

## 5.4.9 Utility Failure

This section provides the hazard profile (hazard description, extent, location, previous occurrences and losses, probability of future events, and climate change impacts) and vulnerability assessment for the utility failure hazard in Wyoming County.

### 5.4.9.1 Hazard Profile

#### Description

A utility failure, or power failure, is defined as any interruption or loss of electrical service caused by disruption of power transmission from an accident, sabotage, natural hazards, or equipment failure (also referred to as a loss of power or power outage). A significant power failure is defined as any incident of a long duration that would require involvement of local and/or state emergency management organizations to coordinate provision of food, water, heating, cooling, and shelter.

Widespread power outages can occur without warning or as a result of a natural disaster. Generally, warning times will be short in the case of technological failure, such as a fire at a sub-station, traffic accident, human error, or terrorist attack. In cases where a power failure is caused by natural hazards, greater warning time is possible. For example, high-wind events such as tornados and hurricanes often cause widespread power failure and are frequently forecasted before they affect a community. Additionally, severe winter weather conditions, such as ice storms, blizzards, and snowstorms, often cause power failure. In most cases, incidents such as these afford ample warning time, allowing power response crews to stage resources in preparation for power failure.

Power failures can cause secondary hazards that affect health of residents. One potential secondary hazard includes chemical accidents, which occur after restoration of power to industrial facilities. Power interruptions at chemical handling plants are of particular concern because of the potential for a chemical spill during restart (U.S. Environmental Protection Agency [EPA] 2001). Chemical spills can exert significant health and environmental impacts.

Another secondary hazard that can result from power failure is loss of communications capability by first responders, which may in turn negatively affect public safety. Backup systems, such as amateur radio operators, may be required during a disaster to augment communications capabilities. Power outages can also lead to instances of civil disturbance, such as looting.

Wastewater and potable water utility interruption may occur as a result of a power failure. These critical utilities are essential to community continuity and recovery. Interruption of service may result in cascading economic and environmental impacts.

Power failure can significantly affect health of the community. During periods of extreme heat or extreme cold, vulnerable populations, such as the elderly and medically frail, can suffer during power failures and are susceptible to hypothermia or heat stroke. Additionally, power failure can lead to food spoilage, which also negatively impacts public health.

Power failure may also lead to an increase in traffic accidents because of lack of functioning traffic control devices such as stoplights and railroad crossing advisory signals. Power outages of long duration will force law enforcement officials to man traffic control points to prevent accidents, which may delay or prevent those officers from responding to other emergency incidents.

### Extent

The extent and severity of a power outage depends on the cause, location, duration, and time of year. An incident can range from a small, localized event to a Countywide power outage. Impacts from an outage can be significant to the County and its residents. Power outages typically occur because of, or in combination with, other emergency or disaster incidents, such as severe weather and flooding, and can exacerbate such emergencies. Severity of an incident will also depend on the electrical distribution system affected.

Power failures lead to inability to use electric-powered equipment, such as lighting; heating, ventilation, and air conditioning (HVAC) units and necessary equipment; communication equipment (telephones, computers, etc.); fire and security systems; small appliances (refrigerators and sterilizers); and medical equipment. Interruption of service for any of these types of equipment can lead to a number of issues including food spoilage, loss of heating and cooling, basement flooding due to sump pump failure, and loss of water due to well pump failure.

### Location

Utility failures in Wyoming County are usually localized and are typically the result of a natural hazard event involving high winds or ice storms. The primary electricity and gas utility providers in Wyoming County are National Fuel Gas Distribution Corporation, Rochester Gas & Electric, Consolidated Edison Company of New York, Inc., and National Grid. Table 5.4.9-1 provides the electric and gas utility providers serving the towns (T) and villages (V) in Wyoming County.

**Table 5.4.9-1. Electric and Gas Utility Providers in Wyoming County**

Jurisdiction	National Fuel Gas Distribution Corporation	Rochester Gas & Electric	New York State Gas and Electric Corporation	Consolidated Edison Company of New York, Inc.	National Grid
Arcade (T)	x	x		x	
Arcade (V)	x			x	
Attica (T)	x			x	x
Attica (V)	x			x	x
Bennington (T)	x		x	x	
Castile (T)	x		x	x	
Castile (V)	x			x	
Covington (T)	x			x	x
Eagle (T)	x	x		x	
Gainesville (T)	x		x	x	
Gainesville (V)			x		
Genesee Falls (T)	x	x	x	x	
Java (T)	x		x	x	
Middlebury (T)			x	x	x
Orangeville (T)	x			x	x
Perry (T)			x		
Perry (V)			x		
Pike (T)	x	x		x	
Sheldon (T)	x		x	x	
Silver Springs (V)	x			x	
Warsaw (T)			x		

Jurisdiction	National Fuel Gas Distribution Corporation	Rochester Gas & Electric	New York State Gas and Electric Corporation	Consolidated Edison Company of New York, Inc.	National Grid
Warsaw (V)		X	X		
Wethersfield (T)					X
Wyoming (V)			X	X	

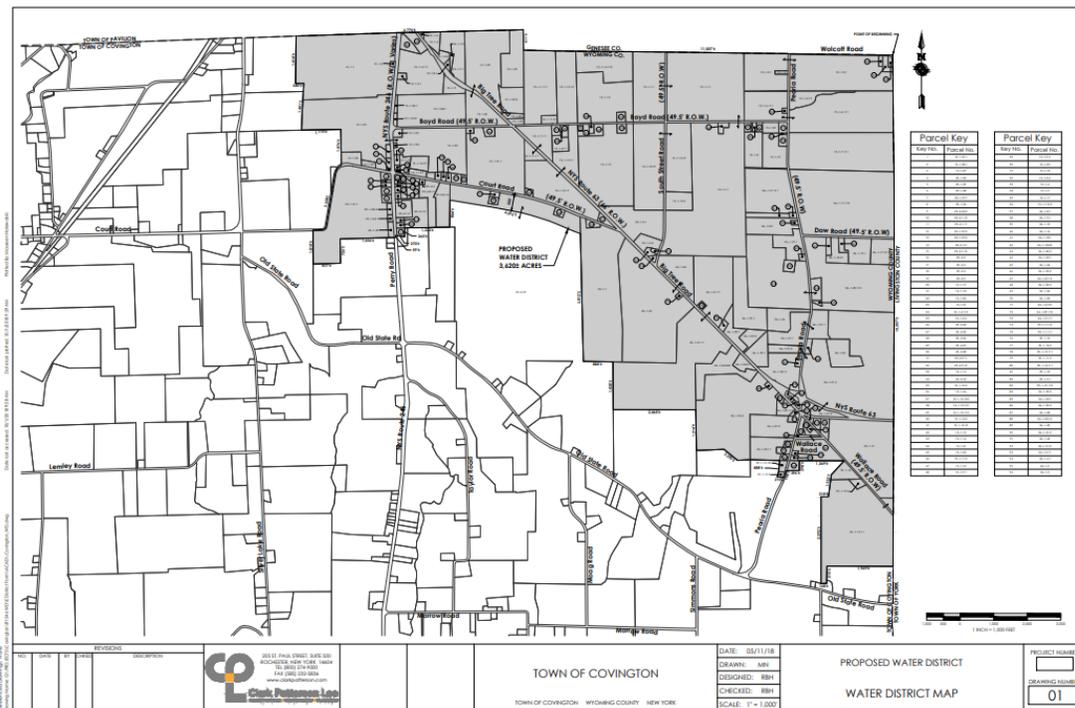
Source: NYSERDA 2019; Middlebury n.d.; Warsaw n.d.

Some areas depend on residential propane tanks for gas service. These companies can generally handle minor interruptions of service. Interruptions are possible anywhere utility service is provided.

Potable water in Wyoming County is provided by the County. In 2013, the Wyoming County Board of Supervisors created the Wyoming County Water Resource Agency (WCWRA). The WCWRA reports to the Wyoming County Board of Supervisors Planning Committee but also has its own independent Board of Directors. The WCWRA provides water sampling; emergency leak detection services (including surveys); geographic information system (GIS) mapping services; asset management planning; and assistance for municipalities with water service expansion plans, including developing long-range plans for potential expansion of public water service areas (Wyoming County n.d.).

Most communities within Wyoming County rely on their community members’ private wells and their own public works water treatment plants for water supply. The Towns of Covington, Perry, and Sheldon utilize special water districts for their residents. The Town of Covington utilizes the Water District #2 to supply public water. As of January 2019, the Town of Covington was still in the planning process for the project. Figure 5.4.9-1 shows the Town of Covington’s Water District #2 service area map.

**Figure 5.4.9-1. Town of Covington's Water District #2 Service Area Map**



Source: Covington 2019



The Perry Center Water District was formed in the Town of Perry in 2000 and provides potable water and hydrant services to 75 parcels along NYS Route 246 and US Route 20A in Perry Center. The Town of Sheldon utilizes the Varysburg Water District.

### **Previous Occurrences and Losses**

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Between 1954 and 2019, the Federal Emergency Management Agency (FEMA) included New York State in one emergency declaration (EM-3186 in 2003 – the Great Northeast Blackout) classified solely as a power outage. Generally, utility-failure disasters have covered a wide region of the state; therefore, they may have impacted many counties. While not all New York counties were included in the disaster declaration, Wyoming County was included in this declaration (FEMA 2020).

For this 2021 Hazard Mitigation Plan (HMP) Update, known utility failure events that have impacted Wyoming County between 2015 and 2019 are identified in Table 5.4.9-2. Because information regarding specific details of utility failures in the County is scarce, knowledge of previous occurrences and losses associated with these events is limited. Therefore, Table 5.4.9-2 may not include all events that have occurred in the County.

Table 5.4.9-2. Utility Failure Events in Wyoming County, 2014 to 2019

Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
October 31, 2019 – November 1, 2019	High Wind	N/A	N/A	Thousands of power outages occurred across the area, and pervasive wind-related damage closed hundreds of roads and did countless tree damage. High winds and lakeshore flooding continued into November 1. Regional damage was estimated to be \$500,000.
February 24, 2019	High Wind	N/A	N/A	Many reports were received of trees and wires down throughout the County causing substantial structural damage to homes and businesses. Thousands were reported without power. Damage was estimated to be \$20,000.
February 11, 2019	Boil Water Notice	N/A	N/A	A Boil Water Notice was issued for the week of February 11, 2019, for the Town and Village of Warsaw due to a water main break causing a drop in water pressure, leading to a storage tank being drained.
January 1, 2019	High Wind	N/A	N/A	Storms brought high winds and gusts reported up to 61 mph. Trees and wires were reported down across the county, causing \$5,000 in estimated damage.
September 21, 2018	Thunderstorm Winds	N/A	N/A	Thunderstorm winds brought trees and wires down in the Java Center, Warsaw, and Castile areas. Damage was estimated to be \$2,000.
April 14, 2018	Ice Storm	N/A	N/A	Two rounds of mixed winter precipitation moved over the area resulting in sleet and freezing rain before temperatures eventually increased above freezing. Several areas saw nearly an inch of sleet combined with around one half of an inch of freezing rain. This resulted in thousands of power outages and substantial tree damage. Freezing rain combined with wind caused multiple trees and power lines to fall. Damage was estimated to be \$15,000.
April 4, 2018	High Wind	N/A	N/A	Damaging wind gusts occurred across the entire area with multiple trees and wires down. Damage was estimated to be \$20,000.
March 1, 2018	Winter Storm	N/A	N/A	A winter storm brought a blanket of heavy, wet snow across the entire region, including Wyoming County. There were also several reports of downed trees and wires due to the combination of the weight of the snow and the brisk winds that accompanied the storm. Snowfall amounts measured 25 inches near Wyoming, 18 inches near Varysburg, 16 inches at Arcade and Warsaw, and 15 inches near Silver Springs. Damage was estimated to be \$50,000.
October 15, 2017	Thunderstorm Winds	N/A	N/A	Thunderstorms ahead of a strong cold front produced damaging winds and downed power lines in Strykersville, Attica, Arcade, Warsaw, Gainesville, Perry, and Castile. Damage was estimated to be \$10,000.
July 12, 2017	Thunderstorm Winds	N/A	N/A	An isolated thunderstorm crossed Wyoming County during the evening hours. The thunderstorm winds downed trees and blew over a barn in Eagle causing power outages. Damage was estimated to be \$15,000.

Table 5.4.9-2. Utility Failure Events in Wyoming County, 2014 to 2019

Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
June 15, 2017	Thunderstorm Winds	N/A	N/A	A warm front brought soaking rainfall to Wyoming County, causing thunderstorms to reach severe limits with trees and wires reported down near Silver Lake. Damage was estimated to be \$25,000.
May 1, 2017	Thunderstorm Winds	N/A	N/A	A line of thunderstorms just ahead of the front produced damaging winds that downed trees and wires across western New York, affecting Arcade and Pike. Damage was estimated to be \$1,000.
April 4, 2017	High Wind	N/A	N/A	Strong winds followed the passage of a cold front bringing measured wind gusts as high as 59 mph. The strong winds downed trees and power lines throughout the region. A portion of Route 19 in Warsaw was closed by downed trees and wires. Damage was estimated to be \$3,000.
March 8, 2017	High Wind	N/A	N/A	Severe windstorms with gusts in excess of 65 mph reported in Warsaw caused numerous wires to down and poles to break throughout the County, which resulted in widespread power outages. National Grid brought in crews from unaffected areas of the region to help with the restoration efforts. Estimates indicated about 164,000 customers in western New York were without power including Wyoming County. Damage was estimated to be \$100,000.
March 1, 2017	High Wind	N/A	N/A	Strong winds following a cold front downed trees and powerlines. Measured wind gusts were 62 mph near Warsaw. Damage was estimated to be \$25,000.
February 15, 2017	Lake-Effect Snow	N/A	N/A	A lake-effect snow developed off Lake Erie and Lake Huron, bringing 10 inches of snow to Warsaw. Damage was estimated to be \$15,000.
July 25, 2016	Thunderstorm Winds	N/A	N/A	Thunderstorm winds downed trees and powerlines on Perry Road and Route 78. Several thousand power outages were reported throughout Strykersville and Attica Center.
June 20, 2016	Thunderstorm Winds	N/A	N/A	Several rounds of thunderstorms developed ahead of a cold front, causing widespread wind damage consisting of downed trees and powerlines in Bennington, Orangeville, Strykersville, Sheldon, Warsaw, Java Center, Pike, Gainesville, and Eagle. An isolated storm near Silver Springs producing 1-inch hail. Damage was estimated to be \$15,000.
June 12, 2015	Thunderstorm Winds	N/A	N/A	Strong thunderstorms produced damaging winds that downed trees and powers lines across the Wyoming County, specifically Warsaw.
April 10, 2015	High Wind	N/A	N/A	High winds in the wake of a cold front brought 58-62mph winds, snapping utility poles leaving tens of thousands without power over an eight-county area, including Wyoming County.
December 25, 2014	High Wind	N/A	N/A	A low-pressure system pushed a cold front across the region and the strong winds gusted to 67 mph and brought down numerous trees and power lines.

Table 5.4.9-2. Utility Failure Events in Wyoming County, 2014 to 2019

Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
November 17, 2014	Lake-Effect Snow	DR-4204	Yes	This lake-effect snow event will be remembered as one of the most significant in Buffalo, NY history. Over 5 feet of snow fell east of Buffalo, 13 fatalities, hundreds of major roof collapses and structural failures, thousands of stranded motorists, food and gas shortages due to impassable roads. Numerous trees also gave way due to the weight of the snow, causing isolated power outages.
July 8, 2014	Thunderstorm Wind	N/A	N/A	A cold front brought severe thunderstorms and winds producing widespread damage throughout the region. Trees and power lines were downed causing power outages. Damage was estimated to be \$15,000.
June 17, 2014	Hail	N/A	N/A	A large area of showers and thunderstorms developed across the region. Several of the thunderstorms produced strong, damaging winds. Damage was mainly reported as downed trees and wires however there were some reports of structural and other damage.
May 9, 2014	Thunderstorm Wind	N/A	N/A	Isolated thunderstorms became severe with winds downing trees and power lines in Cowlesville. Damage was estimated to be \$25,000.
January 6, 2014	High Wind	N/A	N/A	A sharp cold front crossed the region and winds gusted as high as 60 miles per hour. Downed trees and power lines were reported causing \$15,000 in property damage.

Source: NOAA-NCEI 2020; FEMA 2020; WHAM 2019  
 mph Miles per Hour  
 NCEI National Centers for Environmental Information  
 NOAA National Oceanic and Atmospheric Administration

### Probability of Future Events

While the probability of future utility failure incidents in Wyoming County is difficult to predict, the historical record indicates that previous utility failures have occurred as a result of high winds, thunderstorm winds, and winter weather. As infrastructure ages beyond its intended lifespan, it is likely to become less reliable leading to a higher likelihood of failure. Data were not readily available on the frequency of smaller utility interruptions across the County; however, it is reasonable to assume that utility failure events of shorter duration will continue to occur in the future. In addition, future changes in climate may also impact the frequency and probability of future utility failure occurrences.

Section 5.3 of this HMP lists the ranking of all identified hazards of concern for Wyoming County. Probability of occurrence, or likelihood of the event, is one parameter used for hazard rankings. Based on historical records and input from the Planning Partnership, probability of occurrence of utility failures in the County is considered “frequent” (likely to occur within 25 years).

### Climate Change Impacts

Climate change is beginning to affect both people and resources in New York State, and these impacts are projected to continue and become more significant. Impacts related to increasing temperatures and sea level rise are already evident in the state. The Integrated Assessment for Effective Climate Change in New York State (ClimAID) was undertaken to provide decision makers with information on the state’s vulnerability to climate change, and to facilitate development of adaptation strategies informed by both local experience and scientific knowledge (New York State Energy Research and Development Authority [NYSERDA] 2014).

Each region in New York State, as defined by ClimAID, has attributes that will be affected by climate change. Wyoming County is part of Region 1, Western New York and Great Lakes Plain. Some characteristics and issues associated with climate change in this region include relatively low rainfall, increased summer drought risk, high-value crops requiring irrigation, and projected improved condition for grapes (NYSERDA 2014). This region contains an area producing the highest agricultural revenue in the state..

Temperatures are expected to increase throughout the State by 2° F to 3.4° F by the 2020s, 4.1° F to 6.8° F by the 2050s, and 5.3° F to 10.1° F by the 2080s. The lower ends of these ranges assume lower greenhouse gas emissions scenarios, and the higher ends assume higher greenhouse gas emissions scenarios. Annual average precipitation is projected to increase by up to 1 to 8 percent by the 2020s, up to 3 to 12 percent by the 2050s, and up to 4 to 15 percent by the 2080s. By the end of the century, the greatest increases in precipitation are projected to be in the northern parts of the State. Although seasonal projections are less certain than annual results, this additional precipitation will most likely occur during the winter months, with the possibility of slightly reduced precipitation projected for the late summer and early fall. Table 5.4.9-3 lists projected precipitation changes within the Western New York Great Lakes ClimAID Region (NYSERDA 2014).

**Table 5.4.9-3. Projected Seasonal Precipitation Change in Region 1, 2020-2100 (% change)**

Baseline (1971-2000) 34.0 inches	Low Estimate (10 <sup>th</sup> Percentile)	Middle Range (25 <sup>th</sup> to 75 <sup>th</sup> Percentile)	High Estimate (90 <sup>th</sup> Percentile)
2020s	0 percent	+ 2 to + 7 percent	+ 8 percent
2050s	+ 2 percent	+ 4 to + 10 percent	+ 12 percent
2080s	+ 1 percent	+ 4 to + 13 percent	+ 17 percent
2100	- 3 percent	+ 4 to + 19 percent	+ 24 percent

Source: *NYSERDA 2014*

Climatologists predict an increase in the number and intensity of severe weather events. More storms with higher winds will increase the chance that the power infrastructure will be impacted. Extreme temperatures are

predicted to increase as well. During the hot summer months, potential for power overload will increase as demand for power increases. Additionally, climatologists predict an increase in precipitation, which may lead to more winter weather, thus causing additional power failures.

### **5.4.9.2 Vulnerability Assessment**

To understand risk, a community must evaluate the assets that are exposed or vulnerable within the identified hazard area. For the utility failure hazard, all of Wyoming County has been identified as the hazard area. Therefore, all assets in the County (population, structures, critical facilities, and lifelines), as described in the County Profile (Section 4), are vulnerable to a utility failure. This section discusses the potential impact of the utility failure hazard on the County. Specifically, this section addresses:

- Overview of vulnerability
- Data and methodology used for the evaluation
- Impacts on (1) life, health, and safety of residents; (2) general building stock; (3) critical facilities; and (4) future growth and development
- Change of vulnerability as compared to that presented in the 2015 Wyoming County Hazard Mitigation Plan
- Further data collections that will increase understanding of this hazard over time.

#### **Overview of Vulnerability**

The entire County is vulnerable to the utility failure hazard. Loss of power can exert serious impacts on the health and welfare of residents, continuity of businesses, and ability of public safety agencies to respond to emergencies. Individuals with medical needs are vulnerable to power failures, because medical equipment (such as oxygen concentrators) requires electricity to operate. Elderly residents are also vulnerable to the effects of power failure, as power failure could expose older residents to extreme heat or extreme cold. According to the U.S. Census 2019 population estimates, between 2014 and 2018, there were 15,815 housing units in Wyoming County (U.S. Census 2019). Most of these housing units rely on electricity to power in-home heating systems. Individuals living in these households will be exposed to significantly colder (winter months) or hotter (summer months) indoor temperatures during a utility failure. Those that use utility gas for home heating will be less vulnerable.

During power failure events, water purification systems may not function. Further, populations relying on private wells will not have access to potable water. Many power outage events are caused by storm events that can lead to flooding. Without electricity, residents would be unable to pump water from their basements, potentially causing structural and content damage to their homes. Section 5.4.4 (Flood) includes a more detailed discussion of the County's vulnerability to the flood hazard.

#### **Data and Methodology**

Data were collected from Wyoming County and the Planning Partnership. Insufficient data were available to model potential long-term impacts of a utility failure on the County. Over time, additional data will be collected to allow better analysis of this hazard. Available information and a preliminary assessment are provided below.

#### **Impacts on Life, Health, and Safety**

For the purposes of this HMP, the entire population in Wyoming County is considered vulnerable to utility failure events. The County Profile (Section 4) includes a summary of population statistics for the County. Utility failures pose potential health impacts, including injury and death. Other issues pertaining to power outages include food safety from lack of refrigeration and carbon monoxide poisoning from misuse of generators.

Individuals with medical needs are vulnerable to power failures, because medical equipment (such as oxygen concentrators) requires electricity to operate. The elderly population is also vulnerable to the effects of power failure, as power failure could expose older residents to extreme heat or extreme cold. During power failure events, water purification systems may not function. Further, populations relying on private wells will not have access to potable water. Many power outage events are caused by storm events that can lead to flooding. Without electricity, residents would be unable to pump water from their basements, potentially causing structural and content damage to their homes.

Interruption of potable water distribution also has a considerable impact on the firefighting capabilities of many fire departments within Wyoming County. Wyoming County's fire departments rely on the pressurized water system that supplies the fire hydrant connections for fire suppression. Most of the firefighting apparatus in the County relies on these fire department connections for adequate fire suppression. Should frequent or widespread water interruption occur, there will be an increased risk for structural fire and wildfire occurrence within the County.

### **Impacts on General Building Stock**

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The entire building stock of Wyoming County is exposed and is considered vulnerable to the utility failure hazard. The County Profile (Section 4 of this HMP) summarizes the building inventory of the County. Impacts sustained from utility interruption are likely to be secondary impacts. Should potable water distribution be reduced or not available, then structures could be at increased risk for structural fire since current fire suppression is dependent accessing water supply from hydrants.

### **Impacts on Critical Facilities**

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During a power outage event, the County may undergo losses because of an interruption of critical services. Further, increased costs, such as providing shelters and costs related to cooling and heating centers may be incurred. Extended power outages will require officials to shelter victims who require heat and power for activities of daily living. Power interruptions can cause economic impacts stemming from lost income and spoiled food and other goods, costs to the owners/operators of the utility facilities, and costs to government and community service groups.

Backup power is recommended for critical facilities and infrastructure. Loss of power can have serious impacts on the health and welfare of residents, continuity of business, and the ability of public safety agencies to respond to emergencies. Interruption of utility gas or water distribution could also reduce the effectiveness of critical facilities to operate at full capacity.

### **Future Growth and Development that May Impact Vulnerability**

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Understanding future changes that impact vulnerability in the County can assist in planning for future development and ensuring that appropriate mitigation, planning, and preparedness measures are in place. The County considered the following factors to examine potential conditions that may affect hazard vulnerability:

- Potential or projected development
- Projected changes in population
- Other identified conditions as relevant and appropriate, including the impacts of climate change

As discussed in the County Profile (Section 4 of this HMP), areas targeted for future growth and development have been identified across Wyoming County. Any areas of growth could be impacted by the power outage hazard because the entire County is exposed and vulnerable. Specific areas of development are indicated in tabular form and/or on the hazard maps included in the jurisdictional annexes in Volume II of this plan.



An increase in population within Wyoming County could potentially lead to a higher likelihood of utility failure due to an increased demand on aging infrastructure. If utility infrastructure is not maintained and enhanced to accommodate for future demands, then there is a higher likelihood for more frequent utility interruptions. Increased frequency of utility interruptions will lead to an increased risk for socially vulnerable populations and a heightened risk for structural and wildfire because of the current reliance of fire hydrants for fire suppression in Wyoming County.

### **Additional Data and Next Steps**

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For future plan updates, Wyoming County can track data on power outage events and obtain additional information on past and future events, particularly in terms of any injuries, deaths, shelter needs, pipe-freeze incidents, and other impacts. These data will help to identify any concerns or trends for which mitigation measures should be developed or refined. In time, quantitative modeling of estimated power outage events may be feasible as data are gathered and improved.