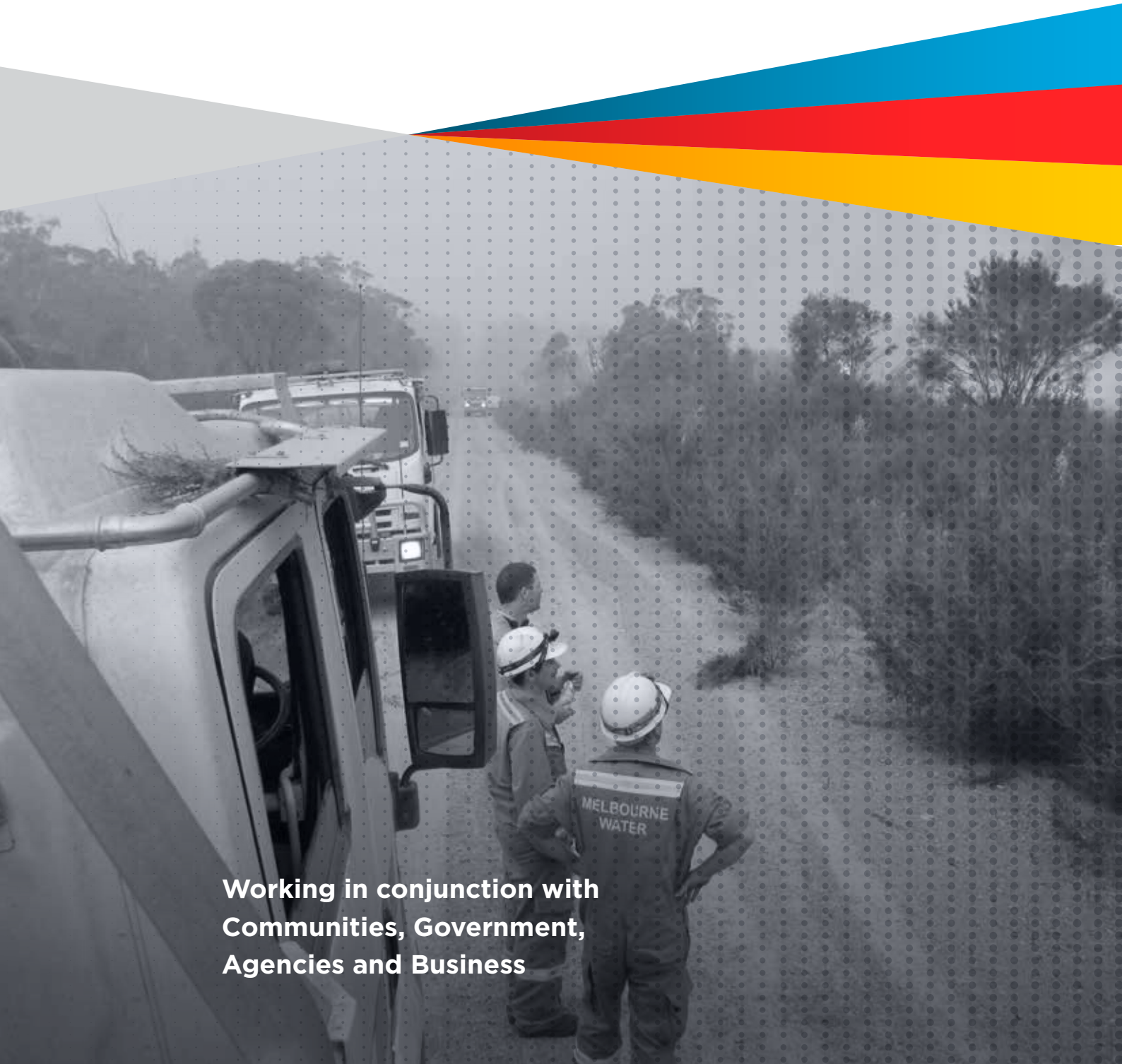# EMV
EMERGENCY MANAGEMENT VICTORIA

Regional Emergency Risk Project 2014/15
State Level Report

Working in conjunction with Communities, Government, Agencies and Business

A message from the Emergency Management Commissioner

Emergency Management Commissioner, Craig Lapsley

I am very pleased to share Emergency Management Victoria's State Summary Report - Regional Emergency Risk Project 2014/15. This is an important document to be shared with communities, businesses and government stakeholders.

It was made possible through strong collaboration across government, agencies, business and universities.

The project is the first all hazard regional-level risk assessment process to be undertaken across Victoria. It contributes to Victoria's risk profile with information now available at municipal, regional and state levels, and provides the basis for further, more detailed, regional risk assessments in the future.

This report provides a summary of findings of a series of regional workshops, which drew on local and regional experience to identify trends and opportunities to refine decision making and planning for optimal allocation of regional resources in regional emergency management capability and capacity.

It includes information on regional stakeholder characteristics, priority emergency risks for each region, as determined by the regional stakeholders themselves, and suggested future emergency management activities.

Key findings confirm that the risks and consequences associated with the "traditional hazards" such as fires, floods and storms are known, but we have less knowledge and understanding of less traditional hazards, such as heatwave or essential services disruption, and their consequences.

Stakeholders participating in these workshops have confirmed through feedback that their knowledge of emergency management has increased because of their participation.

The findings of this project will contribute to regional emergency management planning by providing a more specific focus for regional planning committees, thereby enhancing regional emergency management and improving community resilience.

Craig Lapsley PSM
Emergency Management Commissioner
Emergency Management Victoria

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Executive Summary

The Regional Emergency Risk Project (RERP) was the first risk assessment process to be undertaken at the regional level in Victoria.

The project produced Emergency Risk and Resilience Profiles for each of Victoria's eight geographic regions; Barwon South West, Eastern Metropolitan, Gippsland, Grampians, Hume, Loddon Mallee, North West Metropolitan and South West Metropolitan. These profiles identify priorities for future emergency management planning in regional areas, and support the development of long-term strategies that enable community resilience.

The RERP's objectives were to:

1. Design, organise and facilitate risk workshops that support an open, inclusive and engaging emergency planning environment;
2. Prioritise broader emergency risks for each region based on regional community assets and values, by drawing on regional and state knowledge and expertise;
3. Enhance understanding of existing strategies to reduce or remove broader hazard emergency risk, by assessing their adequacy at regional level;
4. Contribute to regional emergency management knowledge and understanding of broader hazard risks.

The Emergency Management Planning Unit (EMPU) within EMV planned and led workshops with regional stakeholders and subject matter experts (SMEs) across Victoria. Emergency management arrangements were scrutinized to obtain a deeper understanding of all hazard risk management planning specific to each of the state's eight geographical regions.

Workshop discussions focused on identifying hazards, the risks associated with those hazards and current treatments being used to reduce the risk.

Over 200 stakeholders from government, agencies, businesses, and universities participated in 17 EMPU facilitated workshops across Victoria. The summarised Regional Risks of Interest can be viewed under Appendix 1, TABLES 4-11.

The RERP identified:
- Gaps in existing emergency risk treatment processes;
- An insufficient focus on 'less traditional' (but important) emergency risks;
- Inconsistencies in sector wide emergency management terminology;
- That further development of insights into and knowledge of less traditional risks is required.

The outcomes of the RERP support a regional approach to risk ownership, accountabilities, and the development of comprehensive emergency management plans and governance arrangements. This process is supported by EMPU. It aims to enhance regional emergency management and strengthen community resilience by identifying opportunities to refine decision making and planning for optimal allocation of regional resources in regional emergency management capabilities and knowledge.

1. Project Overview

1.1 Background

This report summarises the processes and outcomes of the Regional Emergency Risk Project 2014/15 (RERP).

The RERP is the first all hazard risk assessment process to be undertaken at a regional level in Victoria. The RERP took the initial step towards completing Victoria's risk profile, providing another level of risk information to complement and link existing municipal and state level risk assessments.

The RERP was designed by the Emergency Management Planning Unit (EMPU) within Emergency Management Victoria (EMV) as a risk assessment process for each of the eight geographical regions in Victoria.

Project phases and steps to manage project design, governance, community consultation and delivery were created by EMPU. In 2014/15 EMPU facilitated a series of workshops with regional stakeholders and subject matter experts. Workshops provided forums for stakeholders from government, emergency services, businesses and universities to discuss existing regional emergency management arrangements and to exchange knowledge and experiences. This deepened understanding of all hazards risk management planning approaches for each Victorian region.

The information gathered during the RERP builds on the current emergency risk knowledge in regional areas, and informs emergency planning activities across the state by providing focus on particular "risks of interest" identified through the process. It provides critical data to be used for development of long-term strategies that support community resilience. This process assessed 'all hazards', that is, it did not focus on just one particular hazard, but supported the participants in identifying and assessing all hazards, and associated risks, relevant to their region.

The RERP identified emergency risks of interest, gaps in risk treatments (risk treatments are processes that manage the risk by reducing the likelihood of consequences occurring for diverse emergency types). It created an opportunity for the individual regions to assess where their strengths and weaknesses lie in their current emergency management capacities. The RERP has provided critical information that can be used to focus planning activities for region-specific emergencies, supporting Victoria's capacity to plan for, withstand, respond to, and recover from emergencies at the regional level.

The Victorian Emergency Management Reform White Paper 2012 (White Paper) informed the RERP's design providing clear future priorities on regional emergency management planning reform.

The Victorian Interim Emergency Management Strategic Action Plan 2014/15 (ISAP) provided more specific detail on requirements for short-term emergency management activities at regional level.

The RERP's risk assessment methodology is based on international risk management standards within the National Emergency Risk Assessment Guidelines (EMA 2014). Additional methodological references came from state wide and municipal risk assessments previously conducted in Victoria.

This report provides a general explanation of the process followed and merges regional outputs and outcomes to provide an overall Victorian state representation.

Regional Emergency Risk Workshop

1.2 Project History

The RERP's design, processes and methods were guided by existing policy, strategic and national standards.

The Victorian Emergency Management Reform White Paper 2012 (the White Paper) provided clarity on regional emergency management planning directions. The White Paper states that regional emergency management planning:

- Will enable long-term strategies to be developed for risk management, response and recovery;
- May reduce the need for municipal and agency plans to adopt individual approaches to some hazards;
- Will allow for 'landscape' (sub-regional) planning that relates to a risk footprint extending beyond the boundaries of a single municipality.
- Will support alignment and integration of state and local plans.

Victoria's Interim Emergency Management Strategic Action Plan 2014/15 guided the RERP's actions and desired outcomes by requiring:

- Completion of a risk assessment utilising an agreed framework for all emergency management regions across Victoria; and
- A review of risk mitigation strategies against the assessed risks for all emergency regions across Victoria.

Risk management principles based on the National Emergency Risk Assessment Guidelines (EMA, 2014) and outlined in ISO 31,000:2009 guided EMPU's design of regional workshops and risk assessment method.

The RERP was underpinned by EMV's vision, goals and values, supporting *'a sustainable and efficient emergency management system that reduces the likelihood, effect and consequences of emergencies'* (EMV, 2015) by:

1. Maintaining a sector-wide approach;
2. Considering all-hazards;
3. Focusing on sustainable and efficient emergency management systems;
4. Strengthening capacity to withstand, plan for, respond to and recover from emergencies;
5. Emphasising shared responsibility/community resilience; and
6. Maximising the ability of the emergency management sector's ability to work collaboratively.

EMV shares responsibility for sustainable, community focussed emergency management with a range of Victorian agencies, organisations and departments (EMV 2015). The RERP was created to engage stakeholders, and contribute critical and relevant information to build a strong research-based, data-driven resource supporting regional emergency management planning across the state.

This project was identified as particularly suitable to engage the sector and indirectly support stakeholders in the cultural shift from focussing purely on response to everyone proactively working together to reduce consequences. The key 'cultural drivers' considered in the design of the project that facilitate this change in approach are outlined in Table 1. Cultural shifts are integral to achieving efficient and sustainable emergency management planning.

Cultural Shifts in Emergency Management	
Traditional Focus	**Desired Focus**
Hazard	Consequences/Vulnerability
Response	Before, During and After
Reactive	Proactive
Response Management	Strategic Risk Management
Emergency Services	Everyone's Business
Planning for Communities	Planning with Communities

Table 1: *Cultural Shifts in Emergency Management (modified from Salter, 1997)*

1.3 Objectives

The following objectives guided the RERP in the development of an emergency risk profile for each of Victoria's eight emergency management regions:

1. Design, organise and facilitate risk workshops that support an open, inclusive and engaging emergency planning environment;

2. Draw on regional and state experts to create broader hazard-specific emergency risk priorities based on specific regional community assets and values;

3. Assess the adequacy of broader hazard emergency risk treatment strategies at regional level;

4. Contribute to regional emergency management knowledge that informs regional risk and resilience profiles; and

5. Create opportunities for stakeholders to extend their understanding of broader hazard risks affecting agency-specific emergency response, recovery, mitigation, prevention and preparedness strategies.

1.4 Scope

The RERP's intention was to enhance the understanding of risks and emergency management planning capabilities at regional level and to develop a broader emergency risk profile for each region. This provides a foundation for future regional emergency management activities in Victoria.

The project identified and prioritised broader regional emergency risks of interest, and supports the regions in assessing their strengths, weaknesses, and capacity to treat the identified risks through existing risk treatment strategies.

The RERP facilitated the exchange of knowledge and experiences, and deepens understanding of an all hazard risk management planning approach for each of Victoria's eight regions.

NOTE: The RERP'S purpose was not to conduct comprehensive end-to-end regional emergency risk management studies, or to develop and implement regional emergency risk treatments or emergency management plans. The project's intent was to identify the priority 'risks of interest' for each region, giving direction to more detailed studies in the future.

2. Findings

2.1 Summary of outcomes and outputs

The Regional Emergency Risk Project (RERP) generated the following key outcomes for the regions:

- Enhanced understanding of overall regional emergency management planning arrangements and capabilities;
- Enhanced understanding of roles, responsibilities and risk treatments for selected emergency scenarios;
- Enhanced understanding of the emergency management sector and other stakeholders at a regional level;
- Enhanced regional emergency management stakeholder collaboration;
- Enhanced stakeholder emergency management knowledge;
- Enhanced understanding of underlying regional vulnerability and resilience; and
- Enhanced understanding of regional emergency management risks and their implications for Victoria's emergency resilience.

Participant survey results indicated the following positive findings:

- General confidence in the body of knowledge and expertise relating to traditional, high priority risks such as fire, flood and storm;
- General understanding that agencies had sufficiently developed strategic and tactical plans for regional emergency management;
- Confidence in well-trained personnel with specialist knowledge and equipment.

Participant surveys revealed:

- There are opportunities for improvement in existing risk treatment processes for "non-traditional" risks;
- 'Non-traditional' risks require more focus;
- Development of consistent, sector-wide emergency management terminology is required;
- Consequence analysis revealed new vulnerabilities that need more robust planning;
- There is currently no common platform to address all hazard risk and consequence management at the regional level similar to the all hazard approach considered at municipal level.

The Regional Emergency Risk Profiles provide critical data that informs consequence management (or the minimisation of adverse consequences to users of services or infrastructure caused by the interruption to the services or infrastructure as a consequence of a major emergency), particularly around regional vulnerabilities and exposures.

Workshop discussions focused on estimating potential consequences of an emergency event, and existing emergency management arrangements.

An all-hazard emergency risk profile for each of the eight Victorian regional areas was created from the RERP's data outputs. The specific risk areas and associated risk ratings outlined in Tables 4 to 11 under Appendix 1 aims to inform regional stakeholders where they should focus emergency management planning efforts. Opportunities for improvement in the adequacy of existing risk treatments identified for the "non-traditional" risks form the basis of future emergency management planning activities, as outlined in Section 4 "Steps Forward" of this report.

These outcomes contribute to supporting emergency management in the regions in a number of ways, as shown in Figure one.

Key outcomes	Project is contributing to
Understanding Regional Communities	Regional Emergency Management Governance Structure Buildng
Understanding Regional Values and Assets	Strategic Risk and Consequence Planning (regional and state level)
Understanding Emergency Knowledge Needs	State Emergency Risk Assessment 2017/17
Understanding Hazard Specific Consequences	Minicipal Emergency Risk Assessments
Understanding Emergency Risk Priorities	Emergency Sector Capability - Enhancement of Specific EM Knowledge
Understanding Regional Stakeholders	Regional Emergency Risk Ownership, Accountability and insitutional Arrangements
	Hazard Specific Emergency Risk Assessments

Figure 1: An overview of the RERP's key outcomes and how they relate to regional emergency management in Victoria.

2.2 Regional Stakeholder Characteristics

Online pre- and post-project surveys were completed by 234 regional stakeholders who participated in the workshops. The surveys were designed to help workshop facilitators gain better insight into participant experience in (and understanding of) emergency management, the "functional" areas within emergency management (that is, the areas of emergency planning, preparedness, operational coordination and community participation for prevention (mitigation), response and recovery) that the participants work in, and the proportion of their work activities related to emergency management.

The results were analysed and show (Figure 2):

• More than 60% of workshop participants devoted at least half of their work time to emergency management;
• More than 60% of workshop participants worked in the functional areas of emergency preparedness or response.

Figure 2: Stakeholder Emergency Management - Work Relationship

Proportion of Work Activities Related to Emergency Management
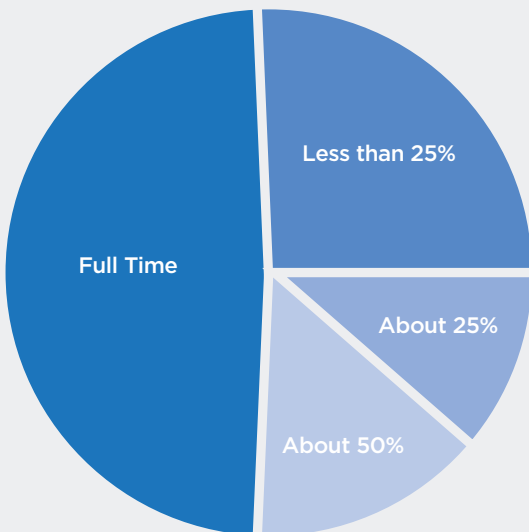
Figure 3 shows that the majority of participants worked in the functional area of preparedness. Interestingly, in the majority of functional areas, the percentage of participants working in these areas increased after the workshops were completed. This may possibly be the result of participants having the opportunity to actually stop and assess how much of their role involves emergency management

Figure 3: Stakeholder Functional Area Distribution of Emergency Management Work
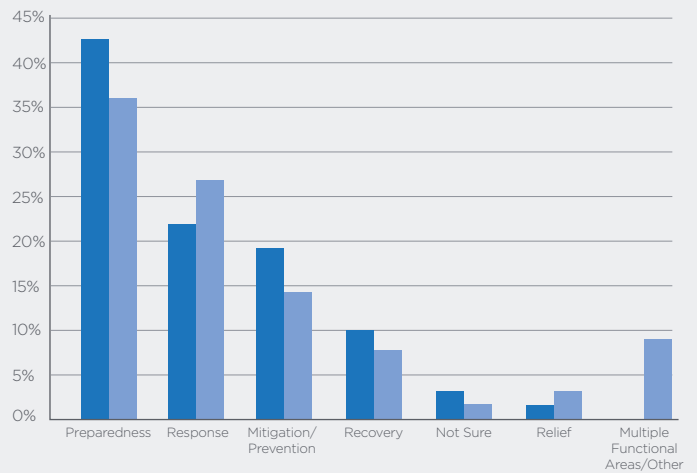
2.3 Identified Regional Emergency "Risks of Interest"

The process helped to identify future focus areas for future emergency management investment within each region through the identification of region-specific key risks of interest. The analyses informed emerging trends only, as more comprehensive risk assessments for each region are yet to be completed.

Figure 4 (below) is an illustration representing the results of the first round of workshops. A brainstorming exercise narrowed the scope for more detailed project activities to follow. The risks of interest are those identified during the workshops. In the diagram, risk identification frequency is indicated by the size of the text (that is, larger text means higher frequency). For example, essential service disruption was mentioned as one of the top risks of interest over several of the regions.

Figure 4: *"Risks of interest"-frequency listed across the regions*

Figure 5 shows identified risks of interest placed under hazard categories. The majority of risks are in the technological hazard category, which includes essential service disruptions and structural failures. The second largest category includes biological hazards such as animal, plant and human diseases, and pest incursions. Natural hazards such as earthquakes, flash floods and heatwaves comprise the third category. Bush and grass fires did not feature as a focus area for any region. This may indicate that participants felt those hazards are already appropriately managed under current emergency management planning arrangements.

The specific risks of interest identified by each region are listed under Appendix 1 TABLES 4-11.

Outcomes of risk assessments are included for each risk of interest, including indicators showing:

1. **Confidence level -** participants perception of the robustness of the risk assessment process based on the quality of data, expertise available and divergence of opinion, and;

2. **Risk level -** based on the worst credible scenario (that is, the scenario generating the worst possible consequences), and the likelihood that these consequences may occur.

Figure 5: Risk categorised by hazard type
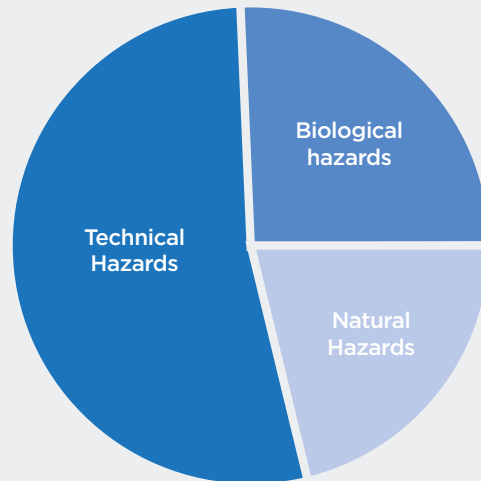
These results contribute to future state and regional emergency management planning activities, and the recommended actions are discussed in Section 4 "Steps Forward" of this report.

3. Approach

3.1 Methodology

A risk assessment process was undertaken for each of Victoria's eight geographical regions; Barwon South West, Eastern Metropolitan, Gippsland, Grampians, Hume, Loddon Mallee, North West Metropolitan and South West Metropolitan, (designated in Part 8, Appendix 8 of the Emergency Management Manual Victoria) shown in different colours on the map below:
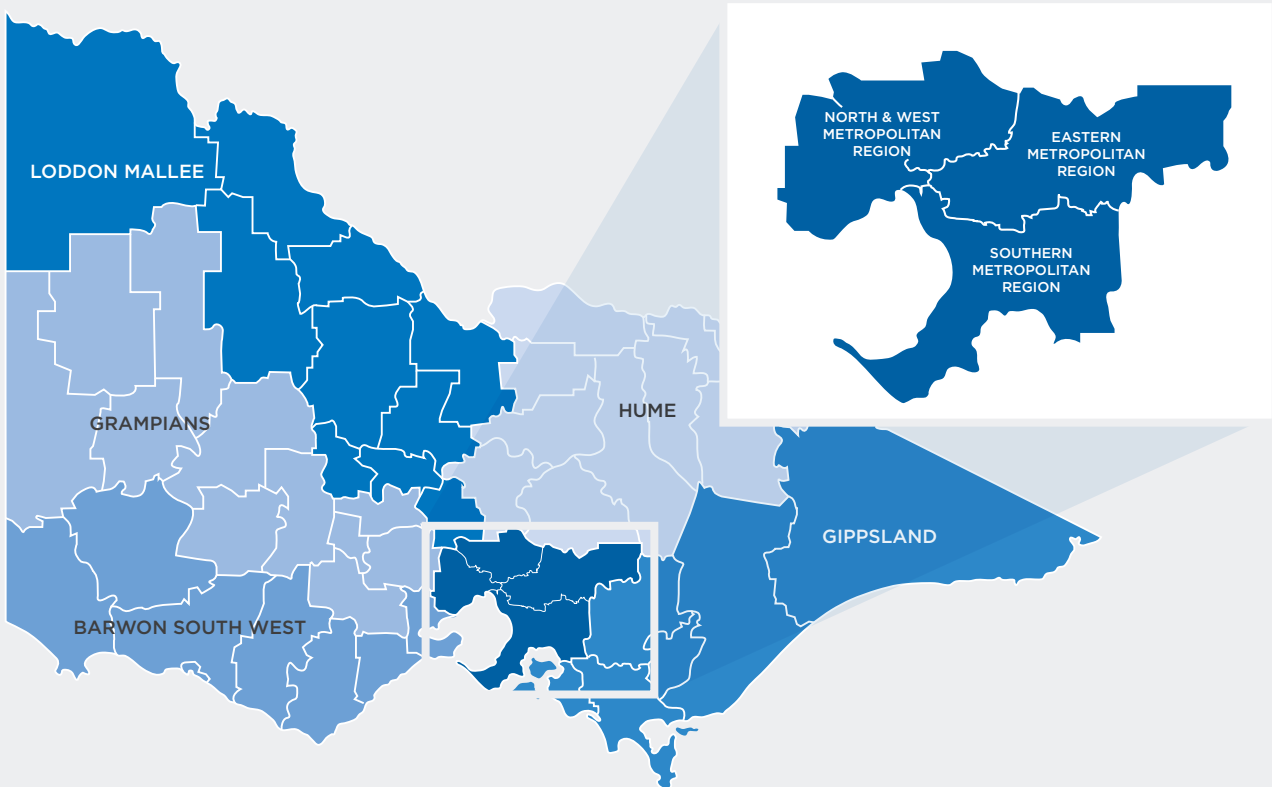
Figure 6: Victoria's eight geographical regions

Stakeholder Engagement

Engagement with key emergency management stakeholders occurred through the following opportunities:

1. Pre- and post-project online evaluation surveys;
2. Online surveys seeking stakeholder characteristics;
3. A preliminary workshop for stakeholder collaboration discussing a suitable project process and design;
4. Two workshops conducted in each region to identify and analyse risks and develop risk treatment analysis strategies;
5. An online survey collecting stakeholder knowledge and understanding of existing risk treatments; and
6. A state-based workshop to generate risk scenarios with subject matter experts.

Over four months, 17 workshops were facilitated across Victoria. Over 200 participants from 50 stakeholder groups took part, involving government departments, agencies, businesses and universities in the process.

3.2 Project Phases and Steps

Workshop Preparation Phase - Step 1:

In order to understand the overall project context, a comprehensive environmental scan was undertaken through consultation with agencies, departments, risk experts and key regional stakeholders.

The scan investigated the following existing and available resources:

• Available expertise and capacities within the regions;

• State and regional capacities to determine who conducts and supports the project;

• Financial, technical and human resources;

• Processes, tools and methodologies; and

• Regional emergency management governance arrangements.

Regional Emergency Risk Profiles were developed by EMPU. These resulted from a need to understand the unique features of each regional community and essentially establish a regional context within which the project could be conducted. Factors such as s ocial demographics, key economic drivers, changing land use, topography, and climate have future strategic implications for risk management and consequence management.

These profiles helped to support the 2015 regional risk workshops and were further refined during the project to provide the most up to date information. They were developed for ongoing use across a range of activities including emergency management planning, exercising/training design, and/or as an information source for response management planning.

Workshop Preparation Phase - Step 2:

Over 50 representatives from regional emergency response, recovery, and fire management planning committees attended a preliminary workshop. Their input provided an understanding of regional stakeholders' involvement in, and understanding of, emergency management and their capacity to participate in the RERP. They established key (subsequent) project phases, essential steps and timeframes (as outlined in Table 2).

Table 2: Emergency Risk Project Phases and Steps

PHASES	STEPS	TIMEFRAME
WORKSHOP PREPARATION	1. - Conduct environmental scan - Establish Regional Emergency Risk Profiles for each Victorian region. 2. - Identify stakeholder participation - Establish working groups. - Establish key project phases, steps and timelines.	August 2014 – February 2015
1ST REGIONAL WORKSHOP	3. Identify risks of interest and existing risk treatments.	March 2015
ONLINE SURVEY	4. Identify inadequacies in existing risk treatments	April 2015
SME WORKSHOP	5. Design risk scenarios based on worst credible event.	April 2015
2ND REGIONAL WORKSHOP	6. Analyse identified high priority risk and adequacy of existing treatment strategies. Identify & record inadequate or unimplemented risk treatments. Analyse & evaluate assigned risk and confidence levels.	April - May 2015
REPORTING	7. Finalise Regional Emergency Risk Reports	June 2015

1st Regional Workshop Phase - Step 3:

Participants for each region considered identified hazards in combination with regional characteristics and vulnerabilities, and existing risk treatments. This phase included consideration of hazards identified through existing state and municipal risk assessment information. Participants identified the top 15 "risks of interest" - risks that may not have received as much treatment attention from the region and warrant further work or investigation.

Online Survey Phase - Step 4:

The online Risk Treatment Adequacy Surveys identified stakeholders' opinions on the adequacy of existing risk treatments for the 15 risks highlighted in the previous phase. The surveys identified particular risks where the participants considered existing risk treatments to be inadequate, and therefore up to seven of the fifteen risks of interest were elevated to the next phase.

Subject Matter Expert Workshop Phase - Step 5:

Step 2 identified that limited specialist subject matter knowledge was available to regional stakeholders for the creation of credible scenarios for use in future project phases. EMPU convened a centralised, state level workshop with Subject Matter Experts (SMEs) to build credible risk scenarios around the risks of interest determined by each region.

Developing and using models and scenarios are effective in establishing a context within which risks can be assessed. As described in the *National Emergency Risk Assessment Guidelines 2014,* "a scenario is one or more representative emergency events that are used to illustrate identified emergency management issues and provide the focus for assessment".

Using scenarios or models allows the exploration of many risk possibilities and outcomes and helps keep focus on key risk areas.

The workshop drew on expertise from 17 subject matter experts from hazard, consequence and essential service areas. There was time to explore one scenario per risk. Therefore, the workshop focussed on the development of a scenario that would result in the worst credible consequences.

Figure 7 outlines the process used to develop risk scenarios.

The process involved:

- Confirmation of a hazard category;
- Consideration of regional assets, values and vulnerabilities;
- Deciding on detailed information such as location, date and time, duration of the event, impact and extent of the event and consequences.

Figure 7: The process of designing risk scenarios

Please note that the scenarios used have been simplified for this report.

Findings of this process were preliminary, and were limited by the time available allowing the exploration of **only one scenario** *for each risk. A more comprehensive, detailed risk assessment would incorporate a range of scenarios with different levels of consequences, ranging from insignificant to catastrophic.*

Second Regional Workshop Phase - Step 6:

The risks of interest identified by the Risk Treatment Adequacy Survey were analysed by regional participants in a second workshop in conjunction with the developed risk scenarios.

Two separate analyses were applied to each risk:

1. Risk level: Participants estimated the likelihood of an event occurring with the consequences described in the scenario (in this case, the worst possible consequences) to determine the 'Risk' level for that scenario.

2. Confidence level: 'Confidence' levels relate to the robustness of the risk assessment process. The *National Risk Assessment Guidelines 2014* lists factors to consider when assigning a confidence level to a risk as "divergence of opinion, level of expertise, and the uncertainty, quality, quantity and relevance of data/information". A low confidence level means participants may have assigned a risk level to a particular risk, but they are not confident that their knowledge or the information they had to base their decision on was adequate and/or complete.

The assessment of 'Confidence' helps to avoid misleading results, by identifying where adverse influences, like lack of knowledge and data, exist and can be addressed. For this reason, the confidence levels should be shown in association with the risk levels when displaying results.

Most participants expressed confidence with the existing body of knowledge and expertise in relation to "traditional" high priority risks such as fire, flood and storms. Participants showed varying degrees of confidence in the knowledge and expertise resources available to them around "non-traditional" risks such as animal/plant disease and essential service disruption. They expressed that more resources were required in order to be able to make an informed decision on the level of risk posed to their region.

Evaluation and reporting Phase - Step 7:

Results from the workshops and surveys were compiled and interpreted during Step 7, including evaluation of findings and recommended actions.

4. Steps Forward

The Regional Emergency Risk Project 2014/15 (RERP) was designed to support development of a coordinated and collaborative approach to broader emergency risk management at regional level across Victoria. This project contributes to the development and understanding of regional broader hazard emergency management planning capabilities across the state.

Data collected during the RERP provides a starting point for future targeted, hazard-specific emergency risk analyses and planning in regions across Victoria. The project prompted discussions around regional emergency management governance arrangements and emergency management planning strategies.

EMPU supports the Regional Emergency Management Planning Committees in the development of Regional Emergency Management Plans, using information and findings from the RERP.

4.1 Suggested Future Emergency Management Planning Activities

The RERP's findings contribute to a variety of state and regional emergency management planning strategies and activities.

Table 3 shows how some of the data generated in the project can be utilised to inform future emergency management planning.

Table 3: Contributions to other emergency management planning activities

PROJECT OUTPUTS	CONTRIBUTION
State-wide priority list of regional values and assets	• Informs the next iteration of State Emergency Risk Assessment
Regional prioritised risks of interest	• Identifies the information requirements that meet regional emergency risk management planning committee information needs
Hazard specific consequences	• Provides data for Risk and Consequence Assessments (used in emergency management planning activities)
Regional Profiles	• Informs municipal, regional, state and hazard specific emergency management planning activities
State-wide/regional risks of interest	• Informs regional emergency governance arrangements • Improves understanding and clarifies ownership, accountability and institutional arrangements for emergency mitigation, response and recovery
Emergency risk 'knowledge gaps'	• Provides data used to identify and address emergency sector specific information demands or needs

4.2 Suggested Future Regional Emergency Management Planning Considerations

Workshop data and facilitator observations led to the following findings. These are formulated at state level for consideration in regional emergency management planning.

Please refer to the individual regional reports for regional specific suggestions that accompany this report. Look under "Our Work" on the EMV website.

1: Concentrate on in-depth hazard specific assessments for Heatwave, Human Disease and Communication Disruption.

Background: Of the total of 51 assessed risks for eight regions these three were assigned risk levels of "extreme" the most often. Heatwave and Human Disease assigned 'extreme' three times each, whereby Communication Disruption was assigned an extreme level twice.

2: Develop region specific technological hazards information packages.

Background: Of 51 assessed risks in eight regions, 28 risks were in the category of technological hazard. Participants acknowledged that the potential frequency and consequences of events caused by such hazards are of regional significance. Participants recognised the most significant regional risks are caused when the community loses essential services and feel underprepared to deal with such risks.

3: Improve regional access to technological and biological hazard subject matter expertise or experts.

Background: Of 51 assessed risks in eight regions, nine were rated with a 'lowest' or 'low' confidence rating showing participants considered the information and advice available to them about the risks was insufficient or unreliable. Of the risks assigned with these two confidence levels, six fell under the "technological hazards" category, and three to the "biological hazards" category. Further analysis showed that under the hazard category, specific forms of 'essential service disruption' are listed four times.

4: Develop sector-wide emergency management terminology.

Background: A lack of consistent language across the emergency management sector could lead to miscommunication and misinterpretation of data.

5: Communicate essential service resilience and business continuity planning practices to regional stakeholders.

Background: Participants requested more information around the 'reliability' of essential services. There was a general lack of an understanding of business continuity planning for all essential service sectors. This was supported by the below average confidence level assigned to 'Essential service disruption – SCADA' ("Supervisory Control and Data Acquisition" – a computer system extensively used to monitor and gather real time data of plant and equipment in many industrial settings).

6: Develop common hazard categories and naming across Victoria.

Background: Naming and categorisation of hazards is inconsistent nationally. This leads to substantial process limitations when aiming to run a comparable process across multiple locations with different stakeholder groups. In order to understand and assess risks in Victoria, common hazard categories, terminology and naming needs to be across the Victorian emergency management sector.

5. Project Evaluation

Pre- and post-project online surveys evaluated participants' emergency management experience levels to assess the RERP effectiveness in reaching its objective to *create opportunities for stakeholders to expand their understanding of broader hazard risks and contribute to regional emergency management knowledge.*

Figures 8 and 9 (below) show participation in regional workshops increased stakeholder's emergency management experience and knowledge.

Figure 8: Workshop Participant EM Experience Analysis

Workshop Participant Experience Rating (Very Good & Excellent)

Pre Regional EM Risk Project
Post Regional EM Risk Project
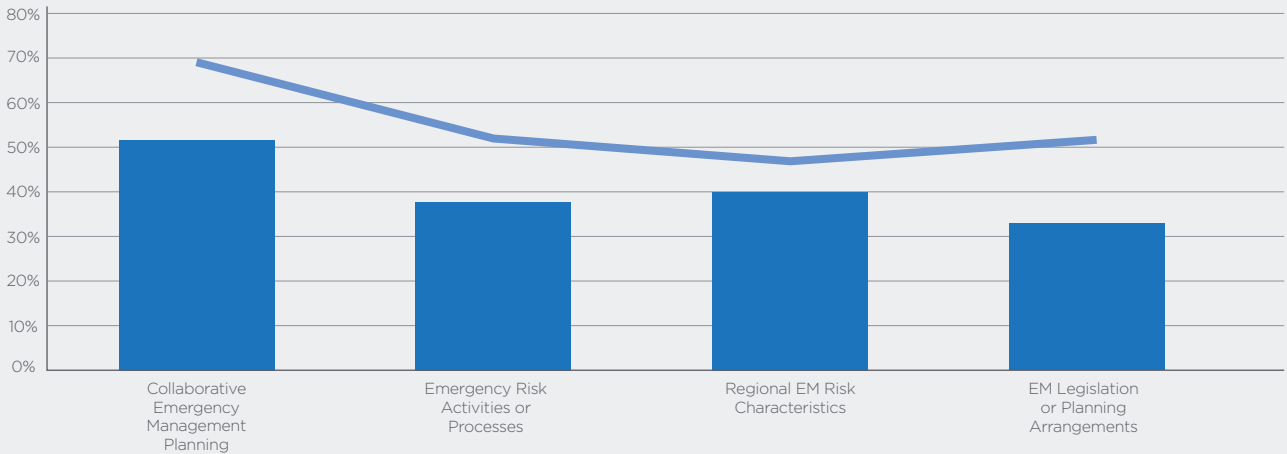
Figure 9: Workshop Participant EM Knowledge Analysis

Workshop Participant Knowledge Rating (Very Good & Excellent)

Pre Regional EM Risk Project
Post Regional EM Risk Project
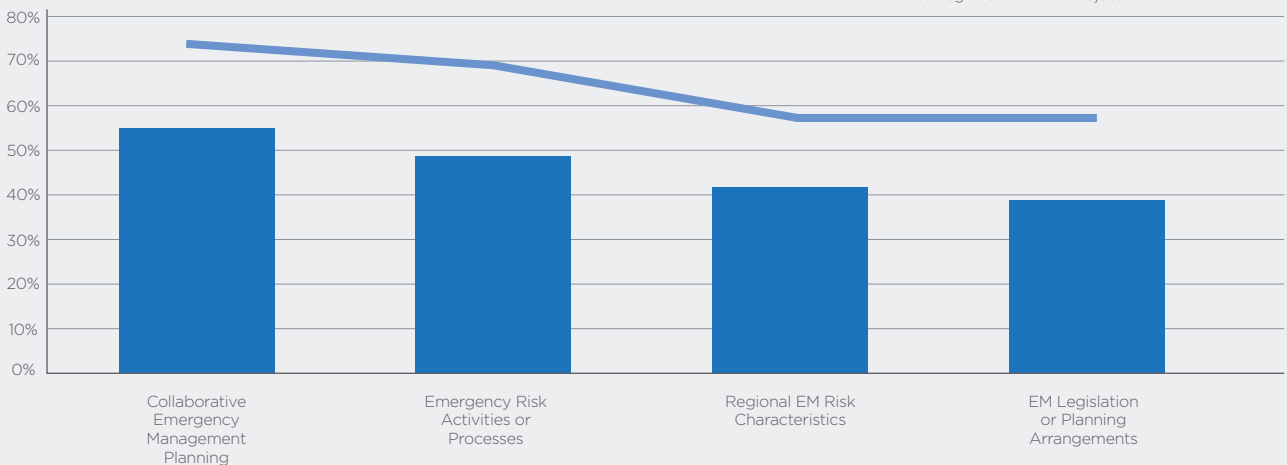
Figure 10 (below) shows correlation between the workshops and an increase in participant emergency management knowledge and experience.

Figure 10: *Workshops' Contributing to EM Knowledge and Experience*

Regional Workshops' Contribution to EM Knowledge and Experience Levels
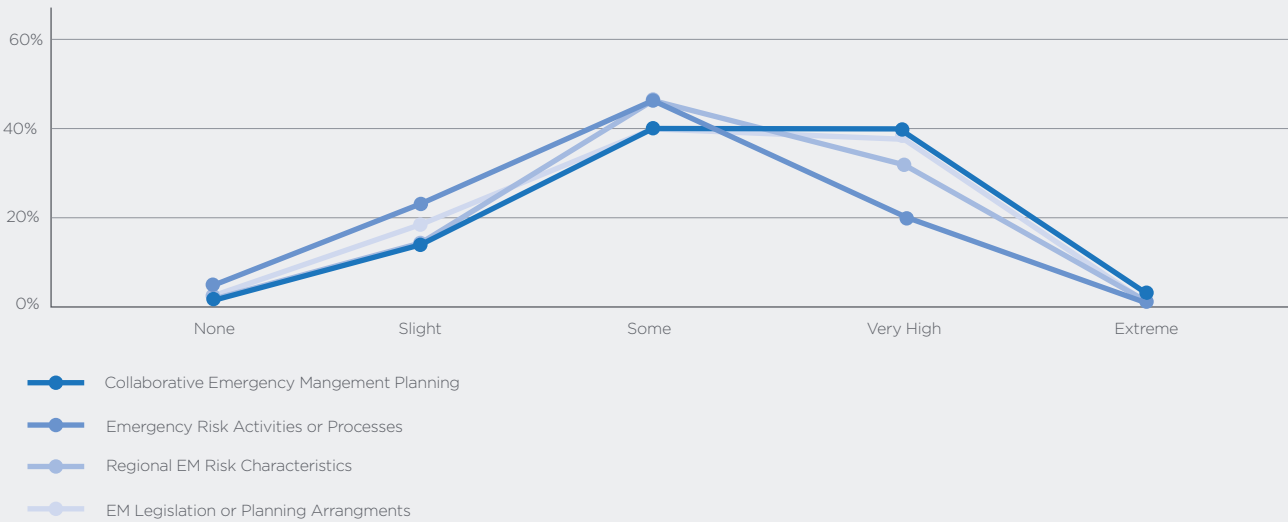
In summary:

- **97%** of the Regional Workshop participants **achieved a knowledge and experience increase in emergency management knowledge** during the workshop periods.

The Regional Emergency Risk Project 2014/15 contributed to positive outcomes in stakeholder emergency management education across Victoria's regional areas. The RERP's findings contribute critical information to the body of knowledge that informs emergency planning activities state wide, creating safer, better prepared, and more resilient communities.

APPENDIX 1:
Regional Risks of Interest

TABLE 4:
Barwon South West Region
Risks of Interest
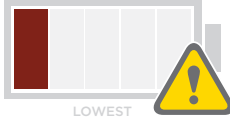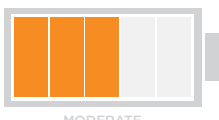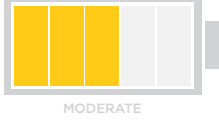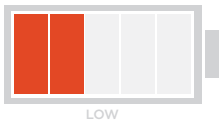
Risk Area	Scenario	Confidence	Risk
Essential Service Disruption – Gas/Oil	Significant third party damage to a gas pipeline in November 2016 results in a leak and leads to regional supply disruptions for five days.	HIGH	
Essential Service Disruption - SCADA	The key communication (relay) tower (incl. SCADA) is hit by a light aircraft in foggy conditions on a Monday morning in June 2015, which disrupts SCADA for 24 - 48 hours.	LOWEST	
Essential Service Disruption -Communications	A loss of a significant telephone exchange at Geelong is affecting 50% of the region for two weeks.	HIGH	
Service Disruption -Marine Pipeline	A burst pipeline releases 50 tonnes of oil affecting 30 km of the coastline in November 2016.	MODERATE	
Landslips/ Rock fall	After a significant long-term rainfall event in BSW, leads to landslips and rock falls along the Great Ocean Road.	HIGH	
Storm Surge	A significant storm surge affecting Victoria's coastline across the region in June 2016.	MODERATE	
Oil Spill	A burst pipeline releases 50 tonnes of oil affecting 30 km of the coastline in November 2016. Regional consequences include, but are not limited to the pollution of beaches and marine life, impacts on tourism, fisheries and local businesses.	LOW	

TABLE 5:
Eastern Metropolitan Region
Risks of Interest

Risk Area	Scenario	Confidence	Risk
Essential Service Disruption -Electricity	Damage to a major transmission line leads to a widespread electricity service disruption in the metropolitan area for more than five days.	MODERATE	
Water Contamination	A water treatment plant failure remains undetected for seven days leading to pathogenic contamination of drinking water for Melbourne's eastern suburbs impacting on human health (widespread gastro outbreak).	HIGH	
Human Disease	A widespread outbreak of a new influenza strain affecting 40% of the population impacts the region causing deaths and overwhelming demand for health services, economy including business, disruption to the operation of essential services and public administration.	HIGH	
Public Transport Disruption	A train derailed at the Box Hill Railway Station at 3.00pm on a weekday leads to closure of the Belgrave and Lilydale lines for one week.	HIGH	
Dam failure	A structural failure compromising the integrity of dam walls at Cardinia and Silvan reservoirs causes major flooding and disruption and the displacement of 100,000 people (< 1 week) and impacting the regional economy and infrastructure for electricity supply and transport services.	HIGH	

TABLE 6:
Gippsland Region
Risks of Interest
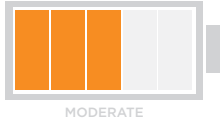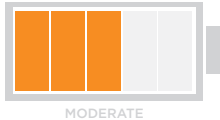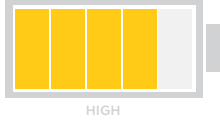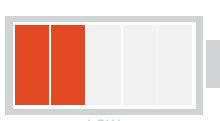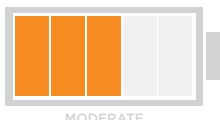
Risk Area	Scenario	Confidence	Risk
Air Pollution - Bushfire	A campaign fire in North East Gippsland causes air pollution impacting on Bairnsdale and the surrounding area for about six to eight weeks in February 2016. The pollution impacts particularly on the tourism industry with intermittent road restrictions and closures due to low visibility.	MODERATE	HIGH
Earthquake	A magnitude 6.5 earthquake occurs on a Friday afternoon in May 2016 with an epicentre 10 km southeast of Morwell. Regional consequences include, but are not limited to collapse of the open-cut coal mine batters, widespread displacement of people, and damage to power generating infrastructure.	MODERATE	HIGH
Essential Service Disruption – Communication	A key communication relay tower (including SCADA Infrastructure) near Rosedale is hit by a light aircraft in foggy conditions on a Monday morning in June 2015, which disrupts SCADA for 24 - 48 hours. The regional consequences include, but are not limited to the ability to monitor and control utility 'supply/demand', interruption of emergency services radio system and interruption of the communication channels for banking and finance.	HIGH	LOW
Essential Service Disruption – Petroleum/Liquid Fuels	Victoria's wholesale Diesel stocks are at an all-time low following major plant outages experienced at both Victorian refineries. An ocean tanker is found to have contaminated product aboard when it arrives from Singapore, which leads to an immediate state wide shortage of diesel fuel. The shortage cannot be addressed until another ocean tanker arrives leading to a 2-week disruption to the state's diesel supplies.	LOW	MEDIUM
Food/Water Contamination	An outbreak of Que Fever leads to contamination of dairy production for goats and cattle in Sale in September 2016. The direct consequences include, but are not limited to loss in sales of milk product. This is due to community concern around safety of product; environment contamination issues of milk disposal, and potential biosecurity containment issues	MODERATE	MEDIUM
Marine Pollution – Oil Spill	A burst pipeline releases 50 tonnes of oil affecting 30 km of the coastline between Golden Beach and Ninety Mile beach in November 2016.	MODERATE	MEDIUM

TABLE 7:
Grampians Region
Risks of Interest
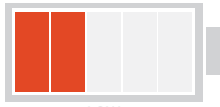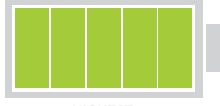
Risk Area	Scenario	Confidence	Risk
Animal/Plant Disease	An outbreak of Foot-and-Mouth disease in early September 2016 affects the region. Significant impacts include, but are not limited to economic losses in the agricultural sector (cattle, sheep, pigs) and the ensuing social consequences on farmers and their families. Contamination efforts require significant emergency management resources and stretch in state and national parks and forests.	LOW	
Essential Services Disruption -Communications	A loss of a major telephone exchange at Ballarat affects half the region for 2 weeks. This impacts industry, local business, ESTA, financial sector and traffic systems. This also causes delays in EM-service response, impairing and disabling the capability to send emergency alerts.	MODERATE	
Essential Service Disruption -Transport	A disruption causes the Armstrong rail overpass to collapse in December 2017 rendering it unusable for 6 to12 months. This results in a total loss of railway transport affecting freight and passenger services.	HIGHEST	
Heatwave	A five-day heatwave across the State affects the region in January 2016. The consequences include, but are not limited to impact on children and the elderly, and people with special needs. There are some infrastructure impacts on train lines and consequences across the agricultural sector.	HIGHEST	
Human Disease	A measles outbreak in June 2016 in a Bacchus Marsh childcare centre affects 20% of the population. The consequences include, but are not limited to, impact on school participation, the active work force and increased pressure on health services.	HIGH	
Pest/Plague	On 17 December 2017 a locust plague travels south from the Wimmera district into wheat belts. Limited access affects the supply of aerial sprays resulting in major crop losses and impacts the regional economy and psychosocial wellbeing of community.	MODERATE	
Essential Service Disruption - Technology	An electricity outage in January affects 50,000 people in and around Ararat for three days.	HIGH	

TABLE 8:
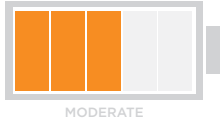## Hume Region
Risks of Interest
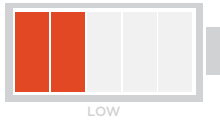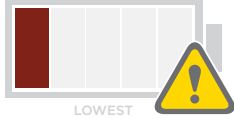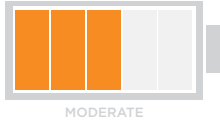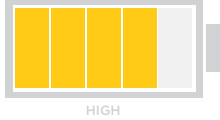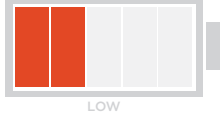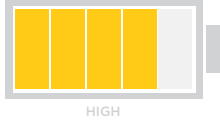
Risk Area	Scenario	Confidence	Risk
Dam Failure	A large unregulated private dam failure at Hidden Valley Estate near Wallan leads to a sudden escape of a large volume of water at midday in a short timeframe affecting the community down stream	LOW	
Essential Service Disruption - Communications	A loss of a significant telephone exchange in Benalla affects 20% of the region for two weeks at the beginning of February. The regional consequences include, but are not limited to impacts to communications and financial systems. Social consequences include a delay in EM-service service response and the loss of emergency alerts.	LOWEST	
Essential Service Disruption - Electricity	Damage to a major transmission line leads to a widespread electricity service disruption at Myrtleford for more than five days in June.	MODERATE	
Essential Service Disruption - Water	A pathogen is undetected in the main water supply for Shepparton. The regional consequences include, but are not limited to 25,000 people affected over a two-week period in February 2016 (a gastro outbreak affecting 300 people).	HIGH	
Essential Service Disruption - SCADA	A key communication (relay) tower (incl. SCADA) is hit by a light aircraft in foggy conditions on a Monday morning in June 2015. The damage disrupts SCADA for 24 - 48 hours over the geographic area of 2 municipalities.	LOW	
Flash Flood	A significant flash flood in Shepparton affecting the town's private and public infrastructure in November 2016.	HIGH	
Waste Water Treatment Failure	A chemical spill In July 2016 into the wastewater treatment system in an Alpine Resort Management Board area leads to critical failure of the plant in July 2016 for two weeks. The regional consequences include, but are not limited to, impacts on human health and on the environment due to untreated overflow polluting streams in sensitive Alpine National Park areas.	MODERATE	
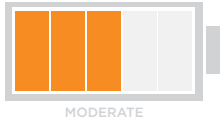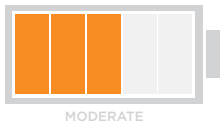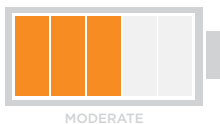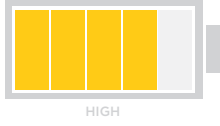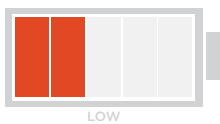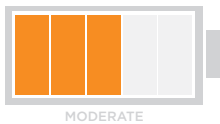
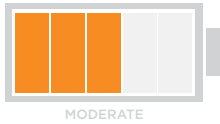| Risk Area	Scenario	Confidence	Risk
Dam Failure	A dam failure leads to a sudden escape of a large volume of water in a short timeframe affecting a community of approximately 2,500 people downstream.	HIGH	
Earthquake	An earthquake of magnitude 5.5 occurs in Bendigo at 10pm on a Friday. Consequences include but are not limited to fatalities, injuries & widespread displacement. Numerous buildings collapse and are damaged (accentuated by mine subsidence), and transport service is disrupted (rail, road / bridges).	MODERATE	
Pest/Plague	A Locust plague commencing on 17 November 2017 travels south from Mildura. The consequences include, but are not limited to limited access and capability to apply aerial sprays and impacts to the psychosocial wellbeing of farmers and community.	MODERATE	
Essential Service Disruption - Communications	A telecommunications exchange is severely damaged during summer leading to a complete outage for ten days affecting 30% of the Loddon Mallee region (not including Bendigo). Access to internet, landline and mobile services is impacted.	MODERATE	
Essential Service Disruption - Gas/Electricity/Water	An electricity supply disruption affects a substantial part of the region for 18 hours. This commenced in the mid-late afternoon in February 2016 (38C degrees temperature). A 'Hanging Rock Concert' planned for the same day is impacted significantly and needs to be rescheduled resulting in crowd management concerns for event organisers.	HIGH	
Flash Flooding	A flash flood resulting from 160mm of rain in a 24-hour period occurs in Mildura, June 2016. Flood mitigation (pumps) failed impacting private and public infrastructure.	HIGH	
Plant/Animal Disease	An outbreak of Foot-and-Mouth-disease across Victoria in early September 2016 is affecting the whole region. Contamination from wild pigs and goats needs to be contained, requiring significant emergency management resources stretching into national parks and forests.	HIGH	

North West Metropolitan Region
Risks of Interest

Risk Area	Scenario	Confidence	Risk
Animal disease	An outbreak of equine influenza in early September affects the whole region in the time leading up to the spring racing carnival. Some regional economic considerations include those on horse racing, and the disruption of the Melbourne Show.	MODERATE	
Essential Service Disruption - Electricity	An electricity supply disruption affects 40% of the region for six hours. It commenced in the mid-late afternoon on a day with peak temperatures around 38C. Regional Consequences include impacts on vulnerable people, regional, security, banking, public transport, traffic management, and communication systems.	MODERATE	
Essential Service Disruption - Communications	A telecommunications exchange is severely damaged leading to a complete outage for ten days affecting 30% of the region. Regional consequences include the interruption of emergency services radio system, limited connectedness of the community, and loss of SCADA systems for electricity transmission control.	MODERATE	
Heatwave	A heatwave event of five consecutive days peaking. Temperatures of up to 40C across the region putting stress on the electricity supply and transport infrastructure and disruptions of major sporting events.	MODERATE	
High rise structure fire	A fire occurs in a high-rise building of combined commercial and residential uses causing substantial damage that prevents habitation for an extended period (>3 months). Impacts include, but are not limited to injuries to >50 people, displacement of >500 people and disruption to local businesses and closure of local roads for an extended period.	HIGH	
Human disease	A widespread outbreak of a new stream of the Bird Flu Virus affects the region leading to deaths and overwhelming demand for health services. Regional consequences include, but are not limited to, disruption to the operation of the airport, public transport, communication systems, & schools.	HIGH	

Southern Metropolitan Region
Risks of Interest

Risk Area	Scenario	Confidence	Risk
Essential Service Disruption - Electricity	An electricity supply disruption affecting a substantial part of the region for 18 hours commenced in the mid-late afternoon (temp. >38C). This affects some shopping centres, education facilities and the manufacturing industry. Impacts include, but are not limited to the transport sector and civil disturbances.	HIGH	
Water Contamination	A failure in the Cardinia Reservoir water treatment plant leads to pathogenic contamination of drinking water for Melbourne's outer south-eastern suburbs and Mornington. A widespread gastro outbreak and mortality of vulnerable people are some of the regional consequences.	MODERATE	
Human Disease	A widespread outbreak of a new stream of the Bird Flu Virus affects the region leading to deaths and overwhelming demand for health services. Regional consequences include, but are not limited to a disruption to public transport and the social system, in particular to places of worship, recreation and public order.	LOW	
Heatwave	A heatwave over five consecutive days has peak temperatures of up to 38C across the region putting stress on the electricity supply, health services and regional business disruption.	MODERATE	
Plant Disease	A Phylloxera outbreak (plant pest affecting vines) has spread throughout the region affecting 80% of vineyards closing down grape harvesting. This impacts the regional economy - wine producers, local businesses, transport movement restrictions, and loss of water due to decontamination.	LOW	
Essential service disruption - Communication	A telecommunications exchange is severely damaged leading to a complete outage for 10 days affecting 30% of the region. This impacts community, emergency services, and the financial sector.	MODERATE	

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