Community Emergency Risk Assessment

Informing Emergency Management Planning

Participant Workbook Version 2.0

This workbook is available for viewing online:

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Version : EMPC-CERA 2.0 March 2014

Acknowledgements

Developed by the Victoria State Emergency Service with the support of our key partners.

Funding from the Commonwealth Government is acknowledged through the Natural Disaster Resilience Grants Scheme.

SES

Australian Government

Attorney-General's Department

Foreword

I am delighted to support the Community Emergency Risk Assessment tool – CERA. The CERA tool represents a significant shift within the Emergency Management and broader municipal management sectors - towards a shared understanding of emergency hazards and the plans, actions and activities that are needed to ensure the safety and resilience of Victorian communities.

We still have a long way to go before we have the ideal processes and systems required to deal with multiple hazards, but the CERA process provides all parties with a framework that can help channel complex social, economic, environmental and organisational factors into a relevant and practical planning format.

I urge all communities, emergency management agencies, businesses and municipal authorities to take advantage of the opportunity that CERA provides you to describe, discuss and understand the hazard environment in which you operate. In so doing, you will not only be able to identify the gaps in your current emergency management approaches, but also see significant opportunities to draw upon each other's strengths when creating robust and efficient emergency management plans.

Craig Lapsley
Fire Services Commissioner, Victoria
(Emergency Management Commissioner Designate)

FIRE SERVICES
COMMISSIONER
VICTORIA

Introduction

The Community Emergency Risk Assessment (CERA), developed by Victoria State Emergency Service (SES), provides Emergency Management Planning Committees (EMPC) with a framework for considering and improving the safety and resilience of their community from hazards and emergencies.

The CERA approach aims to understand the likely impacts of a range of emergency scenarios upon community assets, values and functions. As such, CERA provides an opportunity for multiple community impacts and consequences to be considered enabling collaborative risk treatment plans and emergency preparedness measures to be described.

Risk Assessment

CERA provides a robust framework for a 'community of interest' to identify and prioritise those emergency risks that are likely to create the most disruption. The assessment helps users to identify and describe hazards and assess impacts and consequences based upon the vulnerability or exposure of the community or its functions.

The outputs of the assessment process can be used to inform emergency management planning, introduce risk action plans and ensure that communities are aware of and better informed about hazards and the associated emergency risks that may affect them.

How does it work?

The CERA approach combines hazard information and intelligence from a number of sources in order to gain a clear understanding of the elements that define 'risk' within a specific area. These sources include:

- Existing 'single hazard' risk assessments for example the Victorian Fire Risk Register (VFRR), Integrated Fire Management Planning (IFMP) and Flood Studies;
- New or existing community profile information for example Part 2 of Municipal Emergency Management Plans (MEMP);
- Subject matter experts and local community representatives.

Integral to the success of the process are the in-depth discussions that occur between experts, decision makers and community representatives. The CERA meeting format is designed to promote a collaborative discussion between agencies, experts and community representatives on the ways in which various hazards may affect important assets, values and functions for a defined 'community of interest'. This format enables participants to then identify underlying weaknesses, consequences and long term impacts that may not have been uncovered if discussed in isolation.

During these discussions, participants respond to a number of questions about the defined community, enabling them to describe the factors (for example hazard, exposure or vulnerability) that contribute to a particular risk. Participants work to identify key risks by responding to these questions and collectively discussing the issues that arise.

Introduction

By developing an understanding of the likely impacts and factors that underlie exposure and vulnerability, participants are better placed to describe within their Emergency Management Plan how they will treat these risks or cope with impacts.

What are the steps in the CERA Process?

The CERA process is designed to be undertaken over two facilitated sessions in the following manner. This timing is dependent upon the complexity of each municipality, the capacity of the EMPC, and access to and availability of subject matter experts and community representatives. Some risk assessments may therefore require more than two days to complete.

Session 1

- Convene a 2-3 hour workshop with your Emergency Management Planning Committee (EMPC) members.
- EMPC members identify the hazards they think pose the most significant threat to their community.
- EMPC members identify the assets, values and functions they think are integral to the normal functioning of their community.
- Hazard experts and representatives of key community assets, values and functions are identified and then invited to take part in the risk assessment in Session 2.

Session 2

- A larger committee consisting of hazard experts and community representatives gather for a second 3-5 hour workshop to understand and describe:
  - The nature and behaviour of hazards that may impact upon their community.
  - The exposure and vulnerability of key community assets, values and functions to each hazard.
- The committee then goes on to:
  - Identify strengths and weaknesses in existing planning and mitigation arrangements.
  - Identify opportunities for improvement to prevention, control and mitigation measures.
- To finalise the CERA process SES staff will be able to support the committee in loading the data from the group discussions into an excel-based risk assessment tool that will:
  - Calculate the levels of risk.
  - Create risk sheets (that can be exported) as well as heat maps for inclusion in Emergency Management Plans.

Further sessions can be arranged as needed.

How do you get started?

Contact your nearest SES Regional Office

SES staff will help you to organise your CERA meetings and work through the risk assessment process. They will provide you with materials to support your learning and risk assessment decision-making.

For further information please contact your nearest SES Regional Office or visit **ses.vic.gov.au.**

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Session 1

Understanding 'risk' for hazards and emergencies

Overview

Session 1 should be attended by the Emergency Management Planning Committee (EMPC) members. It is intended to provide an overview of the Community Emergency Risk Assessment (CERA) process and an understanding of **risk** and **risk analysis**.

Initial activities will identify: 1) an overview of key **hazards** threatening the municipality; 2) community assets, values and functions to be protected; 3) the subject matter experts to invite into the Risk Committee for subsequent meetings.

What you will need

To complete Session 1 you will need:

- 2-3 hours.
- EMPC members.
- A Victoria State Emergency Service (SES) Facilitator.
- A large map showing municipality and immediate surrounds.
- Asset, value and function sticky labels for the map.

Objective

The objective of Session 1 is to enable the EMPC members to gain a shared understanding of **Risk Theory** and the factors that should be considered in a natural hazard-based **Risk Analysis**.

By applying this theory to the municipality in question, the group will be able to identify and prioritise the following essential inputs to the CERA process:

- Hazards that pose a threat to the municipality and surrounds.
- Key municipal assets, functions and values.
- Subject matter experts to invite into the risk planning committee.

****NO MOBILE PHONES, LAPTOPS OR TABLETS TO BE USED DURING THE SESSION****

The EMPC has been convened to play a vital role in ensuring community safety. As such, the discussions during this session should be given highest priority. Participants will be provided with breaks to check phones and emails. It is not acceptable for EMPC members to be engaged in other work while taking part in discussions and decision-making around community safety.

Session 1

Understanding 'risk' for hazards and emergencies

Enter details of Session 1 here:

Date:

Location:

Participants

Name	Organisation	Attended?

Session 1

Understanding 'risk' for hazards and emergencies

1.1 How does CERA fit into the emergency management planning process?

The National Emergency Risk Assessment Guidelines (NERAG) defines risk assessment as:

"…the process used to describe risk issues and determine risk management priorities by evaluating and comparing the levels of risk against predetermined standards. During this process, the likelihood, of particular consequences of hazards is assessed, taking account of probabilities of an event occurring, impacting on the elements at risk and having specific consequence outcomes. Information on the elements likely to be exposed to the impact of a hazardous event and their vulnerability to that particular hazard is considered as part of this process." (P11)

Importantly for EMPCs, the CERA process allows communities, organisations and governments to understand and measure the risks involved and decide on the appropriate measures to manage them.

At the end of the CERA process the EMPC should have a list of the hazards that pose the most significant threat to the normal functioning of the community. By also developing an understanding of the factors that contribute to the vulnerability and exposure of social, economic and environmental functions the risk assessment process will highlight opportunities for improvement and collaboration in the emergency management arrangements described within each Emergency Management Plan.

1.2 Clarifying the difference between 'enterprise/corporate risk' and 'disaster risk'

Risk and vulnerability assessments depend on an understanding of the terms. In this context, two main schools of thought can be differentiated. The first school of thought defines risk as a decision by an individual or a group to act in such a way that the outcome of these decisions can be harmful. In contrast, the disaster risk research community views risk as the product of the interaction of a potentially damaging event and the vulnerable conditions of a society or element exposed (UNISDR, 2004; IPCC, 2007).

The word 'risk' has two distinctive connotations: in popular usage the emphasis is usually placed on the concept of chance or possibility, such as in "the risk of an accident"; whereas in technical settings the emphasis is usually placed on the consequences, in terms of "potential losses" for some particular cause, place and period.[1]

[1] Source – United Nations Office for Disaster Risk Reduction

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Understanding 'risk' for hazards and emergencies

1.3 Understanding the risk equation

RISK = HAZARD x EXPOSURE x VULNERABILITY

The concept of **risk** for natural hazards or emergencies combines an understanding of the **likelihood of a hazardous event occurring** with an assessment of its **impact**. Risk is the outcome of interactions between a specific hazard (for example bushfire) and assets or functions that are of value to the human system. The extent of the impact from this interaction will be dictated by the exposure and vulnerability of each specific asset, value or function.

The total risk may be decreased by reducing the size of any one or more of the three contributing variables, the **hazard**, the elements **exposed** and/or their **vulnerability**. This can be illustrated by assuming the dimension of each of the three variables represents the side of a triangle, with risk represented by the area of the triangle. *See Fig 1*.

Fig. 1: The Risk Triangle

Without an understanding of the **assets, values or functions** that a hazard may impact, it is not possible to predict the consequence of a hazard occurring.

Fig. 2: Risk is realised when a hazard impacts upon an asset, value or function.

Session 1

Understanding 'risk' for hazards and emergencies

1.3.1 Useful Definitions

In order to gain an understanding of the elements that make up the Risk Equation, some definitions are provided below. A more complete list of risk-related definitions is provided in the Appendix A.

Hazards[2]

Hazardous events (hazards) can be either naturally occurring, such as earthquakes, tropical cyclones or coastal erosion, or they can be human-made, such as water pollution or terrorist attack. In addition, events can be sudden as in the case of an earthquake, or they can occur over time as in the case for most environmental hazards such as drought.

Impacts[2]

The impact of a hazardous event depends on the elements at risk, such as; population or buildings and their associated vulnerability to damage or change as a result of the event. Impacts occur once the hazard has been realised or becomes manifest.

Exposure [3]

Exposure refers to the inventory of elements in an area in which hazard events may occur. Hence, if population and economic resources were not located in (exposed to) potentially dangerous settings, no problem of disaster risk would exist.

While the literature and common usage often mistakenly cobine exposure and vulnerability, they are distinct. Exposure is a necessary, but not sufficient, determinant of risk. It is possible to be exposed but not vulnerable (for example by living in a floodplain but having sufficient means to modify building structure and behaviour to mitigate potential loss). However, to be vulnerable to an extreme event, it is necessary to also be exposed.

Vulnerability[3]

Vulnerability refers to the propensity of exposed elements such as human beings, their livelihoods, and assets to suffer adverse effects when impacted by hazard events. Vulnerability is related to predisposition, susceptibilities, fragilities, weaknesses, deficiencies, or lack of capacities that favour adverse effects on the exposed elements.

Vulnerability can be seen as situation-specific, interacting with a hazard event to generate risk. Vulnerability to financial crisis, for example, does not infer vulnerability to climate change or natural hazards.

It is important to note that exposure and vulnerability change over time. It will therefore be critical to periodically revisit the assumptions that we have made about them.

[2] Source – Geoscience Australia

[3] Source – Cardona, O.D., M.K. van Aalst, J. Birkmann, M. Fordham, G. McGregor, R. Perez, R.S. Pulwarty, E.L.F. Schipper, and B.T. Sinh, 2012: Determinants of risk: exposure and vulnerability. In: Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation [Field, C.B., V. Barros, T.F. Stocker, D. Qin, D.J. Dokken, K.L. Ebi, M.D. Mastrandrea, K.J. Mach, G.-K. Plattner, S.K. Allen, M. Tignor, and P.M. Midgley (eds.)]. A Special Report of Working Groups I and II of the Intergovernmental

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Understanding 'risk' for hazards and emergencies

1.4 Assessing risk

"Risk assessment – A methodology to determine the nature and extent of risk by analysing potential hazards and evaluating existing conditions of vulnerability that together could potentially harm exposed people, property, services, livelihoods and the environment on which they depend."

The United Nations Office for Disaster Risk Reduction (UNISDR, 2013)

1.4.1 Understanding the importance of 'exposure' and 'vulnerability'

In order to perform a risk assessment it is necessary to understand the exposure and vulnerability of the assets, values or functions that you wish to protect. The exposure and vulnerability of these assets, values or functions will differ depending upon the type of hazard, its intensity or duration.

Example

The simple example below depicts a particular type of hazard (in this case a wind event) impacting on a forest. The forest contains trees of different heights and trunks of different thicknesses. Each tree has a different level of 'exposure' to the wind hazard and a different level of physical 'vulnerability' to the force that the wind applies to it. As such, the risk of damage or collapse is different for each tree.

RISK = HAZARD x EXPOSURE x VULNERABILITY

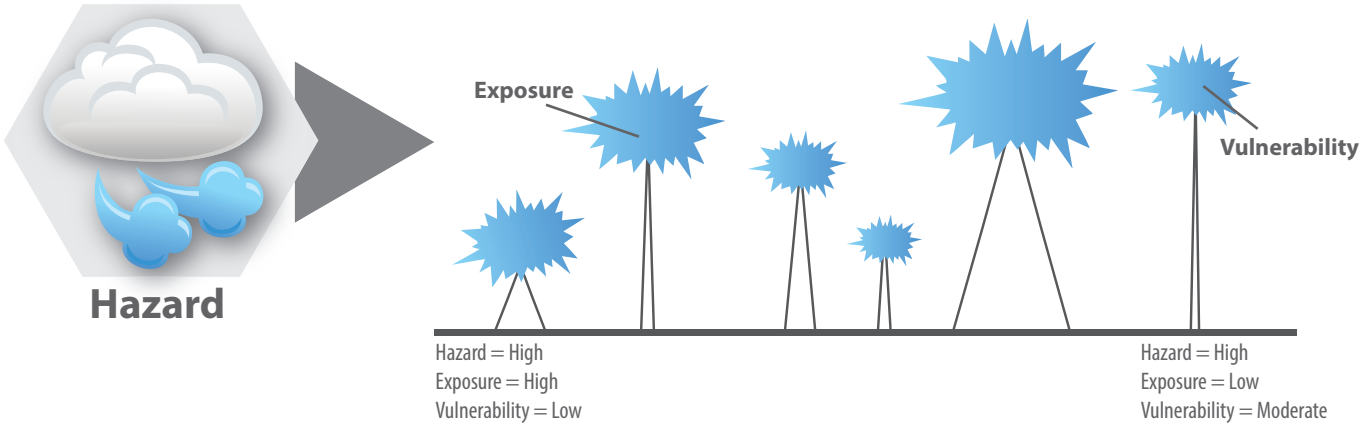

Fig.3: Each tree is at a different level of risk to a hazard event, depending upon its exposure and vulnerability.

Imagine now that you have a limited amount of resources allocated to protecting the forest. You can prioritise how these resources are allocated by assigning different levels of importance (for example asset, value or function) to each tree, depending upon their role in the functioning of the overall forest system (for example low, moderate or critical).

Session 1

Understanding 'risk' for hazards and emergencies

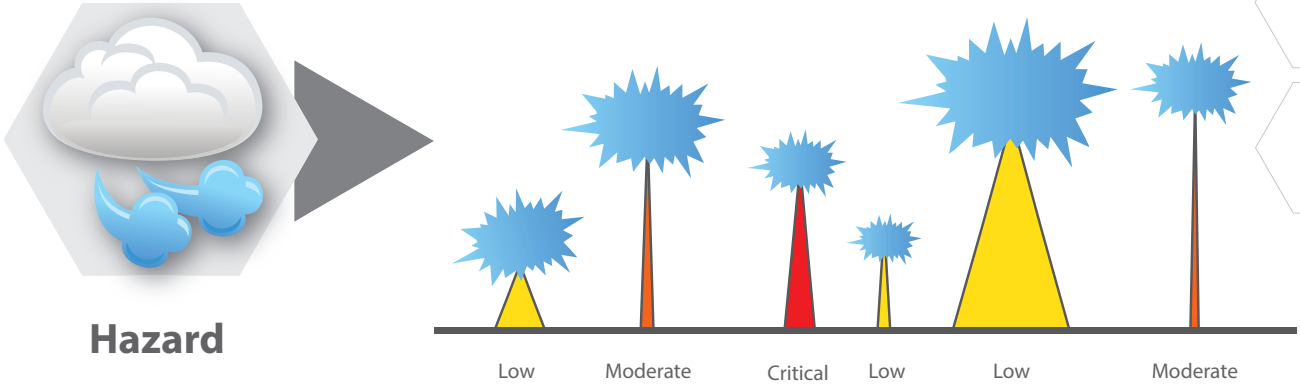

Fig. 4: The importance of each tree to the overall system can be prioritised to help with risk management planning

Once you have prioritised certain trees, it is necessary to understand in more detail the nature of the hazard threatening them and why they may be exposed or vulnerable to its effects. In doing this, it is possible to identify methods or controls for reducing exposure and vulnerability.

1.5 Risk assessment in the municipal context

In order to place hazard or emergency risk into the municipal context, you should now apply the analogy of the forest, with its different functions, values, levels of exposure and vulnerability, to your municipality.
In order to protect your municipality, it is necessary to identify its strengths and weaknesses and understand the impact that various hazards will have upon them.

Fig. 5: Your municipality contains assets, functions and values that are exposed and vulnerable to hazards in different ways.

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Understanding 'Risk' for Hazards and Emergencies

You will need to replace the concept of the blue trees with a more human landscape. Emergency risk management aims to achieve safer, sustainable communities through the protection of:

- People;
- Environment;
- Economy;
- Public Administration;
- Infrastructure;
- Social Capital [4]

These catergories of **assets, functions and values** have been identified as fundamental to the **normal and sustainable functioning of communities**. This means that emergency management practitioners must prioritise assets, functions and values and consider how to distribute resources in a way that will offer the most efficient and effective ways to **maintain normal functioning**.

- **assets** – for example, Roads, bridges, buildings, transport hubs, major industrial facilities, hospitals, churches, public buildings, tourist attractions, natural resources, sporting facilities etc.
- **functions** – for example, Employment, trade, industry, education, health system, administration, transport, energy, water etc.
- **values** (concepts of what is important to a culture or community) – for example, traditions, social identity, social order, respected individuals/buildings/spaces.

[4] National Emergency Risk Assessment Guidelines (2011, p.8)

Session 1

Activity

1.6 Applying the risk equation to your municipality

RISK = **HAZARD** x EXPOSURE x VULNERABILITY

1.6.1. Which hazards threaten your community?

You should first consider the hazards that threaten to impact your community. This will only be an indicative list as the EMPC may not contain the knowledge and resources for an exhaustive assessment. However, this process will provide you with a starting point for future consultation and improvement. In addition, by identifying and inviting subject matter / hazard experts to join the Risk Committee, you will introduce a broader range of knowledge and perspectives to the process.

If you already have a Emergency Management Plan, you may be able to review an existing list of emergency hazards for your municipality. Applying your collective understanding of the municipal assets, values and functions to this list, you can remove hazards which have no relevance to your municipality. For example; removing tsunami from an inland municipality, integrating planning from the IFMP framework.

The CERA Tool also contains a list of potential hazards. While this list is by no means exhaustive, it does provide a starting point that will assist you to identify the risks with the greatest potential to impact your municipal community. Further guidance can be obtained from the current State Emergency Management arragements.

What is an emergency?

It is important that your CERA considers an emergency in the correct context. In short, the CERA process should be used to assess the risk posed by unpredictable events that are outside normal expectations and which require response and recovery measures that are above and beyond existing programs and practices. In this case, low likelihood/high impact events such as major floods, bushfires, transport accidents and disease outbreaks should take priority over high likelihood/low (community) impact events such as house fires, road accidents and drowning.

The following characterisations (provided the Emergency Manual Victoria – www.oesc.vic.gov.au/emergency manual) should be used to help the EMPC to select hazards that are most likely to cause the emergencies as described below:

- They are disruptive to individuals and communities.
- They are not part of day-to-day experience and are outside normal life expectations.
- They are unpredictable in occurrence and effects.
- They require a response for which normal local resources may be Inadequate.
- They have a wide range of effects and impacts on the human, built and natural environments.
- There are complex needs in dealing with them.
- They can be of sudden onset.
- They are destructive of human, animal and/or plant life, health, property and/or the environment.
- They overwhelm normal prudent protective measures.

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Activity

Using existing risk assessment data:

Because CERA is intended to assess risk across a broad range of hazards and consequences, it is important to have a detailed understanding of the community in question; this is particularly the case when assessing the interconnectivity of various community assets, values or functions.

Existing Municipal Emergency Management Plans (including flood plans) and risk assessment data from the Victorian Fire Risk Register can be used to help inform the asset mapping process. Where time permits, this information should be plotted on a map ahead of CERA Session 1. It should however be remembered that there are some limitations associated with relying upon these data sets in isolation, for example:

- The Victorian Fire Risk Register will only map 'assets' that are at risk of being impacted by bushfire. This means that any assets in low bushfire risk areas will tend not to be included on the map.
- Assets tend to be selected for assessment by a limited or specialised group that is not representative of the perspectives or functions of the broader community.
- The CERA process encourages a discussion among a diverse set of hazard experts and community representatives. Hazard specific asset mapping may not capture the diversity or complexity necessary for an 'all hazards' risk assessment process.

1.6.2 Participants should answer the following questions

Q: Which hazards pose a significant threat to the normal functioning of your municipality/ community?

The hazard selection tab of the Community Emergency Risk Assessment Tool (CERA Tool) contains a list of emergency hazards for consideration. It also contains a number of fields allowing you to enter your own additional emergency hazards.

In order to identify and invite a manageable number of key hazard experts to join the Risk Committee for subsequent sessions, you should now prioritise your hazards by answering the following questions:

Q: What are the top 5 to 10* hazards that you feel threaten your municipality?

**This number has been selected in order to make the process manageable. Additional hazards can be selected and described in subsequent sessions if required.*

Q: Which agencies or hazard experts are able to provide the most information about the hazards you feel are threatening your municipality?

The responses to this question should be captured in the following chart.
[Use butcher's paper to note the group's responses]

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Description	Hazard expert
Hazard 1	
Hazard 2	
Hazard 3	
Hazard 4	
Hazard 5	

It is now important to start to understand how these hazards will behave and impact upon your community should they occur. Using your municipality map, answer the question:

Q: How are these hazards likely to physically impact upon your municipality?

Discuss and describe the likely impact of the hazard and mark the likely impact zones on the municipality map. This map will be used to inform discussion in consequent sessions

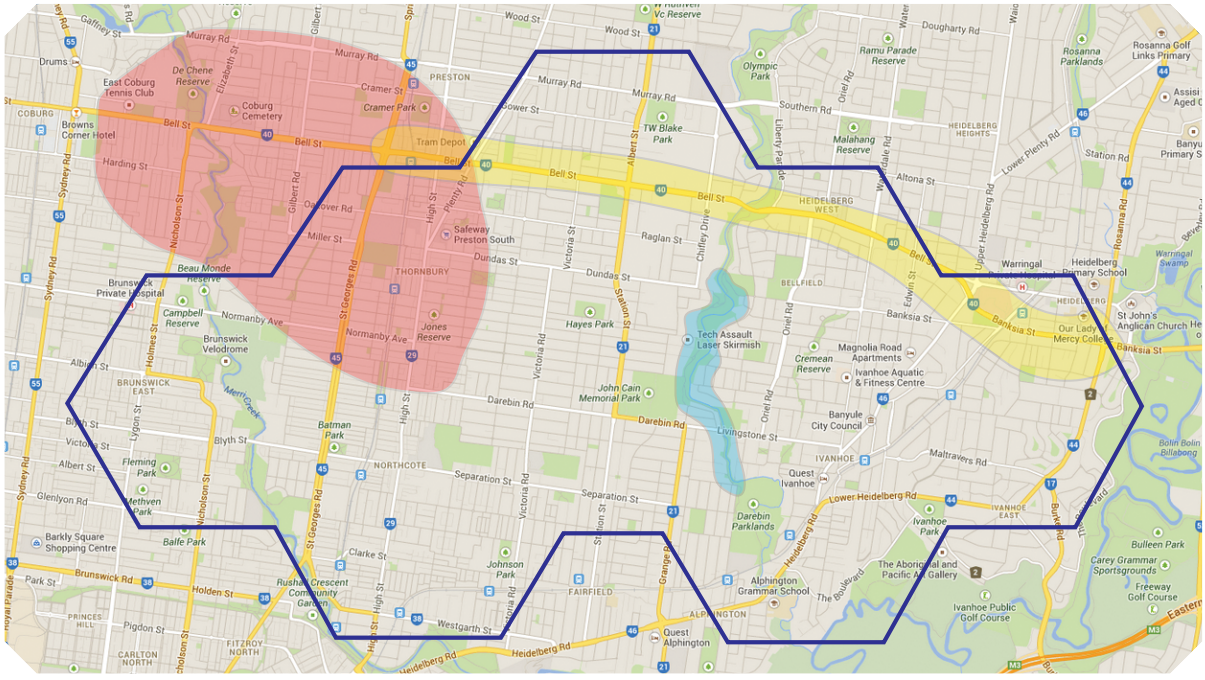

Fig. 6: Likely hazard impact zones should be depicted on the municipality map.

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1.7 Understanding what makes your municipality tick

RISK = HAZARD x **EXPOSURE** x **VULNERABILITY**

The most robust emergency management plans are based upon a detailed understanding of the assets, functions and values that enable the municipality to function normally.

Obtaining this information can seem like an almost impossible task, however, it can be made easier by sticking to the basics and inviting input from a broad range of sources.

A presentation and discussion on the existing municipal profile or the Emergency Management Plan is a useful way to put the impacts associated with each hazard into context. In addition, the following framework can be used to view your municipality from a number of different perspectives:

	Example asset, value or function	**Representatives** Who could be invited into the CERA team to provide information and insight on the asset, value or function?
Social	Schools, sporting/social clubs, religious groups, entertainment, volunteerism, tradition	
Built/ Infrastructure	Roads, bridges, buildings, transport hubs, major industrial facilities, hospitals, churches, public buildings	
Administrative	Welfare payments, health care, legal functions, wage payments	
Economic	Employment, trade, industry	
Environmental	Environmental	

1.7.1 Questions to Ask

Participants should take time to consider the assets, values and functions that underlie the normal functioning of their municipality. Often, a number of functions may be reliant upon one or two broader functions. In order to prioritise risk management activities, a set of core assets, values or functions should be identified.

Q: Which assets, values or functions are vital to the normal functioning of your municipality/ community?

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Q: Which individuals, organisations or bodies are best placed to represent or provide expertise on these assets, values or functions?

The responses to this question should be captured in the table below.
[Use butcher's paper to note the group's responses]

asset, value or function	asset/value/function expert
Social	
Built/ Infrastructure	
Administrative	
Economic	
Environmental	

Use the coloured stickers to show where your assets, values or functions are located/manifested on the map of your municipality.

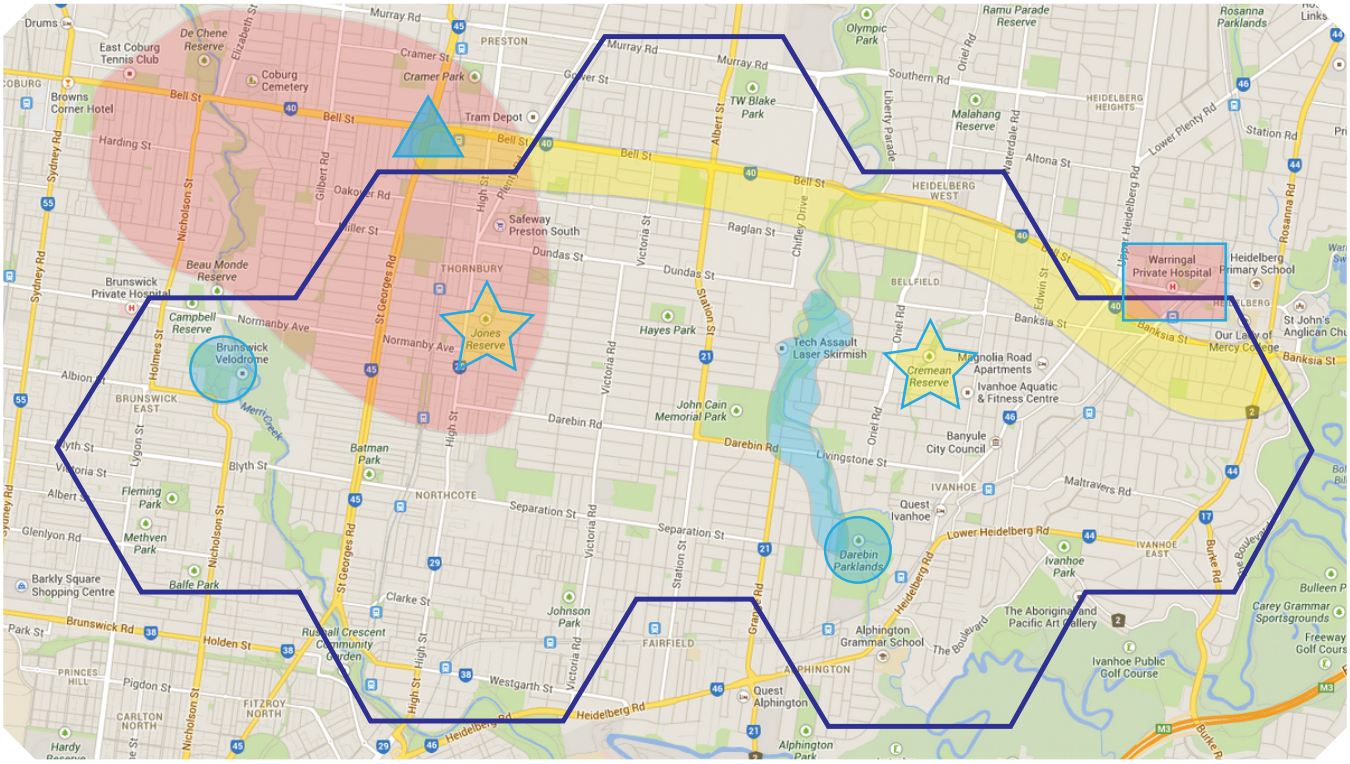

Fig. 7: Key community assets, values and functions should overlay the likely hazard impact zones on the municipality map

Session 1
Outputs

1.8 Outputs

By the end of this process, you should have:

1. A map of your municipality depicting:
    - The likely spread and behaviour of up to five hazards that are most likely to cause a significant disruption to your community.
    - Assets, values and functions that you feel are vital to the normal functioning of your community.

2. A list of experts that are reflective of the hazards you have described.

3. A list of individuals, organisations or bodies that are representative of the assets, values and functions that are most important to the normal functioning of your municipality.

These experts and representatives (some of whom will already be part of the EMPC) will form the Risk Committee responsible for assessing different levels of exposure and vulnerability of key community assets, values and functions when threatened by a range of hazards.

Additional subject matter experts should be contacted using the letter template provided in Appendix B so as to ensure they understand what is being asked of them and where they fit into the planning process.

1.8.1 About Community Representation

A practical consideration for the CERA process will be the balancing of workshop numbers with the need for community representation. The current community safety approach represents a critical shift away from a sole reliance upon 'professional' perspectives for emergency management planning towards active engagement with and empowerment of the community to investigate its own risks and develop its own solutions. In this sense, agencies and authorities are seeking ways to work more effectively with communities by promoting increased involvement through a diverse range of education and awareness programs for natural hazards safety that emphasise community-level engagement, risk appreciation, forward planning and preparedness. [5]

For the purposes of the CERA process, it is vital that the EMPC is able to either draw upon existing community education, awareness and engagement programs or set up new processes in order to ensure that the knowledge and perceptions of their citizens are a major input to the decision-making process. That said, it is equally important that the EMPC decide upon a method for representing community inputs that works with the concept of a 10-15 person Risk Committee workshop. Workshops beyond this size become unmanageable and time-consuming.

There are no easy answers to this, so it falls upon the EMPC to openly discuss the issues of community inclusion and representation and document the process that they wish to adopt. This process should also acknowledge gaps and weaknesses within the approach and should aim to improve upon this each time the CERA process is run.

[5] Attorney General's Department (2010) Guidelines for the development of Community Education, Awareness & Engagement Programs. Australian Emergency Manuals Series No. 45

Session 1
Outputs

For additional information on community participation in emergency management planning, consult the Australian Emergency Management Manual No. 45 - Guidelines for the development of Community Education, Awareness & Engagement Programs.

1.9 How this fits with CERA

The Community Emergency Risk Assessment Tool (CERA Tool) allows you to quantify the risk associated with each of the hazards you have identified as threatening your municipality.

It does this by asking you to rate the 'maximum foreseeable consequence' of a particular hazard. 'Consequence' is considered in terms of the exposure and vulnerability of the assets, values and functions you have identified as vital to the functioning of your municipality.

CERA Tool then subtracts the effects of 'mitigating controls' from the maximum foreseeable consequence to calculate the 'likelihood' or frequency of the hazard and the 'residual consequence' for assets, values and functions.

This process enables users to identify gaps in existing control measures as well as opportunities for improvements. This information can then be integrated into the Emergency Management Plan.

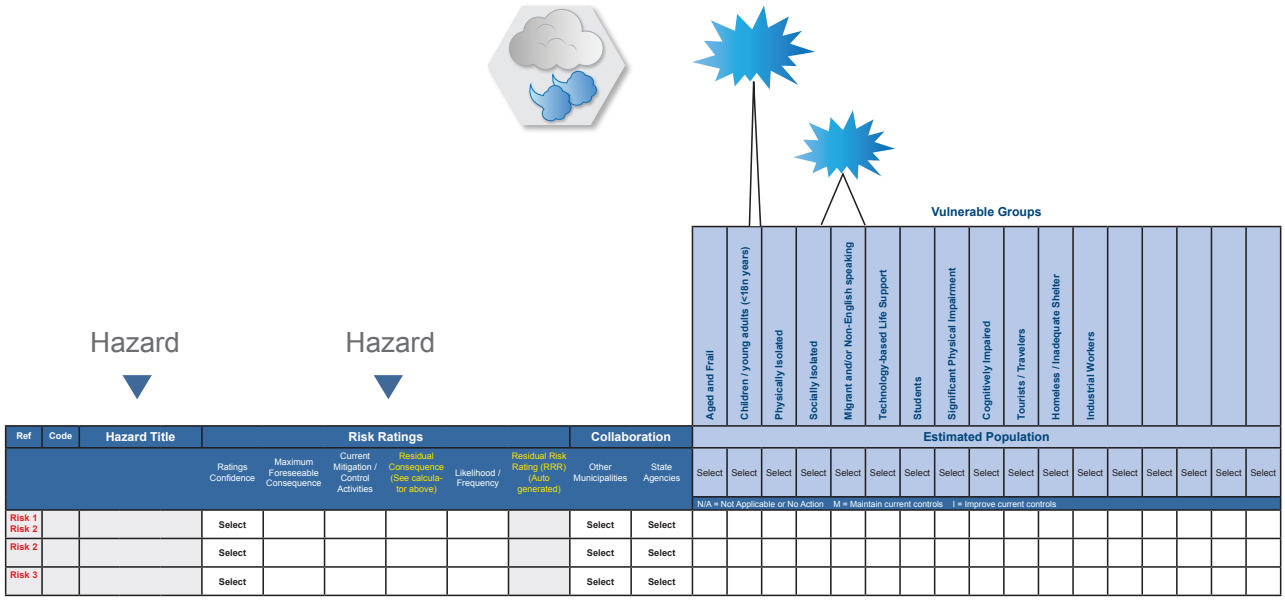

Fig. 8: The CERA Tool helps users to identify gaps in their existing emergency management planning and opportunities for collaboration and improvement.

Session 2

Session 2

Identifying and understanding 'risk' for hazards and emergencies in your community

Overview

Session 2 involves the newly formed Risk Committee. The Risk Committee is a combination of core EMPC members and invited hazard, asset, value or function Subject Matter Experts (SME) or representatives. All participants have a role to play informing the committee's discussions and decision-making and should be prepared to actively participate.

The role of the Risk Committee is to combine hazard information with an understanding of the exposure and vulnerability of key community assets, values and functions in order to calculate the Maximum Foreseeable Consequence of emergency events. This information is translated into a Heat Map by the Community Emergency Risk Assessment Tool (CERA Tool) which, in turn, is used to identify which risks require controls.

What you will need

To complete Session 2 you will need:

- 3-5 hours (depending on how you choose to run the session).
- Core EMPC members.
- Invited subject matter experts (N.B. - SES representative is participating as a SME).
- Name and role tags for all participants.
- A designated facilitator.
- The large map from Session 1 showing municipality and immediate surrounds, including asset, value, and function sticky labels.
- KeyPoint Interactive Voting Kit.
- Participants should be provided with regular breaks to check phones and emails.

Importantly, Session 2 should take the form of an operational scenario, so as to engage participants and allow discussion to focus upon familiar settings and contexts. Tables and chairs should be set up around the municipality map.

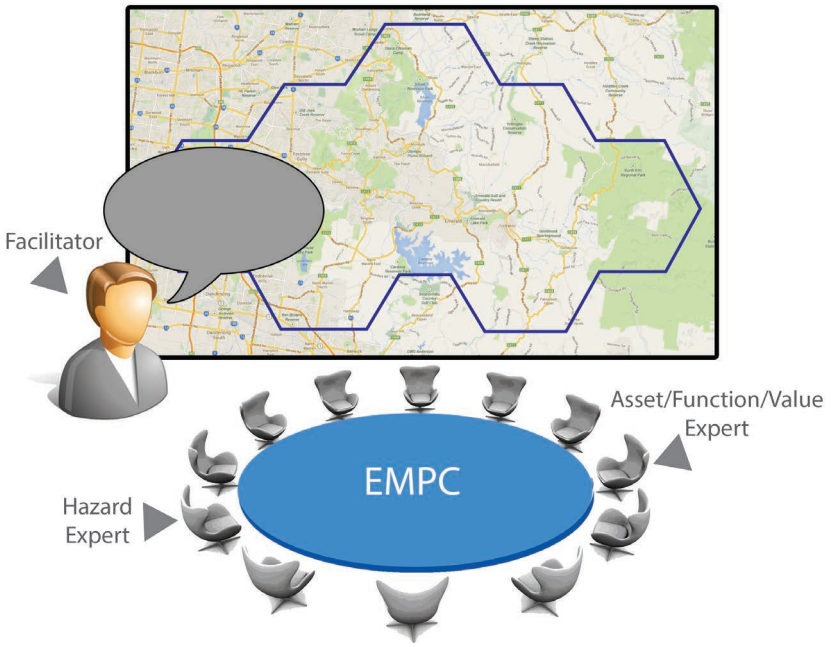

Fig. 9: It is important that participants understand their role and are engaged in the risk assessment process

Session 2

Identifying and understanding 'risk' for hazards and emergencies in your community

Objectives

The objectives of Session 2 are to:

- Allow the Risk Committee members to understand each other's roles and expertise.
- Build a detailed understanding of the hazards that threaten the municipality in question.
- Build a detailed understanding of the assets, values and functions that are important to the normal functioning of the municipality.
- Use the CERA Tool to assess the likely impact/consequence upon key assets, values and functions associated with each of the identified hazards.
- Use the CERA Tool to identify opportunities for hazard prevention or risk mitigation measures.

Enter details of Session 1 here:

Date:

Location:

Participants

Name	Organisation	Attended?

NB – Participants who were invited but did not attend the meeting should be sent a letter noting their absence.

****NO MOBILE PHONES, LAPTOPS OR TABLETS TO BE USED DURING THE SESSION****

The Risk Committee has been convened to play a vital role in ensuring community safety. As such, the discussions during this session should be given highest priority. Participants will be provided with breaks to check phones and emails. It is not acceptable for Risk Committee members to be engaged in other work while taking part in discussions and decision-making around community safety.

Session 2

Identifying and understanding 'risk' for hazards and emergencies in your community

2.1 Understanding the process

2.1.1 Recap

For the benefit of the newly invited Risk Committee members, the facilitator should recap the main points from Session 1, including the risk equation (hazard, exposure and vulnerability), and how this fits into the CERA process.

The group should look at the municipality map to recap on the community profile and the various hazards, assets, values and functions that were identified as being important in Session 1.

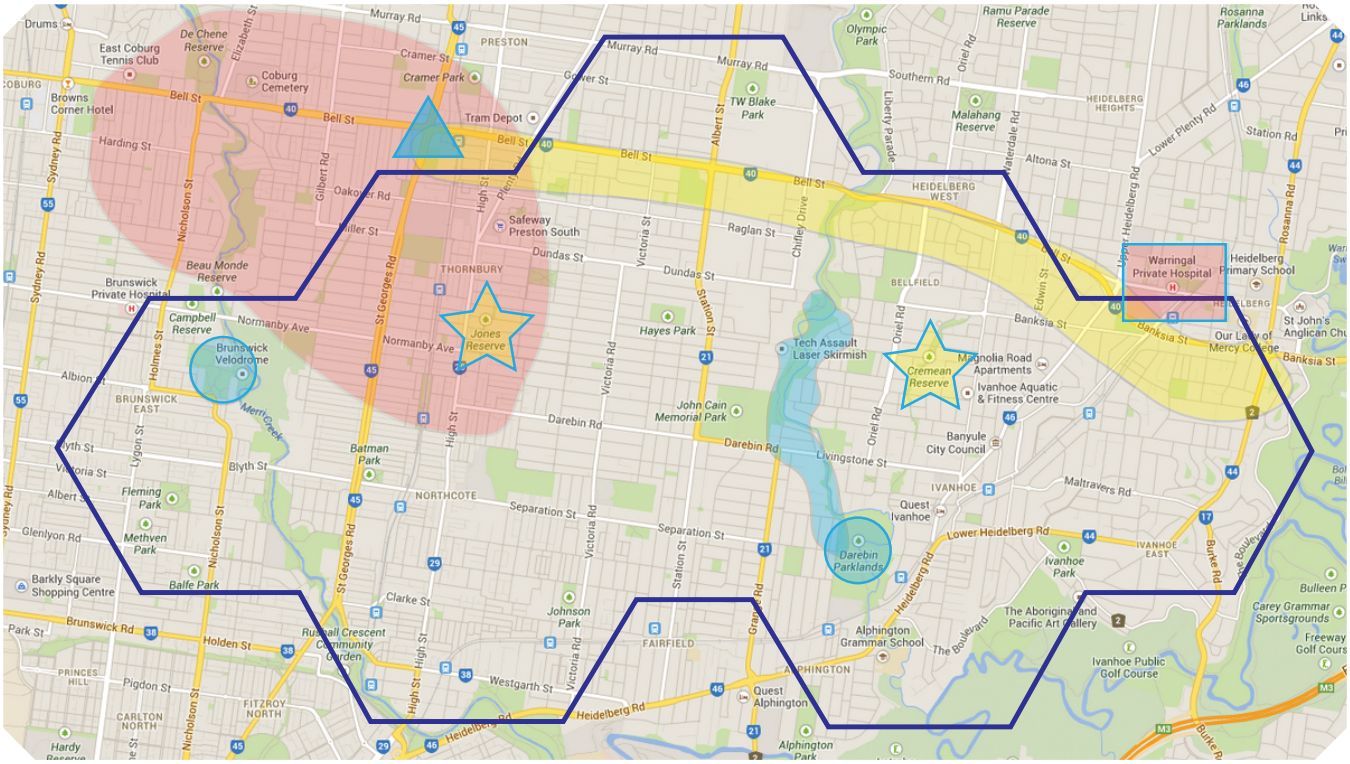

Fig. 10 The Municipality Map should provide the focal point of the Risk Committee's discussions.

2.1.2 Refresh

The members of the Risk Committee were selected by the EMPC members in Session 1. With all members present at Session 2, it is important for everyone to understand why they have been invited and what it is that they can contribute to the process.

It is also important to revisit the decisions and assumptions made in Session 1 about key hazards, assets, values and functions that are important for the municipality.

Session 2

Identifying and understanding 'risk' for hazards and emergencies in your community

Questions for the Risk Committee to discuss

Q: Why am I here and what can I offer to the Risk Committee?

Q: What do we want to achieve as a group in this session?

Q: Are the members of the Risk Committee representative of the assets, values or functions that are vital to the normal functioning of your municipality/community? Has anything been missed or identified incorrectly?

- Each asset, value and function expert should provide the group with an overview of their subject area and describe its importance to the normal functioning of the municipal community.

Q: Are the hazard experts present representative of the range of hazards that are likely to impact upon the municipality? Has anything been missed or identified incorrectly?

[Completed tables from Session 1 should be shown here and assessed for any changes that may be required. Changes should be noted directly.]

The top five to ten hazards most important to your municipality

Description	Hazard expert
Hazard 1	
Hazard 2	
Hazard 3	
Hazard 4	
Hazard 5	

Session 2

Identifying and understanding 'risk' for hazards and emergencies in your community

Assets, values or functions that are vital to the normal functioning of your municipality/community.

asset, value or function	asset/value/function expert
Social	
Built/ Infrastructure	
Administrative	
Economic	
Environmental	

2.2 Analyse emergency 'hazards'

Now it is time for the Risk Committee to start adding information to the CERA Tool.

2.2.1 Inform your assessment

In order to enhance the confidence and reliability of your risk assessment, it is essential to inform the process by accessing available quantitative and qualitative knowledge and data. This is particularly important in instances where members of the Risk Committee may not have had the opportunity to experience certain hazards first-hand.

Data and information from single hazard risk assessments should be used if available. These include the Victorian Fire Risk Register (VFRR), Integrated Fire Management Planning (IFMP) and Flood Emergency Plans, among others.

In addition to published data and reports, risk specialists are typically available to support your process from within various State and Commonwealth agencies, not-for-profit organisations, local Universities and the Private Sector.

Session 2

Identifying and understanding 'risk' for hazards and emergencies in your community

2.2.2 Identify, discuss and document potential causes, impacts and current controls for each key hazard

Before assessing the consequence and likelihood of a particular emergency hazard, it is essential to first understand the full context of the underlying causes or contributing factors driving the hazard and the preventative or detective controls that have been put in place to address them.

A clearly articulated description is important to ensure that the working group has a consistent understanding of the risk being assessed. This information should have already been added to the CERA Tool risk sheets by the subject matter/hazard experts prior to Session 2.

The first part of the risk profile analysis requires the identification of causes or factors that contribute to the hazard event occurring, for example, potential causes for a bushfire could include weather conditions such as prolonged dry heat and strong winds, faulty power lines, high fuel loads etc.

The second part of the risk profile is the identification of the current /existing preventative/detective controls; linked to the cause. Preventative and detective controls relate to preventing or reducing the causative factors for the risk. For example, a preventative control could be fuel planned burning, which can be performed to reduce the fuel load in the lead up to a bushfire season. It should be noted that some hazards, such as earthquakes cannot be prevented or detected prior to the occurrence.

Session 2
Activity

Each subject matter/hazard expert will provide the group with a short presentation on both:

- The nature of the hazard, historical data on the incidence of the hazard within or near to the municipality.
- One to two scenarios that exemplify how the hazard may behave or unfold within the municipality.

Using the municipality map, each hazard expert should address the Risk Committee with responses to the following questions:

Q: What is the nature of the particular hazard? Describe the hazard.

Q: What is the likelihood of this hazard occurring in the municipality? Has it happened in the past? How frequently?

Q: What conditions will lead to this hazard occurring?

Q: How is the hazard likely to behave in the municipality?

Q: Are there particular locations, features or attributes that are likely to exacerbate the magnitude of the hazard?

Q: For how long is the hazard likely to present a threat?

Using the municipality map, provide two scenarios in which the municipality may be or has been affected by the hazard.

2.3 Understanding the impacts and consequences of the hazard upon the community

Once a hazard has been described, the group should assess its potential impact upon critical municipal assets, values and functions by rating four dimensions:

- Maximum Foreseeable Consequence (MFC) – Defined as the maximum foreseeable loss or consequence of a risk event for which there may be no controls or wherein the controls may have failed and/or did not fully contemplate an extreme but plausible scenario.
- Control/mitigation effectiveness – The effectiveness of existing/current controls and mitigation activities in reducing the consequence and/or likelihood of a risk to a tolerable level.
- Residual Consequence – The consequence of a risk event assuming current controls and mitigation activities have operated as intended.
- Likelihood – The probability of a risk being realised across a specific time horizon assuming current controls and mitigation activities have operated as intended.

These ratings may be derived through a workshop voting process, and reflect the overall average. This information is to be captured on the Dashboard tab of the CERA Tool, or recorded in the rating results table provided in Appendix C for transfer into the CERA Tool at a later date.

Session 2
Activity

You may input any number between 1 (NA) and 5, reflecting your assessment (up to 1 decimal place). The colour of the cell will change automatically depending upon the number. The colours broadly reflect the urgency of focus and action using a simple traffic light-type scheme.

A residual risk rating is calculated automatically within the spreadsheet by multiplying the residual consequence and residual likelihood ratings, as depicted in Table 1. The residual risk rating provides a simple ranking mechanism for informing action.

Table. 1: Risk Rating Table

	Consequence Rating				
Likelihood/ Frequency	Insignificant 1	Minor 2	Moderate 3	Major 4	Catastrophic 5
Almost Certain 5	Medium	Medium	High	Extreme	Extreme
Possible/Likely 4	Low	Medium	High	High	Extreme
Unlikely 3	Low	Medium	Medium	High	High
Rare 2	Low	Low	Medium	Medium	Medium
Very Rare 1	Low	Low	Low	Medium	Medium

Adapted from: Australian Emergency Management Committee (2009), 'National Emergency Risk Assessment Guidelines', Tasmanian State Emergency Service, Hobart.

2.3.1 About quantifying the 'exposure' and 'vulnerability' of your critical assets, values and functions

Attempting to quantify levels of exposure and vulnerability attached to your critical assets, values and functions for a range of hazard types can be extremely time consuming and data hungry. The process may involve the collection and synthesis of a range of quantitative inputs including: economic data; business/ service delivery data; engineering and design data; as well as qualitative information on the values that community members place upon certain formal and informal services and functions.

Session 2

Activity

For this iteration of the CERA process, it is felt that such significant data requirements may stifle one of the overarching aims of the process, that is, to facilitate an all hazards approach to emergency management planning.

More important at this stage is:

a) Recognition of the multiple hazards, assets, values and functions that exist within each municipality, and;

b) Engagement of multiple stakeholders in dialogue about the exposure, vulnerability and controls that can be applied in order to maintain a safe and functioning community.

Our expectation of the outcome of this dialogue is:

1. A description of the exposure of critical assets, values and functions to key identified hazard scenarios.
2. An indicative sense of the factors that contribute to the exposure and vulnerability of the assets, values and functions that have been identified as critical to the normal functioning of the municipality under key identified hazard scenarios.
3. A rating of the maximum foreseeable consequence arising from each hazard as it relates to the assets, values and functions that have been identified as critical to the normal functioning of the municipality.

In order to guide this discussion, the vulnerability of each asset, value or function should be considered using the following definitions:

- **Physical vulnerability** comprises aspects of geography, location, and place; settlement patterns; and physical structures including infrastructure located in hazard-prone areas or with deficiencies in resistance or susceptibility to damage.
- **Economic vulnerability** can be understood as the susceptibility of an economic system, including public and private sectors, to potential (direct) disaster damage and loss and refers to the inability of affected individuals, communities, businesses, and governments to absorb or cushion the damage. The degree of economic vulnerability is exhibited post-event by the magnitude and duration of the indirect follow-on effects.
- **Demographic vulnerability** describes the fact that certain population groups may be more vulnerable than others to variability and extremes. For example, the very young and old are more vulnerable to heat extremes than other population groups. A rapidly aging population at the community scale bears implications for health, social isolation, economic growth, family composition, and mobility, all of which are social determinants of vulnerability.
- **Social vulnerability** refers to particular groups and conditions that have been identified as having differential exposure or vulnerability to extreme events. While aggregations (and generalisations) are often less meaningful and require careful interpretation, typically vulnerable social groups include: special needs populations; gender; children and youth; culturally and linguistically diverse (CALD) groups as well as taking into consideration age demographics and socioeconomic status (wealth or poverty).

Session 2

Activity

Similarly, education and access to information related to early warnings, response strategies, coping and adaptation mechanisms, science and technology and human, social, and financial capital is critical for reduction of vulnerability and increasing resilience. A range of factors may control or influence the access to information, including economic status, race and belonging to a social network.

For each hazard, the Risk Committee should cross examine the hazard expert in order to identify consequences for the community and the need for improvements. The outcomes should be noted on butcher's paper and used to inform the 'maximum foreseeable consequence' rating for each group, facility or location in the CERA Tool. Participants should consider the broadest range of potential consequences; this includes cascade, cumulative and 'knock-on' effects.

Examples of knock-on or multiplier effects arising from emergencies:

- The blaze began on 17 August in the Stanislaus National Forest from a still unknown cause. It has now grown to the seventh-largest wildfire in California since 1932.
- Evacuations, some voluntary and some mandatory, are taking place. Despite the threat to some 5,000 homes, only a few have been destroyed.
- California Governor Jerry Brown has declared a state of emergency for San Francisco 150 miles (220km) away as the blaze is also threatening power lines that bring electricity to the city.
- Two of three hydroelectric power stations serving the city were shut down, forcing the San Francisco Public Utilities Commission to spend $600,000 (£385,000) buying power on the open market.
- The blaze reached the park's backcountry at Lake Eleanor on Friday. But it remains some 20 miles away from Yosemite's main tourist area.
- The Park authorities say they have no plans to close the attraction as most of Yosemite, which hosts up to 15,000 visitors a day in the summer, is unaffected by the fire.
- Areas on the north-western edge of the park, including that round the Hetch Hetchy reservoir and Lake Eleanor, have been closed throughout the week.
- Two famous stands of the park's giant sequoia trees, the Merced Grove and the Tuolomune Grove, are in the path of the advancing flames and have been closed for several days.
- A stretch of motorway, Highway 120, which is one of three entrances to the west side of the park, remains closed. Visitors are being urged to use alternative routes from the west.
- The Rim Fire is one of 50 major wildfires burning in the western US. Lack of rain and snow have made it a bad year, with 5,700 fires being tackled so far.

Source: 28 August 2013 'California Rim Fire is 'one fifth contained'. http://www.bbc.co.uk/news/world-us-canada-23829047

Session 2

Activity

Quantifying the **Maximum Foreseeable Consequence** of a hazard event.

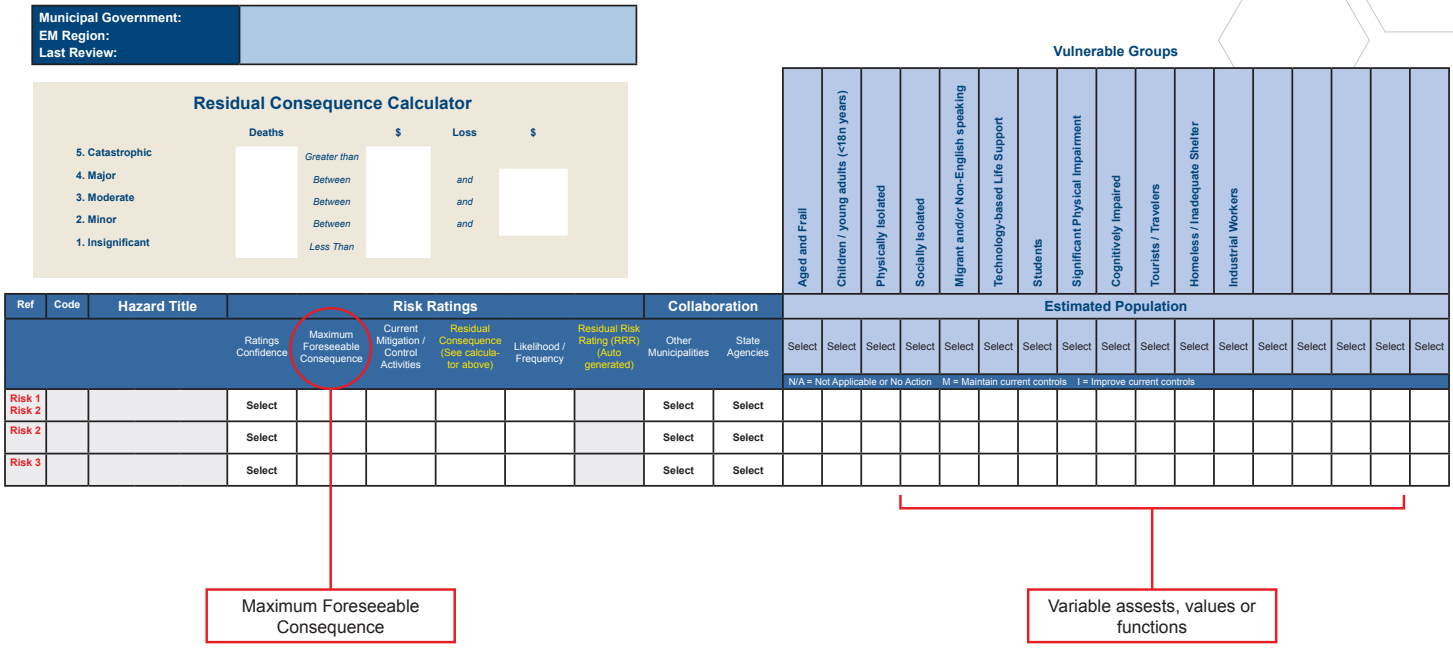

Fig. 11: Quantifying the maximum foreseeable consequence of a hazard

In order to arrive at a group consensus for the Maximum Foreseeable Consequence (MFC) of a hazard event, participants should consult the Consequence Rating Criteria sheet which contains definitions of losses for People, Environment, Economy, Public Administration, Social Setting and Infrastructure.

The group should then discuss the following questions in order to inform their MFC rating:

Q: 'Who' or 'what' is most likely to be affected by the hazard?

Q: Why is this asset, value or function particularly exposed or vulnerable to this hazard?

Q: What are the likely impacts and knock-on effects? Consider impacts outside of the municipality.

Q: What factors contribute to this vulnerability or exposure?

Q: Are there existing controls in place to mitigate the impacts? What are they?

Q: If all controls fail for a particular hazard, what is the Maximum Foreseeable Consequence for specific community assets, values or functions?

The outcomes of this discussion should be captured on the relevant risk sheet.

Session 2
Activity

Once these questions have been discussed, each individual member of the Risk Committee should use their KeyPoint interactive voting controller to select the Maximum Foreseeable Consequence level that they think is most applicable (1–5).

When all votes have been cast, the group should consider whether the outcome matches the general consensus and whether it has produced any surprises. If there are issues to be discussed the group should do this before deciding whether or not it is necessary to cast a second vote.

2.4 Assessing Existing Controls

Next, participants should rate the effectiveness of existing controls and note this within the CERA Tool dashboard.

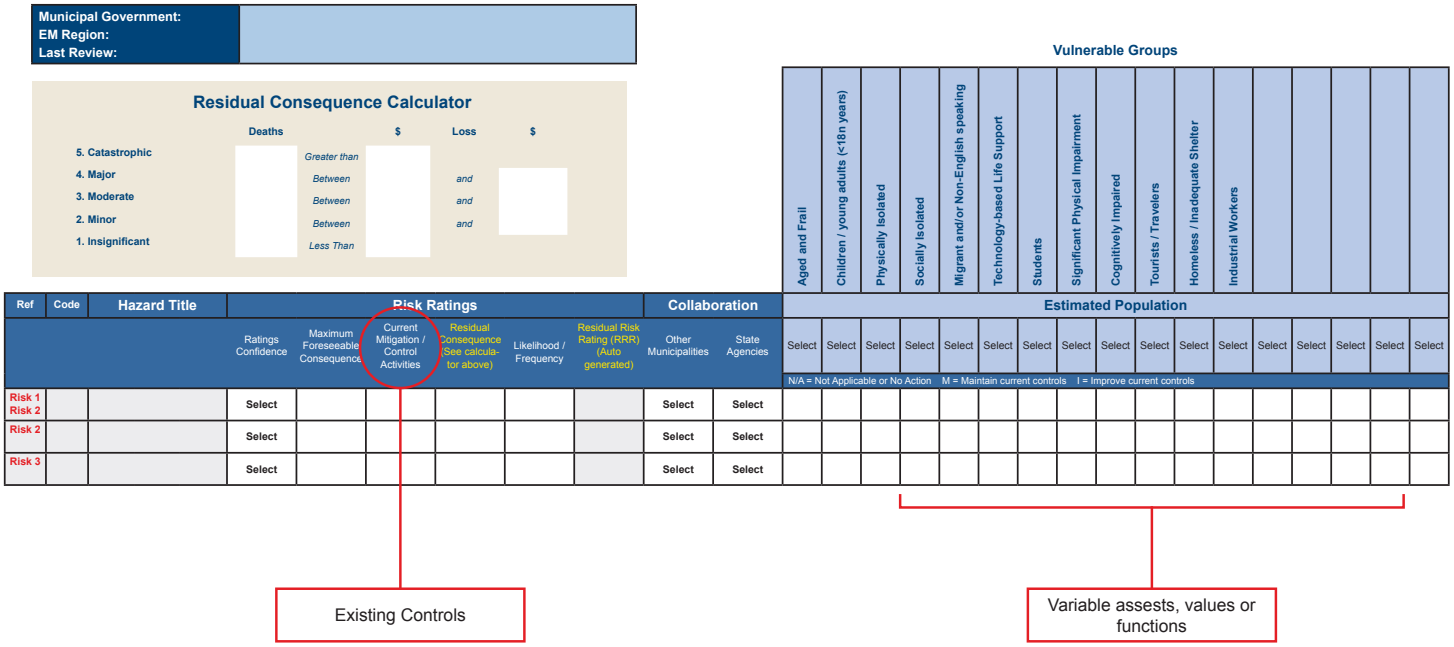

Fig. 12: Assessing existing controls

2.4.1 About Assessing Controls (From the National Emergency Risk Assessment Guidelines – NERAG)

This section describes how to analyse the identified controls to determine their relative effectiveness in mitigating the risk.

Emergency risks generally have one or more controls in place. These controls are generally intended to modify the risk by reducing the likelihood of the scenario consequences. Overall, there may be a large number of identified controls for a particular risk.

However, not all controls are equally effective in reducing risk; some controls are more important than others. Key controls are a class of controls or group of controls that are believed to be maintaining an otherwise intolerable risk at a tolerable level.

Session 2

Activity

Key controls are of primary importance to the risk being analysed, as their failure to operate makes a material difference to the risk level.

Examples of key controls

- A flood levee protecting a town is a key control for flood risk, as it prevents flooding up to the height of the levee. For floods above the height of the levee, it ceases to protect the town, and therefore ceases to be a key control.
- Building codes for storms (high wind), earthquakes and fire are key controls, as the amount of damage from an emergency is highly dependent on whether the event exceeds the building code or not.
- For viruses that infect humans, such as influenza, vaccine production following outbreak of the virus is a key control, as production of a vaccine has a material effect on the extent of infection, and resulting deaths, injury and economic consequences.
- Capability of emergency response resources are a key control for those events where emergency response resources make a material difference to the consequences of an emergency, such as bushfire.

When they operate, some controls will be more effective than others at preventing the risk or mitigating its impacts. Control strength refers to the ability of the control, or group of controls, if it/they operate as intended, and when required, to achieve the control objective. In short, how well will the control reduce the risk?

- A well designed, constructed and maintained flood levee has a high control strength for floods below its design level, as it prevents flooding as designed.
- A warning and evacuation plan for flooding has a lower control strength, as homes will be inundated and damage/disruption will still occur, and not everyone will necessarily respond as needed to minimise people consequences.
- Weather forecasts are of little strength in preventing emergencies by themselves. However, a well-integrated group of controls that includes forecasts, intelligence gathering, public warnings and response services may have an increased strength in the prediction, warning and response to weather-related emergencies.

Some controls, while available and possible to use, are difficult to implement, due to cost, regulatory burden, or community acceptability. Control expediency, refers to the ability of the control to be used/deployed readily and the control's acceptability to stakeholders/the community. In short, how easily can the control be activated and used?

- Evacuations are a very effective control to protect people, but are difficult to implement in practice. Therefore, the expediency of evacuations is relatively low.
- Standstill protocols for foot and mouth are effective in reducing the spread of the disease, but are very damaging to economic activity, and can be met with a high level of community resistance. Therefore, the expediency for these protocols is relatively low.
- Weather warnings are a regularly published, distributed broadly and relatively well understood. Therefore, the expediency of these controls is relatively high.
- Door knocking house to house requires significant resources, but is relatively well understood and regularly implemented. Therefore, the expediency of these controls is medium.

Session 2

Activity

The purpose of determining the level of control is to demonstrate the controls that are responsible for controlling the risk, the conditions under which they are overwhelmed and their expediency to implement. This guides future discussions on risk evaluation and treatment.

It is not possible to have a single, definitive method for determining a level for all possible emergency controls. The following table therefore describes a method to derive a generic level of control. The level of control should reflect the judgement of the team undertaking the risk assessment.

The two criteria, strength and expediency, are each rated from very low to high. These criteria reflect how well the control is able to modify the risk, and the ease of implementing the control. The level of control may be applied to individual controls, or groups of controls as relevant to the context, and the judgement of the group.

As a guide to practitioners, qualitative descriptors of the levels of strength and expediency are shown below. Note that a single control may have different levels of strength and expediency.

Controls / mitigation activities rating criteria:

	Rating	Criteria
1	Effective	Controls in place are effective. There may be no need to change the controls but they should be reviewed for appropriateness.
2	Moderately effective	Although current controls are effective, some improvement opportunities may be/have been identified. Further review and analysis suggested
3	Moderately ineffective	Controls are in place but may be insufficient to reduce risk consequence and/or likelihood to an acceptable level. Review of controls is highly desirable with potential need for update/ remediation.
4	Very ineffective	Controls are in place but are likely insufficient to reduce risk consequence and/or likelihood to an acceptable level. Review and remediation of controls is required.
5	Completely ineffective or non-existent	Few if any controls are in place. Urgent review and remediation of controls is required.

For each risk description, relevant prevention/preparedness controls and response/recovery controls need to be considered. These are the controls that are currently in place for that risk, and are believed by the stakeholders to have a material effect on the likelihood of the emergency event occurring, or the consequences resulting from that event.

Session 2

Activity

It is important to use your knowledge of the factors that contribute to the hazard impact and the vulnerability or exposure of the asset, value or function to assess the effectiveness of the existing controls.

Ask the following questions:

Q: Are there existing controls in place to detect or prevent the hazard from occurring? What are they?

Q: Are there existing controls in place to mitigate the impacts? What are they?

Q: To what extent do the existing controls address the underlying drivers of: hazard likelihood; vulnerability; exposure?

Q: What evidence do you have to suggest the effectiveness of these controls?

The outcomes of this discussion should be captured on the relevant risk sheet.

Session 2
Activity

2.5 Describe how improvements can be made to existing controls in order to reduce the likelihood, impact and consequences associated with hazards

Once existing controls have been identified, potential opportunities to improve controls can be discussed and documented within the bottom section of the risk sheet tab. These opportunities will serve as a starting point in developing and assessing risk treatment options.

Key questions for consideration when identifying opportunities to improve controls include:

For preventative / detective hazard controls:

Q: What can be done to eliminate or reduce the causes or contributing factors for the hazard?

Q: Are there ways to better detect and respond to the hazard before it occurs or increases in magnitude?

For impact mitigation controls:

Q: How can we use our knowledge of vulnerability and exposure to improve existing controls?

Q: What can be done to enhance recovery of the asset, value or function?

To aid in readily tracking the status of opportunities and related actions across all risks, the CERA Tool automatically transcribes all improvement opportunities into a tab known as the consolidated actions tab which is a read-only, aggregated list that will form the basis for further discussion and consideration of treatment strategies.

Session 2
Activity

2.6 Assign a confidence level to your ratings

Once you have reviewed the available data and/or consulted with the hazard experts and community asset, value and function representatives, use Table 2 to assign a level of confidence in your risk assessment. This confidence rating may be captured in the column adjacent to each risk.

In cases where confidence is rated as low, further analysis and/or outside support is suggested. The support and/or rationale for supporting your assessment and confidence rating should be documented within the appropriate risk profile worksheet within the CERA Tool.

The confidence level is based on the best available information at the time and does not preclude revising the level if significant emergency events later prove that initial assessments of risk were incorrect.
Participants should answer the question:

Q: How confident are you in the level of risk that has been selected?

Table. 2: Confidence level ratings

	Low	Moderate	High
Information/Data	Anecdotal only	Some relevant risk data/ information available	Highly relevant, detailed data/information available
Experience	Little or no specialist risk knowledge on the Risk Committee	Risk knowledge resident on the Risk Committee	Specialist risk knowledge resident on the Risk Committee
Consensus	Little or no agreement regarding ratings and/or risk context	General agreement regarding ratings and/or risk context	Broad agreement regarding ratings and/or risk content

2.7 Identify opportunities to improve collaboration with other municipalities, state agencies or community groups

Given the limited resources that municipal council may have to expend upon municipal emergency risk management, it is imperative to collaborate with and leverage the resources of other municipalities and state-level organisations.

In addition, certain risks may impact large areas (i.e. bushfire, flood) spanning multiple municipalities where risk assessment, mitigation and response activities may benefit from coordination and collaboration across these communities. However, in many cases, collaboration may not yet be at optimal levels.

The dashboard tab provides an efficient means of readily capturing the views expressed by the Risk Committee as to the type and level of action that should be taken, if any. The choices are shown in Table 3.

Participants should answer the question:

Q: What opportunities are there to improve collaboration with other municipalities, state agencies or community groups?

Session 2
Activity

Table. 3: Collaboration level ratings

	Definition
NA	Not applicable
Maintain/Improve	Maintain existing relationships and identify opportunities for improved collaboration.
Establish	Collaboration opportunities should be identified and addressed.

2.8 Identify groups, facilities and locations for consideration and responsive action

Perhaps one of the greatest benefits of bringing a municipal perspective to emergency risk assessment is the identification of certain groups, facilities and/or locations that may be impacted by a particular hazard or event.

Having a deep understanding of any underlying drivers of exposure or vulnerability among these groups, assets or functions will provide you with the most effective means of reducing impact and promoting community well-being. Please see Table 4 for examples.

Participants should answer the question:

Q: Which groups, assets, infrastructure or processes require special attention in order to reduce the impacts of certain hazards upon them?

Table. 4: Examples of potential challenges and the groups that they may impact

Potential challenge	Groups that may be impacted
Inability to receive and/or act upon communications that warn of an imminent threat	Socially isolated, physically isolated, non-English speaking, tourists, etc.
Difficulty in evacuating large numbers of people that may require special assistance	Schools, hospitals, aged care facilities, detention centres, etc.
Exposure to accidental hazardous materials release	Agricultural, industrial and/or emergency response workers

Once identified and considered within the CERA process, suggested action may be identified to:

- Enhance preparedness.
- Reduce the impact or likelihood of the risk.
- Enhance resilience should an emergency occur.

The CERA process provides an efficient mechanism for profiling, at a very high level, the type and estimated population of certain groups, facilities and locations. This information is captured within a drop-down below each descriptor within the dashboard. In addition, the level of action that may be required to enhance the current level of mitigation and preparedness, relative to each emergency risk, may be captured as well.

Session 2
Activity

2.9 Determine the need for and priority of risk treatments and/or more in-depth analysis

The information you have gathered within your CERA dashboard and risk profile worksheet provides a platform for broadly assessing each emergency risk and determining the priority, type and level of responsive action. In addition, a 'heat map' is provided within the CERA Tool to help inform your review and analysis. To help guide the process, your risk assessment ratings are summarised in a simple format within the "heat map" tab of your CERA Tool workbook.

The heat map tab contains two key elements:

- A heat map graphic that plots your assessment of Residual Consequence, Control Effectiveness and Likelihood.
- A supporting table that provides confidence and the residual risk ratings (low, medium, high or extreme) for each risk and a risk ranking.

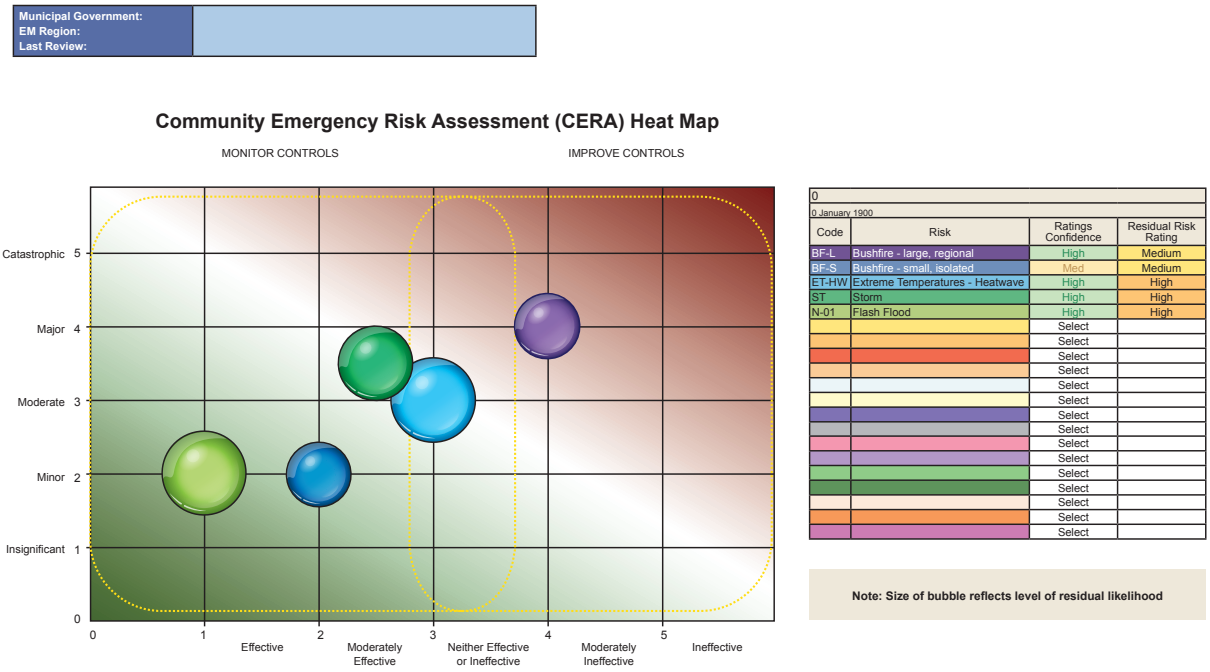

Figure. 12: Heat Map

The heat map helps inform the level and type of action to be taken relative to each risk. The actions can be roughly grouped into two areas:

- Improve controls – Generally speaking, if a risk has a high residual consequence rating and a high control effectiveness rating (current controls are assessed as being ineffective), then action should be taken to review and improve controls.
- Monitor controls – Conversely, if a risk has a high residual consequence rating and an low control effectiveness (i.e. current controls are assesses as having good effect on the risk), then action should be taken to monitor and validate the effectiveness of current controls.

Session 2
Activity

The heat map alone is not an absolute determinant of responsive action. The table to the right of the heat map can help further inform your process. It contains two additional reference points – the confidence level of the ratings as well as a residual risk rating as previously described in Table 1. A risk ranking is also provided based on the calculation:

RANKING = RESIDUAL CONSEQUENCE x EFFECTIVENESS OF CONTROL x LIKELIHOOD

2.9.1 Risk tolerance

The level of tolerance for these risks, and hence the responsive actions required to review and potentially improve controls or risk treatments, can be informed by the principle known as **ALARP** – an acronym that stands for '**as low as reasonably practicable**'.

In brief, the ALARP level may be described as the point at which further steps to reduce the risk will incur costs that are grossly disproportionate to the benefits to be gained. Table 5 below provides indicative risk tolerance levels and responsive actions that may be considered for each level.

Table. 5: Indicative risk tolerance levels

Residual risk rating	Indicative risk tolerance levels
Extreme or High	Generally intolerable – Measures should be taken to reduce the risk and will generally require consultation with and support from state and/or federal agencies.
Moderate	Tolerable – subject to being reduced to ALARP levels and with the goal of moving them into the broadly acceptable region.
Low	Broadly acceptable – generally requiring little if any additional action.

2.9.2 Assessment confidence

The lower the confidence rating, the higher the level of emphasis that needs to be placed upon better understanding the factors driving the risks and the options available for addressing them.

For example, you may encounter a risk where the rating of control effectiveness indicates that current controls should simply be monitored, however the residual risk rating may be extreme or high. In this case, the group may choose to consult with state and/or federal agencies to determine what additional measures can/should be taken. In some cases, no amount of investment may reduce a risk to a "moderate or low" residual risk rating level. However, due diligence and input from subject matter specialists from appropriate levels of government and/or relevant state agencies is first required before drawing such a conclusion.

Session 2
Activity

2.9.3 Dashboard

The information you have gathered within your CERA Tool dashboard tab also provides a platform for broadly assessing each emergency risk and can be used in determining the priority, type and level of responsive action. It provides a mechanism for visualising:

- **Horizontally** – A summary view of the type and level of action required to enhance collaboration and better address the breadth of groups impacted by each emergency risk.
- **Vertically** – A summary view of the type and level of action required to better address the breadth of emergency risks impacting each group, facility and/or location.

For each of these perspectives, a list of state agencies and organisations is provided that may be able to assist your council in addressing each emergency risk. With this information in hand, you can readily visualise and prioritise the risks that may require the most significant extent of action. The same holds true for groups, facilities and locations where the composite of actions may be viewed down the vertical column.

2.10 What happens next?

Based on the outcome of the CERA and evaluation, the Risk Committee now has a platform to select and prioritise the risk treatment activities.

There is no template for the progression of treatment strategies as it is dependent upon the needs of the EMPC. However, it is suggested that the Risk Committee make recommendations to the EMPC in relation to treatment strategies.

2.10.1 Define and implement actions to better manage and/or monitor key risks and controls

The information that the risk subcommittee has collected within each risk profile worksheet can now be reviewed to identify, prioritise and develop suitable risk treatments. The consolidated actions tab in the CERA Tool provides an initial listing of improvement opportunities that have been detailed in the risk tabs.

The responsibility for treatment of risks is shared by all agencies. Treatment of specific risks for the municipal district is not the sole responsibility of the municipal council. Many risk treatments will be carried out in the context of statewide programs or policies. Actions should be allocated to accountable individuals or groups and assigned a target date for completion. In some cases, the group may determine that additional, in-depth analysis is required before an adequate assessment can be made and actions defined.

2.10.2 Define actions to improve collaboration with other municipalities and/or with state agencies

Review your CERA dashboard to determine where and whether actions should be taken to improve collaboration with other municipalities and/or state agencies. Improvement opportunities and actions may be recorded within the relevant risk profile worksheet.

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Activity

2.10.3 Define actions to enhance controls and/or preparedness across groups, facilities and locations

Review the groups, facilities and/or locations noted for action. Discuss and document actions, ownership and timing. As appropriate, liaise with agencies and organisations that align to each group, facility and/or location, as indicated along the bottom of your dashboard.

2.10.4 Leverage CERA outputs to inform your Emergency Management Plan and other related documents/processes i.e. Municipal Health Plan, Council Plan, etc.

Many of the emergency risks and responsive actions identified within your CERA process may also be relevant to other planning activities and resources within your council. In particular, the CERA will directly inform your Emergency Management Plan and can help provide enhanced focus upon the key emergency risks and responsive actions within your community.

2.10.5 Communicate and consult

The effectiveness of the CERA process is largely underpinned by the ability and extent to which EMPCs engage with internal and external stakeholders through ongoing communication and consultation. This ongoing stakeholder engagement is essential to ensure that a comprehensive and responsive Emergency Management Plan is developed and informed by localised information. Broadly speaking, stakeholders can be classified into three groups:

- Individuals affected by the risk emergency events.
- Specialists who contribute to the emergency risk management process.
- Stakeholders with jurisdictional authority for specific hazards and associated risks.

Each stakeholder group offers unique perceptions, needs and concerns and should be given the opportunity to contribute to the emergency management planning process. Information relating to the nature of relevant risks, causes, consequences and appropriate treatment measures should be exchanged through the consultation process.

Relevant stakeholder groups to be consulted might include:

- Emergency service providers (for example CFA, MFB, SES, VicPolice)
- Municipal council staff and groups
- Elected members of local government
- Community groups/members of the community
- State–wide agencies
- State government departments/agencies
- Other external organisations/companies

Session 2

Activity

In facilitating communication with the broader community, methods of communication should also be considered. Potential communication channels include:

- Council newsletters
- Newsletters, surveys and questionnaires
- Community meetings and focus groups
- Media advertisements
- Formal meeting records
- Online forums or websites
- Submissions
- Social Media (Facebook, Twitter etc.)
- Other organisations

A comprehensive communication plan should also be considered. This plan should outline key representatives from each relevant stakeholder group, their relevant contact information and the nature and capacity of their involvement in the emergency risk management process. In the event that priority action is required for urgent risk, the communication plan should specify what external agency should be contacted.

CERA relies on the **all hazards and all agencies approach** to emergency management. Every person working in the Victorian emergency management sector can provided insights into the CERA process.

The effective preparation, reporting and maintenance of the CERA process are best supported by ongoing monitoring and review. There are a number of key entities that are involved in this process, overall, including:

- **Emergency service providers** – Emergency service providers and other agencies play key roles in the emergency management risk management and planning processes. As members of the EMPC, agencies participate and contribute to risk management processes through subject matter expertise for hazard specific information and local knowledge.
- **Municipal Emergency Resource Officer (MERO)** – The MERO, or other delegated officer, should routinely review the status of risk treatments, and collaborate with other municipalities and/or state agencies in enhancing preparedness, response and recovery capabilities across key risk scenarios, etc.
- **Municipal Emergency Management Planning Committee (MEMPC)** – The MEMPC plays a central role in the supporting and executing the CERA process overall. As such, review of the CERA process and outputs should be a regular, standing agenda item for all routine meetings of the MEMPC.
- **Council** – Council should review the output of the CERA process to ensure it is appropriately considered and reflected within the Emergency Management Plan.
- **Audit committee** – Audit committees of councils have oversight responsibility for risk management of the council and, as such, should have the opportunity to review and provide input to CERA outputs as well as the overall Emergency Management Plan.
- **Residents and businesses within the municipality** – Output of the CERA process can be made available on council websites for review and feedback from members of the community.

Appendix A

Risk terminology glossary

These definitions have been taken from The United Nations Office for Disaster Risk Reduction (UNISDR). The UNISDR developed these basic definitions on disaster risk reduction to promote a common understanding on the subject for use by the public, authorities and practitioners.

The terms are based on a broad consideration of different international sources. Feedback from specialists and other practitioners to improve these definitions is encouraged.
Please visit: **www.unisdr.org/we/inform/terminology**

Acceptable risk

The level of potential losses that a society or community considers acceptable given existing social, economic, political, cultural, technical and environmental conditions.

Comment: *In engineering terms, acceptable risk is also used to assess and define the structural and non-structural measures that are needed in order to reduce possible harm to people, property, services and systems to a chosen tolerated level, according to codes or "accepted practice" which are based on known probabilities of hazards and other factors.*

Adaptation

The adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities.

Comment: *This definition addresses the concerns of climate change and is sourced from the secretariat of the United Nations Framework Convention on Climate Change (UNFCCC). The broader concept of adaptation also applies to non-climatic factors such as soil erosion or surface subsidence. Adaptation can occur in autonomous fashion, for example through market changes, or as a result of intentional adaptation policies and plans. Many disaster risk reduction measures can directly contribute to better adaptation.*

Biological hazard

Process or phenomenon of organic origin or conveyed by biological vectors, including exposure to pathogenic micro-organisms, toxins and bioactive substances that may cause loss of life, injury, illness or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.

Comment*: Examples of biological hazards include outbreaks of epidemic diseases, plant or animal contagion, insect or other animal plagues and infestations.*

Building code

A set of ordinances or regulations and associated standards intended to control aspects of the design, construction, materials, alteration and occupancy of structures that are necessary to ensure human safety and welfare, including resistance to collapse and damage.

Comment*: Building codes can include both technical and functional standards. They should incorporate the lessons of international experience and should be tailored to national and local circumstances. A systematic regime of enforcement is a critical supporting requirement for effective implementation of building codes.*

Appendix A

Risk terminology glossary

Capacity

The combination of all the strengths, attributes and resources available within a community, society or organisation that can be used to achieve agreed goals.

***Comment**: Capacity may include infrastructure and physical means, institutions, societal coping abilities, as well as human knowledge, skills and collective attributes such as social relationships, leadership and management. Capacity also may be described as capability. Capacity assessment is a term for the process by which the capacity of a group is reviewed against desired goals, and the capacity gaps are identified for further action.*

Capacity development

The process by which people, organisations and society systematically stimulate and develop their capacities over time to achieve social and economic goals, including through improvement of knowledge, skills, systems, and institutions.

***Comment**: Capacity development is a concept that extends the term of capacity building to encompass all aspects of creating and sustaining capacity growth over time. It involves learning and various types of training, but also continuous efforts to develop institutions, political awareness, financial resources, technology systems, and the wider social and cultural enabling environment.*

Climate change

a. The Inter-governmental Panel on Climate Change (IPCC) defines climate change as: "a change in the state of the climate that can be identified (for example, using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forcings, or to persistent anthropogenic changes in the composition of the atmosphere or in land use".

b. The United Nations Framework Convention on Climate Change (UNFCCC) defines climate change as "a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods".

***Comment**: For disaster risk reduction purposes, either of these definitions may be suitable, depending on the particular context. The UNFCCC definition is the more restricted one as it excludes climate changes attributable to natural causes. The IPCC definition can be paraphrased for popular communications as "A change in the climate that persists for decades or longer, arising from either natural causes or human activity."*

Contingency planning

A management process that analyses specific potential events or emerging situations that might threaten society or the environment and establishes arrangements in advance to enable timely, effective and appropriate responses to such events and situations.

***Comment**: Contingency planning results in organised and coordinated courses of action with clearly-identified institutional roles and resources, information processes, and operational arrangements for specific actors at times of need. Based on scenarios of possible emergency conditions or disaster events, it allows key actors to envision, anticipate and solve problems that can arise during crises. Contingency planning is an important part of overall preparedness. Contingency plans need to be regularly updated and exercised.*

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Risk terminology glossary

Coping capacity

The ability of people, organisations and systems, using available skills and resources, to face and manage adverse conditions, emergencies or disasters.

***Comment**: The capacity to cope requires continuing awareness, resources and good management, both in normal times as well as during crises or adverse conditions. Coping capacities contribute to the reduction of disaster risks.*

Corrective disaster risk management

Management activities that address and seek to correct or reduce disaster risks which are already present.

***Comment**: This concept aims to distinguish between the risks that are already present, and which need to be managed and reduced now, and the prospective risks that may develop in future if risk reduction policies are not put in place. See also Prospective risk management.*

Critical facilities

The primary physical structures, technical facilities and systems which are socially, economically or operationally essential to the functioning of a society or community, both in routine circumstances and in the extreme circumstances of an emergency.

***Comment**: Critical facilities are elements of the infrastructure that support essential services in a society. They include such things as transport systems, air and sea ports, electricity, water and communications systems, hospitals and health clinics, and centres for fire, police and public administration services.*

Disaster

A serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources.

***Comment**: Disasters are often described as a result of the combination of: the exposure to a hazard; the conditions of vulnerability that are present; and insufficient capacity or measures to reduce or cope with the potential negative consequences. Disaster impacts may include loss of life, injury, disease and other negative effects on human physical, mental and social well-being, together with damage to property, destruction of assets, loss of services, social and economic disruption and environmental degradation.*

Disaster risk

The potential disaster losses, in lives, health status, livelihoods, assets and services, which could occur to a particular community or a society over some specified future time period.

***Comment**: The definition of disaster risk reflects the concept of disasters as the outcome of continuously present conditions of risk. Disaster risk comprises different types of potential losses which are often difficult to quantify. Nevertheless, with knowledge of the prevailing hazards and the patterns of population and socio-economic development, disaster risks can be assessed and mapped, in broad terms at least.*

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Risk terminology glossary

Disaster risk management

The systematic process of using administrative directives, organisations, and operational skills and capacities to implement strategies, policies and improved coping capacities in order to lessen the adverse impacts of hazards and the possibility of disaster.

***Comment**: This term is an extension of the more general term "risk management" to address the specific issue of disaster risks. Disaster risk management aims to avoid, lessen or transfer the adverse effects of hazards through activities and measures for prevention, mitigation and preparedness.*

Disaster risk reduction

The concept and practice of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events.

***Comment**: A comprehensive approach to reduce disaster risks is set out in the United Nations-endorsed Hyogo Framework for Action, adopted in 2005, whose expected outcome is "The substantial reduction of disaster losses, in lives and the social, economic and environmental assets of communities and countries." The International Strategy for Disaster Reduction (ISDR) system provides a vehicle for cooperation among Governments, organisations and civil society actors to assist in the implementation of the Framework. Note that while the term "disaster reduction" is sometimes used, the term "disaster risk reduction" provides a better recognition of the ongoing nature of disaster risks and the ongoing potential to reduce these risks.*

Disaster risk reduction plan

A document prepared by an authority, sector, organisation or enterprise that sets out goals and specific objectives for reducing disaster risks together with related actions to accomplish these objectives.

***Comment**: Disaster risk reduction plans should be guided by the Hyogo Framework and considered and coordinated within relevant development plans, resource allocations and programme activities. National level plans needs to be specific to each level of administrative responsibility and adapted to the different social and geographical circumstances that are present. The time frame and responsibilities for implementation and the sources of funding should be specified in the plan. Linkages to climate change adaptation plans should be made where possible.*

Early warning system

The set of capacities needed to generate and disseminate timely and meaningful warning information to enable individuals, communities and organisations threatened by a hazard to prepare and to act appropriately and in sufficient time to reduce the possibility of harm or loss.

***Comment**: This definition encompasses the range of factors necessary to achieve effective responses to warnings. A people-centred early warning system necessarily comprises four key elements: knowledge of the risks; monitoring, analysis and forecasting of the hazards; communication or dissemination of alerts and warnings; and local capabilities to respond to the warnings received. The expression "end-to-end warning system" is also used to emphasise that warning systems need to span all steps from hazard detection through to community response.*

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Risk terminology glossary

Ecosystem services

The benefits that people and communities obtain from ecosystems.

***Comment**: This definition is drawn from the Millennium Ecosystem Assessment. The benefits that ecosystems can provide include "regulating services" such as regulation of floods, drought, land degradation and disease, along with "provisioning services" such as food and water, "supporting services" such as soil formation and nutrient cycling, and "cultural services" such as recreational, spiritual, religious and other non-material benefits. Integrated management of land, water and living resources that promotes conservation and sustainable use provide the basis for maintaining ecosystem services, including those that contribute to reduced disaster risks.*

El Niño-southern oscillation

A complex interaction of the tropical Pacific Ocean and the global atmosphere that results in irregularly occurring episodes of changed ocean and weather patterns in many parts of the world, often with significant impacts over many months, such as altered marine habitats, rainfall changes, floods, droughts, and changes in storm patterns.

***Comment**: The El Niño part of the El Niño-Southern Oscillation (ENSO) phenomenon refers to the well-above-average ocean temperatures that occur along the coasts of Ecuador, Peru and northern Chile and across the eastern equatorial Pacific Ocean, while La Niña part refers to the opposite circumstances when well-below-average ocean temperatures occur. The Southern Oscillation refers to the accompanying changes in the global air pressure patterns that are associated with the changed weather patterns experienced in different parts of the world.*

Emergency management

The organisation and management of resources and responsibilities for addressing all aspects of emergencies, in particular preparedness, response and initial recovery steps.

***Comment**: A crisis or emergency is a threatening condition that requires urgent action. Effective emergency action can avoid the escalation of an event into a disaster. Emergency management involves plans and institutional arrangements to engage and guide the efforts of government, non-government, voluntary and private agencies in comprehensive and coordinated ways to respond to the entire spectrum of emergency needs. The expression "disaster management" is sometimes used instead of emergency management.*

Emergency services

The set of specialised agencies that have specific responsibilities and objectives in serving and protecting people and property in emergency situations.

***Comment**: Emergency services include agencies such as civil protection authorities, police, fire, ambulance, paramedic and emergency medicine services, Red Cross and Red Crescent societies, and specialised emergency units of electricity, transportation, communications and other related services organisations.*

Environmental degradation

The reduction of the capacity of the environment to meet social and ecological objectives and needs.

***Comment**: Degradation of the environment can alter the frequency and intensity of natural hazards and increase the vulnerability of communities. The types of human-induced degradation are varied and include land misuse, soil erosion and loss, desertification, wildland fires, loss of biodiversity, deforestation, mangrove destruction, land, water and air pollution, climate change, sea level rise and ozone depletion.*

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Environmental impact assessment
Process by which the environmental consequences of a proposed project or programme are evaluated, undertaken as an integral part of planning and decision-making processes with a view to limiting or reducing the adverse impacts of the project or programme.

***Comment**: Environmental impact assessment is a policy tool that provides evidence and analysis of environmental impacts of activities from conception to decision-making. It is utilised extensively in national programming and project approval processes and for international development assistance projects. Environmental impact assessments should include detailed risk assessments and provide alternatives, solutions or options to deal with identified problems.*

Exposure
People, property, systems, or other elements present in hazard zones that are thereby subject to potential losses.

***Comment**: Measures of exposure can include the number of people or types of assets in an area. These can be combined with the specific vulnerability of the exposed elements to any particular hazard to estimate the quantitative risks associated with that hazard in the area of interest.*

Extensive risk
The widespread risk associated with the exposure of dispersed populations to repeated or persistent hazard conditions of low or moderate intensity, often of a highly localised nature, which can lead to debilitating cumulative disaster impacts.

***Comment**: Extensive risk is mainly a characteristic of rural areas and urban margins where communities are exposed to, and vulnerable to, recurring localised floods, landslides storms or drought. Extensive risk is often associated with poverty, urbanisation and environmental degradation. See also "Intensive risk".*

Forecast
Definite statement or statistical estimate of the likely occurrence of a future event or conditions for a specific area.

***Comment**: In meteorology a forecast refers to a future condition, whereas a warning refers to a potentially dangerous future condition.*

Geological hazard
Geological process or phenomenon that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.

***Comment**: Geological hazards include internal earth processes, such as earthquakes, volcanic activity and emissions, and related geophysical processes such as mass movements, landslides, rockslides, surface collapses, and debris or mud flows. Hydrometeorological factors are important contributors to some of these processes. Tsunamis are difficult to categorise; although they are triggered by undersea earthquakes and other geological events, they are essentially an oceanic process that is manifested as a coastal water-related hazard.*

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Hazard

A dangerous phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.

***Comment**: The hazards of concern to disaster risk reduction as stated in footnote 3 of the Hyogo Framework are "… hazards of natural origin and related environmental and technological hazards and risks." Such hazards arise from a variety of geological, meteorological, hydrological, oceanic, biological, and technological sources, sometimes acting in combination. In technical settings, hazards are described quantitatively by the likely frequency of occurrence of different intensities for different areas, as determined from historical data or scientific analysis.*

See other hazard-related terms in the Terminology: Biological hazard; Geological hazard; Hydrometeorological hazard; Natural hazard; Socio-natural hazard; Technological hazard.

Hydrometeorological hazard

Process or phenomenon of atmospheric, hydrological or oceanographic nature that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.

***Comment**: Hydrometeorological hazards include tropical cyclones (also known as typhoons and hurricanes), thunderstorms, hailstorms, tornados, blizzards, heavy snowfall, avalanches, coastal storm surges, floods including flash floods, drought, heatwaves and cold spells. Hydrometeorological conditions also can be a factor in other hazards such as landslides, wildland fires, locust plagues, epidemics, and in the transport and dispersal of toxic substances and volcanic eruption material.*

Intensive risk

The risk associated with the exposure of large concentrations of people and economic activities to intense hazard events, which can lead to potentially catastrophic disaster impacts involving high mortality and asset loss.

***Comment**: Intensive risk is mainly a characteristic of large cities or densely populated areas that are not only exposed to intense hazards such as strong earthquakes, active volcanoes, heavy floods, tsunamis, or major storms but also have high levels of vulnerability to these hazards. See also "Extensive risk.*

Land-use planning

The process undertaken by public authorities to identify, evaluate and decide on different options for the use of land, including consideration of long term economic, social and environmental objectives and the implications for different communities and interest groups, and the subsequent formulation and promulgation of plans that describe the permitted or acceptable uses.

***Comment**: Land-use planning is an important contributor to sustainable development. It involves studies and mapping; analysis of economic, environmental and hazard data; formulation of alternative land-use decisions; and design of long-range plans for different geographical and administrative scales. Land-use planning can help to mitigate disasters and reduce risks by discouraging settlements and construction of key installations in hazard-prone areas, including consideration of service routes for transport, power, water, sewage and other critical facilities.*

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Risk terminology glossary

Mitigation

The lessening or limitation of the adverse impacts of hazards and related disasters.

***Comment**: The adverse impacts of hazards often cannot be prevented fully, but their scale or severity can be substantially lessened by various strategies and actions. Mitigation measures encompass engineering techniques and hazard-resistant construction as well as improved environmental policies and public awareness. It should be noted that in climate change policy, "mitigation" is defined differently, being the term used for the reduction of greenhouse gas emissions that are the source of climate change.*

National Platform for Disaster Risk Reduction

A generic term for national mechanisms for coordination and policy guidance on disaster risk reduction that are multi-sectoral and inter-disciplinary in nature, with public, private and civil society participation involving all concerned entities within a country.

***Comment**: This definition is derived from footnote 10 of the Hyogo Framework. Disaster risk reduction requires the knowledge, capacities and inputs of a wide range of sectors and organisations, including United Nations agencies present at the national level, as appropriate. Most sectors are affected directly or indirectly by disasters and many have specific responsibilities that impinge upon disaster risks. National platforms provide a means to enhance national action to reduce disaster risks, and they represent the national mechanism for the International Strategy for Disaster Reduction.*

Natural hazard

Natural process or phenomenon that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.

***Comment**:: Natural hazards are a sub-set of all hazards. The term is used to describe actual hazard events as well as the latent hazard conditions that may give rise to future events. Natural hazard events can be characterised by their magnitude or intensity, speed of onset, duration, and area of extent. For example, earthquakes have short durations and usually affect a relatively small region, whereas droughts are slow to develop and fade away and often affect large regions. In some cases hazards may be coupled, as in the flood caused by a hurricane or the tsunami that is created by an earthquake.*

Preparedness

The knowledge and capacities developed by governments, professional response and recovery organisations, communities and individuals to effectively anticipate, respond to, and recover from, the impacts of likely, imminent or current hazard events or conditions.

***Comment**: Preparedness action is carried out within the context of disaster risk management and aims to build the capacities needed to efficiently manage all types of emergencies and achieve orderly transitions from response through to sustained recovery. Preparedness is based on a sound analysis of disaster risks and good linkages with early warning systems, and includes such activities as contingency planning, stockpiling of equipment and supplies, the development of arrangements for coordination, evacuation and public information, and associated training and field exercises. These must be supported by formal institutional, legal and budgetary capacities. The related term "readiness" describes the ability to quickly and appropriately respond when required.*

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Risk terminology glossary

Prevention
The outright avoidance of adverse impacts of hazards and related disasters.

***Comment**: Prevention (i.e. disaster prevention) expresses the concept and intention to completely avoid potential adverse impacts through action taken in advance. Examples include dams or embankments that eliminate flood risks, land-use regulations that do not permit any settlement in high risk zones, and seismic engineering designs that ensure the survival and function of a critical building in any likely earthquake. Very often the complete avoidance of losses is not feasible and the task transforms to that of mitigation. Partly for this reason, the terms prevention and mitigation are sometimes used interchangeably in casual use.*

Prospective disaster risk management
Management activities that address and seek to avoid the development of new or increased disaster risks.

***Comment**: This concept focuses on addressing risks that may develop in future if risk reduction policies are not put in place, rather than on the risks that are already present and which can be managed and reduced now. See also Corrective disaster risk management.*

Public awareness
The extent of common knowledge about disaster risks, the factors that lead to disasters and the actions that can be taken individually and collectively to reduce exposure and vulnerability to hazards.

***Comment**: Public awareness is a key factor in effective disaster risk reduction. Its development is pursued, for example, through the development and dissemination of information through media and educational channels, the establishment of information centres, networks, and community or participation actions, and advocacy by senior public officials and community leaders.*

Recovery
The restoration, and improvement where appropriate, of facilities, livelihoods and living conditions of disaster-affected communities, including efforts to reduce disaster risk factors.

***Comment**: The recovery task of rehabilitation and reconstruction begins soon after the emergency phase has ended, and should be based on pre-existing strategies and policies that facilitate clear institutional responsibilities for recovery action and enable public participation. Recovery programmes, coupled with the heightened public awareness and engagement after a disaster, afford a valuable opportunity to develop and implement disaster risk reduction measures and to apply the "build back better" principle.*

Residual risk
The risk that remains in unmanaged form, even when effective disaster risk reduction measures are in place, and for which emergency response and recovery capacities must be maintained.

***Comment**: The presence of residual risk implies a continuing need to develop and support effective capacities for emergency services, preparedness, response and recovery together with socio-economic policies such as safety nets and risk transfer mechanisms.*

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Risk terminology glossary

Resilience
The ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions.

***Comment**: Resilience means the ability to "resile from" or "spring back from" a shock. The resilience of a community in respect to potential hazard events is determined by the degree to which the community has the necessary resources and is capable of organising itself both prior to and during times of need.*

Response
The provision of emergency services and public assistance during or immediately after a disaster in order to save lives, reduce health impacts, ensure public safety and meet the basic subsistence needs of the people affected.

***Comment**: Disaster response is predominantly focused on immediate and short-term needs and is sometimes called "disaster relief". The division between this response stage and the subsequent recovery stage is not clear-cut. Some response actions, such as the supply of temporary housing and water supplies, may extend well into the recovery stage.*

Retrofitting
Reinforcement or upgrading of existing structures to become more resistant and resilient to the damaging effects of hazards.

***Comment**: Retrofitting requires consideration of the design and function of the structure, the stresses that the structure may be subject to from particular hazards or hazard scenarios, and the practicality and costs of different retrofitting options. Examples of retrofitting include adding bracing to stiffen walls, reinforcing pillars, adding steel ties between walls and roofs, installing shutters on windows, and improving the protection of important facilities and equipment.*

Risk
The combination of the probability of an event and its negative consequences.

***Comment**: This definition closely follows the definition of the ISO/IEC Guide 73. The word "risk" has two distinctive connotations: in popular usage the emphasis is usually placed on the concept of chance or possibility, such as in "the risk of an accident"; whereas in technical settings the emphasis is usually placed on the consequences, in terms of "potential losses" for some particular cause, place and period. It can be noted that people do not necessarily share the same perceptions of the significance and underlying causes of different risks.*

See other risk-related terms in the Terminology: Acceptable risk; Corrective disaster risk management; Disaster risk; Disaster risk management; Disaster risk reduction; Disaster risk reduction plans; Extensive risk; Intensive risk; Prospective disaster risk management; Residual risk; Risk assessment; Risk management; Risk transfer.

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Risk terminology glossary

Risk assessment

A methodology to determine the nature and extent of risk by analysing potential hazards and evaluating existing conditions of vulnerability that together could potentially harm exposed people, property, services, livelihoods and the environment on which they depend.

***Comment**: Risk assessments (and associated risk mapping) include: a review of the technical characteristics of hazards such as their location, intensity, frequency and probability; the analysis of exposure and vulnerability including the physical social, health, economic and environmental dimensions; and the evaluation of the effectiveness of prevailing and alternative coping capacities in respect to likely risk scenarios. This series of activities is sometimes known as a risk analysis process.*

Risk management

The systematic approach and practice of managing uncertainty to minimise potential harm and loss.

***Comment**: Risk management comprises risk assessment and analysis, and the implementation of strategies and specific actions to control, reduce and transfer risks. It is widely practiced by organisations to minimise risk in investment decisions and to address operational risks such as those of business disruption, production failure, environmental damage, social impacts and damage from fire and natural hazards. Risk management is a core issue for sectors such as water supply, energy and agriculture whose production is directly affected by extremes of weather and climate.*

Risk transfer

The process of formally or informally shifting the financial consequences of particular risks from one party to another whereby a household, community, enterprise or state authority will obtain resources from the other party after a disaster occurs, in exchange for ongoing or compensatory social or financial benefits provided to that other party.

***Comment**: Insurance is a well-known form of risk transfer, where coverage of a risk is obtained from an insurer in exchange for ongoing premiums paid to the insurer. Risk transfer can occur informally within family and community networks where there are reciprocal expectations of mutual aid by means of gifts or credit, as well as formally where governments, insurers, multi-lateral banks and other large risk-bearing entities establish mechanisms to help cope with losses in major events. Such mechanisms include insurance and re-insurance contracts, catastrophe bonds, contingent credit facilities and reserve funds, where the costs are covered by premiums, investor contributions, interest rates and past savings, respectively.*

Socio-natural hazard

The phenomenon of increased occurrence of certain geophysical and hydrometeorological hazard events, such as landslides, flooding, land subsidence and drought, that arise from the interaction of natural hazards with overexploited or degraded land and environmental resources.

***Comment**: This term is used for the circumstances where human activity is increasing the occurrence of certain hazards beyond their natural probabilities. Evidence points to a growing disaster burden from such hazards. Socio-natural hazards can be reduced and avoided through wise management of land and environmental resources.*

Appendix A

Risk terminology glossary

Structural and non-structural measures

- Structural measures: any physical construction to reduce or avoid possible impacts of hazards, or application of engineering techniques to achieve hazard-resistance and resilience in structures or systems.
- Non-structural measures: any measure not involving physical construction that uses knowledge, practice or agreement to reduce risks and impacts, in particular through policies and laws, public awareness raising, training and education.

***Comment**: Common structural measures for disaster risk reduction include dams, flood levies, ocean wave barriers, earthquake-resistant construction, and evacuation shelters. Common non-structural measures include building codes, land use planning laws and their enforcement, research and assessment, information resources, and public awareness programmes. Note that in civil and structural engineering, the term "structural" is used in a more restricted sense to mean just the load-bearing structure, with other parts such as wall cladding and interior fittings being termed non-structural.*

Sustainable development

Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

***Comment**: This definition coined by the 1987 Brundtland Commission is very succinct but it leaves unanswered many questions regarding the meaning of the word development and the social, economic and environmental processes involved. Disaster risk is associated with unsustainable elements of development such as environmental degradation, while conversely disaster risk reduction can contribute to the achievement of sustainable development, through reduced losses and improved development practices.*

Technological hazards

A hazard originating from technological or industrial conditions, including accidents, dangerous procedures, infrastructure failures or specific human activities, that may cause loss of life, injury, illness or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.

***Comment**: Examples of technological hazards include industrial pollution, nuclear radiation, toxic wastes, dam failures, transport accidents, factory explosions, fires, and chemical spills. Technological hazards also may arise directly as a result of the impacts of a natural hazard event.*

Vulnerability

The characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard.

***Comment**: There are many aspects of vulnerability, arising from various physical, social, economic, and environmental factors. Examples may include poor design and construction of buildings, inadequate protection of assets, lack of public information and awareness, limited official recognition of risks and preparedness measures, and disregard for wise environmental management. Vulnerability varies significantly within a community and over time. This definition identifies vulnerability as a characteristic of the element of interest (community, system or asset) which is independent of its exposure. However, in common use the word is often used more broadly to include the element's exposure.*

Appendix B

Pro-forma invitation letter

xx month year

Title Firstname Surname
Position Title (e.g. Director)
Company Name
Street Address
SUBURB/TOWN STATE postcode

Dear Firstname

Invitation to join Risk Committee

Municipality Name is currently undertaking a Community Emergency Risk Assessment (CERA) process to ensure that our emergency management plans adequately and realistically anticipate the range of hazards that threaten to impact upon our community. In addition, Municipal Emergency Management Planning is a requirement under Section 21A of the Emergency Management Act 1986.

To enable Municipality Name to undertake this assessment, the Municipal Emergency Management Planning Committee has undertaken an initial scan of:

1) The hazards that are most likely to impact upon Municipality Name, and:
2) The assets, values and functions that are fundamental to the normal functioning of our community.

The next phase of the risk assessment process requires the assistance and input of subject matter/hazard experts and key stakeholders to form the Risk Committee' This committee will deliberate over the potential consequences for the community as a result of a range of key hazards. The outcomes of these discussions will be quantified using a risk assessment tool and the consequent risk ratings used to inform and update emergency management planning documents. A more detailed description of the CERA process is provided in the ***attached information sheet***.

Due to your knowledge and expertise in **insert relevant expertise here**, the EMPC would like to invite you to assist in the CERA Process and sit on the Risk Committee as a **[subject matter/hazard expert] - [asset/value/function expert] – DELETE AS APPROPRIATE** .

To help you prepare for your role on the Risk Committee, we have supplied some questions and guidance below. A copy of the agenda and ***other relevant documentation*** will be sent to you on the **Date** and the convening of the Risk Committee has been scheduled for the **Date**.

If you have any questions regarding the process, please contact Regional Officer Emergency Management, ROEM Name on ROEM contact number/email.

Yours sincerely,

Name
Title

Appendix B

Pro-forma invitation letter

Expectations of Risk Committee subject matter experts

xxx

Questions to consider:

If you have been identified as a hazard expert, you will be asked to inform your fellow Risk Committee members about the particular hazard and the threat it poses to the municipality in question. Prior to the Risk Committee meeting, you should consider and be prepared to present to your fellow Risk Committee members on the following questions:

- What is the nature of the particular hazard? Describe the hazard.
- What is the likelihood of this hazard occurring in the municipality? Has it happened in the past? How frequently?
- What conditions will lead to this hazard occurring?
- How is the hazard likely to behave in the municipality?
- Are there particular locations, features or attributes that are likely to exacerbate the magnitude of the hazard?
- For how long is the hazard likely to present a threat?
- Using the municipality map, provide two scenarios in which the municipality may be or has been affected by the hazard.

If you have been identified as an **asset, value or function expert**, this means that you have knowledge and insight about a particular municipal asset, value or function that has been identified by the Municipal Emergency Management Planning Committee as being **vital to the normal operation of the municipality or community**. The table below provides examples of what is meant by this:

	Example asset, value or function
Social	Schools, sporting/social clubs, religious groups, entertainment, volunteerism, tradition,
Built/ Infrastructure	Roads, bridges, buildings, transport hubs, major industrial facilities, hospitals, churches, public buildings
Administrative	Welfare payments, health care, legal functions, wage payments,
Economic	Employment, trade, industry
Environmental	Drainage, irrigation, agriculture, environmental services,

Prior to the Risk Committee meeting, you should consider and be prepared to present to your fellow Risk Committee members on the following questions:

- How could the asset, value or function best be described?
- What does the asset, value or function rely upon in order to exist or perform the task it was designed for?
- How does the asset, value or function benefit the community within the municipality or beyond?

Are there particular individuals, groups or users who may rely upon this asset, value or function in particular? (for example elderly, commuters, religious groups, parents etc.)

[i] Standards Australia, Handbook 158:2010 Delivering Assurance based on ISO 31000:2009 Risk management – principles and guidelines, p9.

Appendix C

Rating results table

The Risk Committee's mean score rating results from Session 2 can be entered directly into the CERA Tool, or captured in the table below for transfer into the CERA Tool at a later date.

	Ratings Confidence	Maximum Foreseeable Consequence	Current Mitigation / Control Activities	Residual Consequence	Likelihood / Frequency	Collaboration - Other Municipalities	Collaboration - State Agencies
Hazard 1							
Hazard 2							
Hazard 3							
Hazard 4							
Hazard 5							
Hazard 6							
Hazard 7							
Hazard 8							
Hazard 9							
Hazard 10							
Hazard 11							
Hazard 12							
Hazard 13							
Hazard 14							
Hazard 15							
Hazard 16							
Hazard 17							
Hazard 18							
Hazard 19							
Hazard 20							

Appendix D

Consequence Rating Criteria Tables

Consequence Rating Criteria (Table 1)

	Rating	People	Environment	Economy	Public Administration	Social Setting	Infrastructure
1	Insignificant	• Near misses or minor injuries, no reliance on health system.	• Near misses or incidents without environmental damage, no recovery efforts required	• Financial loss < 0.1% of the jurisdiction's revenues[1], to be managed within standard financial provisions. • Inconsequential disruptions at business level.	• Governing body manages the event within normal parameters. • Public administration functions without disturbances. • Public confidence in governance, no media attention.	• Inconsequential short-term reduction of services. • No damages to objects of cultural significance. • No adverse emotional and psychological impacts.	• Inconsequential short-term failure of infrastructure and service delivery. • No disruption to the public services.
2	Minor	• Isolated cases of serious injuries. • Health system operating within normal parameters. • Displacement of people within jurisdictional capacity to cope. • Personal support needs being met.	• Isolated cases of environmental damage. • One-off recovery efforts required to supplement self-repair. • Damage localised in extent. • Short term impairment of ecosystem functions up to one year.	• Financial loss, 0.1-0.3% of the jurisdiction's revenues[1], requiring activation of reserves to cover loss. • Disruptions at business level leading to isolated cases of loss of employment.	• Governing body manages the emergency event under emergency regime. • Public administration functions with some disturbances. • Isolated expressions of public concern. • Jurisdiction perceived as able to pursue business as usual despite disruptions.	• Isolated and temporary cases of reduced services within community. • Repairable damage to objects of cultural/ heritage significance. • Localised disruption to community wellbeing and social networks over a small area for a period of weeks.	• Infrastructure/ systems failure impacts on part of community's functioning over a small area for a short period (a few weeks). • Localised inconvenience.
3	Moderate	• Isolated cases of lives lost and/or some cases of serious injuries. • Health system operating at maximum surge capacity. • Displacement of people within capacity of the jurisdiction to cope for periods of less than 24 hours. • Elements of jurisdictional personal support system operating at maximum capacity.	• Isolated but significant cases of impairment or loss of ecosystem function(s) at locality within jurisdiction. • Some remedial efforts required for recovery. • Medium term impairment up to two years.	• Financial loss, 0.3-1% of the jurisdiction's revenues[1], requiring adjustments to business strategy to cover loss. • Disruptions to selected industry sectors leading to isolated cases of business failure and multiple loss of employment.	• Governing body manages the emergency event with considerable diversion from policy. • Public administration functions limited by focus on critical services. • Instances of public protests with emergent alarm. • Significant diversion from State policy goal(s) or program(s).	• Ongoing reduced services within community. • Permanent damage to objects of cultural/heritage significance. • Major disruption to community wellbeing and social networks over a locality for a period of months.	• Infrastructure/ systems failure puts severe pressure on part of community's functioning over a medium to large area for a medium period (up to three months). • Widespread inconveniences but no external support required.
4	Major	• Multiple loss of life (mortality in the order of 0.001% of the jurisdictional population). • Health system operating at maximum capacity, under severe pressure. • Isolated cases of displacement of people for periods in the order of a day. • Jurisdictional personal support system operating at maximum capacity. • Normal health care and living standards difficult to maintain.	• Severe impairment or loss of ecosystem functions affecting one or more species or regional landscapes. • Progressive environmental damage. • Extensive recovery effort required. • Serious long term impairment or loss of ecosystem function(s) up to five years.	• Financial loss, 1-3% of the jurisdiction's revenues[1], requiring major changes in business strategy to (partly) cover loss. • Significant disruptions across industry sectors leading to multiple business failures and loss of employment.	• Governing body absorbed with managing the emergency event. • Public administration struggles to provide critical services. • Loss of public confidence in governance, with serious widespread public outcry and some alarm. • State policy goal(s) or program(s) abandoned.	• Reduced quality of life within community. • Significant loss or damage to objects of cultural/heritage significance. • Severe disruption to community wellbeing and social networks over a wide area for up to two years.	• Medium to long term (three to six months) failure of significant infrastructure and service delivery affecting large parts of the community. • Initial external support required.
5	Catastrophic	• Widespread multiple loss of life (mortality in the order of 0.01% of the jurisdictional population). • Health system over-stressed. • Large numbers of displaced people for periods of days or more. • Aid sourced from outside the jurisdiction, people leave the jurisdiction to seek help. • Normal health care and living standards abandoned.	• Widespread severe impairment or loss of ecosystem function(s) across many species and multiple or large regional landscapes. • Irrecoverable environmental damage. • Permanent loss of ecosystem in its pre-existing form. • Limited ecosystem recovery over more than five years.	• Unrecoverable financial loss > 3% of the jurisdiction's revenues[1]. • Asset destruction across industry sectors leading to widespread business failures and loss of employment	• Governing body unable to manage the emergency event. • Disordered public administration without effective functioning. • Public alarm and unrest, civil order requires inter-jurisdictional reinforcement. • Government resigns or alternative governance necessary for some period.	• Community ability to support itself severely impaired. • Widespread loss of objects of cultural/ heritage significance. • Severe disruption to community wellbeing and social networks over the whole area or a large part of it for a period of many years.	• Long term failure (over six months) of significant infrastructure and service delivery affecting most of the community. • Ongoing external support at a large scale required.

Appendix C

Consequence Rating Criteria Tables

Consequence Category Definitions (Table 2)

People	• The health system, i.e. doctors, hospitals, ambulances at local/regional levels. • Local/regionally-based resources and systems to assist people who are displaced from their homes for a length of time. This includes temporary accommodation. • Local/regionally-based resources for supporting affected/displaced people with e.g. material aid, food, financial assistance, personal support services.
Environment	• The continued normal functioning of significant ecosystems.

Economy	• The economy of the local area, considering:
	  • value of overall damage and consequential losses incurred
	  • disruption to particular sectors of industry
	  • need for extraordinary government financial provisions for recovery

Public Administration	• Relates to the impacts of the emergency on the governing body's ability to govern.
Social Setting	• The ability of the community to maintain normal functioning, its resilience, its social fabric and cultural values and heritage.
Infrastructure	• The functionality and continued supply, via the critical infrastructure systems, of the essentials of contemporary society, e.g. fuel, water, telecommunications, transport, food supply, money.

Controls / mitigation activities rating criteria (Table 3)

	Rating	Criteria
1	**Effective**	• Controls in place are effective. There may be no need to change the controls but they should be reviewed for appropriateness.
2	**Moderately effective**	• Although current controls are effective, some improvement opportunities may be/have been identified. Further review and analysis suggested
3	**Moderately ineffective**	• Controls are in place but may be insufficient to reduce risk consequence and/or likelihood to an acceptable level. Review of controls is highly desirable with potential need for update/remediation.
4	**Very ineffective**	• Controls are in place but are likely insufficient to reduce risk consequence and/or likelihood to an acceptable level. Review and remediation of controls is required.
5	**Completely ineffective or non-existent**	• Few if any controls are in place. Urgent review and remediation of controls is required.

Likelihood Rating Criteria (Table 4)

	Likelihood category	Estimated average recurrence interval	Description
1	**Very Rare**	>1,000 years	• No recorded events or any indicative evidence • No recent events in comparable jurisdictions • Minuscule opportunity, reason or means to occur
2	**Rare**	101 – 1,000 years	• Few recorded events or little indicative evidence • Some similar events in comparable jurisdictions • Little opportunity, reason or means to occur
3	**Unlikely**	11 - 100 years	• Some recorded events • Some events in comparable jurisdictions • Some opportunity, reason, or means to occur
4	**Possible / Likely**	1 - 10 years	• Many recorded events • Some events in comparable jurisdictions • Great opportunity, reason, or means to occur
5	**Almost Certain**	More than once a year	• Expected to occur in most circumstances; with strong anecdotal evidence and history of recorded incidents

The community emergency risk assessment participant workbook version 2.0 was printed in March 2014. To download a copy of this manual or to check for updated versions please visit the SES website: **www.ses.vic.gov.au.**