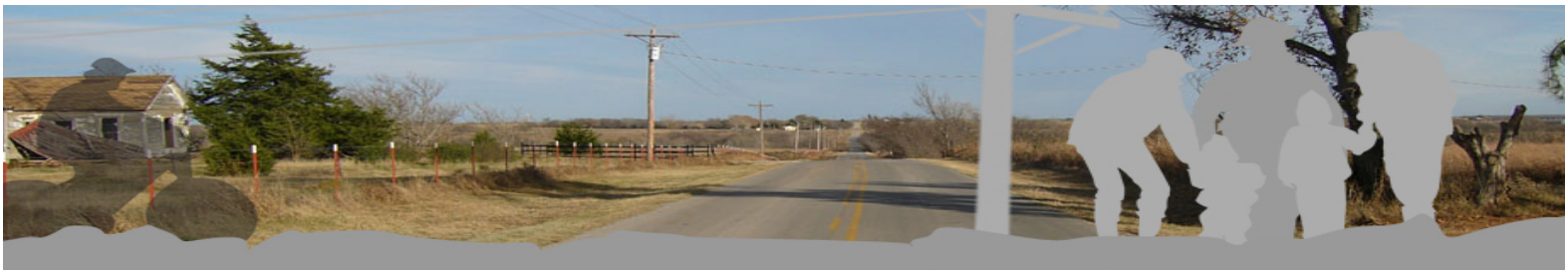

# Hazard Risk Assessment

## *Power and Water Outages*



## Power and Water Outages

This section introduces both power and water outages. Power and water outages can be caused by both natural events and caused by humans. Resources are available to assist you in completing this assessment in the Risk Assessment Resources section.

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### Risk Rating

The following includes factors that can lead to power and water outages.

## Power Outages

### Definition

Power and telecommunication outages often occur in heavy winds, ice or snow storms. Most inhabited areas in the country have access to electricity and with Canada's climate and geography electricity is considered essential in order to maintain heat, provide water and cooking facilities.

### Discussion

The areas most vulnerable to power outage in Canada are rural areas, areas of heavy concentrations of population, and with severe winter conditions. Outages can occur when hydro poles are damaged and fail; or when lines are cut because of wind and snow or when trees and other debris land on them. Power outages can also occur during landslides, avalanches, and earthquakes and frequently occur as a result of accidents. As well, equipment failure in a substation or a transformer, overuse of electrical power can cause brownouts, reduced electrical capacity or power outages.

Other causes of power outages include lightning, defective equipment, and the human element. On average, over a five-year period, approximately 75 percent of all customer outage incidents and 85-90 percent of all customer outage hours were due to distribution system problems.[1]

Many dairy farmers are dependent upon electricity for milking cows and for the survival of animals, such as pigs and chickens, during the winter months. Greenhouse farmers, are also dependent upon electricity to maintain their crops. Faced with prolonged power outages, especially in the winter, many commercial and industrial operations would suffer from severe economic loss.

With the dependence today on telecommunications, any outages of high speed cable networks, wireless communication networks, or telephone service can quickly immobolize businesses and affect emergency response services. Cable faults are costly to repair and difficult to locate. As a result, underground systems have lower outage frequencies, but the duration of an outage once it occurs is typically much longer than on an equivalent overhead system. Outage times to find faults and repair them typically range from 8–48 hours or longer[2].

## It Happened Here…

On August 14, 2003 at 4:11pm the community of Attawapiskat, Ontario (population 1,000) lost power along with an estimated 10 million people in Ontario and 45 million people in the U.S. in what is now known as the Northeast Blackout[3]. The power remained out for days and a state of emergency was declared.

In January 1998 a huge ice storm hit eastern Ontario, Quebec and New Brunswick resulting in power outages and a state of emergency being declared[4]. Notre-Dame-de-Bonsecours, Quebec (population 275) lies in the area known as the Triangle of Darkness that remained without electricity for weeks. At least 25 people died, primarily from hypothermia. Many animals also perished as farmers were no longer able to provide water or adequate ventilation in their barns.

## Power Outages[5, 6] - Natural and Human-caused

| **Hazard Rating** | High Risk ☐ | Low Risk ☐ | Need More Info ☐ | Not Applicable ☐ |
|---|---|---|---|---|

| Yes | No | Need More Info | Not Applicable | FACTORS |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | Extreme weather events such as ice storms, windstorms and hurricanes can cause outages. Does your community experience extreme weather events (Refer to section on Atmospheric hazards)? |
| ☐ | ☐ | ☐ | ☐ | Earthquakes can cause power outages. Is your community at risk for earthquakes (Refer to section on Earthquakes) |
| ☐ | ☐ | ☐ | ☐ | Trees falling on exposed power wire can cause outages, this is especially so for older trees which fall more regularly. Are the power wires in/near your community in close proximity to trees? |
| ☐ | ☐ | ☐ | ☐ | Construction equipment can make contact with overhead power lines and/or uncover underground wires cause outages. Does your community continually have large amounts of construction occurring near or around it? |
| ☐ | ☐ | ☐ | ☐ | When it strikes power equipment lightening can cause outages. Does your community regularly experience lightening (Refer to section on Atmospheric hazards)? |
| ☐ | ☐ | ☐ | ☐ | Mudslides and snow slides can cause outages. These events occur on slopes. Is your community's power lines/equipment located on and/or near slopes such as hills? |

| | | | | |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | Flooding can damage power equipment. Is your community susceptible to flooding (Refer to section on Flooding)? |
| ☐ | ☐ | ☐ | ☐ | Forest, wildland and wildland urban interface fires can damage power equipment. Is your community susceptible to forest, wildland and wildland urban interface fires (Refer to section on Flooding)? |
| ☐ | ☐ | ☐ | ☐ | Heat waves can result in overuse of power and result in power failures. Is your community susceptible to heat waves (Refer to section on Atmospheric hazards)? |

# Water Outages

## Definition

Water outages are situations when a community loses access to water. [7]

## Discussion

Water outages can occur due to a number of causes including street work, pump failures, earthquakes, and flooding. Another cause of water outages is a lack of power. Water outages can create a variety of problems including the lack of sanitary facilities, lack of fire fighting capabilities, and lack of coolant in water-cooled equipment. Hospitals and health care facilities are very dependent upon water.

Approximately 74% of potable water in Canada comes from surface supply while 26% is through groundwater. With increasing concerns regarding the long-term availability of water as a result of climate change and human activity there are potential concerns in the Prairie Provinces.[8]

## It Happened Here…

A snowstorm on May 4, 2010 knocked out power to several water pumps around 6 am in the community of Cardiff, Ontario (population 1100)[9]. The community was without running water for 5 hours.

A frozen waterline disrupted water service to the community of Dalles First Nation, Ontario (population 330). Fourteen elderly and children were evacuated to hotels while band council members worked with contractors to restore service to the 28 affected homes[10].

## Water Outage[11] - Natural Human-caused

| **Hazard Rating** | High Risk ☐ | Low Risk ☐ | Need More Info ☐ | Not Applicable ☐ |
|---|---|---|---|---|

| Yes | No | Need More Info | Not Applicable | FACTORS |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | Gray cast iron pipes are the pipe material most utilities are experiencing failure with due to their brittleness. Pipe failure can cause water outages. Is your community's water supplied through gray cast iron pipes? |
| ☐ | ☐ | ☐ | ☐ | Old pipes fail more frequently. Are the pipes that supply your community's water old? |
| ☐ | ☐ | ☐ | ☐ | Power outages can cause water outages if pumps or other equipment cannot operate. Is your community at risk for power outages (Refer to the previous section on Power Outages)? |

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