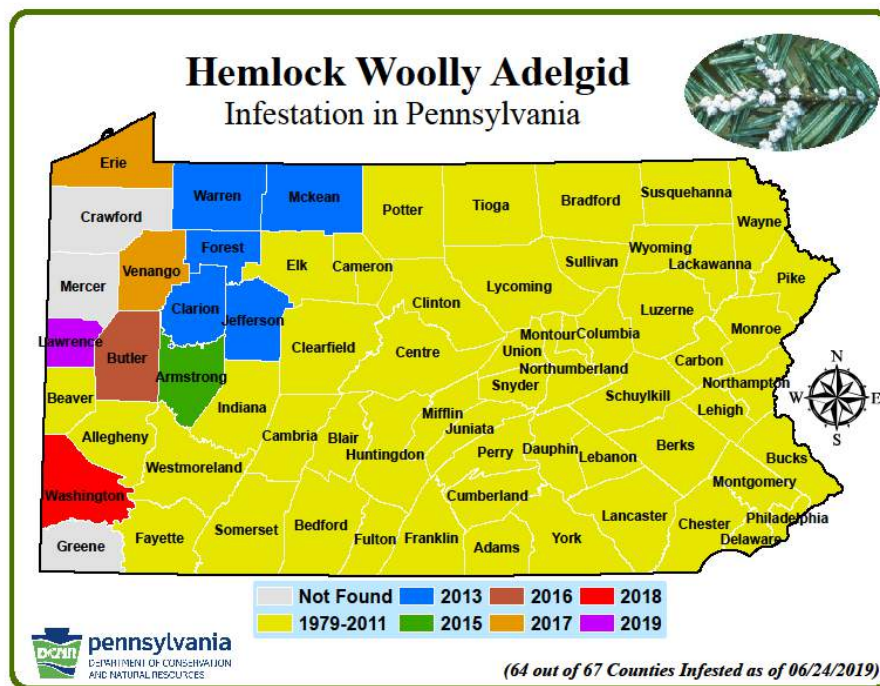
Figure 21 - Emerald Ash Borer Infestation in Pennsylvania



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Another example of an invasive pest is the hemlock woolly adelgid. Hemlock woolly adelgid is a fluid-feeding insect that feeds on hemlock trees throughout eastern North America, including Pennsylvania. The egg sacs of these insects look like the tips of cotton swabs clinging to the undersides of hemlock branches. Hemlock woolly adelgid was introduced from Asia into the Pacific Northwest in 1924. It is likely to have been introduced into the northeastern United States in the 1950s, and it was first discovered in Pennsylvania in 1967. To date, sixty-four counties in Pennsylvania, including Potter County, have been infested with this insect. See *Figure 22 - Hemlock Woolly Adelgid Infestation in Pennsylvania*. Currently, Crawford, Mercer, and Greene counties are the three counties in the commonwealth not reporting an infestation. Eastern hemlock (Pennsylvania's state tree) and Carolina hemlocks (found further south in the Smoky Mountain sections of the Appalachians) are more susceptible to hemlock woolly adelgid damage than Asian and western hemlock trees due to feeding tolerance and predators that protect the latter species. Hemlock woolly adelgid sucks fluid from the base of hemlock needles. It may also inject toxins into the tree as it feeds, accelerating needle drop and branch dieback. Although some trees die within four years, trees often persist in a weakened state for many years. Hemlocks that have been affected by hemlock woolly adelgid often have a grayish-green appearance (hemlocks naturally have a shiny, dark green color).

Figure 22 - Hemlock Woolly Adelgid Infestation in Pennsylvania



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A final example of an invasive species is the Spotted Lanternfly. The Spotted Lanternfly is a harmful invasive species which feeds on plants, damaging or destroying them. This can negatively impact the areas of Pennsylvania known for outdoor scenery and activities. According to the Penn State Extension, the Spotted Lanternfly is a significant threat to Pennsylvania agriculture, landscapes, and natural ecosystems, including grape, tree-fruit, hardwood, and nursery industries, which collectively are worth nearly \$18 billion to the state's economy, outdoor recreation, and biodiversity. The Spotted Lanternfly has not yet been found in Potter County in 2023. However, the Spotted Lanternfly is undoubtedly continuing to spread. The State Department of Agriculture gives the total number of infected counties as fifty-one, as of June 2023. *Figure 23 – Pennsylvania Spotted Lanternfly Infestation* illustrates the counties in Pennsylvania that are considered to be in the quarantine zone for this pest.

The magnitude of an invasive species threat is generally amplified when the ecosystem or host species is already stressed, such as in times of drought. The already weakened state of the native ecosystem causes it to succumb to an infestation more easily. A worst-case example could be the Hemlock Woolly Adelgid causing reduced biodiversity, increased wildfire potential, and thermal harm to small stream cold water fisheries and habitats.

4.3.5.3 Past Occurrence

Invasive species have been entering Pennsylvania since the arrival of European settlers, but not all occurrences required government action. Potter County is known for its great number of geographic features. There are various state game lands within the area which include state game lands 059, 064, and 204. Cherry Springs State Park, Denton Hill State Park, Lyman Run State Park, Ole Bull State Park, Patterson State Park, and Prouty Place State Park are all entirely located within Potter County. Portions of Sinnemahoning State Park and Sizerville State Park are located on the borders of Potter County. Elk and Susquehannock are the state forests within Potter County. These are well-known areas in the county that have significant amounts of forest land and lakes which species may invade. Due to the vast area of forests, there are many invasive terrestrial species that have been widespread in Potter County that are common problems throughout the Commonwealth. Some of the most popular problematic species in Potter County include:

- Japanese knotweed
- Western bean cutworm
- True forget-me-not
- White pine blister rust

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Many of the extreme problematic species have been around for many years. However, the most recent problematic species are the Emerald Ash Borer, Hemlock Woolly Adelgid, and the Spotted Lanternfly. In 2007, both the Emerald Ash Borer and Hemlock Woolly Adelgid were both newly spotted species that caused extreme damage. In 2014, the spotted lanternfly was found in the commonwealth, however, it has not appeared in Potter County yet.

Table 34 - Prevalent Invasive Species in Potter County lists problematic non-native species that are established in Potter County. While all species listed here are not native to Potter County, those species with the most reports pose a more severe ecological threat than some of the others. While not listed in the table, the Spotted Lanternfly is an increasing problem for Potter County. The Spotted Lanternfly is an increasing problem, because nearby counties are seeing an increase in infestations and in property damage and crop damage.

Table 34 - Prevalent Invasive Species in Potter County

Prevalent Invasive Species in Potter County		
Scientific Name	Common Name	Number of Records
Reynoutria japonica	Japanese knotweed	58
Striacosta albicosta	western bean cutworm	21
Myosotis scorpioides	true forget-me-not	18
Cronartium ribicola	white pine blister rust	10
Dendroctonus rufipennis	spruce beetle	10
Choristoneura conflictana	large aspen tortrix	10
Lymantria dispar	spongy moth (formerly gypsy moth)	9
Trifolium pratense	red clover	9
Nasturtium officinale	watercress	6
Popillia japonica	Japanese beetle	6
Adelges tsugae	hemlock woolly adelgid	5
Persicaria perfoliata	mile-a-minute vine, Asiatic tearthumb	5
Trifolium repens	white clover	5
Agrilus planipennis	emerald ash borer	4
Alliaria petiolata	garlic mustard	4
Malacosoma disstria	forest tent caterpillar	3
Berberis thunbergii	Japanese barberry	3
Glechoma hederacea	ground ivy	3
Epilobium hirsutum	hairy willowherb	3
Epipactis helleborine	helleborine	3
Tragopogon lamottei	meadow salsify	3

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Prevalent Invasive Species in Potter County		
Scientific Name	Common Name	Number of Records
Persicaria hydropiper	marsh-pepper smartweed	3
Persicaria maculosa	ladysthumb	3
Rosa multiflora	multiflora rose	3
Pilosella aurantiaca	orange hawkweed	3
Leucanthemum vulgare	oxeye daisy	3
Iris pseudacorus	pale yellow iris, yellow flag iris	3
Cerastium fontanum ssp. vulgare	big chickweed	3
Lotus corniculatus	birdsfoot trefoil	3
Solanum dulcamara	bittersweet nightshade	3
Echinochloa crus-galli	barnyardgrass	3
Cichorium intybus	chicory	3
Verbascum thapsus	common mullein	3
Prunella vulgaris	common selfheal	3
Salix fragilis	crack willow	3
Lysimachia nummularia	creeping yellow loosestrife, creeping Jenny	3
Hesperis matronalis	dames rocket	3
Silene latifolia	white campion	3
Pastinaca sativa	wild parsnip	3
Linaria vulgaris	yellow toadflax	3
Mentha spicata	spearmint	3
Agrostis gigantea	redtop	3
Sonchus arvensis	perennial sowthistle	3
Conium maculatum	poison hemlock	3
Rumex acetosella	red sorrel	3
Lapsana communis	nipplewort	2
Crepis capillaris	smooth hawksbeard	2
Pinus sylvestris	Scots pine	2
Capsella bursa-pastoris	shepherd's-purse	2
Sirex noctilio	Sirex woodwasp	2
Galium mollugo	smooth bedstraw	2
Centaurea stoebe ssp. micranthos	spotted knapweed	2
Euphorbia maculata	spotted spurge	2
Persicaria orientalis	princess-feather	2
Matricaria discoidea	pineapple-weed	2

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Prevalent Invasive Species in Potter County		
Scientific Name	Common Name	Number of Records
Elymus repens	quackgrass	2
Daucus carota	Queen Anne's lace, wild carrot	2
Filipendula ulmaria	queen-of-the-meadow	2
Raphanus sativus	radish	2
Phalaris arundinacea	reed canarygrass	2
Securigera varia	purple crown-vetch	2
Sonchus asper	spiny sowthistle	2
Lonicera tatarica	Tatarian honeysuckle	2
Urtica dioica	stinging nettle	2
Anthemis cotula	stinking chamomile	2
Potentilla recta	sulfur cinquefoil	2
Anthoxanthum odoratum	sweet vernalgrass	2
Ranunculus acris	tall buttercup	2
Lactuca canadensis	tall lettuce	2
Tragopogon dubius	western salsify	2
Abutilon theophrasti	velvetleaf	2
Veronica serpyllifolia	thymeleaf speedwell	2
Oxalis stricta	yellow woodsorrel	2
Fallopia convolvulus	wild buckwheat	2
Barbarea vulgaris	yellow rocket	2
Melilotus officinalis	yellow sweet-clover	2
Phleum pratense	timothy	2
Taraxacum officinale	dandelion	2
Dianthus armeria	Deptford pink	2
Persicaria punctata	dotted smartweed	2
Rumex crispus	curly dock	2
Rumex crispus ssp. crispus	curly dock	2
Euphorbia cyparissias	cypress spurge	2
Ranunculus repens	creeping buttercup	2
Veronica arvensis	corn speedwell	2
Vinca minor	common periwinkle	2
Phytolacca americana	common pokeweed	2
Senecio vulgaris	common groundsel	2
Malva neglecta	common mallow	2

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Prevalent Invasive Species in Potter County		
Scientific Name	Common Name	Number of Records
Cerastium fontanum	common mouse-ear chickweed	2
Hypericum perforatum	common St. Johnswort	2
Tanacetum vulgare	common tansy	2
Holcus lanatus	common velvetgrass	2
Echium vulgare	common viper's bugloss, blueweed	2
Achillea millefolium	common yarrow	2
Rosa cinnamomea	cinnamon rose	2
Agrostis capillaris	colonial bentgrass	2
Tussilago farfara	coltsfoot	2
Arctium minus	common burdock, lesser burdock	2
Stellaria pallida	common chickweed	2
Rumex obtusifolius	broadleaf dock	2
Plantago major	broadleaf plantain	2
Plantago lanceolata	buckhorn plantain	2
Cirsium vulgare	bull thistle	2
Ophiognomonium clavignenti-juglandacearum	butternut canker	2
Poa compressa	Canada bluegrass	2
Cirsium arvense	Canada thistle	2
Erigeron canadensis	Canadian horseweed	2
Phalaris canariensis	canarygrass	2
Nepeta cataria	catnip	2
Neonectria faginata	beech bark disease	2
Saponaria officinalis	bouncingbet	2
Robinia pseudoacacia	black locust	2
Medicago lupulina	black medic	2
Trifolium hybridum	alsike clover	2
Erechtites hieraciifolius	American burnweed	2
Poa annua	annual bluegrass	2
Sonchus oleraceus	annual sowthistle	2
Elaeagnus umbellata	autumn olive	2
Malus pumila	paradise apple	2
Dactylis glomerata	orchardgrass	2
Sonchus arvensis ssp. uliginosus	moist sowthistle	2
Verbascum blattaria	moth mullein	2

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Prevalent Invasive Species in Potter County		
Scientific Name	Common Name	Number of Records
Leonurus cardiaca	motherwort	2
Chenopodium album	lambsquarters	2
Digitaria sanguinalis	large crabgrass	2
Convallaria majalis	lily of the valley	2
Silene flos-cuculi	meadow campion	2
Festuca pratensis	meadow fescue	2
Hieracium caespitosum	meadow hawkweed	2
Poa pratensis	Kentucky bluegrass	2
Sisymbrium officinale	hedge mustard	2
Hypochaeris radicata	hairy cat's ear	2
Galinsoga quadriradiata	hairy galinsoga	2
Cynoglossum officinale	houndstongue	2
Berteroa incana	hoary alyssum	2
Trifolium aureum	hop clover	2
Chelidonium majus	greater celandine	2
Thlaspi arvense	field pennycress	2
Eleusine indica	goosegrass	2
Aegopodium podagraria	goutweed	2
Pinus strobus	eastern white pine	2
Inula helenium	elecampane	2
Viburnum opulus	European cranberrybush	2
Rubus idaeus	European red raspberry	2
Lathyrus latifolius	everlasting peavine	1
Panicum dichotomiflorum	fall panicum	1
Equisetum arvense	field horsetail	1
Fiorinia externa	elongate hemlock scale	1
Aquilegia vulgaris	European columbine	1
Phragmites australis ssp. australis	European common reed, Phragmites	1
Arctium lappa	great burdock	1
Lepidium campestre	field pepperweed	1
Solanum carolinense	horsenettle	1
Apocynum cannabinum	hemp dogbane	1
Geranium robertianum	herb-robert	1
Lonicera japonica	Japanese honeysuckle	1

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Prevalent Invasive Species in Potter County		
Scientific Name	Common Name	Number of Records
Vicia villosa	hairy vetch	1
Iris versicolor	harlequin blueflag	1
Calystegia sepium	hedge bindweed	1
Rhinoncomimus latipes	mile-a-minute weevil	1
Stellaria graminea	little starwort	1
Hylotelephium telephium	live-forever stonecrop	1
Gnaphalium uliginosum	low cudweed	1
Microstegium vimineum	Japanese stiltgrass	1
Artemisia vulgaris	mugwort	1
Harmonia axyridis	multicolored Asian lady beetle	1
Malva moschata	musk mallow	1
Silene noctiflora	nightflowering catchfly	1
Muhlenbergia schreberi	nimblewill	1
Lonicera morrowii	Morrow's honeysuckle	1
Mentha x piperita	peppermint	1
Lolium perenne	perennial ryegrass	1
Bromus racemosus	bald brome	1
Hylastes opacus	bark beetle	1
Asparagus officinalis	asparagus	1
Glyceria grandis var. grandis	American mannagrass	1
Lonicera maackii	Amur honeysuckle	1
Brassica nigra	black mustard	1
Silene vulgaris	bladder campion	1
Robinia hispida	bristly locust	1
Litylenchus crenatae mccannii	beech leaf disease	1
Cryphonectria parasitica	chestnut blight or canker	1
Lonicera spp.	bush honeysuckles (exotic)	1
Taraxacum officinale ssp. officinale	common dandelion	1
Lemna minor	common duckweed	1
Carum carvi	common caraway	1
Stellaria media	common chickweed	1
Rhamnus cathartica	common buckthorn, European buckthorn	1
Anthemis arvensis	corn chamomile	1
Dipsacus fullonum	common teasel	1

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Prevalent Invasive Species in Potter County		
Scientific Name	Common Name	Number of Records
Valeriana officinalis	common valerian	1
Galeopsis tetrahit	common hempnettle	1
Ambrosia artemisiifolia	common ragweed	1
Tomicus piniperda	Common pine shoot beetle, larger pine shoot beetle	1
Spergula arvensis	corn spurry	1
Veronica officinalis	common speedwell	1
Medicago sativa	alfalfa	1
Campanula rapunculoides	creeping bellflower	1
Ribes rubrum	cultivated currant	1
Toxicodendron radicans	eastern poison-ivy	1
Silene latifolia ssp. alba	white cockle	1
Raphanus raphanistrum	wild radish	1
Panicum miliaceum	wild-proso millet	1
Muhlenbergia frondosa	wirestem muhly	1
Hylotelephium telephium ssp. telephium	witch's moneybags	1
Fragaria vesca	woodland strawberry	1
Setaria pumila	yellow foxtail	1
Melilotus albus	white sweetclover	1
Veronica serpyllifolia ssp. serpyllifolia	thymeleaf speedwell	1
Mentha aquatica	water mint	1
Ludwigia palustris	waterpurslane	1
Arrhenatherum elatius	tall oatgrass	1
Hemerocallis fulva	tawny daylily	1
Arenaria serpyllifolia	thymeleaf sandwort	1
Galeopsis bifida	splitlip hempnettle	1
Lythrum salicaria	purple loosestrife	1
Festuca rubra	red fescue	1
Poa trivialis	roughstalk bluegrass	1
Celastrus orbiculatus	round leaf bittersweet	1
Elaeagnus angustifolia	Russian olive	1
Polygonum aviculare	prostrate knotweed	1
Cicuta maculata	spotted waterhemlock	1
Lonicera standishii	Standish's honeysuckle	1

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Prevalent Invasive Species in Potter County		
Scientific Name	Common Name	Number of Records
Coincya monensis	star-mustard	1
Senecio viscosus	sticky groundsel	1
Bromus inermis	smooth brome	1
Digitaria ischaemum	smooth crabgrass	1
Amaranthus retroflexus	redroot pigweed	1
Source: EDDMaps, 2023		

4.3.5.4 Future Occurrence

According to the Pennsylvania Invasive Species Council (PISC), the probability of future occurrence for invasive species threats is growing due to the increasing volume of transported goods, increasing efficiency and speed of transportation, and expanding international trade agreements. Expanded global trade has created opportunities for many organisms to be transported to and establish themselves in new counties and regions. In 2017, Pennsylvania alone imported over \$83 billion in goods from abroad, including agricultural, forestry, and fishery goods that commonly carry unknown pests. Climate change is contributing to the introduction of new invasive species. As maximum and minimum seasonal temperatures change, pests can establish themselves in previously inhospitable climates. This also gives introduced species an earlier start and increases the magnitude of their growth, possibly shifting the dominance of ecosystems in the favor of non-native species. In order to combat the increase in future occurrences, the PISC released the Invasive Species Management Plan in April 2010 and updated the plan in 2017. The plan outlines the Commonwealth’s goals for managing the spread of nonnative invasive species and creates a framework for responding to threats through research, action, and public outreach and communication. More information can be found here: https://www.agriculture.pa.gov/Plants_Land_Water/PlantIndustry/GISC/Pages/default.aspx.

There are several invasive species that are found near Potter County but have not yet been detected inside the county (see *Table 35 – Future Vulnerable Species*). Especially in cases like this, control efforts, heightened awareness, and public outreach and education can help prevent an invasive species from becoming established in the future. Once a species is established, it is more difficult to eradicate it from an ecosystem, so prevention is very important. The species that are labeled in red are listed as a Rank 1 species, which indicates a severe ecological threat to the environment. Therefore, the Spotted Lanternfly is widespread and highly problematic in nearby counties but has not been reported in Potter County (as shown highlighted in red in *Table 35 – Future Vulnerable Species*). The development of appropriate plans will assist the county in

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reducing the possibility of a future encounter with any of these species. Working toward keeping these species from entering the area would be beneficial to the forests of Potter County.

Table 35 - Future Vulnerable Species

Future Vulnerable Species		
Scientific Name	Common Name	Type
Acer campestre	hedge maple	Plant
Acer ginnala	Amur maple	Plant
Acer palmatum	Japanese maple	Plant
Acer platanoides	Norway maple	Plant
Acer pseudoplatanus	Sycamore maple	Plant
Aegilops cylindrica	jointed goatgrass	Plant
Aegilops geniculata	ovate goatgrass	Plant
Aegopodium podagraria	goutweed	Plant
Aesculus hippocastanum	common horse chestnut	Plant
Agrostemma githago	corn cockle	Plant
Agrostis stolonifera	creeping bentgrass	Plant
Ailanthus altissima	tree-of-heaven	Plant
Aira caryophylla	silver hairgrass	Plant
Ajuga reptans	carpet bugle	Plant
Akebia quinata	chocolate vine	Plant
Alcea rosea	hollyhock	Plant
Alliaria petiolata	garlic mustard	Plant
Alnus glutinosa	European black alder	Plant
Alopecurus pratensis	meadow foxtail	Plant
Ammophila arenaria	European beachgrass	Plant
Anchusa officinalis	common bugloss	Plant
Anthriscus caucalis	bur chervil	Plant
Anthriscus sylvestris	wild chervil	Plant
Arctium lappa	great burdock	Plant
Arenaria serpyllifolia	thymeleaf sandwort	Plant
Arrhenatherum elatius	tall oatgrass	Plant
Artemisia absinthium	absinth wormwood	Plant
Artemisia stelleriana	beach wormwood	Plant
Artemisia vulgaris	mugwort	Plant
Arthraxon hispidus	small carpetgrass, joint-head grass	Plant
Bassia hyssopifolia	fivehook bassia	Plant
Bassia scoparia	Mexican fireweed	Plant

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Future Vulnerable Species		
Scientific Name	Common Name	Type
Bellis perennis	English daisy	Plant
Berberis julianae	wintergreen barberry	Plant
Berberis vulgaris	common barberry	Plant
Betula pendula	European birch	Plant
Brassica juncea	Indian mustard	--Plant
Brassica nigra	black mustard	Plant
Brassica rapa	birdsrape mustard	Plant
Bromus arvensis	field brome	Plant
Bromus briziformis	rattlesnake brome	Plant
Bromus hordeaceus	soft brome	Plant
Bromus hordeaceus ssp. hordeaceus	soft brome	Plant
Bromus racemosus	bald brome	Plant
Bromus secalinus	rye brome	Plant
Bromus sterilis	poverty brome	Plant
Bryonia alba	white bryony	Plant
Buglossoides arvensis	corn gromwell	Plant
Bupleurum rotundifolium	hare's ear	Plant
Cakile maritima	European sea-rocket	Plant
Calluna vulgaris	heather	Plant
Calystegia sepium ssp. sepium	hedge false bindweed	Plant
Camelina microcarpa	smallseed falseflax	Plant
Cannabis sativa	hemp/marijuana (sativa)	Plant
Cardamine flexuosa	woodland bittercress	Plant
Carduus crispus	curly plumeless thistle	Plant
Carduus nutans	musk thistle, nodding thistle	Plant
Carex pendula	hanging sedge	Plant
Carum carvi	common caraway	Plant
Catalpa ovata	Chinese catalpa	Plant
Cayratia japonica	bushkiller	Plant
Cedrus deodara	Deodar cedar	Plant
Celastrus orbiculatus	round leaf bittersweet	Plant
Centaurea cyanus	cornflower	Plant
Centaurea jacea	brown knapweed	Plant
Centaurea nigra	black knapweed	Plant
Centaurea nigrescens	alpine knapweed, Tyrol knapweed	Plant
Centaurea stoebe ssp. micranthos	spotted knapweed	Plant

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Future Vulnerable Species		
Scientific Name	Common Name	Type
Centaurea x moncktonii	meadow knapweed	Plant
Centaurium erythraea	European centaury	Plant
Centella asiatica	Asiatic pennywort	Plant
Cerastium fontanum ssp. vulgare	big chickweed	Plant
Cerastium tomentosum	boreal chickweed	Plant
Chenopodium murale	nettleleaf goosefoot	Plant
Chondrilla juncea	rush skeletonweed	Plant
Chorispura tenella	blue mustard	Plant
Clematis terniflora	sweet autumn virginsbower	Plant
Clematis vitalba	evergreen clematis	Plant
Colutea arborescens	bladder senna	Plant
Commelina communis	Asiatic dayflower	Plant
Convallaria majalis	lily of the valley	Plant
Convolvulus arvensis	field bindweed	Plant
Coronopus didymus	lesser swinecress	Plant
Corylus avellana	common filbert	Plant
Cosmos bipinnatus	garden cosmos	Plant
Cotoneaster franchetii	orange cotoneaster	Plant
Cotula coronopifolia	brassbuttons	Plant
Crataegus monogyna	common hawthorn	Plant
Crepis tectorum	narrowleaf hawksbeard	Plant
Cruciata pedemontana	piedmont bedstraw	Plant
Cuscuta approximata	smallseed alfalfa dodder	Plant
Cuscuta epithymum	clover dodder	Plant
Cymbalaria muralis	Kenilworth ivy	Plant
Cytisus striatus	striated broom	Plant
Daphne laureola	spurgelaurel	Plant
Datura stramonium	jimsonweed	Plant
Descurainia sophia	flixweed	Plant
Deutzia scabra	fuzzy pride-of-Rochester	Plant
Digitalis lanata	Grecian foxglove	Plant
Digitalis purpurea	foxglove	Plant
Dipsacus fullonum	common teasel	Plant
Dipsacus laciniatus	cutleaf teasel	Plant
Draba verna	spring whitlowgrass	Plant
Elaeagnus angustifolia	Russian olive	Plant

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Future Vulnerable Species		
Scientific Name	Common Name	Type
Elaeagnus umbellata	autumn olive	Plant
Elsholtzia ciliata	crested latesummer mint	Plant
Erica tetralix	crossleaf heath	Plant
Eriobotrya japonica	loquat	Plant
Euonymus alatus	winged burning bush	Plant
Euonymus europaeus	European spindletree	Plant
Euonymus fortunei	winter creeper	Plant
Euphorbia esula var. esula	leafy spurge	Plant
Euphorbia peplus	petty spurge	Plant
Exochorda racemosa	common pearlbrush	Plant
Fallopia convolvulus	wild buckwheat	Plant
Festuca filiformis	hair fescue	Plant
Frangula alnus	glossy buckthorn	Plant
Galinsoga parviflora	smallflower galinsoga	Plant
Galium odoratum	sweetscented bedstraw	Plant
Galium verum	yellow bedstraw	Plant
Genista tinctoria	Dyer's greenweed	Plant
Geranium columbinum	longstalk cranesbill	Plant
Geranium dissectum	cutleaf geranium	Plant
Geranium lucidum	shining geranium	Plant
Geum urbanum	herb bennet	Plant
Glyceria declinata	waxy mannagrass	Plant
Glyceria maxima	rough mannagrass	Plant
Gypsophila paniculata	babysbreath	Plant
Hemerocallis fulva	tawny daylily	Plant
Hemerocallis lilioasphodelus	yellow daylily	Plant
Hibiscus trionum	Venice mallow	Plant
Hieracium pilosella	mouseear hawkweed	Plant
Hieracium piloselloides	kingdevil hawkweed	Plant
Holcus mollis	German velvetgrass	Plant
Hordeum marinum	seaside barley	Plant
Humulus japonicus	Japanese hop	Plant
Hydrangea paniculata	panicled hydrangea	Plant
Ilex aquifolium	English holly	Plant
Impatiens glandulifera	Himalayan balsam	Plant
Ipomoea hederacea	ivyleaf morning-glory	Plant

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Future Vulnerable Species		
Scientific Name	Common Name	Type
Ipomoea purpurea	tall morning-glory	Plant
Isatis tinctoria	Dyer's woad	Plant
Kerria japonica	Japanese rose	Plant
Kniphofia uvaria	redhot poker	Plant
Koelreuteria paniculata	goldenrain tree	Plant
Lactuca sativa	lettuce	Plant
Lactuca serriola	prickly lettuce	Plant
Lamium amplexicaule	henbit	Plant
Lamium galeobdolon	yellow archangel	Plant
Lamium purpureum	purple deadnettle	Plant
Lathyrus latifolius	everlasting peavine	Plant
Lathyrus sylvestris	flat peavine	Plant
Leontodon taraxacoides	lesser hawkbit	Plant
Leontodon taraxacoides ssp. taraxacoides	lesser hawkbit	Plant
Lepidium appelianum	hairy whitetop	Plant
Lepidium perfoliatum	clasping pepperweed	Plant
Lespedeza thunbergii	Thunberg lespedeza	Plant
Ligustrum obtusifolium	border privet	Plant
Ligustrum ovalifolium	California privet	Plant
Ligustrum vulgare	European privet	Plant
Linaria dalmatica	Dalmatian toadflax	Plant
Linaria genistifolia	broomleaf toadflax	Plant
Linum bienne	pale flax	Plant
Lobularia maritima	sweet alyssum	Plant
Lolium temulentum	poison ryegrass	Plant
Lonicera japonica	Japanese honeysuckle	Plant
Lonicera maackii	Amur honeysuckle	Plant
Lonicera morrowii	Morrow's honeysuckle	Plant
Lonicera periclymenum	woodbine	Plant
Lonicera tatarica	Tatarian honeysuckle	Plant
Lonicera xylosteum	dwarf honeysuckle	Plant
Lotus pedunculatus	big trefoil	Plant
Ludwigia grandiflora ssp. grandiflora	large-flower primrose-willow	Plant
Lunaria annua	annual honesty	Plant
Luzula luzuloides	oakforest woodrush	Plant
Lycium barbarum	matrimony vine	Plant

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Future Vulnerable Species		
Scientific Name	Common Name	Type
Malus baccata	Siberian crabapple	Plant
Malus floribunda	Japanese flowering crabapple	Plant
Malva parviflora	little mallow	Plant
Marrubium vulgare	white horehound	Plant
Medicago lupulina	black medic	Plant
Melissa officinalis	lemon balm	Plant
Mentha x villosa	apple-mint	Plant
Morus alba	white mulberry	Plant
Muscari botryoides	common grape hyacinth	Plant
Mycelis muralis	wall lettuce	Plant
Myosotis discolor	changing forget-me-not	Plant
Myosotis sylvatica	woodland forget-me-not	Plant
Myosoton aquaticum	giant chickweed	Plant
Nicandra physalodes	apple-of-Peru	Plant
Oenothera glazioviana	redsepal evening-primrose	Plant
Onopordum acanthium	Scotch thistle	Plant
Ornithogalum nutans	nodding star-of-Bethlehem	Plant
Ornithogalum umbellatum	star-of-Bethlehem	Plant
Orobanche minor	small broomrape	Plant
Pachysandra terminalis	Japanese pachysandra	Plant
Panicum miliaceum	wild-proso millet	Plant
Parentucellia viscosa	yellow glandweed	Plant
Parthenocissus tricuspidata	Boston ivy	Plant
Pentaglottis sempervirens	evergreen bugloss	Plant
Persicaria orientalis	princess-feather	Plant
Persicaria perfoliata	mile-a-minute vine, Asiatic tearthumb	Plant
Persicaria wallichii	cultivated knotweed	Plant
Petroselinum crispum	parsley	Plant
Phellodendron amurense	Amur corktree	Plant
Phellodendron japonicum	Japanese corktree	Plant
Phleum pratense	timothy	Plant
Phyllanthus urinaria	chamber bitter	Plant
Picea abies	Norway spruce	Plant
Plantago major	broadleaf plantain	Plant
Poa bulbosa	bulbous bluegrass	Plant

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Future Vulnerable Species		
Scientific Name	Common Name	Type
Poa pratensis ssp. pratensis	Kentucky bluegrass	Plant
Poa trivialis	roughstalk bluegrass	Plant
Polycarpon tetraphyllum	fourleaf manyseed	Plant
Polygonum argyrocoleon	silversheath knotweed	Plant
Polygonum posumbu	Oriental lady's thumb	Plant
Populus alba	white poplar	Plant
Populus nigra	Lombardy poplar	Plant
Prunus avium	sweet cherry	Plant
Prunus cerasifera	cherry plum	Plant
Prunus cerasus	sour cherry	Plant
Prunus domestica	plum	Plant
Prunus laurocerasus	cherry laurel	Plant
Prunus mahaleb	Mahaleb cherry	Plant
Prunus padus	European bird cherry	Plant
Prunus spinosa	blackthorn	Plant
Pseudosasa japonica	arrow bamboo	Plant
Quercus robur	English oak	Plant
Ranunculus bulbosus	bulbous buttercup	Plant
Raphanus raphanistrum	wild radish	Plant
Reseda alba	white mignonette	Plant
Reynoutria sachalinensis	giant knotweed	Plant
Rhamnus cathartica	common buckthorn, European buckthorn	Plant
Rhodotypos scandens	jetbead	Plant
Ribes rubrum	cultivated currant	Plant
Rorippa austriaca	Austrian fieldcress	Plant
Rorippa sylvestris	yellow fieldcress	Plant
Rosa canina	dog rose	Plant
Rosa gallica	French rose	Plant
Rosa micrantha	smallflower sweetbrier	Plant
Rosa multiflora	multiflora rose	Plant
Rosa rubiginosa	sweetbrier	Plant
Rosa rugosa	Seaside rose	Plant
Rosa spinosissima	Scottish rose	Plant
Rubus illecebrosus	strawberry raspberry	Plant
Rubus laciniatus	cutleaf blackberry	Plant

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Future Vulnerable Species		
Scientific Name	Common Name	Type
Rubus macrophyllus	largeleaf blackberry	Plant
Salix alba	white willow	Plant
Salix matsudana	corkscrew willow	Plant
Salix pentandra	laurel willow	Plant
Salix purpurea	purpleosier willow	Plant
Salix x pendulina	Wisconsin weeping willow	Plant
Salsola kali	Russian thistle	Plant
Salsola tragus	Russian thistle	Plant
Salvia sclarea	Europe sage	Plant
Schoenoplectiella mucronata	ricefield bulrush	Plant
Secale cereale	cereal rye	Plant
Securigera varia	purple crown-vetch	Plant
Senecio sylvaticus	woodland groundsel	Plant
Setaria faberi	giant foxtail	Plant
Setaria verticillata	bristly foxtail	Plant
Setaria viridis	green foxtail	Plant
Setaria viridis var. viridis	green bristlegrass	Plant
Sherardia arvensis	field madder	Plant
Silene coronaria	rose campion	Plant
Silene flos-cuculi	meadow campion	Plant
Silene gallica	English catchfly	Plant
Silene vulgaris	bladder campion	Plant
Sinapis arvensis	wild mustard	Plant
Sinapis arvensis ssp. arvensis	wild mustard	Plant
Sisymbrium altissimum	tumble mustard	Plant
Solanum nigrum	black nightshade	Plant
Soliva sessilis	lawn burweed	Plant
Sorbaria sorbifolia	false spiraea	Plant
Sorbus aucuparia	European mountain-ash	Plant
Sorghum bicolor	sorghum (type unspecified)	Plant
Sorghum bicolor ssp. drummondii	sudangrass	Plant
Spartina anglica	common cordgrass	Plant
Spiraea prunifolia	bridalwreath spiraea	Plant
Symphytum officinale	common comfrey	Plant
Syringa vulgaris	common lilac	Plant
Tamarix gallica	French tamarisk	Plant

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Future Vulnerable Species		
Scientific Name	Common Name	Type
Tamarix parviflora	smallflower tamarisk	Plant
Taraxacum erythrospermum	rock dandelion	Plant
Thinopyrum intermedium	intermediate wheatgrass	Plant
Thinopyrum ponticum	tall wheatgrass	Plant
Thymelaea passerina	spurge flax	Plant
Thymus praecox ssp. britannicus	wild thyme	Plant
Torilis japonica	Japanese hedge-parsley, erect hedgeparsley	Plant
Trifolium arvense	rabbitfoot clover	Plant
Trifolium campestre	large hop clover	Plant
Trifolium dubium	small hop clover	Plant
Trifolium subterraneum	subterranean clover	Plant
Ulex europaeus	gorse	Plant
Ulmus parvifolia	Chinese elm	Plant
Ulmus procera	English elm	Plant
Ulmus pumila	Siberian elm	Plant
Vaccaria hispanica	cowcockle	Plant
Valeriana officinalis	common valerian	Plant
Ventenata dubia	ventenata	Plant
Verbascum thapsus	common mullein	Plant
Veronica biloba	twolobe speedwell	Plant
Veronica hederifolia	ivyleaf speedwell	Plant
Viburnum lantana	wayfaringtree	Plant
Viburnum opulus ssp. opulus	cranberry viburnum, European highbush cranberry	Plant
Viburnum plicatum	Japanese snowball	Plant
Viburnum tinus	laurustinus	Plant
Vicia cracca	bird vetch	Plant
Vicia villosa	hairy vetch	Plant
Vinca minor	common periwinkle	Plant
Vincetoxicum nigrum	Black dog-strangling vine, black swallowwort	Plant
Viola odorata	English violet	Plant
Vulpia bromoides	squirreltail fescue	Plant
Vulpia myuros	rattail fescue	Plant
Xanthium spinosum	spiny cocklebur	Plant

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4.3.5.5 Vulnerability Assessment

Potter County's vulnerability to invasion depends on the species in question. Human activity and mobility are ever increasing, and combined with the prospects of climate change, invasive species are becoming increasingly threatening. Invasive species can have adverse economic effects by impacting agriculture and logging activities. Natural forest ecosystems provide clean water, recreational opportunities, habitat for native wildlife, and places to enjoy the tranquility and transcendence of nature. The balance of forest ecosystems and forest health are vulnerable to invasive species threats. While there is significant acreage of wetlands, waterways, state parks, and game lands in Potter County where forest managers can impact invasive species, private lands can provide refuge for invasive species if landowners are unaware of or apathetic towards the threat.

Since there are large swatches of public land in Potter County, there is a risk of future damage from invasive species that are present in the area. With about 434,600 acres of total land in Potter County, there is vulnerability to various land sites and waterways. If an invasive species were to invade the popular terrestrial areas or waterways in Potter County, a negative impact could occur. The invasion from an invasive species could cause damage to the scenic and natural resources needed in the county. Additionally, tourism for the county is vulnerable to the invasive species as well and would be affected if the parks were destroyed. Therefore, a great amount of land and native wildlife within Potter County are at risk with the presence of invasive species.

An interesting facet of the invasive species problem in Pennsylvania is that deer do not eat many invasive plants, giving invasive species a competitive advantage over the native species that deer prefer. As such, the management of deer populations in Potter County has a significant impact on the vulnerability of an ecosystem to invasive species, where overpopulation of deer favors invasive species.

The Governor's Invasive Species Council of Pennsylvania (PISC) has identified over 100 species threats that are or could potentially become significant in Pennsylvania. Of these threats, county and municipal leaders believe that the most significant are invasive forest pests like the Emerald Ash Borer, Hemlock Woolly Adelgid, the Spotted Lanternfly, and plants like the Tree-of-Heaven which have all been identified in red in *Table 34 - Prevalent Invasive Species in Potter County*.

Due to the past experiences with invasive plants in the county, there are five primary components which help with managing invasive plants to lower vulnerability:

Prioritize: Public use areas such as state parks and other healthy forest ecosystems should be prioritized over developed and private areas. Locations with lower densities of invasive plants are often easier to control and should be given quick attention. Locations where humans are

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disturbing the landscape opens up niche space, and often times the aggressive invasive species move in faster than native species. Such locations include areas around road work, ditch/culvert work, logging activities, stream improvement/stabilization and bridge work. Some species pose a higher risk than others - invasive species are easiest to control before they become widespread and established in an area, and for that reason, species that are less widespread should be prioritized for management.

Locate: Detailed locations should be recorded for invasive plants so sites can be easily relocated, treated, and monitored.

Delineate: The scale and extent of the infestation should be recorded and mapped so that the progress of the infestation can be monitored.

Control: Methods of control depend on the specific infestation, but the most common approaches are mechanical (cutting and hand-pulling) and chemical (herbicide treatments).

Monitor: Identified sites should be monitored and revisited as often as several times in a growing season (depending on the location/species). Monitoring can allow for early detection of spreading infestations. Most importantly, it prevents a relapse towards full-blown infestation.

It is best to act before a species can become established in the county, so forest management such as park rangers should be aware of invasive species found nearby Potter County, but not yet present in the county (priority species in *Table 35 – Future Vulnerable Species*). Public outreach and education are important to increase knowledge of these species to improve identification and prevention of invasion. Without action, due to the instances and extent of the current infestations, it is reasonable to project that the county’s vulnerability will increase.

Municipalities with an increased risk to invasive species:

- Abbott Township
- Allegany Township
- Austin Borough
- Bingham Township
- Clara Township
- Coudersport Borough
- Eulalia Township
- Galeton Borough
- Genesse Township
- Harrison Township
- Hebron Township
- Hector Township
- Homer Township
- Keating Township
- Oswayo Borough
- Oswayo Township
- Pike Township
- Pleasant Valley Township
- Portage Township
- Roulette Township
- Sharon Township
- Shinglehouse Borough

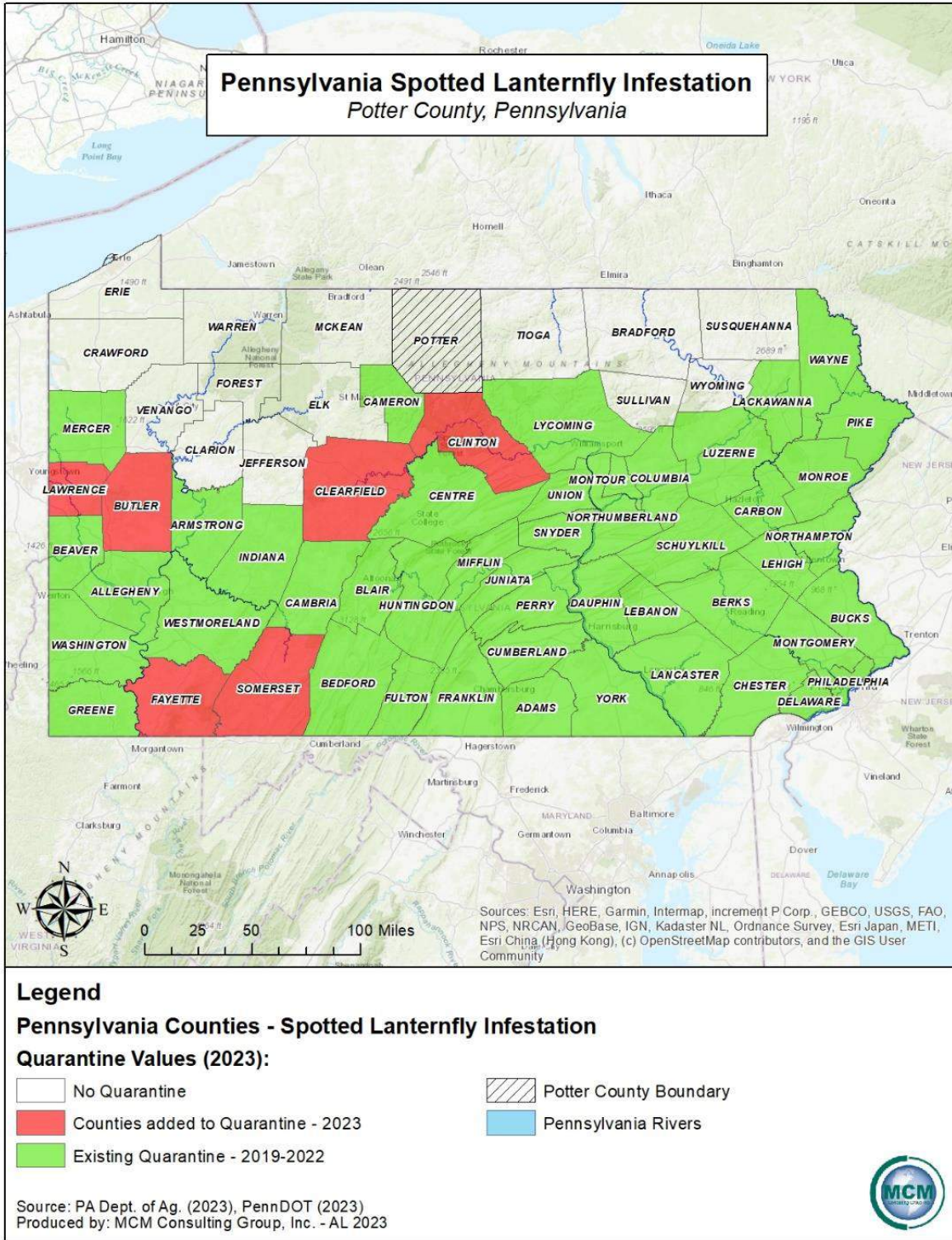
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- Stewardson Township
- Summit Township
- Sweden Township
- Sylvania Township
- Ulysses Borough
- Ulysses Township
- West Branch Township
- Wharton Township

Land use changes in Potter County could be a factor in the potential impact invasive species have on native species.

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Figure 23 - Pennsylvania Spotted Lanternfly Infestation



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4.3.6. Landslides

4.3.6.1 Location and Extent

Rock falls and other slope failures can occur in areas of Potter County with moderate to steep slopes. Many slope failures are associated with precipitation events – periods of sustained above-average precipitation, specific rainstorms, or snowmelt events. Rockfalls, rockslides, rock topples, block slides, debris flows, mud flows, and mud slides are all forms of landslides. Areas experiencing erosion, decline in vegetation cover and earthquakes are also susceptible to landslides. Human activities that contribute to slope failure include altering the natural slope gradient, increasing soil and water content, and removing vegetation cover. Areas where this type of human activity is common are areas that were excavated along highways and other roadways.

The Pennsylvania Department of Conservation and Natural Resources (PA DCNR) describes landslide susceptibility in Potter County as generally low but includes local areas of high to moderate risk. *Figure 24 – Landslide Hazard Areas* shows areas of landslide susceptibility in Potter County. A majority of Potter County is located in the Deep Valleys physiographic province and the northern area is located in the Glaciated High Plateau physiographic province which is known for moderate vulnerability based on physiographic region to all forms of landslide. Steep slopes are evenly spread throughout the county and there are locations that can be prone to landslides in almost every municipality.

4.3.6.2 Range of Magnitude

Landslides cause damage to transportation routes, utilities, and buildings. They can also create travel delays and other side effects for transportation of people and material. Fortunately, death and injuries due to landslides are relatively rare in Pennsylvania. Almost all of the known deaths due to landslides have occurred when rocks fall or other slide along highways involve vehicles. Storm-induced debris flows are the only other type of landslide likely to cause injuries. As residential and recreational development increase on and near steep mountain slopes, the hazard from these rapid events will also increase. Most Pennsylvania landslides are moderate to slow moving and damage objects and buildings, rather than people.

The Pennsylvania Department of Transportation (PennDOT) and large municipalities incur substantial costs due to landslide damage and to additional construction costs for new roads in known landslide-prone areas. A 1991 estimate showed an average of \$10 million per year is spent on landslide repair contracts across the Commonwealth of Pennsylvania and a similar amount is spent on mitigation costs for grading projects (DCNR, 2009). A number of highway sites in Pennsylvania need temporary or permanent repair at an estimated cost of between

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\$300,000.00 and \$2 million each. Similar landslide events that affect traffic and roadways throughout the commonwealth occur intermittently throughout the year. A 7,500-pound rockslide closed down parts of Pennsylvania State Route 11 in Montour County, Pennsylvania in November of 2020 for a number of weeks. Events of similar magnitude can and have occurred in and around Potter County.

The 2018 Pennsylvania Hazard Mitigation Plan lists Potter County as having a moderate incidence of landslides. Potter County landowners and real estate developers must know the magnitude of susceptibility within the county prior to the start of development.

4.3.6.3 Past Occurrence

No comprehensive list of landslide incidents in Potter County is available, and there is no formal reporting system in place. PennDOT and municipal departments are responsible for slides that inhibit the flow of traffic or damage roads and bridges, but they generally only repair the road and the adjacent right-of-way areas.

4.3.6.4 Future Occurrence

Historically, significant landslide events are likely to occur on average once every two years in Potter County. Mismanaged development in steeply sloped areas could increase the frequency of occurrence. Road cuts are the most common development that puts an area at an increased probability of a slide. The Pennsylvania Department of Environmental Protection (PA DEP) has an Erosion and Sediment (E & S) program that sets requirements intended to mitigate erosion associated with development projects of a certain scale. The guidelines offered in this program are similar to landslides prevention practices.

Climate change could increase the frequency of landslides in Potter County, due to increasing rain and runoff. With climate change, hurricanes and tropical storms could become more frequent and more intense. This higher volume of precipitation, falling in a shorter time period, could dramatically increase the number of landslide events. This is related to flash flooding events as well. Soil movement will likely increase with a higher volume of precipitation.

4.3.6.5 Vulnerability Assessment

Landslides are often precipitated by other natural hazards such as earthquakes or floods. A significant landslide can cause millions of dollars in damages. Continued enforcement of floodplain management and proper road and building construction can mitigate the vulnerability to landslides. Floodplain management is important where mining has occurred within proximity to watercourses and associated flat-lying areas. Surface water may permeate into areas that still

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have open fractures and the build-up of surface water in those fractures could lead to unexpected flood events and landslide events.

A comprehensive database of land highly prone to erosion and landslides is difficult to produce. The potential for erosion and landslides should be considered when planning construction projects in Potter County. There are several general factors that can be indicators of landslide prone areas including:

- Locations on or close to steep hills.
- Areas of steep road cuts or excavations.
- Steep areas where surface run-off is channeled.
- Fan shaped areas of sediment and rock accumulations.
- Evidence of past sliding such as tilted utility line, tilted trees, cracks in the ground and irregularly, surfaced ground.

All the municipalities in Potter County are vulnerable to landslides. *Table 36 – Structure Vulnerability Data* illustrates the number of site structure address points per municipality and the number of structures in high slope areas. Landslide events are most likely to occur in steeply sloped areas and in places where landforms have been altered for purposes of highway construction or other development. This is especially true if development is located at the base or crest of cliffs or near large highway cut-outs. These areas should be considered vulnerable to landslides, particularly if mitigation measures have not been implemented.

Table 36 - Structure Vulnerability Data

Structure Vulnerability Data		
Municipality	Number of Addressable Structures Per Municipality	Number of Structures in Slope Area
Abbott Township	531	0
Allegany Township	343	0
Austin Borough	322	0
Bingham Township	425	0
Clara Township	171	0
Coudersport Borough	1,433	0
Eulalia Township	487	1
Galeton Borough	597	3
Genesee Township	524	0
Harrison Township	628	0
Hebron Township	511	0
Hector Township	448	0

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Structure Vulnerability Data		
Municipality	Number of Addressable Structures Per Municipality	Number of Structures in Slope Area
Homer Township	292	0
Keating Township	474	0
Oswayo Borough	85	0
Oswayo Township	199	0
Pike Township	309	1
Pleasant Valley Township	108	0
Portage Township	302	0
Roulette Township	768	2
Sharon Township	546	0
Shinglehouse Borough	637	0
Stewardson Township	351	4
Summit Township	278	1
Sweden Township	711	1
Sylvania Township	277	1
Ulysses Borough	350	0
Ulysses Township	679	2
West Branch Township	733	0
Wharton Township	588	5
Totals:	14,107	21

There are no historic or cultural areas or buildings listed with the National Register of Historic Places that fall within major slope vulnerability areas. The cultural district around Coudersport is also not within a major slope vulnerable area.

Municipalities with an increased risk to landslide (due to slope areas of 25° or greater):

- Abbott Township
- Allegany Township
- Austin Borough
- Bingham Township
- Clara Township
- Coudersport Borough
- Eulalia Township
- Galeton Borough
- Genesse Township
- Harrison Township
- Hebron Township
- Hector Township
- Homer Township
- Keating Township
- Oswayo Borough
- Oswayo Township
- Pike Township
- Pleasant Valley Township

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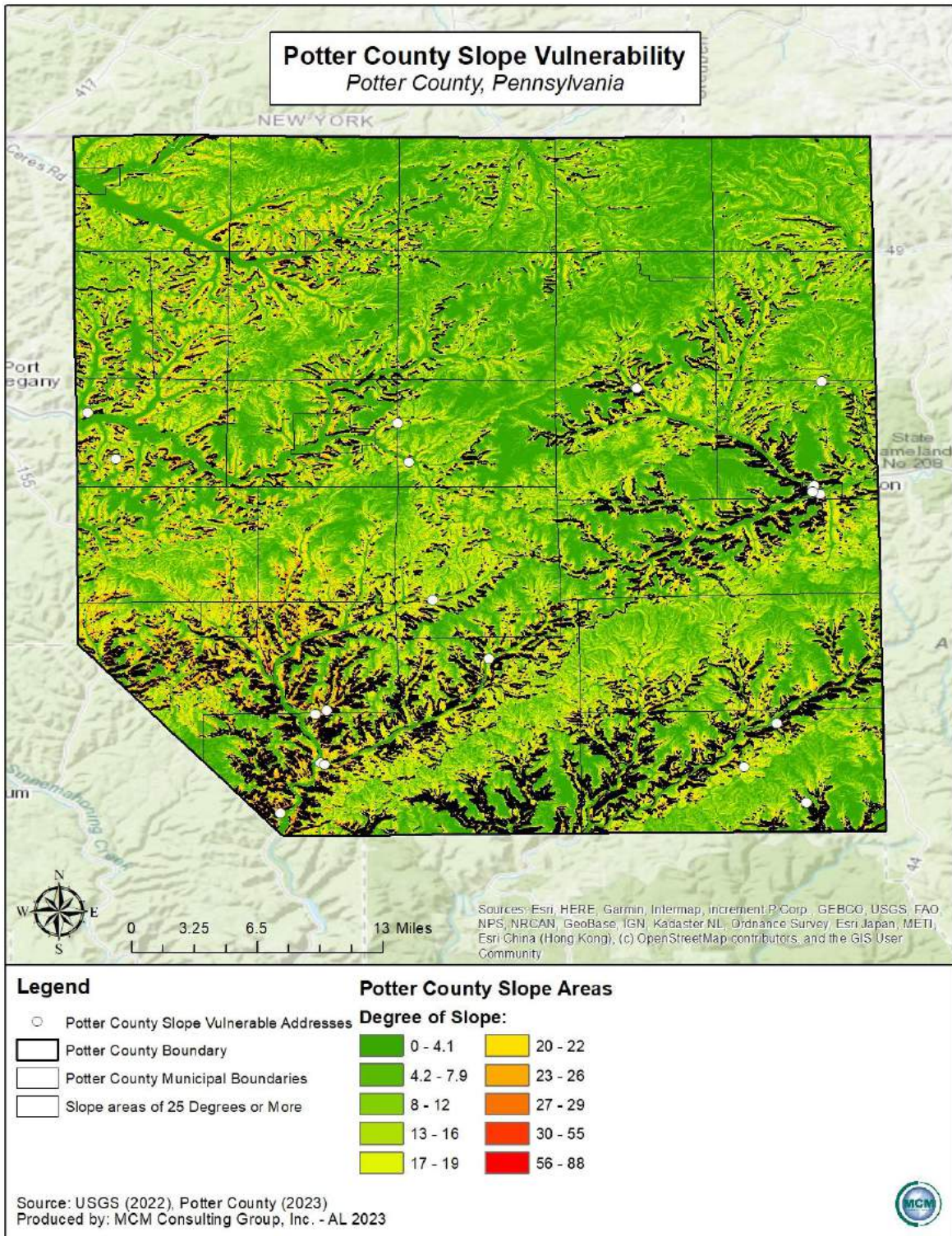
- Portage Township
- Roulette Township
- Sharon Township
- Shinglehouse Borough
- Stewardson Township
- Summit Township
- Sweden Township
- Sylvania Township
- Ulysses Township
- West Branch Township
- Wharton Township

Population change can increase the impacts of landslides in Potter County, especially the eight municipalities that have shown a population increase from the 2010 decennial census to the 2020 decennial census. This population change can be seen in *Table 3 – Population Change in Potter County*.

Another impact on landslide could be land use changes. As trees are harvested for farmland, or farmland is turned into developed areas, the potential for landslides increases in the municipalities listed above that have slope areas of 25° or greater.

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Figure 24 - Landslide Hazard Areas



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4.3.7. Pandemic, Epidemic, Endemic, and Infectious Disease

4.3.7.1 Location and Extent

Epidemic

An epidemic occurs when an infectious disease spreads more quickly than expected by medical and healthcare authorities. It is characterized by widespread growth or extent that spreads quickly and incurs a greater rate of novel or endemic cases than baseline estimates would initially project. When an epidemic occurs, it typically impacts a larger area than a localized outbreak. Epidemics often include multiple countries, although not always spreading to different continents. In short, epidemics are regional.

Pandemic

A pandemic is a disease outbreak that spreads across countries or continents, which affects the population of a vast area. When a pandemic occurs, the event usually affects more people and takes more lives than an epidemic. Pandemics are described as an extensive epidemic. Generally, pandemic diseases cause sudden illness in all age groups on a global scale. Pandemics are continuous events in third-world countries but do not frequently affect the United States. A pandemic is measured and defined by the spreading of a disease rather than the fatalities with which it is associated. The characteristics of a pandemic outbreak include large and rapid scale spread, overload of healthcare systems, inadequate medical supplies, disruption of economy/society, and medical supply shortages. While a pandemic may be characterized as a type of epidemic, an epidemic is not a type of pandemic. Additionally, pandemics travel more efficiently than epidemics. In the event that a pandemic occurs in the eastern United States, the entirety of Potter County would likely be impacted.

Endemic

An endemic is described as a disease that is present in a community at all times but occurs in a relatively low frequency and is not spreading at a rapid rate. An endemic can be a previous pandemic such as influenza, or coronavirus (COVID-19), or a more regionalized virus such as Ebola virus in Africa. An endemic can become a pandemic if the disease mutates into a more virulent strain.

Infectious Disease

Infectious diseases are illnesses caused by pathogenic organisms such bacteria, viruses, fungi, or parasites. Organisms become harmful and cause disease under certain conditions. The sources of infectious disease may originate from contaminated food or waterways, infected animals/livestock, or infection from biological vectors such as mosquitoes, etc. Infectious

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diseases include influenza, rabies, Middle East Respiratory Syndrome (MERS), West Nile virus, Lyme Disease, Zika virus, and Ebola virus.

Pandemic and infectious disease events cover a wide geographical area and can affect large populations, potentially including the entire population of the Commonwealth of Pennsylvania. The exact size and extent of an infected population is dependent upon how easily the illness is spread, the mode of transmission, and the amount of contact between infected and uninfected individuals. The transmission rates of pandemic illnesses are often higher in more populated and urban areas where there are large concentrations of people. The transmission rate of infectious disease will depend on the mode of transmission of a given illness. Pandemic events can also occur after other natural disasters, particularly floods, when there is the potential for bacteria to grow in, and contaminate, standing water.

4.3.7.2 Range of Magnitude

Public health emergencies typically occur on a regional basis. The magnitude of pandemic or infectious disease threat in the Commonwealth will range significantly depending on the aggressiveness of the virus in question, factors within the community that are impacted (medical care access, population density, etc.), and the ease of transmission. For example, the West Nile virus produces clinically asymptomatic cases less than 80% of the time. Therefore, approximately 20% of the cases result in mild infection, also known as West Nile fever. However, there is a small percentage of cases that could result in severe neurological disease and even death.

Pandemic influenza has a higher transmission rate from person-to-person compared to the West Nile virus. Advances in medical technologies have greatly reduced the number of deaths caused by influenza over time. In the early 1900s, flu pandemics historically caused tens of millions of deaths, while the 2009 Novel H1N1, known as swine flu, caused fewer than 20,000 deaths world-wide. Many people infected with swine flu in 2009 recovered without needing medical treatment. Without recent medical inventions and technologies, modern influenza would be associated with higher morbidity rates. About 70% of those who were hospitalized during the 2009 H1N1 flu virus in the United States belonged to a high-risk group. However, with the COVID-19 pandemic, the transmission rates were much higher than any previous outbreaks related to other members of the coronavirus family such as SARS-CoV and MERS-CoV.

In the past 100 years, humanity did not face a microbial pandemic similar in scale to the COVID-19 pandemic. The worldwide transmission rate of COVID-19 from human to human rapidly advanced in 2020 and 2021. Of the six global outbreaks of viral infections, three were caused by coronaviruses (SARS, MERS, and COVID-19).

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While there are limited secondary hazards related to public health emergencies, an outbreak can cause a variety of cascading hazards. Civil disorder due to supply shortages is the most common cascading hazard to result from pandemic, epidemic, or infectious disease. Additional potential effects could include: a shortage of medical supplies and personnel, hoarding of household paper and cleaning supplies, school and business disruption, government closings, government restrictions on travel, low attendance at places of employment, slowed productivity, and widespread economic instability.

The World Health Organization (WHO) developed an alert system to help inform the world about the seriousness of a pandemic. The alert system has six phases, with Phase 1 being the lowest risk and Phase 6 being the greatest risk of pandemic. The phases were developed in 1999, but then revised in 2005 and 2009 to provide a global framework and aid countries in pandemic preparedness and response planning. These phases of alert systems were used during the COVID-19 pandemic. These phases are listed below in *Table 37 - Pandemic Influenza Phases*.

Table 37 - Pandemic Influenza Phases

Pandemic Influenza Phases	
Phase	Characteristics
Phase 1	No animal influenza virus circulating among animals has been reported to cause infection in humans.
Phase 2	An animal influenza virus circulating in domesticated or wild animals is known to have caused infection in humans and is therefore considered a specific potential pandemic threat.
Phase 3	An animal or human-animal influenza reassortant virus has caused sporadic cases or small clusters of disease in people but has not resulted in human-to-human transmission sufficient to sustain community-level outbreaks.
Phase 4	Human-to-human transmission (H2H) of an animal or human-animal influenza virus able to sustain community-level outbreaks has been verified.
Phase 5	The same identified virus has caused sustained community level outbreaks in two or more countries in one WHO region.
Phase 6	The pandemic phase is characterized by community level outbreaks in at least one other country in a different WHO region in addition to the criteria defined in Phase 5. Designation of this phase will indicate that a global pandemic is under way.

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Pandemic Influenza Phases	
Phase	Characteristics
Post-Peak Period	Levels of pandemic influenza in most countries with adequate surveillance have dropped below peak levels.
Possible New Wave	Level of pandemic influenza activity in most countries with adequate surveillance rising again.
Post-Pandemic Period	Levels of influenza activity have returned to the levels seen for seasonal influenza in most countries with adequate surveillance.

Source: WHO, 2009

4.3.7.3 Past Occurrence

Pandemic & Epidemic

Several pandemic influenza outbreaks have occurred over the past 100 years that not only affected Potter County but the United States as a whole. *Table 38 - Past Pandemic Events in the United States* illustrates the various past pandemic events that have occurred since the late 1800's. Prior to COVID-19, the worst recorded pandemic was the Spanish Flu, due to the amount of infection spread that was present in the world. The two most recent pandemics that have occurred in Potter County and the United States are the swine flu/Novel H1N1 and COVID-19 pandemics, with COVID-19 being the most current and having the highest transmission rates.

Spanish Flu

An estimated 1/3 of the world's population was infected and had clinically apparent illnesses during the 1918 - 1919 influenza pandemic. Pennsylvania experienced severe effects from the Spanish Flu. It claimed 500,000 lives in the United States, which included individuals in Potter County. There is a lack of data which provides exact numbers of deaths that occurred in Potter County from the Spanish Flu, however there were a total of 60,000 deaths in Pennsylvania. Deaths occurring in Potter County are included in this number. There were approximately 47,000 reported cases and 12,000 deaths in Philadelphia in just over four weeks. In the first six months, there were about half a million cases and 16,000 deaths of the Spanish Flu in Philadelphia. The factors of high population density including crowded and unhygienic conditions contributed to higher numbers of cases and death rates across Pennsylvania.

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Swine Flu/Avian Flu/H1N1

Each year, different strains of influenza are labeled as potential pandemic threats. Strains of influenza, or the flu, are highly contagious as they commonly attack the respiratory tract in humans. Influenza pandemic planning began in response to the H5N1 (avian) flu outbreak in Asia, Africa, Europe, the Pacific, and the Near East in the late 1990s and early 2000s. Avian flu did not reach pandemic proportions in the United States, but the country began planning for flu outbreaks.

Potter County was impacted by the H1N1 virus during 2009. The Pennsylvania Department of Health (PA DOH) set up clinics throughout the county to administer vaccines to at-risk populations. A total of 10,940 cases and seventy-eight deaths occurred in Pennsylvania from this pandemic but there is insufficient data to determine the exact number of cases and deaths from swine flu in Potter County.

COVID-19

Potter County was directly impacted by the COVID-19 pandemic. As of June 2023, Pennsylvania had an estimated 3,561,872 million total cases and 51,144 deaths related to the COVID-19 pandemic. The first cases in Pennsylvania were reported on March 6, 2020, in Delaware and Wayne counties. The first confirmed case of COVID-19 in Potter County was in March 2020. Beginning in December of 2020, there was a large-scale vaccination effort to combat COVID-19. Municipalities in Potter County indicated an increase in the pandemic and infectious disease section of the risk factor assessment municipal comparison.

Table 38 - Past Pandemic Events in the United States

Past Pandemic Events in the United States	
Year(s)	Common Name
1889	Russian Flu
1918	Spanish Flu/H1N1
1957	Asian Flu/H2N2
1968	Hong Kong Flu/H3N2
2009	Swine flu/Novel H1NI
2020	COVID-19

Sources: WHO & CDC, 2020

Infectious Disease

Not only has Potter County experienced pandemic events, but the county has also experienced infectious disease events. The two major infectious disease events experienced across Potter County and Pennsylvania as a whole are the West Nile Virus and Lyme Disease. Due to the

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climatic traits of Pennsylvania these infectious diseases thrive in Potter County. Both diseases are transmitted by the biological vector of an insect which is found throughout the county.

West Nile Virus

West Nile virus reached the United States in 1999 and a year later was detected in Pennsylvania when mosquito pools, dead birds, and/or horses in nineteen counties tested positive for the virus. By 2003, all counties in the Commonwealth had confirmed cases. A comprehensive network has been developed in Pennsylvania that includes trapping mosquitoes, collecting dead birds, and monitoring horses, people and, in past years, sentinel chickens. Although West Nile Virus positive cases are few in Potter County, 2020 had the most positive cases in Potter County since 2018. Over the past five years, no human has tested positive for West Nile Virus in Potter County. *Table 39 - West Nile Virus Control Program in Potter County since 2018* outlines the West Nile Virus within Potter County from 2018 to 2023.

Table 39 - West Nile Virus Control Program in Potter County since 2018

West Nile Virus Control Program in Potter County Since 2018				
Year	Total Positives	Human Positives	Mosquito Positives	Bird Positives
2018	0	0	0	0
2019	0	0	0	0
2020	0	1	0	0
2021	0	0	0	0
2022	0	0	0	0
2023	0	0	0	0

Source: PA Department of Environmental Protection, 2023

Lyme Disease

Lyme Disease has been present in the United States and Potter County for many years. More wooded areas have higher cases due to ticks being the main biological vector. Lyme disease is found in all sixty-seven counties within Pennsylvania. Potter County had an overall approximate of 356 confirmed cases of Lyme disease from 2000 until 2020, although actual totals may be significantly higher due to under reporting. Potter County as a whole has a moderately high positive total for Lyme Disease in the county, especially over the past several years. It is possible that numbers have risen dramatically due to lack of testing in previous years. Potter County experienced the highest number of positive cases in 2018 and 2019 both at forty-nine cases. Lyme disease case counts have been consistently rising over the past several years. It should be noted that information represented for each county may vary due to reporting practices. Hence these figures represent a rough estimate of the Lyme disease burden in Potter County. *Table 40 -*

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Lyme Disease Data for Potter County outlines the total positive cases of Lyme Disease within Potter County from 2000 to 2020. Data after 2020 was not available for this report.

Table 40 - Lyme Disease Data for Potter County

Lyme Disease Data for Potter County	
Year	Total Positives
2000	0
2001	5
2002	3
2003	12
2004	10
2005	8
2006	1
2007	5
2008	5
2009	7
2010	8
2011	14
2012	11
2013	26
2014	19
2015	26
2016	46
2017	48
2018	49
2019	49
2020	4
Source: PA Tick Check, 2020	

Zika Virus

The Zika virus is another infectious disease that is spread by mosquito bites, and it is related to West Nile virus. Zika virus can also be spread through sexual intercourse, blood transfusion, or passed from mother to child in the womb. The virus was first identified in 1947, but largely came to the attention of the United States in 2015 when there was an outbreak of Zika in Brazil. The direct illness caused by Zika can include fever, red eyes, joint pain, headache, and a rash, or sometimes no symptoms at all. Zika is problematic for pregnant mothers as the virus can result in

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microcephaly or cause other problems for brain development. For adults, the virus can be linked to increased incidence of Guillain-Barré syndrome.

4.3.7.4 Future Occurrence

Pandemic & Epidemic

The probability of a widespread public health emergency effecting Potter County is approximately once every ten years. Minor outbreaks of less serious communicable disease, such as influenza, will occur much more frequently. The occurrence of pandemic influenza outbreaks is unpredictable, and complete avoidance of the events is unlikely. Therefore, future occurrences of pandemics and infectious disease events are very likely. Pandemics may also emerge from other diseases, especially invasive pathogens for which Potter County and Pennsylvania as a whole lack natural immunity.

Influenza

It is estimated that 5% to 25% of Pennsylvanians get the flu each year, and 120 to 2,000 individuals die from complications of influenza. The CDC recommends that everyone six months and older get a flu vaccine every season to prevent future cases from rising. People who are at a high risk of serious flu illness should take flu antiviral drugs as soon as they get sick.

Infectious Disease

Infectious diseases such as West Nile Virus and Lyme Disease have been present in Potter County for many years and are expected to perpetuate. The best way to prevent infectious disease outbreaks, including West Nile Virus and Lyme Disease, is to actively address the causes of the diseases. West Nile Virus occurrence can be reduced by removing mosquito breeding locations in stagnant water sources and Lyme Disease occurrence can be reduced by utilizing insect repellent, removing ticks promptly, applying pesticides, and reducing tick habitats. Occurrence of Zika Virus can also be reduced by removing mosquito breeding areas and areas of stagnant water. Both West Nile Virus and Lyme Disease are expected to continue occurring in Potter County in the future.

4.3.7.5 Vulnerability Assessment

Potter County is considered to be a moderate vulnerability county in regard to the pandemic events. It is extremely difficult to predict the occurrence and the magnitude of a pandemic or epidemic event. The COVID-19 pandemic disproportionately affected populations over the age of sixty-five, especially those in nursing homes. It has had disparate effect on socially vulnerable populations, including unsheltered and homeless individuals.

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Elderly individuals, children and immune deficient individuals are the most vulnerable to disease. Nursing facilities, personal care facilities, daycares, schools, and hospitals are considered more vulnerable since there are often groups of these socially vulnerable individuals present at these community lifelines. Congregate living facilities, including correctional institutions and dormitories would also be at an increased risk due to the difficulties in adhering to the social distancing required to help stop the spread of a pandemic. During the COVID-19 pandemic, nursing homes and personal care homes in Pennsylvania reported high numbers of cases and deaths, and several county jails and state correctional institutions reported wide community spread.

Health-care workers and those working in direct-care (such as correctional institutions or those who cannot social distance due to their jobs) are more likely to be exposed to a pandemic disease. Those who work outdoors for extended periods of time in warm months may be more vulnerable to West Nile Virus, Lyme Disease, or the Zika virus.

The number of hospitals within the county, and availability of beds within the hospitals, determine the amount of care vulnerable and sick patients will receive. It is important for hospitals to review and exercise emergency response plans and continuity of operations plans (COOP) to ensure that there is an effective public health response.

During a public health emergency, the PA DOH may open emergency medicine centers called points of dispensing (PODs) to ensure that medicine, supplies, vaccines, and information reach Pennsylvania residents during a public health emergency. An open POD is where the general public goes to receive free emergency medicine and supplies from public health officials, while a closed POD provides free emergency medicine and supplies to a specific community, like a university, including faculty, staff, and students. Dispensing of medications/vaccines is a core function of the Strategic National Stockpile's Mass Dispensing of Medical Countermeasures Plan.

PODs are coordinated with county emergency managers by the PA DOH with the six regional healthcare districts (see *Figure 25 - Pennsylvania Department of Health Districts*). Potter County is in the Northcentral Region. At the time of the writing of this plan, PODs were involved with mass vaccinations against COVID-19.

Municipalities with an increased risk to pandemic, epidemic, and infectious disease:

- Abbott Township
- Allegany Township
- Austin Borough
- Bingham Township
- Clara Township
- Coudersport Borough
- Eulalia Township
- Galeton Borough

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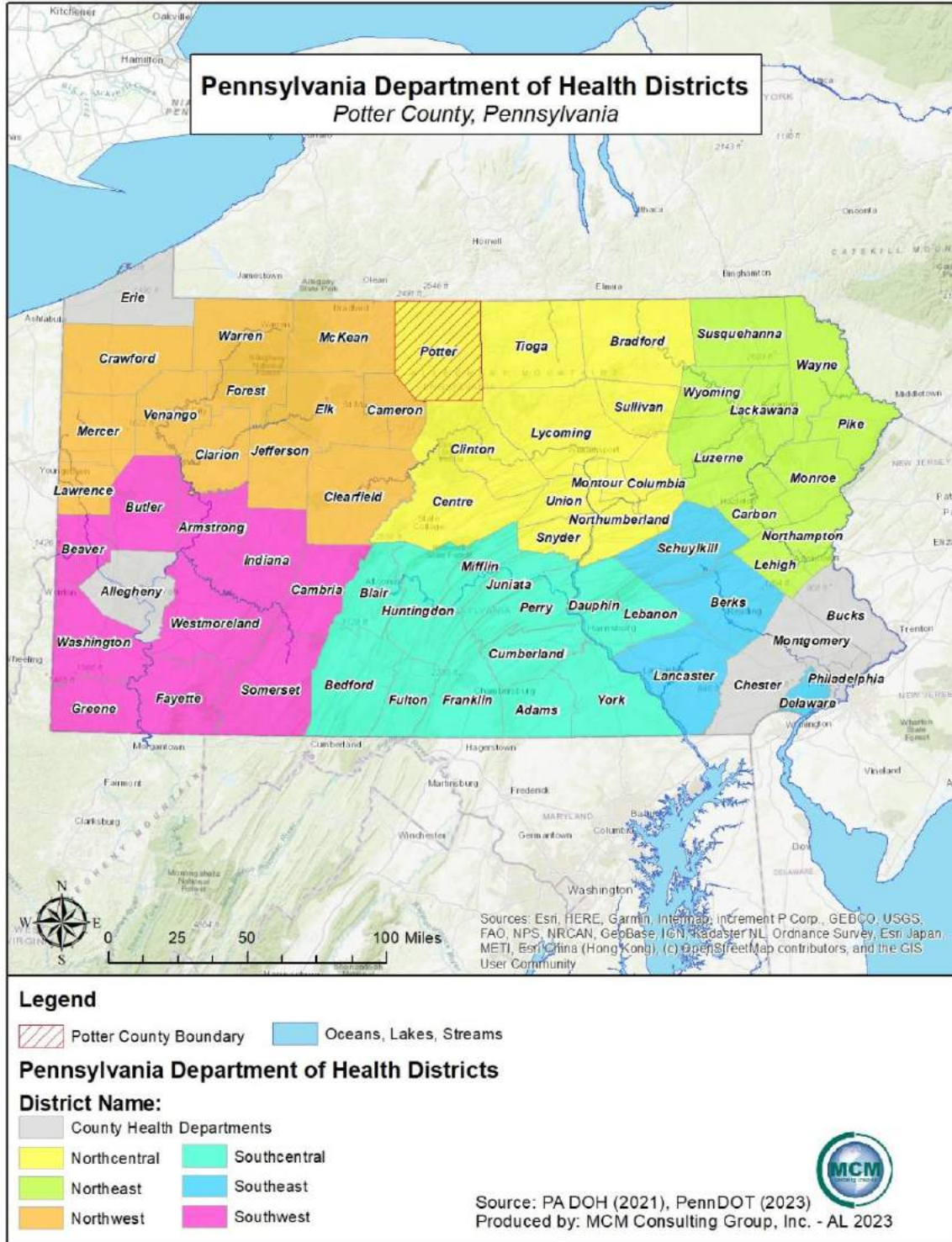
- Genesse Township
- Harrison Township
- Hebron Township
- Hector Township
- Homer Township
- Keating Township
- Oswayo Borough
- Oswayo Township
- Pike Township
- Pleasant Valley Township
- Portage Township
- Roulette Township
- Sharon Township
- Shinglehouse Borough
- Stewardson Township
- Summit Township
- Sweden Township
- Sylvania Township
- Ulysses Borough
- Ulysses Township
- West Branch Township
- Wharton Township

Land use and land development could directly impact the vulnerability of Potter County to pandemic, epidemic, and infectious disease events. Development of forested and rural areas could result in populations coming into direct contact with vectors for infectious disease, including, most prominently, Lyme Disease and West Nile Virus. When rural and natural habitats for wildlife area developed, those vectors that live along and with wildlife have the potential to encounter the individuals developing the properties, and the populations that will occupy those areas. An increase in development could also lead to an increase in the number of individuals living in Potter County, increasing the county’s vulnerability to pandemic events, like COVID-19.

Population changes can directly impact the vulnerability of Potter County to pandemic events, like COVID-19. With increased populations, there is a greater risk of the spread of viruses and communicable diseases, especially in areas where population density is high. Eight of the thirty municipalities in Potter County have had a population increase between the 2010 decennial census and the 2020 decennial census. This can be found in *Table 3 – Population Change in Potter County*. The other municipalities did not have an increase in the same time period. Potter County should monitor population growth in the boroughs around the county.

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Figure 25 - Pennsylvania Department of Health Districts



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4.3.8. Radon Exposure

4.3.8.1 Location and Extent

Airborne radon gas is radioactive and is a step in the radioactive decay of uranium to radium. Radon is a noble gas, cannot be seen and has no odor. Like other noble gasses, radon gas is very stable, so it does not easily combine with other chemicals. Two isotopes of radon are commonly found: ^{222}Rn and ^{220}Rn . The ^{220}Rn isotope has a very short half-life, so it often only exists for fifty-five seconds, not long enough to pose a hazard to humans. The ^{222}Rn isotope has a half-life of 3.8 days which is long enough to pose a threat to humans. Still, due to the relatively short half-life of ^{222}Rn , it only exists in relative proximity to its radioactive parent, usually within tens of feet away. Radon is a carcinogen and when inhaled, it can lead to the development of lung cancer.

Radioactivity, caused by airborne radon, has been recognized for many years as an important component in the natural background radioactivity exposure of humans, but it was not until the 1980s that the wide geographic distribution of elevated values in houses and the possibility of extremely high radon values in houses were recognized. Radon was discovered as a significant source of natural radiation for humans in 1984 in the Reading Prong geologic province in Eastern Pennsylvania, when routine monitoring of employees leaving the not yet active Limerick nuclear power plant showed readings that a construction worker working on the plant frequently exceeded expected radiation levels despite the fact that the plant was not active. The Environmental Protection Agency (EPA) guidelines state that mitigation actions should be taken if levels exceed 4pCi/L in a home, and most uranium miners have a maximum exposure of 67 pCi/L. Subsequent testing of the Limerick power plant worker's home showed high radon levels of 2,500 pCi/L (pico Curies per Liter), triggering the Reading Prong to become the focus of the first large-scale radon scare.

Radon gas is considered ubiquitous and can be found in indoor and outdoor environments. There is no known safe level of exposure to radon. For most people in Pennsylvania, the greatest risk of radon exposure is from within their home in rooms that are below, directly in contact with, or immediately above the ground. Sources of radon include radon in the air from soil and rock beneath homes, radon dissolved in water from private wells and exsolved during water use (rare in Pennsylvania), and radon emanating from uranium-rich building materials such as concrete blocks or gypsum wallboard (also rare in Pennsylvania). Key factors in radon concentration in homes are the rates of air flow into and out of the house, the location of air inflow, and the radon content of air in the surrounding soil. Because of the flow dynamics of air inside of most houses, even a small rate of soil radon gas inflow can lead to elevated radon concentrations.

There are several factors that contribute to higher radon levels in soil gas:

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- Proximity to elevated uranium rich deposits (>50ppm). Areas within a few hundred feet of such deposits are most at risk. Such deposits are rare in Pennsylvania.
- Some more common rocks have higher than average uranium content (5 to 50 ppm), and proximity to such rocks also increases the risk of radon exposure. These rock types include black shales as well as granitic and felsic alkali igneous rocks. This is the most common source of high radon levels in Pennsylvania. The Reading Prong elevated radon levels come from Precambrian granitic gneisses.
- Other soil and bedrock properties that facilitate radon mobility. The amount of pore space in the soil and its permeability – more porous soils will allow radon to travel more easily. Limestone-dolomite soils can also be predisposed to collect radon from radium resultant from weathering of iron oxide or clay surfaces. In some cases (like State College in Centre County, PA) even with underlying bedrock having normal uranium concentrations (.5 to 5 ppm), the vast majority of locations built on limestone-dolomite soils exceed radon concentrations of 4pCi/L, and many exceeded 20 pCi/L.

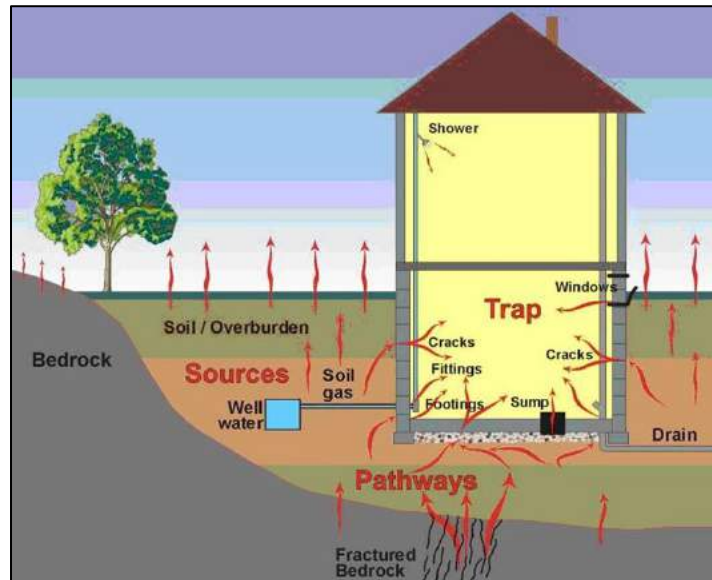
The following three sources of radon in houses are now recognized (see *Figure 26 - Sketch of Radon Entry Points into a House* below):

- Radon in soil air that flows into the house
- Radon dissolved in water from private wells and exsolved during water usage; this is rarely a problem in Pennsylvania
- Radon emanating from uranium-rich building materials (e.g., concrete blocks or gypsum wallboard); this is not known to be a problem in Pennsylvania

High radon levels were initially thought to be exacerbated in houses that are tightly sealed, but it is now recognized that rates of airflow into and out of houses, plus the location of air inflow and the radon content of air in the surrounding soil, are key factors in radon concentrations. Outflows of air from a house, caused by a furnace, fan, thermal “chimney” effect, or wind effects, require that air be drawn into the house to compensate. If the upper part of the house is tight enough to impede influx of outdoor air (where radon concentration is generally <0.1 pCi/L), then an appreciable fraction of the air may be drawn in from the soil or fractured bedrock through the foundation and slab beneath the house, or through cracks and openings for pipes, sumps, and similar features. Soil gas typically contains from a few hundred to a few thousand pCi/L of radon; therefore, even a small rate of soil gas inflow can lead to elevated radon concentrations in a house.

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Figure 26 - Sketch of Radon Entry Points into a House



The radon concentration of soil gas depends upon a number of soil properties, the importance of which is still being evaluated. In general, 10% to 50% of newly formed radon atoms escape the host mineral of their parent radium and gain access to the air-filled pore space. The radon content of soil gas clearly tends to be higher in soils containing higher levels of radium and uranium, especially if the radium occupies a site on or near the surface of a grain from which the radon can easily escape. The amount of pore space in the soil and its permeability for airflow, including cracks and channels, are important factors determining radon concentration in soil gas and its rate of flow into a house. Soil depth and moisture content, mineral host and form for radium, and other soil properties may also be important. For houses built on bedrock, fractured zones may supply air having radon concentrations similar to those in deep soil.

The second factor listed above is most likely the cause of high radon levels in Potter County. The data show that most reported zip codes in the county have high basement radon level test results. The areas and test results are shown in more detail in the past occurrence section.

4.3.8.2 Range of Magnitude

According to the EPA, about 21,000 lung cancer deaths each year in the U.S. are related to radon. It is the second leading cause of lung cancer after smoking and the number one cause of lung cancer among nonsmokers. Radon causes lung cancer by continuing to radioactively decay after being inhaled, and turning into a daughter product (^{218}Po , ^{214}Pb , ^{214}Bi) which may become attached to lung tissue and induce lung cancer due to the continued radioactive decay.

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The EPA reports that the national average radon concentration of indoor air of homes is about 1.3 pCi/L, and they recommend that homes be fixed if the radon level is 4pCi/L or more. There is however no safe level of radon exposure, so the EPA also recommends considering fixing a home if the radon level is between 2 pCi/L and 4 pCi/L.

Table 41 - Radon Risk for Smokers and Nonsmokers shows the relationship between various radon levels, probability of lung cancer, comparable risks from other hazards, and action thresholds. As seen in *Table 41 - Radon Risk for Smokers and Nonsmokers* below, a smoker exposed to radon has a much higher risk of lung cancer.

Table 41 - Radon Risk for Smokers and Nonsmokers

Radon Risk for Smokers and Nonsmokers			
Radon Level (pCi/L)	If 1,000 People Were Exposed to this level over a lifetime...*	Risk of cancer from radon exposure compares to...***	Action Threshold
SMOKERS			
20	About 260 people could get lung cancer	250 times the risk of drowning	Fix Structure
10	About 150 people could get lung cancer	200 times the risk of dying in a home fire	
8	About 120 people could get lung cancer	30 times the risk of dying in a fall	
4	About 62 people could get lung cancer	5 times the risk of dying in a car crash	
2	About 32 people could get lung cancer	6 times the risk of dying from poison	Consider fixing structure between 2 and 4 pCi/L
1.3	About 20 people could get lung cancer	(Average indoor radon level)	Reducing radon levels below 2pCi/L is difficult
0.4	About 3 people could get lung cancer	(Average outdoor radon level)	
NON-SMOKERS			
20	About 36 people could get lung cancer	35 times the risk of drowning	Fix Structure

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Radon Risk for Smokers and Nonsmokers			
Radon Level (pCi/L)	If 1,000 People Were Exposed to this level over a lifetime...*	Risk of cancer from radon exposure compares to...***	Action Threshold
10	About 18 people could get lung cancer	20 times the risk of dying in a home fire	
8	About 15 people could get lung cancer	4 times the risk of dying in a fall	
4	About 7 people could get lung cancer	The risk of dying in a car crash	
2	About 4 people could get lung cancer	The risk of dying from poison	Consider fixing structure between 2 and 4 pCi/L
1.3	About 2 people could get lung cancer	(Average indoor radon level)	Reducing radon levels below 2pCi/L is difficult
0.4	-	(Average outdoor radon level)	
<small>Note: Risk may be lower for former smokers * Lifetime risk of lung cancer deaths from EPA Assessment of Risks from Radon in Homes (EPA 402-R-03-003). ** Comparison data calculated using the Centers for Disease Control and Prevention's 1999-2001 National Center for Injury Prevention and Control Reports.</small>			

4.3.8.3 Past Occurrence

In 1984, the Pennsylvania Radon Bureau responded to the newly detected high radon levels with a massive radon monitoring, educational, and remediation effort. In the start of November 1986, over 18,000 homes had been screened for radon and approximately 59% were found to have radon daughter levels in excess of the 0.020 Working Level (WL) guideline. Radon daughter levels ranged up to 13 WL or 2600 pCi/L or radon gas.

The Pennsylvania Department of Environmental Protection (PA DEP) provides information for homeowners about how to test for radon in their homes, and when they receive a test result over 4 pCi/L, the PA DEP Bureau of Radiation Protection works to help homeowners repair the home and mitigate the hazard. The DEP has estimated that the national average indoor radon concentration is 1.3 pCi/L and the level for action is 4.0 pCi/L; however, they have estimated that the average indoor concentration in Pennsylvania basements is about 7.1 pCi/L and 3.6 pCi/L on the first floor. The PA DEP records all the tests they receive and categorize them in a searchable database by zip code. There are currently 2,174 zip codes in Pennsylvania, but the zip

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code radon test data only covers 986 zip codes. The missing zip codes that report in the database as “N/A” for insufficient data either had fewer than thirty test results or no test results at all.

Figure 42 – Radon Test Results in Potter County shows a total of twelve zip codes in Potter County where tests were reported to the PA DEP to report their findings; those with no available data were not included in the table. The highest average radon level was reported from the 16746 zip code, which is in Roulette Township, with an average reading of 43.7 pCi/L within location of the basement. Most reporting zip codes in Potter County have average basement Radon levels significantly above the suggested EPA action level of 4 pCi/L. The average basement reading for reporting zip codes in the county is 20.86 pCi/L, and the average first floor reading is 5.0 pCi/L.

Table 42 - Radon Test Results in Potter County

Radon Level Test Results					
Zip Code	Postal Community	Location	Number of Tests	Max Result pCi/L	Average Result pCi/L
16915	Coudersport/Oswayo	Basement	906	624.6	15.9
		First Floor	271	96.2	5.0
16748	Ulysses	Basement	76	166.9	13.0
		First Floor	N/a	N/a	N/a
16720	Austin	Basement	46	65.9	12.7
		First Floor	N/a	N/a	N/a
16922	Galeton	Basement	115	266.1	25.0
		First Floor	N/a	N/a	N/a
16923	North Bingham	Basement	39	140.0	9.0
		First Floor	N/a	N/a	N/a
16948	Shinglehouse	Basement	72	393.9	26.7
		First Floor	N/a	N/a	N/a
16746	Roulette	Basement	35	534.3	43.7
		First Floor	N/a	N/a	N/a

Source: PA DEP, 2023

4.3.8.4 Future Occurrence

Radon exposure is likely given the geologic and geomorphic conditions in Potter County. The EPA and USGS have mapped radon potential in the US to help target resources and assist local governments in determining if radon-resistant features are applicable for new construction. The designations are broken down in three zones and are assigned by county, as shown in *Figure 27*

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– *Pennsylvania Radon Levels*. Each zone reflects the average short-term measurement of radon that can be expected in a building without radon controls. Potter County is located within Zone 1 with counties of high potential for radon which indicate an intermediate likelihood of occurrence in the future.

1. Zone 1 has the highest potential and readings can be expected to exceed the 4 pCi/L recommended limit.
2. Zone 2 has a moderate potential for radon with levels expected to be between 2 and 4 pCi/L and
3. Zone 3 has a low potential with levels expected to be less than 2 pCi/L.

Due to the moderate likelihood of future occurrence, the level of radon daughters should be monitored. Radon daughters are the concentration of decay products of radon in the uranium chain. Fortunately, the presence of radon daughters can be monitored through the means as radon gas. *Table 43 - Suggested Actions and Time Frame for Exposure to Radon Daughters* provides suggested actions and time frames for varying levels of exposure to radon daughters.

Table 43 - Suggested Actions and Time Frame for Exposure to Radon Daughters

Suggested Actions and Timeframe for Exposure to Radon Daughters		
Exposure Level*	Suggested Action**	Timeframe For Plan
more than 5.0 WL***	Residents should either promptly relocate or undertake temporary remedial action to lower levels as far below 5.0 WL as possible. Smoking in high areas discouraged.	Within 2-3 days
1.0 to 5.0 WL	Residents should undertake temporary remedial action to lower levels as far below 1.0 WL as possible. Smoking in high areas discouraged.	Within 1 week
0.5 to 1.0 WL	Residents should undertake temporary remedial action to lower levels as far below 0.5 WL as possible.	Within 2 weeks
0.1 to 0.5 WL	Residents should undertake temporary remedial action to lower levels as far below 0.1 WL as possible. Higher exposure levels require action to be taken in a shorter	3 weeks to 3 months
0.02 to 0.1 WL	Residents should undertake temporary and/or permanent remedial action to lower levels below 0.02 WL. Higher exposure levels require action to be taken in a shorter	4 to 15 months

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Climate change will have very minor impacts on the future occurrence of radon exposure in Potter County. If bedrock and geological strata are exposed to air and weathering due to weather pattern changes from climate change, there exists the possibility of increased radon exposure. This is considered unlikely but not out of the realm of possibility for Potter County. There are many unknowns related to specific weather patterns and how they will be impacted by climate change.

4.3.8.5 Vulnerability Assessment

Proper testing for radon levels should be conducted across Potter County, especially in the areas of higher incidence levels, and for those individuals and households that face the contributing risks. This testing will determine the level of vulnerability that residents face in their homes, as well as in their businesses and schools.

Potter County is in the EPA Radon Hazard Zone 1, meaning there is a high risk of radon exposure. Smokers can be up to ten times more vulnerable to lung cancer from high levels of radon depending on the level of radon they are exposed to. Additionally, older homes that have crawl spaces or unfinished basements are more vulnerable to having high radon levels. Average basement radon levels for homes who reported their results to the PA DEP are often found to be above the EPA action level of 4 pCi/L. *Figure 28 – Radon Levels by Zip Code* shows the best available data from the EPA about the percentage of homes with radon levels at or above the EPA action level. The EPA estimates that an average radon mitigation system costs approximately \$1,200.00. The PA DEP Bureau of Radiation Protection provides short- and long-term tests to determine radon levels, as well as information on how to mitigate high levels of radon in a building. The 2018 PA HMP estimates that there are 8,070 vulnerable buildings in Potter County that are in areas with high radon test results, and the cost to mitigate the most impacted of those buildings (an estimated 20% of them or 1,614 buildings) would be \$1,936,800.00.

The two historic buildings in Potter County that are registered with the National Register of Historic Places are at an increased vulnerability to radon exposure if they have not already been mitigated for radon. These locations are the Coudersport and Port Allegany Railroad Station and the Potter County Courthouse, both located in Coudersport Borough.

Municipalities within areas of high radon exposure (over 15.01 pCi/L in basement averages):

- Abbott Township
- Allegany Township
- Austin Borough
- Bingham Township
- Clara Township
- Coudersport Borough

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- Eulalia Township
- Galeton Borough
- Genesse Township
- Harrison Township
- Hebron Township
- Hector Township
- Homer Township
- Keating Township
- Oswayo Borough
- Oswayo Township
- Pike Township
- Pleasant Valley Township
- Roulette Township
- Sharon Township
- Stewardson Township
- Summit Township
- Sweden Township
- Sylvania Township
- Ulysses Borough
- Ulysses Township
- West Branch Township
- Wharton Township

Municipalities without areas of high radon exposure (over 15.01 pCi/L in basement averages):

- Portage Township
- Shinglehouse Borough

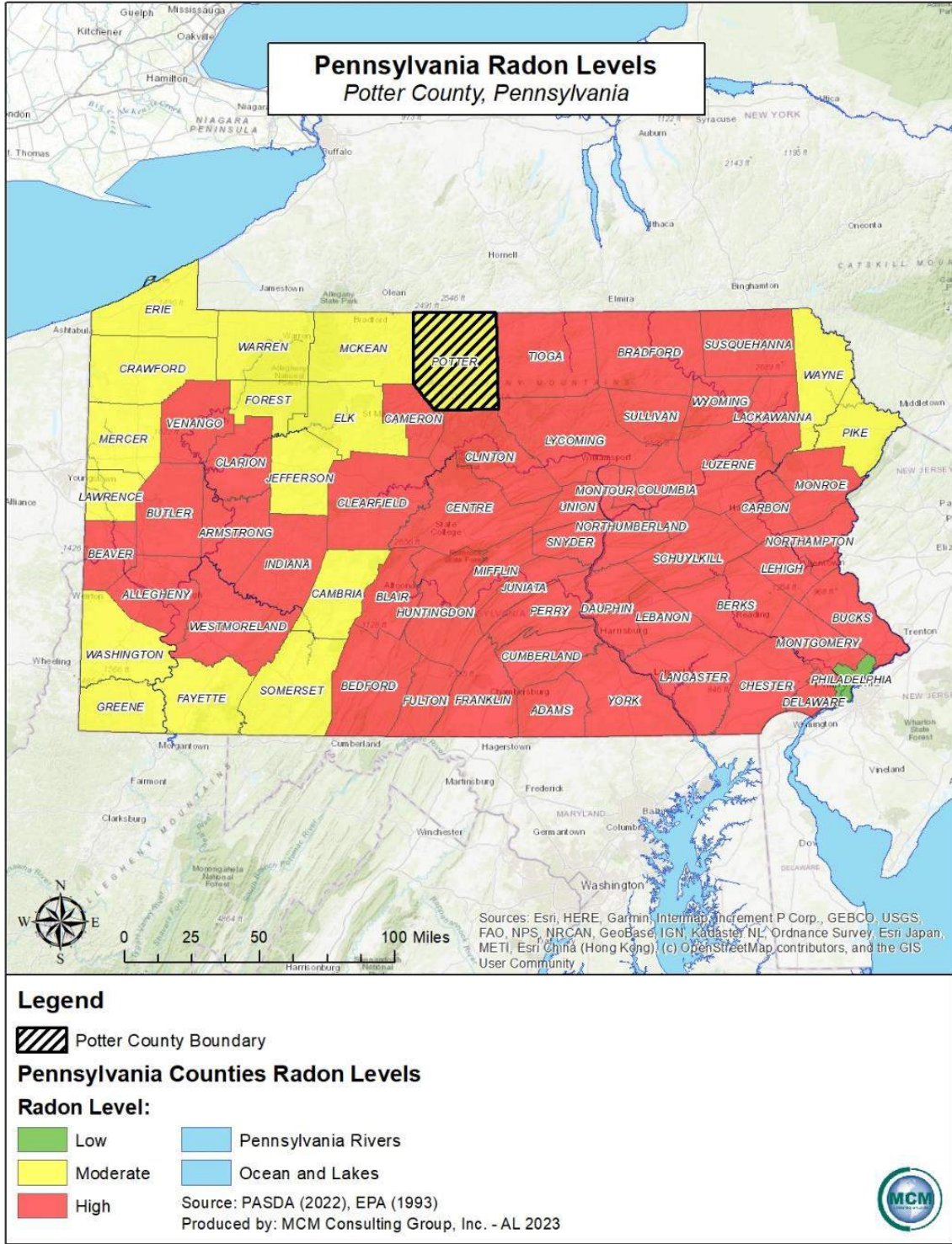
If land use and land development changes occur, the risk and vulnerability of radon exposure in Potter County could increase. With an increase in development there could be a rise in the number of individuals living in Potter County with basements, thereby increasing their exposure to radon. New development in Potter County could also have a decrease on the vulnerability of populations in the county to radon. New development may have radon mitigating systems in place to reduce the vulnerability. Especially in areas of high radon exposure, radon prevention systems can cost between \$500.00 and \$2,000.00 per structure.

Population changes, especially an increase, in Potter County could pose an increase to risk and vulnerability of radon exposure to individuals in each municipality. Between the 2010 decennial census and the 2020 decennial census, Potter County experienced growth in eight of the thirty municipalities. These increases can be seen in *Table 3 – Population Change in Potter County*.

Socially vulnerable populations in Potter County are at an increased vulnerability to radon exposure than other groups in Potter County. Approximately 16.1% of the population of Potter County is in poverty, and those individuals may be located in areas of high radon risk. Those individuals may also be unable to purchase or install radon remediation kits and systems due to economic factors.

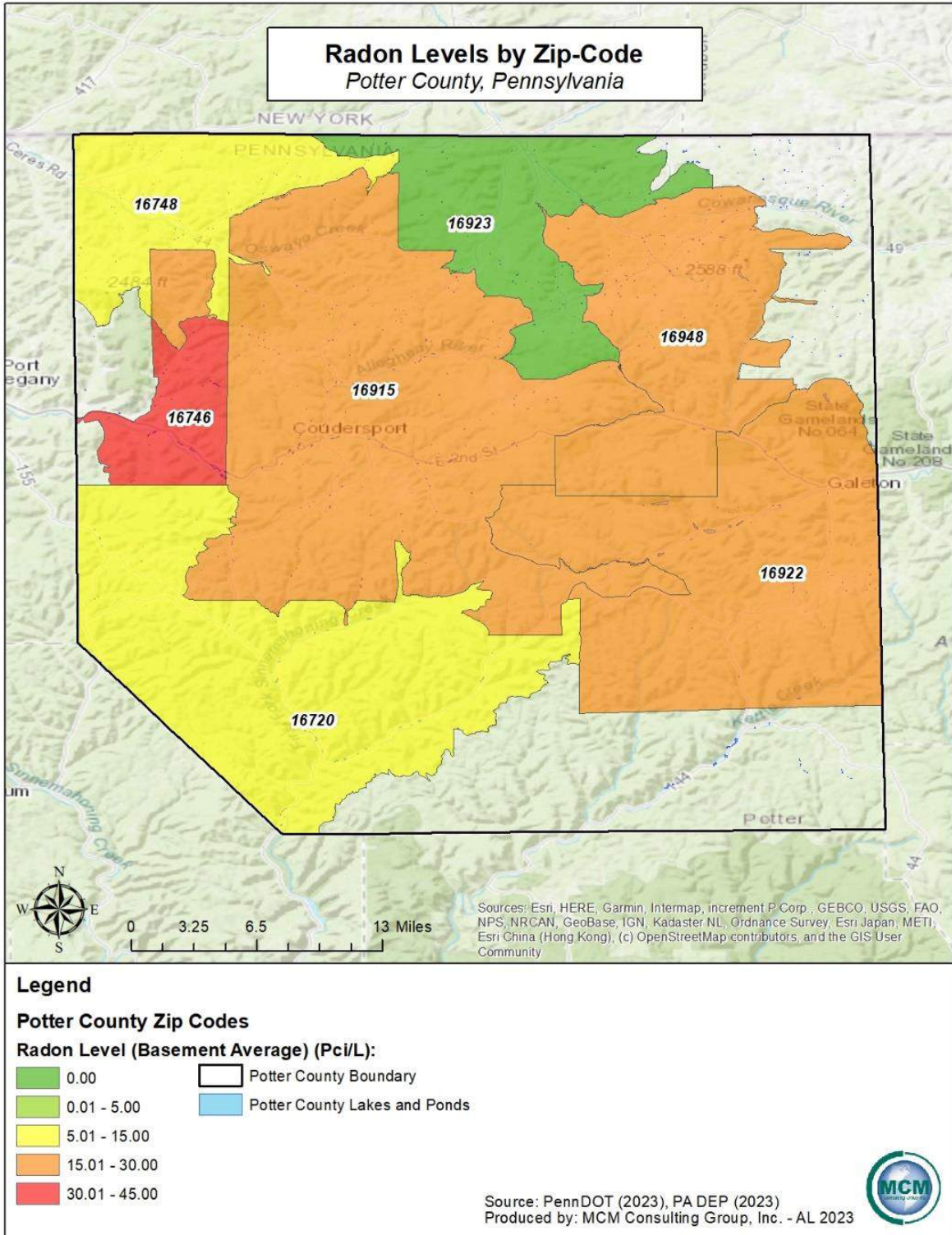
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Figure 27 - Pennsylvania Radon Levels



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Figure 28 - Radon Levels by Zip Code



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4.3.9. Subsidence and Sinkhole

4.3.9.1 Location and Extent

Subsidence is the sinking movement of the earth's surface; the result of this movement is commonly referred to as a sinkhole. There are two common causes of subsidence in Pennsylvania: 1) dissolution of carbonate rock such as limestone or dolomite and 2) mining activity. In the first case, water passing through naturally occurring fractures and bedding planes dissolves bedrock leaving voids below the surface. Eventually, overburden on top of those voids collapses, leaving surface depressions resulting in what is known as karst topography. Characteristic structures associated with karst topography include sinkholes, linear depressions, and caves. Often, sub-surface solution of limestone will not result in the immediate formation of karst features. Collapse sometimes occur only after a large amount of activity, or when a heavy burden is placed on overlying material. The bedrock geology is found mostly in the south-central and eastern portions of the Commonwealth of Pennsylvania, and Potter County is located in a karst vulnerable area. Subsidence in Potter County is primarily due to karst topography and also as a result of mining activity. This plan will focus on both carbonate rock / karst topography and mining activity. Potter County has a history of subsidence due to carbonate rock and mining activity.

Mining activity is concentrated in the southwestern region of the state. The majority of sub-surface (i.e., underground) extraction of materials such as oil, gas, coal, metal ores (i.e., copper, iron, and zinc), clay, shale, limestone, or water can result in slow-moving or abrupt shifts in the ground surface and these areas have a higher potential to be impacted by sinkholes and subsidence. Sinkholes often develop where the cover above a mine is thin. Sinkhole development normally occurs where the interval to the ground surface is less than three to five times the thickness of the extracted seam and the maximum interval is up to ten times the thickness of the extracted seam. In western Pennsylvania, most sinkholes develop where the soil and rock above a mine are less than fifty feet thick.

Human activity can also result in subsidence or sinkhole events. Leaking water pipes or structures that convey storm-water runoff may result in areas of subsidence as the water dissolves substantial amounts of rock over time. Poorly managed stormwater can be an exacerbating factor in subsidence events. In some cases, construction, land grading, or earthmoving activities that cause changes in stormwater flow can trigger sinkhole events.

4.3.9.2 Range of Magnitude

No two subsidence areas or sinkholes are exactly alike. Variations in size and shape, time period under which they occur (i.e., gradually, or abruptly), and the proximity to development ultimately determine the magnitude of damage incurred. Events could result in minor elevation

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changes or deep, gaping holes in the surface. Subsidence and sinkhole events can be addressed before significant damage occurs.

Primarily, problems related to subsidence include the disruption of utility services and damages to private and public property including buildings, roads, and underground infrastructure. Isolated incidents of subsidence throughout the coal regions over the past years have affected houses, garages, and trees that have been swallowed up by subsidence holes. Lengths of local streets and highways, and countless building foundations have been damaged.

If long-term subsident or sinkhole formation is not recognized and mitigation measures are not implemented, fractures or complete collapse of building foundations and roadways may result. The worst-case scenario of a mine subsidence event for Potter County would be similar to an event in Allegheny County in 2013, when sixty-nine homes in Hyde Park sustained mine subsidence damage. The Pennsylvania Department of Environmental Protection responded to the subsidence by filling the mine voids at a cost of \$3.7 million. If mitigation measures are not taken, the cost to fill in and stabilize sinkholes can be significant although sinkholes are limited in range of magnitude.

Voids in the earth's subsurface are created where coal was previously mined and removed. The condition removes a significant portion of the support of the overlying rock strata that usually causes the rock strata to fall or subside into the voids that may damage dwellings or other surface structures above the affected areas. Mining locations across the county should be carefully noted and avoided as sites for new construction unless the proper measures are taken to ensure the mine's soundness.

Figure 29 – Sinkhole Susceptibility in Pennsylvania illustrates the portions of the Commonwealth of Pennsylvania where sinkholes and subsidence are common. The hazard for subsidence and sinkholes in these regions is very high. Potter County has a large portion of mining areas and is therefore one of these regions.

4.3.9.3 Past Occurrence

There is no comprehensive list of mine subsidence in Potter County. The Pennsylvania Department of Conservation and Natural Resources (PA DCNR) provides an online sinkhole inventory database, which lists a total of 3,619 identified sinkholes in Pennsylvania as of 2020. Of these sinkholes there are no sinkholes that fall within Potter County. The fact that no sinkholes were identified does not necessarily mean there are no sinkholes in Potter County. Additionally, the Pennsylvania Department of Environmental Protection indicates that some small incidences of sinkholes occur several times per week and cause limited damage and that many of these are related to failing infrastructure like water main breaks or collapsed pipes.

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4.3.9.4 Future Occurrence

There is currently no reliable information regarding the probability of future occurrence of subsidence or sinkholes in Pennsylvania. One way of estimating the probability of future occurrences would be to project the historical trends into the future, but there is no comprehensive documentation of previous events in Potter County. The PA DEP has noted that mine subsidence events are constant though they vary in intensity and damage. Based on geological conditions and mining activities in Potter County, the annual occurrence of subsidence and sinkholes near karst topography and where mining occurs is considered likely. Although precise locations of future occurrences is difficult to predict due to site-specific conditions that contribute to sinkhole development, there are several signs that can signal potential development.

The signs include:

- Slumping or falling fence posts, trees, or foundations.
- Sudden formation of small ponds.
- Wilting vegetation.
- Discolored well water.
- Structural cracks in walls and/or floors.

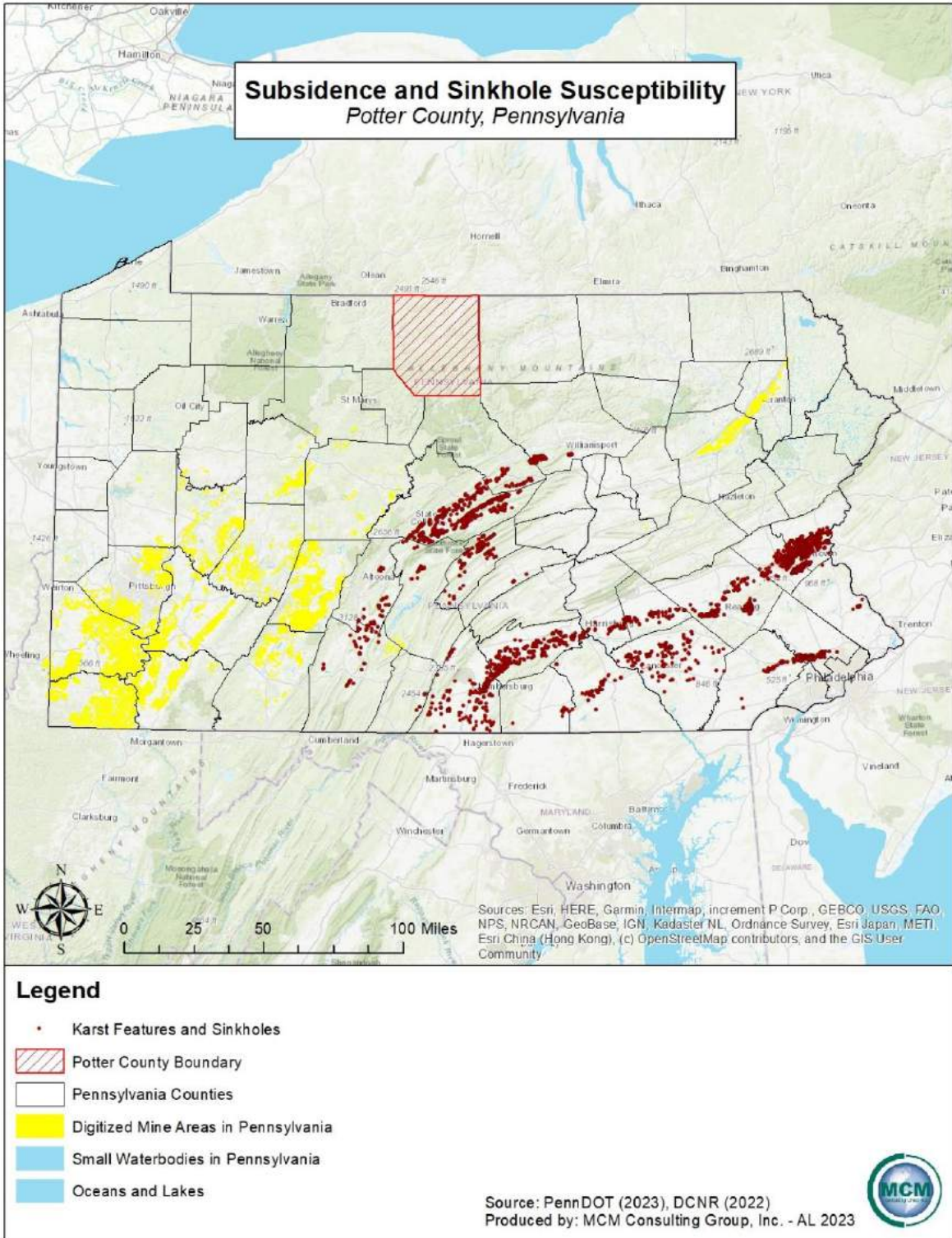
Based on geological conditions and mining activity, subsidence events are likely to occur in Potter County. If land development and mining were to occur in an area that is unstable or unsafe, a subsidence event or sinkhole is likely to form. *Figure 30 – Unsuitable Areas for Mining in Pennsylvania* illustrates the areas of Pennsylvania where mining could potentially cause a subsidence event or a sinkhole. A significant area that is unsuitable for mining is located around Potter County, specifically directly south of the county boundary in adjacent Clinton County. This area can be seen in the figure.

4.3.9.5 Vulnerability Assessment

Areas of the county where commercial mining operations take place are the most vulnerable to subsidence and sinkhole hazards. Natural subsidence and sinkholes have never been reported in Potter County. A mined area may be differentially prone to subsidence based on its geology and depth of mineral seam, but reliable information about the different locations of varying depths of seams are not available. Geologists agree that all areas that are mined are prone to subsidence; therefore, coal mined areas are shown as vulnerable to mine subsidence. Subsidence cannot be ruled out as a potential hazard for Potter County. There are no state or county critical infrastructure facilities at risk in the county due to sinkholes.

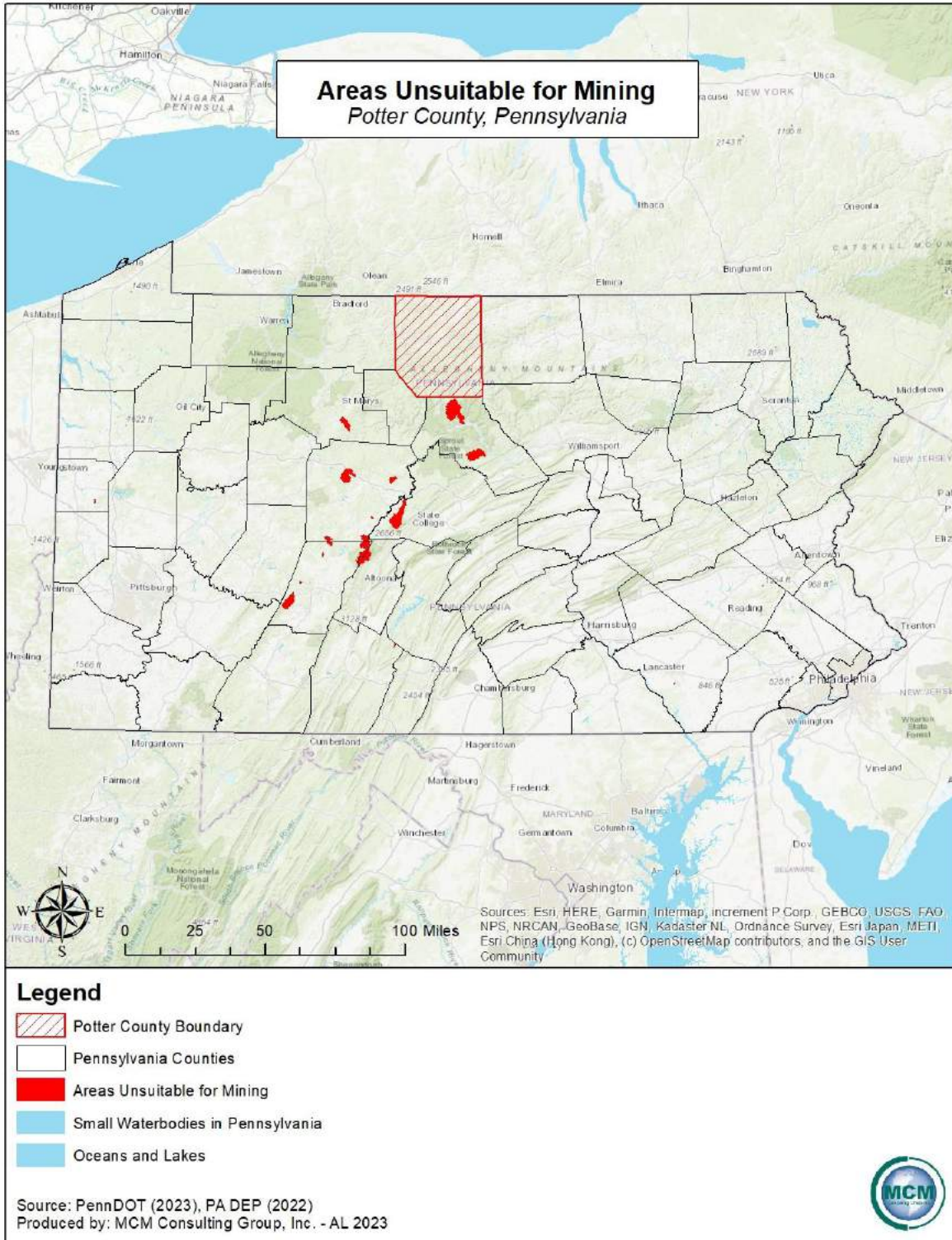
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Figure 29 - Sinkhole Susceptibility in Pennsylvania



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Figure 30 - Unsuitable Areas for Mining in Pennsylvania



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4.3.10. Tornado and Windstorm

4.3.10.1 Location and Extent

Tornadoes and windstorms can occur throughout Potter County and are usually localized in their location and extent. Severe thunderstorms may result in conditions favorable for the formation of windstorms, including tornadoes. Tornadoes are nature’s most violent storms and can cause fatalities and devastation to neighborhoods and municipalities within the county and region. Tornadoes can occur at any time during the day or night but are most frequent during the later afternoon and early evening, which are typically the warmest hours of the day. Tornadoes are most likely to occur in the spring and summer.

Tornadoes

There are two main types of tornadoes: supercell and non-supercell. Supercell tornadoes are the most common and often the most dangerous type of tornado. A rotating updraft is key to the development of a supercell and, eventually, a tornado. Once the updraft is rotating and being fed by warm air, a tornado is formed. The other type of tornado is categorized as non-supercell, which is not as common as a supercell tornado. One type of non-supercell tornado is the “Quasi-Linear Convective Systems” (QLCS). The QLCS tornadoes typically arise during the late night or early morning hours and are typically weaker and more short-lived than supercell tornadoes. However, QLCS are more difficult to detect effectively. Another type of non-supercell tornado is a landspout. These tornadoes are narrow, rope-like funnels that form when a thundercloud grows without a rotating updraft, which causes the spinning motion common with tornadoes to appear near the ground.

Windstorms

Windstorms are experienced on a region-wide scale. The most frequent cause of windstorms in Pennsylvania are thunderstorms, although they may also be caused by hurricanes and winter storms. Windstorms are defined as sustained wind speeds of 40 mph or greater, lasting for at least one hour, or winds of 58 mph or greater lasting for any duration. There are a wide variety of windstorm events that can take place in Potter County.

4.3.10.2 Range and Magnitude

Tornadoes

Each year tornadoes account for \$1.1 billion in damages and cause over eighty deaths nationally. Thus far, 2011 was the second worst year on record for deadly tornadoes behind 1936. The number of tornado reports has increased since 1950. While the extent of tornado damage is usually localized, the vortex of extreme wind associated with a tornado can result in some of the

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most destructive forces on Earth. The damage caused by a tornado is a result of the high-wind velocity and windblown debris, also accompanied by lightning or large hail. The most violent tornadoes have rotating winds of 250 mph or more and are capable of causing extreme destruction and turning normally harmless objects into deadly projectiles.

Tornado movement is characterized in two ways: direction/speed of spinning winds and the forward movement of the tornado, also known as the storm track. The rotational wind speeds can range from 65 to more than 200 miles per hour (mph). The speed of forward motion can range from 0 mph to 50 mph. Forward motion of a tornado path can be a few to several hundred miles in length. Widths of tornadoes vary from less than 100 feet in diameter to more than a mile wide in regard to the largest tornadoes on record. The National Centers for Environmental Information (NCEI) reports that, “the maximum winds in tornadoes are often confined to extremely small areas and vary tremendously over short distance,” which explains why one house in a tornado’s path may be completely demolished while a neighboring house could remain untouched. Some tornadoes never touch the ground and remain short lived, while others may touch the ground or “jump” along its path.

The destruction from tornadoes can range from minor to severe depending on the intensity, size, and duration of the storm. Typically, tornadoes cause the greatest damage to structures of light-weight construction, such as mobile homes. The Enhanced Fujita Scale, also known as the “EF-Scale”, measures tornado strength and associated damages. The EF-Scale is an update to the earlier Fujita Scale, also known as the “F-Scale”, that was published in 1971. These scales classify U.S. tornadoes into six intensity categories based upon the estimated maximum winds occurring within the wind vortex. This scale can be seen in *Table 44 – Enhanced Fujita Scale*. The EF-Scale became effective on February 1, 2007. Since its implementation by the National Weather Service in 2007, the EF-Scale has become the definitive metric for estimating wind speeds within tornadoes based upon damage to buildings and structures. Previously recorded tornadoes are reported with the older F-Scale values, but *Table 44 – Enhanced Fujita Scale* shows F-Scale categories with corresponding EF-Scale wind speeds.

Figure 31 – Pennsylvania Wind Zones identifies wind speeds that could occur across the state, which may be used as the basis for design and evaluation of the structural integrity of shelters and critical facilities. The majority of Pennsylvania falls within Zone III, meaning that the design of shelters and critical facilities should be able to withstand a three-second gust of up to 200 mph, regardless of whether the gust is a result of a tornado, hurricane, tropical storm, or windstorm incident. The western portion of the state falls within Zone IV, which indicates shelters can withstand up to 250 mph winds, while the eastern side falls within Zone II where shelters should be designed to withstand up to 160 mph.

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Since Potter County falls within Zone II, shelters and critical facilities should be designed to withstand up to 200 mph winds, regardless of whether the gust is the result of a tornado, coastal storm, or windstorm event. While it is difficult to pinpoint the exact locations at the greatest risk of a tornado, the southeast, southwest, and northwest sectors of the commonwealth are more prone to tornadoes. See *Figure 32 – Pennsylvania Tornado Impacts*.

Tornadoes/windstorms of all types have caused the following problems in Potter County:

- Power failures lasting four hours or longer.
- Loss of communications networks lasting four hours or more.
- Residents requiring evacuation or provision of supplies or temporary shelter.
- Severe crop loss or damage.
- Trees down or snapped off high above the ground/tree debris-fire fuel.
- Toppled high profile vehicles, including those containing hazardous materials.

Table 44 - Enhanced Fujita Scale

Enhanced Fujita Scale			
EF-Scale Number	Wind Speed (MPH)	F-Scale Number	Description of Potential Damage
EF0	65–85	F0-F1	Minor damage: Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over. Confirmed tornadoes with no reported damage (i.e., those that remain in open fields) are always rated EF0.
EF1	86-110	F1	Moderate damage: Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.
EF2	111–135	F1-F2	Considerable damage: Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes completely destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.

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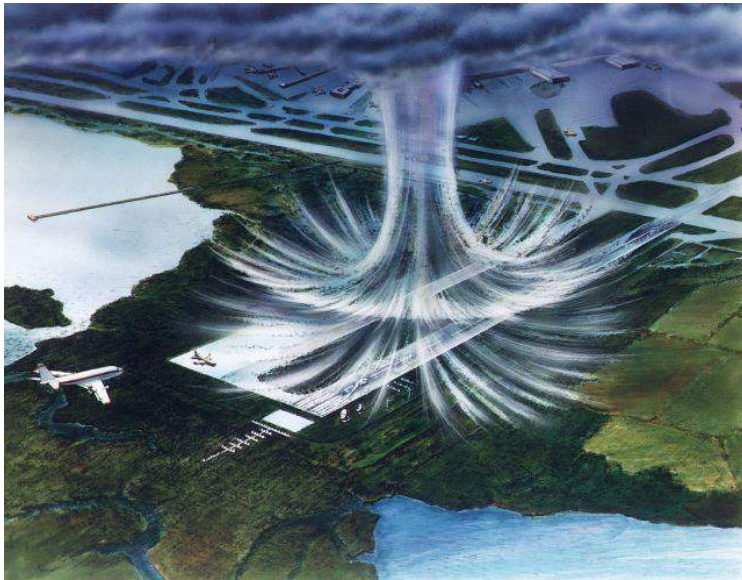
Enhanced Fujita Scale			
EF-Scale Number	Wind Speed (MPH)	F-Scale Number	Description of Potential Damage
EF3	136–165	F2-F3	Severe damage: Entire stories of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance.
EF4	166–200	F3	Devastating damage: Well-constructed houses and whole frame houses completely leveled; cars thrown, and small projectiles generated.
EF5	>200	F3-F6	Extreme damage: Strong frame houses leveled off foundations and swept away; automobile-sized projectiles fly through the air in excess of 100 m (300 ft.); steel reinforced concrete structure badly damaged; high-rise buildings have significant structural deformation.
Source: NWS, 2007			

Most of the tornadoes that have struck Potter County have occurred countywide. In 1985, a total of twenty-three confirmed tornadoes touched down across Eastern Ohio, Southwestern New York, and Central/Western Pennsylvania. This outbreak remains the worst in recorded history for this area. Of these twenty-three tornadoes, eight were of violent intensity (F4 or F5) with estimated wind speeds over 200 mph. Potter County was not impacted by the 1985 outbreak.

Windstorms

Windstorms can be broken down into multiple categories. Straight-line winds are the most common wind event and are different from tornadic winds. It is a ground level, non-rotational, wind that comes out of a thunderstorm. Downdrafts are columns of air that rapidly sinks toward the ground and are classified as either a microburst or microburst. A macroburst is the outward burst of strong winds that are near or at the surface with horizontal dimensions greater than 2 ½ miles. Macrobursts winds may begin over a smaller area and then spread out to a wider area, sometimes producing damage similar to a tornado. On the other hand, microbursts are smaller outward bursts of strong winds near or at the surface. Microbursts are less than 2 ½ miles in

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horizontal dimension and are typically short-lived winds that last a maximum of ten minutes, with windspeeds reaching up to 100 mph. Microburst events can be wet or dry events. Wet microbursts are typically associated with heavy precipitation at the surface. Dry microbursts do not have precipitation associated with them and are commonly found in the western portion of the United States.

A gust front is characterized by wind shift, temperature drop, and gusty winds out ahead of a thunderstorm. Derecho is a long-lived windstorm that is associated with a band of rapidly moving showers or thunderstorms. A typical derecho contains various downbursts and microbursts. If the wind damage is more than 240 miles and includes wind gusts of at least 58 mph, the event would then be classified as a derecho.

4.3.10.3 Past Occurrence

Potter County has experienced twelve tornado events since 1954, and forty-five wind incidents between 1998 and summer of 2022 as seen in *Table 45 – Potter County Tornado History* and *Table 46 – Potter County High Wind History*. Numerous sources provide information in regard to past occurrences and losses associated with tornadoes/windstorms in Potter County and the commonwealth as a whole. Due to the number of sources available with information, specific number of events and losses could vary slightly between sources. Tornado data was only present until 2013, while windstorm data was available until 2022, even though more recent events could have possibly occurred. Historically, the county has experienced both severe windstorms and tornadoes.

The most recent tornado impacted the town of Inez in Homer Township on July 27th, 2013. Inez has been hit with tornados three times since 1954. Inez first tornado occurred in 2011 and the following year in 2012 and the last tornado to occur in Inez was in 2013.

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Table 45 - Potter County Tornado History

Potter County Tornado History					
Location	Date	Magnitude (F/EF Scale)	Deaths	Injuries	Property Damage
Potter County	6/12/1954	F2	0	0	\$25,000.00
Potter County	9/15/1957	F1	0	0	\$25,000.00
Potter County	6/14/1962	F2	0	0	\$2,500.00
Potter County	7/28/1973	F1	0	0	\$25,000.00
Potter County	7/29/1974	F1	0	3	\$25,000.00
Wharton	7/18/1997	F0	0	0	\$0.00
Ellisburg	7/21/2003	F3	0	0	\$200,000
Galeton	7/24/2010	EF1	0	0	\$25,000.00
Inez	4/27/2011	EF0	0	0	\$1,000.00
Inez	5/2/2012	EF0	0	0	\$75,000.00
Coudersport	7/26/2012	EF0	0	0	\$0.00
Inez	7/27/2013	EF1	0	0	\$30,000.00
Source: NOAA NCEI, 2023 Estimated Values are marked*					

Table 46 - Potter County High Wind History

Potter County High Wind History				
Location	Date	Magnitude (knots)	Injuries	Property Damage
Potter County	11/10/1998	51	0	\$0.00
Potter County	1/4/2000	50	0	\$0.00
Potter County	12/12/2000	N/a	0	\$13,900.00
Potter County	02/10/2001	N/a	0	\$5,500.00
Potter County	2/2/2002	63	0	\$0.00
Potter County	3/9/2002	50	0	\$0.00
Potter County	11/13/2003	60	0	\$0.00
Potter County	12/01/2004	60	0	\$0.00
Potter County	12/23/2004	60	0	\$0.00
Potter County	12/01/2006	45	0	\$0.00
Potter County	1/30/2008	53	0	\$0.00
Potter County	09/14/2008	50	0	\$0.00
Potter County	02/12/2009	50	0	\$10,000.00
Potter County	10/29/2012	50	0	\$0.00
Potter County	05/22/2013	50	0	\$5,000.00
Potter County	09/11/2013	50	0	\$2,000.00

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Potter County High Wind History				
Location	Date	Magnitude (knots)	Injuries	Property Damage
Potter County	09/11/2013	50	0	\$2,000.00
Potter County	09/12/2013	50	0	\$2,000.00
Potter County	05/27/2014	50	0	\$1,000.00
Potter County	06/24/2014	50	0	\$1,000.00
Potter County	08/21/2014	50	0	\$1,000.00
Potter County	09/02/2014	50	0	\$1,000.00
Potter County	05/11/2015	50	0	\$1,000.00
Potter County	06/12/2015	50	0	\$1,500.00
Potter County	06/23/2015	50	0	\$500.00
Potter County	07/07/2015	50	0	\$0.00
Potter County	04/30/2017	52	0	\$4,000.00
Potter County	05/01/2017	52	0	\$10,000.00
Potter County	10/15/2017	52	0	\$0.00
Potter County	05/04/2018	61	0	\$6,000.00
Potter County	04/14/2019	62	0	\$0.00
Potter County	05/25/2019	52	0	\$0.00
Potter County	07/28/2019	52	0	\$3,000.00
Potter County	08/15/2019	52	0	\$1,000.00
Potter County	08/17/2019	52	0	\$3,000.00
Potter County	06/03/2020	52	0	\$1,000.00
Potter County	07/06/2020	52	0	\$4,000.00
Potter County	08/27/2020	52	0	\$5,000.00
Potter County	06/29/2021	52	0	\$3,000.00
Potter County	07/13/2021	53	0	\$3,000.00
Potter County	07/16/2021	60	0	\$1,000.00
Potter County	10/16/2021	50	0	\$4,000.00
Potter County	03/07/2022	52	0	\$3,000.00
Potter County	07/24/2022	52	0	\$4,000.00
Potter County	08/04/2022	52	0	\$5,000.00
Source: NOAA NCEI, 2023 Estimated Values are marked*				

4.3.10.4 Future Occurrence

In the United States, tornado activity has increased in variability, with a general decrease in the number of days a year on which activity occurs, but an increase in the number of tornadoes on those days. This indicates an increase in tornado outbreaks. The future probability of a disastrous tornado occurring in Potter County is ranked as possible, but not highly likely. While the chance

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of being hit by a tornado in Potter County is small, the damage that results when the tornado arrives can be devastating. An EF-5 tornado, with a 0.019% annual probability of occurring, can carry wind velocities of 200 mph, resulting in a force of more than 100 pounds per square foot of surface area. This is a “wind load” that exceeds the design limits of most buildings in Pennsylvania. As jurisdictions within the county grow, and as residential and commercial construction continues, the number of people and properties will be greatly affected by tornadoes and windstorms as they increase accordingly.

Based on historic patterns, tornadoes are unlikely to remain on the ground for long distances, especially in areas of the country with hilly terrain, such as the majority of Pennsylvania. However, the high historical number of windstorms with winds at or over 50 knots indicates that the annual chance of a windstorm in the county is uniquely high. The annual tornado seasoning has begun to lengthen, with the season starting earlier than it has historically and ending later. Pennsylvania had, for example, a record number of tornadoes in April and May of 2019 compared to any other April and May on record. Climate change is causing temperatures and air moisture to increase, increasing the frequency and intensity of tornadoes and windstorms. There remains some uncertainty regarding the recurrence of tornadoes. Therefore, the number of future tornadoes and windstorm events could potentially increase due to known and unknown factors.

Based on historical incidents, there are three zones in Pennsylvania that can either experience less than one, one to four, or five to ten of EF-2 or above tornadoes per 3,700 square miles. Communities in Potter County, as shown in *Figure 33 – Tornado Activity in Potter County* below, are expected to have one tornado annually as a future occurrence. The approximation of one to four tornadoes annually assists with determining the rate of future tornado occurrences within Potter County. Future tornadoes will be similar to those that affected the county in past events.

Windstorm events occur on a more frequent basis compared to tornadoes. Potter County, specifically, experiences windstorm events more commonly than tornadoes, which causes power failure, loss of communication networks, and residents requiring temporary shelters and provision of supplies. Therefore, unlike tornadoes, this hazardous event has a highly likely probability for future events to occur within the county.

Climate change and its relationship with tornado outbreaks is hard to identify. Some recent studies suggest that as average temperatures begin to rise, so will the intense storms that often lead to the creation of tornadoes. Warm, moist air is the most important aspect for developing strong tornadoes. Climate change can exacerbate this, and it could potentially lead to an increase in frequency and the severity of the events. Although not yet proven, this is one of the most prevalent theories on how climate change can impact tornado frequency and intensity.

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4.3.10.5 Vulnerability Assessment

The frequency of windstorms and minor tornadoes is expected to remain relatively constant, vulnerability increases in more densely developed areas. Factors that impact the amount of damage caused by a tornado include the strength of the tornado, the time of day, and the area of impact. Usually, such distinct funnel clouds are localized phenomena impacting a small area. However, the high winds of tornadoes make them one of the most destructive natural hazards. There can be many cascading impacts of tornadoes and windstorms including, but not limited to, transportation accidents, hazardous material spills, flooding, and power outages. A proper warning system is vital for the public to be informed of what to do and where to go during such events.

Additional dangers that accompany tornado-associated thunderstorms, and which increase the vulnerability of Potter County, include:

- Flash floods – 146 deaths annually nationwide.
- Lightning – 75 to 100 deaths annually nationwide.
- Damaging straight-line winds – reaching 140 mph wind speed.
- Large hail – can reach the size of a grapefruit and can cause several million in damages annually to property and crops

The economy of Potter County is highly vulnerable to tornadoes. While there may be severe impact on financial and commercial systems of the economy, these storms, and the damage they cause, can disrupt business long-term. The local economy is vulnerable due to the possibility of being crippled by tornadoes and windstorms and their cascading effects when buildings and supporting infrastructure are destroyed in a storm. Power outages can create work stoppages, while transportation accidents and road closures can limit transportation of goods and services. Additionally, flooding cannot be discounted as it can destroy physical structures, merchandise, and equipment essential for business operation.

Potter County's environment is also vulnerable to tornado events. However, since tornado events are typically localized, environmental impacts are rarely widespread. The impact of windstorms on the environment typically takes place over a large area. In either case, where these events occur, severe damage to plant species is likely. This includes uprooting or total destruction of trees and an increased threat of wildfire in areas where dead trees are not removed. Most notably, hazardous material spills can pollute ground water systems and vegetation. In the case of hazardous material spills, the local environment can be negatively impact and can cause extensive cleanup and mitigation efforts. Potter County is considered to be a rural county which

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has a great amount of tourism that occurs in the surrounding hills, mountains, and state parks. Not only is the environment at risk from tornadoes and windstorms, but hikers, tourists, and hunters are also at risk when out in the environment. Consequently, in the event of a tornado or severe storm, these tourists have limited emergency notification measures which result in high vulnerability. A storm has the ability, potentially, to destroy structures, damage private and public property, and injure citizens and tourists in the area. People with disabilities, the elderly, functional needs, and non-English speaking residents are more vulnerable to tornadoes, windstorms, and their cascading effects. Without assistance to evacuate and/or seek shelter, and with potential difficulty understanding information, these at-risk populations may be unable to prepare themselves, or their homes and other possessions, to safely endure the storm.

Tornado, windstorm, and cascading events may affect a small portion, or the entirety, of the county. Therefore, it is important to identify specific critical facilities and assets that are most vulnerable to this hazard. Critical facilities are highly vulnerable to windstorms and tornado events. While many severe storms can cause exterior damage to structures, tornadoes can destroy structures, along with their surrounding infrastructure, immediately halting their function. Tornadoes are often accompanied by severe storms which can be threatening to critical facilities within the county. Many secondary effects from these disasters can jeopardize the operation of these critical facilities as well. Critical facilities are particularly vulnerable to power outages which can leave facilities functionless, potentially crippling infrastructure supporting the population of the county. Due to Pennsylvania Uniform Construction Code Act 45, trailers and mobile homes built before 2004, because of their lightweight construction and often unanchored design, are more vulnerable to high winds/tornadoes and will generally sustain more damage than will mobile homes built after 2004.

Based on information provided in the American Community Survey, as published by the United States Census Bureau, Potter County has 1,744 mobile homes. These include seasonal camps in Potter County that are only occupied during certain months of the year including summer months and hunting seasons. The 1,744 mobile homes account for approximately 14% of the total housing units in Potter County.

There are no historic or cultural properties that are listed with the National Register of Historic Places that are at an increased risk of tornadoes in Potter County. This analysis was run off of the previous tornado paths in the county and 500 foot vulnerability zones. These locations are where hurricanes have previously developed and may develop again. This does not mean that tornadoes will not impact the historic or cultural properties in Potter County.

All of the critical infrastructure and community lifeline facilities are vulnerable to tornado events. Some of the critical infrastructure can be considered at a higher risk due to life safety

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missions that they serve. Facilities that are within 500 feet of previous tornado tracks can be considered at high risk of tornadoes. No major community lifeline facilities or critical infrastructure facilities fall within 500 feet of previous tornado tracks in Potter County.

Municipalities with previous tornado impacts:

- Abbott Township
- Coudersport Borough
- Eulalia Township
- Homer Township
- Keating Township
- Oswayo Borough
- Summit Township
- West Branch Township
- Wharton Township

Municipalities without previous tornado impacts:

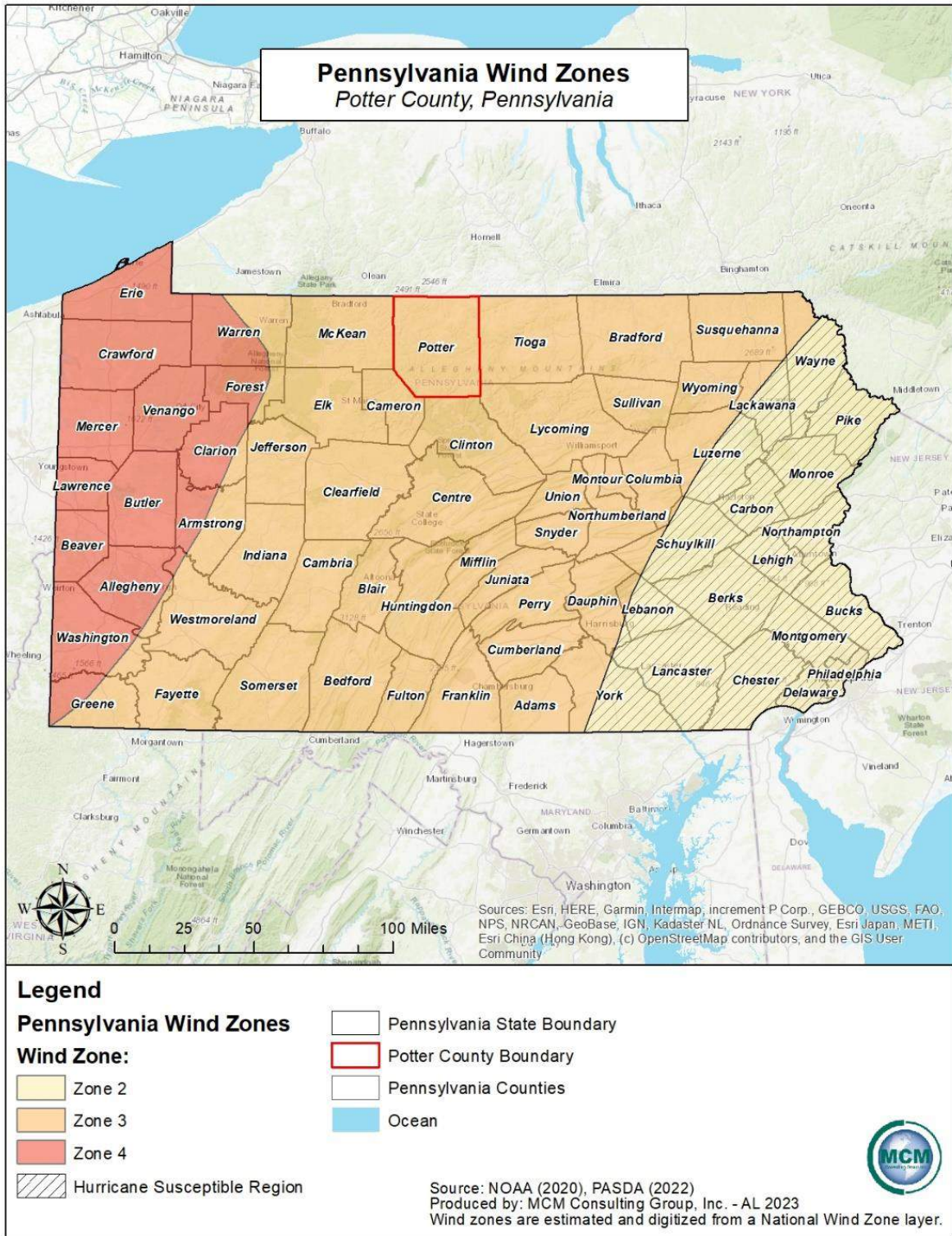
- Allegany Township
- Austin Borough
- Bingham Township
- Clara Township
- Galeton Borough
- Genesse Township
- Harrison Township
- Hebron Township
- Hector Township
- Oswayo Township
- Pike Township
- Pleasant Valley Township
- Roulette Township
- Sharon Township
- Stewardson Township
- Sweden Township
- Sylvania Township
- Ulysses Borough
- Ulysses Township

Eight of the thirty municipalities in Potter County have experienced a population gain between the 2010 decennial census and the 2020 decennial census. These municipalities and the information associated with the population change can be seen in *Table 3 – Population Change in Potter County*.

Land use, in the form of a built environment, such as residential expansion, can cause tornado impact severity to increase. Impact severity increase when built environments provide an influx of people, infrastructure, and critical infrastructure in harm's way.

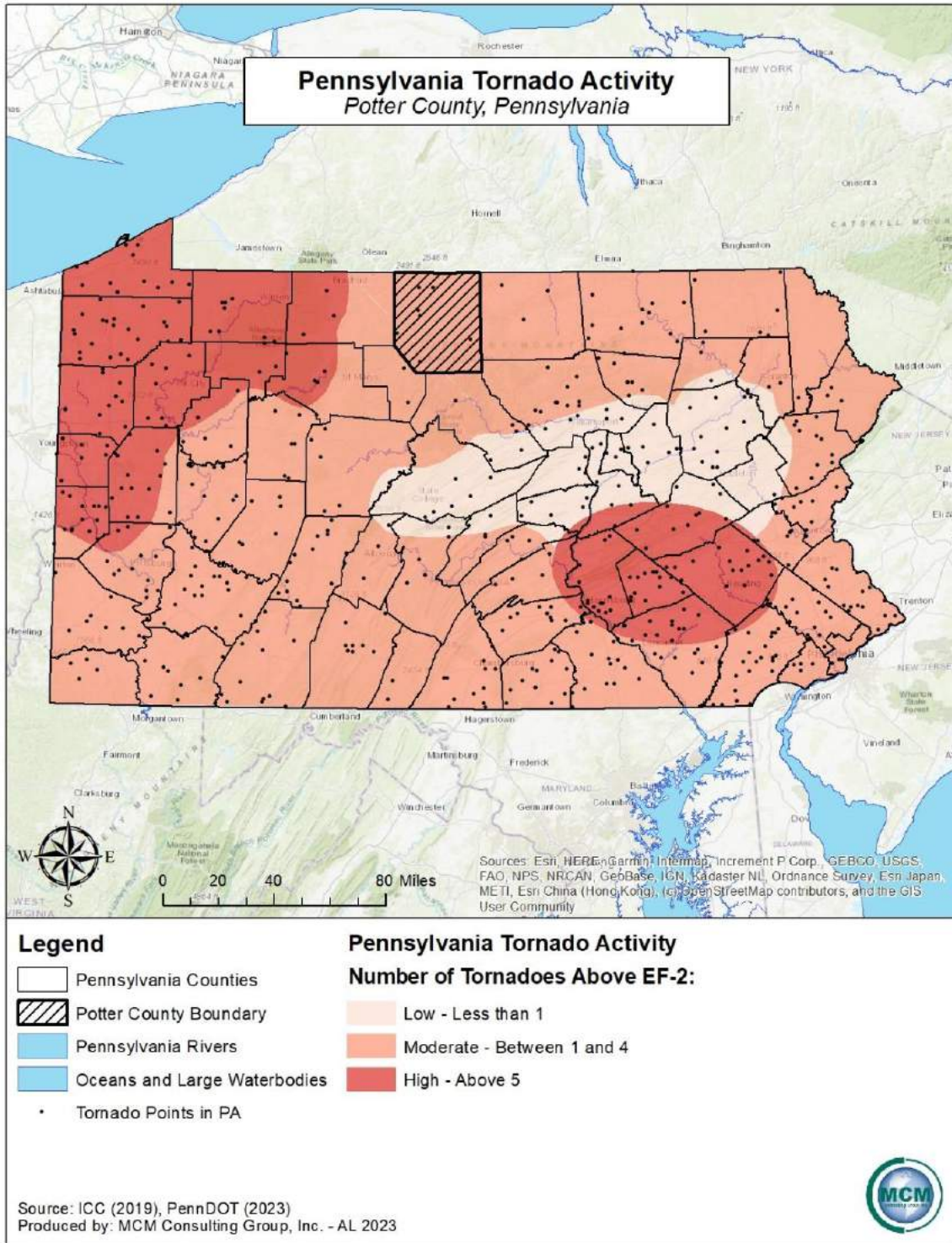
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Figure 31 - Pennsylvania Wind Zones



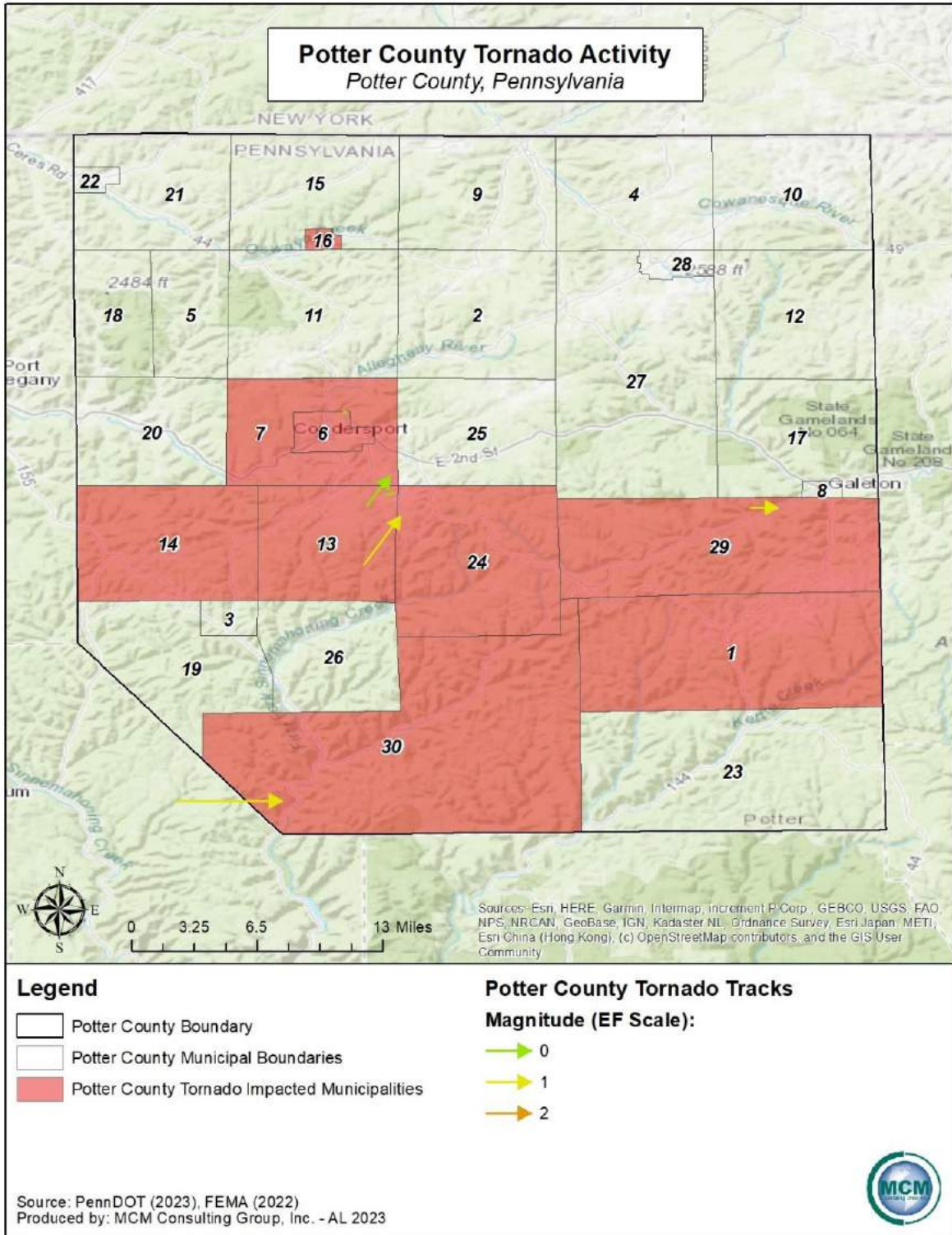
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Figure 32 - Pennsylvania Tornado Impacts



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Figure 33 - Tornado Activity in Potter County



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4.3.11. Wildfire

4.3.11.1 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.

A large portion of Potter County is covered by either farmland or forested areas, 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 and natural areas that include a series of trail systems – all of which are at risk for wildfires.

4.3.11.2 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 Potter 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 Potter 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 47 – Wildland Fire Assessment System* identifies each threat classification and provides a description of the level.

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Table 47 - Wildland Fire Assessment System

Wildland Fire Assessment System	
Rank	Description
Low (L)	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.
Moderate (M)	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.
High (H)	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.
Very High (VH)	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.
Extreme (E)	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.
Source: U.S. Forest Service	

4.3.11.3 Past Occurrence

The Pennsylvania Department of Conservation and Natural Resources (DCNR) has an extensive history of reported wildfires in its state forestry system and districts. Historically, Potter County usually experiences over fifteen of these types of fires annually with all fires being relatively small. However, due to the many acres of farmland, forested areas, and open space in the county,

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under the right conditions the potential exists for a significant wildfire. Potter County lies entirely in District 15 of the DCNR’s Bureau of Forestry. This district encompasses Potter, Clinton, and McKean counties. In 2022, there were a total of thirty-one fires in District 15 that were responsible for destroying 60.6 acres.

District 15 reports the following twenty-three-year wildfire summary based on observed and reported wildfires. *Table 48 – Annual Summary of Wildfire Events* illustrates the number of acres burned in a certain number of fires for District 15 from the year 2000 to the year 2022. Based on the information below, there have been eleven occurrences of an increase in the number of wildfires in District 15. There were also eleven occurrences of a decrease in the number of wildfires in District 15.

Table 48 - Annual Summary of Wildfire Events

Annual Summary of Wildfire Events			
Year	Number of Fires	Acres	Increase or Decrease
2000	23	124.3	-
2001	20	40.7	↓
2002	2	68.2	↑
2003	17	72.3	↑
2004	3	4.0	↓
2005	15	99.6	↑
2006	19	96.1	↓
2007	3	2.2	↓
2008	8	92.2	↑
2009	11	147.0	↑
2010	5	85.2	↓
2011	2	20.7	↓
2012	10	70.8	↑
2013	4	2.8	↓
2014	4	36.4	↑
2015	13	135.7	↑
2016	10	95.0	↓
2017	9	25.5	↓
2018	22	38.7	↑
2019	7	9.4	↓
2020	36	65.2	↑
2021	38	117.1	↑
2022	31	60.6	↓
Source: DCNR, 2023			

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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 and 2023 there were numerous prescribed burns in state owned game lands.

4.3.11.4 Future Occurrence

Annual occurrence of urban fires and wildfires in Potter 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.

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 in 2017, 2018, 2019, 2020, 2021 and 2022. 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).

4.3.11.5 Vulnerability Assessment

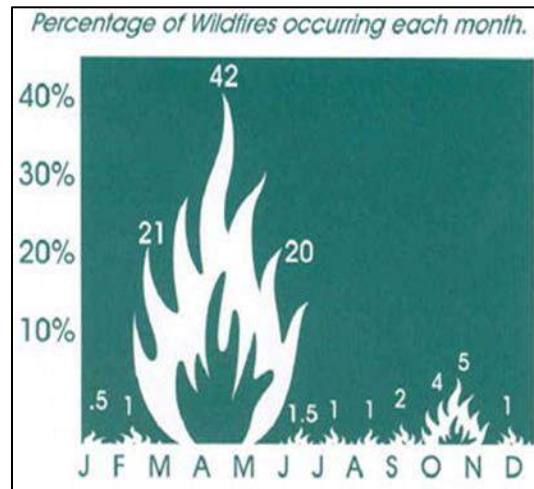
The size and impact of a wildfire depends on its location, climate conditions, and the response of firefighters. If the right conditions exist, these factors may often mitigate the effects of wildfires; however, during a drought, wildfires can be devastating. The highest risk for wildfires in Pennsylvania 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. *Figure 34 – Seasonal Wildfire Percentage* shows the wildfire percentage occurrence during each month in Pennsylvania.

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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.

The Wildland Urban Interface (WUI) 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.

Figure 34 - Seasonal Wildfire Percentage



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 35 – Wildland Urban Interface* shows the extent of Potter 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.

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Both of the historic and cultural building properties in Potter County that are registered with the National Register of Historic Places are in areas with high-density interface or high-density intermix. Those buildings are the Coudersport and Port Allegany Railroad Station and the Potter County Courthouse. Also potentially impacted due to their location in areas of high-density interface or high-density intermix are seventeen critical facilities or community lifeline facilities. The breakdown of those facilities are:

- Three EMS agencies
- Five fire departments
- Four gas stations
- One government assistance location
- Two grocery stores
- One police department
- One toxic release inventory (TRI) location

There are ten fire departments that serve Potter County, a list of which can be seen in the emergency services profile. Each fire department conducts its own schedule of in-house training sessions for its members.

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 a wildfire in Potter County. *Figure 36 – Fire Stations Locations* illustrates the position of fire stations and the location of state game lands, state forests, and natural areas within Potter 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.

Crops and farmland are at an increased risk of wildfires within Potter County. As previously discussed, Potter County has a significant market share in agricultural production, and these economic streams could be negatively impacted or destroyed by a wildfire. Many acres in Potter County (97,780 acres) are at an increased vulnerability. Few critical infrastructure facilities and community lifelines are at an increased risk from wildfires, as most of the critical infrastructure and community lifelines in Potter County can be found in the higher population townships and the county boroughs. Wildfires occur most frequently in rural areas, so the areas of vulnerability do not directly overlap. Based on the wildland urban interface values for Potter County, there are 1,044 address points that are in areas of high-density interface classification. Also, there are 39 address points that are in areas of high-density intermix classification. These 1,083 address points are at an increased vulnerability to wildfire due to their close proximity to vegetation, which could become fuel for a potential wildfire in Potter County.

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A major aspect of wildfires includes the impact of smoke and particulate matter that can result from a large wildfire. Smoke and particulate air pollution can cause poor air quality and unhealthy conditions for areas directly adjacent to, or far away from, wildfires.

In June of 2023, a large portion of the eastern United States was affected by smoke, haze, particulate matters, and poor air quality as a result of wildfires in eastern Canada (Nova Scotia and Quebec). Air currents resulted in smoke and atmospheric effects from the wildfires following areas of low pressure and settling over the mid-Atlantic region including Pennsylvania, New York, New Jersey, Maryland, and Ohio. New York City had the lowest air quality of any city on the planet for June 7th, 2023, as reported by multiple news outlets including CBS and NBC. Pennsylvania saw a large impact from the smoke and particulate matter. The worst locations included the south-central regions of Pennsylvania, which does not include Potter County.

The smoke and haze from the Canadian wildfires reduced visibility in Pennsylvania, caused a smokey, campfire-like odor in the air, and caused health issues for the population of the affected area. Images of the Philadelphia skyline obscured by fog became popular to illustrate the reduction of visibility. Potter County was impacted by the Canadian wildfire smoke and reduced air quality. Individuals across Pennsylvania and Potter County reported health effects like headaches, irritated eyes and sinuses, fatigue, difficulty breathing, chest pains, asthma attacks, irritated throats, and an increase in coughing. This type of impact is common in areas near wildfires but was a first for a large portion of the eastern United States. This type of event will become more common with the changes brought about by climate change. As wildfire events become more common and stronger, smoke and particulate matter pollution will become more common across larger areas of the world.

Table 49 – Air Quality Index Ranking Values illustrates the air quality index rankings based off of information provided by the Environmental Protection Agency.

Table 49 - Air Quality Index Ranking Values

Air Quality Index (AQI) Ranking Values	
Description	Index Value
Good	0-50
Moderate	51-100
Unhealthy for Sensitive Groups	101-150
Unhealthy	151-200
Very Unhealthy	201-300
Hazardous	301-500
Source: AirNow.gov, EPA, 2023	

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Below are daily air quality index values for June 7th, 2023 for reporting areas in Pennsylvania. This information is presented in *Table 50 – Air Quality Index Values for Reporting Areas in PA (06/07/2023)*.

Table 50 - Air Quality Index Values for Reporting Areas in PA (06/07/2023)

Air Quality Values for Reporting Areas in PA – 06/07/2023		
Reporting Areas	Daily AQI for PM 2.5	AQI Ranking
Altoona	161	Unhealthy
Erie	100	Moderate
Indiana County	127	Unhealthy for Sensitive Groups
Johnstown	92	Moderate
Lehigh Valley	309	Hazardous
Liberty-Clairton Area	83	Moderate
Mercer County	70	Moderate
Philadelphia	261	Very Unhealthy
Pittsburgh	105	Unhealthy for Sensitive Groups
Scranton/Wilkes-Barre	268	Very Unhealthy
State College	187	Unhealthy
Susquehanna Valley	285	Very Unhealthy
Source: AirNow.gov, EPA, 2023		

Municipalities with high risk due to wildfires (with areas of high-density interface or intermix):

- Allegany Township
- Austin Borough
- Bingham Township
- Coudersport Borough
- Eulalia Township
- Galeton Borough
- Genesse Township
- Harrison Township
- Hebron Township
- Homer Township
- Oswayo Borough
- Oswayo Township
- Pike Township
- Portage Township
- Roulette Township
- Sharon Township
- Shinglehouse Borough
- Stewardson Township
- Summit Township
- Sweden Township
- Sylvania Township
- Ulysses Borough
- West Branch Township
- Wharton Township

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Municipalities with lower risk due to wildfires (no areas of high-density interface or intermix):

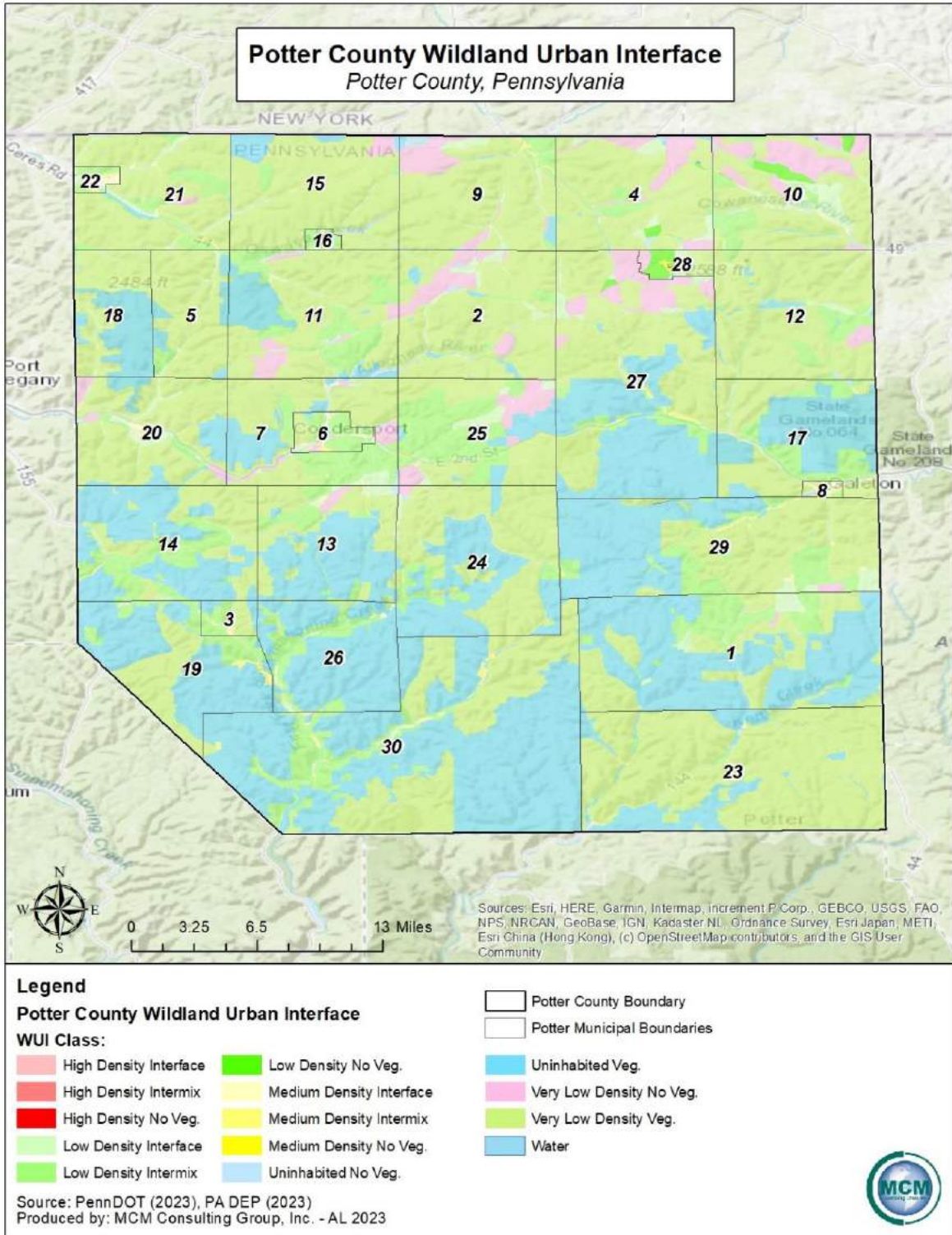
- Abbott Township
- Clara Township
- Hector Township
- Keating Township
- Pleasant Valley Township
- Ulysses Township

As seen in *Table 3 – Population Change in Potter County*, twenty-two of the thirty municipalities in Potter County have experienced a population loss since the previous decennial census conducted in 2010. Based on this information, it can be speculated that the eight municipalities that have experienced population increases may have an increased risk of wildfire conditions and events.

Potter County promotes fishing, hunting, camping, hiking and other outdoor activities and the risk to these land use events in Potter County increases with development. A majority of Potter County is rural and forested, with land cover primarily being made of deciduous forest, evergreen forest, mixed deciduous and evergreen forest, emergent wetlands, and forested wetlands. Wildfires can lead to devastation of forested areas, reducing the ground stability, and leading to cascading hazards like landslides and flash flood events.

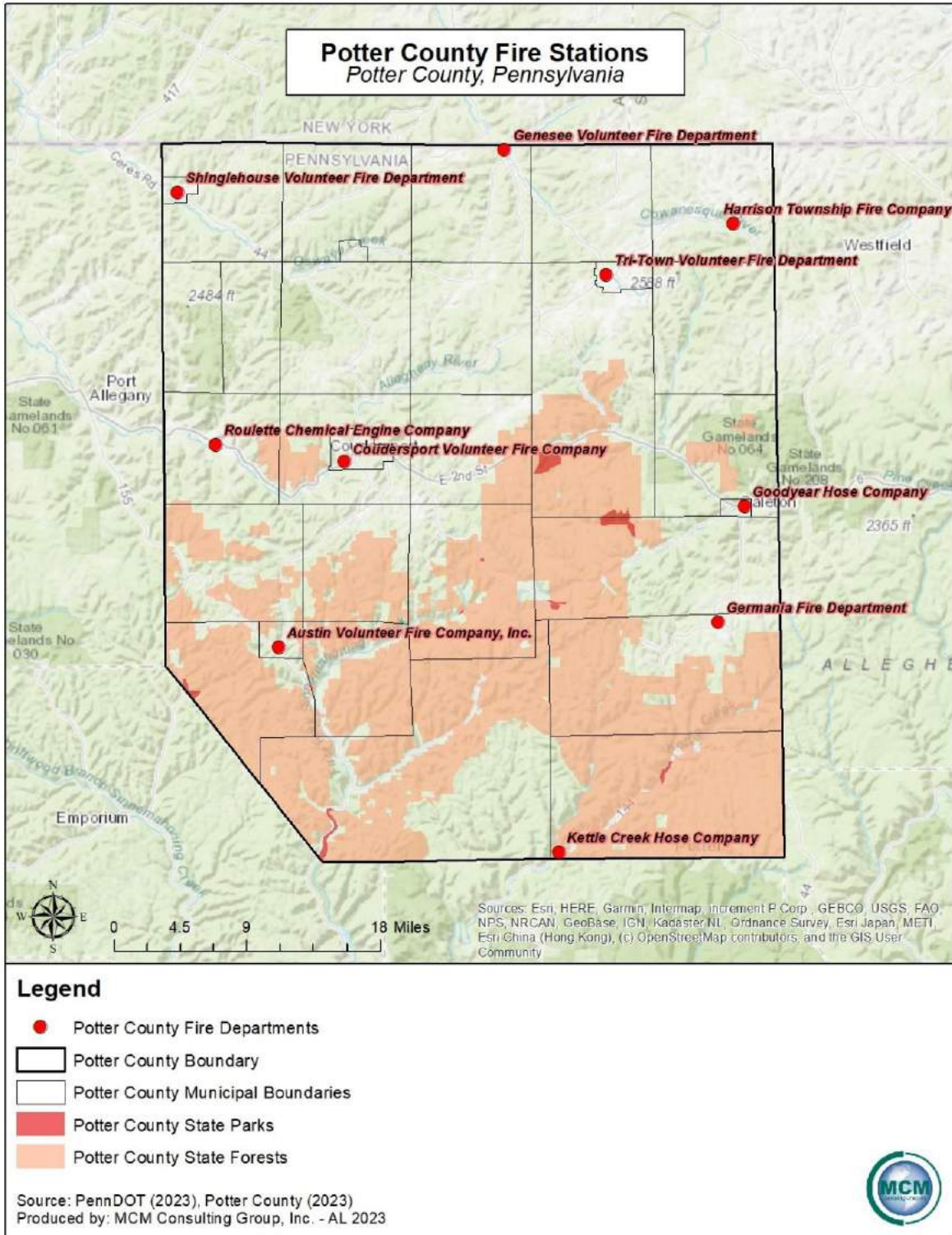
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Figure 35 - Wildland Urban Interface



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Figure 36 - Fire Stations Locations



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4.3.12. Winter Storms

4.3.12.1 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

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insufficient force from upper-level shortwave troughs riding the westerlies (weather 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.

4.3.12.2 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 51 – 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 51 - NESIS Winter Storm Rankings

NESIS Winter Storm Rankings			
Category	Description	NESIS Range	Definition
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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NESIS Winter Storm Rankings			
Category	Description	NESIS Range	Definition
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 ³ mi ² – 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 ³ mi ² 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. Potter County receives an average of about fifty-nine inches of snowfall a year. Most areas of Potter County experience the effects 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 38 - Pennsylvania Annual Snowfall 1981 – 2010* illustrates the long-term trends for snowfall accumulation in Pennsylvania over three decades.

4.3.12.3 Past Occurrences

Figure 37 – Winter Storm Events by County in Pennsylvania shows the number of winter storm events from 1950 – 2013 for the Commonwealth of Pennsylvania. Potter County had forty such events. *Table 52 – Recent Annual Snowfall Estimates* show recent annual snowfall measurements as stated by NOAA. According to NOAA during the time span between the year 2010 and 2011 Potter County was had 93.33 inches of snow. Over the past ten years there has been a decrease

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in the amount of snowfall that affects the county. Overall, Potter County has experienced an decrease in the annual estimated average of snowfall. On average, the annual snowfall totals have decreased in the time periods from 2010 to 2021. A list of additional Potter County winter storms, and other related events is outlined in *Table 53 – Potter County Winter Weather History*.

Table 52 - Recent Annual Snowfall Estimates

Recent Annual Snowfall Estimates	
Time Span	Snowfall Estimates (inches)
2010-2011	93.33 Inches
2011-2012	31 Inches
2012-2013	54 Inches
2013-2014	61.66 Inches
2014-2015	59.33 Inches
2015-2016	25.33 Inches
2016-2017	60 Inches
2017-2018	59 Inches
2018-2019	59.33 Inches
2019-2020	47 Inches
2020-2021	62.67 Inches
2021-2022	60.10 Inches
Source: NOAA, 2021	

Table 53 - Potter County Winter Weather History

Potter County Winter Weather History		
Location	Date	Event Type
Potter County (County Wide)	01/02/1999	Winter Storm
Potter County (County Wide)	01/08/1999	Winter Storm
Potter County (County Wide)	01/14/1999	Winter Storm
Potter County (County Wide)	02/18/2000	Winter Storm
Potter County (County Wide)	12/13/2000	Winter Storm
Potter County (County Wide)	03/24/2001	Winter Storm
Potter County (County Wide)	01/05/2005	Winter Storm
Potter County (County Wide)	01/22/2005	Winter Storm
Potter County (County Wide)	02/21/2005	Winter Storm
Potter County (County Wide)	16/16/2005	Winter Storm
Potter County (County Wide)	01/03/2006	Winter Storm
Potter County (County Wide)	12/13/2007	Winter Storm
Potter County (County Wide)	02/01/2008	Winter Storm

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Potter County Winter Weather History		
Location	Date	Event Type
Potter County (County Wide)	02/26/2008	Winter Storm
Potter County (County Wide)	03/07/2008	Winter Storm
Potter County (County Wide)	12/19/2008	Winter Storm
Potter County (County Wide)	01/10/2009	Winter Storm
Potter County (County Wide)	01/27/2009	Winter Storm
Potter County (County Wide)	10/15/2009	Winter Storm
Potter County (County Wide)	02/01/2011	Winter Storm
Potter County (County Wide)	03/23/2011	Winter Storm
Potter County (County Wide)	12/26/2012	Winter Storm
Potter County (County Wide)	11/26/2013	Winter Storm
Potter County (County Wide)	02/04/2014	Winter Storm
Potter County (County Wide)	02/01/2015	Winter Storm
Potter County (County Wide)	01/23/2017	Winter Storm
Potter County (County Wide)	01/12/2018	Winter Storm
Potter County (County Wide)	02/07/2018	Winter Storm
Potter County (County Wide)	03/01/2018	Winter Storm
Potter County (County Wide)	11/15/2018	Winter Storm
Potter County (County Wide)	01/19/2019	Winter Storm
Potter County (County Wide)	12/16/2020	Winter Storm
Potter County (County Wide)	02/15/2021	Winter Storm
Potter County (County Wide)	01/16/2022	Winter Storm
Potter County (County Wide)	03/12/2022	Winter Storm
Potter County (County Wide)	12/15/2022	Winter Storm
Potter County (County Wide)	03/06/2023	Winter Storm
Source: NOAA NCEI, 2021		

4.3.12.4 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

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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 Potter 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 storm events may become less frequent as the climate warms, but they could become more intense.

4.3.12.5 Vulnerability Assessment

Severe winter storms are of significant concern to Potter 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. Bridge and overpasses are particularly dangerous because they freeze before other transportation surfaces. For the purposes of this Hazard Mitigation Plan, the entire population of Potter County (16,220) 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 Potter 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.

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The table below (*Table 54 – Population per Municipality under 5 Years or 65 Years or Older*) 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 storm, and cascading hazards from winter storms.

Table 54 - Population per Municipality under 5 Years or 65 Years or Older

Population per Municipality under 5 Years or 65 Years or Older				
Municipality	Number of People under 5 years of age	Percent of Population	Number of People 65 years or older	Percent of Population
Abbott Township	12	5.4	82	36.6
Allegheny Township	5	1.4	99	26.8
Austin Borough	46	7.3	112	17.7
Bingham Township	23	3.6	107	16.6
Clara Township	2	1.7	51	43.6
Coudersport Borough	90	3.7	569	23.2
Eulalia Township	42	4.4	315	33.1
Galeton Borough	29	3.4	181	21.0
Genesee Township	25	3.2	188	24.3
Harrison Township	59	6.4	215	23.4
Hebron Township	55	8.1	176	26.0
Hector Township	9	2.4	103	27.5
Homer Township	6	1.3	66	14.2
Keating Township	6	2.4	59	27.3
Oswayo Borough	3	3.0	20	20.2
Oswayo Township	18	7.4	48	19.7
Pike Township	16	4.3	96	25.7
Pleasant Valley Township	2	1.8	30	26.5
Portage Township	2	1.0	48	23.9
Roulette Township	54	5.2	268	25.6
Sharon Township	49	6.6	131	17.7
Shinglehouse Borough	141	14.0	199	19.8
Stewardson Township	10	15.6	32	50.0
Summit Township	2	1.1	72	39.8
Sweden Township	39	4.7	186	22.5
Sylvania Township	0	0	28	45.9
Ulysses Borough	40	6.1	98	15.0
Ulysses Township	30	4.4	174	25.7
West Branch Township	18	4.2	168	39.0
Wharton Township	0	0	32	41.0
Total:	833	-	3,953	-

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Population per Municipality under 5 Years or 65 Years or Older				
Municipality	Number of People under 5 years of age	Percent of Population	Number of People 65 years or older	Percent of Population
Average:	-	4.5	-	27.3
Source: United States Census Bureau (USCB), American Community Survey (ACS), 2023				

Approximately 5.1% of the total population of Potter County is under the age of five years old and approximately 24% of the total population is sixty-five years old or greater. By the numbers, 29.1% of the population is at an increased risk from exposure to winter.

The entire general building stock inventory in Potter 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 damage within Potter County due to a single severe winter storm event. Current modeling tools are not available to estimate specific losses for this hazard. 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 presented in the flood profile due to snow and ice melt. Generally, losses from flooding associated with severe winter storms should be less than that 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.

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, Potter County is generally well-prepared for snow and ice removal each season.

Municipalities with an increased risk to winter storms:

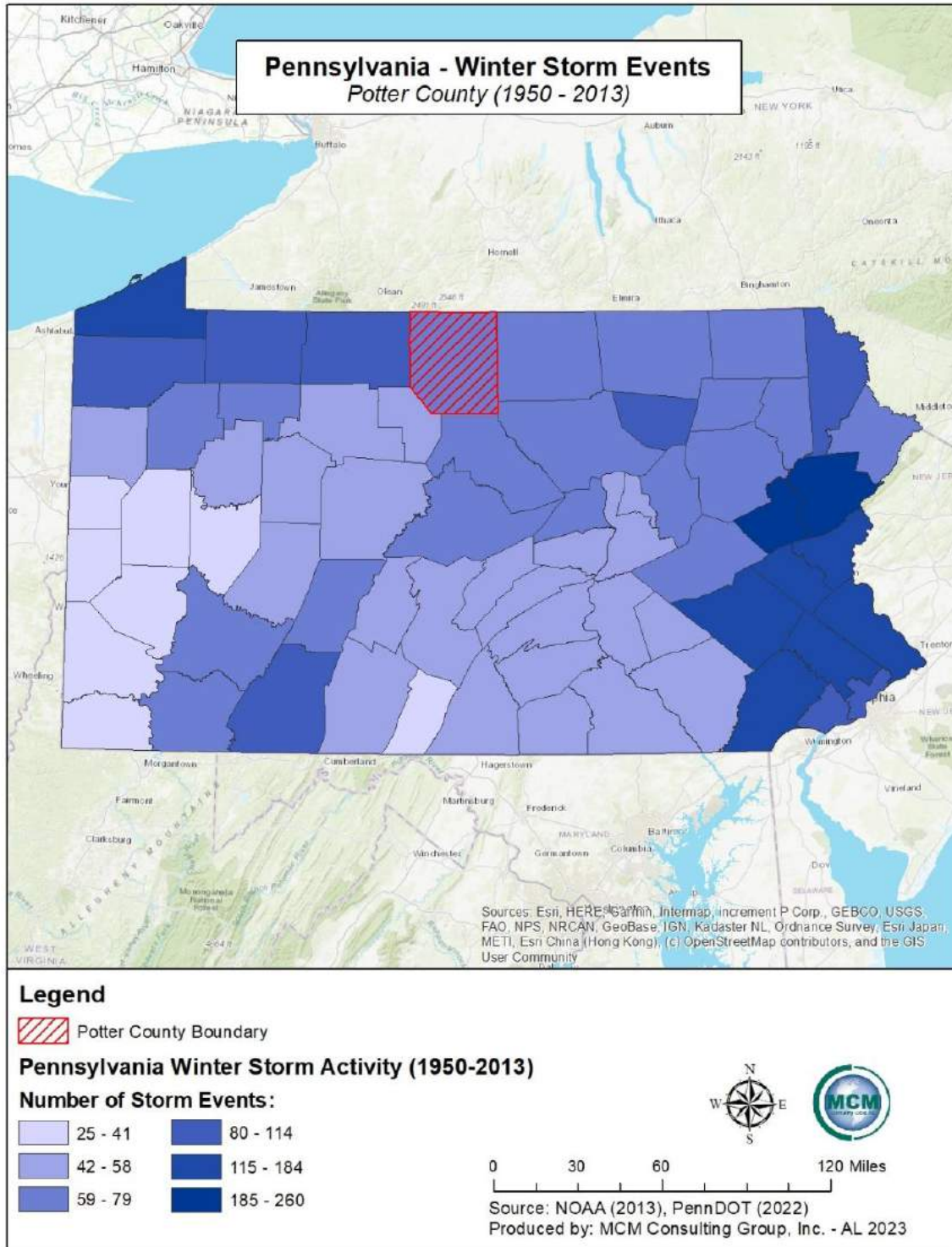
- Abbott Township
- Austin Borough
- Clara Township
- Allegany Township
- Bingham Township
- Coudersport Borough

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- Eulalia Township
- Galeton Borough
- Genesse Township
- Harrison Township
- Hebron Township
- Hector Township
- Homer Township
- Keating Township
- Oswayo Borough
- Oswayo Township
- Pike Township
- Pleasant Valley Township
- Portage Township
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- Stewardson Township
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- Sylvania Township
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- Ulysses Township
- West Branch Township
- Wharton Township

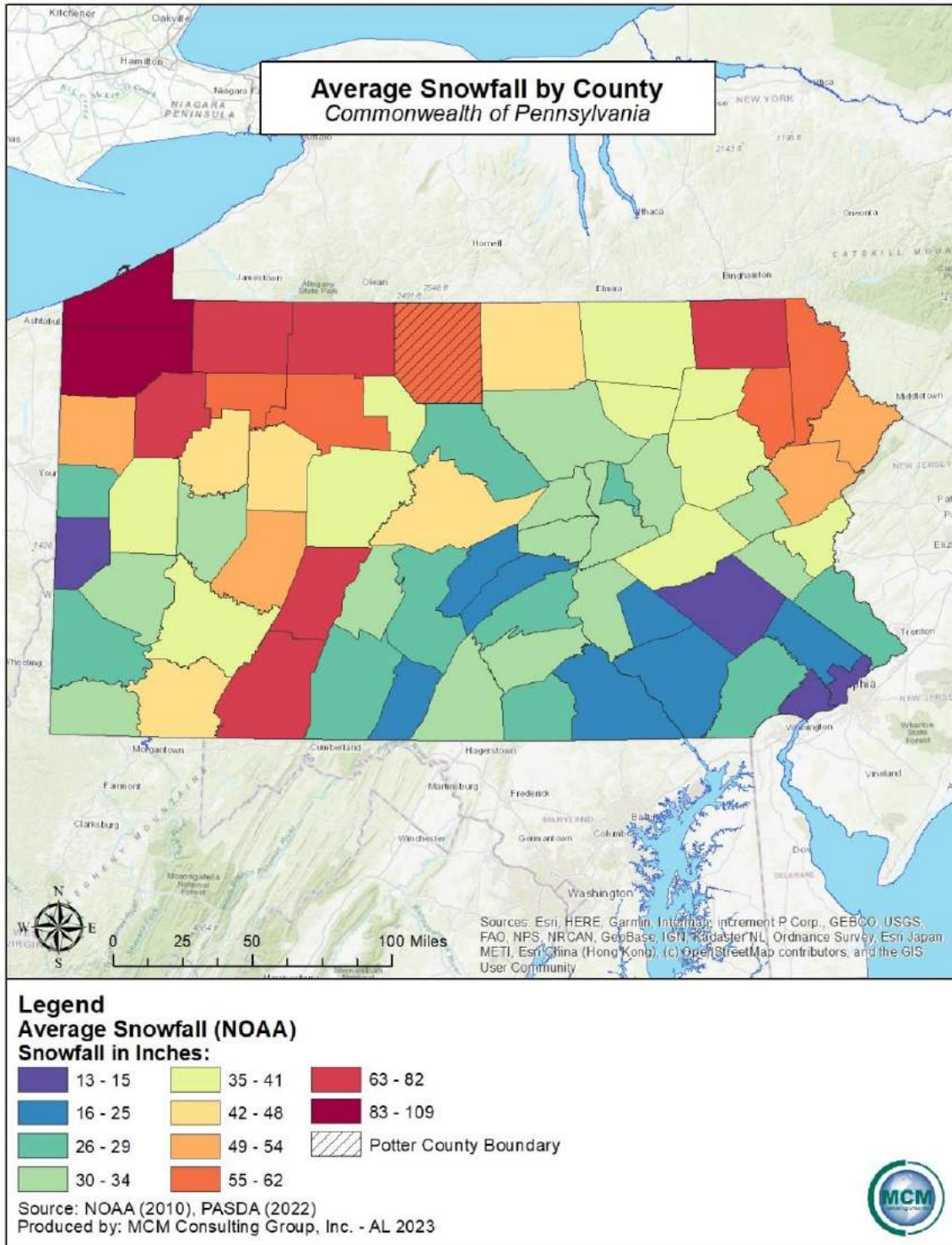
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Figure 37 - Winter Storm Events by County in Pennsylvania



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Figure 38 - Pennsylvania Annual Snowfall 1981 – 2010



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4.3.13. Blighted Properties

4.3.13.1 Location and Extent

The presence of blighted properties in Potter 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 at 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.

4.3.13.2 Range of Magnitude

Potter County has a large number of blighted properties that are located in urban environments, including Austin, Coudersport, Ulysses and some parts of Roulette Township. Most of the

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blighted properties in Potter County are unsecure and 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.

4.3.13.3 Past Occurrence

The number of blighted properties in Potter County has increased in recent years. Although some properties that are considered to be blighted in Potter County have been demolished by the county itself. With recent market trends in real estate, a large number of vacant buildings in Potter County are sold prior to them being blighted.

4.3.13.4 Future Occurrence

Blighted properties in Potter 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 Potter County is liable to decrease.

4.3.13.5 Vulnerability Assessment

Blighted properties are a significant concern when the health and safety of the citizens of Potter 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 Potter 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 attracting new residents to Potter County. If blighted properties flourish in the county, people who travel to Potter County for pleasure, whether that be for summer vacations or seasonal hunting, might reconsider that travel due to the presence of blighted properties.

Municipalities with an increased risk to blighted properties:

- Austin Borough
- Coudersport Borough
- Galeton Borough
- Oswayo Borough
- Roulette Township
- Shinglehouse Borough
- Ulysses Borough

4.3.14. Civil Disturbance

4.3.14.1 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.

4.3.14.2 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 authorities.

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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.

Potter County's greatest likelihood for civil disturbance is in Coudersport, 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. Potter County is home to no universities and post-secondary education centers.

4.3.14.3 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. In Coudersport the County Seat of Potter County, dozens of peaceful protesters showed up on June 11, 2020 to show their support for the George Floyd and the Black Lives Matter movement.

Potter County does not have any major state or federal correctional facilities but does have one county jail that is located near Coudersport, the county seat. The potential of a security event or a threat arising from the county jail is low.

4.3.14.4 Future Occurrence

While unlikely, civil disturbances may occur in Potter County, and it is difficult to accurately predict the probability of future occurrence for civil disturbance events over the long-term. However, *Table 55 - Civil Disturbance Events Reported to PEMA 2012-2018*, depicts the range of potential civil disturbances in Pennsylvania and gives the county some background for consideration of future occurrences.

Table 55 - Civil Disturbance Events Reported to PEMA 2012-2018

Table 4.3.18-2 Civil disturbance events reported to PEMA-KC, 2012-2018 (PEMA, 2018).							
EVENT TYPE	2012	2013	2014	2015	2016	2017	2018
Demonstration	1	3	9	3	3	3	3
Juvenile Detention Center	0	0	0	0	0	0	1
Prison Disturbance	0	2	0	0	0	1	0
Detainee Escape	2	4	3	4	0	2	1
Protest	4	24	49	35	64	78	13
Large Crowd Gathering	0	1	0	4	2	3	2
Riot	0	0	0	1	0	0	0
School Threat	1	2	0	2	0	2	0
Assault	2	8	2	2	3	4	0
Gun/Bomb Incident	3	15	3	7	2	3	0
Civil Disorder - totals	13	59	66	58	74	96	20
<i>*Events totaled through 2018</i>							

According to the Pennsylvania State Hazard Mitigation Plan, from 2012 to 2018, the commonwealth experienced an average of fifty-five civil disturbance events each year. While that number is relatively low and the occurrences in Potter County are rare, the local planning team (LPT) decided civil disturbance should be regarded as a high-risk hazard due to the current political trends and frictions across the country.

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Like civil disturbance, it is extremely difficult to predict when criminal activity may take place in Potter County and throughout the Commonwealth of Pennsylvania. According to the City-Data.com crime index, the 2020 crime rate in Coudersport (the county’s highest population center) is 40.6 times lower than the U.S. average. It was higher than 6.3% of U.S. cities. The 2020 Coudersport crime rate fell by 93% compared to 2019. This reduction in crime is likely due to the COVID-19 social distancing protocols. In the last five years, Coudersport has seen rise of violent crime and decreasing property crime.

Figure 39 - City-Data.com Crime Index



4.3.14.5 Vulnerability Assessment

All municipalities in Potter 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.

Municipalities with an increased risk to civil disturbance events:

- Abbott Township
- Alleghany Township
- Austin Borough
- Bingham Township
- Clara Township
- Coudersport Borough
- Eulalia Township
- Galeton Borough
- Genesse Township
- Harrison Township
- Hebron Township
- Hector Township
- Homer Township
- Keating Township
- Oswayo Borough
- Oswayo Township
- Pike Township
- Pleasant Valley Township
- Portage Township
- Roulette Township
- Sharon Township

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- Shinglehouse Borough
- Stewardson Township
- Summit Township
- Sweden Township
- Sylvania Township
- Ulysses Borough
- Ulysses Township
- West Branch Township
- Wharton Township

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4.3.15. Dam and Levee Failure

4.3.15.1 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 two high-hazard and three low-hazard dams in Potter County that are both publicly and privately owned and are registered with the USACE in the NID. There are five dams within the county that are high-hazard and require an emergency action plan. *Table 57 – Potter County Dam Inventory* illustrates the dams located in Potter County. *Table 56 – High-Hazard Dams Municipal Summary* summarizes the high-hazard dams in Potter County by

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municipality. The municipalities not listed do not have high-hazard dams. *Table 58 – Dam Name and Purpose* lists the dams located in Potter County and their purpose code, and the description of purpose based on the Pennsylvania DEP codes.

Table 56 - High-Hazard Dams Municipality Summary

High-Hazard Dams – Municipal Summary	
Municipality	Number of High-Hazard Dams
Harrison Township	1
West Branch Township	1
Total:	2
Source: USACE NID, 2023	

Table 57 - Potter County Dam Inventory

Potter County Dams							
Dam Name	River	Owner Name	Year Completed	Dam Height (feet)	Drainage Area (acres)	Hazard	EAP
North Fork	White Branch North Fork	Potter County Commissioners	1960	58	2,176	High	Yes
Lyman Run	Lyman Run	DCNR	2007	52.6	11,776	High	Yes
George Snyder	Phoenix	George Snyder	1973	18	262.4	Low	No
Bristol Swamp	Johnson Brook	PA Game Commission	1976	15	160	Low	No
Lake Lloyd	Marsh Creek	Lake Lloyd Homeowners Association	N/A	10	384	Low	No
Source: USACE NID, 2023							

Table 58 - Dam Name and Purpose

Dam Name	Purpose
North Fork	Flood Risk Reduction
Lyman Run	Recreation
George Snyder	Recreation
Bristol Swamp	Fish and Wildlife Pond
Lake Lloyd	Other

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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. Potter County is home to five levee sections, which are detailed in *Table 59 – Potter County Levee Inventory*.

Table 59 - Potter County Levee Inventory

Levee Name	Levee Type	Levee Length (miles)
Left Bank Allegheny River	Flood Risk Reduction	0.15
RB Mill Creek	Flood Risk Reduction	0.40
Galeton Flood Protection Project	Flood Risk Reduction	0.75
Galeton West Branch Pine Creek	Flood Risk Reduction	0.23
Genesee River Soil Levee	Flood Risk Reduction	0.60

4.3.15.2 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 40 – Potter County Dams* shows the location of dams within Potter 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

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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. The following figures (*Figure 41 – Potter Levees – Coudersport LB Allegany, Figure 42 – Potter Levees – Coudersport RB Mill Creek, Figure 43 – Potter Levees – Galeton Flood Project, Figure 44 – Potter Levees – Galeton WB Pine Creek, and Figure 45 – Potter Levees – Genesee River Spoil*) illustrate areas around Coudersport, Galeton and Genesee that are heavily protected by levees.

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.

4.3.15.3 Past Occurrence

Dams

There have been no past occurrences of dam failure or major incidence occurring at the locations of dams within Potter County. Smaller incidents 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 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 Potter 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

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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.

4.3.15.4 Future Occurrence

Dams

Although dam failures can occur at any time, given the right circumstances, the likelihood of a dam failure in Potter 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.

Levees

Although levee failures can occur at any time, given the right circumstances, the future occurrence of levee failures in Potter 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.

4.3.15.5 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 loss of life and economic loss expected in a failure event. *Table 60 – Dam*

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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 60 - Dam Classification

Dam Classification (PA Code 1980)		
Dam Size Classification		
Class	Impoundment Storage (Acre-Feet)	Dam Height (Feet)
A	Equal to 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
Dam Damage Classification		
Category	Loss of Life	Economic Loss
1	Substantial	Excessive
2	Few	Appreciable
3	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 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.

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The characteristics of the two high-hazard dams in Potter County vary greatly. The Lyman Run, located in West Branch Township, has the largest drainage area with a total of 11,776 drainage area acres. The dam that was constructed most recently is the Lyman Run, located in West Branch Township, which was constructed in 2007. The dam that is the oldest in the county is North Folk, which was constructed in 1960. The North Folk is the tallest in the county with a height of fifty-eight feet. The dams in Potter 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 Potter County and counties adjacent to Potter County. A failure at any of the dams in Potter 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 Potter County Hazard Mitigation Plan. This dataset was not readily accessible at the time of this writing. However, each of the municipalities that could be affected by the failure of a high-hazard potential dam could result in the inundation of critical infrastructure facilities and community lifeline facilities.

Potter 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 in the table below:

High-Hazard Potential Dams Risk Types	
Type of Risk	Description
Incremental Risk	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 mis-operation, 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.
Non-Breach Risk	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.

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High-Hazard Potential Dams Risk Types	
Type of Risk	Description
Residual Risk	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 Potter 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 mis-operation, 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 Potter 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, 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

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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 details risk assessment 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.

Levees

Each levee that is located in Potter County is of different length and each protects areas from a different section of waterway and flood way. Galeton Flood Protection Project is the largest in Potter County with a length of 0.75 miles. The Left Bank Allegheny River is the smallest in length in Potter County with a length of 0.15 miles each.

The entire leveed areas for Potter County protect a total of 237 within the county. Also protected are facility points with Potter County that includes community lifeline facilities (municipal buildings, hospitals, police/fire/EMS, schools, childcare centers, and nursing/care homes) facilities. Each levee in Potter County is a mainline levee and protects along a variety land feature. A failure of levees in the urban areas in Potter 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 Potter County. *Table 61 – Number of Vulnerable Structures within Leveed Areas* shows the number of addressable structures and facility type points in the largest levee protection areas within Potter County based on NLD information from 2023. 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.

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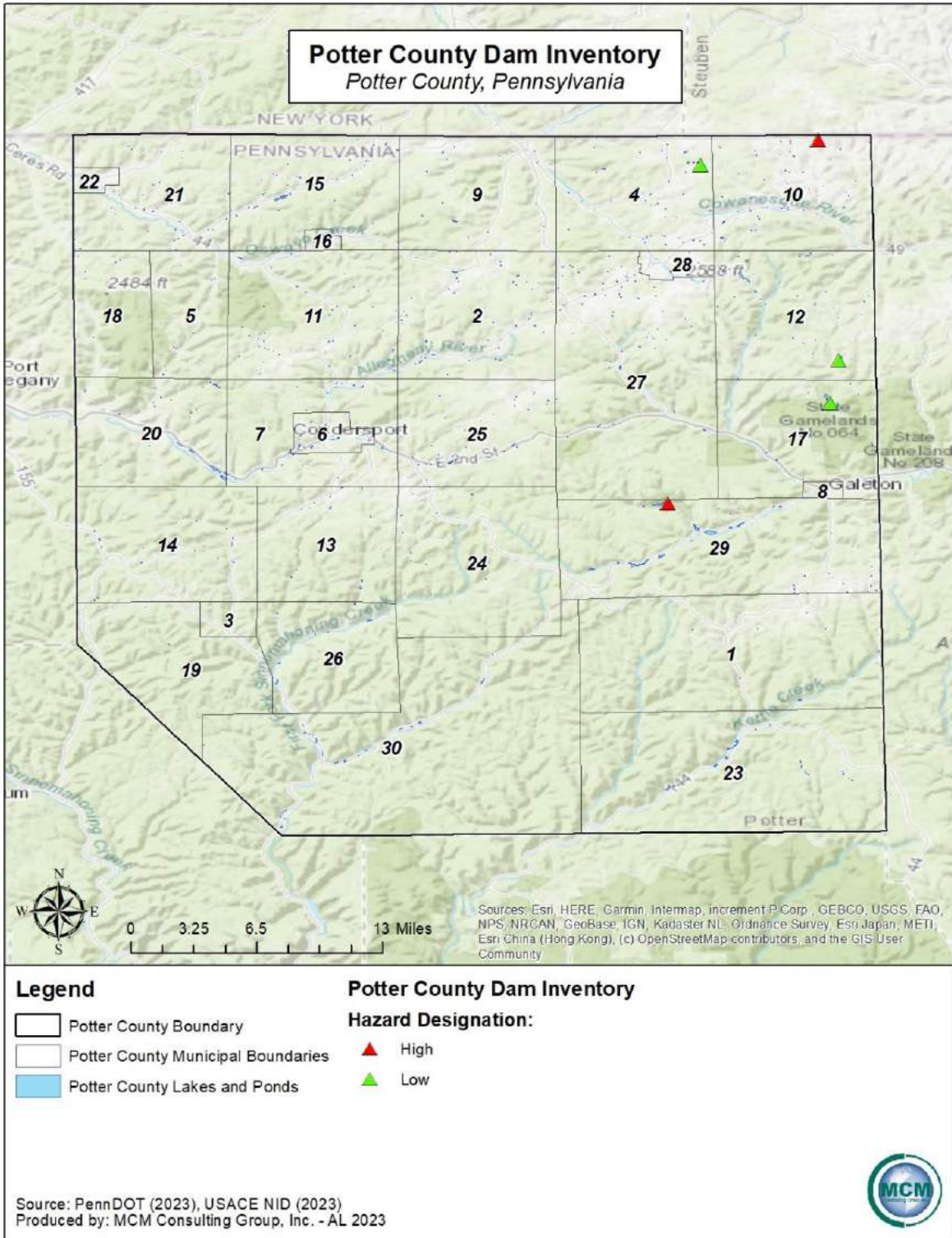
Table 61 - Number of Vulnerable Structure within Leveed Areas

Number of Vulnerable Structures within Leveed Areas		
Leveed Area Name	Addressable Structures in Leveed Area	Facility Type Points in Leveed Area
Coudersport - Left Bank Allegheny River	28	0
Coudersport - Right Bank Mill Creek	102	3
Galeton Flood Protection Project	9	1
Galeton West Branch Pine Creek	7	0
Genessee River Spoil Levee	38	0
Totals:	184	4

The facility points within the Coudersport – Right Bank Levee area include one EMS agency and two gas stations. The Galeton Flood Protection Project protects one facility site point in Potter County, a gas station.

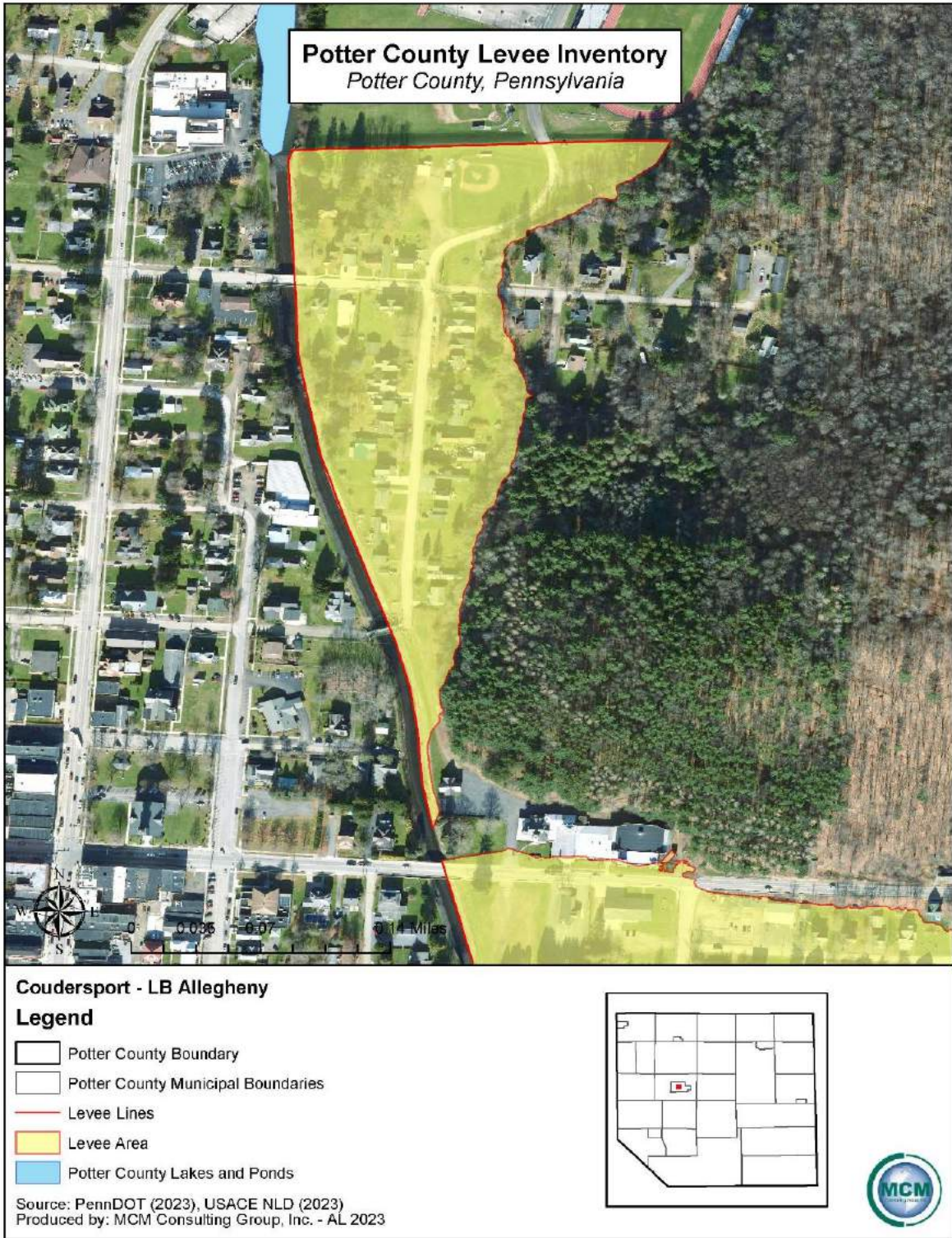
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Figure 40 - Potter County Dams



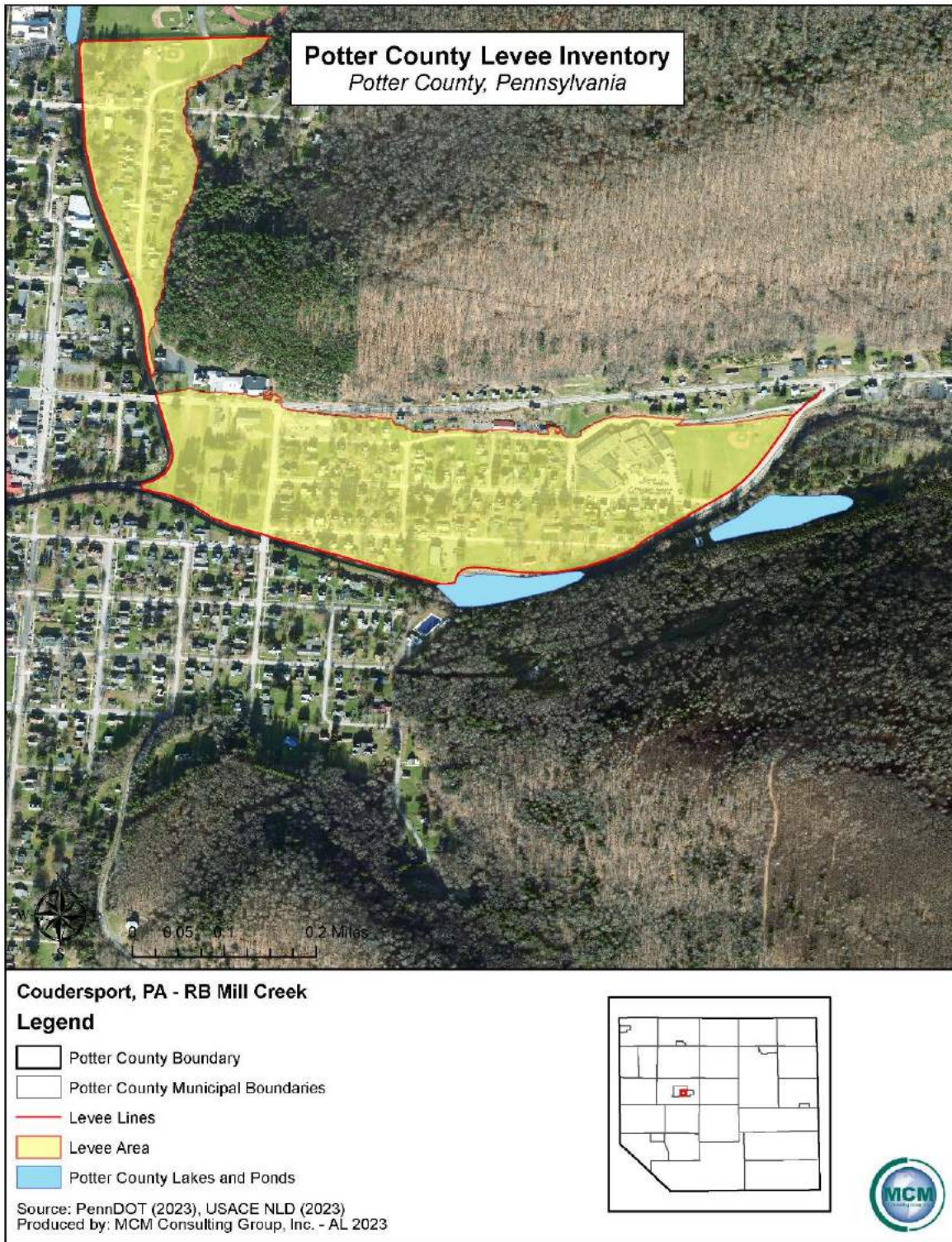
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Figure 41 - Potter Levees – Coudersport LB Allegheny



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Figure 42 - Potter Levees – Coudersport RB Mill Creek



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Figure 43 - Potter Levees – Galeton Flood Project



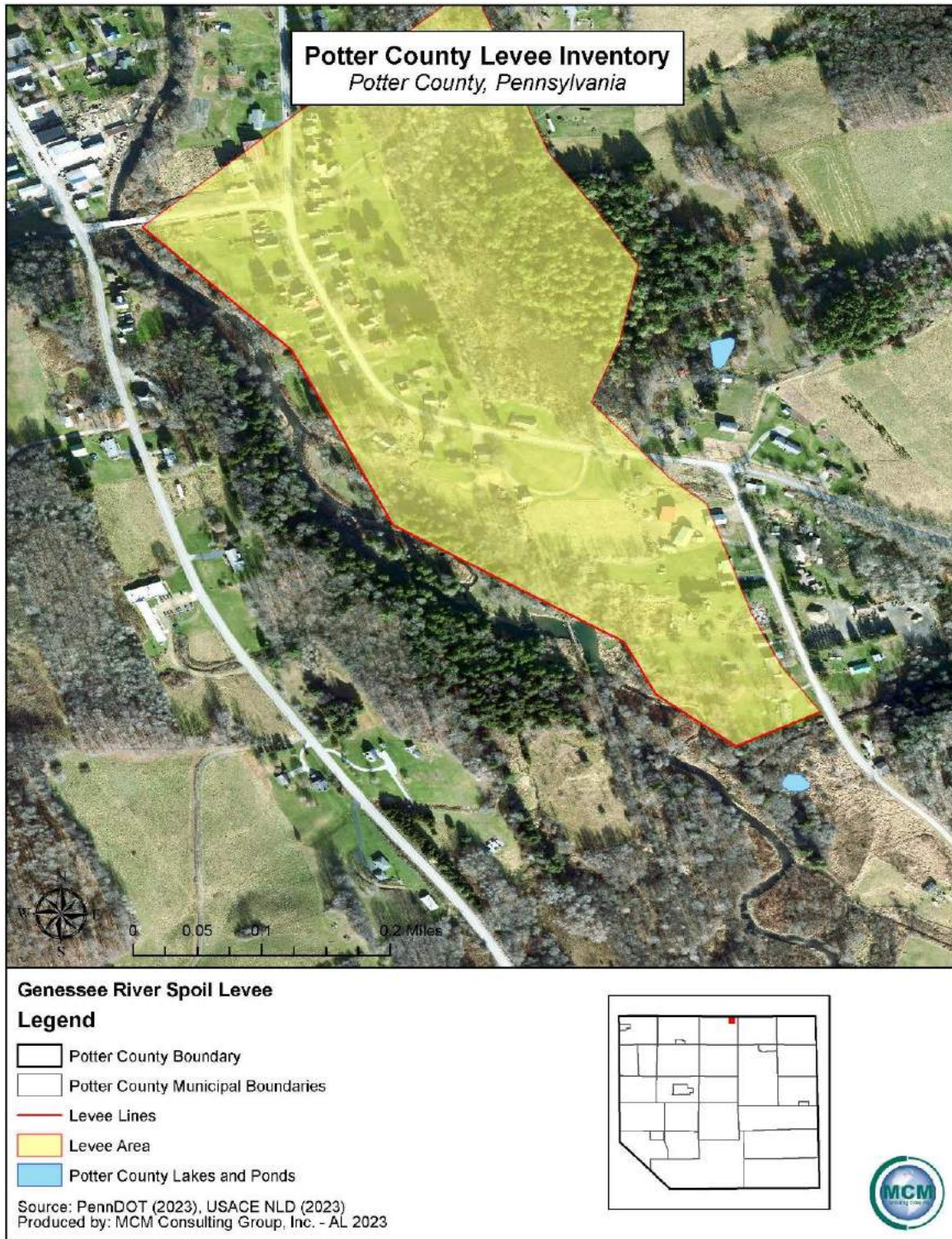
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Figure 44 - Potter Levees – Galeton WB Pine Creek



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Figure 45 - Potter Levees – Genesee River Spoil



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4.3.16. Emergency Services

4.3.16.1 Location and Extent

Fire, emergency medical services (EMS), local emergency management coordinators (LEMC), and law enforcement service agencies are defined per municipality in Potter County. In addition to the local services, the county hosts numerous special teams. Regional and state-wide services are also available.

With the exception of law enforcement, most areas are served by volunteers instead of career personnel, which increases response time due to volunteer availability. Volunteers provide emergency services above separately from their regular careers. Often agencies struggle with the availability of skilled personnel and resources at certain times of the day. The number of responders in general has decreased, in part due to issues including funding and retention of personnel.

Additionally, the time and expense obligations of required training are a factor in the decrease in number of responders. The initial training time for fire, EMS, and law enforcement can take several months to complete. Emergency medical services, requires a regular schedule of continued education to maintain certification. In the fire service, after the initial training, there are specialty courses offered, which are recommended, but not required. For law enforcement, skills such as firearms proficiency must be maintained, and updates to new laws and regulations continues throughout the officer's career.

4.3.16.2 Range of Magnitude

Finances, changing political climates, leadership, or a significant high-profile event can trigger a system to be declared as "success" or "failure". In some cases, a combination of these factors can create a perfect storm. Unfortunately, many "failed" systems are measured by recent events, no matter how successful they may have been in the past. Although financial problems are often blamed on poor leadership, they may have many root causes. Labor rates, benefits, poor productivity, operational design, insurance reimbursements, and market regulation all have a significant direct impact on the financial viability of an organization.

Two fundamental, yet misunderstood, topics are the financial and economic variables that drive emergency service systems. These systems typically generate revenue through tax subsidies, memberships, direct sales, diversification into other lines of business, grants, or fundraising. They spend most of these revenues on direct and indirect labor, and benefits. The remaining dollars go into infrastructure, fuel, medical supplies, insurances, fleet maintenance, dispatch, and other essential items, with hopefully, some left over for recapitalization or fund balance development. The range of the issues related to emergency service shortages are felt across the

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entire United States of America and the Commonwealth of Pennsylvania. Potter County has felt emergency shortages and these shortages have had adverse effects on emergency response in the county.

4.3.16.3 Past Occurrence

There have been no official records kept on shortages to emergency services. However, there has been a decrease in the number of new volunteers in the fire service for several years. Most agencies are private organizations that lack local funding and exist based on tax dollars, fund raising, and donations received from their community. The need for fund raising adds to availability issues of volunteers. Most services past practices are not sustaining the current needs for funding and manpower. Without financial support from the communities, services may not be able to remain in operation to serve those same communities. Recruitment and personnel retention are a key to success.

Potter County has had multiple events that were caused by emergency service shortages, most significantly from 2020 to 2022, exacerbated by the COVID-19 pandemic. Potter County has faced a tremendous emergency services shortage in the past years due to several reasons. However, this shortage has not been caused exclusively by the COVID-19 pandemic and was occurring before the pandemic across Potter County and the Commonwealth of Pennsylvania.

4.3.16.4 Future Occurrence

Historically, it has been difficult for small communities to have a paid fire or EMS service, therefore requiring volunteers. Fewer volunteers to perform the tasks associated with fire, medical, and rescue operations, can negatively affect a service's ability to respond to emergencies. Additionally, operational needs are impacted if there are fewer volunteers to raise funds. Without fundraising and community support these fire departments and volunteer EMS agencies will experience broader challenges. Municipalities can help offset some of the financial burdens to their local fire company with a fire tax.

There are also challenges for individuals who volunteer, including dedicating time beyond their current employment, family, and community commitments to dedicate to training, responding, and fundraising. Training is essential to provide for the general knowledge and safety of volunteers. Becoming certified as a volunteer firefighter requires hundreds of hours of training. With a decrease in the numbers of new volunteers, many current volunteers are aging and unable to perform at the same levels they once were.

Fire departments and EMS agencies, often are tasked with responding to a variety of emergencies, including not only fire and medical emergencies, but also incidents requiring

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rescue, containment of hazardous materials, or assistance to law enforcement. Volunteers need to be well trained and able to respond to different scenarios as needed.

The future occurrence of emergency service shortages is likely to continue in Potter County and across the Commonwealth of Pennsylvania. With a lack of new recruits and officers for emergency services, response will continue to be hindered and response times will continue to be high. Institutional change is the most efficient way to decrease the likelihood of emergency service shortages in Potter County, but that type of change is slow and often long-term.

4.3.16.5 Vulnerability Assessment

The possibility that EMS agencies and fire services could fail creates a vulnerability to all Potter County communities. Occasionally, residents of communities mistakenly think that their local fire department is a paid service. Most municipal fire departments are volunteer agencies and need the support of their communities to maintain their departments.

Personnel shortages have been occurring in law enforcements for several reasons. More students are pursuing other professional careers instead of becoming public safety professionals than previously. This trend could be an effect of the recent changes in the social climate toward law enforcement, the increased number of college students pursuing graduate school degrees, or many other factors. As with any profession, becoming a law enforcement officer requires a commitment of time and money for training at local, state, or federal levels. The selection of law enforcement officers includes not only physical and mental aptitudes, but also a comprehensive physiological screening.

If any current public service agency fails to provide enough personnel to perform their required duties, then those duties must be provided for by another service agency that may be many miles away, creating an increased response time. An increased response time could lead to additional or greater severity in injury or property damage. Many communities in Pennsylvania have already experienced the closure of emergency response agencies.

It is recommended that each municipality assess their own vulnerabilities by maintaining and building relationships with their local providers and working with them to make to plan accordingly for if a local service were to close its operations. Consolidation of services is a possible solution for agencies that are struggling to maintain operations. Statistics, response times, and all times associated with units dispatched are easily obtainable from the county 911 center. Municipalities should research all of the factors which would be part of a consolidation of emergency services with neighboring communities.

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The emergency services departments in Potter County need to be supported to create and or discover new ways to not only recruit but to retain volunteers. If left unattended, the issue will continue and the lack of response will grow, leaving communities more vulnerable to loss of life and loss of property. Community education is a key factor in the maintenance of emergency response agencies. In addition, continued support, and efforts to inform legislature could all prove to be important in assuring that these services remain in operation into the future. At the time of the writing of this plan, a number of bills has been introduced in both the House of Representative and the Senate as a result of a two-year study initiated by Senate Resolution 6 (SR6). The final report can be found here: <http://pehsc.org/wp-content/uploads/2014/05/SR-6-REPORT-FINAL.pdf>.

Emergency response agencies that currently provide services within Potter County are identified in the following tables, *Table 62 – Potter County Fire Departments* identifies the municipalities served. Almost all fire departments in Potter County are volunteer. *Table 63 – Potter County EMS Agencies* identifies each emergency medical service agency and the municipalities served. *Table 64 – Potter County Law Enforcement Agencies* identifies each police department to include the Pennsylvania State Police (PSP) and the municipalities served. This information was provided by the Potter County Emergency Services.

Table 62 - Potter County Fire Departments

Potter County Fire Departments	
Station Name	Location
Austin Volunteer Fire Company, Inc.	Austin Borough
Coudersport Volunteer Fire Company	Coudersport Borough
Genesee Volunteer Fire Department	Genesee Township
Germania Fire Department	Abbott Township
Goodyear Hose Company	Galeton Borough
Harrison Township Fire Company	Harrison Township
Kettle Creek Hose Company	Stewardson Township
Roulette Chemical Engine Company	Roulette Township
Shinglehouse Volunteer Fire Department	Shinglehouse Borough
Tri-Town Volunteer Fire Department	Ulyesses Borough

Table 63 - Potter County EMS Agencies

Potter County EMS Agencies	
Station Name	Location
Austin Emergency Services	Austin Borough
Coudersport Volunteer Ambulance	Coudersport Borough
Gale Hose Ambulance	Galeton Borough

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Potter County EMS Agencies	
Station Name	Location
Genesee Ambulance	Genesee Township
Kettle Creek Ambulance	Stewardson Township
Roulette Ambulance	Roulette Township
Shinglehouse Ambulance	Shinglehouse Borough
Tri-Town Ambulance	Ulysses Borough

Table 64 - Potter County Law Enforcement Agencies

Potter County Law Enforcement Agencies	
Station Name	Location
Coudersport Borough Police Department	Coudersport Borough
Galeton Borough Police Department	Galeton Borough
Pennsylvania State Police (PSP) - Coudersport	Sweden Township
Shinglehouse Borough Polic Department	Shinglehouse Borough
Sweden Township Police Department	Sweden Township

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4.3.17. Environmental Hazards (Fixed Facility and Transportation)

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 Potter County, including US 6, PA 44, PA 49, PA 144, PA 155, PA 244, PA 449, PA 607 and PA 872.

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. There are twelve SARA Title III facilities in Potter County. These facilities listed as SARA sites should not be considered an exhaustive and comprehensive list of all locations where hazardous materials reside in the county. *Figure 47 – Hazardous Waste Locations* identifies SARA Title III facilities as well as several other locations that consume, store, or release potentially hazardous materials and wastes.

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

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TRI information to the EPA. The EPA is the federal enforcement agency responsible for SARA Title III and PEMA classifications. As of 2020, there are four TRI facilities in Potter 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 46 – Oil & 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 wastes. 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:

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- 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. 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 waters 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. There were eleven major vehicle accidents that were listed in the county's reporting data from 2021 to calendar year 2023. More recent events are recorded in the WebEOC and county reporting software and are summarized in *Table 65 – Hazardous Material Incidents*. Transportation accidents that involved hazardous materials were included in the table below.

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Table 65 - Hazardous Material Incidents

Hazardous Material Incidents		
Municipality	Date	Event
Austin Borough	02/15/2021	Natural Gas Release
Coudersport Borough	02/21/2021	Chemical Release/Spill
Hebron Township	03/07/2021	Natural Gas Release
Harrison Township	05/20/2021	Tractor Trailer Into a Residence
Hebron Township	08/31/2021	Chemical Release/Spill
Harrison Township	12/06/2021	Flammable Liquid and Solids
Wharton Township	09/14/2022	Natural Gas Release
Ulysses Township	02/10/2023	Natural Gas Release
Wharton Township	07/15/2023	Natural Gas Release

Source: WebEOC, County Reporting System, 2023

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.

Fixed Facility

There have been a number of hazardous material incidents in Potter County in the past but few of those events have been related to fixed facilities in the county. Between 2021 and 2023, there were eight hazardous material incidents that did not involve transportation. Of those eight incidents, five were related to natural gas releases. More recent events are recorded in WebEOC and county reporting software and are summarized in *Table 65 – Hazardous Material Incidents*.

The EPA tracks the management of hazardous materials in facilities that handle significant amounts of hazardous materials. The four toxic release inventory (TRI) facilities in Potter County as of 2020 are summarized in *Table 66 – 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.

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Table 66 - TRI Facilities

Toxic Release Inventory Facilities				
Name	Address	Industry Sector	Chemical	Production-related Waste Managed (lbs)
Emporium Specialties Co Inc.	94 Foster ST, Austin Pennsylvania 16720	332-Fabricated Metals	Copper compounds, Nickel compounds, Trichloroethylene	0
Morgan Advanced Materials & Technology	1118 E 2 nd ST, Coudersport Pennsylvania 16915	335- Electrical Equipment	Acetone, Antimony, Benoperylene, Copper, Methanol, Polycyclic aromatic compounds	15,713
Catalus Corporation	US. RT 6 W, Galeton Pennsylvania 16922	332- Fabricated Metals	Ammonia Chromium Copper Copper Compounds Lead Nickel Nickel Compounds	750
Chattanooga Labeling Systems	2 Industrial Park RD, Galeton Pennsylvania 16922	327- Nonmetallic Mineral Product	Ammonia Barium compounds Fluorine Hydrogen fluoride	0

Source: EPA, 2023

4.3.17.4 Future Occurrence

Transportation

While many incidents involving hazardous material releases have occurred in Potter 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.

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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 Potter 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 Potter County is vulnerable to 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 Potter County. *Figure 49 – Annual Truck Traffic Percentages* identifies the annual truck traffic percentages for all of the roadways in Potter 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. Ulysses Township contains the most oil and gas wells along with the most drinking water wells, meaning that Ulysses Township is most vulnerable to water contamination from oil and gas wells. *Table 67 – Oil and Gas Wells & Drinking Water Wells* illustrates the type of well and the local domestic drinking water wells for each municipality.

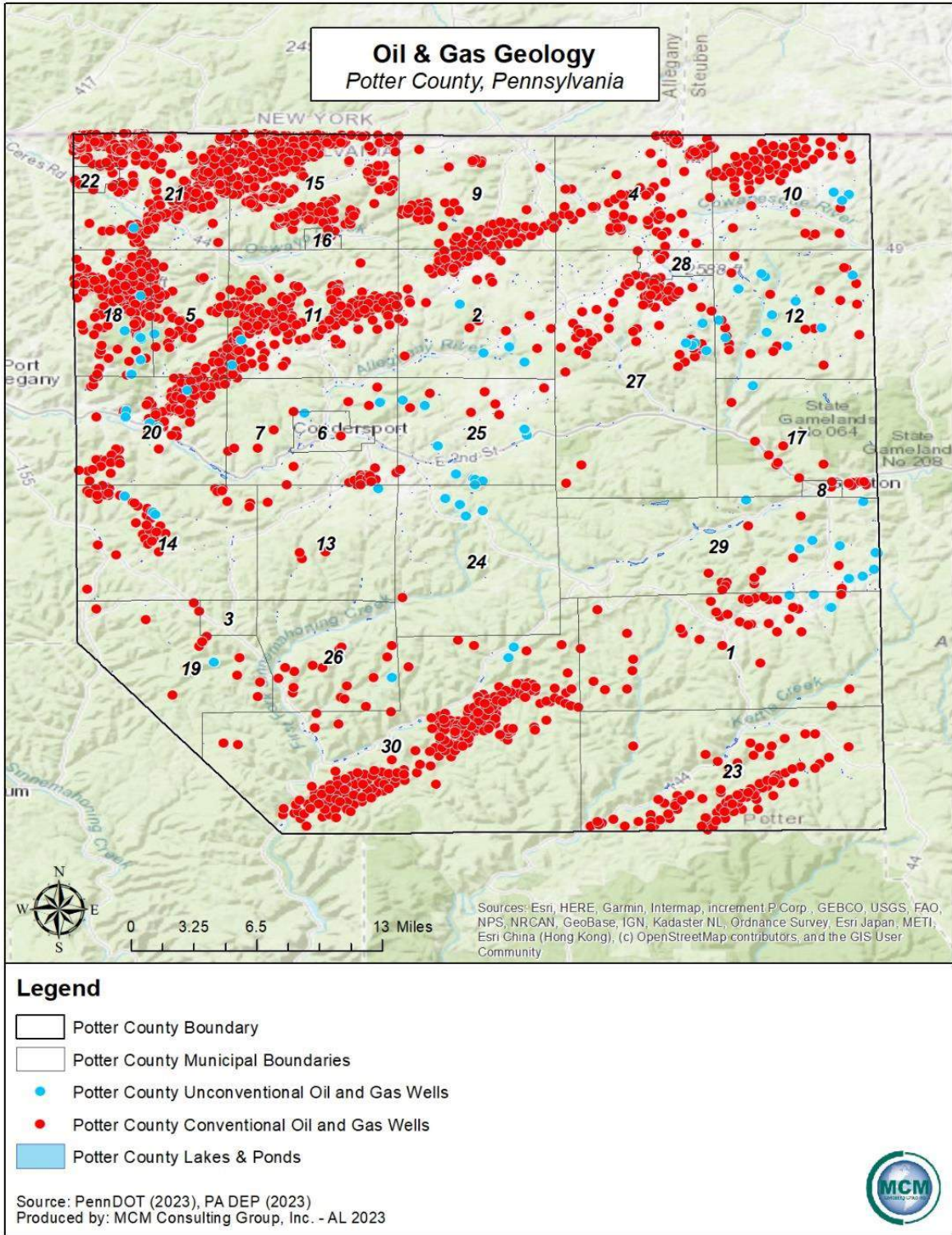
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Table 67 - Oil and Gas Wells & Drinking Water Wells

Oil & Gas Wells in Potter County					
Municipality	Type of Well				Domestic Drinking Water Wells
	Active	Abandoned	Inactive	Proposed	
East Fork Township	1	0	0	0	0
Sylvania TWP	1	0	0	0	0
West Branch Twp	8	0	0	0	0
Summit Twp	9	0	0	0	0
Sylvania Twp	3	0	0	0	0
Keating Twp	3	0	0	0	0
Roulette Twp	3	0	0	0	0
Coudersport	4	0	0	0	0
Sweden Twp	16	0	0	0	0
Ulysses Twp	17	0	0	0	0
Pike Twp	1	0	0	0	0
Hector	1	3	0	0	0
Pleasant Valley Twp	6	0	0	0	0
Total:					
Source: PA DEP, 2023					

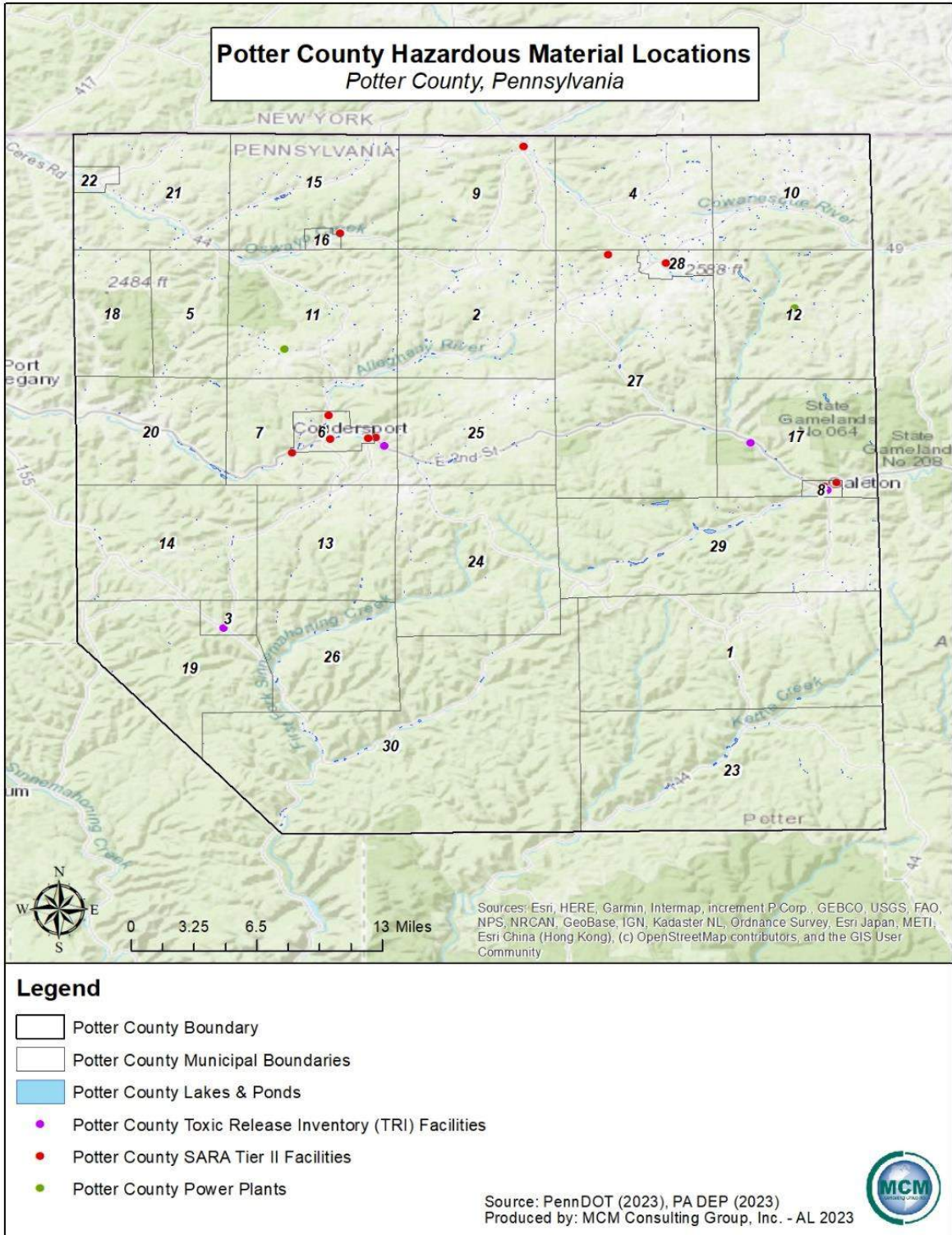
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Figure 46 - Oil and Gas Well Locations



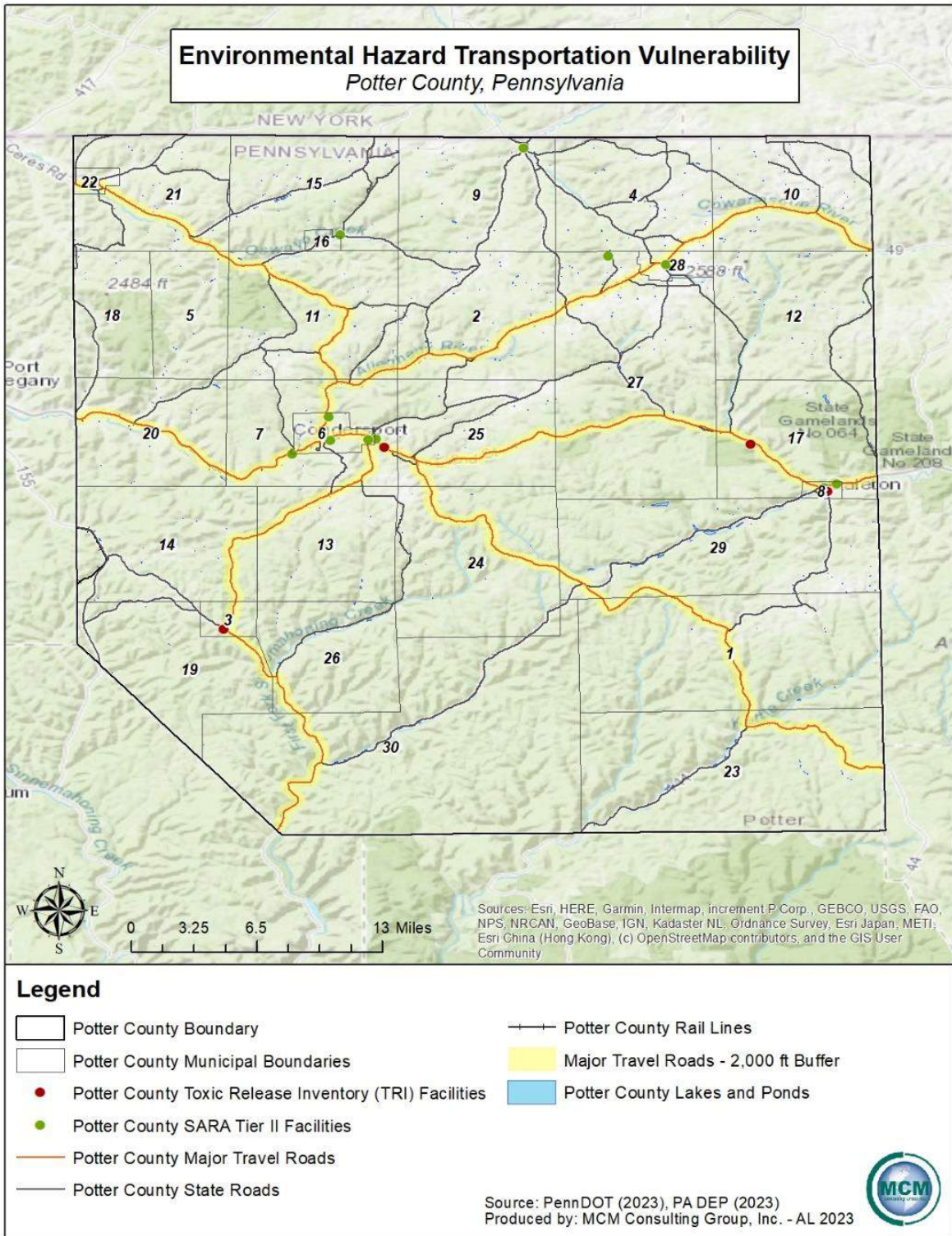
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Figure 47 - Hazardous Waste Locations



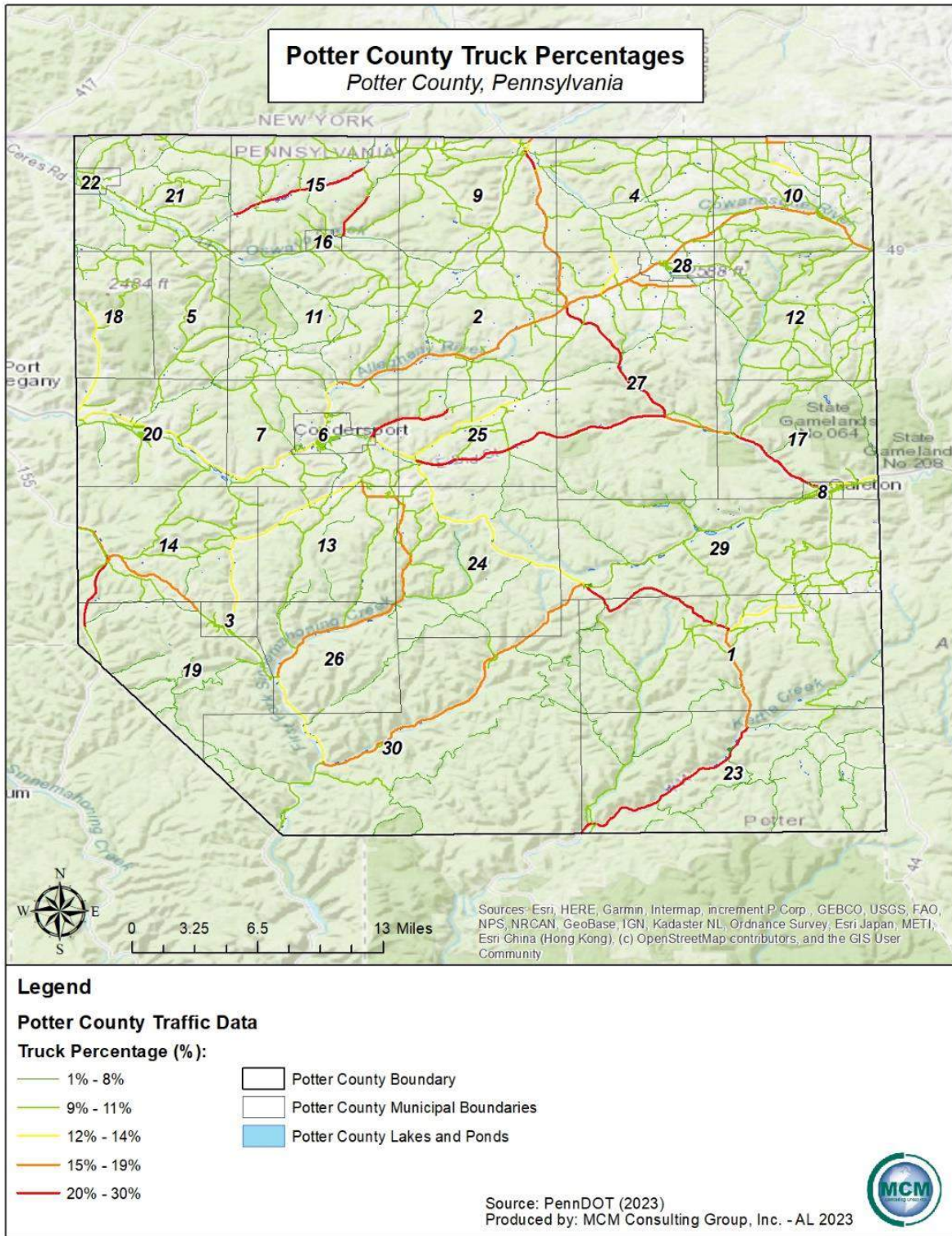
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Figure 48 - Environmental Hazard Transportation Vulnerability



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Figure 49 - Annual Truck Traffic Percentages



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4.3.18. Nuclear Incidents

4.3.18.1 Location and Extent

Nuclear hazards and incidents generally refer to incidents involving (1) a release of significant levels of radioactive materials or (2) exposure of workers or the general public to radiation.

Primary concerns following a nuclear incident or accident are:

- the impact on public health from direct exposure to a radioactive plume
- inhalation of radioactive materials
- ingestion of contaminated food, water, and milk
- long-term exposure to deposited radioactive materials in the environment that may lead to acute health effects (e.g., death, burns, severe impairments), chronic health effects (e.g., cancer), and psychological effects

Nuclear accidents/incidents can be placed into three categories:

1. Criticality accidents which involve loss of control of nuclear assemblies or power reactors
2. Loss-of-coolant accidents which result whenever a reactor coolant system experiences a break or opening large enough that the coolant inventory in the system cannot be maintained by the normally operating make-up system
3. Loss-of-containment accidents which involve the release of radioactivity

A nuclear power facility makes electricity by continuously splitting uranium atoms. Within the Commonwealth of Pennsylvania, there are five nuclear power stations. These are:

- Beaver Valley Power Station, Beaver County;
- Limerick Generating Station, Montgomery County;
- Peach Bottom Atomic Power Station, York County;
- Susquehanna Steam Electric Station, Luzerne County; and,
- Three Mile Island Nuclear Generating Station, Dauphin County. (This station's license expired in 2019 and its owners have begun the decommissioning process; at the time of the writing of this plan, the station was for sale, but it must still adhere to many of the tenets of federal and state emergency response plans.)

There are no nuclear power stations within fifty miles of the Potter County border.

Potter County is not within the fifty-mile planning zone of any of the nuclear power stations. In the event of an emergency, evacuees from distant EPZs may seek shelter in Potter County or pass through the county and use local services.

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4.3.18.2 Range of Magnitude

The Nuclear Regulatory Commission encourages the use of Probabilistic Risk Assessments (PRAs) to estimate quantitatively the potential risk to public health and safety considering the design, operations, and maintenance practices at nuclear power plants. PRAs typically focus on accidents that can severely damage the core and that may challenge containment. The Federal Emergency Management Agency (FEMA), the Pennsylvania Emergency Management Agency (PEMA), and county governments have formulated Radiological Emergency Response Plans that include a Plume Exposure Pathway Emergency Planning Zone (EPZ) with a radius of about ten miles from each nuclear power facility and an Ingestion Exposure Pathway EPZ with a radius of about fifty miles from each facility. See *Table 68 - Emergency Planning Zones*. The exact size and configuration of the EPZ may vary in relation to local emergency response capabilities, topography, road networks, and political boundaries.

Table 68 - Emergency Planning Zones

Emergency Planning Zones	
EPZ	Description
Plume Exposure Pathway (PEP)	Has a radius of about 10 miles from each reactor site. Predetermined protective action plans are in place and include sheltering, evacuation, and the use of potassium iodide where appropriate.
Ingestion Exposure Pathway (IEP)	Has a radius of about 50 miles from each reactor site. Predetermined protective action plans are in place and are designed to avoid or reduce dose from potential ingestion of radioactive materials. These actions include a ban of contaminated food and water.
Source: U.S. Nuclear Regulatory Commission http://www.nrc.gov/about-nrc/emerg-preparedness/about-emerg-preparedness/planning-zones.html	

The magnitude of a nuclear incident differs for those within the Plume Exposure Pathway EPZ and those within the Ingestion Exposure Pathway EPZ. The Plume Exposure Pathway refers to whole-body external exposure to gamma radiation from a radioactive plume and from deposited materials and inhalation exposure from the passing radioactive plume. The duration of primary exposures could range in length from hours to days. The Ingestion Exposure Pathway refers to exposure primarily from ingestion of water or foods such as milk and fresh vegetables that have been contaminated with radiation.

Fixed facility incidents are not the only types of incidents that could affect Potter County. Other types of incidents such as transportation or terrorism could also pose a hazard.

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In the event of a nuclear disaster, radioactive fallout would be the main danger of an incident within a fifty-mile radius. Invisible gamma rays from this fallout can cause radiation sickness due to physical and chemical changes in the cells of the body. If a person would receive a large dose of radiation, that person would die in a very short time. Non-lethal doses in varying degrees would cause radiation sickness among the survivors. Depending on the location of the event all of Potter County could be in the Ingestion Exposure Pathway.

The Nuclear Regulatory Commission uses four classification levels for nuclear incidents:

1. Unusual Event: Events are in process or have occurred which indicate potential degradation in the level of safety of the plant. No release of radioactive material requiring offsite response or monitoring is expected unless further degradation occurs.
2. Alert: Events are in process or have occurred which involve an actual or potential substantial degradation in the level of safety of the plant. Any releases of radioactive material from the plant are expected to be limited to a small fraction of the EPA Protective Action Guides (PAGs).
3. Site Area Emergency: Involves events in process or which have occurred that result in actual or likely major failures of plant functions needed for protection of the public. Any releases of radioactive material are not expected to exceed the EPA PAGs except near the site boundary.
4. General Emergency: Involves actual or imminent substantial core damage or melting of reactor fuel with the potential for loss of containment integrity. Radioactive releases during a general emergency can reasonably be expected to exceed the EPA PAGs for more than the immediate site area.

The nuclear industry has adopted predetermined, site-specific Emergency Action Levels (EALs). The EALs provide the framework and guidance to observe, address, and classify the severity of site-specific incidents and conditions that are communicated to off-site emergency response organizations (Nuclear Regulatory Commission, 2008). There are additional EALs that specifically deal with issues of security, such as threats of airborne attack, hostile action within the facility, or facility attack. These EALs ensure that appropriate notifications for the security threat are made in a timely manner. Each facility is also equipped with a public alerting system, which includes several sirens to alert the public located in the Plume Exposure Pathway EPZ. This alerting system is activated by the counties of each specific EPZ. Emergency notifications and instructions are communicated to the public via the Emergency Alert System as activated by the Commonwealth Resource Coordination Center (formerly Pennsylvania State Emergency Operations Center). State officials also have the capability to send emergency messages as text messages to mobile devices.

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During and after a nuclear incident, the primary concern is the effect on the health of the population near the incident. The duration of primary exposure could range in length from hours to months depending on the proximity to the point of radioactive release. External radiation and inhalation and ingestion of radioactive isotopes can cause acute health effects (e.g., death, severe health impairment), chronic health effects (e.g., cancers) and psychological effects.

Potential environmental impacts specific to the fifty-mile Ingestion Exposure Pathway EPZ, and therefore of most concern to Potter County, include the long-term effects of radioactive contamination in the environment and in agricultural products. Potter County can expect some radioactive contamination in very small amounts in the case of a nuclear incident at either of the five stations nearest it. This is not a significant concern in terms of external exposure and immediate health risks, but even a small amount of radiation will require the protection of the food chain, particularly milk supplies. Small amounts of radiation ingested over time could lead to future health issues. As a result, in the case of a nuclear incident, foodstuffs, crops, milk, livestock feed and forage, and farm water supplies will need to be protected from and tested for contamination. Additionally, spills and releases of radiologically active materials from accidents can result in the contamination of soil and public water supplies. Areas underlain by limestone and some types of glacial sediments are particularly susceptible to contamination.

4.3.18.3 Past Occurrence

Nuclear incidents rarely occur, but the incident at Three Mile Island in Dauphin County is the worst fixed nuclear facility accident in U.S. history. The resulting contamination and state of the reactor core led to the development of a 14-year cleanup and scientific effort. Additionally, the *President's Commission on the Accident at Three Mile Island* examined the costs of the accident, concluding that “the accident at Three Mile Island on March 28, 1979, generated considerable economic disturbance. Some of the impacts were short term, occurring during the first days of the accident. Many of the impacts were experienced by the local community; others will be felt at the regional and national levels.” The report concluded: “It appears clear that the major costs of the TMI Unit 2 accident are associated with the emergency management replacement power and the plant refurbishment or replacement. The minimum cost estimate of nearly one billion dollars supports the argument that considerable additional resources can be cost effective if spent to guard against future accidents.”

Despite the severity of the damage, no injuries due to radiation exposure occurred. However, numerous studies were conducted to determine the measurable health effects related to radiation and/or stress. More than a dozen epidemiological and stress-related studies conducted to date have found no discernible direct health effects on the population in the vicinity of the plant. However, one study conducted by the Pennsylvania Department of Health's *Three Mile Island*

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Health Research Program did find evidence of psychological stress, “lasting in some cases for five to six years.” According to the program chief, “the people suffering from stress perceived their health as being poorer than it actually was when the health department checked the medical records.”

The accident at Three Mile Island had a profound effect on residents, the emergency management community, government officials, and nuclear industry, not only in Pennsylvania, but nationwide. There were minimal requirements for off-site emergency planning for nuclear power stations prior to the accident. Afterward, comprehensive, coordinated, and exercised plans were developed for the state, counties, school districts, special facilities (hospitals, nursing homes, day care centers, and detention facilities) and municipalities to ensure the safety of the populations. Costs associated with an incident at one of the Commonwealth’s nuclear facilities, be it real or perceived, are significant. The mitigation efforts put in place immediately following the 1979 accident continue until today. The Commonwealth’s nuclear/radiological plan, which is a successor of the original “Annex E,” is a result of the Commonwealth’s efforts to address the many components of mitigation planning. The comprehensive planning involving its five nuclear facilities is an ongoing effort. Plans are reviewed and amended on an annual basis.

Another incident occurred at Three Mile Island on February 7, 1993, when an individual drove his car through a chain-link fence and then slammed into a roll-up garage door leading into the facility’s turbine building. Plant officials, fearing the worst, immediately declared a Site Area Emergency. Fortunately, the person who crashed the gate was found and apprehended. Other than property damage caused by the forcible entry through physical structures, there was no lasting damage to the facility.

Potter County has not been affected by a fixed nuclear facility incident from any of state facilities. The county has not been affected by any type of nuclear incident.

4.3.18.4 Future Occurrence

Pennsylvania is the site of the only nuclear power plant in the country with an incident rated as a General Emergency. Since the Three Mile Island incident, nuclear power has become significantly safer and is one of the most heavily regulated industries in the nation. Despite the knowledge gained since then, there is still the potential for a similar accident to occur again at any of the nuclear generating facilities nearest the county. The Nuclear Energy Agency of the Organization for Economic Co-Operation and Development notes that studies estimate the chance of a breach of protective barriers in a modern nuclear facility at less than one in 100,000 per year (Nuclear Energy Agency, 2005). Nuclear incident occurrences may also happen because of intentional actions, but these terrorist acts are rare. Nuclear incidents in or near Potter County should be considered unlikely.

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4.3.18.5 Vulnerability Assessment

In addition to the areas of Potter County facing an indirect contamination risk, the entire county could also be affected on some level by incidents from any of the other nearby nuclear facilities. Evacuation of residents from these areas could lead to increased population or through-traffic in the county. County residents could be negatively impacted through the psychological effects of a nuclear incident as the effects and likelihood of radiation contamination are not always well understood by the public.

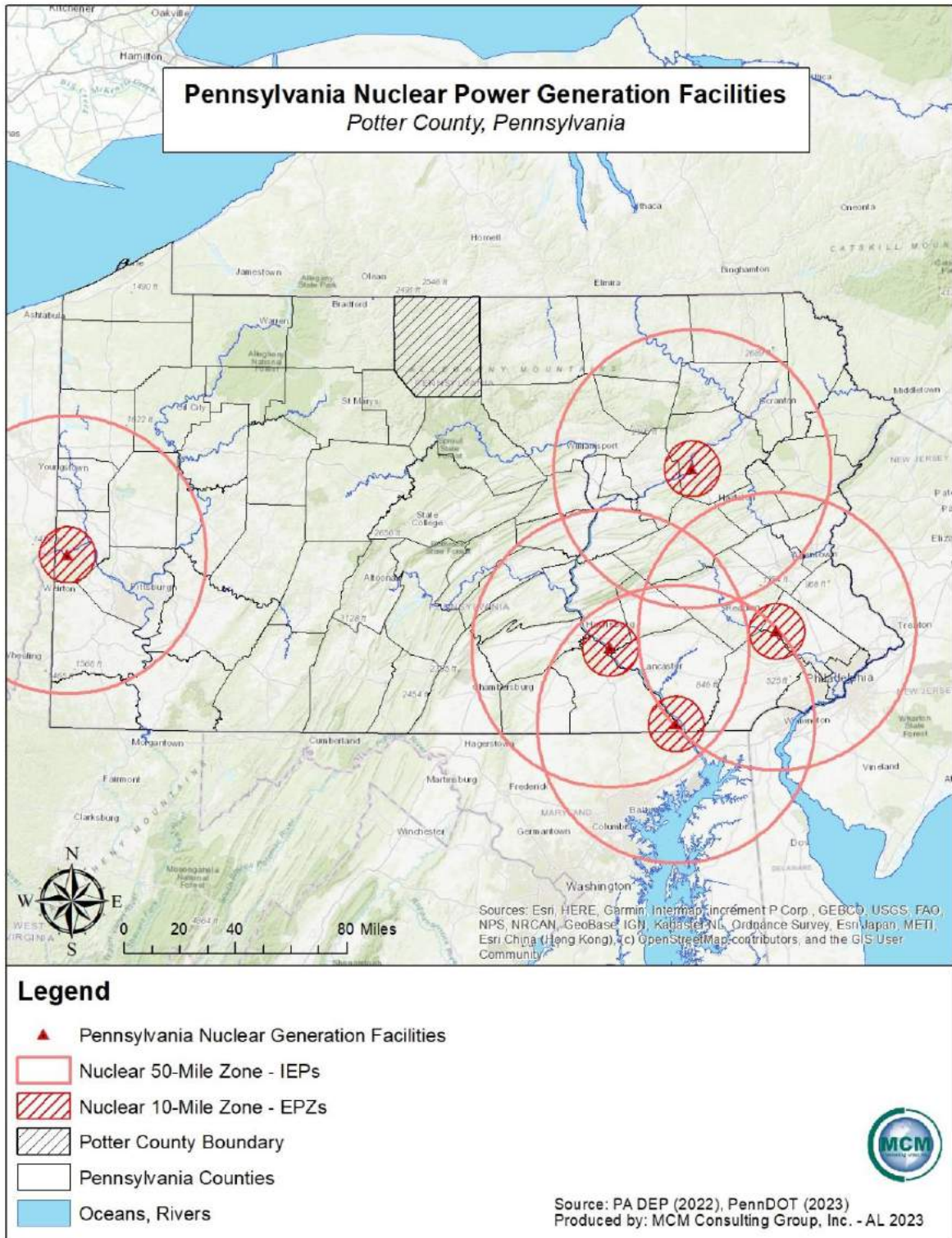
The county's primary vulnerability to nuclear incidents comes in the form of food, soil, and water contamination. In terms of vulnerable land, the majority of the 97,780 acres of farmland held in Potter County's 447 farms are vulnerable to radiological contamination in a nuclear incident. In 2017, the market value of all agricultural products of these farms was nearly \$39,227,000 million.

Water contamination is also a concern in nuclear incidents. There are several public water suppliers that operate in or provide water to the county; the largest of them are: Center Township Water Authority and Municipal Water Authority of Aliquippa. These water supplies, coupled with the county's forty-seven estimated domestic drinking water wells, are all vulnerable to the effects of a nuclear incident.

While it is unlikely that all agricultural products would be lost in the event of a nuclear incident, the county could expect some portion of that \$39.2 million to be lost. Time of year also impacts the vulnerability and losses estimated for a nuclear incident. An incident that occurs during the prime growing and harvesting season will have a larger impact on the county. For example, the incident at Three Mile Island occurred in the off-season; as a result, the Pennsylvania Department of Agriculture estimated that agricultural losses for the entire Commonwealth were not more than \$1 million.

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Figure 50 - Pennsylvania Nuclear Power Stations



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4.3.19. Opioid Epidemic

4.3.19.1 Location and Extent

Pennsylvania and the United States at large have been experiencing an epidemic of 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. Opioid addiction has increased drastically over the last year due to the hardships faced from the COVID-19 pandemic. Opioid use has increased since the beginning of the COVID-19 pandemic which is being attributed to the uncertainty people are feeling due to the pandemic.

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 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.

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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 Potter County, this profile focuses on opioid drugs and the opioid epidemic. The opioid crisis 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.

4.3.19.2 Range of Magnitude

Opioid addiction can lead to overdose, which can be fatal. This type of addiction can affect others that are not the user themselves. The most dangerous side effect of an opioid overdose is depressed breathing. The 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. Opioid addiction can also be passed from mother to child in the womb. This condition, known as neonatal abstinence syndrome, has increased five-fold, according to the National Institute on Drug Abuse (NIDA). This results in an estimated 22,000 babies in the United States born with this condition. First responders such as paramedics, police officers, and firefighters are also affected by the opioid addiction crisis. First responders face exposure risk due to an increase in emergency calls due to an increase in the crisis, particularly to synthetic fentanyl. Two to three milligrams of fentanyl can cause an induced respiratory depression, arrest, and possibly death to occur. Since fentanyl is indistinguishable from several other narcotics and powdered substances, first responders must take extra precaution when dealing with calls related to drug abuse. A worst-case scenario with the opioid epidemic in Potter County would be a high number of overdoses between residents and/or first responders throughout the county.

According to the Center for Disease Control and Prevention (CDC), more than 192 Americans die every day from an opioid overdose. In 2020, a total of 5,168 deaths related to opioid use occurred in Pennsylvania with the average age of 42.4 years old. From February 2019 to February 2020, there has been a 19.1% increase across the commonwealth of Pennsylvania. This could indicate a significant increase in opioid overdoses in Pennsylvania. Heroin and fentanyl are the two drugs most often found in overdose deaths, and they are considered to be highly available and nearly ubiquitous in Pennsylvania.

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4.3.19.3 Past Occurrence

In 2020, there was an estimated total of 91,799 deaths 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. In Potter County the overdose rate of males is greater than the overdose rate of females. Whites have the highest total rate of overdose deaths in Potter County, while blacks have the highest per capita rate of overdose deaths when adjusted for population size. The most used opioids in Potter County are fentanyl, heroin, cocaine, benzodiazepines, and Rx opioids.

Table 69 - Drugs Present in 2020 Pennsylvania Overdose Deaths

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

4.3.19.4 Future Occurrence

Both Potter County, and Pennsylvania as a whole, have seen a steady rise in opioid related deaths over the last several years, with drug-related death rates increasing at a high percentage. Future occurrences of opioid addiction and overdose 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 Wolf Administration 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 PDMP) 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 PDMP 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 Potter County, there is one drug

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take-back box. This drug take-back box location is at the Coudersport Pennsylvania State Police barracks. This locations help reduce future occurrences of opioid use from occurring.

In the event of an opioid overdose, death can sometimes be prevented with the use of the drug naloxone. Pennsylvania Secretary of Health, Dr. Rachel Levine, previously signed updated standing order prescriptions of naloxone. The updated standing orders include the 2mg dose auto injector which has recently become available. 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 opioid 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 40 years and has only one function to reverse the effects of opioids on the brain and respiratory system in order to prevent death. Emergency medical responders have access to the treatment, and as of 2015, naloxone is available without a prescription in Pennsylvania. Also, with the January 10, 2018 disaster declaration, emergency medical technicians (EMTs) are now allowed to leave naloxone behind at a scene, 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 Potter County.

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 Potter 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.

4.3.19.5 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. Opioid addiction 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

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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 Potter County, have seen an increase of time and resources devoted to the opioid epidemic as overdose and response increase.

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, 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 Potter 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 has challenged vulnerable populations, including those with opioid use disorders. The opioid epidemic and COVID-19 pandemic are intersecting and presenting 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, including disruptions of treatment and recovery services, limited access to mental health services and peer support, disrupted routines, loss of work, and stress, may lead to increased opioid use and risk of relapse for those in recovery. Risk factors also arise from indirect factors including housing instability and incarceration. Those with opioid use disorders are at higher risk for housing insecurity, homelessness, and incarceration. Congregate living facilities such as homeless shelters, jails, and prisons are high-risk environments for coronavirus transmission, and there are challenges in implementing recommendations from the CDC such as social distancing and quarantine. Additionally, the pandemic took away the attention from the media, from

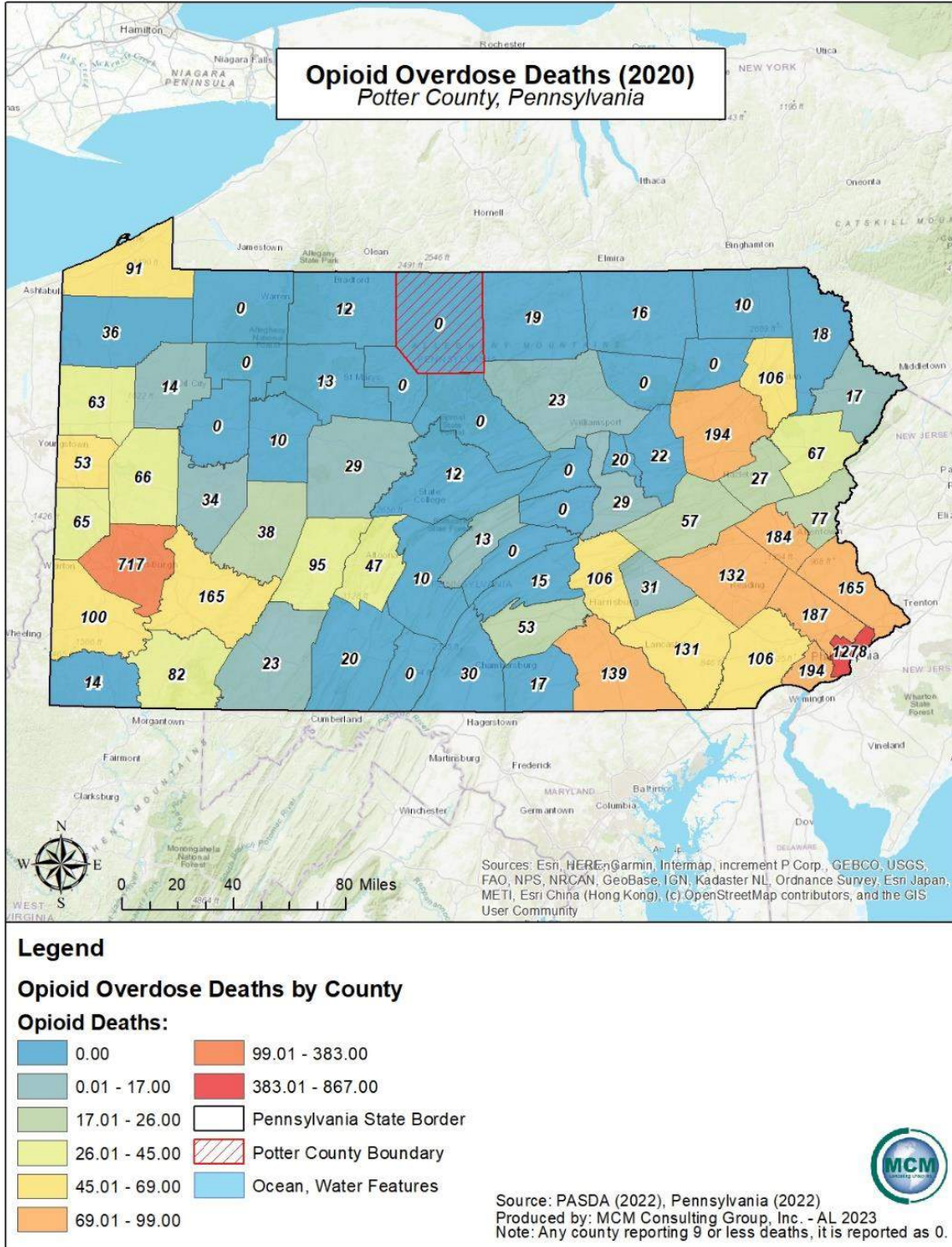
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legislators, and from public health agencies that was being focused on the opioid crisis. The opioid epidemic in Pennsylvania increased 22.9% since the beginning of the pandemic.

Additionally, first responders and medical personnel are also a very vulnerable population when dealing with the opioid epidemic. Fentanyl and related substances are hazardous materials, which cause the environment and the people around the substance to be vulnerable. Contact with fentanyl can impact first responders and others that are related to the opioid user. Depending on the potency of the drug, it can take as little as the equivalent of few grams of table salt to cause health complications. There have been several reports nationally of first responders accidentally overdosing on fentanyl through brief skin contact or the drug becoming airborne. It is best for first responders to err on the side of caution 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 human urine, feces, or medications that have been discarded in the bathroom. 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. State facilities are not at risk to the opioid crisis, but there are some occupation-specific risks that may make some employees more vulnerable. State employees working in direct patient care are vulnerable to fentanyl exposure. However, the physical plant and facilities of the Commonwealth and Potter County are not likely to experience losses from the opioid addiction crisis. Absenteeism associated with an opioid addiction in state facilities located in high-risk areas could lead to economic loss through lost productivity and increased medical costs. *Figure 51 – Opioid Overdose Deaths in Pennsylvania 2020* and *Figure 52 – Opioid Overdose Deaths in Pennsylvania 2021* illustrate the number of deaths per county in the state of Pennsylvania.

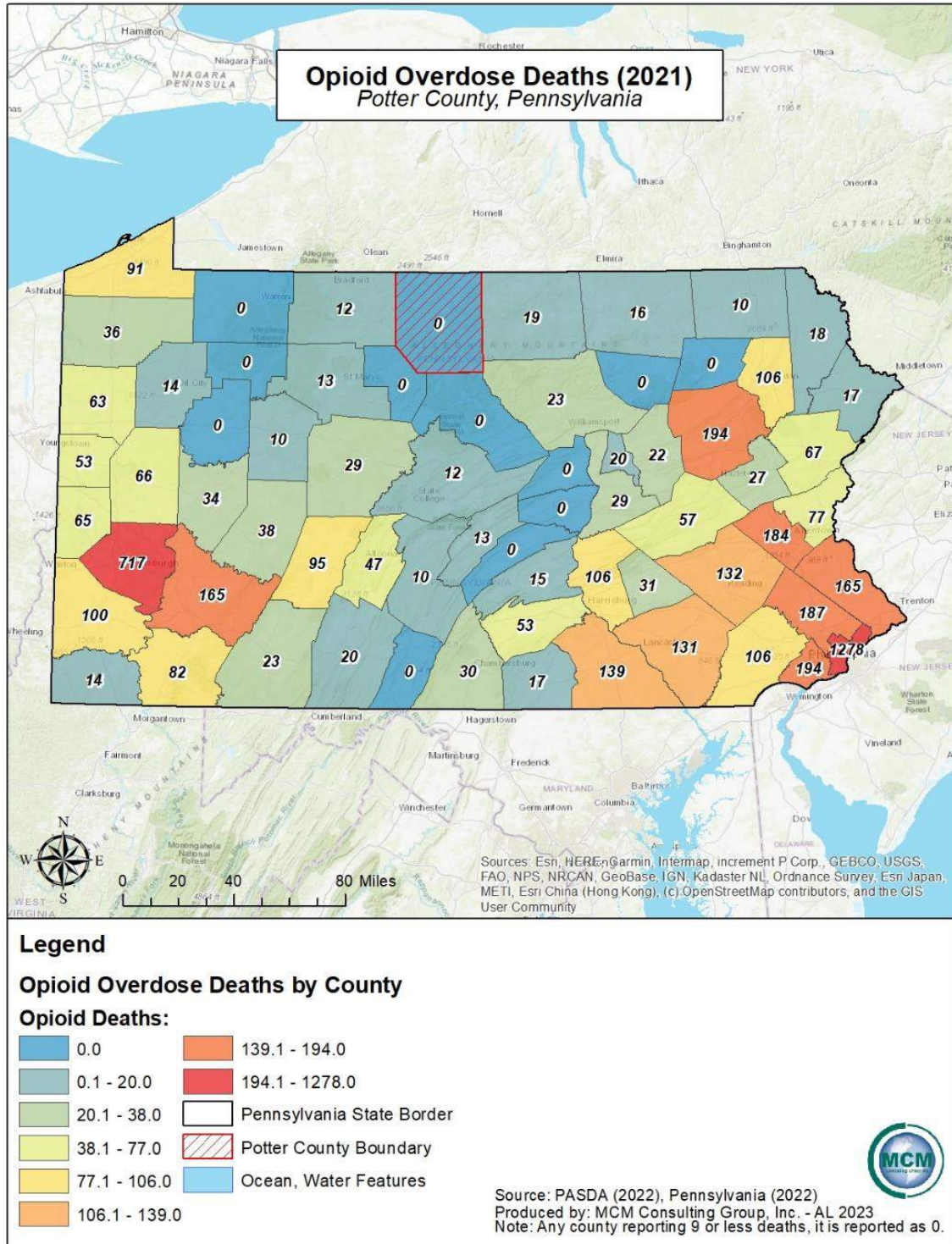
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Figure 51 - Opioid Overdose Deaths in Pennsylvania 2020



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Figure 52 - Opioid Overdose Deaths in Pennsylvania 2021



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4.3.20. Terrorism

4.3.20.1 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)

Cyber-terrorism 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. Cyber-terrorism 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 11th 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

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any major highway and marginalized groups such as LGBTQ persons and racial, religious, or other minorities.

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

4.3.20.2 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 cyber-terrorism. 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
- Cyber-terrorism
- Conventional bomb or bomb threat
- Hijackings
- Release of hazardous materials
- Kidnapping

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- 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, EMS and/or fire units. Potter County has seven districts (public schools K through 12th grade) that include ten primary, secondary, and high schools. The ten schools are Austin Area Elementary School, Austin Area Junior Senior High School, Coudersport Area Elementary School, Coudersport Area Junior Senior High School, Galetton Area School, Northern Potter Childrens School, Northern Potter Junior Senior High School, Oswayo Valley Elementary School, Oswayo Valley Middle School, and Oswayo Valley High School.

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 Potter County, 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.

Cyber terrorism is becoming increasingly prevalent. Cyber terrorism 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 cyber terrorism 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.

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4.3.20.3 Past Occurrence

No major terrorism or cyber terrorism events have occurred in Potter County, Pennsylvania. Cyber terrorism events are becoming more common in areas of local government, and these include counties near Potter 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 11th, 2001, attacks on the World Trade Center and the Pentagon. One of the aircrafts hijacked in the September 11th attacks crash landed in Somerset County, Pennsylvania before it 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 2022, there were a total of at least 646 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

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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 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 53 – 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 54 – Education Environments* and *Figure 55 – Education Environments Cont'd* shows two more summary pages from the report that detail active shooter statistics in educational environments.

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 Potter 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

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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.

4.3.20.4 Future Occurrence

The likelihood of Potter County being a primary target for a major international terrorist attack is small and unlikely. More likely terrorist activity in Potter County includes bomb threats or other incidents at schools. Potter County has seven school districts consisting of ten public schools, and there are several private schools also located in Potter County. These locations are considered soft targets and may be vulnerable, especially to domestic incidents.

4.3.20.5 Vulnerability Assessment

Potter 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:

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- 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.

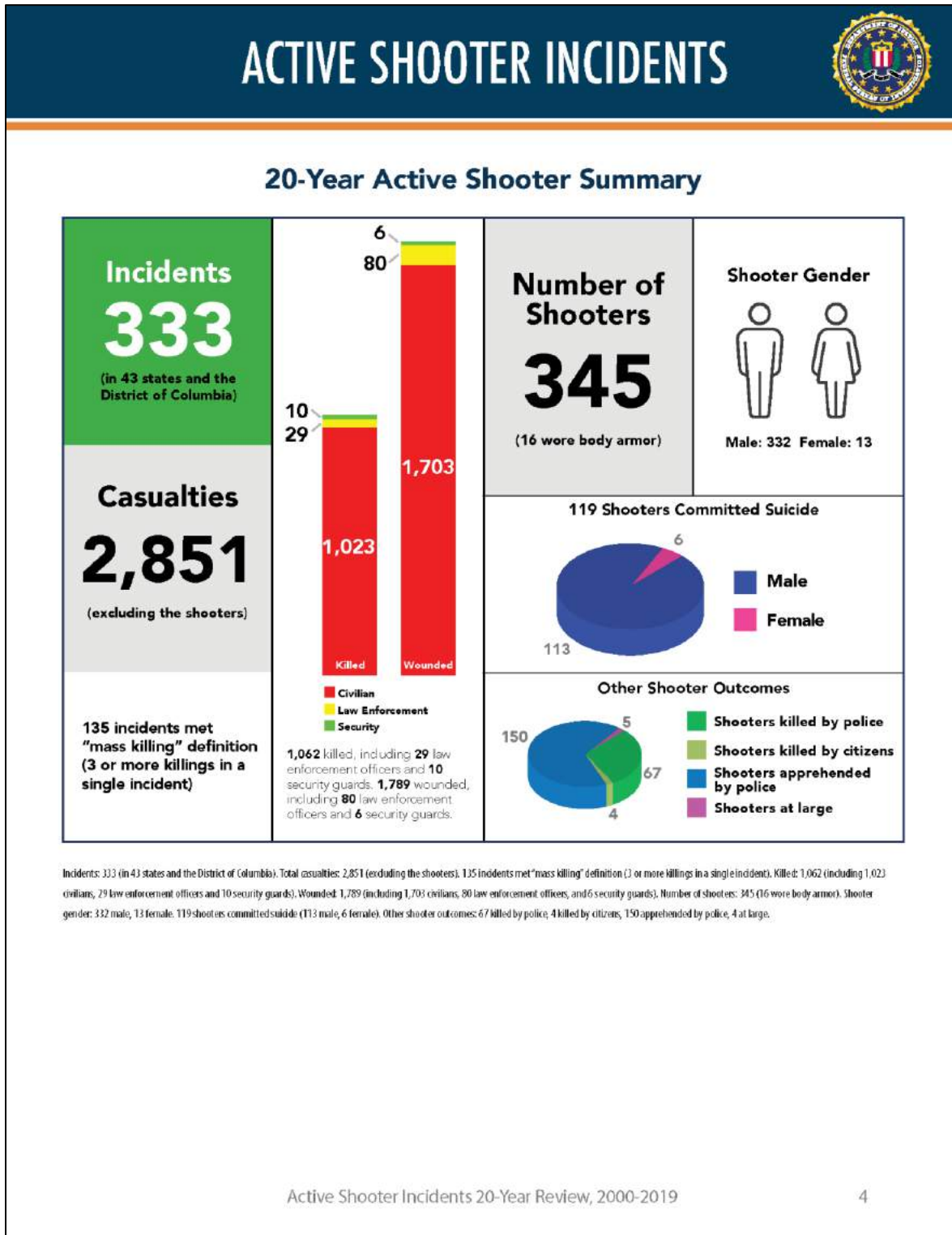
According to a study carried out on the data sourced from the Federal Bureau of Investigation, Pennsylvania is ranked second worst among states when it comes to handling cyber-attacks. The study made by Information Network Associates – an international security consulting company – says an increase of 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 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 Potter 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.

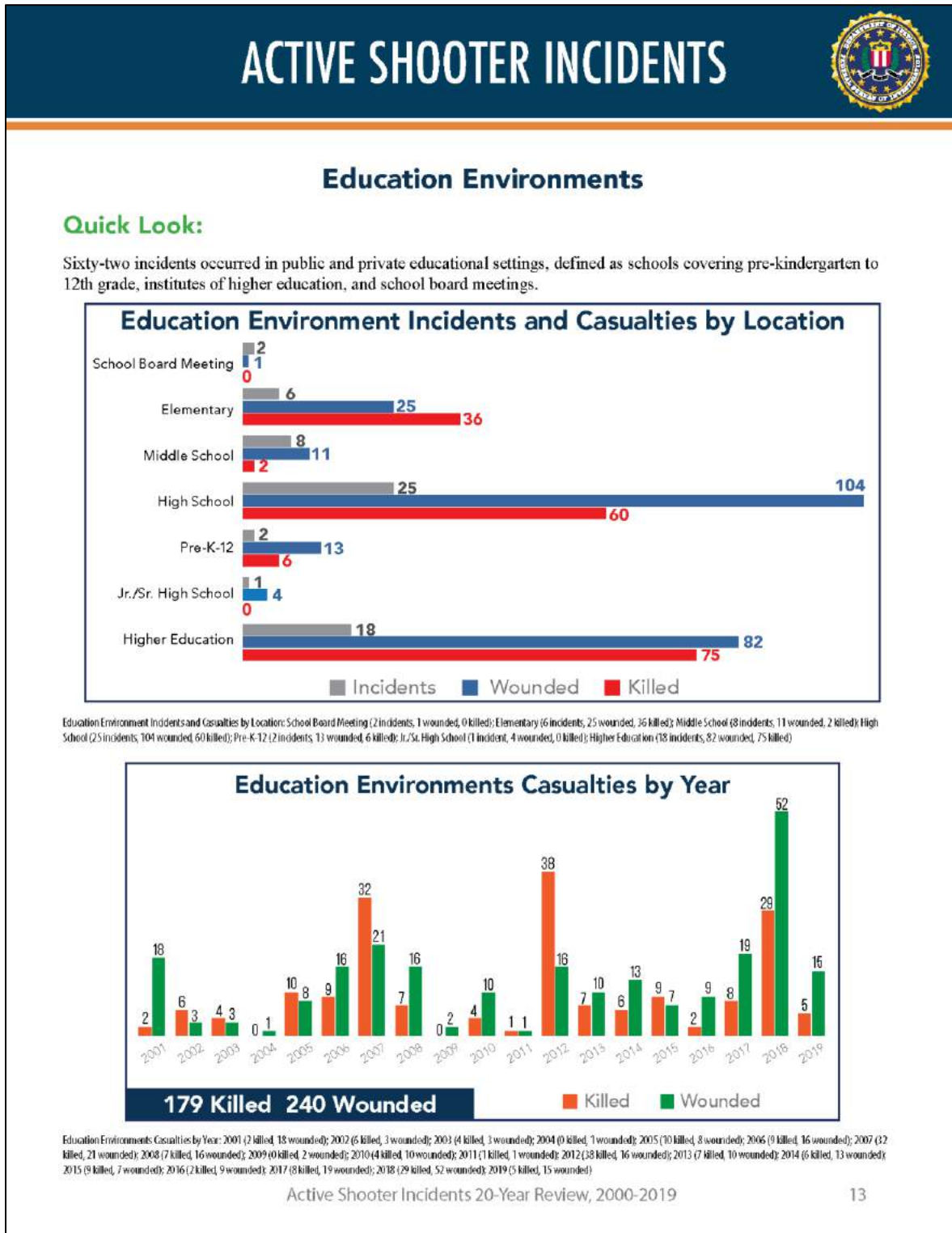
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Figure 53 - Active Shooter Incidents - 20 Year Active Shooter Summary



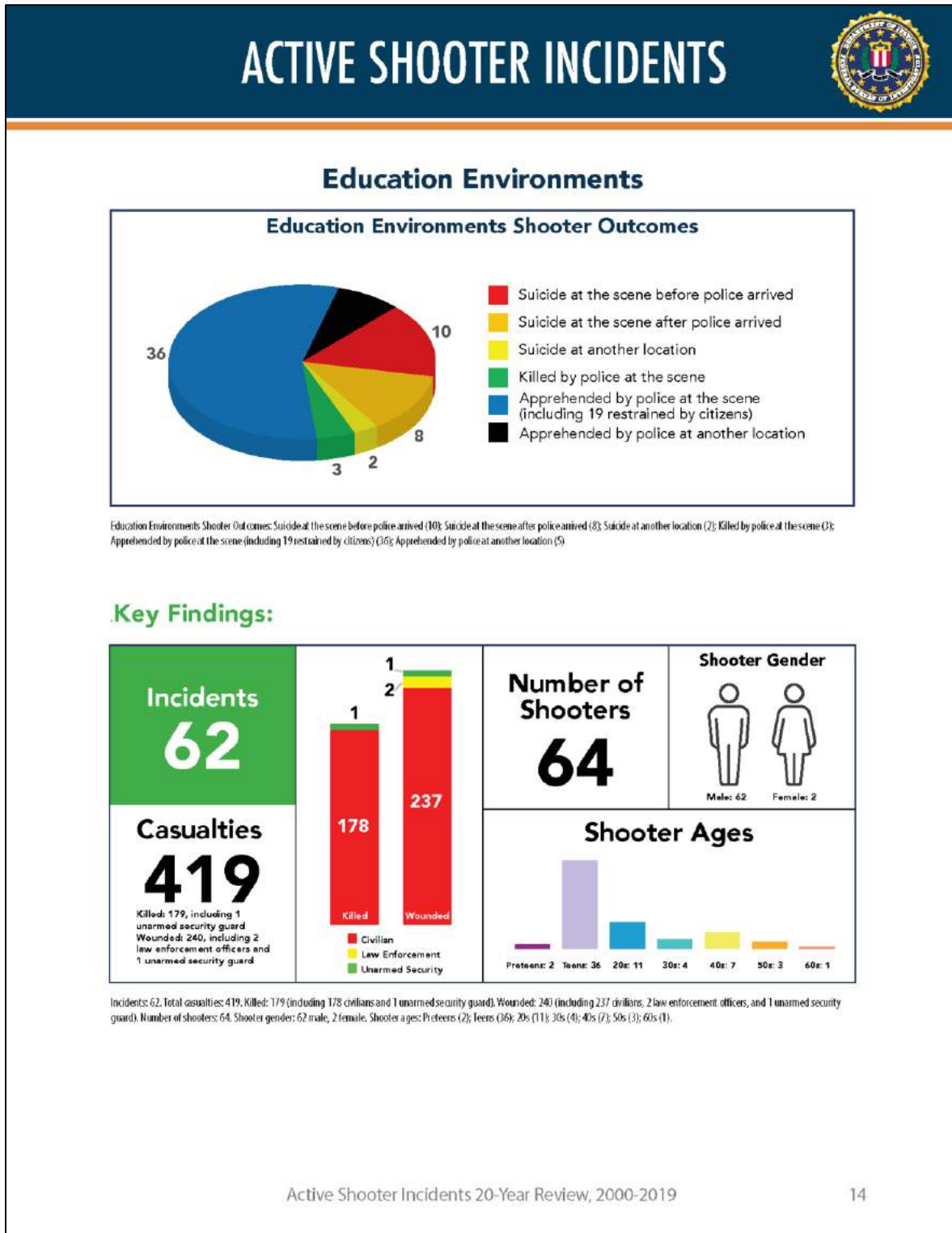
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Figure 54 - Education Environments



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Figure 55 - Education Environments Cont'd



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4.3.21. Transportation Accidents

4.3.21.1 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 amount of roadway, coupled with the high volume of traffic, creates the potential for serious accidents along the roads and bridges. In Potter County there are 244 state-maintained and forty-five locally maintained bridges, according to PennDOT. Major transportation routes in Potter County include U.S. Route 6 and PA Route 44. Other state routes are also present in the county including PA Route 49, 144, 155, 244, 344, 449, 607, and 872. *Figure 56 – Major Transportation Routes* shows the major transportation systems in Potter County.

Potter County has no public airports, but has four private airports; Adams, Freefall Oz, Greeley, and Ranch-Aero airport. There exists a potential extent for air transportation accidents to occur due to the number of commercial air traffic that flyovers the county every day.

There is one freight rail line in Potter County. The railroad company that operates within Potter County, includes the Western New York & PA Railroad Inc. which provides freight services.

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 Potter County.

There are 2,749 oil and gas wells located in Potter County. Pipeline infrastructure is seen throughout the county. There are six major pipeline companies that transport hazardous materials in and through Potter County. Of these pipeline groups, the largest amount of operators transport natural gas as a commodity. *Figure 58 – Utility Pipelines Vulnerability* shows the various pipelines that run through Potter County.

4.3.21.2 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. The majority of motor

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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 as a result of a car crash. Most fatal crashes occur in May and June, but the highest number of crashes overall occur in October, November, and December. Inclement weather and higher traffic volumes and 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.

The worst-case scenario for a transportation accident impacting the county would be a road accident which results in a hazardous material spill on any of the three bridges on U.S. Route 6 in Coudersport Borough. Coudersport Borough is the most populous municipality in Potter County, and with the Allegheny River running through it, the risk of a potential hazardous material spill flowing into it increases the potential harm. Such an event would constitute an immediate health hazard to the population and require evacuation.

4.3.21.3 Past Occurrence

Table 70 – PennDOT Crash Report for Potter County shows crash statistics recorded by the Pennsylvania Department of Transportation between 2010 and 2022. Reports for 2023 were not available at the time of this report. The year 2017 had the most total crashes in Potter County while 2021 had the least total crashes. The number of total crashes has declined overall, over the span of twelve years between 2010 and 2022 in the county. There have been no train with vehicle crashes in the county.

The majority of municipalities in Potter County (24) noted, on the municipality hazard identification worksheet they received, that there was no change in the frequency of transportation accidents. Eulalia Township did note that they have noticed an increase in frequency in transportation accidents in their jurisdiction and they commented that there is “more truck traffic through our township.”

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Table 70 - PennDOT Crash Report for Potter County

PennDOT Crash Report for Potter County								
Year	Vehicle accidents for Potter County				Vehicle Accident Deaths for Potter County			Train/Trolley with Motor Vehicle Crashes/Fatalities
	Total	Fatal Accidents	Injury Crashes	Property Damage Only	Total Vehicle Accident Fatalities	Alcohol-Related Fatalities	Pedestrian Fatalities	
2010	148	1	81	66	1	0	0	0
2011	136	3	65	68	3	1	1	0
2012	120	2	73	45	2	1	0	0
2013	144	3	78	63	3	1	0	0
2014	98	0	54	44	0	0	0	0
2015	105	2	61	42	4	0	0	0
2016	136	2	61	73	2	0	0	0
2017	151	2	69	80	2	1	0	0
2018	141	6	68	67	6	3	1	0
2019	128	3	58	67	3	0	0	0
2020	121	1	55	65	1	0	0	0
2021	90	3	37	50	3	2	0	0
2022	126	2	54	70	2	0	0	0

4.3.21.4 Future Occurrence

Potter 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 taken great strides 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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4.3.21.5 Vulnerability Assessment

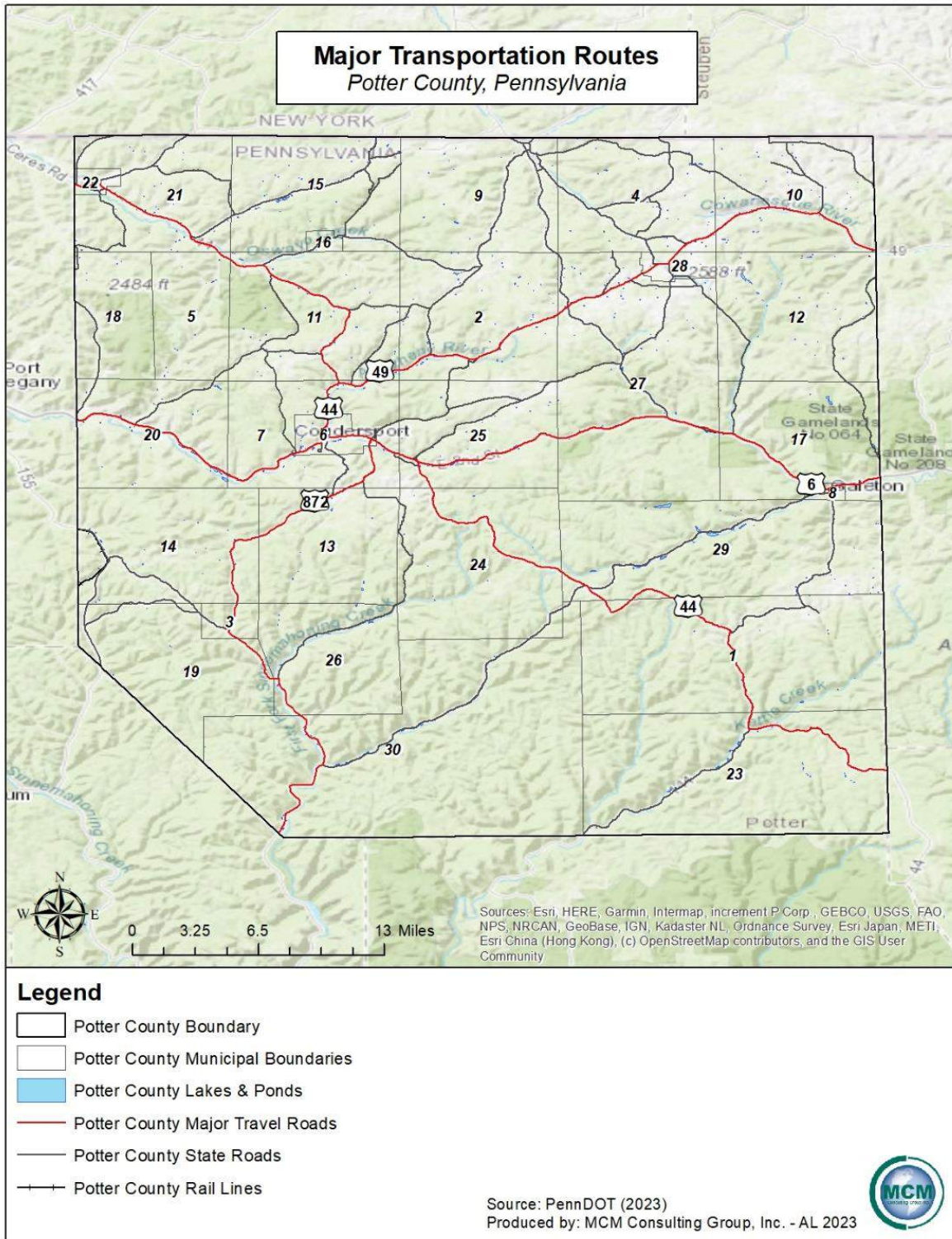
A transportation accident can occur anywhere in Potter County. However, severe accidents are more likely to occur on the county's major highways due to the heavier traffic volumes which make highways extremely vulnerable. The vulnerability for accidents on either highway, railway, or aviation, are directly 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. Approximately 14% of Potter County bridges are in poor condition, indicating an increased vulnerability to transportation accidents, while approximately 43% remain in fair condition.

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 57– Average Daily Traffic on Major Highway Vulnerability* identifies all major highways and railroads within Potter County.

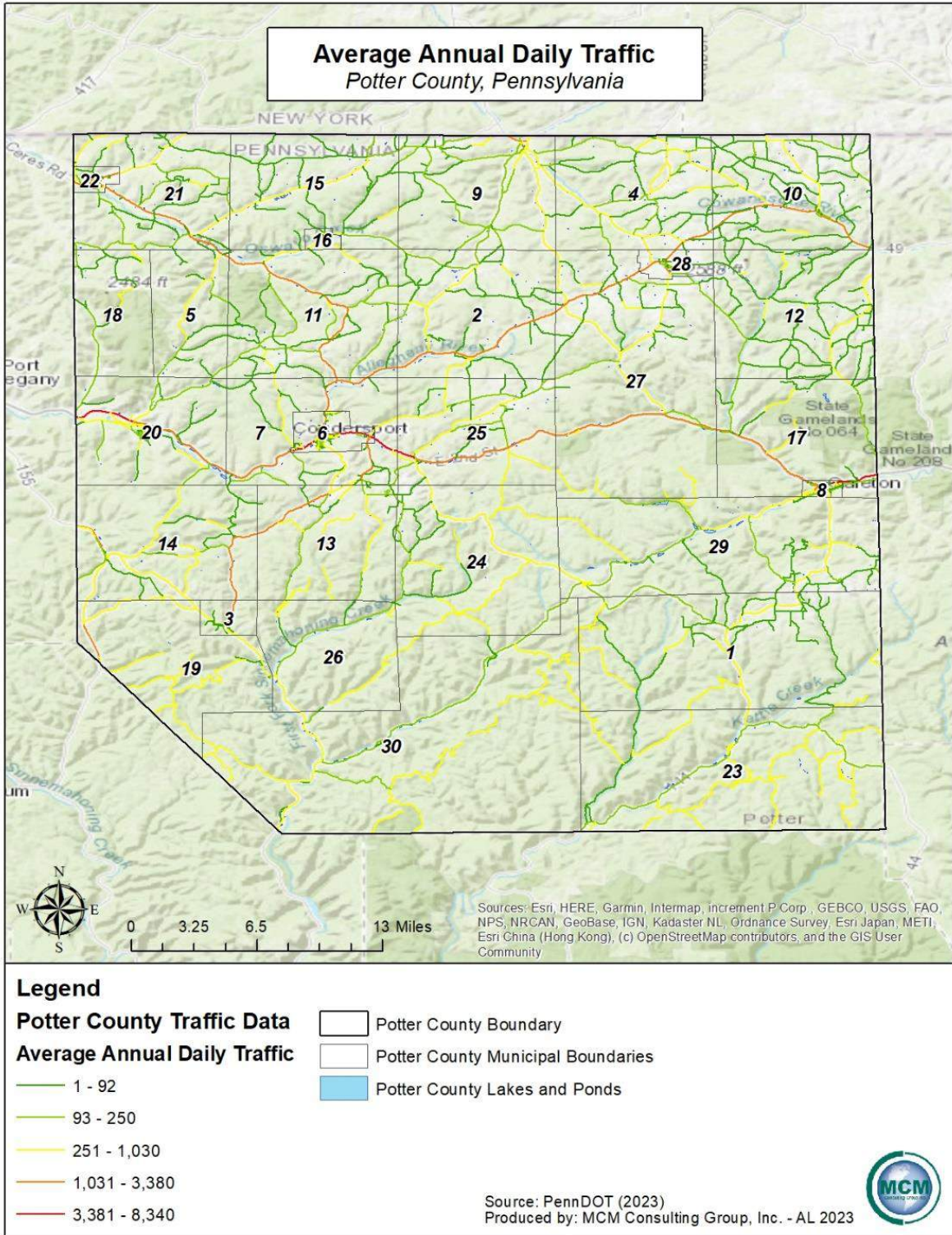
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Figure 56 - Major Transportation Routes



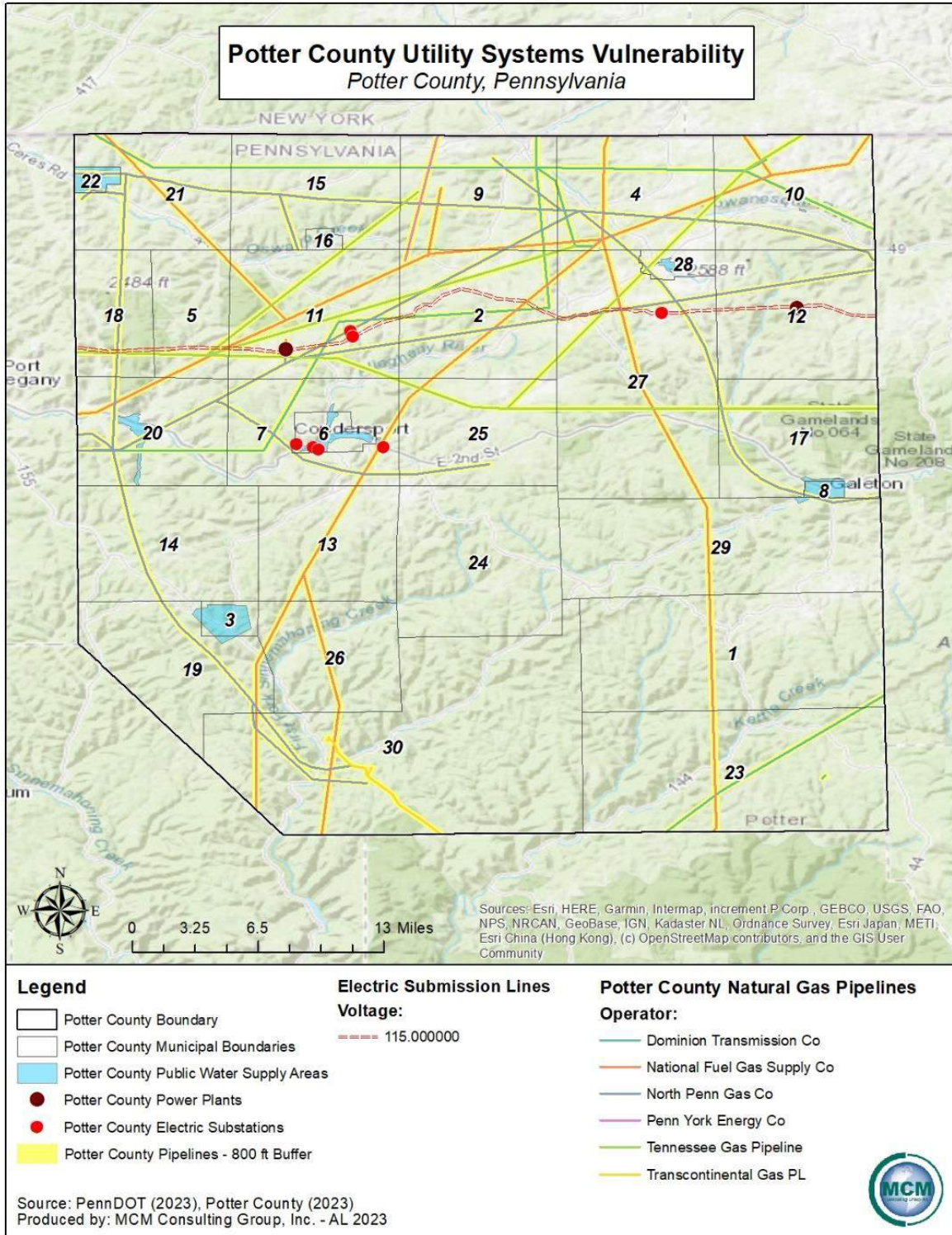
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Figure 57 - Average Daily Traffic on Major Highway Vulnerability



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Figure 58 - Utility Pipelines Vulnerability



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4.3.22. Urban Fire and Explosion

4.3.22.1 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, Potter County has approximately 12,452 housing units. The American Community Survey, conducted by the United States Census Bureau in 2021 estimates a total of 12,452 housing units. This number will be used to determine the vulnerability of buildings and structures to urban fire. 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 51.1% of all structures in Potter County were built before 1970, with a majority of housing units built before 1940.

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.

4.3.22.2 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. Potter County is largely rural/semi-rural and does not have significant expanses of dense population.

Damage 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.

In the calendar year 2022, the Federal Emergency Management Agency's (FEMA) United States Fire Administration states that there were 2,284 civilian home fire fatalities nationwide and the Commonwealth of Pennsylvania accounted for 168 of those civilian home fire fatalities. There was at least one major fire in Potter County that resulted in deaths. This event occurred on April

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11, 2022, in Genesee Township and resulted in the deaths of five children.

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.

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.

4.3.22.3 Past Occurrence

From 1910 to 1990, the Commonwealth of Pennsylvania experienced thirteen major fires in suburban and urban settings, and ten of them occurred after 1980. Between 1978 and 1982, the average number of deaths per fire was 2.7. Since October 1990, the average number of deaths per fire has decreased. *Table 71 – Urban Fire Occurrence* reflects the major fires and explosions that have occurred in Potter County since the year 2021.

Table 71 - Urban Fire Occurrence

Urban Fire Occurrence – Potter County		
Event	Date	Location
Structure Fire	04/02/2021	Coudersport Borough
Structure Fire	09/24/2021	Coudersport Borough
Structure Fire	02/24/2022	Coudersport Borough
Urban Fire	04/11/2022	Genesee Township
Structure Fire - Hotel	04/05/2023	Coudersport Borough
Structure Fire	08/06/2023	Pleasant Valley Township
Source: Potter County, 2023		

As of July 2023, there were seventy-three active natural gas wells in Potter County (PA DEP, 2023). These locations should be closely monitored, and safety protocols should be strictly adhered to in order to avoid explosions and starting fires. Potter County utilizes a database system called JUVARE (formerly CORVENA and Knowledge Center™) to track incidents

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within the county. However, no such data was available to reference urban fires or explosions during the development of this report, and as such no detailed report of past events can be displayed at this time.

4.3.22.4 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 Potter County include Coudersport and Galeton.

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.

4.3.22.5 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 Potter County, and with it comes greater risk for fire and explosion.

Older structures are more vulnerable to urban fire, and fires can spread faster in areas with higher concentrations of housing. There was a total of 8,431 housing units constructed in Potter County between 1939, or earlier, to 1979. That accounts for 67.7% of the housing units in Potter County that are more vulnerable to fire due to engineering practices. Buildings that are made up of more than one housing unit are also at an increased risk of urban fire/structure fire because of the close nature of architecture and the inability to control the risk of fire in an adjacent unit. There are approximately 413 buildings in Potter County that are made up of at least three housing units to more than twenty housing units. This represents 3.4% of the total building units in Potter County.

Vacant housing units are at an increased vulnerability to urban fire due to a lack of attention and active maintenance. As of 2021, there were a total of 6,067 vacant housing units in Potter County. This accounts for 48.7% of the total housing units. Mobile homes are also at an increased risk of fire, although not typically urban, because of construction practices that make them easier to burn and quicker to ignite. There are an estimated 1,744 mobile homes in Potter County.

Urban fire risk also increases as the use of wood burning, fuel, oil, and kerosene, and bottled tank, or LP gas as a primary heat source increases, and the use of space heaters becomes more common. Based on information provided by the American Community Survey, there are

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approximately 759 housing units using wood burning methods for their primary heat source which correlates to 11.9% of the occupied housing units in Potter County. Fuel, oil, and kerosene are used by 230 housing units as the primary source of heat which is 3.6% of the total occupied housing units in the county. Approximately 482 housing units used bottled, tank, or LP gas for primary heating that accounts for 7.5% of Potter County occupied housing units. Utility gas use is the primary heating source for 4,150 homes in Potter County.

The very young (those younger than 5 years of age) and 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. This is often due to lower mobility and a difference in awareness when an emergency event, such as a fire or explosion occurs. In Potter County, the total population under the age of 5 is 833 people which is 5.1% of the 2021 estimate. The total population 65 years and over is 3,954 people, or 24% of the total population. Combined, those groups make up 29.1% of the total population.

Potter County has a total of ten fire departments. More information on the locations of these fire departments can be found in the Emergency Services profile (4.3.16) of this hazard mitigation plan. The areas for which these stations provide coverage as also outlined in the Emergency Services profile of this hazard mitigation plan. If the downward trend in volunteerism and emergency professional employment continues, there could be an increase in the amount of time it takes for a fire department to respond to a fire or explosion. More discussion on this topic can be found in the Emergency Services profile.

Potential cascading effects of urban fires include utility interruption and hazardous material spills. When a fire department taps into a fire hydrant in response to a fire, a drop in water pressure is typical if the fire hydrant is on a shared water main with the residents in that area. This can also result in discolored water and minor water interruptions if the fire hydrant use is prolonged.

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4.3.23. Utility Interruptions

4.3.23.1 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 Potter County is shown in *Table 72 – Potter County Utility Providers*.

Table 72 - Potter County Utility Providers

Potter County Utility Providers	
Utility Type	Name of Utility Provider
Electricity	Tri-County Rural Electric Cooperative, West Penn, Penelec, Thomas Edison Electric
Telephone/9-1-1/Wireless	CenturyLink, Zito Media, Verizon, T-Mobile, AT&T
Natural Gas	JKLM Energy LLC, Pa Gen energy Co LLC, STL Resources LLC
Water	Center Township Water Authority, Municipal Water Authority of Aliquippa

Source: PA Public Utility Commission, 2022

4.3.23.2 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

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storms or other severe weather events, and they can have secondary consequences. Typical 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,

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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 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 Potter County workforce.

4.3.23.3 Past Occurrence

Minor utility interruptions occur annually in Potter County and occur most often in conjunction with winter weather and/or windstorms. Potter County utilizes a database system called WebEOC to track incidents within the county. *Table 73 – Utility Interruptions in Potter County* illustrates the number of interruptions to electric, natural gas, telecommunications, and water services between 2021 and 2023.

Table 73 - Utility Interruptions in Potter County

Utility Interruptions in Potter County		
Date	Event Type	Municipality
06/16/2021	Wires Down	Hebron Township
06/22/2021	Boil Water Advisory	Austin Borough
07/25/2021	Wires Down	Roulette Township
04/20/2022	Boil Water Advisory	Allegany Township
05/27/2022	Boil Water Advisory	Pike Township
09/22/2022	Boil Water Advisory	Galeton Borough
10/06/2022	Boil Water Advisory	Galeton Borough
10/16/2022	Phone Outage	Shinglehouse Borough
12/06/2022	Water Main Break	Roulette Township
12/24/2022	Boil Water Advisory	Genesee Township
01/04/2023	Down Utility	Portage Township
01/19/2023	Boil Water Advisory	Sweden Township
02/24/2023	911 Phone Outage	Shinglehouse Borough
04/10/2023	Landline Phone Outage	Ulysses Township
05/15/2023	Phone Outage	Shinglehouse Borough
Source: Potter County, WebEOC, 2023		

Based on the information provided above, there have been seven occurrences of boil water advisories in Potter County since 2021. There have also been three phone outages that have been related to Shinglehouse Borough. In total, for the time period above, there have been three utility interruption events that are related to downed wires or downed utility infrastructure. This should not be considered a comprehensive list of utility outages, as it only contains those outages

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entered into the county’s incident management system. Smaller utility interruptions may not be reported to the county or the local emergency services.

The Pennsylvania Public Utility Commission tracks the reliability of electric distribution companies (EDC) and outages. *Table 74 – 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 74 - 2018 Winter Storms Riley and Quinn Power Outages

2018 Winter Storms Riley and Quinn Power Outages			
Electric Distribution Company	Customers affected by storms Riley and Quinn 2018 (Percentage of total customers)	Customers affected by Nika 2014 (Percentage of total customer)	Customers affected by Sandy 2012 (Percentage of total customers)
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%)
Total:	1,422,195	959,964	1,769,273
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 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.

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4.3.23.4 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 Potter 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.

4.3.23.5 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 – Potter County Utilities* illustrates the approximate locations of service lines and pipelines throughout Potter County.

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:

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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 for the health, safety, and well-being of Potter 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.

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

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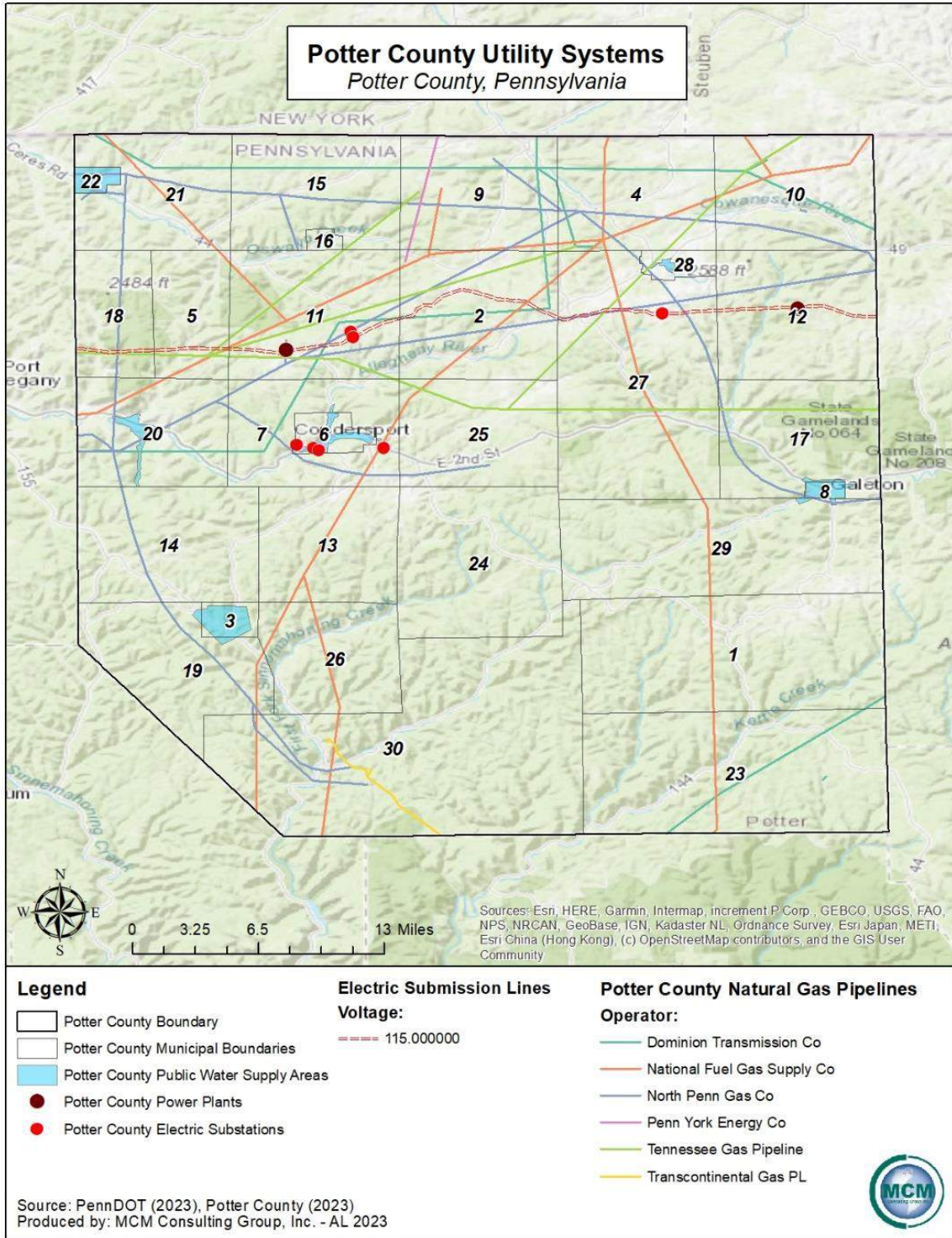
Communications:

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 Potter 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 Potter 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.

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Figure 59 - Potter 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 75 – 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 75 - Risk Factor Approach Summary

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

Table 76 – Risk Factor Approach Summary Cont'd 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 76 - Risk Factor Approach Summary Cont'd

Summary of Risk Factor Approach Used to Rank Hazard Risk.				
RISK ASSESSMENT CATEGORY	DEGREE OF RISK			WEIGHT VALUE
	LEVEL	CRITERIA	INDEX	
PROBABILITY <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	
IMPACT <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	
SPATIAL EXTENT <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	
WARNING TIME <i>Is there usually some lead time associated with the hazard event? Have warning measures been implemented?</i>	MORE THAN 24 HRS	SELF-DEFINED	<i>(NOTE: Levels of warning time and criteria that define them may be adjusted based on hazard addressed.)</i>	1
	12 TO 24 HRS	SELF-DEFINED		2
	6 TO 12 HRS	SELF-DEFINED		3
	LESS THAN 6 HRS	SELF-DEFINED		4
DURATION <i>How long does the hazard event usually last?</i>	LESS THAN 6 HRS	SELF-DEFINED	<i>(NOTE: Levels of warning time and criteria that define them may be adjusted based on hazard addressed.)</i>	1
	LESS THAN 24 HRS	SELF-DEFINED		2
	LESS THAN 1 WEEK	SELF-DEFINED		3
	MORE THAN 1 WEEK	SELF-DEFINED		4

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4.4.2. Ranking Results

Using the methodology described in Section 4.4.1, *Table 77 – Risk Factor Assessment* lists the risk factor calculated for each of twenty-eight potential hazards identified in the 2024 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 77 - Risk Factor Assessment

Potter 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	
HIGH	Cyberterrorism	3	3	3	4	4	3.2
	Utility Interruptions	4	2	3	4	3	3.1
	Winter Storms	4	2	4	1	3	3
	Nuclear Incidents	1	4	4	3	4	3
	Emergency Services	3	3	3	1	4	2.9
	Wildfire	4	2	2	4	3	2.9
	Flash Flood	3	3	2	4	2	2.8
	Pandemic, Epidemic, and Infectious Disease	3	2	4	1	4	2.8
	Environmental Hazards: Fixed Facility	2	3	3	4	2	2.7
	Invasive Species	4	1	3	1	4	2.6
	Radon Exposure	4	1	3	1	4	2.6
	Tornado and Windstorm	3	2	3	4	1	2.6
	Drought	2	2	4	1	4	2.5
	Flood	2	3	3	1	3	2.5
	Transportation Accidents	4	2	1	4	1	2.5
	Urban Fire/Exposure	3	2	2	4	2	2.5
MODERATE	Hurricane and Tropical Storm	2	2	4	1	3	2.4
	Environmental Hazards: Transportation	3	2	2	4	1	2.4
	Blighted Properties	3	2	2	1	4	2.4
	Ice Jam Flood	3	2	2	3	1	2.3
	Lightning Strike	4	1	1	4	1	2.2

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Potter 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	
	Hailstorm	3	1	2	4	1	2.1
	Dam Failure	1	3	3	2	1	2.1
	Levee Failure	1	3	3	2	1	2.1
LOW	Terrorism	1	2	2	4	2	1.9
	Landslides	2	1	1	4	1	1.6
	Earthquake	1	1	2	4	1	1.5
	Civil Disturbance	1	1	1	4	1	1.3

Based on these results, there are sixteen high risk hazards, eight moderate risk hazards, and four low risk hazards in Potter 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 78 – Countywide Risk Factor Assessment* shows the different municipalities in Potter County and whether their risk is greater than (>), less than (<), or equal to (=) the risk factor 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 4.3.23.

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Table 78 - Countywide Risk Factor

Calculated Countywide Risk Factor by Hazard and Comparative Jurisdictional Risk									
IDENTIFIED HAZARD AND CORRESPONDING COUNTYWIDE RISK FACTOR									
JURISDICTION	Cyberterrorism	Utility Interruptions	Winter Storms	Nuclear Incidents	Emergency Services	Wildfire	Flash Flood	Pandemic, Epidemic, Infectious Disease	Environmental Hazards: Fixed Facility
	3.2	3.1	3.0	3.0	2.9	2.9	2.8	2.8	2.7
Abbott Township	=								
Allegany Township	=								
Austin Borough	=								
Bingham Township	=								
Clara Township	=								
Coudersport Borough	=								
Eulalia Township	=								
Galeton Borough	=								
Genesee Township	=								
Harrison Township	=								
Hebron Township	=								
Hector Township	=								
Homer Township	=								
Keating Township	=								
Oswayo Borough	=								
Oswayo Township	=								
Pike Township	=								
Pleasant Valley Township	=								
Portage Township	=								
Roulette Township	=								

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Calculated Countywide Risk Factor by Hazard and Comparative Jurisdictional Risk									
IDENTIFIED HAZARD AND CORRESPONDING COUNTYWIDE RISK FACTOR									
JURISDICTION	Cyberterrorism	Utility Interruptions	Winter Storms	Nuclear Incidents	Emergency Services	Wildfire	Flash Flood	Pandemic, Epidemic, Infectious Disease	Environmental Hazards: Fixed Facility
	3.2	3.1	3.0	3.0	2.9	2.9	2.8	2.8	2.7
Sharon Township	=								
Shinglehouse Borough	=								
Stewardson Township	=								
Summit Township	=								
Sweden Township	=								
Sylvania Township	=								
Ulysses Borough	=								
Ulysses Township	=								
West Branch Township	=								
Wharton Township	=								

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Calculated Countywide Risk Factor by Hazard and Comparative Jurisdictional Risk									
IDENTIFIED HAZARD AND CORRESPONDING COUNTYWIDE RISK FACTOR									
JURISDICTION	Invasive Species	Radon Exposure	Tornado and Windstorm	Drought	Flood	Transportation Accidents	Urban Fire and Explosion	Hurricane and Tropical Storms	Environmental Hazard: Transportation
	2.6	2.6	2.6	2.5	2.5	2.5	2.5	2.4	2.4
Abbott Township					=				
Allegany Township					=				
Austin Borough					=				
Bingham Township					=				
Clara Township					=				
Coudersport Borough					=				
Eulalia Township					=				
Galeton Borough					=				
Genesee Township					=				
Harrison Township					=				
Hebron Township					=				
Hector Township					=				
Homer Township					=				
Keating Township					=				
Oswayo Borough					=				
Oswayo Township					=				
Pike Township					=				
Pleasant Valley Township					=				
Portage Township					=				
Roulette Township					=				
Sharon Township					=				

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Calculated Countywide Risk Factor by Hazard and Comparative Jurisdictional Risk									
IDENTIFIED HAZARD AND CORRESPONDING COUNTYWIDE RISK FACTOR									
JURISDICTION	Invasive Species	Radon Exposure	Tornado and Windstorm	Drought	Flood	Transportation Accidents	Urban Fire and Explosion	Hurricane and Tropical Storms	Environmental Hazard: Transportation
	2.6	2.6	2.6	2.5	2.5	2.5	2.5	2.4	2.4
Shinglehouse Borough	=								
Stewardson Township	=								
Summit Township	=								
Sweden Township	=								
Sylvania Township	=								
Ulysses Borough	=								
Ulysses Township	=								
West Branch Township	=								
Wharton Township	=								

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Calculated Countywide Risk Factor by Hazard and Comparative Jurisdictional Risk									
IDENTIFIED HAZARD AND CORRESPONDING COUNTYWIDE RISK FACTOR									
JURISDICTION	Blighted Properties	Ice Jam Flood	Lightning Strike	Hailstorm	Dam Failure	Levee Failure	Terrorism	Landslides	Earthquake
	2.4	2.3	2.2	2.1	2.1	2.1	1.9	1.6	1.5
Abbott Township									=
Allegany Township									=
Austin Borough									=
Bingham Township									=
Clara Township									=
Coudersport Borough									=
Eulalia Township									=
Galeton Borough									=
Genesee Township									=
Harrison Township									=
Hebron Township									=
Hector Township									=
Homer Township									=
Keating Township									=
Oswayo Borough									=
Oswayo Township									=
Pike Township									=
Pleasant Valley Township									=
Portage Township									=
Roulette Township									=
Sharon Township									=

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Calculated Countywide Risk Factor by Hazard and Comparative Jurisdictional Risk									
IDENTIFIED HAZARD AND CORRESPONDING COUNTYWIDE RISK FACTOR									
JURISDICTION	Blighted Properties	Ice Jam Flood	Lightning Strike	Hailstorm	Dam Failure	Levee Failure	Terrorism	Landslides	Earthquake
	2.4	2.3	2.2	2.1	2.1	2.1	1.9	1.6	1.5
Shinglehouse Borough	=								
Stewardson Township	=								
Summit Township	=								
Sweden Township	=								
Sylvania Township	=								
Ulysses Borough	=								
Ulysses Township	=								
West Branch Township	=								
Wharton Township	=								

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Calculated Countywide Risk Factor by Hazard and Comparative Jurisdictional Risk									
IDENTIFIED HAZARD AND CORRESPONDING COUNTYWIDE RISK FACTOR									
JURISDICTION	Civil Disturbance								
	1.3								
Abbott Township	=								
Allegany Township	=								
Austin Borough	=								
Bingham Township	=								
Clara Township	=								
Coudersport Borough	=								
Eulalia Township	=								
Galeton Borough	=								
Genesee Township	=								
Harrison Township	=								
Hebron Township	=								
Hector Township	=								
Homer Township	=								
Keating Township	=								
Oswayo Borough	=								
Oswayo Township	=								
Pike Township	=								
Pleasant Valley Township	=								
Portage Township	=								
Roulette Township	=								
Sharon Township	=								

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Calculated Countywide Risk Factor by Hazard and Comparative Jurisdictional Risk									
IDENTIFIED HAZARD AND CORRESPONDING COUNTYWIDE RISK FACTOR									
JURISDICTION	Civil Disturbance								
	1.3								
Shinglehouse Borough	=								
Stewardson Township	=								
Summit Township	=								
Sweden Township	=								
Sylvania Township	=								
Ulysses Borough	=								
Ulysses Township	=								
West Branch Township	=								
Wharton Township	=								

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.

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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 Potter 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 Potter County municipality is outlined in section 4.3.3 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 Potter County are estimated to equal \$129.16 million with 27.60% 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 \$431.48 million.

4.4.4. Future Development and Vulnerability

The 2020 census population for Potter County is 16,396 which is 1,061 fewer than the 2010 census. There was an overall decrease of 6.08% in population based on the data. Eight municipalities have seen population increases while the remaining twenty had decreases in the period between 2010 and the 2020 as identified in *Table 79 – 2010 – 2020 Population Change*.

Table 79 - 2010 - 2020 Population Change

Population Change in Potter County from 2010-2020			
Municipality	2010 Census	2020 Census	Percent of Change 2010-2020
Abbott Township	242	228	-5.79%
Alleghany Township	422	397	-5.92%
Austin Borough	562	482	-14.23%
Bingham Township	684	619	-9.50%
Clara Township	199	177	-11.05%
Coudersport Borough	2,546	2,381	-6.48%

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Population Change in Potter County from 2010-2020			
Municipality	2010 Census	2020 Census	Percent of Change 2010-2020
Eulalia Township	889	909	+2.25%
Galeton Borough	1,149	990	-13.84%
Genesee Township	799	726	-9.14%
Harrison Township	1,037	1,022	-1.45%
Hebron Township	589	591	+0.34%
Hector Township	386	343	-11.14%
Homer Township	437	438	+0.23%
Keating Township	312	286	-8.33%
Oswayo Brough	139	134	-3.59%
Oswayo Township	278	224	-19.43%
Pike Township	324	325	+0.31%
Pleasant Valley Township	86	78	-9.30%
Portage Township	228	162	-29.95%
Roulette Township	1,197	1,099	-8.18%
Sharon Township	866	784	-9.46%
Shinglehouse Borough	1,127	1,103	-2.12%
Sweden Township	872	867	-0.58%
Sylvania Township	77	78	+1.30%
Ulysses Borough	621	599	-3.54%
Ulysses Township	635	643	+1.26%
West Branch Township	393	401	+2.03%
Wharton Township	99	117	+18.18%
Source: United States Census Bureau (2023), 2020 Census Data			

The 2019 census estimates indicates that there are approximately 12,345 housing units in Potter County, Pennsylvania. Of those, 7,052 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 expanding jurisdictions. However, certain municipalities experienced significant resident increases and, thus, may be more vulnerable to certain hazards 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 Potter 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 Potter 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 Potter 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 thirty 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 Potter County, and its municipalities have the capacity to do and provides an understanding of what must be changed to mitigate loss.

Potter 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

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and weaknesses that can be resolved through future mitigation actions. The results of this assessment lend critical information for developing an effective mitigation strategy.

5.2. Capability Assessment Findings

All of the municipalities in Potter County completed and submitted a capability assessment survey. The results of the survey were collected, aggregated, and analyzed.

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 Potter County and municipal legal capabilities to mitigate the profiled hazards. It identifies the county and the municipal existing planning documents and their 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

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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 Potter County adhere to the standards of the Pennsylvania Uniform Code (Act 45). Currently, twenty-nine of the thirty municipalities have Erb Inspection as a building code enforcement agency. One municipality has not designated an enforcement agency.

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 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. Currently, Potter County does not administrate a zoning ordinance and Coudersport Borough is the only zoned municipality within Potter County at the time of writing this plan.

Subdivision Ordinance

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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. Twenty-six municipalities in Potter County are currently covered under the Potter County subdivision ordinance (Potter County Planning Commission, October, 2023).

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. Potter County has a county-wide Act 167 which will have revisions underway in 2024.

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 aggravation of existing problems. All municipalities in Potter County have an adopted and approved Act 167 plan at the writing of this plan.

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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.

Potter County last updated its comprehensive plan in 2019.

Article III of the MPC enables municipalities to prepare a comprehensive plan: however, development of a comprehensive plan is voluntary. Two of the municipalities in Potter County have adopted their own comprehensive plans. Those two municipalities are boroughs, and those comprehensive plans are out of date at the time of this writing.

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. Currently, Potter County does not have a designated capital improvement plan outside of the comprehensive plan in place at the writing of this plan.

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

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identified by the Federal Emergency Management Agency (FEMA) to participate in the National Flood Insurance Program and permits all municipalities to adopt floodplain management 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

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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.

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. PEMA 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

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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. Currently, Potter County's DFIRMs are from 2011, except for Galetton Borough which was updated in 2021/2022.

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. All of the municipalities in Potter County submitted an NFIP survey. These surveys can be found in Appendix C of this plan.

5.2.2. Administrative and Technical Capability

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

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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 Potter 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 Potter County have a municipal engineer under contract to perform these duties. Based on information collected in the online survey for capability assessments, of the nineteen online responses, seventeen did not have an in-house engineering department. This is approximately 89.47%.

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. GIS data is managed, maintained, and developed by the Potter County GIS Department, which is available to assist all the county's municipalities. GIS data is an important tool to use in hazard mitigation planning and is instrumental in assessing the risk of municipalities to various hazards. At the writing of this plan no one in the Potter County GIS Department has completed HAZUS training.

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

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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 Potter County and its municipalities to have an emergency management coordinator.

The Potter County Department of Emergency Services 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
- 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. A majority of Potter County municipalities have adopted the county EOP. The notification and resource section of the plan was developed individually by each municipality.

Additional Administrative and Technical Capability Items

The following personnel positions were also identified at a local level, for various municipalities based on the submitted capability assessment surveys.

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- Business Administrator (1)
- Chief Financial Officer (1)
- Clerk (2)
- Community Planner (1)
- Emergency Manager (4)
- Floodplain Administrator (5)
- GIS Coordinator (1)

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

Political Capability

One of the most difficult capabilities to evaluate involves the political will of a jurisdiction to enact meaningful policies and projects designed to mitigate hazard events. The adoption of hazard mitigation measures may be seen as an impediment to growth and economic development. In many cases, mitigation may not generate interest among local officials when compared with competing priorities. Therefore, the local political climate must be considered

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when designing mitigation strategies, as it could be the most difficult hurdle to overcome in accomplishing the adoption or implementation of specific actions.

In addition to the institutional capability of the municipal government structure described above, the county itself can engage in mitigation activities. The county has its own staff, resources, budget, and objectives, which may or may not be like those of its constituent municipalities. Therefore, the county has its own capabilities to mitigate the profiled hazards through planning and coordination of local mitigation efforts. The Potter County GIS Department can provide needed skills in the analysis of geographic data. Other local organizations that can and do act as partners include the Potter County Planning Commission, the Potter County Conservation District, the Potter County Redevelopment Authority and business development organizations, and historical or cultural agencies.

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 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. Based on survey results, most municipalities within the county perceive fiscal capability to be low. 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”.

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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
- 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)

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- 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.

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

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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 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 Potter County Department of Emergency Services 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.

Education activities that directly impact hazard mitigation in Potter 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

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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:

- Potter County Website: <https://pottercountypa.net/>
- Potter County Department of Emergency Services Website:
<https://pottercountypa.net/post.php?pid=24>
- Potter County Department of Emergency Services Facebook Page:
<https://www.facebook.com/PotterDES/>

The Potter County GIS Department website has an education and outreach capability, particularly with the county map viewer, which could be updated to include hazard mitigation data. The websites of the Potter County Department of Emergency Services and the Potter County Planning Commission also post information to educate residents, particularly in disaster preparedness, floodplain management, and zoning requirements. The Potter County Planning Commission 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 Potter County Local Planning Team will identify actions necessary to complete this.

Opportunities for Capability Improvement

There are numerous opportunities to improve the capabilities of the jurisdictions and municipalities in Potter County. All municipalities in Potter County can improve their code enforcement capabilities by reviewing the standards that they use to enforce codes and by examining the op-in option for code enforcement at the county level. Improvement of the subdivision and land use ordinance capabilities could be achieved with a more comprehensive review of what type of subdivision and land use ordinances each municipality has. This information was not readily available as of the writing of this plan.

As stated above, only two municipalities in Potter County have comprehensive plans. Each municipality can improve their planning capabilities by reviewing the need for a comprehensive

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plan at their local level. All of the jurisdictions in Potter County could improve National Flood Insurance capabilities by researching participation in FEMA’s Community Rating System (CRS). Potter County could improve administrative and technical capabilities by reviewing what personnel resources are needed and where county departments are deficient in staffing resources. The county and all of the municipalities can improve their financial capabilities by utilizing more grant opportunities for hazards mitigation. These grants can include state and federal grants on an increasing basis or as they become available. The employment of personnel experienced in grant writing and applying for grants at the state and federal level can help improve this process and capability. The potential grants are listed above.

There is always opportunity to increase and improve the capabilities in Potter County and the municipalities regarding education and outreach. More community outreach events, and the attendance of those offices and departments in hazard mitigation, could increase public awareness and participation in hazard mitigation efforts. This improved capability includes education of common hazards in an area, education on NFIP efforts, and education on at home hazard mitigation opportunities.

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.

Potter County Comprehensive Plan

Overview

Comprehensive plans establish the overall vision, goals, and objectives for a community’s growth. The Northern Pennsylvania Tri-County Comprehensive Plan was adopted by the Potter County Commissioners on December 19, 2019. The plan is a collaborative effort between the three counties in the north central region and contains both regional priorities and action plans for each county in the region. The plan establishes countywide goals and objectives, describes

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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 2019 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 2019 Hazard Mitigation Plan and 2024 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 Potter 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 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 Potter County Comprehensive Plan update. With an integrated process to discuss hazard mitigation plans and comprehensive plan updates, one development session can inform another. This would be a mutually beneficial item, and it would ease collaboration between development teams.

Integration of hazard mitigation into local mechanisms

Integration of hazard mitigation principles into local mechanisms can be efficient for Potter County. All of the municipalities in Potter County can directly interface their planning mechanisms with the Potter County Hazard Mitigation Plan. These potential integration items include municipal comprehensive plans, municipal flood and flood mitigation plans, or the development of transportation plans and other community resources. The incorporated municipalities should continue to review the completed hazard mitigation plan updates and utilize items identified in the risk assessment, mitigation strategy and capability assessment sections. Previously, hazard mitigation information from the Potter County Hazard Mitigation

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Plan has been integrated into other local planning mechanisms. These planning mechanisms include the items listed above.

Previous successful plan integration and mitigation has occurred in the development of comprehensive plans at the local level. Risk assessment is either directly or indirectly addressed in the comprehensive plans for municipalities in Potter County. Emergency operations plans at the local level can also utilize portions of the Potter County Hazard Mitigation Plan and the Potter County Comprehensive Plan when developing portions of the EOP.

Potter County also has implemented items related to blight and blighted properties in the hazard mitigation plan. This includes information that is directly related to plans for blight mitigation already in place at the county-level. Potter County and the local municipalities in the county have previously utilized the Chesapeake Bay Plan (CAP Plan) for determining environmental impacts and transportation planning. This plan can be more directly integrated into the next Potter County Hazard Mitigation Plan. The county has also incorporated Next-Generation 911 addressing requirements in the Potter County Subdivision and Land Development Ordinance (SALDO). This fits with mitigation actions regarding NG911 and the fostering of relationships with state and federal partners.

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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 six goals and twenty-two objectives identified in the 2019 hazard mitigation plan. The 2024 Potter County Hazard Mitigation Plan Update has seven goals and twenty-nine objectives. Objectives have been added and arranged in order to associate them with the most appropriate goal. These changes are noted in *Table 80 – 2019 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 located 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 thirty-four actions identified in the 2019 mitigation strategy. A review of the 2019 mitigation actions was completed by the local planning team. The results of this review are identified in *Table 81 – 2019 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 - 2019 Mitigation Goals and Objectives Review

Potter County 2019 Mitigation Goals and Objectives		
Goal/Objective	Description	Comment
Goal 1	Reduce vulnerability, including loss of life and damage to property, to natural and human- made hazards.	2024 Review Comment: “Reduce vulnerability, including loss of life and damage to property, from natural and human-caused hazards.”
Objective A	Ensure that existing drainage systems (pipes, culverts, channels) are adequate and functioning properly to reduce impacts related to flash flooding and storm water problems.	2024 Review Comment: “.....are adequately maintained and functioning properly.... Existing stormwater management systems and devices.”
Objective B	Minimize future damage due to flooding of the Allegany, Genesee and Susquehanna Rivers and their tributaries.	2024 Review Comment: “Allegany River, Genesee River and the Chesapeake Bay watershed”

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Potter County 2019 Mitigation Goals and Objectives		
Goal/Objective	Description	Comment
Objective C	Reduce impacts related to winter storms, tornadoes, windstorms, drought, flash flooding and stormwater problems.	2024 Review Comment: Update to reflect 2024 RF assessment scores.
Objective D	Ensure that local building codes/ordinances are consistent with FEMA and PA DCED guidelines and are properly enforced.	2024 Review Comment: No comment.
Goal 2	Promote disaster-resistant future development.	2024 Review Comment: “Resilient communities...”
Objective A	Minimize future damage due to flooding of the Allegany, Genesee and Susquehanna Rivers and its tributaries by promoting resistant construction, retrofitting techniques and in the rural areas by erosion/sedimentation control practices.	2024 Review Comment: “Allegany River, Genesee River and the Chesapeake Bay watershed” “and utilize erosion/sedimentation control best management practices in rural areas.”
Objective B	Regulate construction/ development in the county to prevent increases in runoff and subsequent increases in flood flows.	2024 Review Comment: “Adhere to land use and stormwater management planning and state regulations related to construction and development to prevent increase in runoff and subsequent increase in flood flows.”
Objective C	Ensure that new construction is resistant to natural hazards.	2024 Review Comment: “Ensure that new construction and development are resistant to all natural hazards.”
Goal 3	Improve emergency warning and response capabilities and procedures to better protect the citizens of Potter County.	2024 Review Comment: “residents, visitors, and transients of Potter County.”
Objective A	Provide residents with adequate warning of potential floods and other meteorological events.	2024 Review Comment: “Provide all persons in Potter County with adequate warning for all natural and human-caused hazards.”
Objective B	Ensure that emergency response services and critical facilities functions are not interrupted by hazards.	2024 Review Comment: “Ensure that the emergency response services, and critical facility and community lifeline functions are not interrupted by hazard events.”

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Potter County 2019 Mitigation Goals and Objectives		
Goal/Objective	Description	Comment
Objective C	Provide adequate, safe and efficient evacuation routes and shelters during hazard events.	2024 Review Comment: “Provide adequate and well-defined evacuation routes and shelters for all hazard events.”
Objective D	Provide adequate communication systems for emergency management agencies and emergency response units.	2024 Review Comment: No comment.
Objective E	Ensure that local officials are well trained regarding natural hazards and appropriate prevention and mitigation activities and improve communications between the public and emergency management services.	2024 Review Comment: “Ensure that local officials are well trained regarding all hazards and the appropriate prevention and mitigation activities associated with each.” New objective: “Improve communications between the public and emergency management services.”
Goal 4	Protect existing natural resources and preserve environmentally sensitive areas where hazard potential is high.	2024 Review Comment: “Protect existing natural resources and preserve environmentally sensitive high-hazard areas.”
Objective A	Protect existing natural resources and open space, including parks and wetlands, within the floodplains.	2024 Review Comment: “Protect existing natural resources and open space, including parks and wetlands, within Potter County.”
Objective B	Restore degraded natural resources and open space to improve their flood control function.	2024 Review Comment: “Restore at risk natural resources and open space to improve their flood control functions.”
Objective C	Preserve areas where natural hazard potential is high such as steeply sloping areas.	2024 Review Comment: “Preserve areas of high risk for all natural and human-caused hazards.”
Objective D	Help educate property owners with property in floodplains on flood risks and mitigation.	2024 Review Comment: “Educate property owners regarding flood risk and mitigation efforts in the floodplain (Special Flood Hazard Area).”
Goal 5	Increase Public Awareness regarding natural and human-made hazard risks, preparedness and mitigation.	2024 Review Comment: “Increase public awareness of all natural and human-caused hazards and relevant preparedness and mitigation efforts.”

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Potter County 2019 Mitigation Goals and Objectives		
Goal/Objective	Description	Comment
Objective A	Ensure that all residents and business owners are aware of the potential hazards associated with their environment and the ways they can protect themselves.	2024 Review Comment: “Ensure that all persons in Potter County are aware of all natural and human-caused potential hazards.”
Objective B	Improve the participation rate in federal flood insurance through education.	2024 Review Comment: “Educate the public on the National Flood Insurance Program (NFIP).”
Objective C	Develop citizen information on natural, technological, and man-made disaster response.	2024 Review Comment: “Develop resources for public use on all natural and human-caused hazards.”
Goal 6	Implement structural projects to reduce the impacts of hazards.	2024 Review Comment: “Implement structural project planning to reduce the impacts of all natural and human-caused hazard.” Possible new objective under Goal 2.
Objective A	Use the Act 167 Stormwater Management Plan as a guide to implementing structural solutions to reduce the impact of flooding.	2024 Review Comment: “Utilize best management practices, and local, county, and state regulations as a guide to implementing structural solutions to reduce the impact of flooding.” Action directly referencing Act 167
Objective B	Design and implement appropriate flood control projects.	2024 Review Comment: “Design, implement, and maintain flood control infrastructure throughout Potter County.”
Objective C	Provide information to municipal officials regarding available funding for structural projects.	2024 Review Comment: “Educate municipal officials on available funding for hazard mitigation infrastructure projects.”
New Objective	Acquire, reconstruct, demolish, or demolish/reconstruct.....	

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Table 81 - 2019 Mitigation Actions Review

Potter County Mitigation Actions Review Worksheet						
<i>Existing Mitigation Actions</i> (2019 HMP)	<i>Status</i>					<i>Review Comments</i>
	No Progress/ Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
1. Disseminate informational pamphlets on radon exposure to County residents and encourage home and facility testing.			X			2024 Review Comment: No comment
2. Set up booth at Potter County Fair annually to increase public awareness about hazard mitigation			X			2024 Review Comment: Include senior center visits and senior expos.
3. Disseminate informational pamphlets for County residents that explain the risks of hazards, outline precautionary measures that can be taken to help reduce the impacts of a disaster to themselves and their property, and emphasize the value of hazard mitigation, i.e., booth at Potter County Fair.			X			2024 Review Comment: Similar to action 2. Consider revising action.
4. Develop an informational Web site with information on the hazards that can affect the County, how residents can protect themselves from a disaster, and mitigation actions the County and municipalities are taking to help reduce the risks.			X			2024 Review Comment: No comment
5. Cooperate with local media to produce regular public service announcements or news releases on hazard risk, safety, and the importance of mitigation.			X			2024 Review Comment: No comment

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Potter County Mitigation Actions Review Worksheet						
<i>Existing Mitigation Actions</i> <i>(2019 HMP)</i>	<i>Status</i>					<i>Review Comments</i>
	No Progress/ Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
6. Utilize existing programs for school education programs on hazards, hazard safety, and mitigation.			X			2024 Review Comment: No comment
7. Disseminate informational pamphlets or mailings on hazard mitigation for property owners in the 1% annual chance floodplain or owners of repetitive-loss structures.		X				2024 Review Comment: "...in the special flood hazard area or owners of repetitive-loss structure or severe-repetitive loss structures."
8. Work with state and federal officials to enforce sediment and erosion control regulations.			X			2024 Review Comment: "Work with state and federal officials to implement erosion and sediment control regulations as needed."
9. Work with state and federal officials to enforce stream dumping regulations.			X			2024 Review Comment: implement instead of enforce
10. Work with state and federal officials to enforce wetlands development regulations.			X			2024 Review Comment: implement instead of enforce
11. Acquire properties in hazard areas, notably the 1% annual chance floodplain, to convert them to open space.	X					2024 Review Comment: special flood hazard area Combine with action 12.
12. Elevate structures in hazard areas.	X					2024 Review Comment: Combine with action 11.

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Potter County Mitigation Actions Review Worksheet						
<i>Existing Mitigation Actions (2019 HMP)</i>	<i>Status</i>					<i>Review Comments</i>
	No Progress/ Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
13. Regularly inspect and maintain bridges and culverts.			X			<p>2024 Review Comment: Review classification of bridges.</p> <p>New action: Identify potential funding sources to assist with insufficient bridge and culvert areas and projects.</p> <p>New action: “Identify deteriorating bridges and culvert under 20’ that may not have been regularly inspected.”</p>
14. Develop a stream corridor restoration plan.			X			<p>2024 Review Comment: Implementing items on the ground, identifying sites that could be managed.</p>
15. Create and maintain a database and map of all critical facilities in the County.			X			<p>2024 Review Comment: Community lifelines, <u>combination of both private and public sector facilities</u></p> <p>New Action: Continue to provide that data to other county departments, along with state and federal partners.</p> <p>New Action: Communicate changes to critical facility and community lifeline data and identify new assets as needed.</p>

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Potter County Mitigation Actions Review Worksheet						
<i>Existing Mitigation Actions</i> (2019 HMP)	<i>Status</i>					<i>Review Comments</i>
	No Progress/ Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
16. Inspect critical facilities regularly to ensure they comply with standard codes and can withstand the impacts of a disaster.			X			2024 Review Comment: “Ensure that the critical facilities are complying with standard codes and can withstand the impacts of all hazards.”
17. Ensure that all critical facilities have updated emergency response plans.			X			2024 Review Comment: No comment
18. Enforce floodplain development regulations.						2024 Review Comment: “Encourage the implementation of the development of floodplain regulations.”
19. Offer technical assistance to municipalities to develop, address, or enforce floodplain zoning, hillside development regulations, subdivision and development regulations, design review standards, and environmental review standards.			X			2024 Review Comment: No comment.
20. Promote open space preservation.			X			2024 Review Comment: Subdivision and land development regulations (riparian buffers)
21. Promote natural resource planning.			X			2024 Review Comment: Open space preservation blended into this item
22. Review planned infrastructure to ensure that it will be developed outside of hazard-prone areas.			X			2024 Review Comment: “Review planned infrastructure to encourage development away from hazard-prone areas,”

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Potter County Mitigation Actions Review Worksheet						
<i>Existing Mitigation Actions (2019 HMP)</i>	<i>Status</i>					<i>Review Comments</i>
	No Progress/ Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
23. Recommend, encourage, and assist communities to participate in the National Flood Insurance Program (NFIP) Community Rating System (CRS).	X					2024 Review Comment: “Recommend and encourage communities to participate in the National Flood Insurance Program’s (NFIP) Community Rating System (CRS).”
24. Encourage departments responsible for creating and storing data related to parcels, centerlines, buildings, addresses, hydrology, and hazards to develop and enforce data maintenance policies.			X			2024 Review Comment: Enhance ongoing maintenance.
25. Encourage the development of data-sharing policies and agreements between departments and organizations responsible for data creation, management, and use.			X			2024 Review Comment: County is a participating partner in the PA Geoboard. Information is also shared with PEMA for NG911.
26. Develop and maintain hazard occurrence databases to record information on hazards such as date and time of occurrence, duration of disaster, amount of damage, number of injuries, etc.			X			2024 Review Comment: No comment
27. Develop detailed databases on parcels and buildings in and out of the 1% annual chance floodplain. The data could include first-floor elevations, number of stories, basements, value of structure, acreage of parcel in floodplain, etc.		X				2024 Review Comment: “Further develop detailed databases.....”

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Potter County Mitigation Actions Review Worksheet						
<i>Existing Mitigation Actions (2019 HMP)</i>	<i>Status</i>					<i>Review Comments</i>
	No Progress/ Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
28. Develop and distribute a list of contact persons for each organization that may play a part in emergency response, services, relief, or hazard mitigation.			X			2024 Review Comment: No comment
29. Encourage the heads of each department or organization involved in emergency response, services, relief, or hazard mitigation to meet several times a year to discuss hazard mitigation.			X			2024 Review Comment: No comment
30. Develop informational workshops or programs on hazard mitigation and available funding for organizations, departments, elected officials, and volunteers.			X			2024 Review Comment: No comment
31. Disseminate informational brochures for organizations involved in emergency response.			X			2024 Review Comment: Include information on digital options? QR codes?
32. Inventory all available equipment and technology used for emergency response.			X			2024 Review Comment: No comment
33. Continue to target and prioritize at-risk structures, and perform acquisitions, demolitions, relocations, and/or elevations as funding becomes available.			X			2024 Review Comment: Commissioners have adopted a blight removal fund. Inventory of blighted properties or areas per municipalities.

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Potter County Mitigation Actions Review Worksheet						
Existing Mitigation Actions (2019 HMP)	Status					Review Comments
	No Progress/ Unknown	In Progress/Not Yet Complete	Continuous	Completed	Discontinued	
34. Collect Floodplain Management Ordinance-specific information from communities participating in the NFIP including: freeboard requirements; prohibition of identified dangerous materials in the floodway; and prohibition or restriction of hospitals, nursing homes, and jails/prisons.			X			<p>2024 Review Comment: Review or inventory floodplain management ordinances.... Centrally located access to floodplain management ordinances.</p> <p>New Action: “Encourage municipal governments to records floodplain management ordinances to use the county as the repository of those ordinances.”</p> <p>Review in regard to item 23.</p>

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 seven goals and twenty-nine corresponding objectives were developed. *Table 82 – 2024 Goals and Objectives* details the mitigation goals and objectives established for the 2024 Potter County Hazard Mitigation Plan.

Table 82 - 2024 Goals and Objectives

Potter County 2024 Goals and Objective	
Goal/Objective	Description
Goal 1	Reduce vulnerability, including loss of life and damage to property, from natural and human-caused hazards.

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Potter County 2024 Goals and Objective	
Goal/Objective	Description
Objective 1.1	Ensure that existing stormwater management systems and devices are adequately maintained and functioning properly to reduce the impacts related to flash flooding and storm water issues.
Objective 1.2	Minimize future damage due to flooding of the Allegheny River, Genesee River, and Chesapeake Bay watershed.
Objective 1.3	Reduce impacts related to all natural and human-caused hazards.
Objective 1.4	Ensure that local building codes/ordinances are consistent with FEMA and PA DCED guidelines and are properly enforced.
Objective 1.5	Update, maintain, acquire, or develop GIS information directly related to risk assessment and hazard vulnerability and collaborate with local, state, and federal stakeholders.
Goal 2	Promote resilient communities and disaster-resistant future development.
Objective 2.1	Minimize future damage due to flooding of the Allegheny River, Genesee River, and the Chesapeake Bay watershed and its tributaries by promoting resistant construction, retrofitting techniques and utilize erosion/sedimentation control best management practices in rural areas.
Objective 2.2	Adhere to land use and stormwater management planning and state regulations related to construction and development to prevent increase in runoff and subsequent increase in flood flows.
Objective 2.3	Ensure that new construction and development are resistant to all natural hazards.
Goal 3	Improve emergency warning and response capabilities and procedures to better protect the residents, visitors, and transients of Potter County.
Objective 3.1	Provide all persons in Potter County with adequate warning for all natural and human-caused hazards.
Objective 3.2	Ensure that the emergency response services, critical facilities, and community lifeline functions are not interrupted by hazard events.
Objective 3.3	Provide adequate and well-defined evacuation routes and shelters for all hazard events.

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Potter County 2024 Goals and Objective	
Goal/Objective	Description
Objective 3.4	Provide adequate communication systems for emergency management agencies and emergency response units.
Objective 3.5	Ensure that local officials are well trained regarding all hazards and the appropriate prevention and mitigation activities associated with each. Improve communications between the public and emergency management services.
Objective 3.6	Improve communications between the public and emergency management services.
Goal 4	Protect existing natural resources and preserve environmentally sensitive high-hazard areas.
Objective 4.1	Protect existing natural resources and open space, including parks and wetlands, within Potter County.
Objective 4.2	Restore at risk natural resources and open space to improve their flood control functions.
Objective 4.3	Preserve areas of high risk for all natural and human-caused hazards.
Objective 4.4	Educate property owners regarding flood risk and mitigation efforts in the floodplain (Special Flood Hazard Area).
Goal 5	Increase public awareness of all natural and human-caused hazards and relevant preparedness and mitigation efforts.
Objective 5.1	Ensure that all persons in Potter County are aware of all natural and human-caused potential hazards.
Objective 5.2	Educate the public on the National Flood Insurance Program (NFIP).
Objective 5.3	Develop resources for public use on all natural and human-caused hazards.
Objective 5.4	Develop and foster outreach, educations, and awareness of hazard mitigation to underserved and socially vulnerable communities to increase input into the hazard mitigation plan development process.
Goal 6	Implement structural project planning to reduce the impacts of all natural and human-caused hazard.
Objective 6.1	Utilize best management practices, and local, county, and state regulations as a guide to implementing structural solutions to reduce the impact of flooding.
Objective 6.2	Design, implement, and maintain flood control infrastructure throughout Potter County.

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Potter County 2024 Goals and Objective	
Goal/Objective	Description
Objective 6.3	Educate municipal officials on available funding for hazard mitigation infrastructure projects.
Objective 6.4	Complete actions and projects to acquire, elevate, demolish, or demolish/reconstruct properties, repetitive loss properties, and severe repetitive loss properties.
Goal 7	Participate in FEMA’s High-Hazard Potential Dam Program (HHPD).
Objective 7.1	Educate the county municipalities, property owners, and businesses about FEMA’s HHPD program.
Objective 7.2	Reduce long-term vulnerabilities from eligible high-hazard potential dams that pose an unacceptable risk to the public.
Objective 7.3	Identify, by area, locations in the county that could potentially be impacted by FEMA’s HHPD program.

Goal 7 and Objective 7.1, Objective 7.2, and Objective 7.3 relate to multiple mitigation actions in *Table 84 – 2024 Mitigation Action Plan*. Action 7.1.1 relates to Objective 7.1, Action 7.2.1 relates to Objective 7.2, and Action 7.3.1 relates to Objective 7.3. All three of the mitigation actions are covered by Goal 7 of the goals and objectives for the 2024 Hazard Mitigation Plan. The HHPD mitigation actions outlined above are also tied to additional mitigation objectives and goals. Actions 7.1.1, 7.2.1, and 7.3.1 are also directly tied to Objective 1.2 and Objective 5.2. Further details on the additional goals and objectives and the mitigation actions for the HHPD program can be found in *Table 82 – 2024 Mitigation Goals and Objectives* and *Table 84 – 2024 Mitigation Action 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 reducing hazard risks.

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

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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 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

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- 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 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 – 2024 Mitigation Action Plan*.

Table 83 - Mitigation Strategy Technique Matrix

Potter County Mitigation Strategy Technique Matrix				
Hazard	MITIGATION TECHNIQUE			
	Planning and Regulations	Structure and Infrastructure	Natural Systems Protection	Education and Awareness
Drought	X	X	X	X
Earthquake	X	X	X	X
Flood, Flash Flood, and Ice Jam Flood	X	X	X	X
Hurricane and Tropical Storms	X	X	X	X
Invasive Species	X	X	X	X
Landslides	X	X	X	X
Pandemic, Epidemic, Endemic, and Infectious Disease	X	X	X	X

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Potter County Mitigation Strategy Technique Matrix				
Hazard	MITIGATION TECHNIQUE			
	Planning and Regulations	Structure and Infrastructure	Natural Systems Protection	Education and Awareness
Radon Exposure	X	X	X	X
Subsidence and Sinkhole	X	X	X	X
Tornado and Windstorm	X	X	X	X
Wildfire	X	X	X	X
Winter storms	X	X	X	X
Blighted Properties	X	X		X
Civil Disturbance	X	X		X
Dam Failure	X	X	X	X
Emergency Services	X	X		X
Environmental Hazards	X	X	X	X
Nuclear Incidents	X	X		X
Opioid Epidemic	X	X		X
Terrorism	X	X		X
Transportation Accidents	X	X		X
Urban Fire and Explosion	X	X		X
Utility Interruptions	X	X		X

6.4. Mitigation Action Plan

The Potter County Hazard Mitigation Local Planning Team (LPT) immediately began work on the mitigation strategy section of the 2024 hazard mitigation plan (HMP) update after the risk assessment section was completed. The LPT started this section by reviewing the 2019 HMP mitigation strategy section. A review of the previous goals, objectives, actions, and project opportunities documented in the 2019 HMP was conducted. The next step the LPT completed was the brainstorming of possible new actions based on newly 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 join 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.

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Mitigation measures for the 2024 Potter County HMP are listed in the mitigation action plan. *Table 84 – 2024 Mitigation Action Plan* is the 2024 Potter County Mitigation Action Plan. This plan outlines mitigation actions and projects that comprise a strategy for Potter 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 located in Appendix H. *Table 84 – 2024 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
HMGP:	Hazard Mitigation Grant Program, administered by the Federal Emergency Management Agency
BRIC:	Building Resilient Infrastructure and Communities (BRIC) 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

Mitigation Action Evaluation:

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Evaluating mitigation actions involves judging each action against certain criteria to determine whether or not 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?
- 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 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.

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- 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 is identified in the mitigation action evaluation and prioritization tool. The results for the mitigation action evaluation and prioritization are located in Appendix H of this plan.

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Table 84 - 2024 Mitigation Action Plan

Potter County 2024 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 Regulatory	Develop, update, or maintain a stream corridor restoration plan that identifies implementation of items on the ground and sites that could be managed by the plan.	Flood Flash Flood				2024-2029	FMA, Local	Potter County Conservation District Planners Potter County Planning Department Director
1.2.1	Planning and Regulatory	Encourage floodplain regulations to be developed and implemented at the local level.	Flood Flash Flood				2024-2029	FMA, Local	Potter County Hazard Mitigation Officer Potter County Planning Department Director
1.2.2	Planning and Regulatory	Offer technical assistance to municipalities to develop, address, or enforce floodplain zoning, hillside development regulations, subdivision and development regulations, design review standards, and environmental review standards.	Flood Landslide				2024-2029	FMA, Local	Potter County Planning Department Director and Planners
1.3.1	Planning and Regulatory	Develop drought plans to address water usage and recommendations in times of low precipitation and drought declarations.	Drought				2024-2029	Local	Township Supervisors and Borough Managers

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Potter County 2024 Mitigation Action Plan									
Action Number	Mitigation Actions		Hazard Vulnerability	Prioritization			Implementation		
	Category	Description/ Action Items		High	Medium	Low	Schedule	Funding	Local Champion
1.3.2	Structure and Infrastructure	Review the maintenance needs for all municipal buildings to ensure that they are earthquake resilient. If deficiencies are found, evaluate ways to resolve infrastructure needs.	Earthquake				2024-2029	Local	Township Supervisors and Borough Managers
1.3.3	Structure and Infrastructure	Monitor slope movement in municipalities that are at a high-risk of landslide including those municipalities with structures within slope areas greater than 25°.	Landslide				2024-2029	Local	Township Supervisors and Borough Managers
1.3.4	Planning and Regulatory	Work with Potter County and the regional department of health to review the current infectious disease statistics, including but not limited to positive Lyme Disease and West Nile Virus cases.	Pandemic, Epidemic, and Infectious Disease				2024-2029	Local	Township Supervisors and Borough Managers
1.3.5	Planning and Regulatory	Review the areas of social vulnerability in each municipality and determine where those areas of vulnerability directly overlap with high-risk radon areas.	Radon Exposure				2024-2029	Local	Township Supervisors and Borough Managers
1.3.6	Structure and Infrastructure	Review areas of past mining and extraction activities within each municipality for soil movement that could result in damage to emergency shelters, community lifelines, and areas of social vulnerability.	Subsidence and Sinkhole				2024-2029	Local	Township Supervisors and Borough Managers

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Potter County 2024 Mitigation Action Plan									
Action Number	Mitigation Actions		Hazard Vulnerability	Prioritization			Implementation		
	Category	Description/ Action Items		High	Medium	Low	Schedule	Funding	Local Champion
1.3.7	Structure and Infrastructure	Examine areas of dense vegetation interface with community lifelines and reduce those areas to prevent wildfire events close to those locations.	Wildfire				2024-2029	Local	Township Supervisors and Borough Managers
1.3.8	Planning and Regulatory	Examine and research cybersecurity directives, best practices, and resources from the United States Department of Homeland Security's (US DHS) Cybersecurity & Infrastructure Security Agency (CISA) to lessen the impact of a potential cybersecurity incident at the county.	Cyberterrorism				2024-2029	Local	Potter County Department of IT Director
1.3.9	Planning and Regulatory	Examine and review municipal computer systems based on CISA best practices and recommendations to protect local governments from cybersecurity incidents.	Cyberterrorism				2024-2029	Local	Township Supervisors and Borough Managers
1.4.1	Structure and Infrastructure	Ensure that the emergency related critical facilities and community lifelines in Potter County are complying with standard codes and can withstand the impacts of all hazards.	Utility Interruptions Emergency Services				2024-2029	BRIC, Local	Potter County Hazard Mitigation Officer Potter County Engineer

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Potter County 2024 Mitigation Action Plan									
Action Number	Mitigation Actions		Hazard Vulnerability	Prioritization			Implementation		
	Category	Description/ Action Items		High	Medium	Low	Schedule	Funding	Local Champion
1.5.1	Planning and Regulatory	Encourage and enhance data maintenance policies for data storing related to parcels, centerlines, buildings, addresses, hydrology, and hazard mitigation.	All Hazards				2024-2029	Local	Potter County GIS Department Technician Potter County Planning Department Director
1.5.2	Planning and Regulatory	Encourage the development of data-sharing policies and agreements between departments and organizations responsible for data creation, management, and use.	All Hazards				2024-2029	Local	Potter County GIS Department Technician Potter County Planning Department Director
1.5.3	Planning and Regulatory	Continue to foster data relationships with organizations and state and federal partners.	All Hazards				2024-2029	Local	Potter County GIS Department Technician Potter County Planning Department Director
1.5.4	Planning and Regulatory	Develop and maintain hazard occurrence databases to record information on hazards such as date and time of occurrence, duration of disaster, amount of damage, number of injuries, etc.	All Hazards				2024-2029	Local	Potter County GIS Department Technician Potter County Planning Department Director

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Potter County 2024 Mitigation Action Plan									
Action Number	Mitigation Actions		Hazard Vulnerability	Prioritization			Implementation		
	Category	Description/ Action Items		High	Medium	Low	Schedule	Funding	Local Champion
1.5.5	Planning and Regulatory	Further develop detailed databases on parcels and buildings in and out of the special flood hazard area. The data could include first-floor elevations, number of stories, basements, value of structure, acreage of parcel in floodplain, etc.	Flood				2024-2029	Local	Potter County GIS Department Technician Potter County Planning Department Director
2.1.1	Planning and Regulatory	Work with state and federal officials to implement erosion and sediment control regulations as needed.	Flood Flash Flood				2024-2029	FMA, Local	Potter County Conservation District Planners Potter County Planning Department Director
2.2.1	Natural Systems Protection	Promote natural resource planning in conjunction with open space preservation, subdivision and land development, and other land use ordinances.	All Natural Hazards				2024-2029	Local	Potter County Planning Department Director and Planners
2.3.1	Planning and Regulatory	Review planned infrastructure to encourage development away from hazard-prone areas.	All Hazards				2024-2029	BRIC, Local	Potter County Planning Department Director and Planners Potter County Hazard Mitigation Officer

**Draft Potter County, Pennsylvania
2024 Hazard Mitigation Plan**

Potter County 2024 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	Structure and Infrastructure	Review all Potter County emergency warning systems currently in place or in development.	All Hazards				2024-2029	Local	Potter County Hazard Mitigation Officer
3.2.1	Structure and Infrastructure	Continue to provide data on all emergency related critical infrastructure and community lifeline locations to other county departments, along with Potter County state and federal partners.	Utility Interruptions Emergency Services				2024-2029	BRIC, Local	Potter County GIS Department Technician Potter County Planning Department Director
3.2.2	Structure and Infrastructure	Communicate changes to all emergency related critical infrastructure and community lifeline locations with partners and identify any new changes or assets as needed.	Utility Interruptions Emergency Services				2024-2029	BRIC, Local	Potter County GIS Department Technician Potter County Planning Department Director
3.2.3	Structure and Infrastructure	Ensure that all critical facilities have updated emergency response plans.	Emergency Services				2024-2029	Local	Potter County Hazard Mitigation Officer
3.2.4	Structure and Infrastructure	Create and maintain a database and map all emergency related critical infrastructure and community lifeline locations in Potter County. This will include private and public sector locations.	Utility Interruptions Emergency Services				2024-2029	Local	Potter County GIS Department Technician Potter County Planning Department Director

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Potter County 2024 Mitigation Action Plan									
Action Number	Mitigation Actions		Hazard Vulnerability	Prioritization			Implementation		
	Category	Description/ Action Items		High	Medium	Low	Schedule	Funding	Local Champion
3.2.5	Planning and Regulatory	Inventory all available equipment and technology used for emergency response.	Emergency Services				2024-2029	Local	Potter County Emergency Service Agency Officers Potter County Hazard Mitigation Officer
3.3.1	Planning and Regulatory	Review all snow emergency route signage in the county.	Winter Storms				2024-2029	Local	Potter County Hazard Mitigation Officer Potter County PennDOT Rep
3.3.2	Planning and Regulatory	Replace snow emergency route signage that is deemed deficient or neglected during review.	Winter Storms				2024-2029	Local	Potter County Hazard Mitigation Officer Potter County PennDOT Rep
3.4.1	Structure and Infrastructure	Audit the Potter County radio system for emergency management usage and plan further deployment of radios and radio systems in the county.	Emergency Services				2024-2029	Local	Potter County Hazard Mitigation Officer
3.5.1	Planning and Regulatory	Develop and distribute a list of contact persons for each organization that may play a part in emergency response, services, relief, or hazard mitigation.	Emergency Services				2024-2029	Local	Potter County Hazard Mitigation Officer

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Potter County 2024 Mitigation Action Plan									
Action Number	Mitigation Actions		Hazard Vulnerability	Prioritization			Implementation		
	Category	Description/ Action Items		High	Medium	Low	Schedule	Funding	Local Champion
3.5.2	Planning and Regulatory	Encourage the heads of each department or organization involved in emergency response, services, relief, or hazard mitigation to meet several times a year to discuss hazard mitigation.	Emergency Services				2024-2029	Local	Potter County Emergency Service Agency Officers Potter County Hazard Mitigation Officer
3.5.3	Education and Outreach	Disseminate informational brochures in both print and digital media for all organizations involved in emergency response.	Emergency Services				2024-2029	Local	Potter County Hazard Mitigation Officer
3.5.4	Planning and Regulatory	Ensure collaboration with both private and public dam owners, to ensure that their input is included in the local planning team and the planning process at large.	Dam Failure				2024-2029	HHPD, Local	Potter County Hazard Mitigation Officer
3.6.1	Education and Outreach	Disseminate informational pamphlets on radon exposure to county residents and encourage home and facility testing.	Radon				2024-2029	Local	Potter County Hazard Mitigation Officer
3.6.2	Education and Outreach	Set up an information booth at Potter County events like the Potter County Fair, senior center expos, and National Night Out.	All Hazards				2024-2029	Local	Potter County Hazard Mitigation Officer
3.6.3	Education and Outreach	Distribute pamphlets and other media during Potter County events on hazards and hazard vulnerability for citizens and visitors to Potter County.	All Hazards				2024-2029	Local	Potter County Hazard Mitigation Officer

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2024 Hazard Mitigation Plan***

Potter County 2024 Mitigation Action Plan									
Action Number	Mitigation Actions		Hazard Vulnerability	Prioritization			Implementation		
	Category	Description/ Action Items		High	Medium	Low	Schedule	Funding	Local Champion
3.6.4	Education and Outreach	Cooperate with local media to produce regular public service announcements or news releases on hazard risk, safety, and the importance of mitigation.	All Hazards				2024-2029	Local	Potter County Public Relations Officer
4.1.1	Natural Systems Protection	Work with state and federal officials to implement stream dumping regulations.	Environmental Hazards				2024-2029	Local	Potter County Conservation District Planners Potter County Planning Department Director
4.1.2	Natural Systems Protection	Work with state and federal officials to implement wetlands development regulations.	Environmental Hazards				2024-2029	Local	Potter County Conservation District Planners Potter County Planning Department Director
4.2.1	Natural System Protection	Promote open space preservation including subdivision and land development regulations and other land use ordinances (riparian buffers).	All Natural Hazards				2024-2029	Local	Potter County Conservation District Planners Potter County Planning Department Director
4.3.1	Natural Systems Protection	Collaborate with local municipalities to identify high-risk areas for all natural hazards for preservation.	All Natural Hazards				2024-2029	Local	Potter County Hazard Mitigation Officer

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Potter County 2024 Mitigation Action Plan									
Action Number	Mitigation Actions		Hazard Vulnerability	Prioritization			Implementation		
	Category	Description/ Action Items		High	Medium	Low	Schedule	Funding	Local Champion
4.4.1	Planning and Regulatory	Disseminate information pamphlets or mailings on hazard mitigation for property owners in the special flood hazard area or owners of repetitive loss or severe repetitive loss structures.	Flood				2024-2029	FMA, Local	Potter County Hazard Mitigation Officer Potter County Planning Department Director
5.1.1	Education and Outreach	Utilize existing programs for school education programs on hazards, hazard safety, and mitigation.	All Hazards				2024-2029	Local	Potter County Hazard Mitigation Officer
5.2.1	Planning and Regulatory	Recommend and encourage communities to participate in the National Flood Insurance Program's (NFIP) Community Rating System (CRS).	Flood				2024-2029	FMA, Local	Potter County Planning Department Director
5.3.1	Education and Outreach	Develop an informational web site with information on the hazards that can affect the county, how residents can protect themselves from a disaster, and mitigation actions the county and municipalities are taking to help reduce the risks.	All Hazards				2024-2029	Local	Potter County IT Potter County Hazard Mitigation Officer
5.4.1	Education and Outreach	Develop multilingual hazard mitigation plan public notices in languages including Spanish to enhance accessibility for those whose primary language is not English.	All Hazards				2024-2029	Local	Potter County Hazard Mitigation Officer

***Draft Potter County, Pennsylvania
2024 Hazard Mitigation Plan***

Potter County 2024 Mitigation Action Plan									
Action Number	Mitigation Actions		Hazard Vulnerability	Prioritization			Implementation		
	Category	Description/ Action Items		High	Medium	Low	Schedule	Funding	Local Champion
5.4.2	Education and Outreach	Provide hard copies of hazard mitigation plan documents during annual reviews and future HMP development to government facilities and media locations, to facilitate access for socially vulnerable populations.	All Hazard				2024-2029	Local	Potter County Hazard Mitigation Officer
6.1.1	Planning and Regulatory	Encourage municipal governments to record floodplain management ordinances using the county as the repository of those ordinances.	Flood				2024-2029	Local	Potter County Hazard Mitigation Officer Potter County Planning Department Director
6.1.2	Planning and Regulatory	Collect Floodplain Management Ordinance-specific information from communities participating in the NFIP including: freeboard requirements; prohibition of identified dangerous materials in the floodway; and prohibition or restriction of hospitals, nursing homes, and jails/prisons	Flood Flash Flood				2024-2029	FMA, Local	Potter County Hazard Mitigation Officer
6.1.3	Structure and Infrastructure	Regularly inspect and maintain bridges and culverts in accordance with the classification of that bridge, culvert, or system.	Transportation Accidents				2024-2029	Local	Potter County Engineer Potter County Conservation District Planners

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Potter County 2024 Mitigation Action Plan									
Action Number	Mitigation Actions		Hazard Vulnerability	Prioritization			Implementation		
	Category	Description/ Action Items		High	Medium	Low	Schedule	Funding	Local Champion
6.2.1	Structure and Infrastructure	Review flood control infrastructure throughout Potter County when able.	Flood Flash Flood Ice Jam Flooding				2024-2029	FMA, Local	Potter County Conservation District Planners
6.3.1	Planning and Regulatory	Identify potential funding sources to assist with insufficient bridge and culvert areas and projects.	Transportation Accidents Flood				2024-2029	Local	Potter County Engineer
6.3.2	Structure and Infrastructure	Identify deteriorating bridges and culverts under 20' that may not have been regularly inspected.	Transportation Accidents Flood				2024-2029	BRIC, Local	Potter County Engineer Township Supervisors and Borough Managers
6.3.3	Education and Outreach	Develop information workshops or programs on hazard mitigation and available funding for organizations, departments, elected officials, and volunteers.	All Hazards				2024-2029	Local	Potter County Hazard Mitigation Officer
6.4.1	Structure and Infrastructure	Acquire properties in hazard areas, specifically those locations located in the special flood hazard area for Potter County.	Flood				2024-2029	FMA, Local	Potter County Engineer Potter County Hazard Mitigation Officer Potter County Planning Department Director

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Potter County 2024 Mitigation Action Plan									
Action Number	Mitigation Actions		Hazard Vulnerability	Prioritization			Implementation		
	Category	Description/ Action Items		High	Medium	Low	Schedule	Funding	Local Champion
6.4.2	Structure and Infrastructure	Elevate properties in hazard areas, specifically those locations located in the special flood hazard area for Potter County.	Flood				2024-2029	FMA, Local	Potter County Engineer Potter County Hazard Mitigation Officer Potter County Planning Department Director
6.4.3	Structure and Infrastructure	Continue to target and prioritize at-risk structures, and perform acquisitions, demolitions, demolitions and reconstructions, relocations, and/or elevations as funding becomes available.	Flood Blighted Properties				2024-2029	FMA, Local	Potter County Hazard Mitigation Officer Potter County Planning Department Director
6.4.4	Structure and Infrastructure	Review and implement items from community floodplain ordinances related to substantial damage/substantial improvement for all local jurisdictions in the next hazard mitigation plan update.	Flood Flash Flood Ice Jam Flood				2024-2029	FMA, Local	Potter County Hazard Mitigation Officer Potter County Planning Department Director
7.1.1	Education and Outreach	Distribute educational pamphlets about the HHPD program to municipalities and county residents.	Dam Failure				2024-2029	HHPD, Local	Potter County GIS Department Technician Potter County Planning Department Director

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Potter County 2024 Mitigation Action Plan									
Action Number	Mitigation Actions		Hazard Vulnerability	Prioritization			Implementation		
	Category	Description/ Action Items		High	Medium	Low	Schedule	Funding	Local Champion
7.2.1	Education and Outreach	Provide education on local mitigation policies and programs that address high-hazard potential dams to county residents and municipalities.	Dam Failure				2024-2029	HHPD, Local	Potter County GIS Department Technician Potter County Planning Department Director
7.2.2	Planning and Regulatory	Ensure collaboration with both public and private dam owners, to ensure that their input is included in the local planning team, and the planning process in general for high-hazard potential dams.	Dam Failure					HHPD, Local	Potter County Hazard Mitigation Officer Potter County Engineer
7.2.3	Natural Systems Protection	Research the feasibility of installing flood protection measures in areas around Potter 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					HHPD, Local	Potter County Hazard Mitigation Officer Potter County Engineer
7.2.4	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 Potter County.	Dam Failure					HHPD, Local	Potter County Hazard Mitigation Officer Potter County Engineer

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Potter County 2024 Mitigation Action Plan									
Action Number	Mitigation Actions		Hazard Vulnerability	Prioritization			Implementation		
	Category	Description/ Action Items		High	Medium	Low	Schedule	Funding	Local Champion
7.3.1	Education and Outreach	Acquire digitized dam inundation GIS polygons to determine at risk populations for dams designated High-Hazard Potential Dams.	Dam Failure				2024-2029	HHPD, Local	Potter County GIS Department Technician Potter County Planning Department Director

Table 85 - Municipal Hazard Mitigation Actions Checklist

Municipal Hazard Mitigation Actions Checklist							
Municipality	1.1.1	1.2.1	1.2.2	1.3.1	1.3.2	1.3.3	1.3.4
Abbott Township				X	X	X	X
Allegany Township				X	X	X	X
Austin Borough				X	X	X	X
Bingham Township				X	X	X	X
Clara Township				X	X	X	X
Coudersport Borough				X	X	X	X
Eulalia Township				X	X	X	X
Galeton Borough				X	X	X	X
Genesee Township				X	X	X	X
Harrison Township				X	X	X	X
Hebron Township				X	X	X	X
Hector Township				X	X	X	X
Homer Township				X	X	X	X
Keating Township				X	X	X	X
Oswayo Borough				X	X	X	X
Oswayo Township				X	X	X	X
Pike Township				X	X	X	X
Pleasant Valley Township				X	X	X	X
Portage Township				X	X	X	X
Roulette Township				X	X	X	X
Sharon Township				X	X	X	X
Shinglehouse Borough				X	X	X	X

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Municipal Hazard Mitigation Actions Checklist							
Municipality	1.1.1	1.2.1	1.2.2	1.3.1	1.3.2	1.3.3	1.3.4
Stewardson Township				X	X	X	X
Summit Township				X	X	X	X
Sweden Township				X	X	X	X
Sylvania Township				X	X	X	X
Ulysses Borough				X	X	X	X
Ulysses Township				X	X	X	X
West Branch Township				X	X	X	X
Wharton Township				X	X	X	X
<i>Potter County Office or Department</i>	X	X	X				

Municipal Hazard Mitigation Actions Checklist							
Municipality	1.3.5	1.3.6	1.3.7	1.3.8	1.3.9	1.4.1	1.5.1
Abbott Township	X	X	X		X		
Allegheny Township	X	X	X		X		
Austin Borough	X	X	X		X		
Bingham Township	X	X	X		X		
Clara Township	X	X	X		X		
Coudersport Borough	X	X	X		X		
Eulalia Township	X	X	X		X		
Galeton Borough	X	X	X		X		
Genesee Township	X	X	X		X		
Harrison Township	X	X	X		X		
Hebron Township	X	X	X		X		
Hector Township	X	X	X		X		
Homer Township	X	X	X		X		
Keating Township	X	X	X		X		
Oswayo Borough	X	X	X		X		
Oswayo Township	X	X	X		X		
Pike Township	X	X	X		X		
Pleasant Valley Township	X	X	X		X		
Portage Township	X	X	X		X		
Roulette Township	X	X	X		X		
Sharon Township	X	X	X		X		
Shinglehouse Borough	X	X	X		X		
Stewardson Township	X	X	X		X		
Summit Township	X	X	X		X		
Sweden Township	X	X	X		X		
Sylvania Township	X	X	X		X		
Ulysses Borough	X	X	X		X		
Ulysses Township	X	X	X		X		

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Municipal Hazard Mitigation Actions Checklist							
Municipality	1.3.5	1.3.6	1.3.7	1.3.8	1.3.9	1.4.1	1.5.1
West Branch Township	X	X	X		X		
Wharton Township	X	X	X		X		
<i>Potter County</i>				X		X	X

Municipal Hazard Mitigation Actions Checklist							
Municipality	1.5.2	1.5.3	1.5.4	1.5.5	2.1.1	2.2.1	2.3.1
Abbott Township							
Allegheny Township							
Austin Borough							
Bingham Township							
Clara Township							
Coudersport Borough							
Eulalia Township							
Galeton Borough							
Genesee Township							
Harrison Township							
Hebron Township							
Hector Township							
Homer Township							
Keating Township							
Oswayo Borough							
Oswayo Township							
Pike Township							
Pleasant Valley Township							
Portage Township							
Roulette Township							
Sharon Township							
Shinglehouse Borough							
Stewardson Township							
Summit Township							
Sweden Township							
Sylvania Township							
Ulysses Borough							
Ulysses Township							
West Branch Township							
Wharton Township							
<i>Potter County</i>	X	X	X	X	X	X	X

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Municipal Hazard Mitigation Actions Checklist							
Municipality	3.1.1	3.2.1	3.2.2	3.2.3	3.2.4	3.2.5	3.3.1
Abbott Township							
Allegany Township							
Austin Borough							
Bingham Township							
Clara Township							
Coudersport Borough							
Eulalia Township							
Galeton Borough							
Genesee Township							
Harrison Township							
Hebron Township							
Hector Township							
Homer Township							
Keating Township							
Oswayo Borough							
Oswayo Township							
Pike Township							
Pleasant Valley Township							
Portage Township							
Roulette Township							
Sharon Township							
Shinglehouse Borough							
Stewardson Township							
Summit Township							
Sweden Township							
Sylvania Township							
Ulysses Borough							
Ulysses Township							
West Branch Township							
Wharton Township							
<i>Potter County</i>	X	X	X	X	X	X	X

Municipal Hazard Mitigation Actions Checklist							
Municipality	3.3.2	3.4.1	3.5.1	3.5.2	3.5.3	3.5.4	3.6.1
Abbott Township							
Allegany Township							
Austin Borough							
Bingham Township							
Clara Township							
Coudersport Borough							

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Municipal Hazard Mitigation Actions Checklist							
Municipality	3.3.2	3.4.1	3.5.1	3.5.2	3.5.3	3.5.4	3.6.1
Eulalia Township							
Galeton Borough							
Genesee Township							
Harrison Township							
Hebron Township							
Hector Township							
Homer Township							
Keating Township							
Oswayo Borough							
Oswayo Township							
Pike Township							
Pleasant Valley Township							
Portage Township							
Roulette Township							
Sharon Township							
Shinglehouse Borough							
Stewardson Township							
Summit Township							
Sweden Township							
Sylvania Township							
Ulysses Borough							
Ulysses Township							
West Branch Township							
Wharton Township							
<i>Potter County</i>	X	X	X	X	X	X	X

Municipal Hazard Mitigation Actions Checklist							
Municipality	3.6.2	3.6.3	3.6.4	4.1.1	4.1.2	4.2.1	4.3.1
Abbott Township							
Allegany Township							
Austin Borough							
Bingham Township							
Clara Township							
Coudersport Borough							
Eulalia Township							
Galeton Borough							
Genesee Township							
Harrison Township							
Hebron Township							
Hector Township							

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Municipal Hazard Mitigation Actions Checklist							
Municipality	3.6.2	3.6.3	3.6.4	4.1.1	4.1.2	4.2.1	4.3.1
Homer Township							
Keating Township							
Oswayo Borough							
Oswayo Township							
Pike Township							
Pleasant Valley Township							
Portage Township							
Roulette Township							
Sharon Township							
Shinglehouse Borough							
Stewardson Township							
Summit Township							
Sweden Township							
Sylvania Township							
Ulysses Borough							
Ulysses Township							
West Branch Township							
Wharton Township							
<i>Potter County</i>	X	X	X	X	X	X	X

Municipal Hazard Mitigation Actions Checklist							
Municipality	4.4.1	5.1.1	5.2.1	5.3.1	5.4.1	5.4.2	6.1.1
Abbott Township							
Allegany Township							
Austin Borough							
Bingham Township							
Clara Township							
Coudersport Borough							
Eulalia Township							
Galeton Borough							
Genesee Township							
Harrison Township							
Hebron Township							
Hector Township							
Homer Township							
Keating Township							
Oswayo Borough							
Oswayo Township							
Pike Township							
Pleasant Valley Township							

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Municipal Hazard Mitigation Actions Checklist							
Municipality	4.4.1	5.1.1	5.2.1	5.3.1	5.4.1	5.4.2	6.1.1
Portage Township							
Roulette Township							
Sharon Township							
Shinglehouse Borough							
Stewardson Township							
Summit Township							
Sweden Township							
Sylvania Township							
Ulysses Borough							
Ulysses Township							
West Branch Township							
Wharton Township							
<i>Potter County</i>	X	X	X	X	X	X	X

Municipal Hazard Mitigation Actions Checklist							
Municipality	6.1.2	6.1.3	6.2.1	6.3.1	6.3.2	6.3.3	6.4.1
Abbott Township							
Allegany Township							
Austin Borough							
Bingham Township							
Clara Township							
Coudersport Borough							
Eulalia Township							
Galeton Borough							
Genesee Township							
Harrison Township							
Hebron Township							
Hector Township							
Homer Township							
Keating Township							
Oswayo Borough							
Oswayo Township							
Pike Township							
Pleasant Valley Township							
Portage Township							
Roulette Township							
Sharon Township							
Shinglehouse Borough							
Stewardson Township							
Summit Township							

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Municipal Hazard Mitigation Actions Checklist							
Municipality	6.1.2	6.1.3	6.2.1	6.3.1	6.3.2	6.3.3	6.4.1
Sweden Township							
Sylvania Township							
Ulysses Borough							
Ulysses Township							
West Branch Township							
Wharton Township							
Potter County	X	X	X	X	X	X	X

Municipal Hazard Mitigation Actions Checklist							
Municipality	6.4.2	6.4.3	6.4.4	7.1.1	7.2.1	7.2.2	7.2.3
Abbott Township							
Allegany Township							
Austin Borough							
Bingham Township							
Clara Township							
Coudersport Borough							
Eulalia Township							
Galeton Borough							
Genesee Township							
Harrison Township							
Hebron Township							
Hector Township							
Homer Township							
Keating Township							
Oswayo Borough							
Oswayo Township							
Pike Township							
Pleasant Valley Township							
Portage Township							
Roulette Township							
Sharon Township							
Shinglehouse Borough							
Stewardson Township							
Summit Township							
Sweden Township							
Sylvania Township							
Ulysses Borough							
Ulysses Township							
West Branch Township							
Wharton Township							

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Municipal Hazard Mitigation Actions Checklist							
Municipality	6.4.2	6.4.3	6.4.4	7.1.1	7.2.1	7.2.2	7.2.3
<i>Potter County</i>	X	X	X	X	X	X	X

Municipal Hazard Mitigation Actions Checklist							
Municipality	7.2.4	7.3.1					
Abbott Township							
Allegany Township							
Austin Borough							
Bingham Township							
Clara Township							
Coudersport Borough							
Eulalia Township							
Galeton Borough							
Genesee Township							
Harrison Township							
Hebron Township							
Hector Township							
Homer Township							
Keating Township							
Oswayo Borough							
Oswayo Township							
Pike Township							
Pleasant Valley Township							
Portage Township							
Roulette Township							
Sharon Township							
Shinglehouse Borough							
Stewardson Township							
Summit Township							
Sweden Township							
Sylvania Township							
Ulysses Borough							
Ulysses Township							
West Branch Township							
Wharton Township							
<i>Potter County</i>	X	X					

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Table 86 - Objective to Action Checklist

Objective	Number of Actions
Objective 1.1	1
Objective 1.2	1
Objective 1.3	7
Objective 1.4	1
Objective 1.5	5
Objective 2.1	1
Objective 2.2	1
Objective 2.3	1
Objective 3.1	1
Objective 3.2	4
Objective 3.3	2
Objective 3.4	1
Objective 3.5	4
Objective 3.6	4
Objective 4.1	2
Objective 4.2	1
Objective 4.3	1
Objective 4.4	1
Objective 5.1	1
Objective 5.2	1
Objective 5.3	1
Objective 5.4	2
Objective 6.1	3
Objective 6.2	1
Objective 6.3	3
Objective 6.4	4
Objective 7.1	1
Objective 7.2	4
Objective 7.3	1

Table 87 - Actions Tied to Hazard

Actions Tied to Hazard	
Hazard	Actions Related
Blighted Properties	1.5.1, 1.5.2, 1.5.3, 1.5.4, 2.3.1, 3.1.1, 3.6.2, 3.6.3, 3.6.4, 5.1.1, 5.3.1, 5.4.1, 5.4.2, 6.3.3, 6.4.3,
Civil Disturbance	1.5.1, 1.5.2, 1.5.3, 1.5.4, 2.3.1, 3.1.1, 3.6.2, 3.6.3, 3.6.4, 5.1.1, 5.3.1, 5.4.1, 5.4.2, 6.3.3,

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Actions Tied to Hazard	
Hazard	Actions Related
Cyberterrorism	1.3.8, 1.3.9, 1.5.1, 1.5.2, 1.5.3, 1.5.4, 2.3.1, 3.1.1, 3.6.2, 3.6.3, 3.6.4, 5.1.1, 5.3.1, 5.4.1, 5.4.2, 6.3.3,
Dam Failure	1.5.1, 1.5.2, 1.5.3, 1.5.4, 2.3.1, 3.1.1, 3.5.4, 3.6.2, 3.6.3, 3.6.4, 5.1.1, 5.3.1, 5.4.1, 5.4.2, 6.3.3, 7.1.1, 7.2.1, 7.2.2, 7.2.3, 7.2.4, 7.3.1
Drought	1.3.1, 1.5.2, 1.5.3, 1.5.4, 2.2.1, 2.3.1, 3.1.1, 3.6.2, 3.6.3, 3.6.4, 4.2.1, 4.3.1, 5.1.1, 5.3.1, 5.4.1, 5.4.2, 6.3.3,
Earthquake	1.3.2, 1.5.1, 1.5.2, 1.5.3, 1.5.4, 2.2.1, 2.3.1, 3.1.1, 3.6.2, 3.6.3, 3.6.4, 4.2.1, 4.3.1, 5.1.1, 5.3.1, 5.4.1, 5.4.2, 6.3.3,
Emergency Services	1.4.1, 1.5.1, 1.5.2, 1.5.3, 1.5.4, 2.3.1, 3.1.1, 3.2.1, 3.2.2, 3.2.3, 3.2.4, 3.2.5, 3.4.1, 3.5.1, 3.5.2, 3.5.3, 3.6.2, 3.6.3, 3.6.4, 5.1.1, 5.3.1, 5.4.1, 5.4.2, 6.3.3,
Environmental Hazards: Fixed Facility	1.5.1, 1.5.2, 1.5.3, 1.5.4, 2.3.1, 3.1.1, 3.6.2, 3.6.3, 3.6.4, 4.1.1, 4.1.2, 5.1.1, 5.3.1, 5.4.1, 5.4.2, 6.3.3,
Environmental Hazards: Transportation	1.5.1, 1.5.2, 1.5.3, 1.5.4, 2.3.1, 3.1.1, 3.6.2, 3.6.3, 3.6.4, 4.1.1, 4.1.2, 5.1.1, 5.3.1, 5.4.1, 5.4.2, 6.3.3,
Flood	1.1.1, 1.2.1, 1.2.2, 1.5.1, 1.5.2, 1.5.3, 1.5.4, 1.5.5, 2.1.1, 2.2.1, 2.3.1, 3.1.1, 3.6.2, 3.6.3, 3.6.4, 4.2.1, 4.3.1, 4.4.1, 5.1.1, 5.2.1, 5.3.1, 5.4.1, 5.4.2, 6.1.1, 6.1.2, 6.2.1, 6.3.1, 6.3.2, 6.3.3, 6.4.1, 6.4.2, 6.4.3, 6.4.4,
Flash Flood	1.1.1, 1.2.1, 1.5.1, 1.5.2, 1.5.3, 1.5.4, 2.1.1, 2.2.1, 2.3.1, 3.1.1, 3.6.2, 3.6.3, 3.6.4, 4.2.1, 4.3.1, 5.1.1, 5.3.1, 5.4.1, 5.4.2, 6.1.2, 6.2.1, 6.3.3, 6.4.4,
Ice Jam Flood	1.5.1, 1.5.2, 1.5.3, 1.5.4, 2.2.1, 2.3.1, 3.1.1, 3.6.2, 3.6.3, 3.6.4, 4.2.1, 4.3.1, 5.1.1, 5.3.1, 5.4.1, 5.4.2, 6.2.1, 6.3.3, 6.4.4,
Invasive Species	1.5.1, 1.5.2, 1.5.3, 1.5.4, 2.2.1, 2.3.1, 3.1.1, 3.6.2, 3.6.3, 3.6.4, 4.2.1, 4.3.1, 5.1.1, 5.3.1, 5.4.1, 5.4.2, 6.3.3,
Landslide	1.2.2, 1.3.3, 1.5.1, 1.5.2, 1.5.3, 1.5.4, 2.2.1, 2.3.1, 3.1.1, 3.6.2, 3.6.3, 3.6.4, 4.2.1, 4.3.1, 5.1.1, 5.3.1, 5.4.1, 5.4.2, 6.3.3,
Opioid Epidemic	1.5.1, 1.5.2, 1.5.3, 1.5.4, 2.3.1, 3.1.1, 3.6.2, 3.6.3, 3.6.4, 5.1.1, 5.3.1, 5.4.1, 5.4.2, 6.3.3,
Pandemic, Epidemic, and Infectious Disease	1.3.4, 1.5.1, 1.5.2, 1.5.3, 1.5.4, 2.2.1, 2.3.1, 3.1.1, 3.6.2, 3.6.3, 3.6.4, 4.2.1, 4.3.1, 5.1.1, 5.3.1, 5.4.1, 5.4.2, 6.3.3,
Radon Exposure	1.3.5, 1.5.1, 1.5.2, 1.5.3, 1.5.4, 2.2.1, 2.3.1, 3.1.1, 3.6.1, 3.6.2, 3.6.3, 3.6.4, 4.2.1, 4.3.1, 5.1.1, 5.3.1, 5.4.1, 5.4.2, 6.3.3,

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Actions Tied to Hazard	
Hazard	Actions Related
Subsidence and Sinkhole	1.3.6, 1.5.1, 1.5.2, 1.5.3, 1.5.4, 2.2.1, 2.3.1, 3.1.1, 3.6.2, 3.6.3, 3.6.4, 4.2.1, 4.3.1, 5.1.1, 5.3.1, 5.4.1, 5.4.2, 6.3.3,
Terrorism	1.5.1, 1.5.2, 1.5.3, 1.5.4, 2.3.1, 3.1.1, 3.6.2, 3.6.3, 3.6.4, 5.1.1, 5.3.1, 5.4.1, 5.4.2, 6.3.3,
Tornado	1.5.1, 1.5.2, 1.5.3, 1.5.4, 2.2.1, 2.3.1, 3.1.1, 3.6.2, 3.6.3, 3.6.4, 4.2.1, 4.3.1, 5.1.1, 5.3.1, 5.4.1, 5.4.2, 6.3.3,
Transportation Accidents	1.5.1, 1.5.2, 1.5.3, 1.5.4, 2.3.1, 3.1.1, 3.6.2, 3.6.3, 3.6.4, 5.1.1, 5.3.1, 5.4.1, 5.4.2, 6.1.3, 6.3.1, 6.3.2, 6.3.3,
Urban Fire and Explosion	1.5.1, 1.5.2, 1.5.3, 1.5.4, 2.3.1, 3.1.1, 3.6.2, 3.6.3, 3.6.4, 5.1.1, 5.3.1, 5.4.1, 5.4.2, 6.3.3,
Utility Interruption	1.4.1, 1.5.1, 1.5.2, 1.5.3, 1.5.4, 2.3.1, 3.1.1, 3.2.1, 3.2.2, 3.2.4, 3.6.2, 3.6.3, 3.6.4, 5.1.1, 5.3.1, 5.4.1, 5.4.2, 6.3.3,
Wildfire	1.3.7, 1.5.1, 1.5.2, 1.5.3, 1.5.4, 2.2.1, 2.3.1, 3.1.1, 3.6.2, 3.6.3, 3.6.4, 4.2.1, 4.3.1, 5.1.1, 5.3.1, 5.4.1, 5.4.2, 6.3.3,
Windstorm	1.5.1, 1.5.2, 1.5.3, 1.5.4, 2.2.1, 2.3.1, 3.1.1, 3.6.2, 3.6.3, 3.6.4, 4.2.1, 4.3.1, 5.1.1, 5.3.1, 5.4.1, 5.4.2, 6.3.3,
Winter Storm	1.5.1, 1.5.2, 1.5.3, 1.5.4, 2.2.1, 2.3.1, 3.1.1, 3.3.1, 3.3.2, 3.6.2, 3.6.3, 3.6.4, 4.2.1, 4.3.1, 5.1.1, 5.3.1, 5.4.1, 5.4.2, 6.3.3,

7. Plan Maintenance

7.1. Update Process Summary

Monitoring, evaluating, and updating this plan is critical to maintaining its value and success in Potter 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 2024 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 Potter County is a responsibility of all levels of government (i.e., county, and local), as well as the citizens of the county. The Potter 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. 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 Potter 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.
- Complete a review of the mitigation strategy section. Review the goals and objectives identified in the 2024 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 Potter County Department of Emergency Services will maintain a copy of these records and place them in Appendix I of this plan. Potter 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.

7.3. Continued Public Involvement

The Potter County Department of Emergency Services will ensure that the 2024 Potter County Hazard Mitigation Plan is posted and maintained on the Potter County website and will continue to encourage public review and comment on the plan. The Potter County website that the plan will be located at is as follows: <https://pottercountypa.net/post.php?pid=24>

The public will have access to the 2024 Potter County HMP through their local municipal office, the Potter County Planning Commission, or the Potter County Department of Emergency Services. 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 Potter County are encouraged to submit their comments to elected officials and/or members of the Potter County HMP Local Planning Team. To promote public participation, the Potter 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 received will be maintained and considered by the Potter County Hazard Mitigation Planning Team.

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 2024 Potter 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

APPENDIX A:	References
APPENDIX B:	FEMA Local Mitigation Review Tool
APPENDIX C:	Meetings and Support Documents
APPENDIX D:	Municipal Flood Maps
APPENDIX E:	Critical and Community Lifeline Facilities
APPENDIX F:	2024 HAZUS Reports
APPENDIX G:	2024 Mitigation Project Opportunities
APPENDIX H:	2024 Mitigation Action Evaluation & Prioritization
APPENDIX I:	Annual Review Documentation
APPENDIX J:	Potter County & Municipal Adoption Resolutions