COMMUNITY

RISK PROFILE

Annex 018

ABSTRACT

This annex will provide guidance about the risks that impact Dufferin County.

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Appreciation

This Community Risk Profile would not have been possible without the valuable contribution of the following people:

- Belinda Zegill – Manager, Dufferin Oaks
- Brad Lemaich – Chief, Shelburne and District Fire Department
- Brenda Patton – Resident
- Brenda Wagner – Administrator, Dufferin Oaks
- Brendan MacMullin – Project Lead
- Bruce Barbeau – Resident
- Cheri French – Manager, Dufferin County
- Dave Menary – Manager, Township of East Garafraxa
- Denise Holmes – CAO, Township of Melancthon
- Denyse Morrissey – CAO, Town of Shelburne
- Glenn Sterrett – Manager, Town of Grand Valley
- Jane Wilson – CAO, Town of Grand Valley
- Jean Guttridge – Resident
- Jim Clayton – Chief, Mulmur-Melancthon Fire Department
- John Lackey – Manager, Town of Orangeville
- Keith Palmer – Director, Community Services
- Mark Quinten – Sergeant, Ontario Provincial Police
- Matt Doner – Manager, Town of Mono
- Meghan Townsend – Deputy Clerk, Town of Grand Valley
- Mike Richardson – Deputy Chief, Orangeville Fire Department
- Neil Cowan – Technician – Grand Valley
- Pam Hillock – Clerk, Dufferin County
- Paul Hogeveen – Resident
- Scott Martin – Manager, Dufferin County
- Steve Murphy – Community Emergency Management Coordinator
- Tom Reid – Chief, Dufferin County Paramedics

Introduction

This community risk profile examines the highest risk hazards identified in the Provincial Hazard Identification and Risk Assessment (HIRA) with regard to community vulnerabilities and capacities. The HIRA was put together in compliance with provincial standards and uses various definitions and terms taken directly from the Emergency Management Ontario HIRA workbook. The following topics are explored for each hazard, where possible:

Vulnerabilities- Aspects of a community that makes it more likely to be impacted or more severely impacted by a hazard.

*Vulnerable populations-*This section identifies which populations or areas are the most vulnerable to the specific hazard

Social Impacts- The direct negative consequence of a hazard on the physical health of people.

Property Damage- The direct negative consequence of a hazard on buildings, structures and other forms of property, such as crops.

Environmental Damage- The negative consequence of a hazard on the environment, including the soil, water, air and/or plants and animals.

Business/Financial Impact- The negative economic consequences of a hazard.

Psycho-Social Impact- The negative response of a community or a subset of the community to a hazard caused by their perception of risk. This included human responses such as self-evacuation, mass panic and other potential undesirable responses.

Critical Infrastructure Impact- Discusses what critical infrastructure is likely to be impacted by the hazard. Critical infrastructure is a collection of resources required for a community's functioning and may include electricity and utilities, communications systems, transportation, health care, economy, and natural environment.

Changing Risks- The frequency and consequence can be influenced by factors such as mitigation actions and climate change. Changing risks helps to account for these changes.

Capacity- This section refers to resources the County of Dufferin has to help provide an effective response to the specific hazard.

Mitigation and prevention- Mitigation and prevention are proactive measures meant to take place before the hazard occurs. Mitigation aims to reduce the impact the hazard has, while prevention aims to prevent the hazard from occurring in the first place.

Preparedness- Preparedness occurs when the County is getting ready for a hazard. This may include public warnings, resource positioning, and putting staff on standby.

Response and recovery- The response phase occurs directly after the emergency has happened. It involves activating emergency services and the emergency plan and providing for citizens' immediate, emergent needs. Recovery is what occurs after the threat is responded to. Recovery aims to restore a community affected by a hazard back to normal.

Legal Authority

"In developing its emergency management program, every municipality shall identify and assess the various hazards and risks to public safety that could give rise to emergencies and identify the facilities and other elements of the infrastructure that are at risk of being affected by emergencies."

-Emergency Management and Civil Protection Act R.S.O. 1990, c.3, s.5.1(2)

Hazard Identification and Risk Assessment (HIRA)

The HIRA is a risk assessment tool that is used to assess which hazards pose the greatest risks, the likelihood of them occurring, and the potential impact they may have. Please note that this process is not used as a prediction tool to determine which hazard will cause the next emergency. There are four steps to create and maintain a HIRA. These steps are: Hazard identification, risk assessment, risk analysis, monitor and review. The following grid is part of both the risk assessment and risk analysis step and prioritizes the hazards based on the highest risk total. The risk total is calculated using the likelihood, consequence, and changing risk of each hazard.

Risk Overview Grid

Risk	Hazards		
	Natural	*Technological*	*Human-Caused*
High	• Flooding • Snowstorm/Blizzard • Cold Wave • Ice Storm • Forest/Wildland Fire • Tornado • Heat Wave	• HAZMAT – Fixed Site • HAZMAT – Transportation • Energy Supply Emergency • Explosion/Fire • Critical Infrastructure Failure	
Medium	• Geomagnetic Storm • Lightning • Windstorm • Erosion • Drinking Water Emergency • Earthquake • Freezing Rain • Human Health Emergency • Food Emergency	• Transportation Incident – Air • Building/Structural Collapse	• Cyber Attack
Low	• Hail • Pest Infestation • Hurricane • Drought/Low Water • Fog • Land Subsidence	• Oil/Natural Gas Emergency • Transportation Incident – Rail • Nuclear Facility Emergency • Transportation Incident - Road • Radiological Emergency • Dam Failure	• Sabotage • Special Event • Terrorism • Civil Disorder

Overview:

During the HIRA process, the following hazards were identified as the highest risks within the community. These hazard were explored and documented to create this Community Risk Profile.

Natural Hazard Profiles

Flooding	
Vulnerabilities	
Vulnerable Populations	• Residents of low-lying areas, areas near bodies of water
Changing Risks	• Population growth is leading to more interaction with the hazard • Climate change is causing an increase of this hazard
Critical Infrastructure	• Transportation • Road access for emergency services • Potable water
Capacity	• Emergency services • Conservation authorities • Public works • Public Health • NGOs • Restoration contractors
Mitigation and Prevention	• Water level monitoring (already being maintained by conservation authorities) • Rain barrel usage decreases the amount of water after heavy rainfall that drains into the watershed. • Limiting construction in floodplains • Building dykes and water blocking structures near vulnerable buildings.
Preparedness	• Sandbagging buildings when floods are likely or imminent. • Public education and awareness • Issuing early warnings where possible. • Specific plans are in place with the conservation authorities.
Response and Recovery	• May need to open a shelter for displaced citizens. • Evaluate structural safety of affected buildings; allow citizens to return home where safe.

Snowstorms/Blizzard	
Vulnerabilities	
Vulnerable Populations	• All
Changing Risks	• Population growth is leading to more interaction with the hazard • Climate change is causing an increase of this hazard
Critical Infrastructure	• Risk of building collapse under snow load. • Hazardous road conditions and road closures can cause delayed emergency response. • Electricity and communications systems.
Capacity	• Emergency Services • Public Works • Environment Canada • CANWARN • ARES • Snowmobile clubs • NGOs
Mitigation and Prevention	• Early public alerting • Have redundant power sources available to critical buildings • Ensure building codes regarding snow loads are met or exceeded in County-owned buildings, and encourage residents to do the same. • Roads are closed if they are deemed to present hazardous driving conditions.
Preparedness	• Ensure an extra supply of salt, sand, and snow plows are available. • Salting and brining of the road in advance of snowfall. • Initiate school closures if hazardous road conditions are likely
Response and Recovery	• Continuous plowing and salting of the road • Consider delivering food and medications to vulnerable individuals in longer length emergencies (perhaps through liaisons with NGOs). • Monitor water levels as the snow begins to melt.

Extreme Cold	
Vulnerabilities	
Vulnerable Populations	• Elderly, infants, those with existing medical conditions • Outdoor workers • Citizens with poorly-insulated homes.
Changing Risks	• Population growth is leading to more interaction with the hazard • Climate change is causing an increase of this hazard • Number of vulnerable population is increasing
Critical Infrastructure	•
Capacity	• Emergency services • Social services • Environment Canada • NGOs and service clubs • CCAC
Mitigation and Prevention	• Provide assistance/incentives for residents with drafty homes to improve their home's heat retention.
Preparedness	• Initiate wind-chill advisory public awareness when extreme cold is forecasted. • Ensure vulnerable populations are safe.
Response and Recovery	• Warming centre may need to be opened.

Ice storms	
Vulnerabilities	
Vulnerable Populations	• All
Changing Risks	• Population growth is leading to more interaction with the hazard • Climate change is causing an increase of this hazard
Critical Infrastructure	• Electricity and communications structures • Road closures • Delayed access to emergency services
Capacity	• Emergency services • Public works • Social services • Environment Canada • CANWARN • ARES • Hydro companies • NGOs
Mitigation and Prevention	• Establish redundant electricity sources for critical infrastructure. • Ensure communications structures and power lines meet or exceed CSA standards
Preparedness	• Roads are salted or brined in advance of predicted snow or ice storms.
Response and Recovery	• Consider opening a shelter for longer-term events. • Food and medication may need to be delivered to vulnerable populations through longer-term events. • Be prepared for a power outage. • Debris Management Plan may need to be activated.

Forest Fire		
Vulnerabilities		
Vulnerable Populations	•	Outdoor enthusiasts
	•	Residents in close proximity to forests
Changing Risk	•	Population growth is leading to more interaction with the hazard
	•	Climate change is causing an increase of this hazard
Critical Infrastructure	•	Roads
	•	Natural environment
Capacity	•	Emergency services
	•	Ministry of Natural Resources and Forestry
	•	Public Health
	•	Dufferin County Forest staff
	•	Ontario Parks staff
	•	Mutual aid fire departments
Mitigation and Prevention	•	Public education on forest fire prevention.
	•	Consider MOUs with neighbouring Counties' fire departments.
Preparedness	•	Monitoring dead fuel moisture or implementing a similar dryness index monitoring system.
Response and Recovery	•	Consider ecosystem restoration efforts, as required.

Tornados	
Vulnerabilities	
Vulnerable Populations	• Trailer park/campsite visitors and residents • Outdoor enthusiasts • Those unable to seek shelter • Residents of homes that do not meet the building code.
Changing Risks	• Population growth is likely to lead to more interaction with the hazard • Climate change may cause an increase of this hazard
Critical Infrastructure	• Electricity and communications structures • Road access • Building damage
Capacity	• Emergency services • Environment Canada • CANWARN • Social services • Public works • Hydro companies • NGOs and volunteers
Mitigation and Prevention	• Encourage schools and businesses to practice tornado drills • Encourage campgrounds and trailer parks to have a warning system and a secure structure residents and guests can take shelter in.
Preparedness	• Advise residents to shelter-in-place when a tornado warning is issued, and to be ready to shelter-in-place when a watch is issued. • Public education and awareness will likely decrease losses. • Advise residents to secure loose items outdoors in advance of a wind storm if it is safe to do so.
Response and Recovery	• Address emergency health and safety issues • Remove debris from roadways to allow for emergency response • Consider need for a shelter and provide temporary housing • Debris Management Contingency Plan.

Extreme Heat	
Vulnerabilities	
Vulnerable Populations	• Elderly, infants and those with pre-existing medical conditions • Citizens without access to air conditioning systems • Outdoor workers
Changing Risks	• Population growth is leading to more interaction with the hazard • Climate change is causing an increase of this hazard • Number of vulnerable population is increasing
Critical Infrastructure	• Industry, especially companies that involve labour outdoors. • Potential for rolling brownouts.
Capacity	• Emergency services • Social services • Community centres • Environment Canada • NGOs and service clubs • CCAC (Community Care Access Centre)
Mitigation and Prevention	• Consider extending public pool hours and lowering fares on high Humidex days.
Preparedness	• Heat advisory public awareness campaigns and public education on how to prevent heat-related emergencies • Encourage outdoor workers to take frequent breaks.
Response and Recovery	• May need to open a cooling centre.

Human Health Emergencies	
Vulnerabilities	
Vulnerable Populations	• Locations with higher population densities • Health care professionals • Elderly, infants, those with pre-existing medical conditions
Changing Risks	• Population growth is likely to lead to more interaction with the hazard • Number of vulnerable population is increasing
Critical Infrastructure	• Health care • Industry • Public services
Capacity	• Emergency services • Hospitals and health laboratories • Public Health • Ministry of Health • National Emergency Stockpile System
Mitigation and Prevention	• Public education regarding hygiene and infectious disease prevention (which is done successfully by Public Health) • Continuing education courses for health care providers regarding emerging infectious diseases and best practices. • Enforcement of quarantines.
Preparedness	• Keep the public aware of the current situation and means of preventing transmission.
Response and Recovery	• Ensure quarantine measures are effective and deliver essential items like food and medication to individuals who are quarantined. • Request access to the National Emergency Stockpile System if local resources are overwhelmed.

Technological Hazard Profiles

Hazardous Materials- Fixed Site	
Vulnerabilities	
Vulnerable Populations	• Site employees • Residents in close proximity to the incident
Changing Risks	• Number of non-emergency occurrences are increasing • Business and international practices more likely to increase risk
Critical Infrastructure	• Industry • Local residences • natural environment • 911 dispatch centre and hospital are in close proximity to heavy industry • Road and railway access
Capacity	• Emergency services • CBRNE (Chemical, Biological, Radiological, Nuclear, Explosive) teams from OFMEM if local resources are overwhelmed.
Mitigation and Prevention	• Encourage heavy industry to create and share emergency plans. • Consider audits of heavy industry emergency plans by the Fire Prevention Office • Consider 'buffer zones' between heavy industry and residential areas
Preparedness	• Public education of residents near sites, including evacuation and shelter-in-place actions. • Consider training more first responders to a hazardous materials awareness level. • Regular training for health care professionals in decontamination procedures.
Response and Recovery	• Ensure mandatory reporting takes place, may need to access OFMEM's CBRNE (chemical, biological, radiological, nuclear and explosives) team if local resources are overwhelmed.

Hazardous Materials- Transportation Incident	
Vulnerabilities	
Vulnerable Populations	• People in proximity to incident
Changing Risks	• Number of non-emergency occurrences are increasing • Population growth is likely to lead to more interaction with the hazard • Business and international factors are more likely to increase the risk
Critical Infrastructure	• Road access • Natural environment • Nearby services, businesses and residences
Capacity	• Emergency services • Public works • CBRNE team from OFMEM if local resources are overwhelmed.
Mitigation and Prevention	• Consider establishing trucking bypass routes that avoid high density residential areas. • Ensure citizens are aware of shelter-in-place and evacuation procedures.
Preparedness	• Consider training more first responders to at least a hazardous materials awareness level. • Regular training for health care professionals in decontamination procedures.
Response and Recovery	• Ensure mandatory reporting takes place • Road closures may need to be coordinated. • Ensure spills are cleaned up in such a way that protects human health and the environment.

Energy Supply Emergency	
Vulnerabilities	
Vulnerable Populations	- Those requiring medical appliances that run on electricity - Homes with poor temperature regulation and retention - Farmers (specifically those with livestock)
Changing Risk	- Number of non-emergency occurrences are increasing - Population growth is leading to more interaction with the hazard - Climate change is causing an increase of this hazard - Number of vulnerable population is increasing
Critical Infrastructure	- Road delays - Fuel - Food and medications - Livestock - Industry - Communications systems
Capacity	- Emergency services - Social services - NGOs and service clubs - Hydro companies
Mitigation and Prevention	- Ensure power lines and associated structures are appropriate for the climate. - Ensure alternate redundant energy sources for essential buildings such as the EOC, dispatch centers, and hospitals. - Establish generator share programs (especially in agricultural communities) - Encourage citizens to have a 72-hour kit.
Preparedness	Have generators and fuel available.
Response and Recovery	May need to open a shelter for longer term outages, especially if temperatures are extreme.

Explosions and Fires	
Vulnerabilities	
Vulnerable Populations	• Those in close proximity to the incident
Changing Risks	• Population growth is likely to lead to more interaction with the hazard • Business and international practices more likely to increase risk
Critical Infrastructure	• Nearby residences, businesses and services • Natural environment
Capacity	• Emergency services • CBRNE team from EMO if local resources are overwhelmed.
Mitigation and Prevention	• Encourage heavy industry to maintain and share an emergency plan, consider audits of emergency plans by Fire Prevention Office
Preparedness	• Consider CBRNE training for firefighters and awareness-level training for other emergency responders.
Response and Recovery	• CBRNE teams can be requested from EMO if local resources are exceeded. • Inquiries/investigations should be initiated as required.

Critical Infrastructure Failure

Vulnerabilities	
Vulnerable Populations	• Those requiring medical appliances that run on electricity • Homes with poor temperature regulation and retention • Farmers (specifically those with livestock)
Changing Risk	• Number of non-emergency occurrences are increasing • Population growth is leading to more interaction with the hazard
Critical Infrastructure	• Food and Water • Electrical Power System • Gas and Oil • Transportation Networks • Health System • Telecommunications Systems • Financial Services
Capacity	• Emergency services • Generator share programs • Social services • ARES • NGOs and service clubs • Hydro companies
Mitigation and Prevention	• Ensure power lines and associated structures are appropriate for the climate. • Ensure alternate redundant energy sources for essential buildings such as the EOC, dispatch centers, and hospitals. • Establish generator share programs (especially in agricultural communities) • Encourage citizens to have a 72-hour kit.
Preparedness	• Have extra generators and fuel available.
Response and Recovery	• May need to open a shelter for longer term outages, especially if temperatures are extreme.

Human Caused Hazard Profiles

Cyber Attack	
Vulnerabilities	
Vulnerable Populations	• All
Changing Risk	• Human activity is likely to lead to more interaction from the public • Business and international factors are more likely to increase the risk
Critical Infrastructure	• Communication systems • Data • Website • Laptops/Computers
Capacity	• Information Technology • In-house Specialists • Resource contracts
Mitigation and Prevention	• Policies and procedures • Security systems, setups, and standards
Preparedness	• Regularly test systems
Response and Recovery	• Response plans

Conclusion

Because of the unique climate, geography, and industry the County of Dufferin and its Member Municipalities have, there are a variety of hazards that are possible or likely to occur. It is essential to understand not only the probability and consequences of each hazard, but to also understand that each hazard brings unique challenges to the table in how it impacts vulnerable populations and critical infrastructure, as well as the challenges associated with prevention, mitigation, preparedness, response, and recovery.

By analyzing vulnerabilities and current response capacity, The County of Dufferin and its Member Municipalities can more effectively plan for and respond to emergencies, and as a result build safer, more resilient communities.