

Worksheets

ADAPTING TO CLIMATE CHANGE

A Guide for Ontario Municipalities[®]

Table 3.1: Estimates of Likelihood of Risks (Step 3)

Probability Range	Very Low	Low	Moderate	High	Very High
Type of Event					
Significant Single Event; or	Not likely to occur in period	May occur once between 30 and 50 years	May occur once between 10 and 30 years	Likely to occur at least once a decade	Likely to occur once or more annually
On-going / Cumulative Occurrence	Not likely to become critical/beneficial in period	May become critical/beneficial in 30-50 years	Likely to become critical/beneficial in 10-30 years	Likely to become critical/beneficial in a decade	Will become critical/beneficial within several years

Note: Use as many rows as needed to include the selected risk events.

Table 3.2: Estimates of Consequences of Risks (Step 3)
 (Use one table for each risk event)

Factor	People				Economic			Environment			
	Health & Safety	Displacement	Loss of Livelihood	Reputation	Infrastructure Damage	Financial Impact on Municipality	Financial Impact on Stakeholders	Air	Water	Land	Ecosystems
Very Low											
Low											
Moderate											
High											
Very High											

Note: The project team should modify the columns to include the consequences that they consider important for example some may wish to include legal liability or differentiate between capital and operating costs.

TABLE 3.3: Suggested display for stakeholders and risk perception.

Risk Events	Stakeholders	Perception of Risk
	Use a many rows as needed	

Figure 4: Risk Evaluation Matrix (Step 4)

Consequences	Very High					
	High					
	Moderate					
	Low					
	Very Low					
		Very Low	Low	Moderate	High	Very High
		Likelihood				

	Extreme Risk: Immediate controls required
	High Risk: High priority control measures required
	Moderate Risk: Some controls required to reduce risks to lower levels
	Low Risk: Controls likely not required
	Negligible Risk: Risk events do not require further consideration

Table 5.1: Risk Treatment and Adaptation Measures

Risk Event	Adaptation Measure or Risk Treatment (Use as many rows as needed for each event)	Time Frame	Cost	Effectiveness	Acceptability	Comment / Evaluation

Time Frame	Cost	Effectiveness	Acceptability
Short – can be implemented within 10 years	\$ - can be completed within existing or planned budget allocation	Low – will have minor effect on risk event	Low – significant public/corporate/stakeholder resistance
Medium – can be implemented within 10-20 years	\$\$ - will require additional funding	Moderate – will have moderate effect on risk event	Moderate – moderate public/corporate/stakeholder resistance
Long – can be implemented within 20 – 50 years	\$\$\$ - will require major additional funding/major capital program	High – will virtually overcome risk event	High – little or no public/corporate/stakeholder resistance

The costs and benefits of adaptation measures can be difficult to assess, so it is important that the project team has access to the relevant expertise if they need it. An example would be the impact of reduced use of a wastewater treatment facility because of expected higher water levels. To build a new facility would be very costly. In the short term the community might have to forgo other developments. In the longer term, better facilities might strengthen the community's treatment capacity and allow an increased number of residents and businesses without additional infrastructure costs. Also municipalities are very sensitive to whether costs affect their operating or their capital budgets. Any of these outcomes has associated economic, social and cultural costs and benefits that could affect the analysis.

One means the project team could use to assess residual risk is to revisit the consequence rating at Step 3 and consider the change resulting from the proposed adaptation measure(s). This will provide a sense for the effectiveness of the adaptation measure(s) and the remaining risk levels.

Notes: