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CITY OF GREATER SUDBURY

Hazard Identification and Risk Assessment

This document is available in accessible formats upon request.

Revised December 1, 2024

INTRODUCTION

Since September 11, 2001, the Government of Ontario has increased its capabilities and responsibilities in Emergency Management for the Province. The Emergency Management and Civil Protection Act changed how municipalities create and maintain their emergency plans. It has also changed the municipal focus on “Emergency Measures” (being preparedness and response) to “Emergency Management” (mitigation, prevention, preparedness, response, and recovery).

PURPOSE

The purpose of this document is to identify the hazards, which have caused, or possess the potential to cause, disastrous situations by overwhelming response capabilities within the City of Greater Sudbury. This information will aid our Emergency Management Section and Community Safety Department to prepare for more effective emergency responses and operations. The planning phase will seek to mitigate the effects of a hazard, prepare for response measures, and ensure the safety of our citizens, preserve life, and minimize damage.

OUR GOAL

The City of Greater Sudbury, Emergency Management Section’s goal is to ensure that our municipality is prepared to respond to and recover from all natural, technological and man-made emergencies by providing leadership and support through a risk-based program of mitigation, prevention, preparedness, response and recovery.

Through emergency planning, our long-term vision is to co-ordinate and support effective management, training and education to reduce the risks to citizen health, safety, security and property. The key reason for an Emergency Management Program is to support the creation of a disaster-resilient community. A realistic risk-based program properly resourced and exercised will save lives and money.

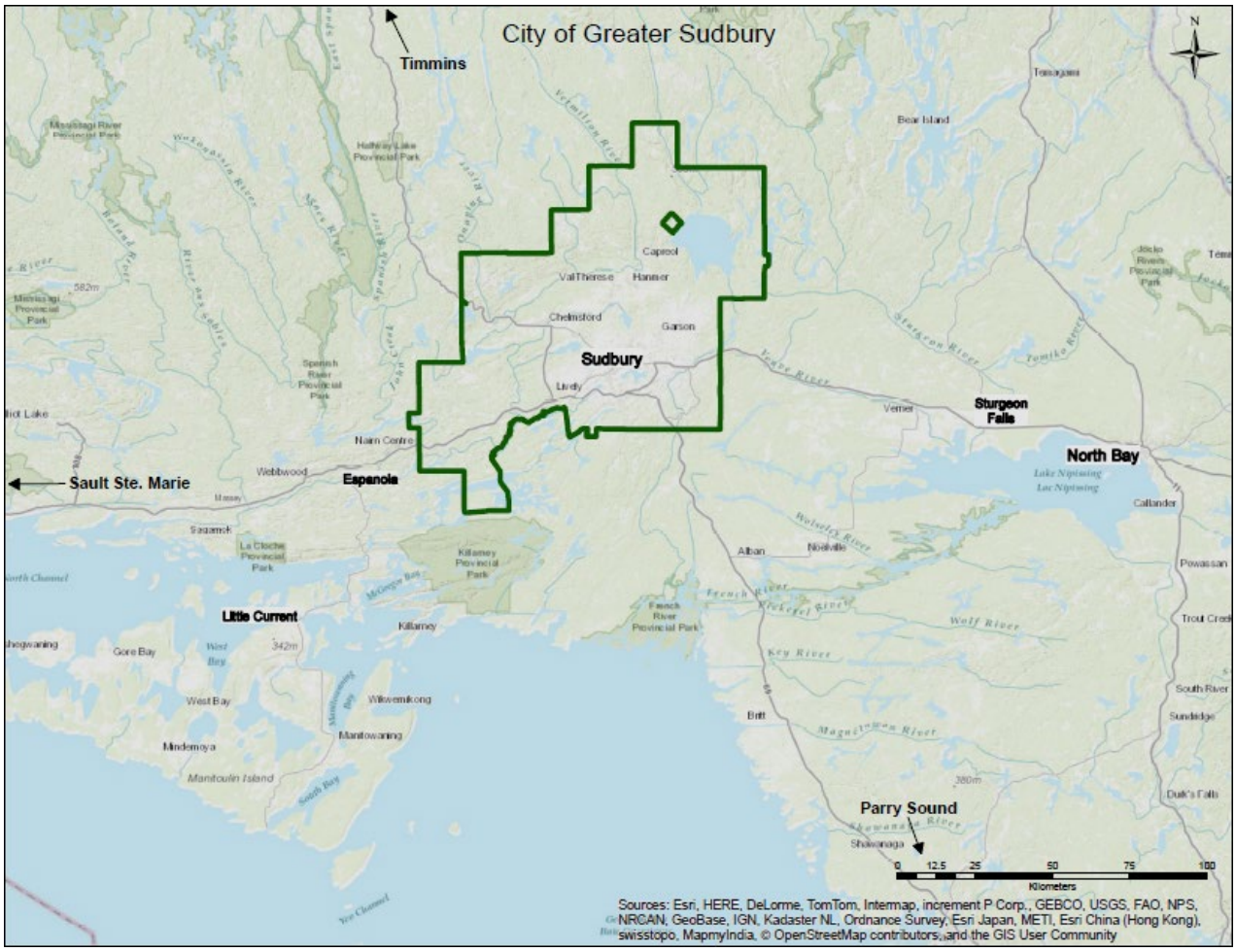
SITUATION

The City of Greater Sudbury is located on the southern edge of the Sudbury Basin in Northern Ontario (see Figure One). The city sits on the Trans-Canada Highway, connecting Western Canada to Toronto, Ottawa, and other points east of Ontario. Greater Sudbury can be reached by ground via Highways 17, 69 and 144, as well as by train and airplane. It is also important to note, is that Sudbury is considered a train hub, connecting rail lines across Ontario as well as Canada.

Sudbury is surrounded by several urban centres, both small and large including:

- Timmins, located 275 km North of Sudbury
- Ottawa, located 450 km East of Sudbury
- Toronto, located 400 km South of Sudbury
- Sault Ste. Marie, located 300 km West of Sudbury.

Figure One: City of Greater Sudbury Location Map



POPULATION

The 2021 Census estimated that 166,004 people live within the 3,627 km^2 area that makes up the City of Greater Sudbury. A breakdown of the City's population by community can be found in Figure Two. The majority of the population resides in the City proper located generally in the area formerly known as the City of Sudbury. The remainder of the City's population resides in small urban communities separated by rural development and undeveloped land.

Figure Two: Population by Community

Area	Population
Azilda	4,641
Capreol	2,934
Chelmsford	7,035
Coniston	2,027
Copper Cliff	2,374
Dill, Cleland and Dryden	1,098
Dowling	1,939
Falconbridge, Skead, Wahnapitae	4,396
Garson	5,568
Hanmer	6,134
Levack and Onaping	1,082
Lively	4,731
Naughton	899
Northeast Townships	516
Southeast Townships	1,098
Val Caron, Blezard Valley, McCrea Heights, Guilletville	6,516
Val Therese	7,562

Source: City of Greater Sudbury Demographic Data Dashboard

ECONOMY

The City of Greater Sudbury is perceived to be predominantly a mining-based community. The 2021 census lists health care and social assistance as the largest portion of the labour force in Greater Sudbury at 15.5% followed by retail trade at 11.9% and mining, quarrying, and oil and gas extraction at 9%. Educational services and construction come in fourth and fifth at 8% and 7.6%. The median household income in Greater Sudbury is $91,000.

HIRA WORKING COMMITTEE

The process undertaken to produce this report involved significant time and effort on the part of the City's Working Committee. This Committee, representing City services (Emergency Management, Public Health, Paramedic Services, Fire and Police Services), the hospital, industry and various community partners, provided the necessary information required, to determine the hazards most likely to affect the City as a whole. Currently the report is reviewed by Greater Sudbury's Community Emergency Management Coordinator and circulated to City departments and partner agencies for comment before publication. A sample form used by the City is included as Appendix 2.

HOW DEGREE OF RISK IS MEASURED

Emergency Management Ontario (EMO) provides a template for communities to use for measuring risk based on likelihood and consequence. The Emergency Management Section expanded these to include response capability (City's ability to respond to each hazard). The City of Greater Sudbury is one of the larger urban centres in Ontario that does not have an urban neighbour within one hour of travel time. Recognizing that external resources are not immediately available, response capability becomes a variable that must be considered when prioritizing risk in the community.

The Emergency Management Section used several factors when evaluating each risk. Though several methods were considered, the final product evaluated risks based on likelihood, consequence and response capabilities. Each of these factors was assigned a ranking and upon completion, all three factors were combined to provide an overall score out of a possible one mark. These risks were then placed in priority order based on their score. A high score indicated a hazard that was of high risk to the community, whereas a low score indicated a hazard that was a low risk to the community. Further details with regards to evaluating HIRA are offered below.

1. Likelihood: Ranking from 1 (rare) to 6 (certain)

When evaluating each risk's occurrence in Greater Sudbury, a great deal of statistical data was used to determine if an event had occurred in the past. Once this data was collected, each risk was ranked based on time factors, such as less than 5 years, 5-19 years, etc. High marks were assigned to those events that had taken place in the past five years, while low marks were assigned to those events that had never taken place in the Sudbury area.

2. Consequences: Ranking from 1 (low) to 30 (high)

Consequence is the result of the interaction between exposure, vulnerability and capacity in a community. Understanding many different types of consequence helps inform effective future program development and risk treatment. To determine the potential consequences

of each risk, an assessment is performed to identify the effect of a hazard on structures, people, the environment and reputation.

Once the assessment is completed, consequence is determined based on the risk having no impact or having high impact on structures, people, the environment and reputation.

3. Response Capabilities: Ranking from 1 (excellent) to 4 (poor)

The final component to the HIRA involved analyzing the City's ability to respond to each type of risk. There are many factors that influence the City's response capability including equipment, personnel, communications, technical support, training, experience and contingency plans. The ability of outside agencies to respond to events was also examined. Rankings for this category were placed in reverse order with high marks being assigned to emergencies where the City would have difficulty responding, making these events a higher risk to the community.

THE RANKING SCALE

Each hazard has been scored based on the following scale:

Likelihood

1 – Rare	Occurs every 100 years or more. Less than a 1%, chance of occurrence in any year.
2 – Very Unlikely	Occurs every 50-99 years. Between 1-2% chance of occurrence in any year.
3 – Unlikely	Occurs every 20-49 years. Between 2-5% chance of occurrence in any year.
4 – Probable	Occurs every 5-19 years. Between 5-20% chance of occurrence in any year.
5 – Likely	Occur < 5 years. Over 20% chance of occurrence in any year.
6 – Certain	The hazard will occur annually. 100% chance of occurrence in any year.

Consequences

0 – None	Not likely to result in an impact on structures, people, environment or reputation
1 – Low	Could cause minor impact on structures, people, environment or reputation
2 – Medium	Could cause major impact on structures, people, environment or reputation
3 – High	Could cause widespread or severe impact on structures, people, environment or reputation

Response Capabilities

1 – Excellent	Ability to respond using only internal resources
2 – Good	Ability to respond using mainly internal resources and a small number of external resources
3 – Fair	Ability to respond using mainly external resources and a small number of internal resources
4 – Poor	Ability to respond using only external resources

The highest score that can be attained from evaluating these factors is 180.

SUMMARY OF FINDINGS

The following summary shows a ranked listing of the top hazards for the City of Greater Sudbury emphasizing those hazards that require specific attention in the Emergency Management Program (i.e.: response plans, training/exercises public awareness, etc.).

Event	Ranking
Human Health Emergencies and Epidemics	132
Hazardous Materials Incident – Fixed Site	60
Hazardous Materials Incident – Transportation	60
Tornadoes	44
Explosion or Fires	42
Lightning and Thunderstorms	40

Note: A ranked listing of all City of Greater Sudbury hazards is located in Appendix 1.

CATEGORIES OF HAZARDS

The Emergency Management Program divides hazards into three main categories: Natural, Technological and Human-Caused.

1. Natural Hazards

Natural hazards are emergencies that result from the forces of nature. The following natural hazards have been identified and assessed for the City of Greater Sudbury:

• human health emergencies	• extreme heat
• floods	• blizzard
• fires (forest, wildland, urban interface)	• fog
• extreme cold	• agriculture and food emergencies
• ice/sleet storms	• hailstorms
• tornadoes	• hurricanes
• windstorms	• earthquakes
• lightning and thunder storms	• drought

REPORT MAINTENANCE

This report is reviewed and updated annually by the staff of Emergency Management as required by the Province of Ontario, *Emergency Management and Civil Protection Act*.

Appendix 1

RANKED LISTING

Hazard	Ranking	Likelihood	Consequences	Response Capabilities	Incident Specific Plan
Natural					
Human Health Emergencies	132	6	22	2	Y
Lightning and Thunderstorms	40	5	8	2	
Tornadoes	44	4	11	3	
Floods	35	5	7		Y
Windstorms	35	5	7	3	
Extreme Cold	30	6	5	2	
Fires (Forest and Wildland)	30	6	5	3	
Earthquakes	30	6	5	3	
Extreme Heat	18	6	3	2	Y
Blizzard	16	4	4	2	
Hurricane	13	1	13	3	
Drought	6	1	6	2	
Agriculture and Food Emergencies	4	1	4	2	
Hailstorms	3	1	3	2	
Technological					
Hazardous Materials – Fixed Site	60	6	10	4	Y
Hazardous Materials – Transportation	60	6	10	4	Y
Explosions or Fire	42	6	7	2	

Hazard	Ranking	Likelihood	Consequences	Response Capabilities	Incident Specific Plan
Air Crash Offsite– Rural	36	4	9	2	
Energy Emergency - Hydro	30	6	5	2	
Critical Infrastructure – Sewer	30	5	6	2	
Mine Emergencies	30	5	6	2	
Transport Accident – Passenger	28	4	7	2	
Critical Infrastructure – Hospital Fire	24	4	6	3	
Critical Infrastructure – Bridge Collapse	20	4	5	2	
Critical Infrastructure - Telecomms	20	4	5	3	
Dam Failure	17	1	17	3	Y
Critical Infrastructure – Computers (Internet)	16	4	4	2	
Energy Emergency – Natural Gas	10	5	4	2	
Air Crash Onsite – Airport	9	1	9	2	
Air Crash Onsite – Residential	9	1	9	2	

Hazard	Ranking	Likelihood	Consequences	Response Capabilities	Incident Specific Plan
Building Structural Collapse	9	1	9	2	
Technological					
Building Structural Collapse	7	1	7	3	
Critical Infrastructure – Water	10	1	5	3	
Other Mass Casualty Incidents	6	1	6	3	
Man-made					
Civil Disorder	28	4	7	2	
Sabotage	24	4	6	2	
Terrorism	9	1	9	2	

HIRA SHEET

SCORE

Event:
Type:

Frequency	4	High	Event(s) in the last 5 years.
	3	Medium	It has been 5-15 years since the last event.
	2	Low	It has been more than 15 years since the last event.
	1	Nil	It has never occurred in the Sudbury area.

Probability	3	Likely	Has occurred in the past and will occur again in the future.
	2	Possible	Could occur in the future.
	1	Unlikely	Has not occurred and will not in the future.

Consequence	4	High	Fatalities, severe damage, essential services out.
	3	Substantial	Widespread injuries/damage, basic services out.
	2	Limited	Some injuries, minor/localized damage.
	1	Negligible	Too small or unimportant to be worth considering.

Response Capabilities	4	Poor	Ability to respond using only external resources.
	3	Fair	Ability to respond using mainly external resources and a small number of internal resources.
	2	Good	Ability to respond using mainly internal resources and a small number of external resources.
	1	Excellent	Ability to respond using only internal resources.

Environmental Impact:

Environment	Concerns	Controlling these Concerns
Ground		
Air		
Water		

Other Concerns:

Critical Infrastructure at Risk:

Organizations That Can Offer Assistance:

Population Affected:

Existing Plans:

References

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