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Environment and
Planning Committee

The 2022 flood event in Victoria

Inquiry | Final Report

July 2024

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Functions

The Environment and Planning Standing Committee will inquire into and report on any proposal, matter or thing concerned with the arts, coordination of government, environment, and planning the use, development and protection of land.

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Terms of reference

Inquiry into the 2022 flood event in Victoria

On 22 February 2023, the Legislative Council agreed to the following motion:

That this House requires the Environment and Planning Committee to inquire into, consider and report, by 30 June 2024, on the state's preparedness for and response to Victoria's major flooding event of October 2022 (the Flood Event), including but not limited to the —

1. causes of and contributors to the Flood Event;
2. adequacy and effectiveness of early warning systems;
3. resourcing of the State Emergency Service, the adequacy of its response to the Flood Event and the adequacy of its resourcing to deal with increasing floods and natural disasters in the future;
4. implementation and effectiveness of the 2016 Victorian Floodplain Management Strategy in relation to the Flood Event;
5. location, funding, maintenance and effectiveness of engineered structures, such as floodwalls, rural levees and culverts, as a flood mitigation strategy;
6. Flood Event as a whole, including but not limited to, the catchments and floodplains of the —
 - a. Avoca River;
 - b. Barwon River;
 - c. Broken River;
 - d. Campaspe River;
 - e. Goulburn River;
 - f. Loddon River;
 - g. Maribyrnong River;
 - h. Murray River;
7. the 2007 decision of the Minister for Planning to approve the construction of a flood wall around Flemington Racecourse and whether the growing impacts of climate change were considered;
8. the implications for future planning decisions including —
 - a. how the Victorian planning framework can ensure climate mitigation is a consideration in future planning decisions;

Terms of reference

- b. how corporate interests may influence decision-making at the expense of communities and climate change preparedness; and
9. any other related matters.

Chair's foreword

The wettest month on record in Victoria had devastating consequences for many communities across the state. The flood event in October 2022 was a significant natural disaster. This Inquiry was an important way to give a voice to those who had lost so much because of these floods, and to help recommend ways that communities and government could better prepare for, respond to, and recover from, future flood disasters.

The stories from communities across the state were deeply impactful, as was the expert evidence received from emergency responders, local authorities, climate scientists, hydrologists, and urban planners. From that evidence it is undeniable that climate change is intensifying weather events and increasing the risks we face living in this country 'of droughts and flooding rains'.

It is also clear that in the maelstrom of this disaster a community spirit shone through. Many stories were told of people going above and beyond to help their neighbours, of mobilising all resources to protect towns, and of reaching out and ensuring that no one was left alone or abandoned in a time of crisis. However, the committee clearly heard that resilience can be tested, and community spirit must be constantly nurtured and strengthened.

Responses from government agencies must match the community focused efforts of residents. Remembering the human impact of disaster events in marshalling responses will stand response agencies in good stead for the future. Stresses and strain should be salvaged, not exacerbated, by government responses.

Not all the damage done in the October 2022 flood event was caused by nature alone.

The impact of the volume of rain that fell was exacerbated by decisions made, often years prior, on the shape of the built environment, new physical infrastructure, and by our planning system. The committee was asked to examine several of these including rural levees and culverts, and floodwalls, notably at Flemington Racecourse.

The Flemington Racecourse Floodwall increased the extent and duration of the flood in Maribyrnong. Parts of the Rivervue Retirement Village removed from a land subject to inundation overlay were, in fact, flooded less than a decade later. Releases of water from Lake Eppalock and Lake Eildon impacted local landholders and communities.

This Inquiry sought answers to the same question as many in the community—why?

The report gives a detailed account of the evidence received on each of the instances where decision making contributed to flooding.

Decisions taken more than a decade ago are often difficult to piece back together in a way that is completely satisfactory to all affected parties. From the evidence we received, notably from Tony Pagone AM KC and his independent review panel,

it is clear that mistakes were made, now with the benefit of better data and new technologies, we have a better understanding of likely effects to better inform future decision making.

Nothing can bring back the homes and businesses destroyed, nor the lives tragically lost in this flood event, but honest learning and a determination to enact change is a fitting and lasting tribute.

For government, one of the most critical roles going forward is accurately and honestly informing communities about risk. New flood modelling is being undertaken across all Melbourne catchments, and flood studies across the state should be regularly undertaken. That new information will inevitably show increased flood risk. Communities need to be properly supported through this process and community leaders need to show compassion, offer support, and avoid exploiting genuine fear and uncertainty.

Preparedness for the next disaster is another essential component of what comes from this latest experience. The VICSES and local search and rescue played a fundamentally important role in the flood response, and clearly need more funding to continue to fulfil that role into the future.

The risk ahead of us is dynamic, not static. As our climate changes and the built environment changes, so will the shape of future disasters. Learning from each disaster event can improve our preparedness for the future. One of the reasons this Inquiry was established was a belief that a disaster event of this scale needed a comprehensive review. A form of review should be part of each natural disaster response, although in the future this is probably best done within the formal structure of Victoria's emergency management framework.

For eighteen months, the Legislative Council Environment and Planning Committee has worked on this report, and our work has been informed by 880 submissions, evidence at public hearings in Rochester, Echuca, Seymour, Shepparton and Melbourne. The Committee conducted site visits in Avondale Heights, Maribyrnong, Flemington and Echuca, and heard from a wide range of witnesses, including some who appeared on more than one occasion. On behalf of the committee, I would like to thank all of those who took the time to tell us their stories and who brought their expertise to the Committee to help us inform this report.

The Committee tabled an Interim Report in April 2024 during the Legislative Council's regional sitting in Echuca. That Interim Report focused on evidence gathered and findings in relation to the floods in Northern Victoria. This Final Report has detailed findings and recommendations for the whole of the state.

I would like to thank all of my committee colleagues for their diligent work and the collegiate spirit shown throughout the Inquiry, especially Sonja Terpstra MLC who served as Chair of the Committee until November 2023 and led the Committee during the regional hearings.

Inquiries like this owe much to the hardworking staff in the Committee Secretariat, led by Manager Lilian Topic, Inquiry Officer Caitlin Connally, Research Assistant Adeel Siddiqi, Communications Adviser Ben Kimber, with administrative support led by Sylvette Bassy and the teams in Hansard and Broadcasting who helped bring the Inquiry to the communities most connected to our work. Please accept my sincere thanks on behalf of all Committee members.

Natural disasters are part our lives and flood risk is growing as the climate changes. How well we prepare, and how well we respond, is the test of our humanity.

A handwritten signature in black ink, appearing to read 'Ryan Batchelor', with a large, stylized loop at the end.

Ryan Batchelor MLC
Chair

Key pillars of disaster management: from planning to recovery

Floods are a part of life for many Victorian communities, and significantly impact those who live, work or travel on or around floodplains. Yet the scale and severity of the flood event in 2022 was unprecedented.

As our climate changes, causing weather events to become more intense and more severe, and as development changes the built environment around floodplains, the frequency and severity of flood events will only intensify. As a result, those living and working near watercourses are facing new pressures to adapt to these changes, and uncertainty that arises because of them. Communities will need to become more resilient and more prepared to respond to emergency events, and better supported to do so. Government must integrate the new climate-induced reality in each stage of its policy development: from planning, to mitigation and environmental management, through to emergency response and recovery.

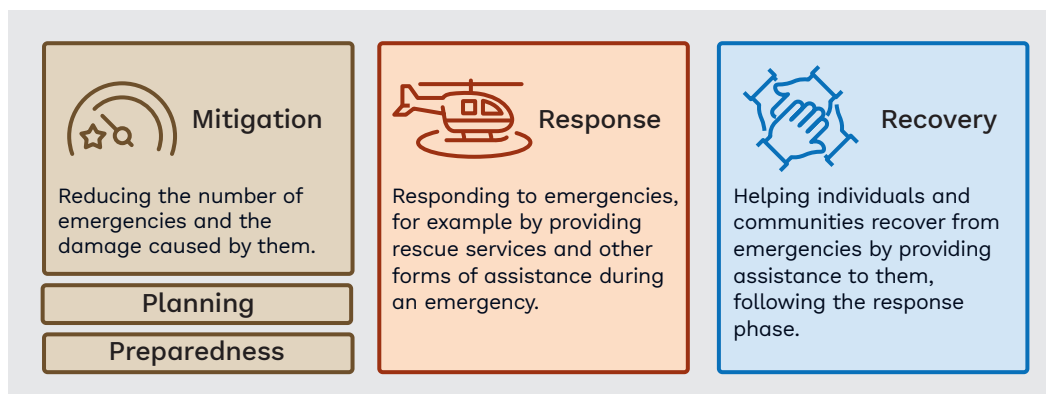
The Environment and Planning Committee's Final Report into the 2022 flood event identifies key areas for improvement in the State's approach to disaster management. This Executive Summary provides a consolidated overview of the findings and strategic recommendations from the Committee's comprehensive review. It is organised according to what the Committee believes must be the three foundation pillars of effective disaster management: that it is **integrated, community centred** and **accessible**.

The Committee believes that focusing on these key pillars would refine emergency management practices:

1. **Integrated:** fully integrated and disaster aware decision-making that efficiently aims to mitigate risk of harm, and ensures services and responses are coordinated and accountable
2. **Community centred:** fostering confidence in a system that meets and adapts to community needs
3. **Accessible:** expanding the reach of services and information, ensuring understanding and visibility in the community of available services, and ensuring services and information are targeted at all members of the community.

Emergency management covers the spectrum of emergency activities from preparedness for a possible crisis through to recovery in its aftermath. The figure below shows the phases of an emergency management response. The pillars identified by the Committee should be prevalent across all phases.

Phases of emergency management



Source: Legislative Council Environment and Planning Committee. Adapted from the Victorian State Emergency Management Plan.

The 2022 flood event in Victoria

October 2022 saw one of Victoria's most severe flooding events, affecting communities across the state, from urban cities to rural agricultural zones. The floods were primarily triggered by an extraordinary rainfall event on 12 and 13 October, compounded by conditions where catchments were already saturated.

A rare triple La Niña event, a negative Indian Ocean Dipole, and a positive Southern Annular Mode converged to produce exceptionally high rainfall across the region. Over just two days, on 12 and 13 October, intense rain fell on already saturated grounds and full reservoirs, leading to rapid river overflows and extensive flooding from Melbourne to Northern Victoria.

The flooding in 2022 devastated Victoria, affecting 81% of local government areas. Major population centres in metropolitan Melbourne and Northern Victoria were affected, including Maribyrnong, Rochester, Seymour, and Greater Shepparton.

The impact on communities was devastating. Towns such as Rochester and Seymour were inundated, with nearly every dwelling in Rochester affected in some way. Maribyrnong was faced with a quick evacuation in the early hours of 14 October when many residents were asleep and may not have received warnings. The floods caused significant damage to homes, infrastructure, and led to a loss of life; creating widespread disruption and displacement. In agriculture, the effects were equally severe. The flooding led to the loss of thousands of livestock and the destruction of vast areas of crops and pasture, dealing a heavy blow to the Victorian economy.

The aftermath of the floods brought to light several critical issues, particularly concerning emergency management and water reservoir policies. Flood-affected communities grappled with challenges in insurance coverage and affordability, while questioning the efficacy of water management practices that they believe failed to mitigate the flood's impact. The extensive damage and the prolonged recovery process has highlighted the need for improved flood preparedness and infrastructure

resilience, prompting calls for a comprehensive review and overhaul of existing flood management strategies. The 2022 flood event underscored the urgent need for enhanced planning and proactive measures to protect vulnerable communities against the increasing frequency of extreme weather events.

In its Interim Report and this Final Report the Committee has looked at a very broad range of issues generated by the floods in Victoria in 2022 and the response to them from official bodies and communities. The engagement with this Inquiry from affected communities has seen an unprecedented contribution from stakeholders. More information on the contribution can be found in Chapter 1.

This Executive Summary does not focus on each individual chapter of the Report or on individual findings and recommendations. Those are collated from page xxvii. This summary focuses on what the Committee has identified as the crucial three pillars, outlined above, that must be in place to guide emergency management responses to any event, but particularly to flood emergencies.

Integrated disaster preparedness

Awareness of disaster risk, and preparedness for those risks, should be fully integrated into policy development and decision-making processes. In doing so, the Victorian Government can ensure that its operational procedures consider disaster risk at every stage, upgrade essential infrastructure, and streamline roles and responsibilities to facilitate a rapid and coordinated response during emergencies.

Key findings underscore the necessity for these improvements, showing that decision-making that does not account for flood risk puts communities in peril, revealing gaps in current flood management strategies and the urgent need for updated infrastructure to cope with evolving flood risks.

Planning decisions require careful consideration in floodplains, and it is a risk in itself to rely on modelling changes or mitigation activities to say that risk has abated.

Several issues were identified concerning the efficiency and effectiveness of flood response infrastructure and procedures. A recurring theme was the inadequacy of existing mitigation infrastructure and its maintenance, highlighted by frequent breaches and confusion over ownership and responsibilities.

Additionally, the lack of a publicly accessible statewide database of flood risk information limits public and local government access to crucial data, complicating preparedness and response efforts.

A more integrated approach requires:

- decision-making that considers the growing nature of flood risk as the climate changes, leading to better initial decisions
- limiting inappropriate new housing and business developments inside 1% annual exceedance probability (AEP) floodplains

- meaningful community engagement at all stages of the process
- the development of a publicly accessible flood risk database to establish a single source of trusted information
- communities supported to be better prepared to manage a crisis when it occurs
- clear responsibilities for maintenance and management of flood mitigation infrastructure
- better coordination and communication throughout official and community channels
- reforming strategies for rebuilding infrastructure beyond a like-for-like approach to enhance resilience against successive flood events, described as betterment.

Recommendations to address the Committee's determination for a more integrated emergency response include:

- **Increasing Public Preparedness and Clarity (Recommendation 6):**
This recommendation arises from findings indicating a general lack of clarity about the roles and responsibilities of various government departments during emergencies. By clearly stating the operational role and responsibilities of each emergency service in preparation for a flood emergency, and outlining the appropriate chain of command, the Victorian Government can ensure that communities are better prepared and more responsive during crisis.
- **Consider Flood Risk in Decision-Making (Recommendations 11, 15):**
Decision-making needs to fully and properly account for current and future flood risk, especially as the climate and built environment change. Limiting inappropriate new development in floodplains is an effective first step in mitigating and minimising future risk.
- **Updating Flood Management Strategies (Recommendations 3, 4, 5, 7, 8, 9, 12, 13, 17):** Responding to findings that existing flood management strategies and tools, such as FloodZoom and the Victorian Flood Database, are outdated or limited in accessibility, these recommendations emphasise the need for comprehensive reviews and updates. This includes conducting a comprehensive assessment and update of flood studies to inform planning, decision-making and disaster response, integrating flood studies into planning schemes and enhancing the public accessibility of flood risk data.
- **Infrastructure Reviews and Updates (Recommendations 19, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 32, 33, 34, 35, 36, 37):** Much of the critical infrastructure such as levees, dams, and culverts has been found inadequate in recent flood events (including in 2022), necessitating a review and potential overhaul of management strategies. Proposals include developing new initiatives like ring levee programs and reviewing levee management arrangements.

- **Funding and Administrative Reforms (Recommendations 39, 40):** In light of findings highlighting inefficiencies in funding and administrative processes for disaster recovery, these recommendations aim to streamline these processes. This includes simplifying the application procedures for disaster recovery funding and enhancing support mechanisms for infrastructure resilience projects.
- **Operational Improvements (Recommendations 41, 42, 43, 44, 45, 46, 47, 48, 49, 50):** Findings from the Inquiry point to operational challenges with emergency tools and systems, such as gauge networks and sandbag distribution, during the 2022 floods. Recommendations focus on improving these systems to ensure they are more effective and responsive in future crises.

By addressing these key areas, Victoria can enhance its emergency management framework to be more robust, responsive, and resilient, thereby significantly improving its ability to mitigate risks and reduce the impact of disasters on communities statewide.

Community-centred emergency management

A community-centred response is crucial in ensuring that emergency management not only addresses physical risks but also effectively engages with communities and supports the psychological and social needs of those affected. This approach prioritises understanding, preparing, and actively supporting individuals, especially vulnerable populations, during emergencies. Findings from the 2022 flood event highlighted several areas where a more community-centred approach would have significantly enhanced the effectiveness of response strategies, particularly in terms of community engagement, support, and housing solutions for vulnerable groups.

The importance of a community-centred response was particularly highlighted in relation to the Inquiry's findings around the inadequacy of current evacuation processes and support mechanisms during the flood event. Residents reported significant trauma associated with rapid evacuation, and others such as people with disability reported that their needs were not considered or planned for at all. This highlights the necessity for more sensitive and well-planned evacuation warnings and processes that consider the emotional and physical wellbeing of individuals.

The 2022 flood event exposed significant gaps in the support structures for affected communities, from preparedness through to recovery. Many residents continue to experience mental health challenges and trauma from their experiences during the floods. Delays and complexities in accessing financial support further exacerbated the distress of affected individuals and businesses.

To foster a community-centred response, the Committee's findings showed a clear imperative to:

- enhance the capacity and training of the Victoria State Emergency Service, particularly in volunteer recruitment and support

- simplify processes for accessing financial aid to ensure timely and less burdensome support for recovery
- increase support mechanisms that address both the practical and emotional impacts of disasters, focusing on mental health and community resilience.

Recommendations aimed at fostering a community-centred response include:

- **Community Engagement and Support (Recommendations 6, 16, 48, 49, 51, 53, 54, 55):** These recommendations stem from findings that highlighted a lack of understanding among residents and business owners regarding flood risks and preparedness. There is a clear need for improved community awareness and engagement initiatives. These recommendations suggest developing programs that not only educate but also actively involve communities in emergency planning and response processes. Enhancing the operational capabilities of the Victoria State Emergency Service by ensuring better resourcing and support, establishing cross-border emergency support systems, and increasing the readiness of high-risk areas for emergency scenarios are key components.
- **Housing and Vulnerable Populations (Recommendations 22, 23, 63):** Vulnerable communities are often disproportionately affected by disasters, as observed during the aftermath of the 2022 floods where the impact on housing stability was profound. Recommendations focus on funding resilient housing solutions, such as retrofitting homes to withstand floods. Additionally, these proposals include a critical review of housing support frameworks to ensure they adequately meet the needs of impacted populations, emphasising the importance of accessible and sufficient support in recovery phases.

By implementing these recommendations, Victoria can enhance its approach to emergency management, ensuring it is not only effective in managing the physical aspects of disasters but also in addressing the emotional and social impacts on communities.

Accessible emergency management

Ensuring accessibility in emergency response is crucial for enabling all community members, regardless of their location, abilities, or resources, to receive and understand emergency information and services effectively. This approach is central to creating an inclusive emergency management system that addresses the needs of diverse populations. The findings from the 2022 flood event highlighted gaps in the accessibility of emergency information, particularly for individuals with disabilities, those in remote areas, and non-English speakers.

The dissemination of emergency information during the flood event was inconsistent and confusing for many residents, with some communities receiving delayed or inaccurate warnings. This inconsistency hindered timely and informed decision-making, impacting the effectiveness of the emergency response.

The Committee's findings suggest a need for:

- standardising the clarity and timeliness of emergency warnings and information across all platforms
- enhancing public awareness of reliable information sources, thus reducing reliance on unofficial channels like social media
- ensuring that all community members have equal access to critical information, especially in diverse linguistic and socio-economic groups.

Recommendations aimed at enhancing accessibility include:

- **Enhancing Information Accessibility (Recommendations 7, 10, 12, 44, 45, 46):**
These recommendations address findings that revealed challenges in the distribution and clarity of emergency warnings and information during the flood event. There was a noted inconsistency in the transmission of emergency warnings, with some communities receiving excessive or conflicting information while others received limited or delayed warnings. To improve this, recommendations include funding and developing publicly accessible flood data to provide easy access to flood risk information. Reviewing the accessibility of this information for individuals with disabilities is crucial to ensure that everyone can prepare for and respond to emergencies effectively.
- **Overhauling Emergency Communication Systems (Recommendations 47, 52):**
Findings indicated that the current emergency communication systems do not adequately serve all demographic groups, particularly in rural and remote areas affected by digital connectivity issues. Recommendations propose a comprehensive review and overhaul of these systems to ensure they are inclusive and capable of reaching all community segments. This includes the installation of new technologies and the enhancement of existing systems to provide real-time, accurate, and easy-to-understand information across various platforms.
- **Multi-faceted and Inclusive Warning Systems (Recommendations 46, 47):**
The need for a more inclusive emergency warning system was highlighted by findings showing that some community members had difficulty understanding flood warnings due to language barriers or the complexity of the information presented. Recommendations call for the creation of a multi-faceted warning system that includes real-time translation of warnings into multiple languages and delivering information in formats accessible to people with different disabilities.

By implementing these recommendations, the Government can significantly improve the accessibility of its emergency management systems, ensuring that every community member, regardless of their circumstances, can access critical information and services in times of crisis. This will not only enhance the State's capacity to respond effectively to emergencies but also ensure that its approach is equitable and inclusive.

Certain planning decisions and flood impacts

The Inquiry heard significant evidence around two key planning decisions that affected residents in Maribyrnong and surrounds during the October 2022 flood event—the construction of the Flemington Racecourse flood wall and the decisions about the flood overlay at the Rivervue Retirement Village.

The Report is clear that the Flemington Racecourse flood wall did increase the extent and duration of the October 2022 flood event for residents in the Maribyrnong Township, by an average of 1% in flood extent, and 2% in flood depth. The associated mitigation works (including at nearby culverts) were largely ineffective in offsetting these impacts as intended. Modelling shows these effects for the Maribyrnong Township will increase in the future in more severe flooding events. Modelling also shows that the racecourse flood wall has a ‘shielding’ effect for residents in Kensington Banks in 1% AEP floods. In light of these findings, the Committee recommends that the flood wall’s efficacy should be considered as part of a review of mitigation across the catchment.

The decision to remove the flooding overlay at the Rivervue Retirement Village is more opaque.

The Committee heard evidence that the owners of the Rivervue Retirement Village made a request to remove the flooding overlay (LSIO) at the site. That request was based on the completion of earthworks intended to mitigate flood risk at the site. Melbourne Water did not object to the LSIO removal, and the Moonee Valley City Council decided to remove the overlay.

Melbourne Water’s lack of objection to the LSIO removal was based on data from 2003 modelling that was itself inaccurate. Members of the Maribyrnong Flood Review Panel gave evidence that the 2003 model was not calibrated properly, and Melbourne Water advised it relied on this modelling to base its decision to not object to the overlay removal following the completion of the site earthworks.

Mistakes were clearly made in the calibration of the 2003 flood model, and there was a reliance on mitigation works on the site that were not effective.

The Rivervue Retirement Village site is within the flood zone identified by the new Melbourne Water modelling for 1% AEP in 2024.

Both of these situations raise questions about reliance on the effectiveness of mitigation works to reduce risk as a justification for approving planning decisions in floodplains.

A note on climate resilience

Technology is giving us new insights and detail not previously available to consider future risk. Flood modelling is another example of where new technology and new data can be used to gain a better appreciation of future risk.

During the Committee's final hearing on 10 May 2024, the Committee heard from Melbourne Water and expert members of the Flood Review Panel. Updated modelling of the Maribyrnong River was released by Melbourne Water prior to the hearing. This included 2024 modelling and 2100 modelling, which took account of climate change considerations. The modelling clearly signals that flood risk is becoming more unpredictable with climate change. Evidence from independent experts on the Flood Review Panel was they were 'very confident' in the modelling and the questions it resolves.

The increased flood risk identified by the new modelling will clearly be challenging for many in local communities to receive. The updated flood model for the Maribyrnong is just the first of these new models being prepared across metropolitan Melbourne. As Melbourne Water completes new and updated modelling across all of its catchments, other communities are likely to face similar challenges.

The Committee has embarked on another inquiry into climate resilience. The Terms of Reference for that inquiry can be found on the Parliament's website. The inquiry calls on the Committee to investigate the main risks facing Victoria's built environment and infrastructure from climate change and the impact these will have on the people of Victoria. This includes how the Government is preparing for these impacts, the barriers in upgrading infrastructure to become more resilient to the impacts, and preparedness for future climate disaster events.

The Terms of Reference for the *Inquiry into climate resilience* will allow the Committee to look more closely at the updated flood modelling in the context of infrastructure and planning, in Melbourne's catchments and also as modelling becomes available in other parts of the state. Issues that have arisen around infrastructure, such as the Flemington Racecourse flood wall and the mitigation measures which were unsuccessfully undertaken in relation to it, could be investigated further in that inquiry.

Findings and recommendations

2 The October 2022 flood event

FINDING 1: October 2022 was the wettest month ever in Victoria since records began in 1900. The climatic conditions were unprecedented, and rain fell on already saturated ground, creating uniquely devastating flood conditions. **25**

FINDING 2: The 2022 flood event affected 63 local government areas and one alpine resort, representing 81% of all local government areas in Victoria. **27**

FINDING 3: Over 5,000 culturally significant Aboriginal heritage sites were impacted by the 2022 flood event. **27**

3 Victoria's flood governance arrangements

FINDING 4: The Victorian Government did not initiate a review of the 2022 flood by the Inspector-General for Emergency Management. **62**

RECOMMENDATION 1: That, following a significant natural disaster such as the 2022 flood, the Inspector-General for Emergency Management conduct a review at an appropriate time to provide feedback for continuous improvement. **62**

RECOMMENDATION 2: That the Victorian Government confirm the powers of the Inspector-General for Emergency Management to undertake reviews on a self-referral basis or, if such powers do not exist, to legislate to provide these powers. **62**

FINDING 5: In many regional areas where there is a shortage of State Emergency Service volunteers, Country Fire Authority brigades stepped in to assist and in many cases were the lead agency on the ground responding to the floods. **63**

RECOMMENDATION 3: That the Victorian Government consider all the evidence, findings and recommendations from this Report when developing a new Victorian Floodplain Management Strategy. **65**

RECOMMENDATION 4: That the new Victorian Floodplain Management Strategy detail the coordination responsibility of the Victorian Government to ensure all flood studies for all local government areas are fully funded and completed. **65**

RECOMMENDATION 5: That the Victorian Government make public the internal, de-identified after-action review conducted by the Department of Energy, Environment and Climate Action. **71**

RECOMMENDATION 6: That the Victorian Government clearly state the operational role and responsibilities of each emergency service in preparation for a flood emergency, outlining the appropriate chain of command, communication protocols, and engagement with the local community. **83**

4 Planning and flood risk

FINDING 6: Flood studies are an effective tool for assessing flood risk. However:

- they must use up-to-date methodologies, technology, and data
- there needs to be statewide coordination of the frequency they are conducted
- there should be statewide funding to ensure they are kept up to date. **94**

RECOMMENDATION 7: That the Victorian Government ensure regional catchment management authorities, with local councils, are funded and resourced to conduct and implement up to date flood studies on a regular basis. **94**

RECOMMENDATION 8: That the Victorian Government require peer review of publicly funded flood modelling as part of the next Victorian Floodplain Management Strategy. **94**

RECOMMENDATION 9: That Melbourne Water and other floodplain management authorities review flood models every five years and update the models at least every 10 years and after the occurrence of a major flood. **94**

FINDING 7: Since the integration of the Victorian Flood Database and Melbourne Water’s Flood Database into FloodZoom, there is no sufficiently publicly accessible statewide database of flood risk information and maps. FloodZoom is limited to flood analysts, particularly those deployed in the State Control Centre and incident control centres. **98**

RECOMMENDATION 10: That the Victorian Government provide Victorians with access to appropriate data contained within the FloodZoom platform. **98**

FINDING 8: Vendor disclosure statements under the *Sale of Land Act 1962 (Vic)* do not adequately disclose flood risk to purchasers of lands. **100**

RECOMMENDATION 11: That the Victorian Government introduce amendments to the *Sale of Land Act 1962 (Vic)* to require vendor disclosure statements to include a simple statement on flood risk. In addition, houses or dwellings previously flooded must be included in any vendor declaration statement. **100**

RECOMMENDATION 12: That Emergency Management Victoria work with local government authorities and local State Emergency Service units to provide access to local flood guides to all residents in a flood zone, that identify the likely flood impacts on individual properties. **102**

RECOMMENDATION 13: That the Victorian Government improve individual and community awareness about their own roles and responsibilities in emergency management, and make available information resources for preparing for flood and other emergencies. **103**

RECOMMENDATION 14: That the Victorian Government require the emergency management sector to ensure that the needs of vulnerable communities including people with disability are included in all disaster preparation and response plans and ensure that sufficient funding is available to make all disaster emergency responses inclusive for people with disability. **105**

RECOMMENDATION 15: That the Victorian Government provide flood risk and planning information in a way that is appropriately accessible to people with additional needs, including people with disability. **105**

RECOMMENDATION 16: That the Victorian Government ensure early warning systems include consideration of a voluntary register of people in need of additional support to receive early warning and support during natural disasters. **105**

RECOMMENDATION 17: That the Victorian Government fast-track the implementation of flood studies into planning schemes. This should be done cooperatively with local councils and relevant stakeholders, group together flood studies into regional amendments, and use the Minister for Planning's powers as required, within two years of completion. **128**

RECOMMENDATION 18: That the Victorian Government introduce amendments to the *Planning and Environment Act 1987* (Vic) and Victoria Planning Provisions so that planning and other authorities must address climate change at all levels of the planning process. **133**

RECOMMENDATION 19: That the Victorian Government work with floodplain management authorities and climate scientists to understand how flood modelling can be used to better predict the impact of climate change on flooding and update its flood management policies in line with this understanding. **133**

RECOMMENDATION 20: That regional local councils work closely with their regional catchment management authorities to better understand, manage, and mitigate the risk of building on floodplains in regional Victoria. **140**

FINDING 9: Limiting inappropriate new development in flood-prone areas is an effective first step in minimising future flood risk. **144**

RECOMMENDATION 21: That Victoria's strategic land use planning limit inappropriate new housing and business developments inside 1% AEP floodplains. **144**

RECOMMENDATION 22: That the Victorian Government support residents within 1% AEP floodplains, including with funded programs, to manage the risk facing their existing properties and make their properties more flood resilient. **144**

FINDING 10: Due to the interconnectedness of the two systems, any flood-related changes to Victoria's planning system should require changes to building standards and regulation to ensure the changes are compatible and effective between the two systems. **145**

FINDING 11: Urban planning changes need to be rapid, statewide, consistent and systemic. Asking local councils and communities to manage land use planning and hazard management alone is unsustainable given the issues regarding climate disasters impact much bigger geographic areas than a single local government area. **146**

RECOMMENDATION 23: That the Victorian Government fund a resilient homes program to raise or retrofit residential properties at risk of flood inundation, and which prioritises homeowners affected by the 2022 flood event. **148**

FINDING 12: There was inadequate record keeping regarding the planning approvals and decision-making process used by Melbourne Water regarding the Rivervue development resulting in a lack of transparency about the decision-making process. **159**

FINDING 13: According to Melbourne Water’s updated modelling of the Maribyrnong River, approximately 850 additional properties in Kensington Banks would flood in a 2024 1% AEP flood scenario, and the modelling suggests the Flemington Racecourse flood wall provides a ‘shielding’ effect to these residents of around 5 cm in flood depth. **166**

FINDING 14: Although it was not within the pre-existing land subject to inundation overlay, the Rivervue Retirement Village would flood in a 2024 1% AEP flood scenario, and there is a likelihood that its exclusion from the pre-existing overlay was due to an error in the calibration of the previous model. **167**

FINDING 15: Modelling of the Maribyrnong River shows that, despite the Flemington Racecourse flood wall, the racecourse will flood in both a 2024 and 2100 1% AEP flood scenario. **167**

FINDING 16: Updated modelling of the Maribyrnong River demonstrates that climate change has had a profound impact on flood risk in the area since 2003 and is predicted to worsen flood depth and extent into the year 2100. **169**

FINDING 17: The use of strategic land use planning to mitigate flood risk requires the Victorian Government and planning authorities to consider the effects of climate change as well as projected changes to land use over time. **176**

RECOMMENDATION 24: That the Victorian Government require planning authorities, floodplain management authorities and other relevant actors to take account of the change in land use and especially projected changes to land use when setting flood levels for planning and development and the application of the land subject to inundation overlay. **176**

5 Flood mitigation infrastructure

RECOMMENDATION 25: As part of the development of the new Victorian Floodplain Management Strategy, that the Victorian Government review the operation of the last Strategy, in consultation with local councils, community representatives, expert advisory groups and other relevant stakeholders. **182**

RECOMMENDATION 26: That the Victorian Government's review of the last Victorian Floodplain Management Strategy (and development of the new Strategy) examine levee funding and management arrangements to determine if they are still fit for purpose based on new information and insights from the October 2022 flood event. **191**

RECOMMENDATION 27: That the Victorian Government fund floodplain managers to develop maps modelling scenarios demonstrating the impact on landholders of specified levee breaches. **194**

FINDING 18: That of the 4,000 kilometres of levee banks in rural Victoria, approximately half occur in the Loddon and Avoca catchments where, in the absence of sufficient levee protection, flood waters will remain for extended periods impacting agricultural land. **196**

FINDING 19: The existing policy framework under the Victorian Floodplain Management Strategy places a significant responsibility on rural councils and landowners to manage their own levee systems. This has resulted in inadequately maintained levees, contributing to extensive breaches in October 2022 and greater financial pressure on councils and landowners for repairs. **199**

RECOMMENDATION 28: That the Victorian Government review the Victorian Floodplain Management Strategy to examine issues around rural levee management. This should include the roles and responsibilities of local councils and private landowners and consider the adequacy of taxpayer support for maintaining these systems. **199**

RECOMMENDATION 29: That the Victorian Government fund the pilot of a ring levee development program in Northern Victoria to protect house and curtilage in flood-prone areas. **200**

FINDING 20: While the temporary levee in Echuca did mitigate flooding for most of the town, approximately 190 properties were significantly negatively affected. The lack of proper warning, inadequate support, and insufficient resources for those facing inevitable inundation contributed to a sense of abandonment among affected residents.

204

FINDING 21: The construction of the temporary levee in Echuca exhibited clear deficiencies in communication and planning surrounding the levee's construction. The decision-making process was not transparent, and the roles and responsibilities of various agencies during the emergency response were unclear, leading to confusion and uncertainty among residents.

204

FINDING 22: A range of stakeholders along the middle and lower Maribyrnong catchment believe that the Flemington Racecourse flood wall exacerbated flooding in surrounding areas.

213

FINDING 23: During the 2022 flood event, the Flemington Racecourse flood wall contributed to an increase of 1% in flood extent and approximately 2% in flood depth in affected areas.

222

FINDING 24: The compensatory measures implemented alongside the Flemington Racecourse flood wall were largely ineffective. These measures only reduced flood levels by a few millimetres, far less than initially projected, indicating a need for more robust flood mitigation strategies in the future.

222

RECOMMENDATION 30: That the Victorian Government ensure that future flood mitigation efforts include updated and rigorous hydraulic modelling before implementation, ensuring the effectiveness of compensatory measures. Additionally, these strategies should undergo independent peer review to validate their expected performance.

223

RECOMMENDATION 31: That the Victorian Government ensure that major flood mitigation measures be assessed and reviewed to ensure they perform as intended.

223

RECOMMENDATION 32: That the efficacy and impact of the Flemington Racecourse flood wall be considered as part of Melbourne Water's review of mitigation in the Maribyrnong River catchment announced following the updated flood modelling.

223

FINDING 25: There is strong local community sentiment that Lake Eppalock should remain at no more than 90% capacity at times of expected high rainfall. **231**

RECOMMENDATION 33: That the Victorian Government further investigate options for increasing outlet capacity at Lake Eppalock. This investigation should involve:

- conducting a cost-benefit analysis to evaluate financial feasibility
 - extensive stakeholder engagement to gather input from affected parties and communities
 - examination of environmental effects
 - environmental risk assessments to understand potential impacts on local ecosystems, wildlife and water quality
 - reviewing water-sharing arrangements to ensure:
 - appropriate adjustments to maintain equitable water distribution and
 - compliance with legal and regulatory requirements.
- 231**

FINDING 26: Around the 2022 flood event, inflows to Lake Eildon were significantly higher than releases. While the releases from Lake Eildon contributed to flooding immediately downstream of the storage, the timing of these releases reduced the severity of the flood peak further downstream including at Seymour and Shepparton. **239**

RECOMMENDATION 34: That the Victorian Government ensure that, for future events that are expected to replicate high storage and high rainfall conditions, new temporary operating rules for water storage and release are developed. These new rules must take account of the interest of those who are affected by Eildon and Eppalock's storages including downstream landholders and water entitlement holders. **239**

FINDING 27: There is notable community concern that the current maintenance of culverts is inadequate and eroding their capacity to provide flood mitigation during an event. In October 2022, there were several instances of blockages or other maintenance issues causing culverts to operate ineffectively. **243**

FINDING 28: Improving the maintenance and implementation of culverts is a potential avenue for embedding a betterment approach to flood mitigation infrastructure updates. **243**

RECOMMENDATION 35: That the Victorian Government ensure that the state's existing culvert infrastructure in high-risk flood areas is fit for purpose, and that the Government also consult with local councils and other relevant stakeholders and prioritise betterment in any upgrade works deemed necessary. **243**

RECOMMENDATION 36: That the Victorian Government audit transport links in and out of disaster-prone areas. **243**

FINDING 29: Confusion about the ownership and maintenance of flood mitigation infrastructure has led to ineffective management and upkeep of these assets. The lack of formal or unclear management led some sites to deteriorate, making them ineffective in providing mitigation during the October 2022 flood event. **246**

RECOMMENDATION 37: That the Victorian Government clarify responsibility for flood mitigation infrastructure, with clear accountability and transparency for who is responsible for each asset. **246**

FINDING 30: The application process for funding under the Commonwealth-State Disaster Recovery Funding Arrangements poses a significant administrative challenge for local governments who bare the evidentiary burden. This is compounded by the broader difficulties of councils to sustain recovery efforts, rebuild mitigation infrastructure, and resume business-as-usual activities following a disaster. **251**

RECOMMENDATION 38: That the Victorian Government work with the Commonwealth Government to ensure the Disaster Recovery Funding Arrangements are not unduly burdensome. **251**

FINDING 31: A like-for-like approach to rebuilding mitigation infrastructure following a flood event is inadequate. There is a clear pattern of infrastructure failing to withstand successive flood events, resulting in repeated damage and economic losses. **255**

RECOMMENDATION 39: That the Victorian Government prioritise investment in betterment projects to improve the resilience of mitigation infrastructure, and in doing so work with the Commonwealth Government to achieve this goal. **255**

RECOMMENDATION 40: That the Victorian Government adapt policies and funding models to prioritise betterment initiatives, including ensuring that financial resources are allocated effectively to meet long-term needs of at-risk communities, and in doing so work with the Commonwealth Government to achieve this goal. **255**

6 Flood emergency warnings

FINDING 32: The transfer of State-owned rain and river gauges into the Bureau of Meteorology’s existing flood warning network is an appropriate measure to improve the communication of flood warnings. 260

RECOMMENDATION 41: The transfer of ownership and responsibility for public gauges to the Bureau of Meteorology should be completed as a priority, and the Victorian Government should request the Commonwealth Government provide a public update by the end of 2024 on these transfer timelines. 260

FINDING 33: Many stakeholders advocated for the urgent expansion of Victoria’s rainfall and streamflow gauge network. Gaps in gauges can result in inaccurate or delayed flood predictions and flood warnings to communities. 263

FINDING 34: Telemetric-equipped gauges provide important real-time data to inform flood predictions and response actions. However, in 2022, in parts of Victoria, gauge failures led to inaccurate forecasts potentially hindering community preparedness. 264

RECOMMENDATION 42: That the Victorian Government identify and fill critical gaps in the state’s gauge network. New gauges should be installed in priority locations as soon as possible, and existing gauges should be upgraded with telemetry services. Information from flood gauges and telemetry services should be easily accessible by the public. 264

FINDING 35: The 2022 flood event was the first time the new protocols under the Australian Warning System were used for a large scale flood event. 280

FINDING 36: It was difficult for the Committee to determine the adequacy of emergency warnings issued during the 2022 flood event because data is collected across disparate agencies and is not consistent. 282

FINDING 37: During the 2022 flood event, the transmission of emergency warnings was inconsistent across affected communities. Some areas received excessive warnings from competing sources whilst others received incorrect, limited or delayed warnings. In both circumstances communities experienced a degree of confusion which limited people’s capacity to make informed decisions. 284

RECOMMENDATION 43: That the Victorian Government use the experience of warnings transmitted during the 2022 flood event to identify and adopt best practice for community warning frequency. **284**

FINDING 38: Stakeholders reported that during the 2022 flood event, delayed or inaccurate information on the VicEmergency service added to the confusion among affected communities making it more difficult to make informed decisions. **288**

RECOMMENDATION 44: That the Victorian Government improve the accuracy, timeliness, and relevance of the VicEmergency service during an emergency. In doing so, the Government should actively seek input from non-government and government stakeholders to ensure that the service can meet the diverse needs of different communities during a crisis. **288**

FINDING 39: The national Emergency Alert system is an important tool for supporting a multi-pronged approach to warnings during a crisis. However, it is subject to some limitations, notably its reliance on land-based reception and limited capacity to sustain multiple alert campaigns simultaneously. **292**

FINDING 40: The development of a National Messaging System is an important forward-looking initiative to improve warnings during a natural disaster, however, any system must ensure it is addressing the constraints and limitations currently experienced under the Emergency Alert system. **292**

FINDING 41: During the 2022 flood event, social media played an important role in disseminating information. However, its unregulated nature meant it contributed to the spread of misinformation leading to heightened confusion and uncertainty. **296**

FINDING 42: Social media cannot replace official warning channels as the primary source of information during a crisis event. It is important that official sources take a proactive approach to communication to prevent residents relying on social media. **296**

FINDING 43: During the 2022 flood event, the adequacy and effectiveness of early warnings varied from municipality to municipality. Some communities experienced timely and accurate information whilst others lacked sufficient information. **298**

FINDING 44: Early warnings issued during the 2022 flood event demonstrated several issues:

- inconsistent dissemination and clarity of warnings and information
- information was delayed or inaccurate, or did not contain sufficient detail for the public to make informed decisions
- some community members lacked awareness of where to access information, resulting in some over-relying on social media information.

299

RECOMMENDATION 45: That the Victorian Government improve the flood warning system so that warnings are:

- accurate with the most up-to-date information
- delivered in a timely way
- clear and easily understood
- consistently disseminated across different communities
- accessible in relevant formats and languages, where appropriate.

299

FINDING 45: There is a disconnect between emergency warning communication methods and the needs of diverse communities, and an urgent need for a more inclusive approach to emergency communications.

302

FINDING 46: During the 2022 flood event, there were reported instances where people were unable to understand flood warnings and information due to accessibility barriers.

302

RECOMMENDATION 46: That the Victorian Government ensure the emergency warning system is inclusive and able to be used by all Victorians, and should:

- include real-time translation of warnings into multiple languages during a crisis event
- deliver information in easier to understand ways which meet the needs of people with a disability.

302

FINDING 47: Communication of emergency warnings in rural and remote areas can be impeded by digital connectivity issues. Given the growing reliance on digital forms of communication, this is a significant challenge to address to ensure effective communication during natural disasters or other crisis events.

305

FINDING 48: Telecommunications access was an issue and local residents reported delays in restoration of digital connectivity. **305**

RECOMMENDATION 47: Given the essential role of digital connectivity in emergency management and response, that the Victorian Government, working with the Commonwealth Government as necessary, address connectivity limitations, focusing on rural and remote areas. Potential options to consider are the need for:

- enhanced infrastructure investment
- geographically based coverage
- rapid deployment of temporary satellite vans.

305

FINDING 49: Insights from the public response to emergency information during the 2022 flood event indicated a persistent underestimation of risks by the community which delayed some in taking appropriate action, such as evacuating. This inconsistency was exacerbated by unclear or inconsistent warnings and information, heightening confusion in critical moments. **311**

RECOMMENDATION 48: That the Victorian Government establish long-term community awareness initiatives to ensure the public understand flood risk and actions. Successful bushfire awareness campaigns could be used as a basis for such initiatives. **311**

7 Resourcing and response of the Victoria State Emergency Service

FINDING 50: The Victoria State Emergency Service is designated as the lead control agency for flood events under Victoria's *State Emergency Management Plan*. However, the response to events like the 2022 floods is complex and involves coordination across multiple agencies to effectively manage emergency events. **313**

FINDING 51: Notwithstanding annual fluctuations, the Victoria State Emergency Service is responding to an increasing number of events over time. Given the link between climate change and increased extreme weather events, this trend will continue. **316**

FINDING 52: Despite increased funding over time, the Victoria State Emergency Service lacks the appropriate resources to prepare and respond effectively to major emergencies such as flood events. **321**

FINDING 53: Cross training across agencies and other forms of cooperation may be helpful to address capability and capacity issues. **321**

FINDING 54: Concerns were expressed about the Victoria State Emergency Service's ability to attract and adequately train volunteers. **325**

FINDING 55: A productive relationship between the Victoria State Emergency Service and the Victoria SES Volunteers Association, characterised by effective communication and robust mechanisms for addressing concerns, is crucial for maintaining a strong volunteer base, ensuring operational effectiveness, and enhancing volunteer satisfaction and retention. **325**

RECOMMENDATION 49: That the Victorian Government increase funding for training of volunteers to boost the capacity of State Emergency Service units and Shepparton and Echuca and Moama Search and Rescue squads to respond during emergencies. **325**

FINDING 56: For the 2022 flood event, approximately 62.5% of volunteers involved with the Victoria State Emergency Service were involved in flood response activities, coming from 98% of the units across the state. **332**

FINDING 57: In the 2022–23 annual reporting period, flood incidents accounted for over 25% of incidents the Victoria State Emergency Service responded to and accounted for over 34% of response hours. **332**

FINDING 58: The 2022 flood event in Victoria saw a record deployment of 1.5 million sandbags, marking an unprecedented effort to mitigate flood impacts. **339**

FINDING 59: During the 2022 flood event, the Victoria State Emergency Service experienced some challenges in sandbag management and distribution, with local councils noting shortages and coordination issues, affecting timely support in critical areas. **339**

RECOMMENDATION 50: To improve the management and distribution of sandbags during a flood event, that the Victorian Government:

- ensure that there is sufficient supply quantity of sandbags available for preparation for floods in a wet year.
- assess the benefits of a coordinated sandbag management system in Victoria. This system could include capacity for scalable sandbagging stations and address resource gaps in high-risk flood areas.
- ensure that emergency management plans are regularly updated to reflect current resource and logistical capabilities.
- explore options for supplementing reliance on sandbags with innovative new products such as floodgates or water inflated barriers.

339

FINDING 60: The Victoria State Emergency Service demonstrated remarkable commitment and resilience during the 2022 flood event, successfully conducting over 1,500 flood rescues. This considerable effort underscores the dedication of both the staff and volunteers who, despite personal impacts from the flooding, continued to provide crucial support to affected communities.

348

FINDING 61: During the 2022 flood event, the Victoria State Emergency Service faced substantial challenges in conducting rescues, such as:

- insufficient volunteer capacity and inadequate resource availability, particularly in severely affected areas like Rochester
- communication issues impeding the readiness and timeliness of the SES' rescue response.

348

FINDING 62: During the 2022 flood event, there were numerous examples of community-led rescue efforts, where locals used personal resources to rescue neighbours and other community areas. This grassroots response not only highlights community resilience and willingness to assist but also raises concerns about the reliance on informal rescue efforts due to the constraints and limitations faced by official emergency services.

349

RECOMMENDATION 51: That the Victorian Government develop a strategic rescue plan in areas at high risk of flooding, so that they have appropriate resources and expertise for rescues during a crisis event. This plan should include consideration of procurement, expansion of reserve caches and processes for rapid deployment of resources.

349

FINDING 63: There was inconsistency in evacuation preparedness across communities affected by the 2022 flood event, which compromised response effectiveness. It is crucial to ensure individuals and businesses are being encouraged to develop robust evacuation plans, and that the Victoria State Emergency Service issues timely, accurate and informative evacuation warnings. **353**

RECOMMENDATION 52: That the Victorian Government, in collaboration with the Victoria State Emergency Service, review its approach to evacuation warnings to identify opportunities for improvement and increased community responsiveness. **353**

FINDING 64: On 14 October 2022, residents of Maribyrnong in the evacuation zone had approximately 8 hours to evacuate from when the evacuation process was underway to the Maribyrnong River reaching its peak flooding height. **354**

FINDING 65: The evacuation of Maribyrnong residents on 14 October 2022 was challenging because of rapid flooding that strained early morning evacuation efforts and inconsistent flood warning advice the previous evening. Nonetheless, the Victoria State Emergency Service adapted, intensifying their response as the situation escalated. **357**

FINDING 66: Maribyrnong residents affected by the evacuation reported significant trauma associated with the process, further exacerbated by the overall impact of the major flooding event. The timing of the evacuation warnings led to some residents receiving insufficient notice, leaving them unprepared to evacuate promptly. **357**

FINDING 67: Despite structured coordination efforts between the Victoria and New South Wales State Emergency Services, including daily teleconferences and shared resources, there remains a significant need for formalisation of these arrangements. **360**

RECOMMENDATION 53: That the Victorian Government and the Victoria State Emergency Service work with:

- a. New South Wales to finalise the MOU that has been initiated, and to make it publicly available
- b. South Australian counterparts to initiate and establish a MOU or other mechanisms for cross-border cooperation in relation to shared emergency events, and to make this publicly available. **361**

FINDING 68: The Victoria State Emergency Service was a pivotal part of the emergency response to the 2022 flood event. The exceptional dedication and resilience of the staff and volunteers in supporting communities and mitigating risks to life and property is commendable.

363

FINDING 69: The Victoria State Emergency Service is the appropriate control agency for flood emergencies, however strategic improvements are necessary in communication, resource allocation, and volunteer support to enhance its overall effectiveness and sustainability in managing such crises.

364

RECOMMENDATION 54: That the Victoria State Emergency Service undertake a strategic review of its resources, leadership and personnel allocation. This review should focus on enhancing communication systems, ensuring adequate availability of essential resources like rescue equipment, and implementing robust volunteer recruitment processes, support and training programs.

364

RECOMMENDATION 55: That the Victorian Government increase funding and support for the Victoria State Emergency Service to enable a comprehensive upgrade of emergency communication technologies, ensure a steady supply of critical response resources, and expand volunteer recruitment and retention programs, thereby bolstering the agency's capability to manage and respond to emergencies effectively.

364

RECOMMENDATION 56: That the Victorian Government ensure that incident control centres include a mechanism for local expertise to be included in their operations and help inform processes to assist managing localised warnings and response.

364

FINDING 70: Both volunteer brigades and career firefighters played a crucial role in response efforts during the 2022 flood event, demonstrating their capability and commitment under challenging circumstances. However, the recurring issues of available resources and personnel fatigue highlights a significant area for improvement in emergency response management, infrastructure and support.

371

FINDING 71: Shepparton Search and Rescue demonstrated significant operational effectiveness during the 2022 floods, despite operating under resource constraints. These challenges underscore the need for enhanced structural and resource-based support for independent emergency services to ensure optimal response capabilities in future emergencies.

373

RECOMMENDATION 57: That the Victorian Government increase funding to Shepparton and Echuca and Moama Search and Rescue squads to ensure optimal response capabilities in future emergencies. **374**

FINDING 72: The scale of Victoria’s flood event in 2022 meant the activation of Australian Defence Force resources was necessary to assist ongoing response efforts from state-based emergency services. **376**

FINDING 73: The Committee heard that many Rochester community members were devastated when they observed the Australian Defence Force passed them by on route to other flood-affected towns. **376**

FINDING 74: The timing of the activation of the Australian Defence Force to some flood-affected communities caused community concern about disaster response efforts. However, the emergency response to events such as floods should be led and coordinated at the state level and not be reliant on Australian Defence Force support. **377**

8 Flood recovery

FINDING 75: In many communities, including Rochester, support in the days directly after peak floods was from local first responders, community and spontaneous volunteers. **386**

FINDING 76: During major flood events or crises, Emergency Relief Centres operated by local councils are crucial for providing residents with immediate support in a safe environment. **386**

FINDING 77: During the 2022 flood event, some Emergency Relief Centres activated by local councils experienced some challenges in readiness and efficiency. **386**

RECOMMENDATION 58: That the Victorian Government, working with local councils, establish statewide operating guidelines for Emergency Relief Centres. These guidelines should include protocols on rapid activation, streamlined communication and resource mobilisation. Local councils should remain empowered to tailor protocols to meet local needs. **386**

RECOMMENDATION 59: In line with Recommendation 58, that the Victorian Government, working with local councils, investigate options for emergency funding arrangements to assist operating Emergency Relief Centres and include these arrangements in statewide operating guidelines. **386**

FINDING 78: Recovery hubs play a crucial role in supporting communities long after the immediate aftermath of a disaster, providing a central point for longer-term assistance and services. **388**

FINDING 79: The absence of computers and internet access impeded members of the community from applying for individual relief grants. **388**

RECOMMENDATION 60: That the Victorian Government plan and resource recovery hubs (including online access) sufficiently to fulfil their role in long-term community recovery and resilience building. **388**

FINDING 80: The complexity of processes associated with flood recovery financial supports exacerbated the distress of some flood-impacted individuals, families and businesses. Some communities experienced delays to immediate relief and some were potentially deterred from claiming assistance which would have facilitated recovery. **396**

FINDING 81: Despite the availability of a wide range of grants and financial support programs, it is challenging to effectively align support that is broadly available with the different needs of affected individuals. **396**

RECOMMENDATION 61: That the Victorian Government simplify the application process for disaster recovery funding. This could include reducing paperwork, providing hands-on assistance and investigating technology to streamline processes. **396**

RECOMMENDATION 62: That the Victorian Government evaluate the criteria and funding arrangements for financial assistance post-disaster with a view to:

- a. better aligning support with costs of recovery
- b. proposing options for quickly deploying support mechanisms according to the scale and complexity of the event.

396

FINDING 82: In Northern Victoria, the broader issues of housing availability, affordability and suitability in the region created additional issues for housing flood-affected people. These issues underscore a systemic challenge extending beyond the immediate emergency response. 405

FINDING 83: In Maribyrnong, ongoing housing challenges following the 2022 flood event include long-term displacement of residents, with many still in temporary accommodation or living in partially restored homes. 405

RECOMMENDATION 63: That the Victorian Government review its framework for providing housing support following an environmental disaster. In particular, the Government should assess the application system to ensure that genuinely affected households are provided support in a timelier manner and to mitigate the risk of fraudulent claims. 405

RECOMMENDATION 64: That the Victorian Government recognise caravan parks as essential businesses in disaster-prone areas as providers of housing and emergency support and ensure support is available (including grants) under Disaster Recovery Funding Arrangements to caravan park operators, including those operating on Crown Land. 405

FINDING 84: In Northern Victoria, the October 2022 flood event has seen the prolonged submersion of land and infrastructure resulting in extensive damage and erosion. The damage of the floods has been widespread including the tragic loss of life, displacement of residents and damage to thousands of homes and businesses. 412

FINDING 85: The flooding in Maribyrnong exceeded initial damage projections, affecting over 500 residences and necessitating extensive clean-up efforts, significantly impacting local infrastructure and community facilities. 412

RECOMMENDATION 65: That the Victorian Government, noting that repair of natural environment is often overlooked in disaster recovery, assess and make funding available for natural environment and restoration. 412

RECOMMENDATION 66: To assist with ongoing clean-up of flood-affected areas following disasters, that the Victorian Government establish a dedicated financial support program for local businesses involved in debris removal and restoration efforts. This should include reimbursement mechanisms for businesses, such as earthmoving companies, that contributed equipment and personnel to the clean-up but suffered significant financial losses doing so. 412

RECOMMENDATION 67: That the Victorian Government pay its bills on time, especially following natural disasters. **412**

RECOMMENDATION 68: That the Victorian Government work to support better collaboration between local communities, contractors, and government agencies, ensuring swift deployment of additional human resources for efficient post-disaster clean-up efforts. **412**

RECOMMENDATION 69: That the Victorian Government collaborate with local authorities and community groups to develop and implement a debris management strategy and ensure that it aligns with broader disaster management plans as part of future-proofing for environmental events. **412**

FINDING 86: There is a pressing demand for comprehensive community support, including practical measures, and a critical necessity for increasing support mechanisms addressing emotional and mental impacts for an effective emergency response. **416**

RECOMMENDATION 70: That the Victorian Government develop community-based initiatives and resource-sharing mechanisms, fostering resilience and solidarity among towns facing challenges from environmental disasters. These should ensure timely and effective responses to future crises, leveraging collective strength and kindness to aid in the recovery process. **416**

FINDING 87: The 2022 flood event caused significant and enduring trauma to many of those affected, manifesting in mental health challenges that require comprehensive support and intervention. **424**

RECOMMENDATION 71: That the Victorian Government provide long-term funding contracts for mental health services in flood-affected regions, with a focus to securing dedicated mental health professionals and effective service delivery in communities impacted by natural disasters. **424**

FINDING 88: By September 2023, there were over 10,000 insurance claims from the 2022 flood event, totalling \$489 million; 87% of all claims have been closed, with a lower closure rate for residential and commercial property claims. **428**

FINDING 89: Timely insurance processing is crucial for easing financial strain and expediting post-disaster rebuilding. Delays or inadequate coverage prolong hardships, hindering recovery for individuals and communities.

431

FINDING 90: The significant challenges faced by insurers and policyholders during the 2022 flood event underscore the urgent need for enhanced national coordination and reform in disaster insurance practices.

437

RECOMMENDATION 72: That following the outcomes of the House of Representatives' *Inquiry into insurers' responses to 2022 major floods claims*, the Victorian Government advocate to the Commonwealth Government that it take action to ensure that residents and businesses in flood-affected areas can obtain and maintain necessary insurance.

438

RECOMMENDATION 73: That the Victorian Government's response to this Inquiry identifies the responsible authorities for each recommendation and provides a timeframe for action and reports back to Parliament on progress made implementing the recommendations.

438

What happens next?

There are several stages to a parliamentary inquiry.

The Committee conducts the inquiry

This Final Report on the Inquiry into the 2022 flood event in Victoria is the result of extensive research and consultation by the Legislative Council Environment and Planning Committee.

The Committee received written submissions, spoke with people at public hearings, attended site visits, reviewed research evidence and deliberated over a number of meetings. Experts, government representatives and individuals expressed their views directly to us as Members of Parliament.

A parliamentary committee is not part of the Government. The Committee is a group of members of different political parties (including independent members). Parliament has asked us to look closely at an issue and report back. This process helps Parliament do its work by encouraging public debate and involvement in issues.

You can learn more about the Committee's work at: <https://www.parliament.vic.gov.au/epc-lc>.

The report is presented to Parliament

This report was presented to Parliament and can be found at: <https://www.parliament.vic.gov.au/get-involved/inquiries/floodinquiry/reports>.

A response from the Government

The Government has six months to respond in writing to any recommendations made in this report.

The response is public and put on the inquiry page on Parliament's website when it is received at: <https://www.parliament.vic.gov.au/get-involved/inquiries/floodinquiry/reports>.

In its response, the Government indicates whether it supports the Committee's recommendations. It can also outline actions it may take.

Chapter 1

About the Inquiry

1.1 The Inquiry

The Legislative Council Environment and Planning Committee received its first inquiry for the 60th Parliament on 22 February 2023.

The Committee investigated Victoria's preparedness for, and response to, Victoria's major flooding event of October 2022. In particular, the Committee considered factors such as what caused and contributed to the flood event, emergency services, government policy, flood mitigation strategies, and the Victorian planning framework.

On 18 April 2024, the Committee tabled its Interim Report at the Legislative Council regional sitting in Echuca. The Interim Report was focused on the recovery needs of Northern Victoria. This Final Report considers all areas impacted by flooding and examines the 2022 flood event in more detail.



Committee Chair Ryan Batchelor discussing the Interim Report for the Inquiry into the 2022 flood event in Northern Victoria

This Chapter examines the important contributions of the Maribyrnong and Northern Victorian communities affected by flooding to the Inquiry and to the work of the Committee.

The Inquiry opened to public submissions on 6 March 2023. The original date to provide submissions by May 2023 was extended several times to accommodate flood-affected communities and residents. The last public submission was accepted on 31 January 2024. A total of 880 submissions were received.

Throughout the course of the Inquiry, the Committee held 13 days of public hearings, comprising 57 sessions and 183 witnesses. Witnesses ranged from representatives from the Victorian Government and emergency services to people directly affected by the flooding. Several site visits were also conducted in Northern Victoria and Maribyrnong.

The contribution of communities in Maribyrnong and Northern Victoria is discussed more in the Sections below.

1.2 The October 2022 flood event in Maribyrnong

1.2.1 Public submission phase

Of the 880 submissions made to the Inquiry, around 87 came from areas affected by flooding of the Maribyrnong River in October 2022. The tables below outline the main contributing areas.

Table 1.1 Submissions from stakeholders impacted by the Maribyrnong floods

Electoral district	Number of submissions
Essendon	50
Melbourne	15
Niddrie	10
Laverton	3
Sunbury	2
Warrandyte	2
Ivanhoe	1
Bundoora	1
St Albans	2
Point Cook	1

Source: Legislative Council Environment and Planning Committee.

1.2.2 Public submission writing workshop: Maidstone (3 May 2023)

The Committee Secretariat held the first of three public submission writing workshops at the Medway Golf Club in Maidstone on the evening of 3 May 2023. See Section 1.3 on engagement from the Northern Victorian community for details on the other submission writing workshops.

The Committee resolved very early in the Inquiry that people affected by the floods be at the forefront of the Inquiry's investigations.

Holding targeted submission writing workshops is not a customary practice of committee inquiries. The workshops were held to allow people to gain a practical insight into the process of a parliamentary inquiry. Attendees were given an overview of the Inquiry, including the terms of reference, and were provided practical tips and advice on how to make a submission, including how to present evidence and arguments in a clear and persuasive way. Hard copy submission forms that could be posted back to the Committee were provided. Assistance with lodging an online submission was also offered, with committee staff on hand to answer questions and address any concerns about the process.



Clockwise from top left: Inquiry Officer Kieran Crowe briefs residents about the inquiry process at a submission writing workshop in Maidstone; Committee Manager Lilian Topic listens to local residents at the Maidstone submission writing workshop; residents ask questions of committee staff at the submission writing workshop in Maidstone; residents affected by flooding of the Maribyrnong River attend a submission writing workshop in Maidstone.

1.2.3 Public hearings

After launching the public hearing phase of the Inquiry in Northern Victoria in August 2023 (see Section 1.3.3), the Committee conducted further public hearings throughout October, November and December 2023, and May 2024.

More than 180 witnesses, presenting as individuals or on behalf of organisations, appeared across the 13 days of public hearings held for this Inquiry.

The Committee heard from multiple municipal councils, water authorities, government departments, the Victoria Racing Club, flood recovery committees, insurance associations, the Bureau of Meteorology, volunteering organisations and many others.

Minister for Water Harriet Shing and Minister for Emergency Services Jaclyn Symes appeared at separate hearing sessions held on 6 December 2023. Melbourne Water was recalled to appear on 10 May 2024, after an initial appearance on 11 October 2023.



Clockwise from top left: Committee Members Wendy Lovell, Ryan Batchelor, David Ettershank, Melina Bath and Gaelle Broad listen to evidence at one of the 13 days of public hearings; media organisations attended many of the hearings, including this council panel session involving City of Melbourne, Moonee Valley City Council and Maribyrnong City Council; Melbourne Water Independent Review Panel Chair G Tony Pagone AM KC reappeared at the Inquiry with Tim Peggie and Mark Babister in May 2024; Melbourne Water Managing Director Nerina Di Lorenzo reappeared alongside Craig Dixon and Tim Wood after the release of new flood modelling for the Maribyrnong River catchment.

1.2.4 Site visits

On 10 October 2023, the Committee undertook two site visits in the Maribyrnong area.

They met with the Victoria Racing Club who showed them the Flemington Racecourse flood wall.

They also toured the Rivervue Retirement Village at Avondale Heights where they met with management and residents to discuss the impact of the Maribyrnong River flood.



Clockwise from top left: Kay Barlow, Tony Goddard, Sue Ryan and Vula Kerr shared their experiences of the Maribyrnong River flood with Members of the Committee during a site visit; John Berger, Gaelle Broad, David Ettershank and Samantha Ratnam were among Members of the Committee who toured the flood-affected Rivervue Retirement Village in Avondale Heights; Committee Members Gaelle Broad, David Ettershank, Sheena Watt, Wendy Lovell, John Berger, Rikkie-Lee Tyrrell and Samantha Ratnam with Victoria Racing Club CEO Steve Rosich; Rivervue Retirement Village's Darren Lewis explains the impact of Maribyrnong River flooding to Committee Members including Samantha Ratnam, David Ettershank, Wendy Lovell and Gaelle Broad.

1.2.5 Online open mic session

On 18 October 2023, the Committee hosted an online open mic session for flood-affected individuals who might not have already had a chance to share their stories by making a public submission. Nineteen people from across Victoria took part, including five who were impacted by the Maribyrnong River flood in October 2022.



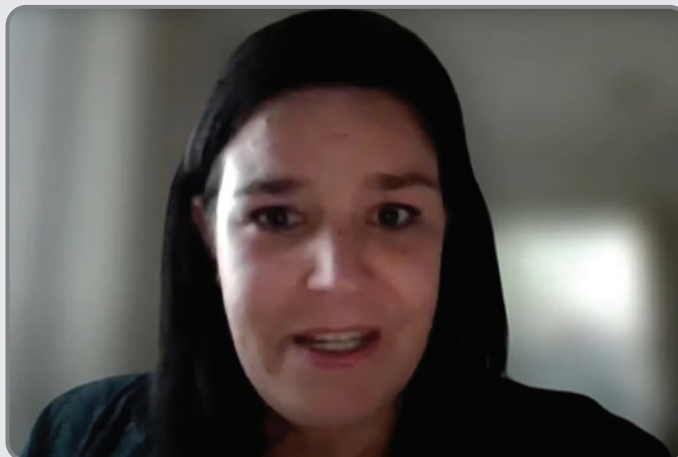
“The community has really banded together to be able to write something and to be heard.”

Linh Nguyen,
Maribyrnong



“It’s really important that people make submissions because without those personal stories and the lived experience of people who can make submissions how will government or policy makers really understand what’s required to make the improvements so we can do it better next time.”

Faye Bendrups,
Maribyrnong



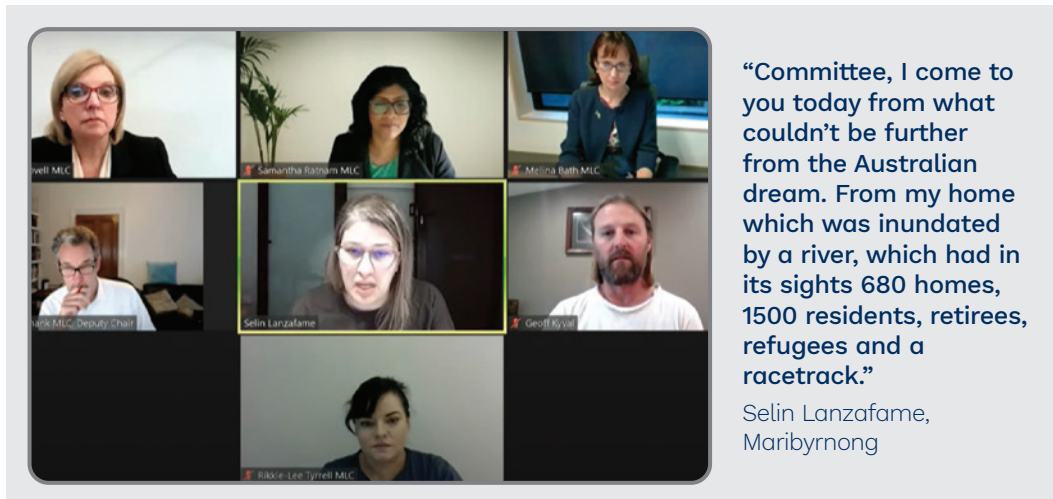
“I think there are lessons to be learned here and as hard as it is for organisations involved to hear those lessons and potentially their failures, they need to hear them, they need to learn from them.”

Sarah Marshall,
Maribyrnong



“At our village 47 homes were flooded with residents needing to find and fund alternate housing for seven months while a rebuild took place.”

Tony Goddard,
Avondale Heights



“Committee, I come to you today from what couldn’t be further from the Australian dream. From my home which was inundated by a river, which had in its sights 680 homes, 1500 residents, retirees, refugees and a racetrack.”

Selin Lanzafame,
Maribyrnong

1.3 The October 2022 flood event in Northern Victoria

1.3.1 Public submission phase

As noted, a total of 880 submissions were received for this Inquiry. Approximately 608 of these were from Northern Victoria. The main contributing towns and local government areas are listed below.

Table 1.2 Submissions from towns in Northern Victoria

Town	Number of submissions
Rochester	344
Echuca	58
Bendigo	19
Seymour	16
Kerang	15

Source: Legislative Council Environment and Planning Committee.

Table 1.3 Submissions from flood-affected local government areas in Northern Victoria

Local government area	Number of submissions
Campaspe	429
Murrindindi	36
Greater Shepparton	27
Gannawarra	25
Loddon	22
Greater Bendigo	18

Source: Legislative Council Environment and Planning Committee.



Inquiry Officer Kieran Crowe briefs residents at the Rochester submission writing workshop.



The Seymour submission writing workshop.



“We haven’t really spoken to any other people that have been impacted by the flood until tonight.”

Stuart Hanley, Seymour

1.3.2 Public submission writing workshops

On 23 April 2023, the Mayor of Campaspe Shire, Cr Rob Amos, wrote to the Committee, requesting support for Campaspe Shire residents to complete public submissions to the Inquiry. Residents of the Shire had faced flooding from the Murray, Goulburn, and Campaspe Rivers. Councillor Amos told the Committee that at that time 50% of residents were able to return to their homes. However, others were living in caravans on their properties or at camping grounds, in temporary accommodation at Elmore, or had not returned to the region at all. It was the Mayor’s view that many residents did not have the technology they would usually rely on to complete an online submission.

A request for support from Mitchell Shire Council followed soon after.

After commencing public submission writing workshops in Maidstone on 3 May 2023, the Committee Secretariat conducted further workshops in Seymour (7 June 2023) and Rochester (14 June 2023).

Our children are the future of Rochester and rebuilding not only involves physical structures but also the social fabric of our community.

Elizabeth Trewick, Principal, St Joseph’s School and Rochester Community Recovery Committee, public hearing, Rochester, *Transcript of evidence*, p. 4.



Clockwise from top left: Rikkie-Lee Tyrrell, Wendy Lovell, Gaelle Broad, Sonja Terpstra, Samantha Ratnam and Melina Bath at the Seymour public hearing; beef farmer Andrew Perry gives evidence at the Seymour public hearing. Nick Stecher is on the left; a panel of Victorian councils gave evidence at the Echuca public hearing.



Committee Members hear from Rochester and Elmore District Health Service (REDHS) at the Rochester Shire Hall.



Representatives from the Committee for Greater Shepparton, the Greater Shepparton Lighthouse Foundation, Murray Dairy and Valley Pack appeared as part of a panel at the Mooroopna public hearing.

1.3.3 Public hearings and site visit

The Committee launched the public hearing phase of the Inquiry in Rochester on 23 August 2023. Over 100 people attended the public gallery as local and district residents gave candid and impassioned evidence. Further day-long public hearings were held at Echuca (24 August), Mooroopna (13 September) and Seymour (14 September). In Echuca, Members of the Committee undertook a site visit and inspected the Echuca flood levee.

Hearings in each of these towns were supported by the local councils and communities who assisted with set-up and organisation of venues and provided advice to committee staff prior to the hearings.



Left to right: Committee Members tour the Echuca flood levee; Mark Cattell, ACO Readiness, Victoria State Emergency Service, took Committee Members on a tour of the Echuca flood levee.

1.3.4 Open mic sessions

Two open mic sessions were held during the public hearing phase of the Inquiry, including an in-person session at Rochester where 16 local and district residents shared what they had experienced before, during and following the October 2022 flood event. A further 19 people from across Victoria recounted their lived experiences and shared their views at an online session held on 18 October 2023. On both occasions, the Committee heard heartfelt evidence about the impact of the floods on lives and livelihoods.



More than 100 people attended the Rochester Shire Hall for a public hearing and open mic session.



Clockwise from top left: Catriona Jenkins at the Rochester open mic session; John Oakley recounts his flood experience at the Rochester open mic session; Gaelle Broad, Wendy Lovell, John Berger, Sonja Terpstra and Melina Bath hear from witnesses at Rochester.



“Look, something definitely needs to be done, some accountability and some care perhaps for those of us that live downstream and a bit of courtesy. But thank you so much for giving us the opportunity to speak.”

Naomi Clark, Bunbartha



“We have to invest in community leaders and we have to provide that support for them to educate their communities.”

Sam Atukorala,
Shepparton



“These disasters are not going to stop and the way to do better is to ensure we deliver inclusive planning, robust frameworks and proper resourcing of local government and state emergency services.”

Leah Taaffe, Echuca



“I personally view this inquiry as the only viable expression to date to communicate our experience in the hope that it aids our community.”

Cameron David Lovering,
Rochester



“Our children are the future of Rochester and rebuilding not only involves physical structures but also the social fabric of our community.”

Elizabeth Trewick,
Rochester



“So, the challenge I pose to all levels of government in this post-flood, post-pandemic environment is to strategically rebuild trust, credibility and capacity and lead well under pressure.”

Kate Burke, Echuca



“There is still so much pain in our community today. We struggle for data; we struggle for agencies to share information and we will continue to struggle for a long time to recover.”

Leigh Wilson, Rochester



“There needs to be some recalibration of response agencies in their established doctrines and ethos to ensure that we are all working as one agency.”

Ann-Marie Roberts,
City of Greater Bendigo

1.4 Online and social media engagement

The Committee used connections with local councils and community members, as well as social media to reach as many communities and individuals as possible throughout each phase of the Inquiry.

Information about Committee activities was provided via:

- media releases
- news articles on the Parliament of Victoria website
- videos
- social media posts
- advertising through *The Age* newspaper.

This included information about submission timeframes, hearing schedules and other Inquiry updates.

There was also extensive interest and coverage provided by external media organisations.

Comments to social media were gathered to inform the Committee Secretariat and internally produced videos have received thousands of views on YouTube.

Local community members were willing to appear on camera and share their stories.



Committee Chair Ryan Batchelor gives an update on the Inquiry via Parliament's social media.

The Legislative Council Environment and Planning Committee thanks everyone who provided a submission, appeared at a hearing or participated in workshops for their engagement with the Inquiry.

Full coverage of the Inquiry can be found at these locations:

Videos: <https://vicparl.news/floodinquiryvids>

Media releases: <https://www.parliament.vic.gov.au/floodinquiry>

Facebook posts: <https://www.facebook.com/VicParliament>

Instagram posts: <https://www.instagram.com/victorianparliament>.

Chapter 2

The October 2022 flood event

2.1 Introduction

The October 2022 flood event was one of the most devastating in Victoria's history.¹ Rivers, creeks and streams from Melbourne to Central and Northern Victoria flooded, inundating towns, cities and agricultural areas.

This Chapter provides an overview of the flood event, focusing on the climatic drivers and extent of flooding in affected areas. It will focus on a high-level summary of the flood event, with the rest of the Report dedicated to examining the event in greater detail, in particular the response of governments and emergency services.

The remainder of the Report will include personal stories from members of the Victorian community who were directly affected by the 2022 floods.

2.2 Causes of and contributing factors to the October 2022 flood event

Flooding events are caused by a range of complex factors. However, the primary contributor to the October 2022 flood event in Victoria was an extraordinary period of rain over two days on 12 and 13 October 2022. The extreme rain occurred at a time when catchments were already wet due to climatic factors.

2.2.1 Climatic drivers

In winter and spring 2022, there was high soil moisture and full water reservoirs because of weather patterns which had been active for years prior to the onset of severe flooding. These weather patterns were described by the Bureau of Meteorology as:

- La Niña
- the Indian Ocean Dipole
- the Southern Annular Mode.²

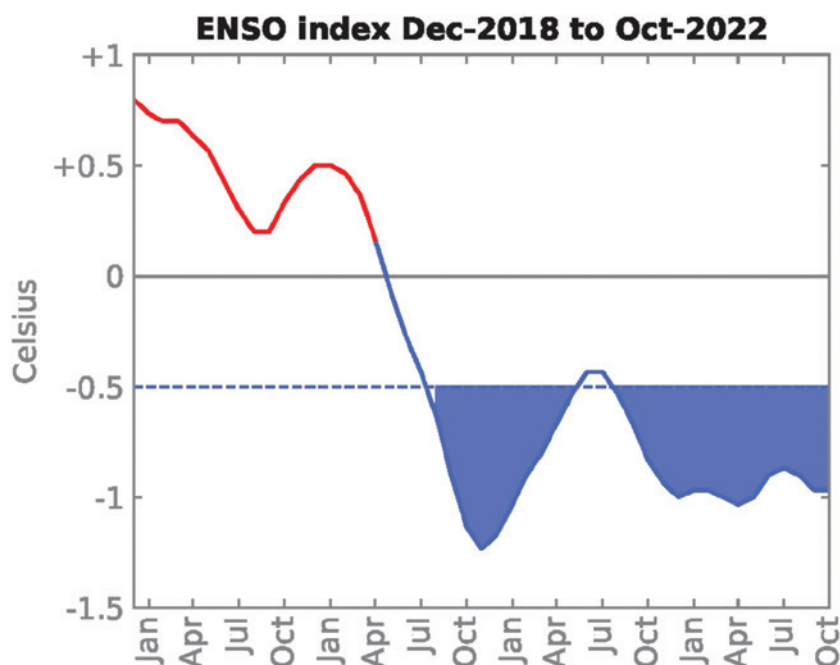
La Niña is a weather pattern involving cooling of surface temperature in the Pacific Ocean and stronger trade winds. It increases the chances of above-average rainfall during spring and summer for northern and eastern Australia. The spring and summer

¹ Victoria State Emergency Service, 'Victorian Floods 2022', *Community Matters*, Edition 21, 2022, p. 4.

² Bureau of Meteorology, *Submission 73*, p. 3.

of 2022–23 was the third consecutive year of La Niña. It is only the fourth time since records began that La Niña has lasted for 3 consecutive years in a row.³ The La Niña conditions strengthened and matured during October and November 2022.⁴

Figure 2.1 Triple La Niña event, December 2018 to October 2022



Source: ARC Centre of Excellence for Climate Extremes, *Large scale climate drivers in Australia*, 2022, <<https://climateextremes.org.au/large-scale-climate-drivers-in-australia-2022>> accessed 29 November 2023.

The Indian Ocean Dipole describes the difference in sea surface temperatures between the east and west of the Indian Ocean. Cooler temperatures in the west are referred to as a Negative Indian Ocean Dipole and bring the likelihood of above-average rain in winter and spring to northern and southern Australia.⁵ The Negative Indian Ocean Dipole began in August 2022 and continued through the spring.⁶

When La Niña and negative Indian Ocean Dipole conditions combine, the likelihood of above-average rainfall over Australia is further increased, particularly for the eastern half of the country.⁷ Since measurements began in 1900, it has only happened five times.⁸ This includes years with widespread and record flooding, 1974 and 2010.⁹

³ Melbourne Water, *Fact Sheet: Maribyrnong River Flood Event: What we know so far*, 2023, <https://hdp-au-prod-app-mw-yoursay-files.s3.ap-southeast-2.amazonaws.com/5716/7384/1817/Fact_Sheet_What_we_know_so_far_Maribyrnong_Flood.pdf> accessed 1 June 2024, p. 2.

⁴ Bureau of Meteorology, *Submission 73*, p. 3.

⁵ Bureau of Meteorology, *Indian Ocean Dipole*, <<http://www.bom.gov.au/climate/enso/history/In-2010-12/IOD-what.shtml>> accessed 24 April 2023.

⁶ Bureau of Meteorology, *Submission 73*, p. 3.

⁷ Bureau of Meteorology, *Climate Driver Update Archive*, <http://www.bom.gov.au/climate/enso/wrap-up/archive/20221011_archive.shtml> accessed 24 April 2023.

⁸ In 1964, 1974, 1989, 1998 and 2010.

⁹ Bureau of Meteorology, *What is La Niña and how does it impact Australia?*, <<http://www.bom.gov.au/climate/updates/articles/a020.shtml>> accessed 24 April 2023.

A further climatic phenomenon, the Southern Annular Mode, had an influence on the weather in the lead up to the 2022 floods. The Southern Annular Mode refers to westerly winds that blow around the Southern Ocean near Antarctica. If the winds shift away from the equator towards the pole, then it is known as a positive Southern Annular Mode. This results in more rain in south-eastern Australia during spring and summer. The event lasts for one to two weeks.¹⁰ The Southern Annular Mode was mostly positive during spring 2022.¹¹

In its submission, the ARC Centre of Excellence for Climate Extremes explained that:

La Niña is associated with above-normal rainfall over the Murray-Darling during the winter and spring seasons. In addition, a generally positive phase of the Southern Annular Mode (SAM) and generally negative phase of the Indian Ocean Dipole additionally favoured wet conditions in south-eastern Australia during the preceding year.¹²

The result of these climatic drivers in the lead up to the floods was:

- increased rain
- extremely high upper layer soil moisture
- close-to-full water reservoirs.¹³

When ground is already saturated, heavy rainfall is less likely to be absorbed into the land. Water reservoirs that are nearly at capacity have little ability to hold excess water. As a result, increased flows enter creeks and river systems, raising the risk of riverine flooding.¹⁴

Figure 2.2 shows data from the Bureau of Meteorology illustrating that by September 2022, the ground moisture was already 'very much above average' in parts of Central and Northern Victoria, and in the highest 1% of moisture in some areas. In October, soil was in the highest 1% of moisture range for most of the state.

¹⁰ Bureau of Meteorology, *Southern Annular Mode*, <<http://www.bom.gov.au/climate/sam>> accessed 24 April 2023.

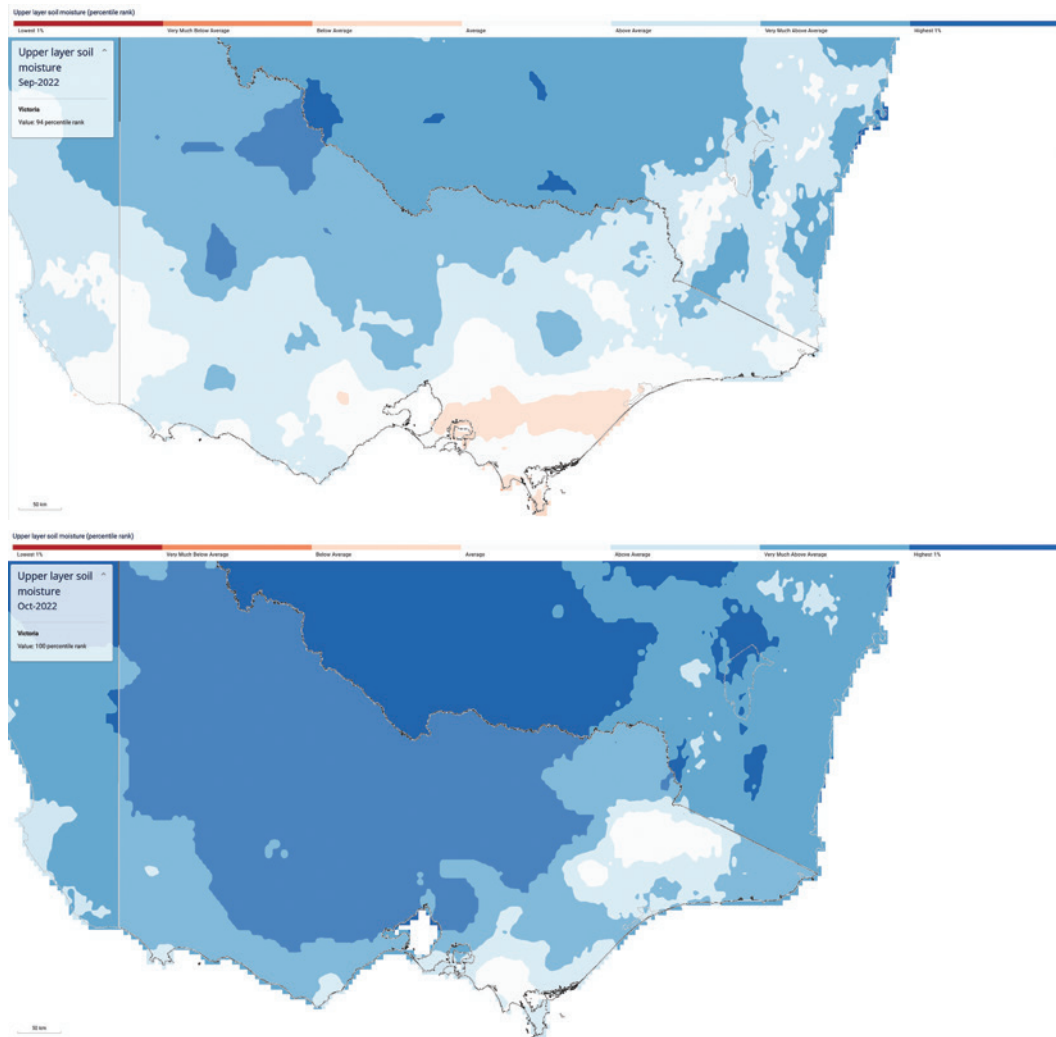
¹¹ Bureau of Meteorology, *Submission 73*, p. 3.

¹² The ARC Centre of Excellence for Climate Extremes, *Submission 309*, p. 2.

¹³ Bureau of Meteorology, *Submission 73*, p. 3.

¹⁴ Ibid.

Figure 2.2 Upper layer soil moisture, September and October 2022, Victoria



Source: Bureau of Meteorology, *Australian Water Outlook*, <<https://awo.bom.gov.au/products/historical/soilMoisture-rootZone/4,-27.528.134.165/nat.-25.609.134.362/r/d/2023-03-29>> accessed 30 March 2023.

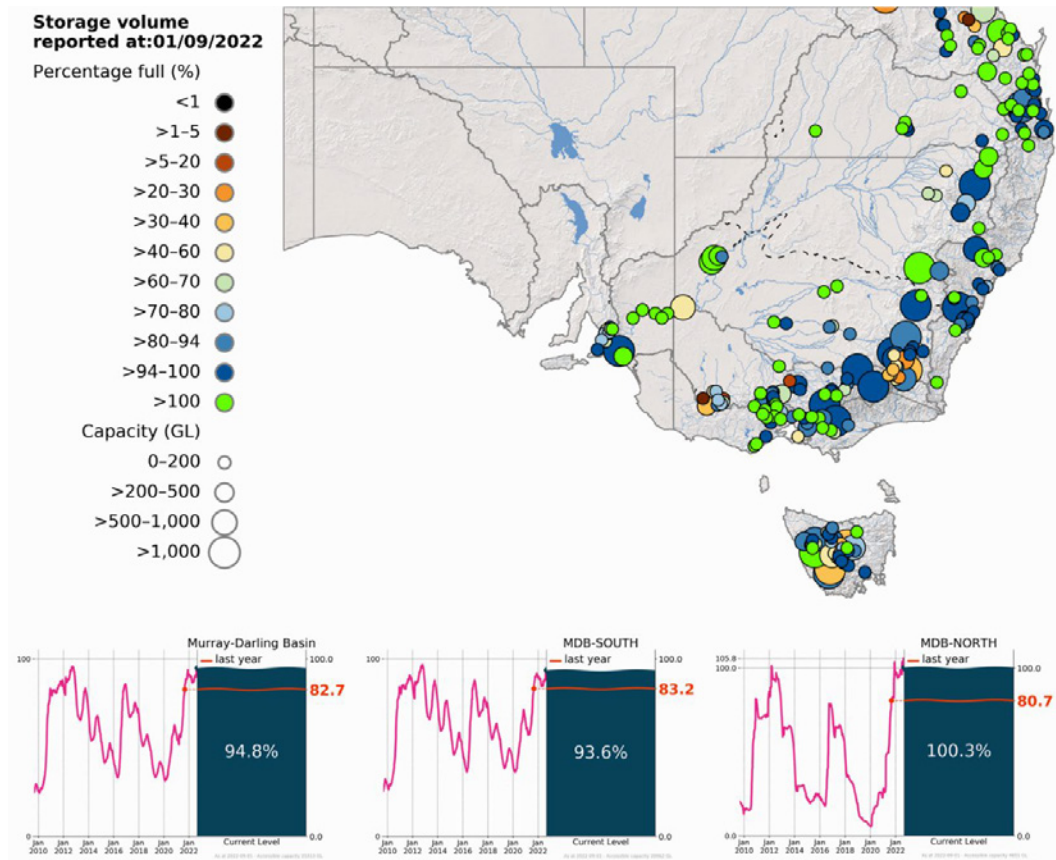
Following two years of above-average rainfall, by Spring 2022 many public water storages across south-eastern Australia (including the Murray-Darling basin) were ‘at or near capacity’.¹⁵ The Bureau’s submission noted that from 1 September 2021 to September 2022 the overall storage volume for:

- the Murray-Darlin Basin increased from 82.7% to 94.8% of capacity
- the Southern Basin increased from 83.2% to 93.6% of capacity
- the Northern Basin increased from 80.7% to 100.3% of capacity.¹⁶

¹⁵ Ibid.

¹⁶ Ibid., pp. 3-4.

Figure 2.3 Storage conditions, percentage full of accessible storages capacity, 1 September 2022



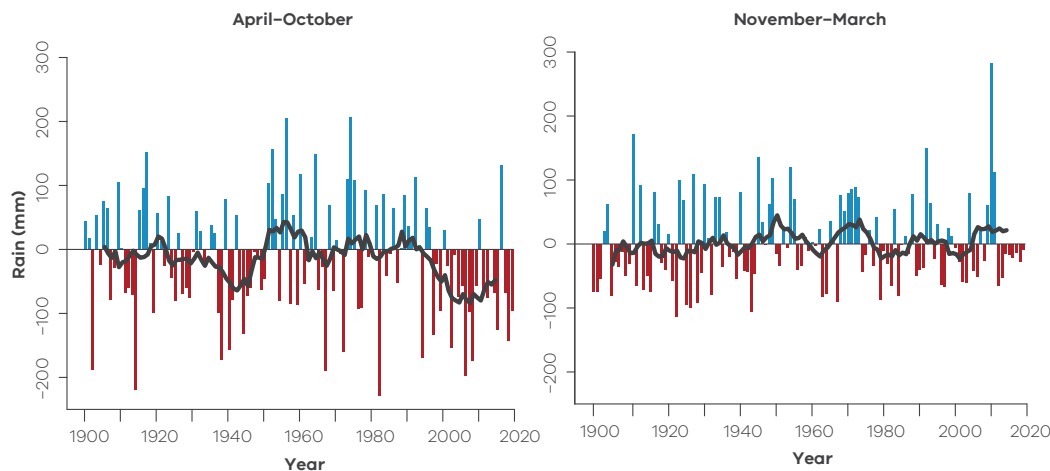
Source: Bureau of Meteorology, *Submission 73*, p. 4.

2.2.2 October 2022 rainfall

In the days immediately preceding the floods, Victoria experienced an extraordinary period of rainfall. Rainfall ran into catchments which were already at capacity and onto land that was at its highest 1% moisture level. The month of October 2022 was not just the wettest October recorded, but the wettest month ever in Victoria since records began in 1900. The rainfall was more than double the October average.¹⁷ Figure 2.4 below shows the average rainfall in Victoria in April–October (left) and November–March (right).

17 Ibid., p. 5.

Figure 2.4 Victorian average rainfall anomaly in April–October and November–March



Notes: The averages (1961–1990) are 448.2 mm and 212.9 mm. The dark line shows the 11-year moving average.

Source: Bureau of Meteorology, *Victoria's water in a changing climate*, 2021, p. 21.

The rainfall which contributed directly to the extreme flooding event occurred on 12 and 13 October 2022. On 12 October, moist air from the north brought very heavy rain, particularly in central parts of the state. According to the Bureau of Meteorology, in these areas there was 'widespread daily rainfall totals between 20 and 60 mm and isolated totals exceeding 100 mm'.¹⁸ On 13 October, a cold front passed through Victoria and brought the heaviest rain to north-eastern and central parts of the state.¹⁹ Many sites (66) experienced their highest ever recorded October daily rainfall between 12 and 14 October 2022.²⁰ A number of sites in Central and North-Eastern Victoria received more than 150 mm over 48 hours to 9 am on 14 October, with some sites having their wettest two consecutive days on record.²¹

As a result, major flooding occurred on many rivers, resulting in road closures, and inundating many homes, properties and large areas of farmland.

Figure 2.5 below from the Bureau of Meteorology shows the total rainfall in Victoria during October 2022.

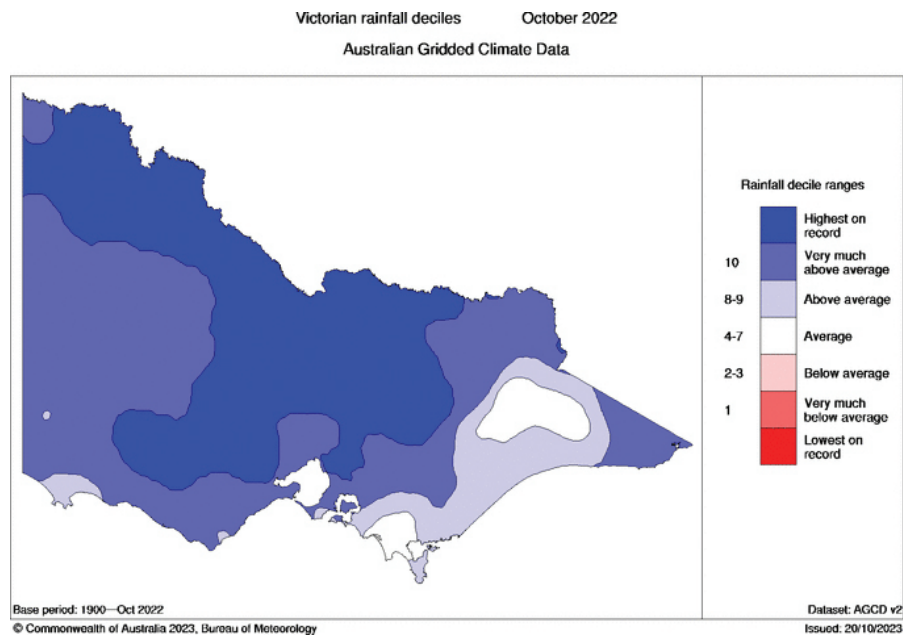
¹⁸ Ibid.

¹⁹ Bureau of Meteorology, *Victoria in October 2022: wettest month on record, very warm nights*, 1 November 2022, <<http://www.bom.gov.au/climate/current/month/vic/archive/202210.summary.shtml>> accessed 14 March 2023.

²⁰ Ibid.

²¹ Bureau of Meteorology, *Submission 73*, p. 5.

Figure 2.5 Total rainfall in Victoria during October 2022



Source: Bureau of Meteorology, *Victoria in October 2022: wettest month on record, very warm nights*, 1 November 2022, <<http://www.bom.gov.au/climate/current/month/vic/archive/202210.summary.shtml>> accessed 14 March 2023.

FINDING 1: October 2022 was the wettest month ever in Victoria since records began in 1900. The climatic conditions were unprecedented, and rain fell on already saturated ground, creating uniquely devastating flood conditions.

2.3 Overview of the flood event

The October 2022 flood event was one of the most devastating in Victoria's history.²² Cities and towns across the state were flooded. Tragically the lives of two men were lost, in Rochester and in Nathalia, as well as homes, businesses, and infrastructure.

The following Sections provide an overview of the flood event with reference to population centres that were most impacted in terms of the number of properties affected and the scale of damage.

However, it should be noted that smaller towns and agricultural regions across the state were also severely affected by the flooding. The livelihoods of many in regional and rural Victoria were impacted, crops and livestock were lost, machinery and infrastructure were damaged, and harvests were ruined.

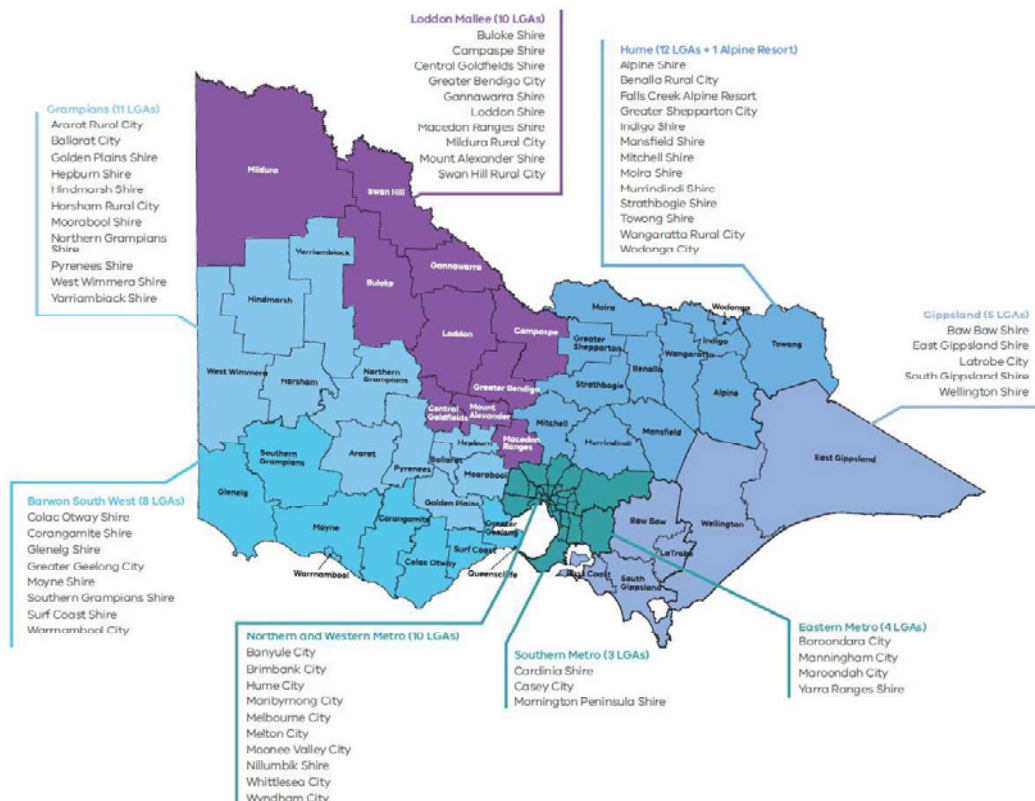
²² Victoria State Emergency Service, 'Victorian Floods 2022', *Community Matters*, Edition 21, p. 4.

Across Victoria, 63 local government areas (and one alpine resort) were affected by flooding, representing 81% of all local government areas. Figure 2.6 below shows all of the flood-impacted local government areas. In summary, there were:

- 13 affected areas in Hume
- 5 affected areas in Gippsland
- 4 affected areas in Eastern Metropolitan
- 3 affected areas in Southern Metropolitan
- 10 affected areas in Northern and Western Metropolitan
- 8 affected areas in Barwon South West
- 11 affected areas in the Grampians
- 10 affected areas in Loddon Mallee.²³

According to the Department of Energy, Environment and Climate Action, over 5,000 known Aboriginal cultural heritage sites were impacted by the flood event and corresponding response and recovery activities.²⁴

Figure 2.6 Flood-impacted local government areas



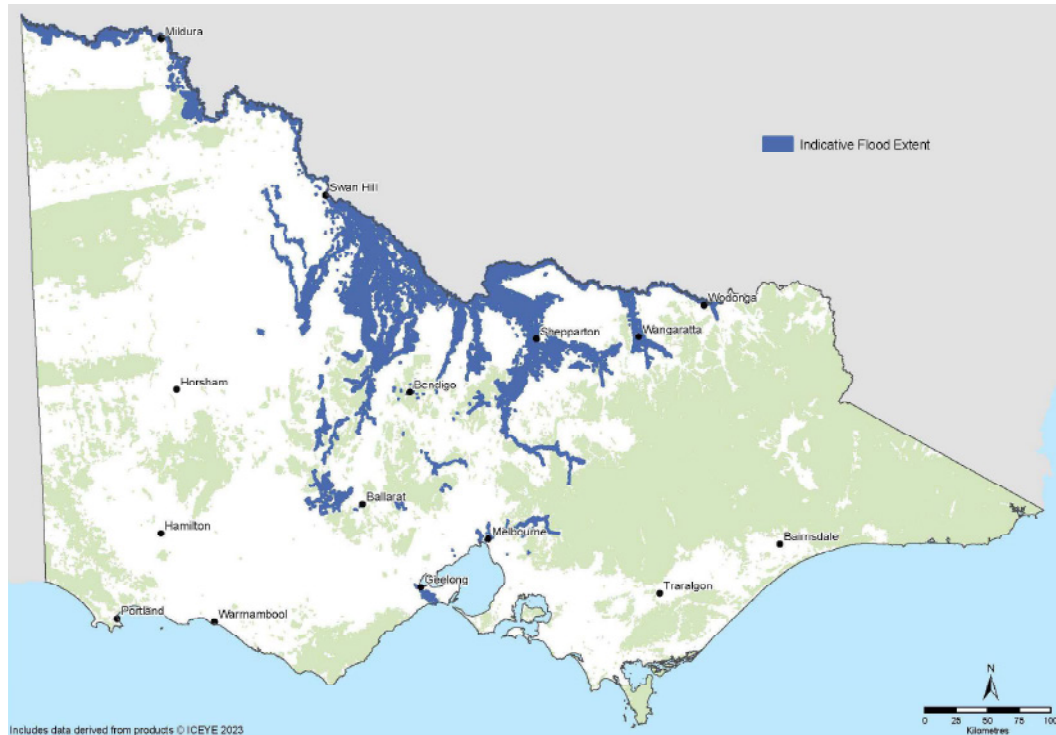
Source: Victorian Government, *Submission 295*, p. 70.

²³ Victorian Government, *Submission 295*, p. 70.

²⁴ Carolyn Jackson, Deputy Secretary, Regions, Environment, Climate Action and First Peoples, Department of Energy, Environment and Climate Action, public hearing, Melbourne, 21 November 2023, *Transcript of evidence*, p. 14.

Figure 2.7 below from the Victorian Government’s submission shows the indicative observed flood extent from the October 2022 event.

Figure 2.7 Indicative observed flood extent



Source: Victorian Government, *Submission 295*, p. 69.

FINDING 2: The 2022 flood event affected 63 local government areas and one alpine resort, representing 81% of all local government areas in Victoria.

FINDING 3: Over 5,000 culturally significant Aboriginal heritage sites were impacted by the 2022 flood event.

2.3.1 Rochester

Rochester, where the Campaspe River runs through the centre of the town, was heavily impacted by the October 2022 flood event. Every dwelling in the town was affected in some way, and sadly one person was found deceased in their home.²⁵ In the days before the floods of 2022, Rochester received 70 mm of rainfall on 13 October and 30 mm on the 14 October.²⁶

²⁵ Victorian Government, *Submission 295*, p. 70.

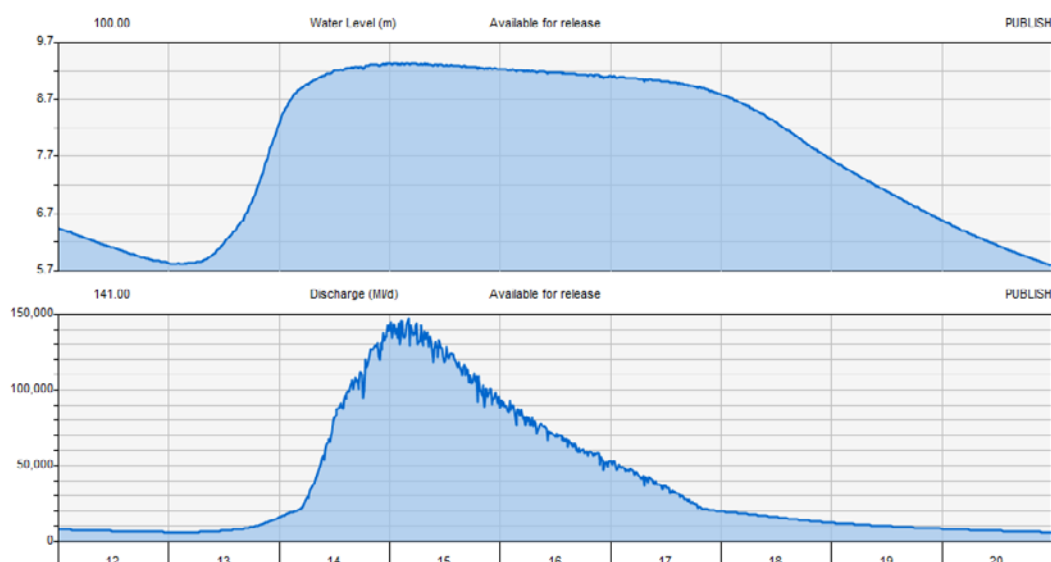
²⁶ Bureau of Meteorology, *Daily Rainfall: Rochester*, <http://www.bom.gov.au/jsp/ncc/cdio/weatherData/av?p_nccObsCode=136&p_display_type=dailyDataFile&p_startYear=2022&p_c=-1281576287&p_stn_num=080049> accessed 20 March 2023.

Rochester has previously been impacted by serious flooding, including most recently in 2011. In 2011, 80% of the town was affected by flooding.²⁷ The Victorian Government submission noted that on 14 October 2022 Rochester was ‘inundated with flood peaks higher than those recorded in 2011’.²⁸

Upstream from Rochester sits Lake Eppalock, a reservoir originally designed to hold water for use by irrigators. As a result of the heavy rainfall on 13 and 14 October, the reservoir reached capacity and water overflowed into the Campaspe River. Some submitters to the Inquiry believe this water contributed to the severity of the flooding at Rochester and other towns upstream.²⁹ This issue will be discussed further in Section 5.5.

At Rochester, the Campaspe peaked at midnight on Friday 14 October and unlike the Maribyrnong, the water levels stayed high for days afterwards. This is illustrated in Figure 2.8 below.

Figure 2.8 Campaspe River at Rochester water height (m) and discharge (ML/d) between 12 and 19 October 2022



Source: Department of Environment, Land, Water and Planning, *Water Measurement Information System*, <<https://data.water.vic.gov.au>> accessed 30 March 2023.

In its submission, the Campaspe Shire Council³⁰ described the extent of damage and destruction which occurred in Rochester, stating it was ‘hardest hit, with over 800 homes either damaged or uninhabitable’. The Council provided its submission to

²⁷ Victoria State Emergency Service, *Rochester Local Flood Guide*, 2020, p. 3.

²⁸ Victorian Government, *Submission 295*, p. 68.

²⁹ For example, see: Campaspe Shire Council, *Submission 650*, p. 3; Wayne Park, *Submission 5*, p. 1.

³⁰ Campaspe Shire Council incorporates the townships of Rochester, Echuca, Gunbower, Torrumberry and other small rural communities.

the Inquiry on 5 June 2023. At the time, it noted that over 70% of Rochester residents were 'still not back in their home some seven months post the event'. Further:

- 250 households were living in caravans on their impacted properties
- many residents were living in makeshift accommodation, such as sheds
- others were living outside the municipality.³¹

At the time of writing, approximately 110 residents are also living at the Elmore Village. This village was established by the Victorian Government at the height of the floods and it housed 350 residents at its peak.

Campaspe Shire Council, *Submission 650*, p. 2.

Figure 2.9 below gives an aerial view of the flooding.

Figure 2.9 An aerial view of the flooding in Rochester in October 2022



Source: Benjamin Preiss, "This is going to break a lot of people': Nearly every house in Rochester inundated", *The Age*, 15 October 2022, <<https://www.theage.com.au/national/victoria/this-is-going-to-break-a-lot-of-people-nearly-every-house-in-rochester-inundated-20221015-p5bq0i.html>> accessed 22 March 2023.

The Victoria State Emergency Service Rochester Unit received over 350 requests for assistance. They managed to conduct rescues despite their facility and the Country Fire Authority station being affected by flooding. A staging post was set up at the sewage treatment plant to coordinate rescues.³²

³¹ Campaspe Shire Council, *Submission 650*, p. 2.

³² Victoria State Emergency Service, 'Victorian Floods 2022', p. 12.

The first death of the October 2022 flood event was recorded in Rochester when a 71-year-old man was found dead in the backyard of his home.³³ A second flood-related death was recorded in Nathalia, north of Shepparton on 19 October 2022.³⁴

Paul Poort

On 14 October at 17:00, the floodwaters breached the floor of our home and we were inundated with this water. When you realise that there is nothing you can do to stop the water coming in, the impact is devastating. Initially we were told that this flood would be about 100 millimetres higher than the previous flood of 2011. If this had been the case, we would not have been flooded, as we would still have had the clearance. We built our home 16 years ago, ensuring not only that we built it to the regulation height that we were given but that we actually built ours a level higher. Many residents in our town talk about the wave of water that came through at that time, and many of these residents, like us, did not have flood inundation in 2011 but did in 2022.

One of our big issues will be getting insurance for flooding in the future. Will there be an embargo on our town for flood cover, and if not, will we be able to afford it, if we can even get cover? What, if anything, will our governments do to ensure that we are not disadvantaged by this event, regarding insurance cover?

Source: Paul Poort, public hearing Open Mic, Rochester, 23 August 2023, *Transcript of evidence*, p. 71.

Hannah Taylor

Our home was one that should never have got wet in Rochester, among many others. The water did not come from the river but down a road like a tsunami. The water had stopped rising for about half an hour and then within half an hour we were sandbagging the motel (two doors up from our home) and evacuating. We were two weeks off having a fully renovated home, which we'd been doing for two and a half years. I was 36 weeks pregnant at the time of the flood.

Source: Hannah Taylor, *Submission 22*, p. 1.

³³ Benjamin Preiss, "This is going to break a lot of people': Nearly every house in Rochester inundated', *The Age*, 15 October 2022, <<https://www.theage.com.au/national/victoria/this-is-going-to-break-a-lot-of-people-nearly-every-house-in-rochester-inundated-20221015-p5bq0i.html>> accessed 22 March 2023.

³⁴ 'Man found dead in floodwater at Nathalia, north-west of Shepparton in Victoria', *ABC News*, 19 October 2022, <<https://www.abc.net.au/news/2022-10-19/victoria-flood-death-at-nathalia-shepparton/101550728>> accessed 17 April 2023.

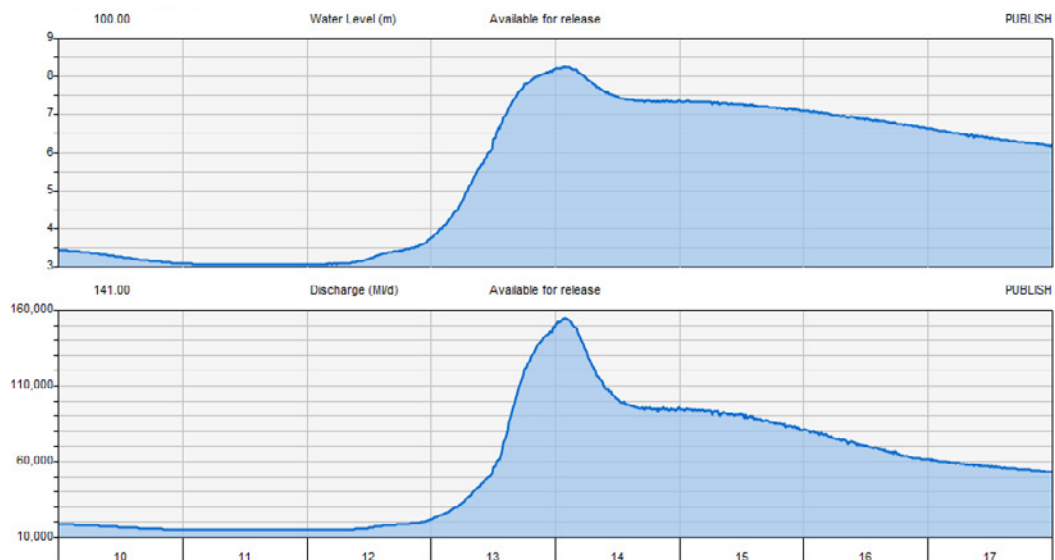
2.3.2 Seymour

The township of Seymour was the first major town to experience flooding in October 2022,³⁵ when rainfall caused a rapid rise in the Goulburn River. Seymour is located on the Goulburn River, which flows to the west of the town. It is located approximately 60 kilometres from Lake Eildon, a reservoir where the Goulburn is dammed. Seymour has a history of flooding that has resulted in the town's commercial centre being moved three times in between the late 19th century and 1916–17.³⁶

Seymour recorded 89.8 mm of rain on 13 October and 65.8mm on 14 October 2022.³⁷

As shown in Figure 2.10 below, the Goulburn River peaked in the early hours of 14 October at 8.26 m, exceeding the previous record of 7.64 m which occurred in May 1974.³⁸ The floods were the second worst in Seymour's history after the floods in 1916.³⁹

Figure 2.10 Goulburn River at Seymour water height (m) and discharge (ML/d) between 10 and 17 October 2022



Source: Department of Energy, Environment and Climate Action, *Water Measurement Information System*, <<https://data.water.vic.gov.au>> accessed 30 March 2023.

The Mitchell Shire Council's submission noted the widespread damage in Seymour, with over 250 properties experiencing over floor flooding.⁴⁰

³⁵ Mitchell Shire Council, *Submission 521*, p. 4.

³⁶ Victoria State Emergency Service, *Seymour Local Flood Guide*, 2020, p. 3.

³⁷ Bureau of Meteorology, *Daily Rainfall: Goulburn River at Seymour, 2022*, <http://www.bom.gov.au/jsp/ncc/cdio/weatherData/av?p_nccObsCode=136&p_display_type=dailyDataFile&p_startYear=2022&p_c=-1553247063&p_stn_num=088126> accessed 22 March 2022.

³⁸ Victorian Government, *Submission 295*, p. 77.

³⁹ Victoria State Emergency Service, *Seymour Local Flood Guide*, p. 3.

⁴⁰ Mitchell Shire Council, *Submission 521*, p. 6.

Ultimately more than 254 homes and businesses were flooded above floor level. Hundreds of kilometres of roads were significantly damaged, with more than 50 roads closed during the event and for a considerable time thereafter. The cost of the roads alone was in excess of \$3 million.

Cr Fiona Stevens, Mayor, Mitchell Shire Council, public hearing, Seymour, 14 September 2023, *Transcript of evidence*, p. 2.

Figure 2.11 below shows the extent of the flooding in central Seymour.

Figure 2.11 An aerial view of the flooding at Seymour in October 2022



Source: Chip Le Grand, Rejected Seymour levee could have averted flooding disaster, *The Age*, 18 October 2022, <<https://www.theage.com.au/national/victoria/rejected-seymour-levee-could-have-averted-flooding-disaster-20221017-p5bqfi.html>> accessed 22 March 2023.

In its submission, the Victorian Government reported that the Seymour Victoria State Emergency Service unit area received 274 requests for assistance, of which 150 were made on 13 October.⁴¹

⁴¹ Victorian Government, *Submission 295*, p. 45.

Lindsay Poxon

On the day of the 2022 flood, I had to go to Melbourne to help my sister with a hospital appointment on Thursday 13th. I left before 11am, at that time, the Goulburn River was already running a banker, Whiteheads Creek was therefore, unable to drain into the flood level River and the stalled and spreading floodwater had caused the closure of Wallis Street between GV Hwy and High St and there was, easily, 100mm of water in High Street near the Vietnam Veterans Walk. Along Emily Street, near Deep Creek, the floodwater was over more than half the double carriageway, with the inbound lanes almost blocked with water. As I crossed the River bridge, the course of the River was visibly in flood. The rain did not stop during my journey down the Hume Freeway and several of the reasonably large culverts which cross the Freeway, were overflowing with up to 100mm on the pavement, causing a problem for traffic, also some pavement areas were breaking up badly. I believe that not too long after I had left Seymour for the day, the water levels I had observed in Town, had started to go up even higher quite quickly.

I did not return to Seymour until the early hours of Friday, by which time the floods in Town had reached their high and damaging levels of inundation. The roads were closed and I got to my home via Redbank Road, coming in from the North of Seymour. The roads were all closed from my side of Town and I could not access the flooded areas for many days.

Source: Lindsay Poxon, *Submission 759*, p. 2.

2.3.3 Greater Shepparton

Greater Shepparton sits on the confluence of the Goulburn and Broken Rivers. The Goulburn runs south to north, with Shepparton on the east bank and the town of Mooroopna on the west. The Broken River runs across the south of Shepparton before joining the Goulburn. The Goulburn is the larger of the two rivers. It runs from the high country, through Lake Eildon and on to the Murray River, passing Shepparton as it nears the Murray and Broken Rivers. The Seven Creeks also meets the Goulburn at Kialla West just south of Shepparton. Flooding events in Greater Shepparton can differ depending on which river is flooding or if both are flooding at the same time.⁴²

Shepparton and Mooroopna are built on flat ground that is prone to flooding. Previous major floods include those in 1974, 1993 and 2010, with the 1974 flood—a Goulburn River dominant flood—being the worst in the modern era, peaking at 12.09 m.⁴³

In 2022, Shepparton received 34.6 mm of rain on 13 October and 46.6 mm on 14 October. There were also water releases from Lake Eildon into the Goulburn River

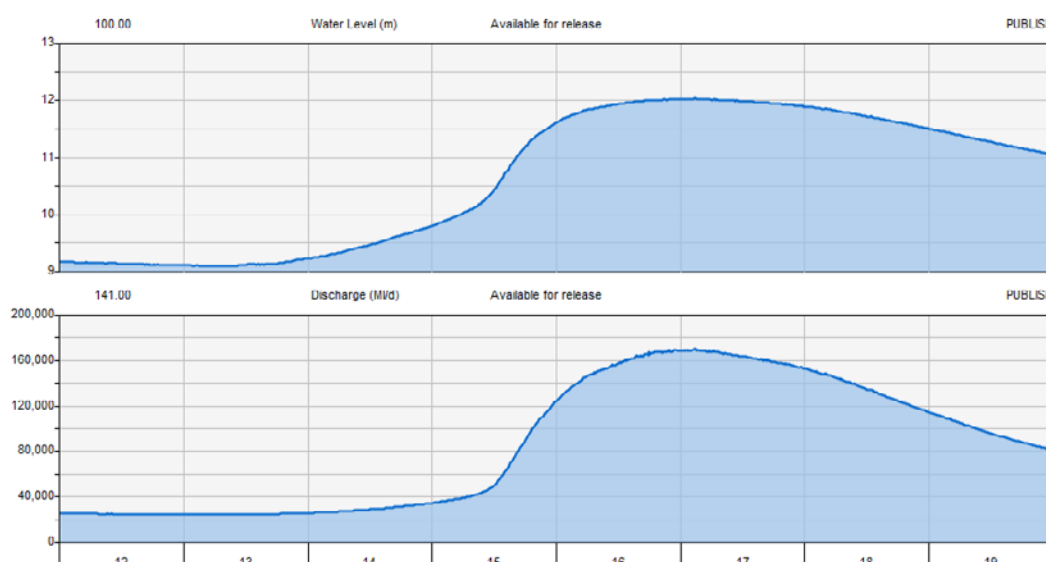
⁴² Victoria State Emergency Service, *Shepparton, Mooroopna and Kialla Local Flood Guide*, 2023, pp. 2–4.

⁴³ Tyler Maher, 'Shepparton floods: the situation as it stands', *Shepparton News*, 16 October 2022, <<https://www.sheppnews.com.au/news/shepparton-floods-the-situation-as-it-stands>> accessed 22 March 2023.

on 13 October as levels peaked at the reservoir. Some stakeholders contended that these water releases contributed to flooding downstream (see Section 5.5 for further discussion on Lake Eildon's water releases during the 2022 flood event).⁴⁴ Parts of Shepparton and Mooroopna, including the causeway floodplain between the two towns, began flooding on 15 October.⁴⁵

According to information from the Bureau of Meteorology, the adopted flood peak for the Goulburn was 12.06 m, which occurred on 17 October 2022. The local flood guide for the catchment explained that the 2022 flood was bigger than the 1974 event. The location of the river gauge has changed since 1974 so official readings are different, but when measured at the same place as the old gauge, the 2022 flood 'was 1cm higher than 1974'.⁴⁶

Figure 2.12 The Goulburn River at Shepparton water height (m) and discharge (ML/d) between 12 and 19 October 2022



Source: Department of Energy, Environment and Climate Action, Water Measurement Information System, <<https://data.water.vic.gov.au>> accessed 30 March 2023.

The Committee for Greater Shepparton described some of the impacts of flooding experienced in the Shepparton area, noting:

- approximately 1–2% of houses in Shepparton-Mooroopna experienced above floor flooding
- at the peak of flooding, there were over 800 road closures across the Goulburn Murray region
- a significant number of houses were isolated (but were not flooded).⁴⁷

⁴⁴ For example, see: Mark Lamb, Chief Executive Officer, Murray Darling Association, public hearing, Mooroopna, 13 September 2023, *Transcript of evidence*, p. 33.

⁴⁵ Monique Preston, 'Year in review 2022: Flooding devastates the region', *Shepparton News*, 10 January 2023, <<https://www.sheppnews.com.au/news/year-in-review-2022-flooding-devastates-the-region>> accessed 22 March 2023.

⁴⁶ Victoria State Emergency Service, *Shepparton, Mooroopna and Kialla Local Flood Guide*, p. 6.

⁴⁷ Committee for Greater Shepparton, *Submission 393*, p. 4.

Many residents' daily lives were affected directly through property damage or isolation, and their health and wellbeing impacted. Residential properties, businesses and farms were impacted. Culturally significant sites were flooded. Local properties, waterways, parks and roadways suffered considerable damage as did several major Council assets.

Greater Shepparton City Council, *Submission 654*, p. 3.

Figure 2.13 below shows the extent of flooding in Shepparton.

Figure 2.13 An aerial view of flooding in Shepparton in October 2022



Source: City of Greater Shepparton, *Flood Information Update*, 26 October 2022, <<https://greatershepparton.com.au/whats-happening/news/news-article/456/post/flood-information-update-october-2022>> accessed 30 March 2023.

Approximately 4000 properties were isolated or inundated in Shepparton and Mooroopna.⁴⁸ In its submission, the Victorian Government noted that the Shepparton Search and Rescue Squad was the busiest volunteer unit during the October 2022 flood event. The Shepparton Search and Rescue Squad:

- received 980 requests for assistance—
 - 41% (402) requests were made on 16 October
 - 550 related directly to flood impacts
- conducted over 180 rescues, including 287 with potential for flood waters to enter premises.⁴⁹

Of the requests for assistance to the Shepparton Search and Rescue Squad, 770 (78.6%) came from the Shepparton area specifically.⁵⁰

⁴⁸ Monique Preston, 'Year in review 2022: Flooding devastates the region', *Shepparton News*, 10 January 2023, <<https://www.sheppnews.com.au/news/year-in-review-2022-flooding-devastates-the-region>> accessed 1 June 2024.

⁴⁹ Victorian Government, *Submission 295*, p. 45.

⁵⁰ Ibid.

Vicki and Geoff Woodhouse

At a local level there was no warning notification that was consistent. (2009 flood we had SES door knocking insisting we leave our property....the water came no where as close to our house as October 2022).

We had no contact from local government until water had subsided from access streets.

Source: Vicki and Geoff Woodhouse, *Submission 435*, p. 1.

Naomi Clark

This time last year, 12 months yesterday to the day, we lost our house and our land. I am at Bunbartha, which is about 10, 15 minutes out of Shepparton. We live practically a stone's throw from Loch Garry, which is an infrastructure I imagine most people know about, where when the water gets to a certain point in Shepparton, they open the bars and let it out onto the flood plains. We were not expecting to flood ourselves; we were expecting it to flood a couple of roads away. However, on that particular day when Goulburn–Murray Water was supposed to lift the bars, due to lack of management, I feel, and no common courtesy obviously for us downstream, the bars were not pulled at an adequate time, and all the water that built up in the loch then blew out the majority of levees, which then led to me and my neighbours losing our homes and our farms. We are hobby farmers, so we work. We do not make a wage off our farms. It is purely we bought it to set ourselves up and so our kids could have an opportunity to be out of town and ride horses and pursue their interests. So for us it has just been absolute turmoil. I probably sound a bit exhausted – it has been a long 12 months. It is taking its toll.

Source: Naomi Clark, online open mic, public hearing, 18 October 2023, *Transcript of evidence*, p. 12.

2.3.4 Echuca

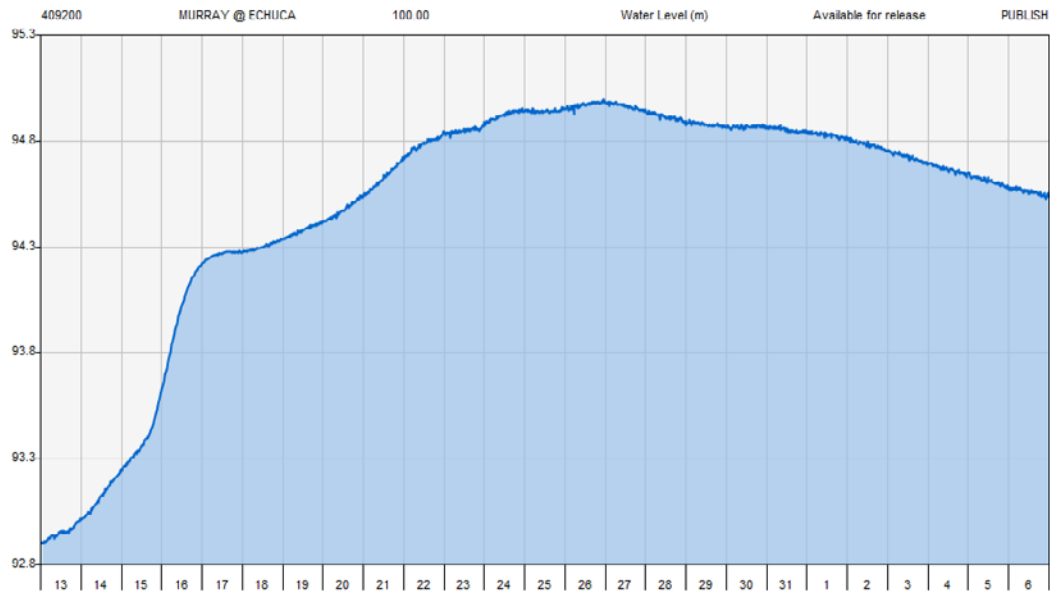
Echuca has a long history of flooding, with floods in 1870 and 1993 considered the worst on record, with heights of 96.2 m and 94.77 m respectively. Historically, floods are more severe when all three rivers in the region flood at once.⁵¹ Echuca sits at the confluence of the Murray River and the Campaspe River. The Goulburn also runs nearby, joining the Murray 15 km to Echuca's east.

Echuca received 55 mm of rain on 13 October and 35 mm on 14 October 2022. Flooding began on the Campaspe River on 15 October and later the Murray, reaching a peak

⁵¹ Victoria State Emergency Service, *Echuca Local Flood Guide*, 2023, p. 2.

of 94.98 m, the highest since 1916.⁵² Figure 2.14 below shows the height of the Murray River between 13 October and 5 November 2022. The data clearly depicts that from 13 October 2022 the Murray River peaked slowly but stayed elevated for several weeks after flooding began.

Figure 2.14 Murray River at Echuca water height (m) between 13 October and 5 November 2022



Source: Department of Energy, Environment and Climate Action, *Water Measurement Information System*, <<https://data.water.vic.gov.au>> accessed 30 March 2023.

Unlike other flood-affected areas, because the Murray River did not peak until nearly two weeks after the flooding began there was time to consider flood mitigation measures.

On 17 October, Emergency Management Victoria, as the lead agency during the flooding event, made the decision that a levee needed to be built to protect as much of the town as possible.⁵³ A levee was constructed within 48 hours along the eastern side of the town that faces the Murray. It was built on the first available flat solid ground back from the Murray floodplain, along residential streets.⁵⁴ The levee was constructed from earth and sandbags by locals with the help of Australian Defence Force personnel.⁵⁵

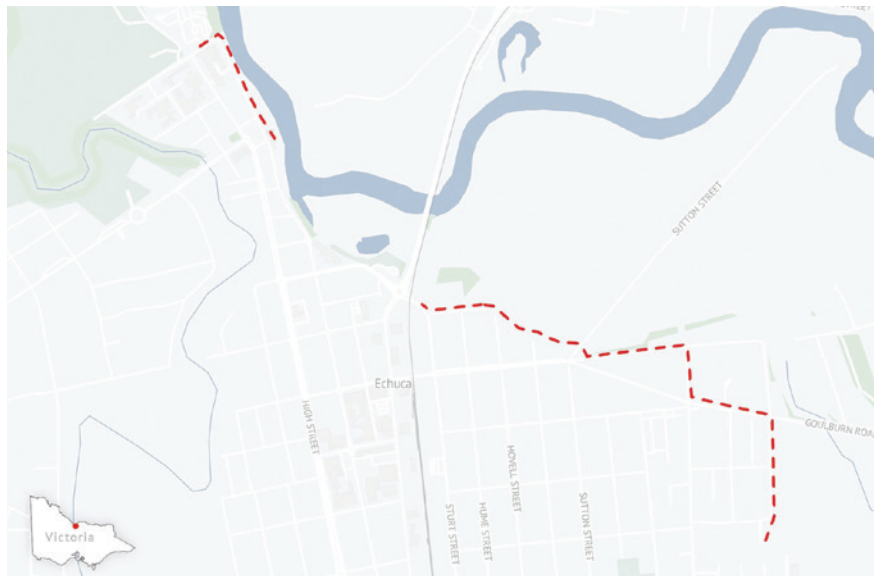
⁵² Ibid. The flood gauge at Echuca Wharf uses the Australian Height Data metric, which measures water level based on height above sea level. This accounts for the large number in comparison to other river levels, which measure depth from riverbed to water level.

⁵³ Campaspe Shire Council, *A statement from Campaspe Shire council regarding the Echuca levee*, 25 October 2022, <<https://www.campaspe.vic.gov.au/Our-council/News-media/Latest-news/Statement-Echuca-Levee>> accessed 1 June 2024.

⁵⁴ Bianca Hall and Patrick Hatch, 'Line in the sand: How a makeshift levee divided a country town', *Sydney Morning Herald*, 2 November 2022, <<https://www.smh.com.au/interactive/2022/echuca-levee/index.html>> accessed 29 March 2023.

⁵⁵ Ibid.

Figure 2.15 The location of the temporary levee in Echuca, October 2022



Source: Bianca Hall and Patrick Hatch, 'Line in the sand: How a makeshift levee divided a country town', *Sydney Morning Herald*, 2 November 2022, <<https://www.smh.com.au/interactive/2022/echuca-levee/index.html>> accessed 29 March 2023.

The levee protected the vast majority of the town from flooding. However, approximately 190 properties on the other side of the levee were inundated. It is unclear what considerations were taken regarding the location of the levee, and whether the construction of such a levee was part of flood emergency plans before the flood event in October. However, the Shire of Campaspe Flood Emergency Plan does dictate that property may be protected by construction of temporary levees, making particular reference to the potential need for a temporary levee at Echuca East. Figure 2.16 below shows a partial aerial view of the levee and flood damage in Echuca.

Figure 2.16 Partial aerial view of the levee and flood damage in Echuca from October 2022 flood event



Source: Bianca Hall and Patrick Hatch, 'Line in the sand: How a makeshift levee divided a country town', *Sydney Morning Herald*, 2 November 2022, <<https://www.smh.com.au/interactive/2022/echuca-levee/index.html>> accessed 29 March 2023.

Flood mitigation measures, including the temporary levee in Echuca, will be discussed further in the Chapter 5.

Glenn Carrington

On the weekend of 15th & 16th October 2022, all residents in Echuca and surrounds received a text message to evacuate their homes. We decided to stay along with, I would expect, a vast majority of residents. We did however begin lifting our belongings off the floor, just in case.

On 17th October 2022, the Campaspe Shire, SES and Emergency Management Victoria held a community information session at around 10am in the morning. At this information session authorities advised that the water was likely to be higher than originally anticipated and that to protect the town a levee would be built essentially cutting off around 60 or more houses. Unfortunately, we were one of those houses.

At around 2pm that same afternoon, a police officer came to us to let us know that if we didn't evacuate that day, we wouldn't be able to get back to our house because the levee was going to cut off our access. The new estimate of flood level was that we would have around one to one and a half metres of water going through our house. By the time we heard this news, it was too late to sand bag our house, and incidentally, we were advised they had run out anyway.

Our family and friends helped us remove as much of our belongings as we could, and we moved in with our daughter and son-in-law.

As it turned out, the levee was built with vehicle access and we were able to keep an eye on our property as the flood levels rose. We noticed that the SES had pumps set up along the length of the levee in various locations, and one was set up across the road from our home.

We began hearing stories of looters gaining access to properties that had been evacuated, and I decided to return home and stay to keep an eye on our home on 26th October 2022. That night at around midnight I heard pumps start up from across the other side of the levy and I went out to take a look. What I saw absolutely disgusted me. The town's sewer system had overflowed into the storm water and was flooding the streets on the "right" side of the levy. They were pumping the excess water over the levee to the "wrong" side.

Source: Glenn Carrington, *Submission 527*, pp. 1–2.

2.3.5 Water releases from Lake Eildon and Lake Eppalock

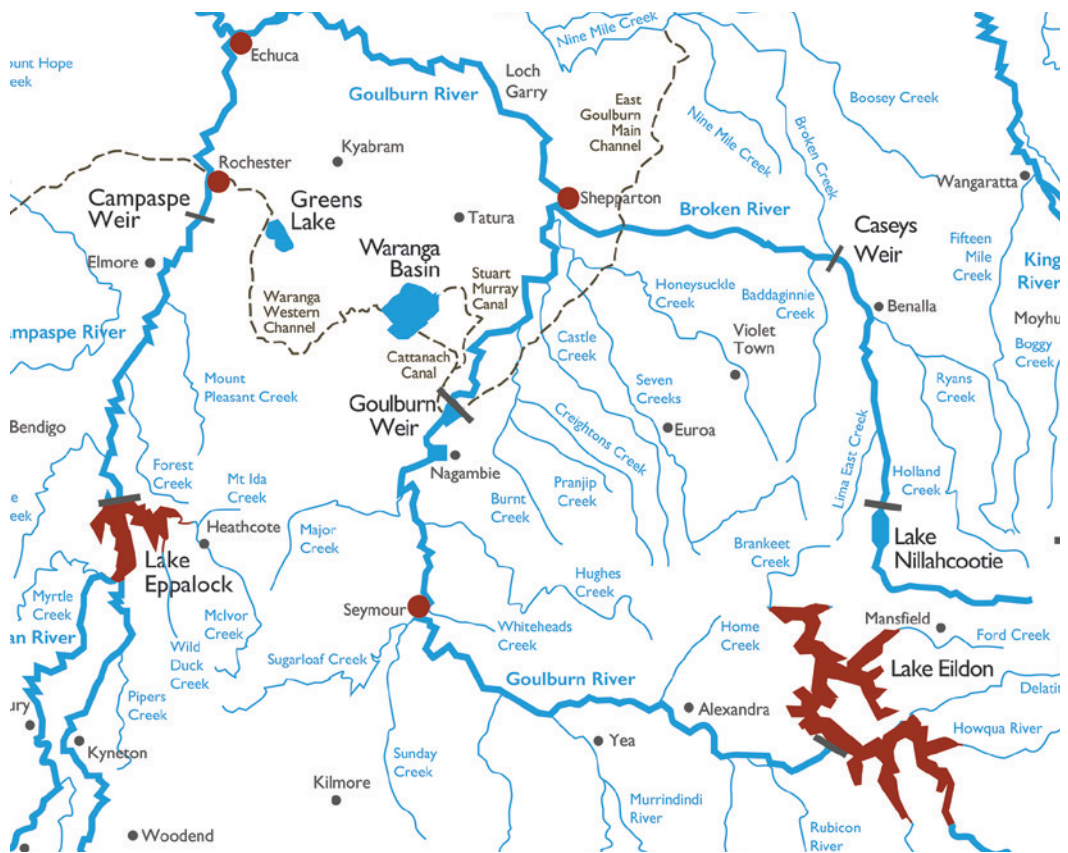
The Committee heard evidence from stakeholders expressing concerns that water releases and overflows from the Lake Eildon and Lake Eppalock dams in the days prior worsened the severity of flooding. These stakeholders contended that the flooding

in towns downstream from the dams—which included Rochester, Seymour and Shepparton—experienced worse flooding because of these releases.

This Section provides an explanation of the water releases from Eildon and Eppalock and canvasses some of the evidence from stakeholders on the impact it had on flooding.

Figure 2.17 below shows the location of the two reservoirs and the towns and cities that experienced severe flooding.

Figure 2.17 The location of Lake Eildon and Lake Eppalock and the towns and cities that experienced severe flooding



Source: Goulburn-Murray Water, *GMW Overview*, <<https://www.g-mwater.com.au/about/gmw-overview>> accessed 17 April 2023.

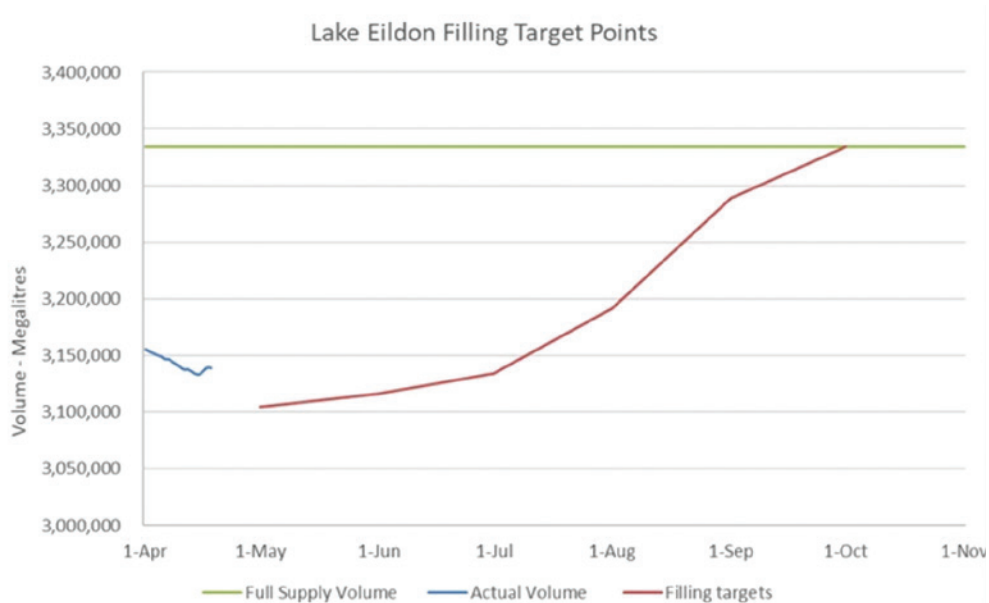
Big Eildon dam was constructed in the 1950s to provide water storage for irrigation for farmers along the Goulburn irrigation district. There is also a hydropower station at the lake. A decade later in the 1960s, the Lake Eppalock dam was created to store water for irrigation along the Campaspe and to supply water to Bendigo.⁵⁶

⁵⁶ Goulburn-Murray Water, *Lake Eildon*, <<https://www.g-mwater.com.au/water-operations/storages/goulburn/lakeeildon>> accessed 17 April 2023; Goulburn-Murray Water, *Lake Eppalock*, <<https://www.g-mwater.com.au/water-operations/storages/campaspe/lakeeppalock>> accessed 17 April 2023.

Goulburn-Murray Water is responsible for operating both reservoirs. According to the corporation, ‘the primary purpose of its dams are to store water for its customers’ water entitlements’, and ‘large dams are not designed or operated specifically for flood mitigation’.⁵⁷ The *Water Act 1989* (Vic) prescribes filling targets and sets out that a key duty for storage managers is to hold water allocated to their customers.⁵⁸

In relation to filling targets, for Lake Eildon these have been set ‘so that Lake Eildon will reach full capacity with inflows that would be expected in 95 years out of 100’.⁵⁹ Each year, Goulburn-Murray Water aims for the lake to be 100% full by 1 October, or 1 November in wetter years.⁶⁰ Figure 2.18 below shows the filling targets that were in place for 2023, and the actual volume of the lake as of April 2023. It should be noted when considering the scale of the graph that as of 20 April 2023, Lake Eildon was 94% full.⁶¹ It should also be noted that filling targets are only used between 1 May and 1 November, as storage levels historically decrease after this time.⁶²

Figure 2.18 Target volumes for Lake Eildon in 2023



Source: Goulburn-Murray Water, *Managing water levels at Lake Eildon*, <<https://www.g-mwater.com.au/news-updates/notices/managing-water-levels-at-lake-eildon.html>> accessed 21 April 2023.

57 Goulburn-Murray Water, *Managing Water Storages*, <<https://www.g-mwater.com.au/water-operations/managing-water-storages>> accessed 17 April 2023.

58 *Water Act 1989* (Vic); Goulburn-Murray Water, *Managing Water Storages*, <<https://www.g-mwater.com.au/water-operations/managing-water-storages>> accessed 17 April 2023.

59 Goulburn-Murray Water, *Managing water levels at Lake Eildon*, <<https://www.g-mwater.com.au/news-updates/notices/managing-water-levels-at-lake-eildon.html>> accessed 21 April 2023.

60 Ibid.

61 Ibid.

62 Ibid.

Goulburn-Murray Water reviews Lake Eildon's storage capacity monthly. For example, in September 2023 an environmental order was placed to target flows downstream of Goulburn Weir. Between 80,000 and 120,000 ML was expected to be released over a month to meet this order.⁶³

The water levels of Lake Eildon and Eppalock are near capacity during winter and particularly spring. Where a significant rain event occurs (such as the October 2022 event), these large managed storages with spillways must release water to avoid breaching capacity.

This is managed by organised water releases. However, the capacity for water releases is limited and these cannot be undertaken immediately. Goulburn-Murray Water's website explained that 'the amount of [flood] mitigation generally reduces as the size of the flood increases, so there may be little mitigation benefit for large floods'.⁶⁴

In the days leading to the October 2022 flood event, Goulburn-Murray Water conducted water releases for six consecutive days ranging from 9000 mg/l a day to 36,000 mg/l a day, due to forecasts of significant rainfall. At the time, Lake Eildon was already at 98.9% capacity.⁶⁵

Releasing water from dams can be a significant mitigation measure. However, as noted above, some stakeholders from flood-affected areas in Northern Victoria attributed some blame to the water releases for the magnitude of flooding their towns experienced. Water releases at Lake Eildon and Lake Eppalock is discussed further in Chapter 5.

⁶³ Ibid.

⁶⁴ Goulburn-Murray Water (GMW), *Managing Water Storages*, <<https://www.g-mwater.com.au/water-operations/managing-water-storages>> accessed 17 April 2023.

⁶⁵ Chip Le Grand, 'Climate risks for dams revealed as Eildon struggles to hold back floods', *The Age*, 15 November 2022, <<https://www.theage.com.au/politics/victoria/climate-risk-for-dams-revealed-as-eildon-struggles-to-hold-back-floods-20221110-p5bx9p.html>> accessed 21 April 2023.

Maree Traill

We are familiar with floods in Rochester, I was around for the 2011 floods and a few before that. After the 2011 floods, another lady started the Rochester Community Page Facebook page and invited me to help admin it. So we are well and truly familiar with how to get information out to the community and fast....

We all know how it goes, Eppalock started spilling late September, then in the week starting the 10th of October, we got unprecedented rains. I remember laying in bed, I think on Wednesday the 12th it was, thinking oh my god is it ever going to stop. We had town meetings, with the usual emergency services present, SES, Vic Pol, Fire brigade, NCCMA, Campaspe shire, ERV and more people I've probably forgotten. Herein comes my first complaint – Goulburn Murray Water, the management body of the lake? Were not present during any of these meetings.

NONE of the media were present to live stream these meetings to those in the community who couldn't attend – I DID. Me, a volunteer community member with a husband and 3 boys, 10, 11 and 13. I just wanted the community to know what was going on.

I'm going to assume that GMW were releasing water from the lake in the lead up to these unprecedented rains, but the fact that releases are restricted by the size of the valve at the lake to 1800 megalitres a day – a pitiful amount. Who builds a bath and puts a pinhole sized plug in the bottom??

The rain came, the lake spewed its hateful water at us. How much exactly? No idea.... because yet again GMW were silent. They would have surely had an idea of inflows into the lack from the catchment? After the flood event they released a report saying that 235000 megalitres of water flowed into the lake in the unprecedented rain – that's more than 2 thirds of the entire capacity of the lake that flowed in!! I get that we can't control rainfall but that lake should be able to control releases via mitigation gates!! There's no way out for huge volumes of water except over the top

Source: Maree Traill, *Submission 10*, p. 1.

2.3.6 Losses to agriculture

The floods of October 2022 also caused damage to smaller settlements and large swathes of agricultural land. The impact in these areas was immense. Homes were destroyed, infrastructure and assets were damaged, livestock and harvests were lost.⁶⁶ This flooding included the Loddon and Avoca rivers.

Table 2.1 below, provided by Agriculture Victoria, is an overview of the losses sustained by farmers and Victorians in regional areas.

⁶⁶ Agriculture Victoria, *Flood and Storm Impacts in late 2022*, <<https://agriculture.vic.gov.au/farm-management/emergency-management/floods/flood-and-storm-impacts-late-2022>> accessed 31 March 2023.

Table 2.1 Agricultural impacts of the October 2022 floods

Impact measured	Number as at 9 December 2022
Livestock deaths	15,662
Livestock missing	1,937
Fencing damaged (kilometres)	12,000
Hay or silage destroyed (tonnes)	153,850
Stored grain lost (tonnes)	5,120
Pasture lost (hectares)	168,703
Field crops lost (hectares)	218,640
Total farm area affected (hectares)	498,629
Perished beehives	1,164
Beehives requiring feeding	2,074
Honey flow losses—actual (tonnes)	208

Source: Agriculture Victoria, *Flood and storm impacts in late 2022*, <<https://agriculture.vic.gov.au/farm-management/emergency-management/floods/flood-and-storm-impacts-late-2022>> accessed 31 March 2023.

2.3.7 Maribyrnong

In Melbourne, the Maribyrnong River began to flood on the evening of 13 October 2022. There was 10 mm of rain on 13 October and 22.8 mm on 14 October.⁶⁷ By 6 am on 14 October, the flood waters were peaking at the monitoring station in Keilor, a few kilometres north-east of the most affected areas in Maribyrnong and Moonee Ponds.⁶⁸

The catchment area for the Maribyrnong River, like other parts of the state, experienced heavy rainfall in the lead up to the flooding event. A factsheet by Melbourne Water notes that the catchment is wide in the upstream area stretching from Gisborne in the west, to Lancefield and then Wallan in the east. The Maribyrnong and its tributaries funnel into a narrow shape as they reach metropolitan Melbourne. This means that longer rainfall events, such as those in the days preceding the flood, have higher peak flows in the downstream parts of the Maribyrnong in the metropolitan area.⁶⁹

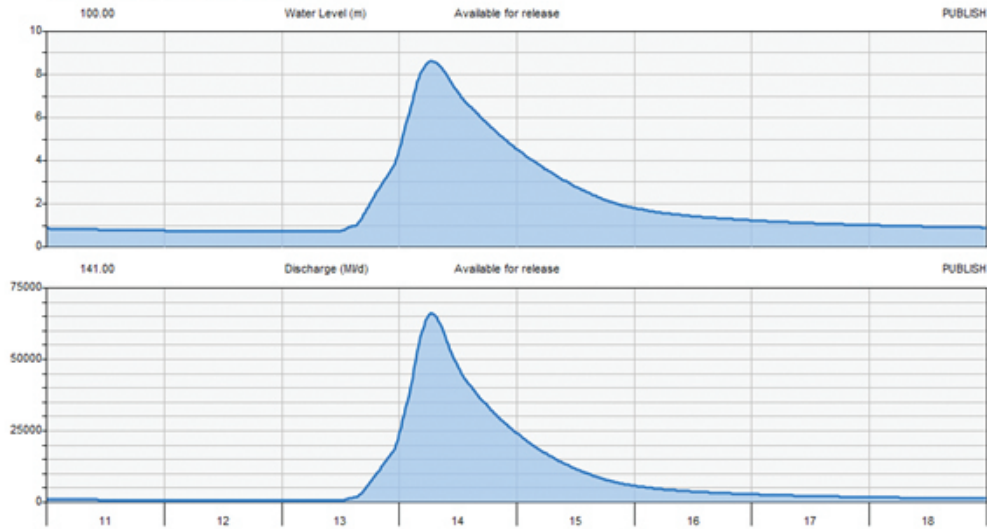
Figure 2.19 below shows the height of the Maribyrnong at Keilor and the amount of water discharged through the Maribyrnong for the week beginning 11 October 2022. The data indicates that the river peaked quickly, escalating from midday on 13 October to peak on the morning of 14 October, before dissipating almost as quickly to be close to its previous height by 16 October.

⁶⁷ Bureau of Meteorology, *Daily Rainfall, Gisborne (Rosslynne Reservoir)*, 2022, <http://www.bom.gov.au/jsp/ncc/cdio/weatherData/av?p_nccObsCode=136&p_display_type=dailyDataFile&p_startYear=2022&p_c=-1520146637&p_stn_num=087182> accessed 15 March 2023.

⁶⁸ Department of Environment, Land, Water and Planning, *Water Measurement Information System*, <<https://data.water.vic.gov.au>> accessed 15 March 2023.

⁶⁹ Melbourne Water, *Fact Sheet: Maribyrnong River Flood Event: What we know so far*, 2023, <https://hdp-au-prod-app-mw-yoursay-files.s3.ap-southeast-2.amazonaws.com/5716/7384/1817/Fact_Sheet_What_we_know_so_far_Maribyrnong_Flood.pdf> accessed 1 June 2024, p. 1.

Figure 2.19 Maribyrnong River at Keilor water height (m) and discharge (ML/d) between 11 and 18 October 2022



Source: Department of Environment, Land, Water and Planning, *Water Measurement Information System*, <<https://data.water.vic.gov.au>> accessed 30 March 2023.

The Victorian Government submission to this Inquiry notes that that flooding in Maribyrnong reached a peak of 4.216 m. The Government said that Maribyrnong has a ‘history of significant flood events’, with several serious flooding incidents occurring from 1906 to 1993.⁷⁰ According to information from Melbourne Water, the October 2022 flood event was the area’s third worst following floods in 1906 which reached 4.5 m and in 1916 which reached 4.26 m.⁷¹ The October 2022 flood was higher than the floods of 1974, which caused widespread property damage and flooded the Flemington Racecourse.⁷²

The Maribyrnong City Council noted that, as a consequence of the October 2022 flooding, 525 properties were impacted, including homes, businesses and community organisations.⁷³

The City of Melbourne, which includes sections of the lower reaches of the Maribyrnong River within its municipal boundaries, explained that:

- three businesses were severely affected
- five businesses had light-to-medium impact
- the basement of one residential block flooded:
 - 80 vehicles were damaged
 - residents’ personal belongings in basement storage cages were damaged.⁷⁴

⁷⁰ Victorian Government, *Submission 295*, p. 80.

⁷¹ Melbourne Water, *Fact Sheet: Maribyrnong River Flood Event: What we know so far*, p. 3.

⁷² *Ibid.*, pp. 2–3.

⁷³ Maribyrnong City Council, *Submission 530*, p. 3.

⁷⁴ City of Melbourne, *Submission 296*, pp. 5–6.

The Committee notes that there are contrasting figures about the number of properties damaged in Maribyrnong, with *The Age* reporting that 606 properties were affected.⁷⁵

The most heavily impacted area in terms of property damage was in the north of the Maribyrnong City Council boundary, in a low-lying area bisected by Raleigh Road. This area was previously flooded in 1974. Figure 2.20 was provided in a submission to the Inquiry. It shows the extent of the flooding in that area.

Figure 2.20 The extent of the flooding in an area of Maribyrnong on 14 October 2022



Source: Lee Lanzafame, *Submission 19*, p. 21.

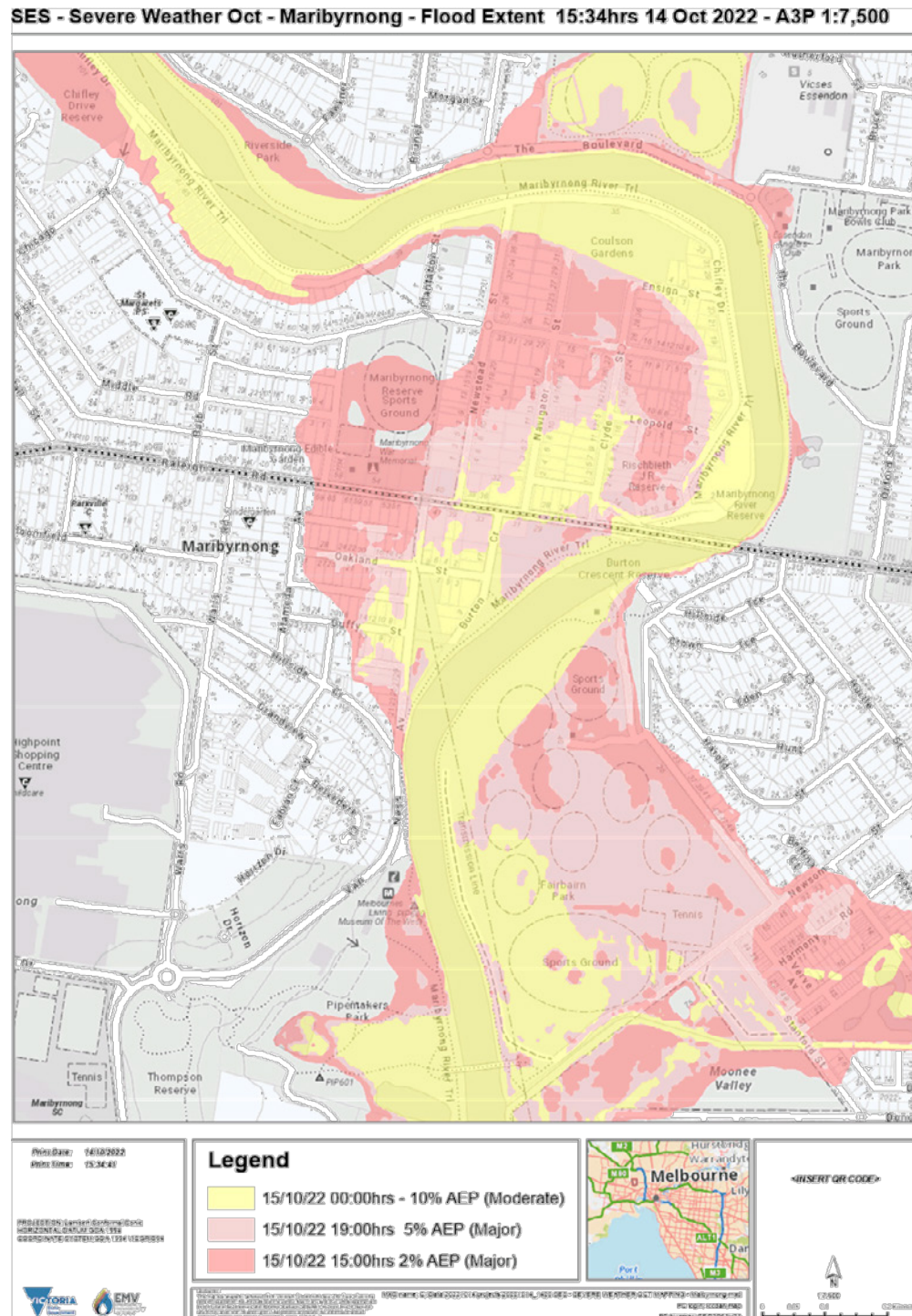
Moonee Valley City Council was another local government area significantly affected by flooding along the Maribyrnong in 2022. Parts of the municipality sit on the opposite bank of the river to Maribyrnong City Council's municipality. The submission by Moonee Valley City Council to Melbourne Water's Maribyrnong River Flood Review states that 180 residents were impacted by the flooding, the majority of which were over 65 and vulnerable. The flooding affected parts of Ascot Vale close to the river, and a retirement home called Rivervue, in Avondale heights.⁷⁶ In addition, parts of Kensington and West Melbourne in the City of Melbourne also experienced flooding.

Figure 2.21 below shows the extent of the flooding in the Maribyrnong City Council area on 14 October 2022.

⁷⁵ Clay Lucas and Sophie Aubrey, 'Flood alert system failed, leaving Maribyrnong residents to flee rising water', *The Age*, 6 February 2023, <<https://www.theage.com.au/politics/victoria/flood-alert-system-failed-leaving-maribyrnong-residents-to-flee-rising-water-20230203-p5chsd.html>> accessed 16 March 2023.

⁷⁶ Moonee Valley City Council, submission to Melbourne Water's *Maribyrnong River Flood Review*, pp. 7–12.

Figure 2.21 The extent of the flooding along the Maribyrnong River in Melbourne on 14 October 2022



2

Source: City Development Delegated Committee (City of Maribyrnong), *Agenda Item 6.2*, 28 March 2023, p. 89.

According to Victorian Government figures, between 13 and 14 October there were 70 requests for assistance due to the Maribyrnong flooding.⁷⁷

⁷⁷ Victorian Government, *Submission 295*, p. 83.

Paul Williamson

As I lay on my couch after dinner on that Thursday night, I received many texts from friends, local and overseas, hoping our situation was ok and wishing us the best. I assured them that I had been constantly checking in on the Bureau of Meteorology, Flood Watch for Maribyrnong river and was comfortable that the projected flood levels of 2.4m for the area not of concern for our house as our land is at a level of 2.9m. I was aware that lower lying properties on the other side of Maribyrnong road had been door knocked by the SES.

I went to bed that night relaxed in the knowledge that tomorrow there may be some water in our street, it was not going to be the big one I have been waiting 27 years for. That all changed at 4.30 am on Friday Oct 14th, when the evacuation text arrived on my phone. I went straight down to the river and talked to neighbours and police who were door knocking. We moved our cars to higher ground at the other end of Duffy st. My partner stayed with her car on the high ground of Duffy st, as I watched the water steadily rise. I was at first concentrating on watching the front yard and watched the water slowly rise to the level of our front deck as other properties were inundated. I had raised the floor level prior to undertaking a renovation in 2012. From the front deck I heard gurgling of water rising through the toilet, bath, shower and sink ... it was then I noticed the back yard was totally inundated with our back shed with a metre of water through it and the outdoor fridge and my prized electric smoker floating. The water came through the front door as I scrambled to get my musical instruments and computers to the 2nd story.

I grabbed photos, documents, clothing and put them on beds with my partners words ringing in my ears that all her memorabilia should be moved upstairs, just in case ... I assured her that we would be fine, given the flood level information available from BOM, the lack of urgency from emergency services. We were aware that lower lying areas of the township had been door knocked and alerted to possible inundation. Eventually waist high water was throughout the downstairs area of the house and almost above my head in the back yard. After saving as much as possible I stayed in the house that night and watched as the water receded leaving the full extended of the catastrophe.

Source: Paul Williamson, *Submission 17*, pp. 3-4.

Antoinette Bufalino

As I have lived in the area for many decades, I am aware of how it occurs, have experienced the 1974 flood.

At 04:30 I was alarmed because the water had come through the storm water drains so therefore, I was horrified at the thoughts that I had in my head the day before had come true.

I immediately got dressed harnessed my dog and went around to Ensign St. At the apartments where I have a few friends to alarm them because I knew the water comes through Coulson Park first before it actually comes to Chifley drive so I knew they would be in undated with water already.

As I approached the tenants were already up and discussing what we should do next as we were not notified by the SES nor the council nor Melbourne water nor nobody.

We were left to our own devices to engage into some sort of emergency procedure and rescue some of our neighbours which in fact Mary which lived in inside St. Had to be rescued by us.

I remember that morning we were just all in action, it was all adrenaline, we were anxious, frightened uncertainty of what we should do and the velocity of that water coming in was horrifying.

Source: Antoinette Bufalino, *Submission 734*, p. 1

The Committee received many submissions which included firsthand accounts of the flood event by residents of Maribyrnong. Readers can find these on the Committee's webpages.

Chapter 3

Victoria's flood governance arrangements

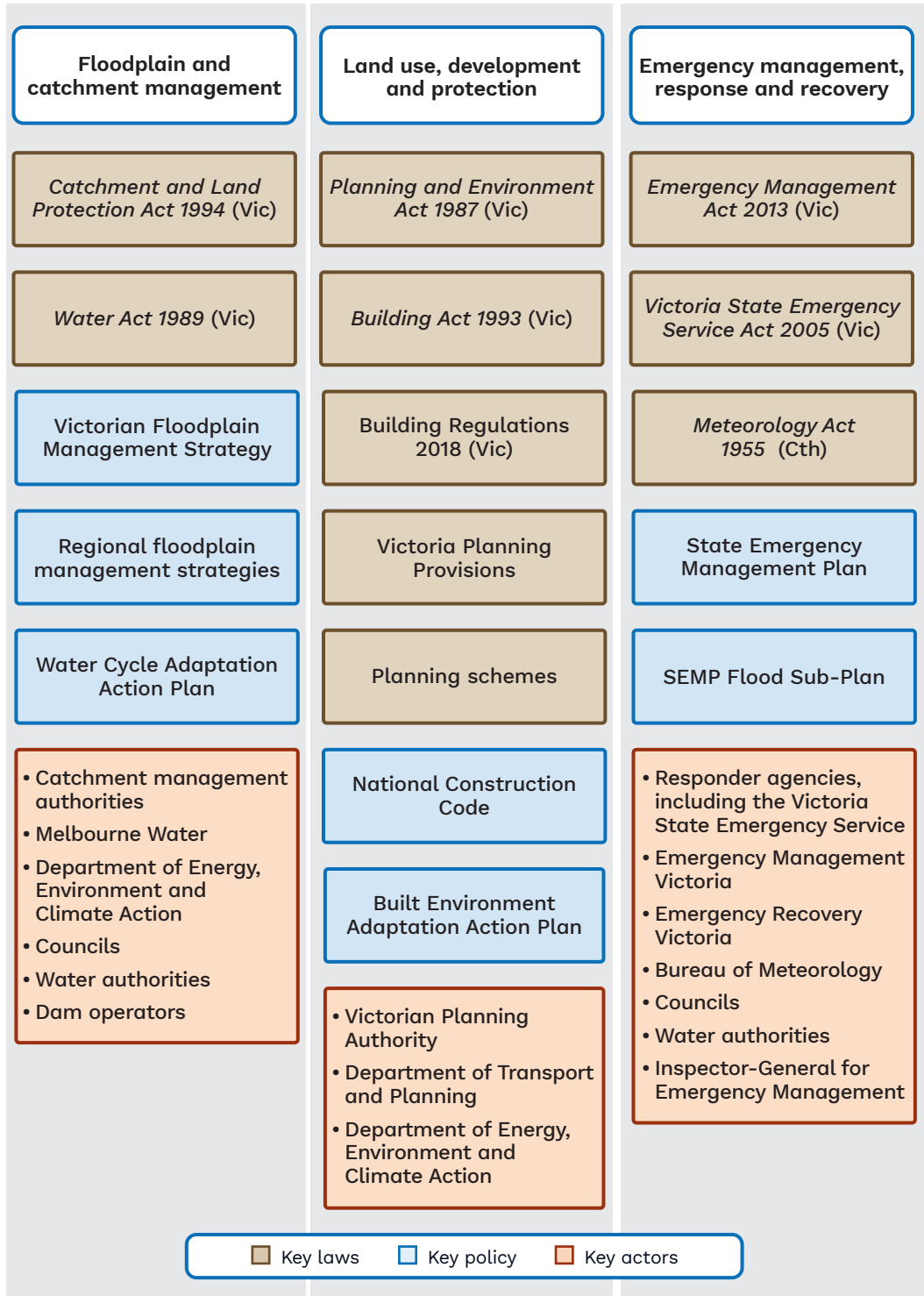
3.1 Introduction

Victoria's flood governance arrangements are complex, spanning numerous legislative instruments and policy documents, and involving a range of government and non-government actors. This Chapter highlights key legislation and government policies relevant to flood management. With reference to the Victorian Floodplain Management Strategy and State Emergency Management Plan, it attempts to summarise the main roles and responsibilities of those involved in flood management.

3.2 Overview of governance structure

The following figure provides an overview of Victoria's flood governance arrangements. It is divided into three categories—floodplain and catchment management; land use, development, and protection; and emergency management, response and recovery. It highlights the key policy, legislation and actors relating to each of these categories.

Figure 3.1 Overview of Victoria's flood governance arrangements

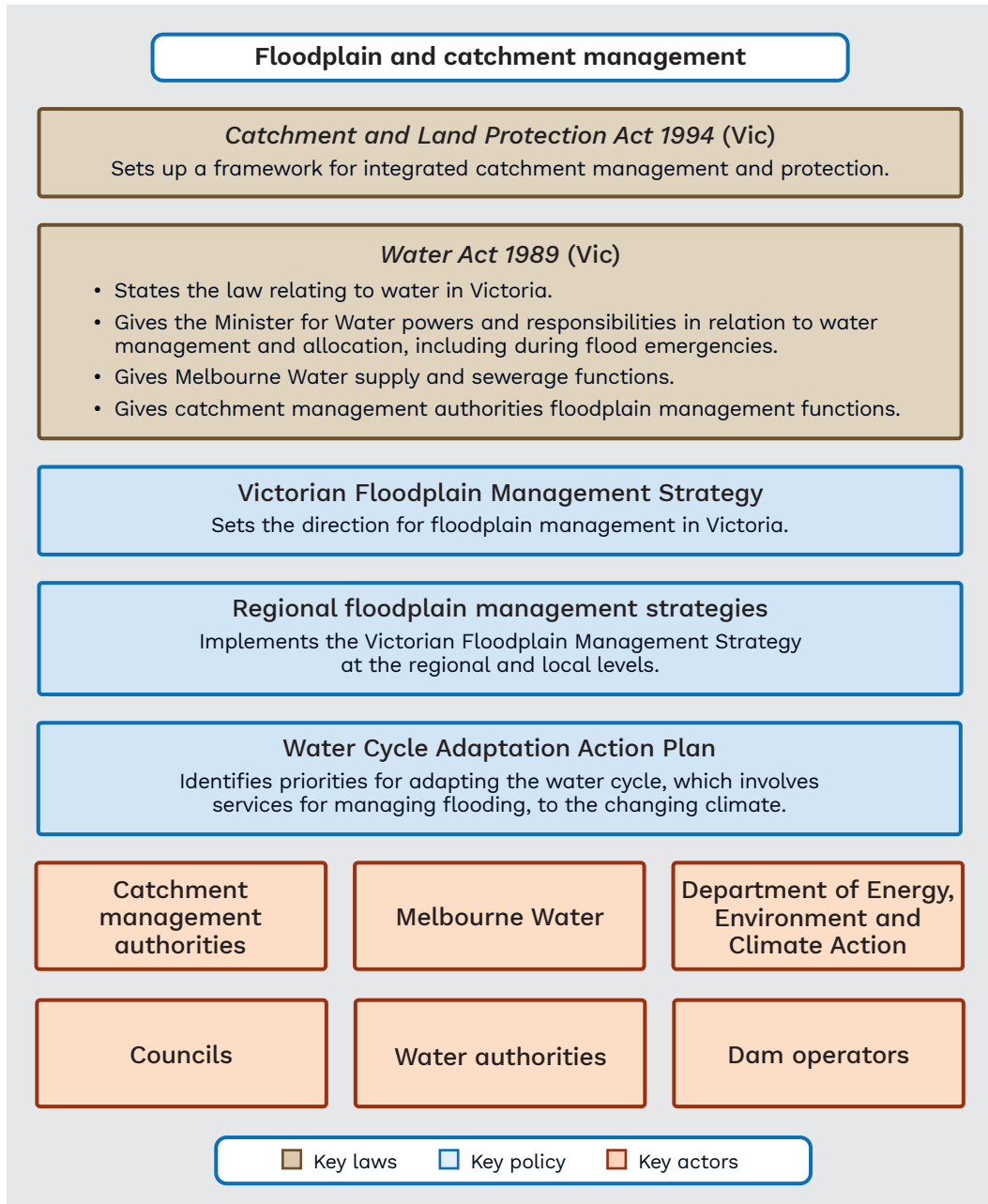


Source: Legislative Council Environment and Planning Committee.

3.3 Legislation relevant to floodplain management

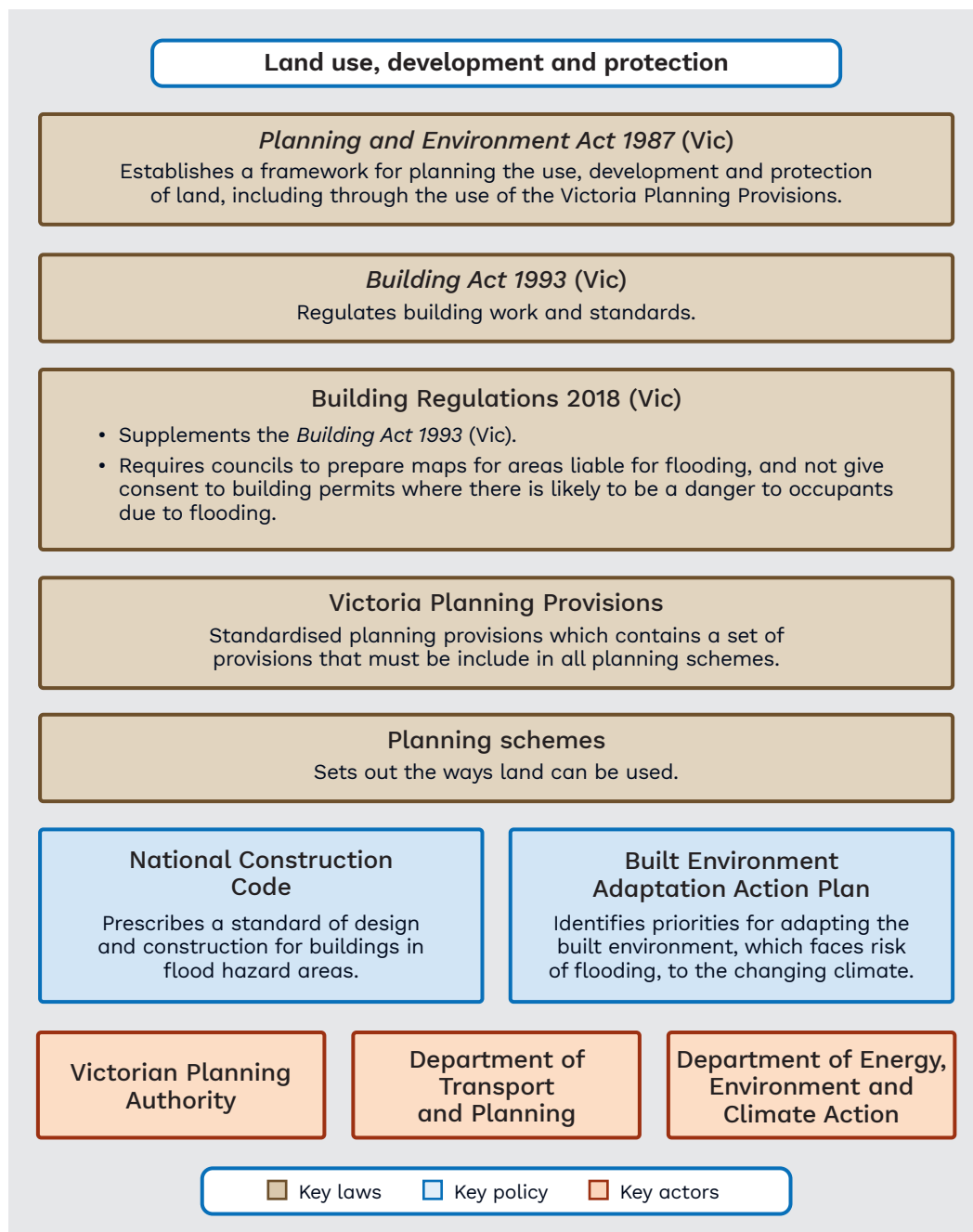
The legislation in this Section is relevant to floodplain and catchment management in Victoria. Figures 3.2 and 3.3 below provide a high-level overview of this legislation as well as key policy and actors.

Figure 3.2 Overview of floodplain and catchment management arrangements



Source: Legislative Council Environment and Planning Committee.

Figure 3.3 Overview of land use, development and protection arrangements



Source: Legislative Council Environment and Planning Committee.

3.3.1 Catchment and Land Protection Act 1994 (Vic)

The *Catchment and Land Protection Act 1994 (Vic)* sets up a framework for the integrated management and protection of catchments.¹ The Act enables the Governor

¹ *Catchment and Land Protection Act 1994 (Vic)* s 1.

in Council, on the recommendation of the Minister for Water, to determine catchment and land protection regions.² At present, Victoria has ten such regions, each of which is managed by a catchment management authority.

Figure 3.4 Map of catchment and land protection regions



Source: Vic Catchments, Home <<https://viccatchments.com.au>> accessed 2 February 2024.

Catchment management authorities' functions include preparing regional catchment strategies and advising the Minister for Water on regional priorities.³ Catchment management authorities also have functions under the *Water Act 1989* (Vic), including floodplain management.⁴

Since 2022, Melbourne Water has acted as catchment management authority for the Port Phillip and Western Port Region.⁵ Other catchment management authorities whose regions experienced significant flooding in the 2022 flood event include:

- Corangamite Catchment Management Authority
- Mallee Catchment Management Authority
- North Central Catchment Management Authority
- Goulburn Broken Catchment Management Authority
- North East Catchment Management Authority.

² *Catchment and Land Protection Act 1994* (Vic) s 10.

³ *Catchment and Land Protection Act 1994* (Vic) s 12.

⁴ *Water Act 1989* (Vic) pt 10 div 4.

⁵ *Catchment and Land Protection Act 1994* (Vic) s 11A.

3.3.2 Water Act 1989 (Vic)

The *Water Act 1989* (Vic) establishes the legal framework for the allocation and management of water resources, including the use of water for irrigation, domestic use, and other purposes.⁶ It also sets out the powers and responsibilities of the Minister for Water in relation to water management and allocation, including during flood emergencies.⁷

Under the Act, Melbourne Water has water supply and sewerage functions.⁸ Likewise, catchment management authorities have functions relating to designated waterways, such as preparing regional waterway strategies,⁹ and in relation to floodplain management.¹⁰ These include:

- finding out how far and high flood waters are likely to be
- declaring flood levels and building lines
- controlling developments
- minimising flooding and flood damage
- providing advice to government and the community.¹¹

3.3.3 Local government legislation

The *Local Government Act 2020* (Vic) seeks to give effect to the *Constitution Act 1975* (Vic), which provides that councils are a distinct and essential tier of government with functions and powers considered necessary by the Parliament.¹²

Alongside the 2020 Act, the *Local Government Act 1989* (Vic) seeks to ensure councils have the functions and powers necessary to perform their role.¹³

The two Acts are the main pieces of legislation guiding Victoria's councils, prescribing their constitution, management, and operations, among other things. Under the 1989 Act, councils are responsible for public sewers and drains.¹⁴ Councils are also designated planning authorities under the *Planning and Environment Act 1987* (Vic).¹⁵

⁶ *Water Act 1989* (Vic) s 1.

⁷ *Water Act 1989* (Vic) pt 3 div 1.

⁸ *Water Act 1989* (Vic) s 22.

⁹ *Water Act 1989* (Vic) pt 10.

¹⁰ *Water Act 1989* (Vic) pt 10 div 4.

¹¹ *Water Act 1989* (Vic) s 202.

¹² *Local Government Act 2020* (Vic) s 1.

¹³ *Local Government 2020* (Vic) s 4.

¹⁴ *Local Government Act 1989* (Vic) s 198.

¹⁵ *Planning and Environment Act 1987* (Vic) ss 8A and 8AA.

3.3.4 Planning and Environment Act 1987 (Vic)

The *Planning and Environment Act 1987* (Vic) establishes a framework for planning the use, development and protection of land in Victoria.¹⁶ The Act enables the Minister for Planning to create the Victoria Planning Provisions,¹⁷ and enables planning authorities—including the Minister and councils—to prepare and amend planning schemes.¹⁸ These schemes must seek to further the objectives of planning in Victoria, which are outlined in the Act, and may make any provision relevant to the use, development, protection or conservation of land.¹⁹

In preparing a planning scheme or amendment, planning authorities must have regard to the Victoria Planning Provisions, which contains a set of provisions that must be included in all planning schemes.²⁰ Through the Victoria Planning Provisions and planning schemes, the Victorian Government implements floodplain strategies, policies and guidelines, including the Victorian Floodplain Management Strategy, discussed in Section 3.5.²¹

3.3.5 Building legislation

The *Building Act 1993* (Vic) regulates:

- building work and standards
- plumbing work and standards
- building practitioners, employees and plumbers.²²

The Act also provides for accreditation, building and safety matters, building disputes, and building and occupancy permits, which are required for a range of building works including levees.²³

The Act is supplemented by the *Building Regulations 2018* (Vic). The Regulations require councils to prepare maps for all areas prone to flooding.²⁴ They also require a building permit applicant in an area prone to flooding to receive consent from the relevant council for the permit.²⁵ A council must not give its consent to a building permit if the council believes there is likely to be danger to the life, health or safety of building occupants due to flooding.²⁶

¹⁶ *Planning and Environment Act 1987* (Vic) s 1.

¹⁷ *Planning and Environment Act 1987* (Vic) s 4A.

¹⁸ *Planning and Environment Act 1987* (Vic) s 8.

¹⁹ *Planning and Environment Act 1987* (Vic) s 6(1).

²⁰ *Planning and Environment Act 1987* (Vic) s 12(2)(aa).

²¹ Victorian Government, *Submission 295*, pp. 92–93.

²² *Building Act 1993* (Vic) s 1.

²³ *Building Act 1993* (Vic) s 1.

²⁴ *Building Regulations 2018* (Vic) s 148.

²⁵ *Building Regulations 2018* (Vic) s 153(2).

²⁶ *Building Regulations 2018* (Vic) s 153(4).

The Act and Regulations exist alongside the National Construction Code. The Code prescribes a standard design and construction for buildings in flood hazard areas. For example, it requires buildings in flood hazard areas to be designed and constructed to resist floatation, collapse or significant permanent movement during flood events.²⁷ Such buildings must also comply with the Standard for Construction of Buildings in Flood Hazard Areas,²⁸ which aims to reduce the risk of death or injury of building occupants during flood events.²⁹

3.3.6 Climate Change Act 2017 (Vic)

The *Climate Change Act 2017* (Vic) establishes a framework for climate action in Victoria. One of the purposes of the Act is to provide for a strategic response to climate change through a climate change strategy, adaptation action plans and emissions reduction pledges.³⁰ For example, the Act establishes a long-term emissions reduction target of net-zero by 2050.³¹

Under the Act, an adaptation action plan must be prepared in respect of the water cycle system, which includes flood management services, and the built environment system.³² The Water Cycle Climate Change Adaptation Action Plan 2022–2026 considers flood mitigation assets, the mapping of flood risk, and the impact of flood to the water cycle system.³³ The Built Environment Climate Change Adaptation Act Plan 2022–2026 likewise considers the impact of natural hazards like flooding on the built environment.³⁴

3.4 Legislation relevant to flood response

The legislation outlined in this Section is relevant to flood response in Victoria.

Figure 3.5 below provides a high-level overview of this legislation as well as key policy and actors.

²⁷ Commonwealth of Australia and States and Territories of Australia, *National Construction Code Volume One – Building Code of Australia*, Australian Building Codes Board, 2019, p. 88.

²⁸ *Ibid.*, p. 95.

²⁹ Commonwealth of Australia and States and Territories of Australia, *Construction of buildings in flood hazard areas – ABCB Standard 2012.3*, Australian Building Codes Board, 2019, p. ii.

³⁰ *Climate Change Act 2017* (Vic) s 1(e).

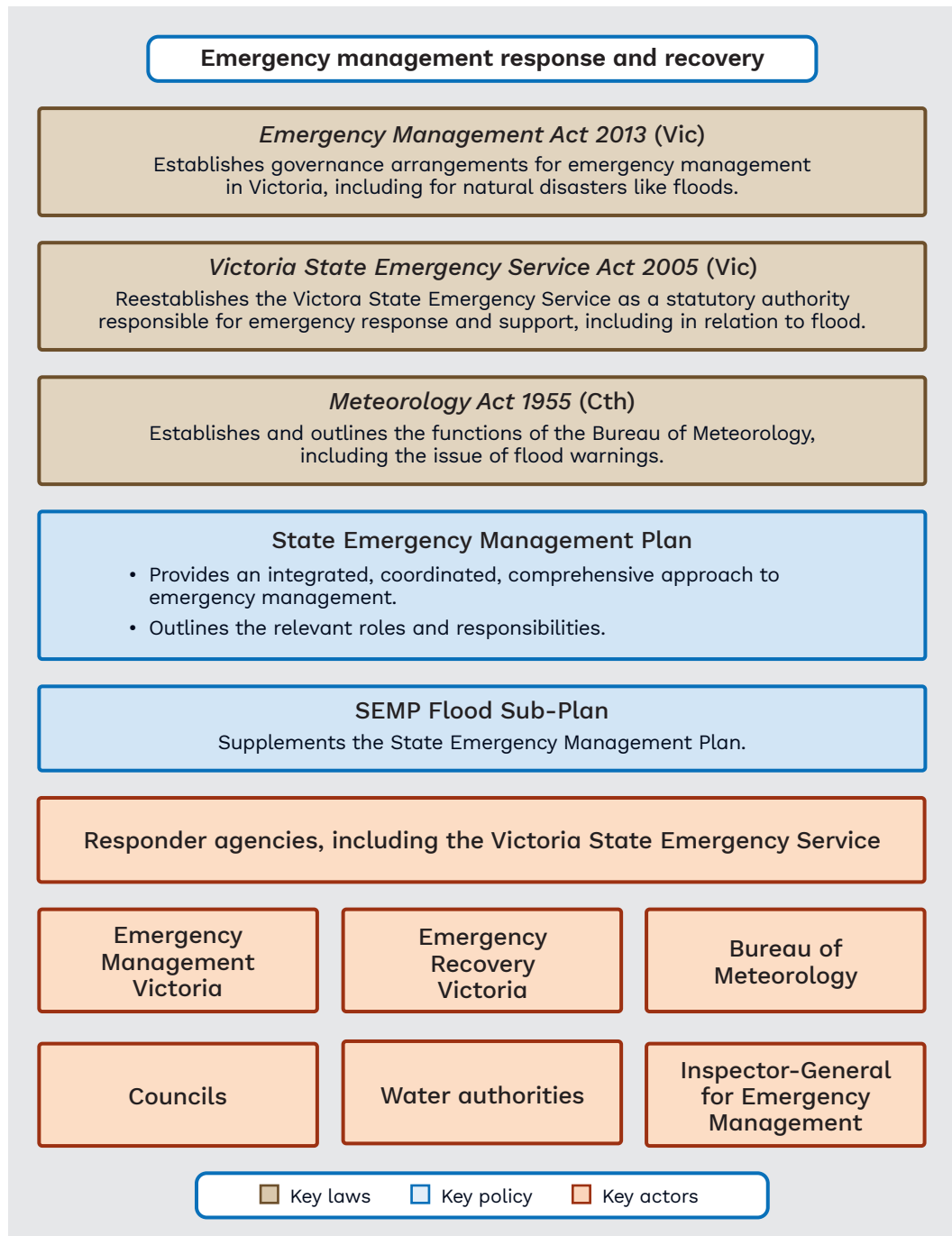
³¹ *Climate Change Act 2017* (Vic) pt 2 div 1.

³² *Climate Change Act 2017* (Vic) s 34(4).

³³ Department of Environment, Land, Water and Planning, *Water Cycle Climate Change Adaptation Action Plan 2022–2026*, 2022, p. 10.

³⁴ Department of Environment, Land, Water and Planning, *Built Environment Climate Change Adaptation Action Plan*, 2022, p. 42.

Figure 3.5 Overview of flood-related response and recovery arrangements



Source: Legislative Council Environment and Planning Committee.

3.4.1 Emergency management legislation

The *Emergency Management Act 2013* (Vic) establishes governance arrangements for emergency management in Victoria.³⁵ It defines emergency to include 'earthquake, flood, wind-storm or other natural event',³⁶ and is intended to be read alongside the *Emergency Management Act 1986* (Vic).³⁷

The 2013 Act establishes Emergency Management Victoria,³⁸ which consists of two members—a Chief Executive and an Emergency Management Commissioner.³⁹ Each of these roles has significant functions.

Emergency Management Victoria is responsible for coordinating whole of government policy for emergency management in Victoria.⁴⁰ The Chief Executive provides advice and makes recommendations to the Minister for Emergency Services relating to the functions of Emergency Management Victoria and takes a lead role in coordinating investment planning and large-scale strategic projects on behalf of responder agencies.⁴¹ Likewise, the Emergency Management Commissioner is responsible for:

- coordinating emergency response agencies
- managing the State Control Centre
- preparing and reviewing the State Emergency Management Plan.⁴²

The 1986 Act provides for the organisation of emergency management in Victoria.⁴³ Although the 2013 Act repealed a significant portion of the 1986 Act, several important provisions remain. For example, it requires the Minister for Emergency Services to ensure that satisfactory emergency management arrangements are in place to facilitate mitigation, response to and recovery from emergencies.⁴⁴ Moreover, it clarifies that the Minister is not responsible for operational matters in relation to emergency management.⁴⁵ The 1986 Act also enables the Premier to declare a state of disaster,⁴⁶ facilitates the compensation of registered emergency workers,⁴⁷ and enables certain police officers to declare an emergency area.⁴⁸

³⁵ *Emergency Management Act 2013* (Vic) ss 3 and 5.

³⁶ *Emergency Management Act 2013* (Vic) s 3.

³⁷ *Emergency Management Act 2013* (Vic) s 4(1).

³⁸ *Emergency Management Act 2013* (Vic) s 14.

³⁹ *Emergency Management Act 2013* (Vic) s 16.

⁴⁰ *Emergency Management Act 2013* (Vic) s 17(2)(a).

⁴¹ *Emergency Management Act 2013* (Vic) s 21.

⁴² *Emergency Management Act 2013* (Vic) s 32(1).

⁴³ *Emergency Management Act 1986* (Vic) s 1.

⁴⁴ *Emergency Management Act 1986* (Vic) s 5(1).

⁴⁵ *Emergency Management Act 1986* (Vic) s 5(2); operational decisions sit with key emergency management officials, including the Emergency Management Commissioner and the Chief Officer Operations of the Victoria State Emergency Service.

⁴⁶ *Emergency Management Act 1986* (Vic) s 23.

⁴⁷ *Emergency Management Act 1986* (Vic) pt 6.

⁴⁸ *Emergency Management Act 1986* (Vic) ss 36A and 36B.

As well as Emergency Management Victoria, the 2013 Act establishes the State Crisis and Resilience Council⁴⁹ and the Inspector-General for Emergency Management.⁵⁰

State Crisis and Resilience Council

The State Crisis and Resilience Council is the peak crisis and emergency management advisory body in Victoria. It comprises:

- Department Heads
- the Chief Commissioner of Police
- the Chief Executive of Emergency Management Victoria
- the Emergency Management Commissioner
- the Inspector-General for Emergency Management, as an observer
- the Chief Executive Officer of the Municipal Association of Victoria, representing local government.⁵¹

Its functions include advising the Minister for Emergency Services and considering and approving the State Emergency Management Plan.⁵²

Inspector-General for Emergency Management

The Inspector-General for Emergency Management's objectives are to provide assurance to the Government and community in respect of emergency management arrangements, and to foster continuous improvement in emergency management. Some of the ways the Inspector-General achieves this is by:

- developing the Assurance Framework for Emergency Management
- undertaking system-wide reviews
- evaluating state-wide training and exercising arrangements.⁵³

In his evidence to the Committee, Inspector-General Tony Pearce explained that, whereas the 2013 Act enables him to undertake system-wide reviews, a review into the 2022 flood event would have required a referral from the Victorian Government:

[M]y capacity to inquire into these types of events is dependent, because of the way the legislation is written, on being actually requested to do that, so I cannot actually conduct an inquiry or a review into an event such as this of my own volition.⁵⁴

⁴⁹ *Emergency Management Act 2013* (Vic) pt 2.

⁵⁰ *Emergency Management Act 2013* (Vic) pt 7.

⁵¹ *Emergency Management Act 2013* (Vic) s 8.

⁵² *Emergency Management Act 2013* (Vic) s 7.

⁵³ *Emergency Management Act 2013* (Vic) s 64(1).

⁵⁴ Tony Pearce, Inspector-General for Emergency Management, public hearing, Melbourne, 25 October 2023, *Transcript of evidence*, p. 31.

Later Chapters highlight the importance of post-flood reviews, as well as the potential need for the Inspector-General to conduct own-motion reviews into particular events.

FINDING 4: The Victorian Government did not initiate a review of the 2022 flood by the Inspector-General for Emergency Management.

RECOMMENDATION 1: That, following a significant natural disaster such as the 2022 flood, the Inspector-General for Emergency Management conduct a review at an appropriate time to provide feedback for continuous improvement.

RECOMMENDATION 2: That the Victorian Government confirm the powers of the Inspector-General for Emergency Management to undertake reviews on a self-referral basis or, if such powers do not exist, to legislate to provide these powers.

3.4.2 Victoria State Emergency Service Act 2005 (Vic)

The *Victoria State Emergency Service Act 2005* (Vic) re-establishes the Victoria State Emergency Service (SES) as a statutory authority.⁵⁵ Under the Act, the Victoria SES is accountable to the Minister for Emergency Services.⁵⁶ It is responsible for emergency response, including flood response, and emergency support, including assisting agencies to perform their duties under the 2013 Emergency Management Act.⁵⁷

The Act sets out the powers and responsibilities of the Victoria SES, including the power to enter land in emergency situations and construct, remove or alter levees, as well as remove debris.⁵⁸ In exercising its functions and powers, the Victoria SES must collaborate and consult with Emergency Management Victoria.⁵⁹

3.4.3 Fire rescue legislation

The *Country Fire Authority Act 1958* (Vic) establishes the Country Fire Authority.⁶⁰ The Authority is responsible for the prevention and suppression of fires in country Victoria, as well as for the protection of life and property in the case of fire and the general control of fire stations and brigades.⁶¹ While the Act does not specifically address flooding, the Authority has a duty to assist in the response to any major emergency in Victoria.⁶²

⁵⁵ *Victoria State Emergency Service Act 2005* (Vic) ss 4(1) and 28.

⁵⁶ *Victoria State Emergency Service Act 2005* (Vic) s 8.

⁵⁷ *Victoria State Emergency Service Act 2005* (Vic) s 5.

⁵⁸ *Victoria State Emergency Service Act 2005* (Vic) ss 32AB and 32AC.

⁵⁹ *Victoria State Emergency Service Act 2005* (Vic) s 4B.

⁶⁰ *Country Fire Authority Act 1958* (Vic) s 6.

⁶¹ *Country Fire Authority Act 1958* (Vic) s 20.

⁶² *Country Fire Authority Act 1958* (Vic) s 20AAA.

The *Fire Rescue Victoria Act 1958* (Vic) establishes Fire Rescue Victoria.⁶³ Fire Rescue Victoria is responsible for the prevention and suppression of fires in its fire district,⁶⁴ which includes metropolitan Melbourne and certain regional centres.⁶⁵ The Act does not specifically address flooding. However, similar to the Country Fire Authority, Fire Rescue Victoria has a duty to assist in the response to any major emergency in Victoria.⁶⁶

According to the Victorian Government's submission, the Country Fire Authority and Fire Rescue Victoria both aided in the response to the 2022 flood event.⁶⁷

FINDING 5: In many regional areas where there is a shortage of State Emergency Service volunteers, Country Fire Authority brigades stepped in to assist and in many cases were the lead agency on the ground responding to the floods.

3.4.4 Meteorology Act 1955 (Cth)

The *Meteorology Act 1955* (Cth) establishes and outlines the functions of the Bureau of Meteorology.⁶⁸ These functions include the issue of warnings of weather conditions likely to endanger life or property, including weather conditions likely to give rise to floods.⁶⁹

3.5 Victorian Floodplain Management Strategy

In 2016, the Victorian Government released the Victorian Floodplain Management Strategy (the Strategy). Developed by the Department of Environment, Land, Water and Planning—now the Department of Energy, Environment and Climate Action—the Strategy sets the direction for floodplain management in Victoria.⁷⁰ It clarifies roles and responsibilities relevant to floodplain management in Victoria and signals the Victorian Government's commitment to improve the state's floodplain management. Some of these roles and responsibilities are captured in Section 3.7 below.

Whereas the overarching Strategy 'outlines the vision and objectives for floodplain management in Victoria',⁷¹ much of its implementation occurs through regional floodplain management strategies. According to the Strategy, regional strategies are intended to 'apply the policies, actions and accountabilities outlined in [the] Strategy

⁶³ *Fire Rescue Victoria Act 1958* (Vic) s 6.

⁶⁴ *Fire Rescue Victoria Act 1958* (Vic) s 7.

⁶⁵ Fire Rescue Victoria, *Response area*, <<https://www.frv.vic.gov.au/response-area>> accessed 5 February 2024.

⁶⁶ *Fire Rescue Victoria Act 1958* (Vic) s 7AA.

⁶⁷ Victorian Government, *Submission 295*, p. 21.

⁶⁸ *Meteorology Act 1955* (Cth) ss 5 and 6.

⁶⁹ *Meteorology Act 1955* (Cth) s 6.

⁷⁰ Department of Environment, Land, Water and Planning, *Victorian Floodplain Management Strategy*, 2016, p. 5.

⁷¹ *Ibid.*, p. 96.

at the regional and local levels'.⁷² With reference to guidelines developed by the Department of Energy, Environment and Climate Action, catchment management authorities (and Melbourne Water) collaborate with councils, Victoria SES and their local communities to develop strategies for their respective regions.⁷³ These strategies aim to identify flood risks, for example through local flood studies, and prioritise activities needed to mitigate these risks.⁷⁴

In its submission, the Victorian Government emphasises the importance of regional floodplain management strategies in securing funds for 'locally prioritised actions'.⁷⁵ Further, it states that:

Sound strategy within the [Victorian Floodplain Management Strategy] at state level and within each region's [regional floodplain management strategy], as well as flood studies to understand local risk, underpins the state's investment in warning systems and other mitigation infrastructure. Significant investment in design and engagement with local communities to address their priorities has meant many key projects were shovel ready when Commonwealth funding became available.⁷⁶

In 2020, Ernst and Young conducted an audit into the Strategy's implementation.⁷⁷ It found that the Department of Land, Water and Planning had established clear governance structures to oversee the Strategy's implementation.⁷⁸ It also found that the Department had put effective procedures in place to monitor and report on the Strategy's actions.⁷⁹ Subsequently, in 2022, the Department reported that all 56 of the Strategy's actions had been completed or embedded as part of business-as-usual practice.⁸⁰

3.5.1 Committee comment

The Committee notes that the Victorian Floodplain Management Strategy has a ten-year term from 2016. As such, the Victorian Government is set to replace the Strategy by 2026.

Despite the success of the current Strategy—as demonstrated in the Department of Land, Water and Planning's 2022 Implementation Snapshot—the 2022 flood event revealed numerous issues with Victoria's flood planning, response, and recovery. The Committee has identified these issues in its Final Report, and any new statewide floodplain management strategy must account for them.

⁷² Ibid., p. 99.

⁷³ Ibid.

⁷⁴ Ibid.

⁷⁵ Victorian Government, *Submission 295*, p. 60.

⁷⁶ Ibid., p. 58.

⁷⁷ Department of Environment, Land, Water and Planning, *Implementation Snapshot: 2016–2022 Six Years of Delivery*, 2022, p. 2.

⁷⁸ Ibid.

⁷⁹ Ibid.

⁸⁰ Ibid.

RECOMMENDATION 3: That the Victorian Government consider all the evidence, findings and recommendations from this Report when developing a new Victorian Floodplain Management Strategy.

RECOMMENDATION 4: That the new Victorian Floodplain Management Strategy detail the coordination responsibility of the Victorian Government to ensure all flood studies for all local government areas are fully funded and completed.

3.6 State Emergency Management Plan

In 2018, the Victorian Parliament amended the 2013 Emergency Management Act to require the Emergency Management Commissioner to prepare the State Emergency Management Plan.⁸¹ First approved in 2020, the Plan seeks to provide 'an integrated, coordinated, comprehensive approach to emergency management [...] at the state level'.⁸²

The Plan breaks emergency management down into five phases—mitigation, planning, preparedness, response and recovery—⁸³and outlines the roles and responsibilities relevant to each of these phases.⁸⁴ In doing so, it emphasises that 'building safer and more resilient communities is the shared responsibility of all Victorians, not just the [emergency management] sector'.⁸⁵ Hence, alongside the emergency management sector, it outlines the functions of individuals, families and households, businesses, and community groups and networks in emergency management.⁸⁶

The Plan is supplemented by the Flood Sub-Plan⁸⁷ and Storm Sub-Plan,⁸⁸ and replaces parts of the Emergency Management Manual Victoria, which ceased to have effect on 1 December 2020.⁸⁹

3.6.1 Emergency management tiers and control centres

The State Emergency Management Plan organises emergency management into three operational tiers: incident, region, and state.⁹⁰ According to the Plan, most emergencies

⁸¹ *Emergency Management Act 2013 (Vic)* s 60AD.

⁸² Emergency Management Commissioner, *Victorian State Emergency Management Plan*, Emergency Management Victoria, Melbourne, 2023, p. 14.

⁸³ *Ibid.*, p. 5.

⁸⁴ Emergency Management Victoria, *Roles and Responsibilities*, <<https://www.emv.vic.gov.au/responsibilities/state-emergency-management-plan-semp/roles-and-responsibilities>> accessed 5 February 2024.

⁸⁵ Emergency Management Commissioner, *Victorian State Emergency Management Plan*, p. 10.

⁸⁶ *Ibid.*

⁸⁷ Victoria State Emergency Service, *State Emergency Management Plan, Flood Sub-plan Edition 3.0*, Victorian Government, Melbourne, 2022.

⁸⁸ Victoria State Emergency Service, *State Emergency Management Plan, Storm Sub-plan Edition 2.0*, 2022.

⁸⁹ Emergency Management Commissioner, *Victorian State Emergency Management Plan*, p. 7.

⁹⁰ *Ibid.*, p. 8.

are dealt with at the local tier, using local resources.⁹¹ However, emergencies that 'need more resources, have greater consequences and recovery needs or need messages sent to broader groups of people' may require activation of the regional and/or state tiers.⁹² Under the 2013 Emergency Management Act, Victoria's emergency management regions are determined by the Governor in Council.⁹³ At present, they consist of:

- Barwon South West
- Gippsland
- Grampians
- Hume
- Loddon Mallee
- North West Metro
- Southern Metro
- Eastern Metro.⁹⁴

Figure 3.6 Map of Victoria's emergency management regions



Source: Municipal Association of Victoria, *Municipal Emergency Management Enhancement Group*, <<https://www.mav.osn.au/what-we-do/policy-advocacy/emergency-management/municipal-emergency-enhancement-group>> accessed 9 February 2024.

At the state tier, the Emergency Management Commissioner appoints a State Response Controller.⁹⁵ The State Response Controller is responsible for managing and leading the state response, for example by overseeing the State Control Centre, and directing and supporting regional and incident controllers.⁹⁶

⁹¹ Ibid.

⁹² Ibid.

⁹³ *Emergency Management Act 2013 (Vic) s 77A.*

⁹⁴ Victoria, *Victorian Government Gazette*, No. G 39, 1 October 2020,

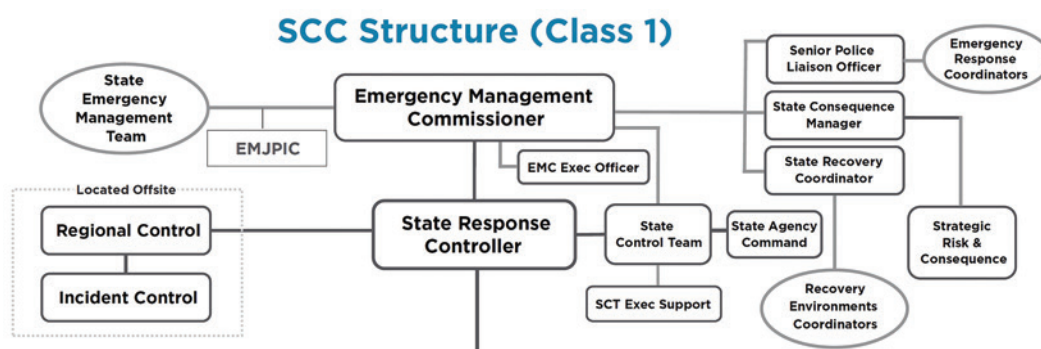
⁹⁵ Emergency Management Victoria, *Fundamentals of Emergency Management (Class 1 Emergencies) Edition 1*, Victorian Government, Melbourne, 2015, p. 21.

⁹⁶ Ibid., p. 22.

At the regional tier, the State Response Controller appoints a Regional Controller.⁹⁷ Operating from a Regional Control Centre, the Regional Controller manages and leads the region's response, and reports to the State Response Controller.⁹⁸

At the incident level, the relevant control agency typically appoints an Incident Controller.⁹⁹ However, if the incident is or may become a major emergency, the Regional Controller appoints the Incident Controller.¹⁰⁰ Operating from an Incident Control Centre, the Incident Controller is responsible for controlling the incident and ensuring appropriate incident management.¹⁰¹

Figure 3.7 State Control Centre structure for a Class 1 emergency



Source: Emergency Management Victoria, *Fundamentals of Emergency Management (Class 1 Emergencies) Edition 1*, Melbourne, 2015, p. 21.

3.6.2 Regional and municipal emergency management plans

As well as the State Emergency Management Plan, the 2013 Emergency Management Act provides for the preparation of regional emergency management plans¹⁰² and municipal emergency management plans.¹⁰³

The Act establishes a regional emergency management planning committee for each region.¹⁰⁴ Committees consist of members nominated by the heads of Victorian Government departments, the Chief Commissioner of Police, the Country Fire Authority, Victoria SES, and others.¹⁰⁵ Each committee is responsible for preparing and reviewing its regional emergency management plan.¹⁰⁶

⁹⁷ Ibid., p. 24.

⁹⁸ Ibid., pp. 24–26.

⁹⁹ Ibid., p. 28.

¹⁰⁰ Ibid., p. 29.

¹⁰¹ Ibid., p. 35.

¹⁰² *Emergency Management Act 2013 (Vic)* s 57.

¹⁰³ *Emergency Management Act 2013 (Vic)* s 59D.

¹⁰⁴ *Emergency Management Act 2013 (Vic)* s 53.

¹⁰⁵ *Emergency Management Act 2013 (Vic)* s 54.

¹⁰⁶ *Emergency Management Act 2013 (Vic)* s 57.

Likewise, the Act requires municipal councils to create municipal emergency management planning committees, consisting of members nominated by the Chief Commissioner of Police, the Country Fire Authority, Victoria SES, and others.¹⁰⁷ Each committee is responsible for preparing and reviewing its municipal emergency management plan.¹⁰⁸

The State Emergency Management Plan explains that 'a [regional emergency management plan] contextualises the [State Emergency Management Plan] for its region'.¹⁰⁹ Likewise, 'a [municipal emergency management plan] contextualises its [regional emergency management plan] and is informed by local and municipal risks'.¹¹⁰

In this way, the [State Emergency Management Plan], [regional emergency management plans] and [municipal emergency management plans], in conjunction with any community [emergency management] plans, form a holistic planning landscape to mitigate, plan and prepare for, respond to and recover from emergencies.¹¹¹

3.6.3 Other key documents

Alongside the Victorian Floodplain Management Strategy, regional floodplain management strategies, and municipal and emergency management plans, the State Emergency Management Plan identifies numerous other important state, national and international documents that guide Victoria's emergency management arrangements. These include the:

- Sendai Framework for Disaster Risk Reduction 2015–2030
- National Principles for Disaster Recovery
- National Disaster Risk Reduction Framework
- Ministerial Guidelines for emergency management planning
- Resilient Recovery Strategy
- Victorian Preparedness Framework.

3.7 Key roles and responsibilities

This Section summarises some of the different roles and responsibilities of government and non-government actors in relation to flood management.

¹⁰⁷ *Emergency Management Act 2013* (Vic) ss 59–59A.

¹⁰⁸ *Emergency Management Act 2013* (Vic) s 59F.

¹⁰⁹ Emergency Management Commissioner, *Victorian State Emergency Management Plan*, p. 16.

¹¹⁰ *Ibid.*

¹¹¹ *Ibid.*

3.7.1 Department of Energy, Environment and Climate Action

The Department of Energy, Environment and Climate Action has significant responsibilities under the State Emergency Management Plan, including in relation to flood and other natural disasters.¹¹² With regard to flood mitigation, preparedness and planning, the Department participates in:

- the development and reform of legislative policy
- flood emergency planning
- flood intelligence and mapping
- the Total Flood Warning System
- dam safety management.¹¹³

The Department formulates policy and regulation for floodplain management (e.g., the Victorian Floodplain Management Strategy), and plans and delivers floodplain management programs aimed at reducing flood risk.¹¹⁴

Under the Victorian Floodplain Management Strategy, the Department's predecessor was accountable for:

- coordinating Total Flood Warning System services at the state level¹¹⁵
- managing regional water monitoring partnerships¹¹⁶
- working with the insurance industry.¹¹⁷

According to the Victorian Government's submission, the regional water monitoring partnerships maintain Victoria's streamflow-gauging network, and involve the Department, as well as councils, catchment management authorities, Melbourne Water, and other water corporations.¹¹⁸ In general, the Department plays a big part in the maintenance of this network:

- supplementing the permanent gauging network with portable loggers
- upgrading river and rainfall gauges across the state
- working with councils to identify flood warning gauges with limited service
- installing new rainfall and streamflow gauges.¹¹⁹

¹¹² Emergency Management Victoria, *Role statement – Department of Energy, Environment and Climate Action*, <<https://www.em.vic.gov.au/responsibilities/state-emergency-management-plan-semb/roles-and-responsibilities/role-statements/role-statement-department-of-energy-environment-and-climate-action>> accessed 29 January 2024.

¹¹³ Ibid.

¹¹⁴ Ibid.

¹¹⁵ Department of Environment, Land, Water and Planning, *Victorian Floodplain Management Strategy*, p. 62.

¹¹⁶ Ibid.

¹¹⁷ Ibid., p. 85.

¹¹⁸ Victorian Government, *Submission 295*, p. 36.

¹¹⁹ Ibid.

Under the Strategy, the Department is also accountable for the preparation and/or maintenance of various flood-related tools, guidelines and standards, including:

- flood mapping standards¹²⁰
- guidelines for the management of flood databases¹²¹
- FloodZoom (Victoria's flood intelligence platform)¹²²
- a development plan for state-level Total Flood Warning System services¹²³
- a management framework for flood mitigation infrastructure¹²⁴
- guidelines for managing residual flood water¹²⁵
- guidelines for regional floodplain management strategies.¹²⁶

In terms of flood response and relief, the Department supports responder and other agencies, for example by providing flood mapping information, advice, and real time access to stream flow data collection for flood warning purposes.¹²⁷ According to the Flood Sub-Plan, it also manages the VicEmergency Hotline, which is designed to provide emergency information to community members during and after major incidents, including flood events.¹²⁸

In relation to flood recovery, the Department is a coordinating agency for natural environment, public land and inland waters. It leads the assessment, restoration, clean-up and rehabilitation of Department-managed roads, bridges, tunnels and culverts.¹²⁹ It also provides a coordinated response to manage residual water after a major flood event on relevant land.¹³⁰

The Committee notes that, following the flood event, the Department commissioned an after-action review of its water emergency operational response. The Committee received a confidential and de-identified copy of the review's final report. The review involved numerous participants, including representatives from the Department, water corporations, and the Victoria SES, and recommended ways for the Department to more effectively fulfil its role in flood management and response. The review was comprehensive in its scope:

¹²⁰ Department of Environment, Land, Water and Planning, *Victorian Floodplain Management Strategy*, p. 34.

¹²¹ *Ibid.*, p. 35.

¹²² *Ibid.*, p. 36.

¹²³ *Ibid.*, p. 63.

¹²⁴ *Ibid.*, p. 74.

¹²⁵ *Ibid.*, p. 92.

¹²⁶ *Ibid.*, p. 99.

¹²⁷ Emergency Management Victoria, *Role statement – Department of Energy, Environment and Climate Action*, <<https://www.emv.vic.gov.au/responsibilities/state-emergency-management-plan-semp/roles-and-responsibilities/role-statements/role-statement-department-of-energy-environment-and-climate-action>> accessed 29 January 2024.

¹²⁸ Victoria State Emergency Service, *State Emergency Management Plan, Flood Sub-plan Edition 3.0*, p. 22.

¹²⁹ Emergency Management Victoria, *Role statement – Department of Energy, Environment and Climate Action*.

¹³⁰ *Ibid.*

In December 2022, Resilient Services was appointed to plan and facilitate a Victorian Flood Event 2022 After Action Review (AAR) – DEECA Water Emergency Operational Response (round 1), which included 16 AAR stakeholder workshops between January and March 2023, focusing on control and support arrangements, collaboration between agencies and the management of resources during the Flood Event.

Following that, Resilient Services was appointed to facilitate additional AAR's across 12 thematic areas (round 2). Between the 31 May and 28 June 2023, 13 online workshops were conducted via Microsoft Teams (MS Teams), with a further two individual sessions for participants unable to participate in the workshops.

Areas of strength and areas of improvement were identified for action.

The Committee believes that such internally instigated reviews provide opportunities to learn lessons, demonstrate continuous learning and improvement, and should be commended. Agencies should not wait for the Inspector-General for Emergency Management, parliamentary or other external inquiries to undertake review processes.

RECOMMENDATION 5: That the Victorian Government make public the internal, de-identified after-action review conducted by the Department of Energy, Environment and Climate Action.

3.7.2 Other Victorian Government departments

The Department of Transport and Planning is responsible for maintaining a high level of preparedness for emergencies that may affect the state's road networks.¹³¹ It formulates policy and regulations in land use planning and building systems, and provides support to emergency response agencies, for example by providing spatial information and services, and facilitating access to networks.¹³²

The Department of Health participates in community engagement, education and awareness around flooding.¹³³ According to the Flood Sub-Plan, it has a support function in minimising the impact of storm events on individuals, communities, public health and the health system, and is the control agency for drinking water contamination.¹³⁴

¹³¹ Emergency Management Victoria, *Role statement – Department of Transport and Planning (including Head, Transport of Victoria)*, <<https://www.emvic.gov.au/responsibilities/state-emergency-management-plan-semp/roles-and-responsibilities/role-statements/role-statement-department-of-transport-and-planning-including-head-transport-for-victoria>> accessed 30 January 2024.

¹³² Ibid.

¹³³ Emergency Management Victoria, *Role statement – Department of Health*, <<https://www.emvic.gov.au/responsibilities/state-emergency-management-plan-semp/roles-and-responsibilities/role-statements/role-statement-department-of-health>> accessed 31 January 2024.

¹³⁴ Victoria State Emergency Service, *State Emergency Management Plan, Flood Sub-plan Edition 3.0*, pp. 27–28.

3.7.3 Emergency Management Victoria

As well as supporting the development and maintenance of the State Emergency Management Plan, Emergency Management Victoria has considerable roles and responsibilities under the Plan.¹³⁵

Its role in mitigation, planning and preparedness involves coordinating whole of government policy for emergency management in Victoria.¹³⁶ Moreover, it involves supporting the Emergency Management Commissioner to perform the Commissioner's functions under the Emergency Management Act.¹³⁷ This includes advising the State Crisis and Resilience Council on behalf of Fire Rescue Victoria, the Country Fire Authority and Victoria SES.¹³⁸ According to the Victorian Government's submission, Emergency Management Victoria is also responsible for coordinating a statewide emergency risk assessment.¹³⁹

In relation to response, Emergency Management Victoria takes a lead role in coordinating investment planning and large-scale strategic projects on behalf of responder agencies.¹⁴⁰ Among other things, the Emergency Management Commissioner is responsible for:

- coordinating emergency response agencies
- managing the State Control Centre
- preparing and reviewing the State Emergency Management Plan
- coordinating data collection and impact assessment processes.¹⁴¹

As part of recovery, Emergency Management Victoria is a lead agency in the provision of financial assistance to government agencies and councils eligible for disaster expenditure.¹⁴² Further, the Emergency Management Commissioner is responsible for coordinating the recovery activities of all agencies with recovery responsibilities under the Plan.¹⁴³

¹³⁵ Emergency Management Victoria, *Role statement – Emergency Management Victoria*, <<https://www.emv.vic.gov.au/index.php/responsibilities/state-emergency-management-plan-semp/roles-and-responsibilities/role-statements/role-statement-emergency-management-victoria>> accessed 30 January 2024.

¹³⁶ *Emergency Management Act 2013* (Vic) s 17(2)(a).

¹³⁷ Emergency Management Victoria, *Role statement – Emergency Management Victoria*.

¹³⁸ *Ibid.*

¹³⁹ Victorian Government, *Submission 295*, p. 15.

¹⁴⁰ *Emergency Management Act 2013* (Vic) s 21.

¹⁴¹ Emergency Management Victoria, *Role statement – Emergency Management Commissioner*, <<https://www.emv.vic.gov.au/responsibilities/state-emergency-management-plan-semp/roles-and-responsibilities/role-statements/role-statement-emergency-management-commissioner>> accessed 31 January 2024.

¹⁴² Emergency Management Victoria, *Role statement – Emergency Management Victoria*.

¹⁴³ Emergency Management Victoria, *Role statement – Emergency Management Commissioner*.

3.7.4 State Crisis and Resilience Council

As discussed in Section 3.4.1, the 2013 Emergency Management Act establishes the State Crisis and Resilience Council.¹⁴⁴ The Council consists of:

- the heads of Victorian Government departments
- the Chief Commissioner of Police
- the Chief Executive of Emergency Management Victoria
- the Inspector-General for Emergency Management
- the Chief Executive Officer of the Municipal Association of Victoria.¹⁴⁵

It plays a significant role in flood mitigation, planning and preparedness:

- acting as the peak crisis and emergency management advisory body in Victoria
- considering the State Emergency Management Plan
- advising the Minister for Emergency Services.¹⁴⁶

According to the State Emergency Management Plan:

The [State Crisis and Resilience Council] is the peak crisis and [emergency management] body to the Victorian Government and provides advice to Ministers and relevant Cabinet sub-committees. It is responsible for the development and implementation of whole of government [emergency management] policy and strategy. It does not make operational or tactical decisions.¹⁴⁷

3.7.5 Emergency Recovery Victoria

Under the State Emergency Management Plan, Emergency Recovery Victoria leads emergency recovery coordination and relief across Victoria.¹⁴⁸ It coordinates state and regional recovery, for example by engaging with communities, governments and non-government agencies to ensure appropriate recovery supports are in place.¹⁴⁹

It also acts as the lead agency to coordinate spontaneous volunteers, Disaster Recovery Funding Arrangements funding, insurance industry response, and state-led or -supported clean-up.¹⁵⁰

¹⁴⁴ *Emergency Management Act 2013* (Vic) s 6.

¹⁴⁵ *Emergency Management Act 2013* (Vic) s 8.

¹⁴⁶ *Emergency Management Act 2013* (Vic) s 7.

¹⁴⁷ Emergency Management Commissioner, *Victorian State Emergency Management Plan*, p. 8.

¹⁴⁸ Emergency Management Victoria, *Role statement – Emergency Recovery Victoria*, <<https://www.emv.vic.gov.au/responsibilities/state-emergency-management-plan-semp/roles-and-responsibilities/role-statements/role-statement-emergency-recovery-victoria>> accessed 30 January 2024.

¹⁴⁹ *Ibid.*

¹⁵⁰ *Ibid.*

3.7.6 Victoria State Emergency Service

As the control agency for storm, flood, earthquake, tsunami and landslide, the Victoria State Emergency Service (SES) plays a significant role in emergency response. The State Emergency Management Plan highlights this role, as well as Victoria SES' responsibilities in relation to flood mitigation and recovery.¹⁵¹

To support mitigation, planning and preparedness, Victoria SES participates in community engagement, flood emergency planning, the Total Flood Warning System, and dam safety management.¹⁵² It also assists councils in emergency planning, prepares information and warnings, and maintains control centre facilities under its responsibility, among other things.¹⁵³

Under the Victorian Floodplain Management Strategy, Victoria SES is accountable for:

- providing the Department of Energy, Environment and Climate Action its requirements and specifications for flood mapping¹⁵⁴
- emergency planning and response for storm surges and coastal flooding¹⁵⁵
- aspects of the Total Flood Warning System, including community education, providing opportunities for the incorporation of local knowledge¹⁵⁶
- engaging experts in the development of flood emergency planning, e.g., the Flood Sub-Plan¹⁵⁷
- ensuring arrangements are in place to access flood-specialist services.¹⁵⁸

Where necessary, Victoria SES also prepares regional flood emergency plans, municipal flood emergency management plans, and municipal flood and storm emergency management plans,¹⁵⁹ which exist alongside local flood guides. Moreover, Victoria SES undertakes strategic planning for response and provides public information and warnings.¹⁶⁰ According to the Victorian Government's submission, Victoria SES has 'developed and delivered more than 170 local flood guides that provide tailored information to flood-prone communities across Victoria'.¹⁶¹

¹⁵¹ Emergency Management Victoria, *Role statement – Victoria State Emergency Services*, <<https://www.emv.vic.gov.au/responsibilities/state-emergency-management-plan-semp/roles-and-responsibilities/role-statements/role-statement-victoria-state-emergency-services>> accessed 30 January 2024.

¹⁵² Ibid.

¹⁵³ Ibid.

¹⁵⁴ Department of Environment, Land, Water and Planning, *Victorian Floodplain Management Strategy*, p. 34.

¹⁵⁵ Ibid., p. 51.

¹⁵⁶ Ibid., p. 63.

¹⁵⁷ Ibid., p. 88.

¹⁵⁸ Ibid., p. 91.

¹⁵⁹ Victoria State Emergency Service, *State Emergency Management Plan, Flood Sub-plan Edition 3.0*, p. 8.

¹⁶⁰ Ibid.

¹⁶¹ Victorian Government, *Submission 295*, p. 43.

With regards to flood response, Victoria SES is responsible for providing continuous protection of life, property and the environment from the effects of flood and storm, for example by conducting searches and performing rescues.¹⁶² It also:

- supports Victoria Police with evacuations
- rescues persons entrapped by collapsed structures
- protects property from further damage.¹⁶³

Victoria SES aids in flood recovery by restoring SES-managed public buildings and assets, and providing assistance and advice to people affected by flood.¹⁶⁴ Further, it supports the initial impact assessment process.¹⁶⁵

3.7.7 Inspector-General for Emergency Management

As explained in Section 3.4.1, the Inspector-General for Emergency Management has functions under the 2013 Emergency Management Act.¹⁶⁶ It undertakes independent assurance activities, for example maintaining the assurance framework and undertaking system-wide reviews.¹⁶⁷

3.7.8 Catchment management authorities

Catchment management authorities have significant responsibilities under the State Emergency Management Plan, particularly in relation to flooding.¹⁶⁸

To support flood mitigation, preparedness and planning, the authorities:

- prepare flood response action plans
- aid in the preparation and implementation of local floodplain management plans
- assist local government to incorporate flood-related planning controls in planning schemes
- participate in legislative policy, land use planning, waterway management, and flood emergency planning.¹⁶⁹

¹⁶² Emergency Management Victoria, *Role statement – Victoria State Emergency Services*.

¹⁶³ Victoria State Emergency Service, *State Emergency Management Plan, Flood Sub-plan Edition 3.0*, p. 14.

¹⁶⁴ Emergency Management Victoria, *Role statement – Victoria State Emergency Services*.

¹⁶⁵ Victorian Government, *Submission 295*, p. 43.

¹⁶⁶ *Emergency Management Act 2013* (Vic) pt 7.

¹⁶⁷ *Ibid.*, s 64(1).

¹⁶⁸ Emergency Management Victoria, *Role statement – Catchment Management Authorities*, <<https://www.emv.vic.gov.au/responsibilities/state-emergency-management-plan-semp/roles-and-responsibilities/role-statements/role-statement-catchment-management-authorities>> accessed 29 January 2024.

¹⁶⁹ *Ibid.*

In its submission, the Victorian Government points out that:

As authorities with floodplain management functions under the Water Act 1989, CMAs have the technical ability to take into account flood risk when assessing planning permit applications and to understand the long term implications to the property, adjoining properties and the catchment generally. Using their specialist knowledge, CMAs are, in most instances, able to manage risk by recommending conditions on a planning permit to the responsible authority (generally a council).¹⁷⁰

Under the Victorian Floodplain Management Strategy, catchment management authorities are accountable for:

- identifying and prioritising post-flood data needs¹⁷¹
- working with local government to ensure Planning Schemes use planning controls that align with their flood risks¹⁷²
- supporting local government to assess new flood mitigation infrastructure¹⁷³
- works to manage large-scale waterway erosion¹⁷⁴
- maintaining the expertise to provide flood-specialist services to Incident Controllers¹⁷⁵
- developing and reviewing regional floodplain management strategies.¹⁷⁶

Catchment management authorities also aid with flood response and recovery. For example, they:

- provide regional flood advice
- collect and maintain flood information and data
- support responder agencies in their work.¹⁷⁷

Likewise, they are responsible for developing flood recovery programs for their own assets and waterways, as well as for supporting land managers, the Department of Energy, Environment and Climate Action, and others in certain aspects of their recovery efforts.¹⁷⁸

¹⁷⁰ Victorian Government, *Submission 295*, p. 96.

¹⁷¹ Department of Environment, Land, Water and Planning, *Victorian Floodplain Management Strategy*, p. 33.

¹⁷² *Ibid.*, p. 43.

¹⁷³ *Ibid.*, p. 71.

¹⁷⁴ *Ibid.*, p. 79.

¹⁷⁵ *Ibid.*, p. 91.

¹⁷⁶ *Ibid.*, p. 99.

¹⁷⁷ Emergency Management Victoria, *Role statement – Catchment Management Authorities*.

¹⁷⁸ *Ibid.*

3.7.9 Melbourne Water

Melbourne Water has significant responsibilities over the Melbourne metropolitan area, including catchment management, water corporation and flood prediction functions.¹⁷⁹

In relation to flood mitigation, preparedness and planning, Melbourne Water participates in legislative policy, waterway management, and flood emergency planning.¹⁸⁰ It also plays a role in flood mitigation infrastructure, the Total Flood Warning System, and dam safety management.¹⁸¹ Moreover, it:

- develops and implements plans to protect its assets and systems
- develops its own flood monitoring system
- regulates development in flood-prone areas as a referral authority under council planning schemes.¹⁸²

Alongside the regional catchment management authorities, under the Victorian Floodplain Management Strategy Melbourne Water is accountable for:

- identifying and prioritising post-flood data needs¹⁸³
- working with local government to ensure planning schemes use planning controls that align with their flood risks¹⁸⁴
- supporting local government to assess new flood mitigation infrastructure¹⁸⁵
- works to manage large-scale waterway erosion¹⁸⁶
- maintaining the expertise to provide flood-specialist services to Incident Controllers¹⁸⁷
- developing and reviewing regional floodplain management strategies.¹⁸⁸

Melbourne Water predicts floods for larger Melbourne metropolitan catchments, as opposed to the Bureau of Meteorology. If it predicts a moderate or greater flood, it activates its Flood Response Plan.¹⁸⁹

¹⁷⁹ Emergency Management Victoria, *Role statement – Melbourne Water*, <<https://www.emv.vic.gov.au/responsibilities/state-emergency-management-plan-semp/roles-and-responsibilities/role-statements/role-statement-melbourne-water>> accessed 29 January 2024.

¹⁸⁰ Ibid.

¹⁸¹ Ibid.

¹⁸² Ibid.

¹⁸³ Department of Environment, Land, Water and Planning, *Victorian Floodplain Management Strategy*, p. 33.

¹⁸⁴ Ibid., p. 43.

¹⁸⁵ Ibid., p. 71.

¹⁸⁶ Ibid., p. 79.

¹⁸⁷ Ibid., p. 91.

¹⁸⁸ Ibid., p. 99.

¹⁸⁹ Victorian Government, *Submission 295*, p. 34.

In terms of response, Melbourne Water:

- provides advice and support to responder agencies and the Department of Energy, Environment and Climate Action
- manages local dam safety incidents
- provides flood predictions to the Bureau of Meteorology for certain water courses.¹⁹⁰

After a flood has occurred, it also provides relevant emergency works and waterway and drain clearance.¹⁹¹

Significantly, Melbourne Water leads the delivery of several flood recovery activities, including restoring water systems for domestic use with the Department of Energy, Environment and Climate Action.¹⁹²

3.7.10 Water corporations

Water corporations are responsible for managing major water storages.¹⁹³ They conduct training exercises to ensure effective implementation of emergency management plans, and participate in dam safety management.¹⁹⁴ They also provide advice and support to the Department of Energy, Environment and Climate Action for dam safety events, and manage local dam safety incidents in relevant dams.¹⁹⁵

In its submission, the Victorian Government emphasises that while water corporations are responsible for managing major water storages:

Victoria's major storages were designed and built to provide water supply and irrigation services, not to mitigate floods. Any flood mitigation from a dam is incidental and opportunistic and depends on its water level at the time of flood-inducing rain. Any regulating gates are in place solely to keep the dam safe and maximise water storage, while fixed spillways keep large dams at safe operating levels and allow floodwaters to pass.¹⁹⁶

The following water corporations experienced flooding in their regions during the 2022 flood event:

- Goulburn-Murray Water
- Goulburn Valley Water
- Grampians Wimmera Mallee Water

¹⁹⁰ Emergency Management Victoria, *Role statement – Melbourne Water*.

¹⁹¹ Ibid.

¹⁹² Ibid.

¹⁹³ Victorian Government, *Submission 295*, p. 59.

¹⁹⁴ Emergency Management Victoria, *Role statement – Water Corporations*, <<https://www.emv.vic.gov.au/responsibilities/state-emergency-management-plan-semp/roles-and-responsibilities/role-statements/role-statement-water-corporations>> accessed 30 January 2024.

¹⁹⁵ Ibid.

¹⁹⁶ Victorian Government, *Submission 295*, p. 60.

- Lower Murray Water
- Melbourne Water.

Additionally, the Murray-Darling Basin Authority is an Australian Government statutory agency responsible for storages and structures on the Murray River.¹⁹⁷

3.7.11 Local government

Local government plays a significant role in flood mitigation. Councils are a participating agency for:

- land use planning
- building regulations
- flood mitigation infrastructure on council land
- flood emergency planning
- the Total Flood Warning System
- safety management for relevant dams.¹⁹⁸

They also contribute to storm mitigation such as through drain and culvert clearance.¹⁹⁹

Under the Victorian Floodplain Management Strategy, local government authorities are accountable for:

- ensuring their planning schemes identify areas at risk of a 1% annual exceedance probability flood²⁰⁰
- documenting local Total Flood Warning System services in municipal flood emergency plans²⁰¹
- maintaining stream gauges whose sole purpose is to service as an element in a Total Flood Warning System service²⁰²
- outside of the Port Phillip and Westernport region, new flood mitigation infrastructure²⁰³ and existing flood mitigation infrastructure.²⁰⁴

¹⁹⁷ Ibid., p. 59.

¹⁹⁸ Emergency Management Victoria, *Role statement – Councils*, <<https://www.emv.vic.gov.au/responsibilities/state-emergency-management-plan-semp/roles-and-responsibilities/role-statements/role-statement-councils>> accessed 30 January 2024.

¹⁹⁹ Ibid.

²⁰⁰ Department of Environment, Land, Water and Planning, *Victorian Floodplain Management Strategy*, p. 43.

²⁰¹ Ibid., p. 63.

²⁰² Ibid., p. 63.

²⁰³ Ibid., p. 71.

²⁰⁴ Ibid., p. 74.

In terms of response, councils are responsible for coordinating relief at a municipal level, for example by establishing emergency relief centres.²⁰⁵ Otherwise they play a predominantly supporting role, aiding Incident Control Centres and government departments.²⁰⁶

Councils coordinate recovery at a municipal level.²⁰⁷ They do so by, among other things:

- forming municipal recovery committees
- providing recovery centres
- looking after roads, culverts and other infrastructure
- cleaning up council-owned buildings and assets.²⁰⁸

They also support other agencies, for example to provide public health advice.²⁰⁹

3.7.12 Bureau of Meteorology

The Bureau of Meteorology plays a significant role in flood response, issuing warnings on weather conditions likely to endanger life or property, providing hydrological and meteorological information, and providing expert advice for related emergencies.²¹⁰ It also participates in certain flood mitigation activities such as:

- flood emergency planning
- community engagement
- flood intelligence and mapping
- the Total Flood Warning System.²¹¹

In its Service Level Specification of Flood Forecasting and Warning Services for Victoria, the Bureau outlines the flood forecasting and warning services it provides in Victoria.²¹² According to the specification, the Bureau develops and maintains prediction systems throughout Victoria. However, Melbourne Water is responsible for modelling and prediction services for the Melbourne Metropolitan catchments, including Maribyrnong River.²¹³

²⁰⁵ Emergency Management Victoria, *Role statement – Councils*.

²⁰⁶ Ibid.

²⁰⁷ Ibid.

²⁰⁸ Ibid.

²⁰⁹ Ibid.

²¹⁰ Emergency Management Victoria, *Role statement – Bureau of Meteorology*, <<https://www.emv.vic.gov.au/responsibilities/state-emergency-management-plan-semp/roles-and-responsibilities/role-statements/role-statement-bureau-of-meteorology>> accessed 30 January 2024.

²¹¹ Ibid.

²¹² Australian Government, *Service Level Specification for Flood Forecasting and Warning Services for Victoria – Version 3.5*, Bureau of Meteorology, Melbourne, 2013, p. 2.

²¹³ Ibid., p. 6.

3.7.13 Victoria Police

In preparing the State Emergency Management Plan, the Emergency Management Commissioner must consult Victoria Police.²¹⁴ Under the Plan, Victoria Police has considerable response functions. For example, it is responsible for the effective coordination of emergency response within regions and municipal areas.²¹⁵ Moreover, it is the control agency for search and rescue on land and Victorian waters, supports other agencies, for example by providing personnel, and shares responsibility for:

- evacuation
- media coordination
- traffic management
- registration of evacuees.²¹⁶

The Flood Sub-Plan explains that 'Victoria Police, as the designated control agency for water rescue, coordinates rescued undertaken during flood events.'²¹⁷

3.7.14 Fire rescue agencies

Despite being primarily responsible for responding to fire, Fire Rescue Victoria provides key support for incidents involving natural events including flood.²¹⁸ As indicated in Section 3.4.3, the Country Fire Authority plays a similar role in flood response. In the context of the 2022 flood event, for example, both agencies supported Victoria SES to attend requests for assistance.²¹⁹

3.7.15 Australian defence agencies

The Commonwealth Government's Department of Defence supports Emergency Management Victoria during major emergencies, as directed by the Commonwealth Government.²²⁰ Further, the Emergency Management Commissioner or Victoria Police Commissioner can request the Department's support during major emergency operations.²²¹ During High Risk Weather Seasons, the Department prepares Australian

²¹⁴ *Emergency Management Act 2013* (Vic) s 60AF.

²¹⁵ Emergency Management Victoria, *Role statement – Victoria Police*, <<https://www.emv.vic.gov.au/responsibilities/state-emergency-management-plan-semp/roles-and-responsibilities/role-statements/role-statement-victoria-police>> accessed 5 February 2024.

²¹⁶ Ibid.

²¹⁷ Victorian State Emergency Service, *State Emergency Management Plan, Flood Sub-plan Edition 3.0*, p. 27

²¹⁸ Emergency Management Victoria, *Role statement – Fire Rescue Victoria*, <<https://www.emv.vic.gov.au/responsibilities/state-emergency-management-plan-semp/roles-and-responsibilities/role-statements/role-statement-fire-rescue-victoria>> accessed 30 January 2024.

²¹⁹ Victorian Government, *Submission 295*, p. 44.

²²⁰ Emergency Management Victoria, *Role statement – Australian Defence Force*, <<https://www.emv.vic.gov.au/responsibilities/state-emergency-management-plan-semp/roles-and-responsibilities/role-statements/role-statement-australian-defence-force>> accessed 5 February 2024.

²²¹ Ibid.

Defence Force Emergency Support Forces to provide rapid response to requests for assistance.²²²

3.7.16 National Emergency Management Agency

The National Emergency Management Agency is a Commonwealth Government agency that assists state and territory governments to respond to disasters.²²³

The Agency is responsible for coordinating the Commonwealth Government response to emergencies and for administering the Disaster Recovery Funding Arrangements.

3.7.17 Victorian Building Authority

As the principal regulator for building and plumbing in Victoria, the Victorian Building Authority works with agencies to identify risks and suggest mitigation measures.²²⁴

It provides support to Emergency Recovery Victoria to coordinate clean-up and provides advice to the Department of Transport and Planning to facilitate building and asset restoration.²²⁵

3.7.18 Non-government actors

As indicated in Section 3.6, the State Emergency Management Plan describes emergency management as a shared responsibility between all Victorians. This includes non-government actors, in particular:

- individuals, families and households
- small, medium and large businesses
- community groups and networks.²²⁶

The Plan expects that individuals, families, households and businesses will mitigate emergency risk to themselves, support response activities performed by the emergency management sector, and meet their own relief and recovery needs where possible.²²⁷ Moreover, it anticipates that community groups and networks will help mitigate emergency risk in general, and provide support to people to meet those people's relief and recovery needs.²²⁸

²²² Ibid.

²²³ Emergency Management Victoria, *Role statement – National Emergency Management Agency*, <<https://www.emv.vic.gov.au/responsibilities/state-emergency-management-plan-semp/roles-and-responsibilities/role-statements/role-statement-national-emergency-management-agency>> accessed 30 January 2024.

²²⁴ Emergency Management Victoria, *Role statement – Victorian Building Authority*, <<https://www.emv.vic.gov.au/responsibilities/state-emergency-management-plan-semp/roles-and-responsibilities/role-statements/role-statement-victorian-building-authority>> accessed 30 January 2024.

²²⁵ Ibid.

²²⁶ Emergency Management Commissioner, *Victorian State Emergency Management Plan*, p. 11.

²²⁷ Ibid.

²²⁸ Ibid.

3.8 Conclusion

This Chapter outlines the main legislative instruments and policy documents relevant to flood emergency management in Victoria. In doing so, it summarises some of the key roles and responsibilities of those involved in flood mitigation, planning, preparedness, response and recovery.

Evidently, Victoria's flood governance arrangements are comprehensive. They are also complicated. Several of the policy documents outlined in this Chapter, particularly the State Emergency Management Plan and corresponding sub-plans, seek to clarify the complex array of legislative and non-legislative roles, duties and accountabilities. Likewise, regional floodplain management strategies, regional and municipal emergency management plans, local flood guides and agencies with educative functions attempt to make these arrangements relevant and accessible to Victorian communities. Notwithstanding this, the complexity of these arrangements and their fragmentation across numerous legislative and policy documents risks making them difficult to understand, even inaccessible to the public. It is important that governance arrangements balance complexity, comprehensibility and effectiveness.

Arguably, this complexity is necessary to ensure an 'integrated, coordinated, comprehensive approach to emergency management'. However, in the context of a major flood emergency such as the 2022 flood event, this same complexity makes it difficult for both government and the public to identify where these arrangements may be improved. This is discussed further in Chapters 4–8. This highlights the importance of assurance activities and emphasises the need for after-action reviews. It also underscores the importance of ensuring an appropriate level of public awareness of key governance arrangements, particularly in relation to emergency management which is the responsibility of all Victorians.

RECOMMENDATION 6: That the Victorian Government clearly state the operational role and responsibilities of each emergency service in preparation for a flood emergency, outlining the appropriate chain of command, communication protocols, and engagement with the local community.

Chapter 4

Planning and flood risk

4.1 Introduction

Flooding is a regular occurrence in parts of Victoria and, as evidenced by the 2022 flood event, has the potential to significantly impact the lives of Victorians. This is particularly the case for those who live, work or travel on floodplains. In line with the State Emergency Management Plan, it is vital that Victoria has appropriate mitigation, planning and preparedness measures in place to reduce the impact of floods, and to ensure that the state is well placed to respond to and recover from major flood events, such as occurred in October 2022.

This Chapter focuses on certain aspects of the mitigation, planning and preparedness phases of emergency management as they relate to floods. It examines how different levels of government, as well as non-government bodies and the public, assess and manage flood risk. In relation to managing flood risk, it spotlights Victoria's planning system, and considers how strategic land use planning could mitigate the effects of flooding, for example by limiting inappropriate development on floodplains. It also considers the role of Victoria's building system in flood mitigation.

Chapter 5 examines mitigation infrastructure, such as dams and levees. Chapter 6 explores preparedness in the context of flood prediction, monitoring and warnings.

4.2 Assessing flood risk

To prepare for and mitigate the impacts of flood, government and other bodies must first understand the risk of flood to Victorian communities. One way they do so is by measuring and evaluating flood risk, as set out in the Victorian Floodplain Management Strategy (see Chapter 3 for an overview of the Strategy).

4.2.1 Flood metrics

According to the Victorian Floodplain Management Strategy, quantifying flood risk involves measuring:

- the probability of flood events
- the population at risk of flooding
- the damage associated with different flood events.¹

¹ Department of Environment, Land, Water and Planning, *Victorian Floodplain Management Strategy*, 2016, p. 27.

The probability of flood events

To measure and express the probability of flood events, floodplain managers use the annual exceedance probability (AEP).² AEP refers to the likelihood of a flood occurring or being exceeded in any given year, and is expressed as a percentage.³ Using the language of AEP, a flood might be said to have an AEP of 1%. A flood with an AEP of 1% has a 1% or 1-in-100 chance of occurring in any one year, and a 10% chance of occurring in any decade.⁴

The Committee heard evidence from witnesses who also used the concept of average recurrence interval to express flood probability. Average recurrence interval is ‘a way of explaining how rare an event is, by comparing how often, on average, the particular event of interest has occurred in the past’.⁵ In terms of average recurrence interval, a flood might be described as a 1-in-100 year flood. With a 1-in-100 year flood, there is a 1% chance that a flood of the same size will recur in any year. Expressed in terms of AEP, it has an AEP of 1%.

In the Strategy, the Government explains that the concepts of AEP and average recurrence interval are technically interchangeable, but that the concept of ‘average recurrence interval’ can be psychologically misleading:

People can be tempted to think that if they experience a ‘1-in-100 year’ flood, their property will then be safe for another 100 years.⁶

In Victoria, most development controls and decisions factor in the 1% AEP flood.⁷ In its *Guidelines for Development in Flood Affected Areas*, the Government acknowledges that floods larger than the 1% annual exceedance flood do occur. It explains that ‘the probable maximum flood’ refers to the largest possible flood that could occur in a particular location, but contends that:

It is not usually feasible, or socially or economically justifiable to adopt the [probable maximum flood] as the standard for all floodplain management activities.⁸

There are some instances in which the Government suggests planning authorities consider the probable maximum flood, such as for buildings that house vulnerable people.⁹ Notwithstanding this—and despite criticisms from several stakeholders—the 1% AEP continues to operate as the ‘design flood event’, that is, the level of risk used to

² Ibid., p. 28.

³ Ibid.

⁴ Environment Canterbury Regional Council, *Flood probabilities*, <<https://www.ecan.govt.nz/your-region/your-environment/natural-hazards/floods/flood-probabilities>> accessed 16 March 2023.

⁵ Bureau of Meteorology, *How to read the average recurrence interval maps*, <http://www.bom.gov.au/climate/extremes/how_to_read_arimaps.shtml> accessed 28 March 2024.

⁶ Department of Environment, Land, Water and Planning, *Victorian Floodplain Management Strategy*, p. 28.

⁷ Department of Environment, Land, Water and Planning, *Guidelines for Development in Flood Affected Areas*, 2019, p. 9.

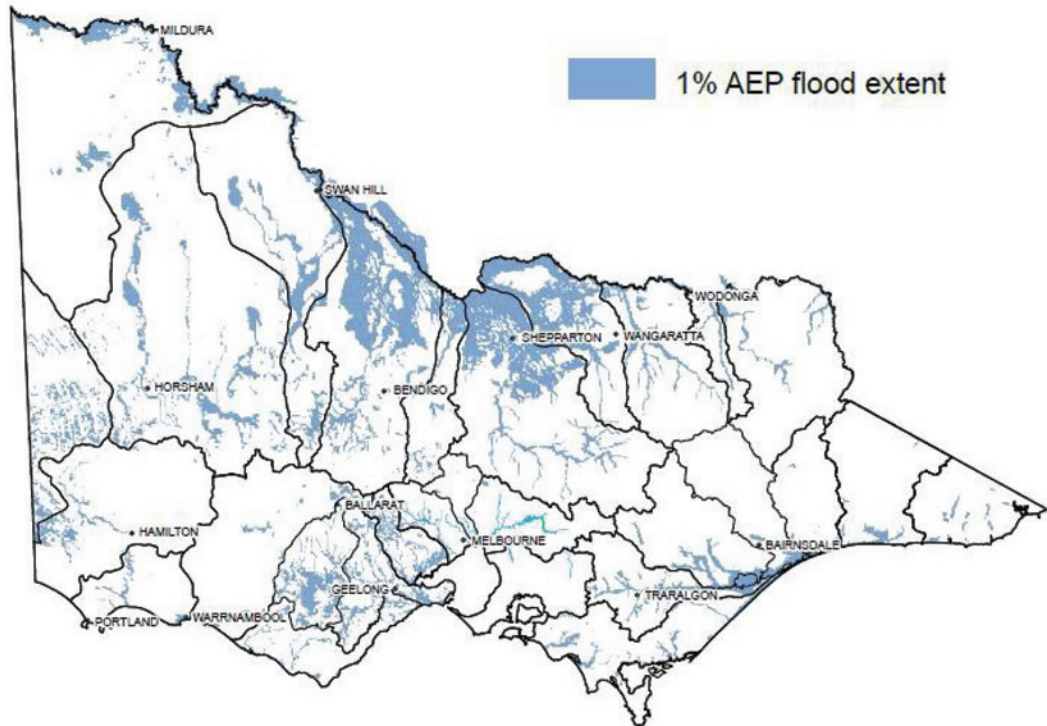
⁸ Ibid.

⁹ Ibid., p. 31.

determine which areas the planning and building systems should protect.¹⁰ Section 4.5 considers the appropriateness of using the 1% AEP flood as the design flood event.

Figure 4.1 shows the areas susceptible to a 1% AEP flood in Victoria.

Figure 4.1 Areas susceptible to 1% AEP riverine flooding in Victoria



Source: Victoria State Emergency Service, *State Emergency Management Plan, Flood Sub-Plan*, Edition 3, 2022, p. 10.

The population at risk of flooding

Flood hazards impact communities differently. As such, quantifying flood risk involves measuring populations at risk of flooding. The Strategy identifies two important measurements of population, namely size and relative vulnerability.¹¹ Both of these have an impact on the provision of warnings, evacuations, and strategic land use and emergency management planning. The Strategy recognises that the following groups of people are particularly vulnerable to flood hazards:

- people in hospitals
- people in nursing homes
- people in schools
- people in childcare facilities
- people in corrective facilities

¹⁰ Department of Environment, Land, Water and Planning, *Victorian Floodplain Management Strategy*, p. 103.

¹¹ *Ibid.*, p. 29.

- older people
- people with limited mobility.¹²

The damage associated with different flood events

The Strategy identifies three types of damage caused by flood:

- direct tangible damages
- indirect tangible damages
- intangible damages.¹³

It states that '[f]loods of different sizes cause different amounts of damage', and introduces the concept of average annual damage:

[Average annual damage] provides a basis for comparing the economic effectiveness of different structural and non-structural mitigation measures, allowing the costs of mitigation to be compared with its benefits.¹⁴

The concept of average annual damage is used by different stakeholders, including developers, councils and catchment management authorities, to measure the cost of certain works, including mitigation works. It is government policy that '[l]arge-scale flood mitigation activities or works on waterways must be demonstrated, through a flood study, to be cost effective, i.e. have demonstrable benefits in terms of reduced average annual damage [...] that are greater than any costs to waterway health'.¹⁵

Chapter 2 outlines some of the damage caused by the October 2022 flood event.

4.2.2 Measuring risk

In the Victorian Floodplain Management Strategy, the Government acknowledges that 'floods are potentially one of the most predictable disasters confronting Victoria' and that '[t]ools are available to analyse their magnitude, frequency and impact on the landscape'.¹⁶ At the same time, it recognises that the effectiveness of these tools depends on the availability of technically rigorous and detailed data on flood extent, height, behaviour and the topological characteristics of areas at risk of inundation.¹⁷

Flood studies

One way to achieve the necessary detail and rigour in Victoria's flood data is to commission hydrologists and flood mapping experts to conduct flood studies.

¹² Ibid.

¹³ Ibid.

¹⁴ Ibid.

¹⁵ Ibid., p. 80.

¹⁶ Ibid., p. 30.

¹⁷ Ibid., pp. 30–31, 35.

Flood studies are ‘comprehensive technical assessment[s] of flood behaviour’ that ‘[provide] information on the extent, depth and velocity of flood waters, and on the distribution of flood flows’.¹⁸ They incorporate aerial photography, historic flood records, river surveys, streamflow analysis, local knowledge, and geological mapping.¹⁹ Typically, local councils work with regional catchment management authorities and the Victoria State Emergency Service (SES) to undertake flood studies in regional Victoria.²⁰ In the Port Phillip and Westernport region—which comprises all of urban Melbourne, including Maribyrnong²¹—local councils partner with Melbourne Water.²² Flood studies fill gaps in knowledge, and ‘provide a sound technical basis for developing calibrated and verified computer models’ that help the Government to understand:

- the probability of floods of different sizes occurring
- the effects of floods of different probabilities
- the probability that floods of a similar size to past events will occur.²³

Flood studies model certain hydrological inputs and hydraulic behaviour, calibrate these models against historical floods, and assess the scale of potential flood damages, among other things.²⁴ Government-funded flood studies must meet certain standards under the Victoria Flood Data and Mapping Guidelines. For example, they must:

- develop flood maps that make use of local knowledge and are vetted by the relevant catchment management authority
- cover a range of flood extents
- provide information that can be used and disseminated by emergency services.²⁵

To ensure flood studies have practical value, the Strategy requires that they produce the following outputs:

- draft Planning Scheme Amendments
- preferred elements for a Total Flood Warning System
- preferred options for flood mitigation measures
- drafts of the relevant components of the Municipal Flood Emergency Plan.²⁶

¹⁸ Ibid., p. 105.

¹⁹ The *Statement of Obligations for Catchment Management Authorities* issued under s 186A of the *Water Act 1989* (Vic) requires catchment management authorities to ‘collect, maintain and enhance flood information’ for their region, participate in flood mapping, provide technical assistance, and ensure that this information is provided to the Department for inclusion in state-wide databases.

²⁰ Victorian Government, *Submission 295*, p. 58.

²¹ Port Phillip and Western Port Regional Catchment Strategy, *Urban Melbourne*, <<https://portphillipwesternport.rcs.vic.gov.au/local-areas/greater-melbourne>> accessed 24 April 2024.

²² Victorian Government, *Submission 295*, p. 59.

²³ Department of Environment, Land, Water and Planning, *Victorian Floodplain Management Strategy*, p. 28.

²⁴ Ibid., p. 31.

²⁵ Department of Environment, Land, Water and Planning, *Victorian Flood Data and Mapping Guidelines*, 2016, p. 9.

²⁶ Department of Environment, Land, Water and Planning, *Victorian Floodplain Management Strategy*, p. 32.

However, if there are compelling reasons not to do so, the Strategy explains that these outputs may not need to be produced.²⁷ It provides the example of sparsely populated rural areas, where the main outputs needed would be flood maps and draft planning scheme amendments.²⁸

The Government funds flood studies through regional floodplain management strategies.²⁹ According to its submission, the Government has funded 66 local and regional flood studies since the release of the Strategy in 2016.³⁰ A list of Government-funded flood studies, including the 66 mentioned, appears in Appendix D.

At a public hearing, Stuart Menzies, Director of State Planning Services at the Department of Transport and Planning, explained that '[t]here is an ongoing program of flood studies being updated, principally by floodplain management authorities'.³¹ In her evidence to the Inquiry, Hon Harriet Shing MLC, Minister for Water, noted that:

600 households were affected across the Moonee Valley, Maribyrnong and broader areas of the Maribyrnong catchment, but all around regional Victoria we are talking about thousands of impacted homes and properties. So this is work that we need to continue to refine and to improve, and this is where again the release of \$5 million in additional funding for flood studies has been particularly important and the incorporation of climate change as an impact on the risk profile that is being contemplated across flood-prone areas and future decision-making.³²

In a public hearing, Melbourne Water explained that it is in the process of providing new models for every catchment in Melbourne by 2026, and that these updated models will map flood levels for the present day as well for the year 2100. Managing Director Nerina Di Lorenzo said that the program is:

a nation-leading program, and we are well progressed, with models like the Maribyrnong starting to be available to guide awareness and preparedness, development and building design and physical mitigations where feasible.³³

Tim Wood, General Manager of Service Programs, elaborated that as part of this program Melbourne Water is:

working with the 38 councils across our operating region. As I mentioned before, until we get into the detail of every single study, it is estimated that there will be something like 250 flood studies that will come out of that process. We have started that program. The program works by working with each individual municipality. We have already completed three of those municipalities. We have just completed the Maribyrnong riverine model. We are working and have active projects in place, with various stages

²⁷ Ibid.

²⁸ Ibid.

²⁹ Department of Environment, Land, Water and Planning, *Implementation Snapshot: 2016–2022 Six Years of Delivery*, 2022, p. 3.

³⁰ Victorian Government, *Submission 295*, p. 59.

³¹ Stuart Menzies, Director, State Planning Services, public hearing, Melbourne, 11 October 2023, *Transcript of evidence*, p. 3.

³² Harriet Shing, Minister for Water, public hearing, Melbourne, 6 December 2023, *Transcript of evidence*, p. 5.

³³ Nerina Di Lorenzo, Managing Director, Melbourne Water, public hearing, Melbourne, *Transcript of evidence*, p. 3.

of completion, with 19 of the other municipalities. In the remaining ones we almost have agreements in place, and there are a couple more of that we are still working with. So we are pretty confident that that program is well in train to be delivered.³⁴

Regarding how the program is being funded, he told the Committee that:

Within our pricing submission we work with our economic regulator, the ESC, for a five-year pricing submission. In this current submission we sought an uplift of \$13 million for this program. We received that, and that is what we are using to roll the program out.³⁵

Section 4.8 examines Melbourne Water's updated flood modelling for the Maribyrnong River, which Melbourne Water released in April 2024.

Brad Drust, Chief Executive Officer of North Central Catchment Management Authority, acknowledged the Government's funding of flood studies and emphasised its importance in updating planning schemes and securing investment for flood mitigation infrastructure:

Close to \$7 million of investment directly linked to the work plan actions has been secured in the [North Central] region, with some highlights being: since the flood events of 2010–11 there have been 30 flood studies and management plans undertaken in the north-central region of Victoria, improving flood intelligence and planning for over 50 townships; planning scheme amendments to include an understanding of flood risks from these studies and plans in town developments have been completed for 10 townships; and significant investment has been secured for flood-mitigation infrastructure design and construction, with works undertaken or underway in nine communities to physically reduce the impact of flooding.³⁶

Likewise, Leigh Findlay from the Committee for Greater Shepparton noted the success of modelling in preventing the flooding of houses in the Goulburn Broken catchment area:

The final point we want to make is that there was overwhelming support and positive feedback on the accuracy of our flood mapping, and that underpins the smart development of housing in our community. On the Goulburn Broken CMA and council's planning controls, the feedback from everybody was that it was a standout success. For everything post 1974 that was flood-mapped, the feedback was that it was very, very accurate in terms of where the water got to. And of the housing that had been developed post 1974, there was not a house that went under.³⁷

³⁴ Tim Wood, General Manager, Service Programs, Melbourne Water, public hearing, Melbourne, 10 May 2024, *Transcript of evidence*, p. 14.

³⁵ Ibid.

³⁶ Brad Drust, Chief Executive Officer, North Central Catchment Management Authority, public hearing, Melbourne, 25 October 2023, *Transcript of evidence*, p. 47.

³⁷ Leigh Findlay, Board Chair, Committee for Greater Shepparton, public hearing, Shepparton, 13 September 2023, p. 20.

On the other hand, the Committee heard from stakeholders who suggested that councils and floodplain management authorities were not receiving adequate funding to conduct updated flood studies.

Focusing on rural councils, Rural Councils Victoria argued councils 'are too resource-stretched in planning to undertake the necessary strategic planning-scheme work'.³⁸ As a result, it contended that flood maps are 'outdated or inaccurate, leading authorities to base decisions on incorrect data and projections'.³⁹ To address this, Rural Councils Victoria called on the Government to 'provide extra resources to rural councils so that every rural area is supported in creating updated and localised flood mapping'.⁴⁰

Given what they described as the success of updated flood modelling in planning schemes, the Committee for Greater Shepparton contended that ongoing funding is needed for councils and floodplain management authorities to maintain updated planning schemes:

As detailed in the report, not one house in Greater Shepparton's newer residential developments was flooded, in contrast a number of homes predating contemporary mapping, controls and design remain uninhabitable with little prospect of a speedy rebuild.

...

It is vital the [Goulburn Broken Catchment Management Authority] and [Greater Shepparton City] Council continue to have access to funding to maintain their flood mapping, studies and planning schemes and to expand coverage to existing residential areas and to areas identified for future development. The process of review and updating is key to ensuring emerging or changing climate risks are modelled and addressed.⁴¹

The Committee also heard from stakeholders who questioned the adequacy of current flood modelling and mapping. For example, Mitchell Shire Council argued that:

Current flood and fire mapping which supports the Victorian Planning Process fails to appropriately consider future predicted areas of increasing vulnerability. This failure will result in increasing risk being transferred to future communities.⁴²

The Council recommended that the Victorian Government 'fund and coordinate an urgent, state-wide review of existing flood and fire overlays ... to ensure that they best represent current levels of risk and vulnerability'.⁴³

³⁸ Rural Councils Victoria, *Submission 559*, p. 7.

³⁹ Ibid.

⁴⁰ Ibid.

⁴¹ Committee for Greater Shepparton, *Submission 393*, p. 10.

⁴² Mitchell Shire Council, *Submission 521*, p. 20.

⁴³ Ibid.

Nick Wimbush, who has worked as a panel member for Planning Panels Victoria but appeared before the Committee in his individual capacity, called for greater transparency and peer reviews of flood modelling:

Probably one of the things that need to happen is that there is a degree of transparency in how the model is put together. It should be open for people to question the inputs to modelling, and I am not just talking about Melbourne Water; I am talking broadly, and there should be a high degree of peer review in a model. If it is a flood authority that does its own modelling internally, that is fine, but there should be external people – consultants, experts – who go through what has been done to see if it makes sense. It is not going to still probably cover every circumstance or stop every bit of flooding, but it will give you a much stronger sense of how to make sure that it is as good as it can be.⁴⁴

In a public hearing, Stuart Menzies from the Department of Transport and Planning explained that floodplain management authorities are typically responsible for ensuring the quality of their flood modelling. However, he noted that peer review does occasionally occur.⁴⁵

The Committee heard from stakeholders who strongly criticised aspects of Melbourne Water’s modelling of the Maribyrnong River, particularly as it relates to the Rivervue Retirement Village. Given its relevance to land use planning and other areas of flood management, Rivervue Retirement Village is discussed at Section 4.7.2.

Likewise, the Committee received evidence from various stakeholders including local councils about the difficulties of implementing flood studies into planning schemes, limiting their effectiveness. This is discussed in detail at Section 4.5.4.

The Committee commends Melbourne Water for its work in updating flood models across the Port Phillip and Western Port region, and particularly for the level of sophistication of the work in modelling flood levels for the year 2100 taking into account climate change for the first time. The Committee acknowledges the difficulty of implementing new information into planning schemes, and notes that while Melbourne Water has begun work to trigger changes in the relevant planning schemes, this has yet to occur.

The Committee accepts that flood studies are an effective tool for identifying flood risk. It acknowledges the Victorian Government’s efforts to fund flood studies and ensure their practical value since the 2010 and 2011 flood events, and following the release of the Strategy in 2016. Given their effectiveness, the Committee believes there is scope to expand the use of flood studies by ensuring councils and floodplain management authorities receive adequate funding to complete the work required to conduct and implement them.

⁴⁴ Nick Wimbush, public hearing, Melbourne, 12 October 2023, *Transcript of evidence*, p. 70.

⁴⁵ Stuart Menzies, *Transcript of evidence*, p. 7.

FINDING 6: Flood studies are an effective tool for assessing flood risk. However:

- they must use up-to-date methodologies, technology, and data
- there needs to be statewide coordination of the frequency they are conducted
- there should be statewide funding to ensure they are kept up to date.

RECOMMENDATION 7: That the Victorian Government ensure regional catchment management authorities, with local councils, are funded and resourced to conduct and implement up to date flood studies on a regular basis.

RECOMMENDATION 8: That the Victorian Government require peer review of publicly funded flood modelling as part of the next Victorian Floodplain Management Strategy.

RECOMMENDATION 9: That Melbourne Water and other floodplain management authorities review flood models every five years and update the models at least every 10 years and after the occurrence of a major flood.

4.3 Communicating flood risk

Where flood risk data exists, it is generally made available to the public and relevant authorities and informs various government activities. It is primarily used by catchment management authorities who have a legislated responsibility for managing floodplains, including:

- identifying the likely extent and height of flood waters
- declaring flood levels, flood fringe areas and building lines
- controlling development in land adjoining waterways
- developing and implementing plans to minimise flood damage
- advising municipal councils, the Department of Energy, Environment and Climate Action and the community in relation to flooding and controlling development in inundation-prone areas.⁴⁶

As well as responsible authorities, it is also important that individuals and communities understand their flood risk. This is so they can adequately plan and prepare in the event of flooding. Community preparedness is discussed further in Chapter 6.

⁴⁶ *Water Act 1989 (Vic)* s 202.

4.3.1 Communicating risk to individuals and communities

As evidenced by the October 2022 flood event, flooding has the potential to impact people’s social, emotional, physical and financial wellbeing. Victoria has implemented a shared responsibility approach to emergency management, meaning individuals and communities are expected to participate in planning for, responding to and recovering from emergencies, including major flood events.⁴⁷ As such, it is vital that Victorians have access to relevant flood information in order to understand their individual flood risk.

The Committee was told effective communication is key to achieving an appropriate level of understanding of flood risk among Victorians. The Victorian Government acknowledges this in the Victorian Floodplain Management Strategy, particularly in regard to land subject to inundation by floods less likely than a 1% AEP flood.⁴⁸ Because land use planning provisions do not generally apply to these floodplains, the Strategy notes it is important for people living and working in these areas to be able to make informed decisions about the risks they face:

The Victorian Government will seek to ensure that individuals can have full disclosure of the flood risks associated with their property, not just information relating to the 1% Annual Exceedance Probability flood.⁴⁹

In the context of major emergencies, the State Emergency Management Plan notes that ‘[t]he community needs information to make informed choices about their safety and to take responsibility for their own recovery’.⁵⁰ In doing so, it outlines the Emergency Management Commissioner’s communications responsibilities in relation to flood (and other) emergencies. These include:

- ensuring warnings are issued
- ensuring the relevant Minister is given up-to-date information
- with the Victoria SES, handling public, stakeholder and government communications.⁵¹

These responsibilities relate primarily to the response and recovery phases of flood emergency management and are covered in Chapters 7 and 8 of this Report. This Section deals principally with individuals’ and communities’ awareness of flood risk prior to the occurrence of a flood event.

⁴⁷ Emergency Management Commissioner, *Victorian State Emergency Management Plan*, Emergency Management Victoria, Melbourne, 2023, p. 10.

⁴⁸ Department of Environment, Land, Water and Planning, *Victorian Floodplain Management Strategy*, pp. 86–87.

⁴⁹ *Ibid.*, p. 86.

⁵⁰ Emergency Management Commissioner, *Victorian State Emergency Management Plan*, p. 27.

⁵¹ *Ibid.*, p. 27.

Access to flood mapping and other intelligence

Formerly, flood risk data collected through flood studies and elsewhere was uploaded into one of two databases:

- a central database known as the Victorian Flood Database
- Melbourne Water’s Flood Database.⁵²

Information in these databases informed local planning schemes, the assessment of applications to develop in floodplains (planning permits), and emergency response planning and coordination.⁵³

In 2022, the Department of Energy, Environment and Climate Action (then referred to as the Department of Environment, Land, Water and Planning) integrated the two databases into a web-based flood intelligence platform called FloodZoom.⁵⁴ FloodZoom synthesises flood forecasts, flood mapping, real-time river height gauges and property data to provide flood response agencies with improved knowledge of likely floods before, during and after a flood event.⁵⁵

Through the integration of the two databases, Action 12b of the Strategy required the Department and Melbourne Water to ‘to provide Victorians with a single point of entry to readily accessible and authoritative records of flood data in Victoria’. Despite this, FloodZoom is not a public platform.⁵⁶ Rather, as the Victorian Government’s submission explained it is ‘a specialist tool built for trained flood analysts and hydrologists’.⁵⁷

In their evidence to the Committee, the Department of Energy, Environment and Climate Action’s Water and Catchments Group explained that in future the Digital Twin Victoria program would make more flood information available, becoming in essence ‘the public-facing component of FloodZoom’.⁵⁸ They elaborated that the platform could be used by individuals to plan and prepare for their relevant flood risk:

I think that will really be for planning purposes as well. So before an event if you wanted to understand your flood risk, that is not just in the planning scheme, which may be a one in 100, as we talk about. You might want to understand your risk at lower events or larger events. You will be able to have access. We sort of have access now. You can go out to a CMA and you can ask about a property, and they will provide that free of charge. In Melbourne Water I think there is a portal you can ask and you can get advice

⁵² Department of Environment, Land, Water and Planning, *Victorian Floodplain Management Strategy*, p. 35.

⁵³ Ibid.

⁵⁴ Department of Environment, Land, Water and Planning, *Implementation Snapshot: 2016–2022 Six Years of Delivery*, p. 6.

⁵⁵ Department of Energy, Environment and Climate Action, *Long-term preparation for flooding, 2023*, <<https://www.water.vic.gov.au/our-programs/floodplain-management/long-term-preparation-for-flooding>> accessed 5 April 2024.

⁵⁶ Department of Environment, Land, Water and Planning, *Victorian Floodplain Management Strategy*, p. 35.

⁵⁷ Victorian Government, *Submission 295*, p. 59.

⁵⁸ Andrew Fennessy, *Transcript of evidence*, p. 13.

around certain flood areas. What we are trying to do is streamline that and make that available before an event for everyone so you can prepare going forward.⁵⁹

Notwithstanding this, flood maps and other forms of intelligence are typically made available to the public. For example, the Victoria SES makes flood information available in their local flood guides (see Figure 4.2).⁶⁰

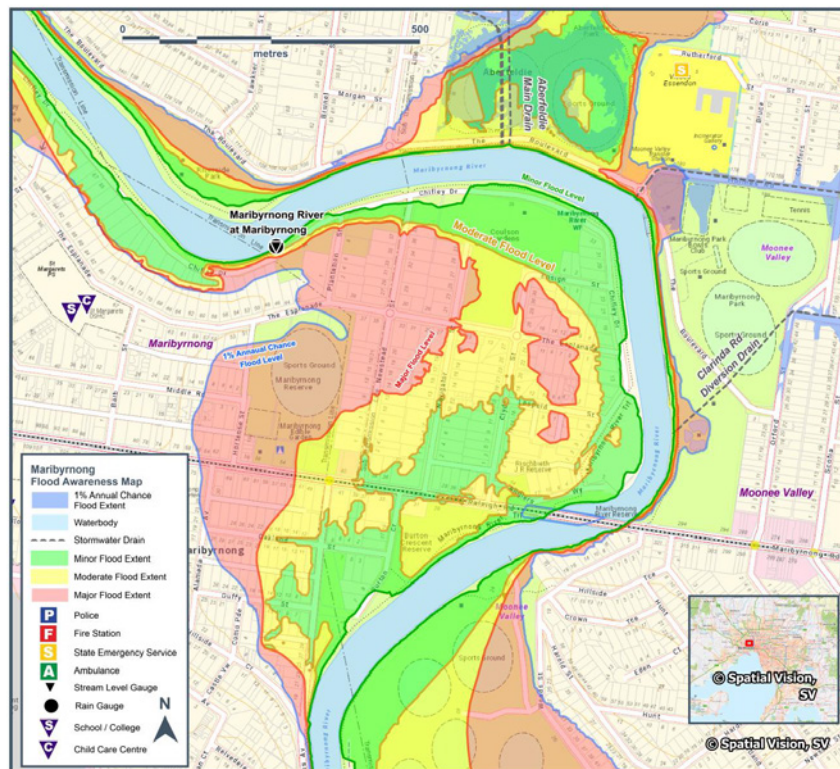
Figure 4.2 Example of flood information from the Maribyrnong flood guide

Maribyrnong River

The Maribyrnong Township is located approximately 8km north west of Melbourne’s central business district. It comprises a mix of residential, business, and public use areas. The Maribyrnong River is the main watercourse in the area formed by the junction of Jacksons Creek and Deep Creek and flows generally southward. The Maribyrnong River borders the Maribyrnong township to the north, east and south.

The Maribyrnong River has a large upstream catchment and flooding can occur along the developed floodplain edges. The Maribyrnong township can be severely impacted by riverine flooding and the increase in population density and intensification of land use will result in increased flood risks. Maribyrnong has a number of parks mostly near the Maribyrnong River. These reserves are typically unsuitable for development due to the risk of flooding and have been established as gardens and reserves.

The following map shows the expected flooding during minor, moderate and major flood events, in addition to a 1% flood event in the Maribyrnong Township. A 1% flood means that there is a 1% chance of a flood of this size occurring in any one year.



Disclaimer
 This map publication is presented by Victoria State Emergency Service for the purpose of disseminating emergency management information. The contents of the information have not been independently verified by Victoria State Emergency Service. No liability is accepted for any damage, loss or injury caused by errors or omissions in this information or for any action taken by any person in reliance upon it. Flood information is provided by Melbourne Water.

Source: Victoria State Emergency Service, *Maribyrnong Local Flood Guide*, 2022, p. 2.

59 Michael Jenz, Executive Director, Statewide Infrastructure and Rural Strategy, public hearing, Melbourne, 25 October 2023, *Transcript of evidence*, p. 13.

60 See, for example: Victoria State Emergency Service, *Echuca Local Flood Guide*, 2023, <<https://www.ses.vic.gov.au/documents/8655930/9320037/Echuca+Local+Flood+Guide++August+2023.pdf>> accessed 3 April 2024, pp. 2-5.

Likewise, many catchment management authorities and councils maintain their own flood intelligence platforms for public use,⁶¹ or provide information to individuals on request. Greater Shepparton Council also described working with emergency services such as the Victoria SES and catchment management authorities to conduct events designed to communicate flood risk to communities.⁶²

The Committee for Greater Shepparton's submission noted the importance of making flood mapping data available to the public, praising Goulburn Broken Catchment Management Authority's public-facing flood intelligence platform:

It is also important to recognise the role flood mapping plays in community and industry preparedness for flood events. The GBCMA's Community Flood Intelligence Portal provided an invaluable source of trusted information and reassurance to the community leading into and during the October 2022 floods. It also allowed volunteers under the guidance of Council to doorknock and engage with community members most at risk of flooding to assist their preparations including relocation.⁶³

The Committee acknowledges that—by providing meaningful flood information to flood analysts, hydrologists, and catchment management authorities—the Department of Energy, Environment and Climate Action's FloodZoom database effectively underpins Victoria's flood readiness and response. As mentioned, however, Action 12b of the Strategy required the Department and Melbourne Water, through FloodZoom, to provide Victorians with accessible and authoritative records of flood data. Given that it is not publicly accessible, FloodZoom does not yet fully satisfy this Action.

FINDING 7: Since the integration of the Victorian Flood Database and Melbourne Water's Flood Database into FloodZoom, there is no sufficiently publicly accessible statewide database of flood risk information and maps. FloodZoom is limited to flood analysts, particularly those deployed in the State Control Centre and incident control centres.

RECOMMENDATION 10: That the Victorian Government provide Victorians with access to appropriate data contained within the FloodZoom platform.

The Committee considers improving public awareness of local flood guides below.

Vendor disclosure statements

The Strategy notes that 'people considering whether to buy properties on floodplains should be informed about flood risks before deciding to buy'.⁶⁴ At present, the *Sale*

⁶¹ See, for example, Corangamite Shire Council, *Corangamite Flood Portal*, <https://flood.ccmaknowledgebase.vic.gov.au/flood_map.php?agreement=Agree+and+Continue> accessed 20 February 2024.

⁶² See Peter Harriott, Chief Executive Officer, Greater Shepparton City Council, public hearing, Shepparton, 13 September 2023, *Transcript of evidence*, p. 8.

⁶³ Committee for Greater Shepparton, *Submission 393*, p. 10.

⁶⁴ Department of Environment, Land, Water and Planning, *Victorian Floodplain Management Strategy*, p. 87.

of *Land Act 1962* (Vic) requires vendors under contract for a sale of land to give the purchaser a statement of matters affecting the land being sold (i.e., a vendor disclosure statement).⁶⁵ Vendor disclosure statements must be signed prior to the contract being signed and must cover:

- financial matters⁶⁶
- insurance details⁶⁷
- whether the land is in a bushfire-prone area⁶⁸
- any planning controls.⁶⁹

Because the Act requires vendors to disclose any zoning and overlays that apply to a piece of land for sale, the Strategy explains that '[p]eople buying land in municipalities that incorporate flood provisions into their local Planning Schemes already receive [flood probability] information on disclosure statements'.⁷⁰ However, this assumes that all relevant planning schemes reflect the most up-to-date flood information. As discussed in Section 4.5, this is not always the case. Because planning controls typically only apply to areas within a 1% AEP flood level, vendors may not be required to disclose flood risk information about properties outside this level.

The Strategy proposes two options for requiring vendors to communicate flood risk to people purchasing land in these floodplains:

- designating flood-prone areas, including land subject to inundation less than the 1% AEP, in Building Regulations, and therefore requiring them to be included in flood maps made available to the public
- requiring vendor disclosure statements to include a simple statement advising purchasers that it is in their interest to investigate and understand any flood risk.⁷¹

Noting that '[e]ither approach would require legislative change' and 'increase the demand to make flood maps publicly available', the Strategy committed the Victorian Government to consulting with Consumer Affairs Victoria to determine administrative and legal issues involved in including flood risk information on vendor disclosure statements.⁷² By 2022, the Government had completed this work, concluding that the current arrangements were adequate to address flood risk.⁷³

The Committee understands that, under the *Sale of Land Act*, vendors must disclose flood-related planning controls. However, due to a backlog of flood studies to be implemented into planning schemes, not all planning controls reflect the most

⁶⁵ *Sale of Land Act 1962* (Vic) s 32.

⁶⁶ *Sale of Land Act 1962* (Vic) s 32A.

⁶⁷ *Sale of Land Act 1962* (Vic) s 32B.

⁶⁸ *Sale of Land Act 1962* (Vic) s 32C(b).

⁶⁹ *Sale of Land Act 1962* (Vic) s 32C(d).

⁷⁰ Department of Environment, Land, Water and Planning, *Victorian Floodplain Management Strategy*, p. 87.

⁷¹ *Ibid.*

⁷² *Ibid.*

⁷³ Department of Environment, Land, Water and Planning, *Implementation Snapshot: 2016–2022 Six Years of Delivery*, p. 8.

up-to-date flood information. Moreover, because planning controls do not generally cover land subject to inundation beyond the design flood event, vendors are not required by legislation to disclose flood risk that is less likely than the 1% AEP flood.

As highlighted throughout this Chapter, the Victorian Government funds an ongoing program of flood studies and planning scheme amendments across Victoria and particularly in regional catchments to translate updated flood information into planning controls. Likewise, Melbourne Water is in the process of updating flood models for the entirety of its region by 2026. As this work is completed, planning controls will become more accurate, and this will improve the ability of vendor disclosure statements to communicate flood risk. Notwithstanding this, there is an opportunity for legislation to require vendors to better inform purchasers of their potential flood risk.

FINDING 8: Vendor disclosure statements under the *Sale of Land Act 1962 (Vic)* do not adequately disclose flood risk to purchasers of lands.

RECOMMENDATION 11: That the Victorian Government introduce amendments to the *Sale of Land Act 1962 (Vic)* to require vendor disclosure statements to include a simple statement on flood risk. In addition, houses or dwellings previously flooded must be included in any vendor declaration statement.

Notifying residents of flood risk

Despite the above, the Committee heard from stakeholders who questioned the public's—and in particular, landowners'—knowledge of relevant flood information, including flood zones and overlays.

In his submission, Dr Peter Mitchell noted that Seymour's flood controls appeared to cover most properties impacted by the 2022 flood, but questioned Seymour residents' awareness of these zones and overlays:

I would like to see all current and new property owners within these zones/overlays individually notified that they are in a flood zone and – based on any new information from 2022 – the likely height of floods on all properties. People cannot make good decisions without the information. How do we check that the information is available, and they are fully aware of the risk before they buy, and are not just relying on the lawyer reviewing contracts?⁷⁴

Echuca Neighbourhood House's submission suggested that the Government:

Based on previous flood levels, identify and communicate with those residents and business owners to ensure possessions and property are relocated to secure premises.⁷⁵

⁷⁴ Dr Peter Mitchell, *Submission 620*, p. 5.

⁷⁵ Echuca Neighbourhood House, *Submission 66*, p. 2.

This kind of action is not unprecedented. As mentioned, local councils and the Victoria SES engage in community engagement activities to help Victorians understand their flood risk.

Dr Faye Bendrups, President of the Victoria SES Volunteers Association, praised a Maribyrnong City Council program that developed a profile of each property in Maribyrnong that would be exposed to over-floor flooding, explaining:

[I]n 2013, so 10 years ago now, the Maribyrnong council developed, under the direction of Theo Pykoulas, a groundbreaking community engagement program which developed up a profile of each property that would be exposed to over-floor flooding – did a generic chart of each of those properties but with the individual address with all sorts of information on it and all sorts of advice as well on the back, laminated so that people could keep it on their fridge, delivered in a plastic pink folder so it would not get lost and damaged. But that was for every property that was at risk of over-floor flooding in the Maribyrnong township.⁷⁶

The program, she explained, involved the Footscray SES unit knocking on residents' doors, and later providing residents a number of resources:

They received the local flood guide, a hard copy of it for themselves. They received instructions on how to do sandbagging. That is the cover letter. They received an emergency toolkit brochure. They receive the booklet that is the home emergency plan and so forth. So in other words there were a lot of resources they received that gave them a lot of information in their hand as well as speaking directly to people by the SES volunteers who were doing the doorknock.

That program I believe won an award for community resilience.⁷⁷

Despite the effectiveness of the program, Dr Bendrups noted that doorknocks of this kind had not been conducted again since 2013.

Alongside community engagement programs, stakeholders stressed to the Committee the importance of ensuring planning schemes were updated with the most recent flood mapping and data, so that planning schemes reflect the most up-to-date information. Section 4.5.4 discusses the implementation of flood studies into planning schemes.

The Committee notes that while flood maps and appropriate vendor disclosure statements are an important means of providing comprehensive information on flood risk to Victorians, there is an opportunity for local government to engage with communities to enhance the public's understanding of this risk.

⁷⁶ Dr Faye Bendrups, President, Victoria SES Volunteers Association, public hearing, Melbourne, 11 October 2023, *Transcript of evidence*, p. 57.

⁷⁷ *Ibid.*

RECOMMENDATION 12: That Emergency Management Victoria work with local government authorities and local State Emergency Service units to provide access to local flood guides to all residents in a flood zone, that identify the likely flood impacts on individual properties.

4.4 Mitigating flood risk

After assessing flood risk, governments are well-placed to plan for and ultimately mitigate these risks. The Floodplain Management Strategy identifies numerous ways in which the Victorian Government might avoid or minimise future flood risks. These include:

- land use planning
- building controls
- mitigation infrastructure
- warning systems
- education programs
- emergency responses.⁷⁸

Flood mitigation infrastructure, warning systems, and emergency responses are considered in Chapters 5–7 of this Report. The remainder of this Chapter deals with the role of individuals in mitigating flood risk and explores land use planning and building regulations as a means of flood mitigation.

4.4.1 Individual preparedness

Under the State Emergency Management Plan, individuals, families and households share responsibility for emergency management with the emergency management sector. The Plan sets out expectations for individuals, families and households to:

Mitigate emergency risk to oneself and others in the family and household, support response activities by the [emergency management] sector and meet their own relief and recovery needs where possible, including planning for the specific needs of those in the family or household most at-risk in emergencies.⁷⁹

Regarding mitigation and planning, the Plan expects individuals, families and households to:

- be aware of potential risks in their environment
- take protective measures including taking out insurance

⁷⁸ Department of Environment, Land, Water and Planning, *Victorian Floodplain Management Strategy*, p. 39.

⁷⁹ Emergency Management Commissioner, *Victorian State Emergency Management Plan*, p. 11.

- develop emergency plans
- keep emergency plans current and ready to implement
- after an emergency, review and improve emergency plans.⁸⁰

As mentioned, the Victoria SES makes local flood guides available for different municipalities. Typically, these guides contain information about local flood risk, maps indicating the 1% AEP flood, and an emergency checklist.⁸¹ They also outline what residents should include in their emergency toolkits and refer residents to the Australian Red Cross' website for help creating emergency plans.

Throughout this Report, the Committee highlights the profound impact of the October 2022 flood event on individuals and communities. Moreover, it spotlights the incredible efforts of flood-affected Victorians in all stages of managing, responding to and recovering from the flood event. The Committee acknowledges the importance of individuals and communities maintaining responsibility for understanding and managing their own flood risk. However, it is incumbent on the Victorian Government—in collaboration with local government—to ensure that these individuals and communities understand their responsibility, and that they are appropriately equipped to do so.

RECOMMENDATION 13: That the Victorian Government improve individual and community awareness about their own roles and responsibilities in emergency management, and make available information resources for preparing for flood and other emergencies.

4.4.2 Catering for people with additional needs

Appropriate communication of flood risk to people with additional needs is vital to ensuring that all Victorians—including Victorians with disability—have the appropriate information and supports in place to effectively plan and prepare for flood.

Anne-Marie Roberts from Greater Bendigo City Council emphasised the importance of emergency preparedness for people in vulnerable groups:

I just wanted to make a bit of a note on an earlier comment about preparedness and the level of preparedness for people. It is really interesting. It is a really challenging space to work in for people to be planning, but again a priority for us in local government is that we do a lot of resilience and preparation within community but it is a whole-of-agency approach, so we advocate through the NDIS around having emergency preparedness planning within systems to support vulnerable people. We want agencies on board to

⁸⁰ Ibid., p. 62.

⁸¹ See, for example, Victoria State Emergency Service, *Echuca Local Flood Guide*, 2023, <<https://www.ses.vic.gov.au/documents/8655930/9320037/Echuca+Local+Flood+Guide+-+August+2023.pdf/68d70501-70d6-3266-d84a-7a772aa1964e?t=1694069163682>> accessed 3 April 2024.

ensure that they understand the priority for people in those vulnerable categories, for example, disability, aged, disconnected, so that there is not just a reliance on an agency to get that messaging out, but it is supportive – [...] it is people centred.⁸²

At a public hearing, Leah Taaffe, Chief Executive Officer of Community Living and Respite Services, contended that ‘there are significant gaps at every level of government in relation to planning, response and recovery,’ and that the emergency management framework ‘absolutely does not consider vulnerable people and how to ensure they are supported through emergencies and natural disasters’.⁸³ She called for emergency management agencies to be required to embed resources for people with disability into their systems:

As part of the NDIS practice standards, registered NDIS service providers like us are required to meet the recently created outcome of ‘emergency and disaster management’, which includes planning that ensures that the risks to the health, safety and wellbeing of participants that may arise in an emergency or disaster are considered and mitigated and ensures the continuity of supports critical to the health, safety, and wellbeing of participants in an emergency or disaster. This is really important work that should be completed, albeit it has only been done by registered providers. But that work is absolutely futile if emergency management systems and organisations are also not required to embed resources and requirements for people with disability.⁸⁴

Despite the requirement for National Disability Insurance Scheme service providers to undertake emergency planning with their clients, Maribyrnong City Council’s submission noted that this did not always occur:

Finally, a number of people were evacuated into the relief centre who arrived without critical essential medical aides and medication. Some carers were unsure of what to do and clearly had not undertaken emergency planning with their client prior to the flood. Evidence exists that people living with disability are disproportionately impacted by emergencies and that a shared responsibility approach needs to be taken. At the municipal level of planning, it is not clear who is responsible to lead this work as Council no longer has the same engagement with high risk communities as we did in the past with many services now provided via funded NDIS providers and clients.⁸⁵

In its submission, the Salvation Army highlighted research that demonstrated that ‘people who are affected by disasters and are vulnerable along one dimension such as living in poverty are often also vulnerable along other dimensions (such as, age, gender, disability status, level of disaster exposure)’.⁸⁶ It suggested the need for ‘government emergency management plans and frameworks to explicitly recognise the relationship between disaster risk and vulnerability during the phases of disaster preparedness, impact, response, and recovery’.⁸⁷

⁸² Ann-Marie Roberts, Greater Bendigo City Council, public hearing, Echuca, 24 August 2023, *Transcript of evidence*, p. 16.

⁸³ Leah Taaffe, Chief Executive Officer, Community Living and Respite Services, public hearing, Echuca, 24 August 2023, *Transcript of evidence*, p. 63.

⁸⁴ Ibid.

⁸⁵ Maribyrnong City Council, *Submission 530*.

⁸⁶ The Salvation Army, *Submission 619*, p. 7.

⁸⁷ Ibid., p. 53.

Disaster Legal Help Victoria underscored the fact that vulnerable communities face additional barriers in planning and preparing for flood disasters:

DLHV is concerned that the burden of responsibility for disaster preparedness is currently weighted too heavily on individual community members, including the responsibility to stay up to date with disaster risks and make disaster plans. The expectation that individuals will stay informed and be self-reliant in disasters is not realistic and does not account for community members who face systemic barriers in accessing information and preparing for disasters. These may include First Nations communities, Culturally and Linguistically Diverse communities, and people with disabilities. Community members who are in financial distress may also lack time and resources to stay informed and prepare for disasters.⁸⁸

It called for ‘improved information and communication campaigns from government that achieve a wider reach’, and which are co-designed with vulnerable communities to ‘ensure that information and communication is tailored and specific to differing needs and circumstances’.⁸⁹ It also called for ‘programs and initiatives that proactively support community members with disaster planning’, which would in turn ‘make disaster preparedness more achievable for many’.⁹⁰

The Committee acknowledges the importance of individuals and communities sharing responsibility with the emergency management sector in managing their flood risk. However, it emphasises the importance of recognising and addressing that vulnerable communities in Victoria—such as people with disability—sometimes face additional barriers in planning and preparing for flood. Therefore, the Victorian Government must ensure the emergency sector appropriately caters to the needs of these communities, particularly in the planning and preparedness phases of emergency management.

RECOMMENDATION 14: That the Victorian Government require the emergency management sector to ensure that the needs of vulnerable communities including people with disability are included in all disaster preparation and response plans and ensure that sufficient funding is available to make all disaster emergency responses inclusive for people with disability.

RECOMMENDATION 15: That the Victorian Government provide flood risk and planning information in a way that is appropriately accessible to people with additional needs, including people with disability.

RECOMMENDATION 16: That the Victorian Government ensure early warning systems include consideration of a voluntary register of people in need of additional support to receive early warning and support during natural disasters.

⁸⁸ Disaster Legal Help Victoria, *Submission 622*, p. 4.

⁸⁹ *Ibid.*, p. 4.

⁹⁰ *Ibid.*

4.5 Land use planning and flood risk

Peter Harriott, Chief Executive Officer, Greater Shepparton City Council

Planning is so important. ... If there is a message coming out of today: we need to support planning schemes going forward, and the key to that is for the flood studies that are prepared by the catchment management authority, supported by council, are critical to getting the data accurate.

Source: Peter Harriott, Chief Executive Officer, Greater Shepparton City Council, public hearing, Shepparton, 13 September 2023, *Transcript of evidence*, p. 2.

In its submission, the Victorian Government identified Victoria's planning and building systems as essential for identifying and managing flood risk.⁹¹ Although inter-related, the two systems are technically distinct. The planning system refers to the system governing the use, development and protection of land in Victoria. On the other hand, the building system regulates the construction of buildings and other structures.

The Government's Guidelines for Development in Flood Affected Areas explain that most forms of development require some mix of planning or building permits:

Building permits relate specifically to the carrying out of building construction. Most forms of development in flood affected land require a planning permit. They include subdivisions, buildings and works.

If building construction is proposed in a flood affected area or in a waterway, Building Regulations 153 or 154 also apply, unless dealt with through the planning permit system.⁹²

Although the planning and building systems are in many ways distinct, the 2020 Royal Commission into National Natural Disaster Arrangements further explained that together, '[I]and-use planning regimes and building regulations govern how and where homes, businesses and infrastructure are built'.⁹³ As they relate to natural disasters like flood, the Royal Commission elaborated that they 'influence the exposure and vulnerability of structures and communities to natural hazards' and 'can also be used to mitigate risk and improve resilience'.⁹⁴

This Section deals principally with the role of Victoria's planning system in managing flood risk. However, Section 4.6 briefly considers the role of Victoria's building system in flood management, particularly in relation to the building of houses in floodplains.

⁹¹ Victorian Government, *Submission 295*, p. 92.

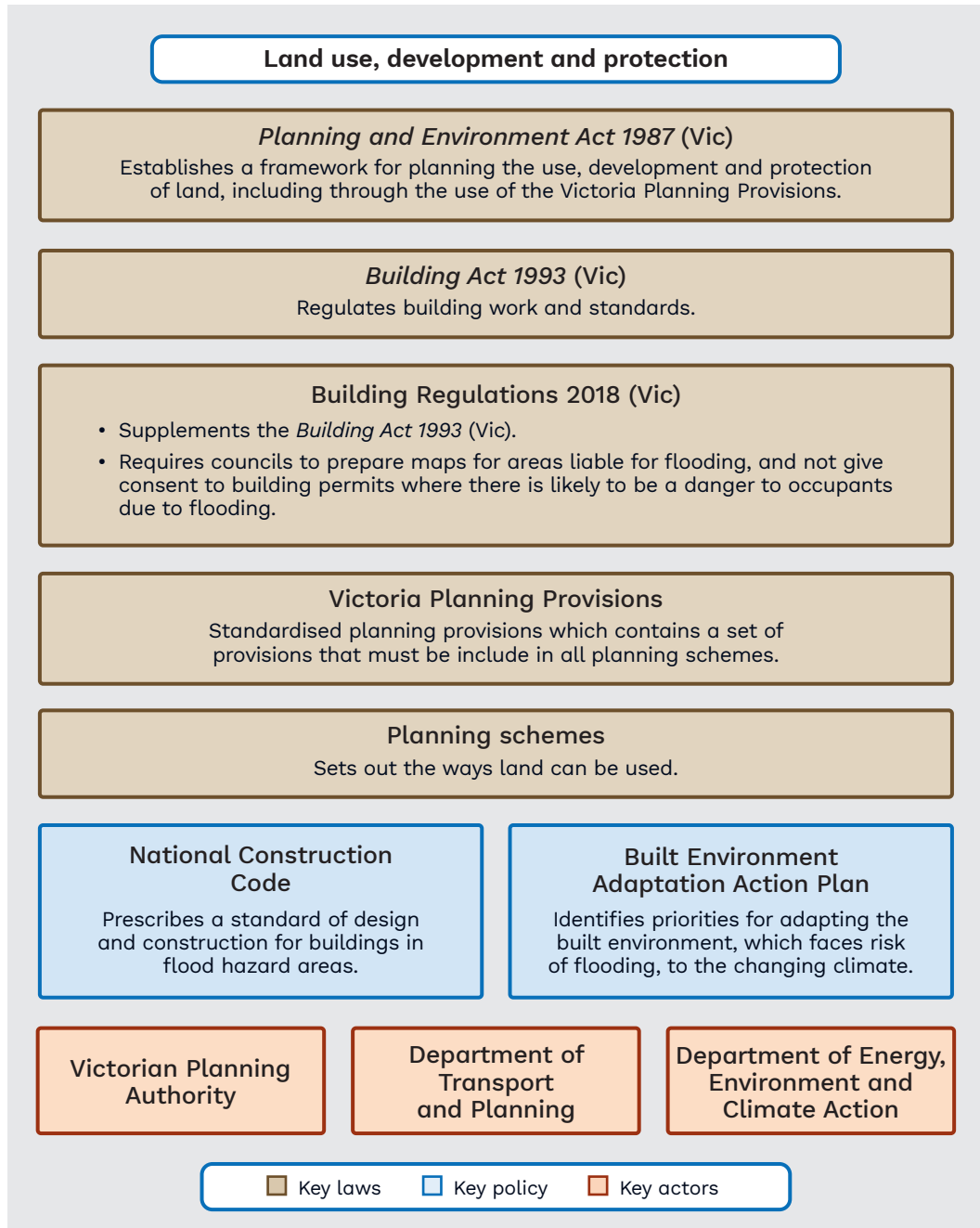
⁹² Department of Environment Land, Water and Planning, *Guidelines for Development in Flood Affected Areas*, p. 17.

⁹³ Royal Commission into National Natural Disaster Arrangements, *Report*, Australian Government, 2020, p. 399

⁹⁴ *Ibid.*

Figure 4.3 summarises the key legislation, policy and actors relevant to Victoria’s planning and building systems as they relate to flood management.

Figure 4.3 Victoria’s planning and building systems, as relevant to flood management



Source: Legislative Council Environment and Planning Committee.

4.5.1 Mitigating flood risk through strategic land use planning

Land use planning is one of the Victorian Government's primary means of mitigating flood risk because of its efficacy and cost efficiency. The Victorian Floods Review stressed the importance of land use planning as an effective flood mitigation measure.⁹⁵ Likewise, the Victorian Floodplain Management Strategy explains that:

Land use planning and building controls are generally more cost effective than flood mitigation infrastructure, flood warning systems, flood education programs or flood emergency responses.

This is particularly true for new subdivisions.

In its submission, the Municipal Association of Victoria also pointed to the potential benefits of focusing on strategic land use planning over hard mitigation infrastructure:

While investment in infrastructure will continue to be important to protect life and property in the short to medium term, investment in strategic planning for settlements that accounts for flood and other hazard risk will be essential for saving money and lives in the longer term.⁹⁶

Several levels of Victoria's planning system consider flood risk, with mitigation occurring primarily through the use of controls in planning schemes.

4.5.2 An overview of Victoria's planning system

As outlined in Chapter 3, the *Planning and Environment Act 1987* (Vic) establishes a framework for planning the use, development and protection of land in Victoria.⁹⁷ Among other things, it facilitates the creation of the Victoria Planning Provisions,⁹⁸ as well as the preparation and amendment of planning schemes.⁹⁹

Victoria Planning Provisions

The Victoria Planning Provisions is a document of standard planning provisions created under the Planning and Environment Act.¹⁰⁰ It is intended to assist in providing a consistent and coordinated framework for planning schemes.¹⁰¹ Some sections, like the Planning Policy Framework, are required to be included in all planning schemes.¹⁰²

⁹⁵ Neil Comrie AO, APM, *Review of the 2010–11 Flood Warnings & Response*, Victorian Government, Melbourne, 2011, p. 17.

⁹⁶ Municipal Association of Victoria, *Submission 681*, pp. 15–16.

⁹⁷ *Planning and Environment Act 1987* (Vic) s 1.

⁹⁸ *Planning and Environment Act 1987* (Vic) s 4A.

⁹⁹ *Planning and Environment Act 1987* (Vic) s 8.

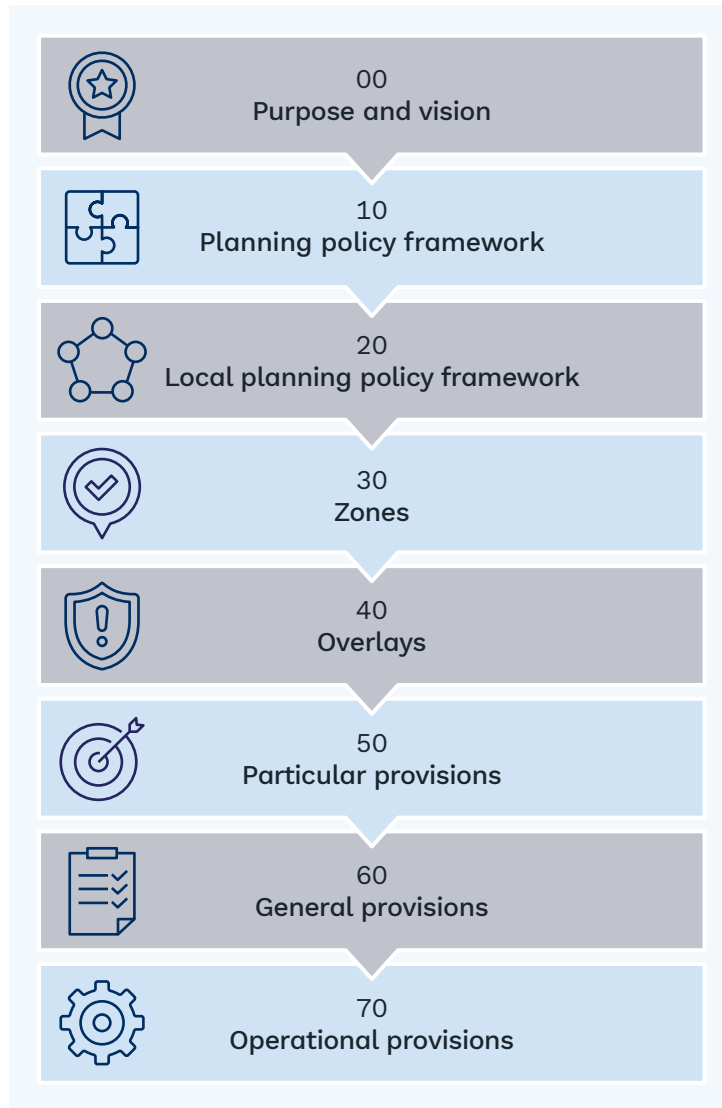
¹⁰⁰ Department of Environment Land, Water and Planning, *Using Victoria's Planning System*, October 2022, p. 1.

¹⁰¹ *Planning and Environment Act 187* (Vic) s 4A.

¹⁰² See Victoria, *Victorian Government Gazette*, No. S 87, 2 March 2023, pp. 2–3.

Figure 4.4 shows the broad structure of the Victoria Planning Provisions. Given the document acts as a template for planning provisions, the structure resembles the structure of most planning schemes.

Figure 4.4 Structure of the Victoria Planning Provisions



Source: Department of Transport and Planning, *Victoria Planning Provisions*, 2024, <<https://planning-schemes.app.planning.vic.gov.au/Victoria%20Planning%20Provisions/ordinance>> accessed 27 May 2024.

The Provisions' Planning Policy Framework, which is replicated in all planning schemes, contains numerous flood-related ordinances. The Framework's floodplains ordinance requires the relevant planning authority to identify any land affected by flooding and to plan for the cumulative impacts of land use and development on flood behaviour.¹⁰³

¹⁰³ *Victoria Planning Provisions (Vic) cl 13.03-1S.*

It also requires planning authorities to consider the Victorian Floodplain Management Strategy and other policy documents and guidelines, such as regional floodplain management strategies.¹⁰⁴ Similarly, the Framework's water ordinance contains a number of flood-related strategies for planning authorities, including:

- undertaking measures to minimise the quantity and retard the flow of stormwater from developed areas¹⁰⁵
- ensuring planning is coordinated with the activities of catchment management authorities¹⁰⁶
- discouraging incompatible land use activities in areas subject to flooding.¹⁰⁷

Whereas the bushfire planning provision prioritises the protection of human life over all other policy considerations,¹⁰⁸ the floodplain management provisions do not contain an equivalent purpose. While the provisions do intend to assist the protection of life from flood hazard,¹⁰⁹ this is arguably a much broader objective. In a public hearing, Goulburn Broken Catchment Management Authority recommended updating the flood provisions of the Victoria Planning Provisions to integrate human life into the flood decision-making framework:

[W]e think that that would be an improvement in terms of the decisions that are being made across the flood plain and the way that flood studies and flood mapping and everything are actually being interpreted to enable people to be protected as number one.¹¹⁰

Planning schemes

Using the Victoria Planning Provisions as a template, planning schemes control how land can be used or developed within particular areas, usually municipal districts, and reflect state and local planning policies. In line with the Provisions, they are comprised primarily of maps and ordinances. Maps within planning schemes describe where planning controls such as zones and overlays apply within the planning scheme area. Ordinances, on the other hand, comprise policies and written clauses.¹¹¹

In flood-prone areas, municipal councils may use planning schemes to manage flood risk to their communities, for example through the use of planning controls. Zones within planning schemes reserve land for specific uses, including urban floodways. Overlays prescribe requirements which must be met by development in the areas covered. Flood-related planning controls are discussed in greater detail at Section 4.5.3.

¹⁰⁴ *Victoria Planning Provisions (Vic)* cl 13.03-1S.

¹⁰⁵ *Ibid.*, cl 14.02-1S.

¹⁰⁶ *Ibid.*

¹⁰⁷ *Ibid.*, cl 14.02-2S.

¹⁰⁸ *Ibid.*, cl 13.02-1S.

¹⁰⁹ *Ibid.*, cl 13.03-1S.

¹¹⁰ Chris Cumming, Chief Executive Officer, Goulburn Broken Catchment Management Authority, public hearing, Melbourne, 25 October 2023, *Transcript of evidence*, p. 68.

¹¹¹ Department of Transport and Planning, *Victoria Planning Provisions*, <<https://planning-schemes.app.planning.vic.gov.au/Victoria%20Planning%20Provisions/ordinance>> accessed 17 April 2024.

Municipal councils are generally responsible for the administration and enforcement of planning schemes that apply to their districts.¹¹² However, for planning schemes that apply to land outside any municipal district, the Minister for Planning is responsible.¹¹³ A planning scheme may also make any person responsible for it or any of its provisions.¹¹⁴ In general, planning schemes are binding on all Ministers, government departments, public authorities and municipal councils.¹¹⁵

As well as the Victoria Planning Provisions, planning authorities use regional strategic plans and regional growth plans to inform planning schemes.¹¹⁶ Local councils collaborate to prepare regional strategic plans to inform long-term decision making and investment, considering various land uses and threats from natural hazards.¹¹⁷ Moreover, they collaborate to prepare regional growth plans which plan for growth, land use change and environmental protection within a region.¹¹⁸ For metropolitan Melbourne, the Victorian Government prepares a document called Plan Melbourne which performs a similar function to the regional strategic and growth plans.¹¹⁹

The Victorian Government is in the process of updating Plan Melbourne and developing ‘a new plan for Victoria’ to cover the whole state.¹²⁰ The new statewide plan will seek to do a number of things, including ‘establishing targets for local government areas for where and how many homes need to be built’.¹²¹ This new plan provides the Government an opportunity to improve how the planning system manages flood risk within Victorian communities.

In areas prone to flooding, councils may consult with floodplain managers to prepare and incorporate local floodplain development plans into planning schemes. These plans usually describe the history of flooding in an area, the extent and behaviour of past floods, environmental values and constraints, and sources of flood information.¹²² They establish guidelines and requirements for permitted development in an area, which can assist in streamlining and simplifying the consideration of planning permit applications.¹²³

¹¹² *Planning and Environment Act 1987* (Vic) s 13.

¹¹³ *Ibid.*

¹¹⁴ *Ibid.*

¹¹⁵ *Ibid.* s 16.

¹¹⁶ Department of Environment, Land, Water and Planning, *Victorian Floodplain Management Strategy*, p. 41.

¹¹⁷ *Ibid.*

¹¹⁸ *Ibid.*

¹¹⁹ Department of Environment, Land, Water and Planning, *Guidelines for Development in Flood Affected Areas*, p. 19.

¹²⁰ Victorian Planning Authority, *What is “a new plan for Victoria”?*, 23 November 2023, <<https://vpa.vic.gov.au/faq/what-is-a-new-plan-for-victoria>> accessed 20 May 2024; Engage Victoria, *Developing a new plan for Victoria*, <<https://engage.vic.gov.au/developing-a-new-plan-for-victoria>> accessed 20 May 2024.

¹²¹ Premier of Victoria, *Developing A New Plan For Victoria*, <<https://www.premier.vic.gov.au/developing-new-plan-victoria>> accessed 20 May 2024.

¹²² Department of Transport and Planning, *Planning Practice Note 12: Applying the flood provisions in Planning Schemes, A guide for councils*, June 2015, pp. 7–8.

¹²³ *Ibid.*

4.5.3 Flood-related planning controls

Planning controls include zones and overlays, which affect how land can be used. Whereas all land is zoned for a particular purpose (for example, residential, industrial, or commercial), not all land is subject to an overlay. Where an overlay does apply, the land to which it applies will typically have some special feature (for example, a heritage building, significant vegetation, or flood risk), and the relevant planning authority may prohibit development or require a planning permit for any development to proceed. The permit process is considered in Section 4.6.1.

There are three overlays and one zone directly relevant to flood-prone areas:

- the urban floodway zone
- the floodway overlay
- the special building overlay
- the land subject to inundation overlay (LSIO).

Urban floodway zone

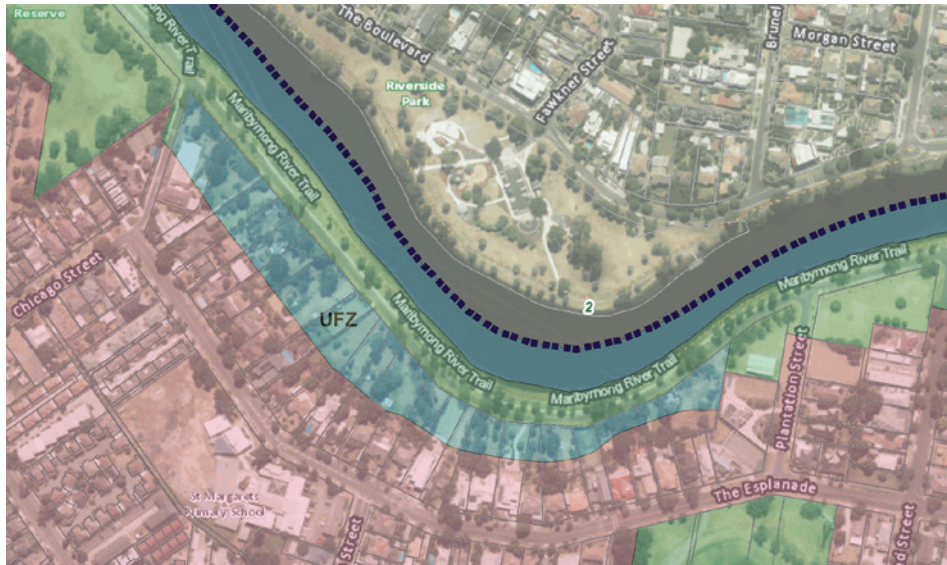
Planning authorities may apply an urban floodway zone to an area with high flood hazard. The zone limits most forms of development, generally permitting only low-density development compatible with the passage or storage of flood water, such as agricultural or recreational uses. Because of the zone's restrictive nature, planning authorities do not typically use the urban floodway zone.¹²⁴ More often, they will zone land prone to flooding in a way that allows for its primary use (for example, residential, industrial, commercial), and apply a flood overlay to acknowledge the land's flooding characteristics.¹²⁵

Figure 4.5 shows a small part of the maps in the Maribyrnong Planning Scheme. In it, the Maribyrnong River itself and a small number of areas adjoining the river have been zoned as an urban floodway (UFZ, highlighted in below). Other areas along the river have been zoned for public park and recreational use (green), and general residential use (red).

¹²⁴ Department of Environment, Land, Water and Planning, *Guidelines for Development in Flood Affected Areas*, p. 19.

¹²⁵ *Ibid.*

Figure 4.5 An urban floodway zone (UFZ) in the Maribyrnong Planning Scheme



Source: Department of Transport and Planning, *Maribyrnong planning scheme*, <<https://planning-schemes.app.planning.vic.gov.au/Maribyrnong/maps>> accessed 17 April 2024.

Flood overlays

Flood overlays identify where land use or development may require a planning permit as part of development approval processes.¹²⁶ They comprise three main types:

- floodway overlays
- special building overlays
- LSIOs.

Floodway overlays apply to floodways, that is, parts of a floodplain that are important for the discharge or storage of water during major floods.¹²⁷ Floodways can be defined in different ways, including by reference to depth and flow velocity, or flood extent.¹²⁸ Melbourne Water, for example, categorises floodways by depths in excess of one metre.¹²⁹ The floodway overlay is the strongest form of flood overlay, specifying types of development that are inappropriate due to high flood risk.

Figure 4.6 shows a small area of the Maribyrnong River—including a bridge—to which a flood overlay has been applied.

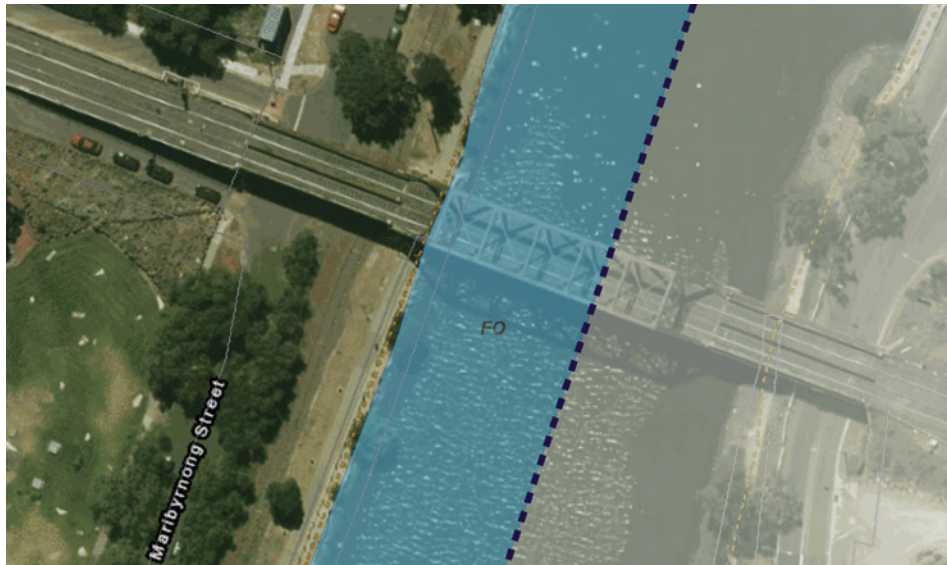
¹²⁶ Ibid.

¹²⁷ Ibid.

¹²⁸ Ibid.

¹²⁹ Melbourne Water, *Overlays explained*, <<https://www.melbournewater.com.au/building-and-works/flooding-information-and-advice/overlays-explained>> accessed 23 February 2024.

Figure 4.6 A flood overlay (FO) in the Maribyrnong Planning Scheme



Source: Department of Transport and Planning, *Maribyrnong planning scheme*, <<https://planning-schemes.app.planning.vic.gov.au/Maribyrnong/maps>> accessed 17 April 2024.

Special building overlays apply to stormwater flooding, particularly on land likely to be flooded when the capacity of underground drainage systems is exceeded.¹³⁰ This is more common in urban areas.

Figure 4.7 shows a residential area in the Maribyrnong Planning Scheme to which a special building overlay has been applied.

Figure 4.7 A special building overlay (SBO) in the Maribyrnong Planning Scheme



Source: Department of Transport and Planning, *Maribyrnong planning scheme*, <<https://planning-schemes.app.planning.vic.gov.au/Maribyrnong/maps>> accessed 17 April 2024.

¹³⁰ Ibid.

LSIOs apply to riverine and coastal flooding, representing land subject to the 1% AEP flood. They do not apply to land where a floodway overlay applies.

Figure 4.8 shows a residential area in the Maribyrnong Planning Scheme to which an LSIO has been applied.

Figure 4.8 A land subject to inundation overlay (LSIO) in the Maribyrnong Planning Scheme



Source: Department of Transport and Planning, *Maribyrnong planning scheme*, <<https://planning-schemes.app.planning.vic.gov.au/Maribyrnong/maps>> accessed 17 April 2024.

The appropriateness of the current design flood event

Rather than the worst possible extent of flooding, flood controls such as the urban flood zone typically reflect the 1% AEP flood. The Government's Guidelines for Development in Flood Affected Areas explains that:

The purpose of the [flood] overlays is to define what is considered an acceptable threshold for managing flood risk.¹³¹

The Committee heard from individual and organisational stakeholders who criticised the use of the 1% AEP to inform planning controls and development.

In its submission, IAG contended that:

[L]and use planning needs to move away from measuring risk using the traditional 1% Annual Exceedance Probability (AEP) threshold mandated under previous generations of planning guidelines, and towards more appropriate risk measures which consider the economic and life safety consequences of the full range of possible flood events.¹³²

¹³¹ Ibid.

¹³² IAG, *Submission 651*, p. 5.

Referencing its own research, it argued further ‘that overreliance on the 1% AEP flood standard has resulted in disproportionate sensitivity to climate induced changes in flood risk in areas immediately adjacent to flood planning areas’.¹³³

Darren Smolenaars, whose family was affected by the October 2022 flood event in Rochester, questioned why ‘town planning building height requirements [were] not aligned with a safety margin above the [worst] case scenario flood peak’.¹³⁴

For its part, the Insurance Council of Australia contended that the Victorian Government’s policy objectives of land use and planning should ‘[r]econsider the 1% AEP ... as the accepted standard for development and incorporate climate change scenarios in risk models to allow for future state risk assessment in decision making’.¹³⁵ It did so on the basis that 1% AEP floods have become more frequent, potentially as a consequence of climate change:

In the last several years we have 1% AEP events more frequently with devastating consequences for life and property.

...

A failure to account for future climate scenarios and risk creates a latent risk in any planning strategy and scheme and presents a real danger the objectives of planning are not met in the long term. A greater investigation to determine how climate change may alter the behaviour and impact of a 1% AEP flood is required to properly inform risk-based decision making.¹³⁶

The impact of climate change and its consideration in planning schemes is examined in greater detail below at Section 4.5.5.

Following the 2010–2011 flood event, the Victorian Flood Review questioned the appropriateness of using the 1% AEP flood as the design flood event, noting that:

The effectiveness of minimum floor levels is limited to the ‘design event’. Until about 30 years ago, it was common to use the largest historical flood in an area as the design event for planning purposes, and this approach is still used in some rural locations. Currently, however, the 1 in 100 year flood is seen as the acceptable risk for planning purposes, regardless of the potential consequences of the flood. The difference between this design level and that of the probable maximum flood measure can vary hugely.¹³⁷

It recommended that the Victorian Government ‘reconsider in what circumstances the ‘1 in 100 year event’ is the appropriate design event’.¹³⁸

¹³³ Ibid.

¹³⁴ Darren Smolenaars, *Submission 251*, p. 1.

¹³⁵ Insurance Council of Australia, *Submission 693*, p. 2.

¹³⁶ Ibid., p. 5.

¹³⁷ Victorian Floods Review, p. 197.

¹³⁸ Ibid.

Despite this recommendation, the Strategy enshrined as policy that ‘[t]he 1% Annual Exceedance Probability flood will remain the design flood event for the land use planning and building systems in Victoria’, explaining that while the Victorian Floods Review ‘questioned if the 1% AEP flood should still be used as the [design flood event] in Victoria:

The Victorian Government has determined that the 1% AEP flood is the appropriate standard to regulate and protect most forms of development through the planning and building systems.¹³⁹

While the 1% AEP flood remains the design flood event, flood mapping is required to use the most recent edition of the *Australian Rainfall and Runoff*.¹⁴⁰ In a public hearing, Stuart Moseley, Chief Executive Officer of the Victorian Planning Authority, explained that while the appropriateness of the current design flood event ‘is a very important question for public policy’, the Authority takes comfort in the fact that the *Australian Rainfall and Runoff* also requires consideration of climate change:

The records in [*Australian Rainfall and Runoff*] obviously are historical averages and for the last number of years have started to reflect more frequent and intense rain events, but there is this considerable period of record before that where they did not. So there is a recognition that the average is not an indicator of the future, and [*Australian Rainfall and Runoff*] gives guidance around what assumptions should be made in terms of rainfall projections and what increase is expected in intensity or depth per degree Celsius of local warming.¹⁴¹

The Committee acknowledges that it is not feasible for planning controls to eliminate all flood risk, and that any attempt to do so will have profound social and economic impacts. As such, it understands that both the Government and community must contend with some level of risk. Planning schemes need to use a commonly accepted benchmark of risk, and the 1% AEP provides such a marker. Given the ongoing ways that climate change, intensification of weather patterns and urban development impact on flood risk, there is merit in maintaining the current benchmark, and working to understand awareness of what that level of risk means.

Risk is dynamic, not static, and will change over time. Therefore, flood risk derived from studies and modelling should be kept up to date and communities informed of these updates.

It is also clear from the evidence that public understanding of the translation of the 1% AEP risk to the likely impact of flooding events is low. More could be done to better inform the public about the implications of using the 1% AEP flood (or any alternative) as the default design flood event, that is, the size of flood against which planning and building controls are set. This is so that Victorians understand the level of flood risk the community faces, and the implications of this level of risk.

¹³⁹ Department of Land, Water and Planning, *Victorian Floodplain Management Strategy*, p. 40.

¹⁴⁰ Victorian Government, *Submission 295*, p. 94.

¹⁴¹ Stuart Moseley, Chief Executive Officer, Victorian Planning Authority, public hearing, Melbourne, 12 October 2023, Melbourne, *Transcript of evidence*, p. 36.

4.5.4 Implementing flood studies into planning schemes

To ensure planning controls—including flood-related zones and overlays—reflect the most up-to-date flood information, planning authorities work with floodplain management authorities to translate flood studies into planning schemes.

Flood studies are comprehensive technical assessments of flood behaviour.¹⁴² They define the nature of flood hazards across floodplains, including flood extent, depth, and velocity, as well as flow distribution.¹⁴³ Moreover, they assess flood risk, evaluate mitigation options, and provide detailed flood mapping.¹⁴⁴ In accordance with the Victorian Floodplain Management Strategy, flood studies must generally produce draft planning scheme amendments.¹⁴⁵

The process of implementing flood studies into planning schemes involves both planning authorities and floodplain management authorities. First, the relevant floodplain management authority—Melbourne Water or one of the nine regional catchment authorities—works with the local council to conduct a flood study. Then, the relevant planning authority—most often, the local council—works with the floodplain management authority and other stakeholders to develop a planning scheme amendment that introduces the flood study into the area’s planning scheme.

Amending a planning scheme

Councils and other planning authorities amend planning schemes via planning scheme amendments. Planning scheme amendments allow planning authorities to make changes relevant to the use or development of land in floodplains. For example, they enable planning authorities to introduce or alter flood-related planning controls, and to ensure planning schemes reflect the most up-to-date flood information. The process for amending planning schemes is dictated by the Planning and Environment Act and Regulations, and guided by various government policy documents, most notably *Using Victoria’s Planning System*. The following summarises the process of amending a planning scheme, particularly as it relates to flood.

¹⁴² Department of Land, Water and Planning, *Victorian Floodplain Management Strategy*, p. 105.

¹⁴³ Ibid.

¹⁴⁴ Department of Energy, Environment and Climate Action, *Long-term preparation for flooding*, <<https://www.water.vic.gov.au/our-programs/floodplain-management/long-term-preparation-for-flooding>> accessed 27 March 2024.

¹⁴⁵ Department of Land, Water and Planning, *Victorian Floodplain Management Strategy*, p. 32.

Box 4.1 The planning scheme amendment process

The Planning and Environment Act empowers the Minister for Planning to amend the Victoria Planning Provisions, subject to certain requirements. Where specified, an amendment to the Victoria Planning Provisions may provide for an amendment to a planning scheme.

The Act also enables certain planning authorities—including the Minister for Planning and municipal councils—to amend planning schemes directly. In order to better prepare for and respond to floods, planning authorities may amend planning schemes to update controls on land use and development in flood-prone areas. Often, this is done in response to updated flood modelling. Examples of potential changes include:

- alteration of the boundaries of floodplains
- adjustment of flood-related zones and/or overlays
- insertion or deletion of local planning provisions relevant to flood.

Before a municipal council can prepare an amendment to a planning scheme, it must first apply to the Minister for Planning for authorisation. The Minister may authorise the preparation and may attach conditions to this authorisation. Alternatively, the Minister can refuse to authorise the preparation. If the Minister does not make a decision and notify the council of the decision within 10 business days of receiving the council's application for authorisation, the council may prepare the amendment without authorisation.

In relation to the preparation of an amendment, the Act empowers the Minister to issue directions, and requires planning authorities to have regard to these directions. Likewise, pt 3 of the Act sets out a series of processes and requirements that planning authorities must follow in amending a planning scheme. The Minister's direction on the planning scheme amendment process sets out and clarifies this process, and sets times for completing steps in the process.

In line with these and other directions and guidelines, the process for a council to amend a planning scheme can include the following steps (similar steps apply to amendments made by other planning authorities):

1. **Initiation:** Generally, councils initiate their own planning scheme amendments. However, anyone can request one, subject to certain fees. The relevant council will decide whether to support a request, and applicants have no right of review over this decision. If a person requests a council to prepare a planning scheme amendment, the person should also demonstrate how the proposed amendments address the matters listed in stage 3 (preparing an amendment).

(Continued)

Box 4.1 Continued

2. **Authorisation:** As mentioned, councils must formally seek consent from the Minister for Planning to prepare an amendment, and the Minister may support the amendment, with or without conditions, or refuse it. According to the Victorian Government's guidelines, the purpose of authorisation is to ensure the amendment is consistent with the State policy or interests and the Victoria Planning Provisions.

Although councils must wait for authorisation from the Minister before preparing an amendment, they may prepare a draft amendment to assist in making an application for authorisation.

3. **Preparation:** Once the Minister has authorised the preparation of the planning scheme amendment (or failed to provide notice of a decision within 10 business days of the council's request for authorisation), the council prepares the amendment. In preparing an amendment, councils must consider:
- a. ministerial directions
 - b. the Victoria Planning Provisions
 - c. any strategic plan, policy statement, code or guidelines in the planning scheme
 - d. social, environmental and economic impacts.
4. **Exhibition and notice:** After preparing an amendment, councils must formally exhibit the amendment. This involves making the amendment publicly available, and giving notice of its preparation to every minister, public authority and council materially affected by it, as well as to owners occupying land materially affected by the amendments. Once notice is given, any person can make a submission to the relevant council about the amendment, and the council must publish all such submissions.
5. **Consideration:** Once a council finishes receiving submissions, it must consider those submissions. If a submission requests a change to the planning scheme amendment, the council must decide whether or not to change or abandon the amendment. Alternatively, the council can refer the submission to an independent panel appointed by the Minister.
6. **Panel review:** Victorian Government guidance explains that if a council does not accept a submission that seeks a change to an amendment, the council must refer that submission to an independent panel. Under the Planning and Environment Act, panels must consider all submissions referred to them, and must hold hearings to give a reasonable opportunity for submitters (and other relevant parties) to be heard. The panel must then report its findings to the council, and the council must consider the panel's report, including any recommendations, before deciding whether or not to adopt the amendment.

(Continued)

Box 4.1 Continued

7. **Adoption:** After consideration of any submissions and panel reports, a council can choose to adopt—or abandon—an amendment, with or without changes. If the council does not make a decision, the amendment eventually lapses.
8. **Approval:** If a council chooses to adopt an amendment, the council must then submit it to the Minister for Planning for approval. The Minister can choose to approve, subject to any changes and/or conditions, or refuse to approve the amendment. Before doing this, the Minister can also receive submissions, and refer any submissions to an independent panel. If the Minister approves the proposed amendment, the Minister must publish notice of it in the Government Gazette, at which point the amendment comes into effect.

Source: *Planning and Environment Act 1987* (Vic) pt 3; Department of Transport and Planning, *Amending a planning scheme*, 2024, <<https://www.planning.vic.gov.au/planning-schemes/amendments/amending-a-planning-scheme>> accessed 14 May 2024; Department of Environment Land, Water and Planning, *Using Victoria's Planning System*, October 2022, pp. 16–54.

Barriers to updating planning schemes

Despite the Government funding flood studies through regional floodplain management strategies, councils face numerous challenges implementing these flood studies into planning schemes.

In particular, witnesses and submitters stressed that councils lack the time and resources to implement flood studies efficiently. In its submission, Corangamite Shire Council called on the Victorian Government to increase the allocation of funding for flood studies and planning scheme amendments, noting that councils are resource-constrained and therefore rely on government grants to complete activities identified in regional floodplain management strategies.¹⁴⁶ This was echoed by several other councils, including Strathbogie Shire Council and Mitchell Shire Council.¹⁴⁷

Councils informed the Committee that, due to these difficulties, there is an increasing number of flood studies that have been completed but not yet implemented into planning schemes.

According to Mitchell Shire Council:

While the Goulburn Broken Catchment Management Authority does have a rolling program of flood studies for implementation, there is a backlog of completed flood studies that are yet to be implemented via Planning Scheme Amendments.

¹⁴⁶ Corangamite Shire Council, *Submission 509*, pp. 3–4.

¹⁴⁷ See Strathbogie Shire Council, *Submission 519* and Mitchell Shire Council, *Submission 521*.

The 2022 review [of the Victorian Floodplain Management Strategy] noted that Action 13d (2) was being completed through \$30,000 grants available to Local Government to progress flood study outputs into Planning Scheme Amendments. Whilst this is a good initiative, the funding available is insufficient to support a streamlined Planning Scheme Amendment process.¹⁴⁸

Speaking to the Committee at a public hearing, Brett Luxford, Chief Executive Officer of Mitchell Shire Council, elaborated:

There are a number of flood studies that have been done, and trying to get them into the planning scheme is a really challenging piece of work. It takes councils anywhere from 18 months to two years to get a planning scheme amendment into the planning scheme, which comes at a significant cost. There are still a lot. I am not sure how many there are, but I know of two within our municipality that have been undertaken that have not made it into the planning scheme yet. And there are a number across the state. There is a real need for support from state government to get that up-to-date flood mapping into the planning scheme so that communities are aware.¹⁴⁹

Guy Tierney, Statutory Planning and Floodplain Manager at Goulburn Broken Catchment Management Authority, substantiated this backlog, concluding that the failure to implement flood studies into planning schemes meant that ‘there are a lot of flood plains out there which are not in planning schemes at the moment and need to be’.¹⁵⁰

The North Central Catchment Management Authority also noted backlogs, with Chief Executive Officer Brad Drust informing the Committee that 10 flood studies in the catchment were awaiting planning scheme amendments at the time.¹⁵¹

As well as a lack of time and resources, the Municipal Council of Victoria pointed out several other factors hampering councils’ ability to update planning schemes with up-to-date flood information:

Councils’ ability to drive necessary changes to their planning schemes is hampered by a range of factors, including lack of resources and technical knowledge within councils, variable catchment management authority (CMA) capacity and cooperation, planning panels weakening planning controls proposed by councils, and the political pressure placed on councillors from their constituents when proposing new planning controls that may limit development or impact land value.¹⁵²

¹⁴⁸ Mitchell Shire Council, *Submission 521*, pp. 10–11.

¹⁴⁹ Brett Luxford, Chief Executive Officer, Mitchell Shire Council, public hearing, Seymour, 14 September 2023, *Transcript of evidence*, p. 10.

¹⁵⁰ Guy Tierney, Statutory Planning and Floodplain Manager, Goulburn Broken Catchment Management Authority, public hearing, Melbourne, 25 October 2023, *Transcript of evidence*, p. 53.

¹⁵¹ Brad Drust, *Transcript of evidence*, p. 46.

¹⁵² Municipal Association of Victoria, *Submission 681*, p. 14.

Beyond the issue of appropriately resourcing councils to implement flood studies into planning schemes, the process for amending a planning scheme takes a considerable amount of time.

Peter Harriot, Chief Executive Officer of the Greater Shepparton City Council, stressed the importance of the Government providing support to fast-track amendments:

We are arguing that there should be state support to bring all these studies together – not only support but that there is consistency across the modelling and in the treatment and that these amendments are made to our planning schemes in a rapid manner and do not take the years and years and years that most planning scheme amendments take. These need to take priority.¹⁵³

Speaking to the Committee, Stuart Menzies, Director of State Planning Services at the Department of Transport and Planning, explained that while the timeframe for planning scheme amendments could vary, ‘a standard flood amendment with submissions’ may take 6–12 months.¹⁵⁴ As noted above, however, some councils have experienced planning scheme amendments taking up to two years.

Fast-tracking planning scheme amendments

On 1 May 2023, the Minister for Planning appointed a Flood-related Amendments Standing Advisory Committee to provide the Minister, councils and catchment management authorities timely advice on the implementation of flood studies and any associated draft planning scheme amendments.¹⁵⁵ In a response to a question on notice from the Committee, the Department of Transport explained that the Standing Advisory Committee would provide an opportunity for councils to fast-track the amendment process:

[The Standing Advisory Committee] will be available to councils that elect to request that the Minister for Planning become the planning authority for their amendment and use her powers of intervention under the PE Act to ‘fast-track’ the amendment process.

This fast-track pathway should increase certainty and is expected to cut 3–6 months from the approval timeframes compared to the standard amendment process under the Act.¹⁵⁶

¹⁵³ Peter Harriott, Chief Executive Officer, Greater Shepparton City Council, public hearing, Melbourne, 13 September 2023, *Transcript of evidence*, p. 16.

¹⁵⁴ Stuart Menzies, *Transcript of evidence*, p. 20.

¹⁵⁵ Department of Transport and Planning, *Flood-related Amendments Standing Advisory Committee*, <<https://www.planningpanels.vic.gov.au/panels-and-committees/projects/flood-related-amendments-standing-advisory-committee>> accessed 25 March 2024; Department of Environment, Land, Water and Planning, *Terms of reference: Flood-related Amendments Standing Advisory Committee*, (n.d.), <https://www.planningpanels.vic.gov.au/_data/assets/pdf_file/0032/635549/14f38ff3918c13ad03d7c5fe983c4268e3c97fac.pdf> accessed 25 March 2024.

¹⁵⁶ Department of Transport and Planning, *Inquiry into the 2022 flood event in Victoria hearings*, response to questions on notice received 14 November 2023, pp. 8–9.

Following that, on 30 May 2023, the Victorian Government also committed \$22.2 million to fund its regional flood-related amendments program.¹⁵⁷ Designed to help rural and regional councils translate flood studies into planning scheme amendments, the program provides, as needed:

- funding to assist with the cost of—
 - amending a planning scheme
 - a planning panel or Flood-related Amendments Standing Advisory Committee hearing
- assistance through the Department of Transport and Planning to prepare draft amendments.¹⁵⁸

According to the program’s webpage, the 2022 flood event highlighted that many completed flood studies had not been introduced into planning schemes, despite the importance of flood-related planning controls for restricting land use and development in flood-prone areas and improving landholder and decision maker awareness and mitigation of flood risk.¹⁵⁹

The Committee heard from stakeholders who offered further alternatives to the current planning scheme amendment process. The City of Melbourne suggested that where flood data is produced using best practice guidelines and subject to public scrutiny, there may be an opportunity to bypass notice of amendment requirements:

The City of Melbourne is of the view that because of the risk to life and property, the Department of Transport and Planning should consider introducing updated flood data into planning schemes using an alternative process to that outlined under S.19 of the Planning and Environment Act, 1987. If the standards used to generate the data meet best practice guidelines and are scrutinised by a public process, then a more streamlined process than the standard planning scheme amendment process may be a more appropriate planning pathway.¹⁶⁰

The Committee was warned that any fast-tracking of the planning scheme amendment process would require that the public—and in particular, affected landowners—still be consulted. Speaking to the Committee, Andrew McKeegan from the Department of Transport and Planning noted that while ‘[p]eople often say the schemes should be quicker ... the reality is you still also need to consult with those landowners on the impact of that, and that takes time’.¹⁶¹ Goulburn Broken Catchment Management Authority also acknowledged the importance of community consultation.¹⁶² Noting

¹⁵⁷ Victorian Government, *Regional flood-related amendments program*, <<https://www.planning.vic.gov.au/guides-and-resources/council-resources/flood-related-amendments>> accessed 22 March 2024.

¹⁵⁸ Ibid.

¹⁵⁹ Ibid.

¹⁶⁰ City of Melbourne, *Submission 296*, p. 20.

¹⁶¹ Andrew McKeegan, Deputy Secretary, Planning and Land Services, Department of Transport and Planning, public hearing, Melbourne, 11 October 2023, *Transcript of evidence*, p. 5.

¹⁶² Guy Tierney, *Transcript of evidence*, p. 57.

that the consultation process is ‘time-consuming and resource hungry’ for councils, however, they suggested that a statewide approach could expedite the process without removing the element of consultation.¹⁶³

A group, catchment-based or statewide approach

The Committee heard from a number of councils and catchment management authorities who recommended a group, catchment-based, or statewide approach to flood mapping and the implementation of flood studies into planning schemes.

Goulburn Broken Catchment Management Authority spoke to the Committee about the potential for a program whereby councils within a particular catchment management region could group together any flood studies that have not yet been implemented into planning schemes, and the Victorian Government would fast-track these as a group amendment.

Noting that ‘[i]t is important that priority is given to implementing the latest flood data into planning schemes’, Strathbogie Shire Council likewise argued that ‘[g]roup amendments should be fast tracked and run by the State Government to avoid them being bogged down in local politics or stalled by lack of resources’, with Advisory Committees being used ‘to ensure adequate consultation is undertaken’.¹⁶⁴

Notably, under Victoria’s current planning system, the Minister for Planning is already able to make GC amendments, that is, amendments that make changes to more than one planning scheme.¹⁶⁵

Brimbank City Council’s submission called for Melbourne Water to ‘undertake a review of its flood mapping data within the catchment, with consideration to the type of future flood events anticipated as a result of climate change, and current and future land use and development’, and to then produce a GC amendment:

Once flood mapping has been revised and updated, Melbourne Water, as the Planning Authority, should then undertake a GC Amendment in consultation with Brimbank, Hume, Maribyrnong, Melbourne and Moonee Valley City Councils to ensure a consistent and regional approach to flood mapping is applied along the Maribyrnong River.¹⁶⁶

As discussed throughout this Chapter, Melbourne Water is in the process of updating its flood modelling throughout the Port Phillip and Westernport region. In April 2024, it released its updated modelling of the Maribyrnong River, including a 2100 model factoring in climate change. In a public hearing, Melbourne Water’s Craig Dixon explained that ‘[t]here are two options’ for updating the relevant planning schemes

¹⁶³ Chris Cumming, *Transcript of evidence*, p. 54.

¹⁶⁴ Northern Victorian Emergency Management Cluster, *Submission 515*, p. 4.

¹⁶⁵ Department of Environment Land, Water and Planning, *Using Victoria’s Planning System*, ch. 2 p. 9.

¹⁶⁶ Brimbank City Council, *Submission 286*, p. 5.

with this new information, including through the Department of Transport and Planning:

It can either go through council or because this model sits across four councils it alternatively can go potentially through the department of planning. We are having discussions with the relevant councils right now – we started that this week – and with the department of planning next Tuesday just to align on what the most effective way is to get this into the system appropriately.¹⁶⁷

Beyond simply fast-tracking the implementation of flood studies via ministerial group amendments, the Committee received evidence about the need for a statewide approach to flood mapping and planning controls.

In its submission, Melbourne City Council considered the potential for a consistent flood dataset for land use planning:

The Planning Institute of Australia has recommended that a framework be established for a consistent and publicly accessible dataset for coastal and riverine flooding to inform land use decisions.¹⁶⁸

Noting its lack of up-to-date flood data and limited technical knowledge, Corangamite Shire Council contended that:

There needs to be a coordinated statewide approach to risk mapping and planning controls, similar to bushfire risks, and further resources invested in this area. A precautionary approach may be appropriate in waterway areas with no flood information, until flood investigations and planning controls are completed.¹⁶⁹

Greater Shepparton City Council likewise recommended '[t]he implementation of a state wide planning approach to flood modelling, similar to the scheme in place to manage bushfire risks, should be considered'.¹⁷⁰

The Northern Victorian Emergency Management Cluster's submission argued that 'the existing approach to implementing flood studies via the planning scheme amendment process, town by town and council by council, is not providing a consistent response to the current levels of risk'.¹⁷¹ To address this, it recommended:

That the State implements a consistent state-wide planning approach to flood and coastal inundation, similar to the current bushfire arrangements, with the Minister for Planning made responsible for incorporating best-available flood and inundation data into planning schemes.¹⁷²

¹⁶⁷ Craig Dixon, Executive General Manager, Service and Asset Lifecycle, public hearing, Melbourne, *Transcript of evidence*, p. 6.

¹⁶⁸ City of Melbourne, *Submission 296*, p. 20.

¹⁶⁹ Corangamite Shire Council, *Submission 509*, p. 4.

¹⁷⁰ Greater Shepparton City Council, *Submission 654*, p. 10.

¹⁷¹ Northern Victorian Emergency Management Cluster, *Submission 515*, p. 12.

¹⁷² *Ibid.*

Both the Municipal Association of Victoria and Campaspe Shire Council echoed this recommendation, arguing that '[t]he current approach to implementing flood studies through the planning scheme amendment process on a town-by-town, council-by-council basis results in inconsistent and often substandard outcomes'.¹⁷³

Rather than a statewide approach, the Insurance Council of Australia recommended the Victorian Government establish 'a catchment-based approach to land use planning and hazard management'.¹⁷⁴ In a public hearing, Chief Executive Officer Kylie Macfarlane elaborated that:

A catchment view to land use planning is essential, factoring in climate change, albeit we acknowledge that that is complex, and being able to review those plans when events occur so we are learning from the impact of particular events on the land and how, potentially, land use planning policies need to change again into the future. It cannot be a static model.¹⁷⁵

In the context of metropolitan Melbourne, Maribyrnong City Council contended that:

There should be a state-led catchment based approach to planning reforms for flooding and broader climate change impacts, similar to the approach taken with Bushfire Overlays. This will expedite the planning process and enable Melbourne Water to be efficient as it eliminates the need for them to work with each Council on individual planning schemes. This must be done with consideration of the economic and social impacts of any changes on existing properties and communities.¹⁷⁶

In a similar vein, Peri Urban Councils Victoria's submission identified three main issues with the planning framework's ability to mitigate the impact of floods, namely out-of-date flood mapping, permit applications being assessed at a localised level, and the cost of updating and implementing science into planning schemes.¹⁷⁷ To address these issues, it recommended that the Victorian Government create an interim statewide flooding and inundation overlay, similar to the Bushfire Management Overlay.¹⁷⁸

The Committee acknowledges the Victorian Government's efforts following the 2022 flood event to provide increased funding and support to councils to implement flood studies into planning schemes. Despite these efforts and the importance of updating planning schemes to mitigate the effects of future flood events, councils continue to experience time and resource constraints that make it difficult to implement flood studies. As such, the Committee calls on the Government not only to continue supporting councils through the regional flood-related amendments program and the use of the Flood-related Amendments Standing Advisory Committee, but to expand the provision of ongoing funding for flood studies and their implementation

¹⁷³ Municipal Association of Victoria, *Submission 681*, p. 4; Campaspe Shire Council, *Submission 650*, p. 11.

¹⁷⁴ Insurance Council of Australia, *Submission 693*, p. 2.

¹⁷⁵ Kylie Macfarlane, Chief Operating Officer, Insurance Council of Australia, public hearing, Melbourne, 20 November 2023, *Transcript of evidence*, p. 23.

¹⁷⁶ Maribyrnong City Council, *Submission 530*, p. 9.

¹⁷⁷ Peri Urban Councils Victoria, *Submission 626*, p. 2.

¹⁷⁸ *Ibid.*, pp. 4-5.

into planning schemes. Moreover, the Committee calls on the Government to consider leading a statewide, catchment-based approach to flood studies and flood-related land use planning.

RECOMMENDATION 17: That the Victorian Government fast-track the implementation of flood studies into planning schemes. This should be done cooperatively with local councils and relevant stakeholders, group together flood studies into regional amendments, and use the Minister for Planning's powers as required, within two years of completion.

4.5.5 Planning schemes and the changing climate

Dr Stuart Strachan

The planning scheme has to be the starting point for mitigating the effects of climate change on communities. Particularly if elimination of the causes of climate change is to be achieved with minimal disruption to the social and economic basis of our state.

Dr Stuart Strachan, *Submission 401*, p. 8.

In evidence to the Committee, Professor Julie Arblaster, Deputy Director of the ARC Centre of Excellence for Climate Extremes, explained that 'the science is clear that the climate is changing due to human emissions of greenhouse gases, predominantly from the burning of fossil fuels such as coal, oil and gas', and that '[c]limate change is also disrupting the water cycle, with an increase in short-duration, high-intensity rainfall events projected with additional warming of the climate'.¹⁷⁹

The Bureau of Meteorology similarly contended that despite a decrease since the late 1990s in April to October rainfall in Australia's south-east:

Even in regions where the average rainfall is expected to decrease or stay the same such as Victoria, it is anticipated that there will be an increase in intense in short-duration heavy rainfall events. Short-duration extreme rainfall events (such as for hourly rainfall totals) are often associated with flash flooding, which brings increased risk to communities. This will lead to a complex mix of effects on streamflow, and associated flood and erosion risks, including increased risk of small-scale flash flooding.¹⁸⁰

Despite the above, Professor Arblaster cautioned the Committee about accepting 'detailed projections' of extreme rainfall change at the local level:

[F]uture changes in rainfall patterns for regions such as Victoria are very complex and dependent on very regional and local-scale conditions. So while in general we can expect rainfall variability to increase with climate change, and more frequent

¹⁷⁹ Professor Julie Arblaster, Deputy Director, ARC Centre of Excellence for Climate Extremes, public hearing, Melbourne, 6 December 2023, *Transcript of evidence*, pp. 53-54.

¹⁸⁰ Bureau of Meteorology, *Submission 73*, p. 15.

swings from extreme droughts to flooding rainfall, it is however our view that any more detailed projections for extreme rainfall change at this very local scale – for example, for a city or a catchment – are beyond the current state of climate science. So I want to caution the committee to be extremely wary of products that are being offered to local, state and federal governments that claim to have some accurate and specific data on how extreme rainfall will change in the future, because they are not supported by our scientific understanding. These have the potential to provide false confidence around climate projections and risk really economically costly investments and maladaptation.¹⁸¹

Notwithstanding this uncertainty around the impact of climate change on extreme rainfall at a local level, Professor Arblaster contended that ‘we need to plan for both increases and decreases of extreme rainfall and its impacts’, and that ‘reducing emissions is the key action that can be taken to make us more resilient to climate change’.¹⁸² Likewise, her colleague Kimberley Reid argued that despite these uncertainties:

The effects of climate change are felt through extreme weather events. While rainfall and floods are strongly related, understanding how rainfall may respond to climate change is very different from understanding how floods may change, and this is because flood risk is strongly related to non-weather factors such as where we build, the materials we use to build and how we manage water. Despite the uncertainties in how extreme rainfall and floods may behave in the future, there are still ample opportunities to mitigate to reduce flood risks within the present climate.¹⁸³

Climate change adaptation in land use planning

The Planning and Environment Act does not specifically incorporate a requirement that planning schemes facilitate climate change adaption. However, it does establish broad objectives for planning, some of which align with climate change adaption. These objectives include sustainable land use, the protection of natural resources, and the maintenance of ecological processes.¹⁸⁴

Unlike the Planning and Environment Act, the Victoria Planning Provisions specifically requires planning authorities to facilitate climate change adaptation through the preparation and amendment of planning schemes.

In its submission, the Victorian Government explained that:

Planning controls and new initiatives are always evolving and it is government priority to update the [Victoria Planning Provisions] and planning schemes using the best available data and climate science to ensure the planning and building system enables climate resilience [sic] settlements and communities.¹⁸⁵

¹⁸¹ Professor Julie Arblaster, *Transcript of evidence*, p. 54.

¹⁸² *Ibid.*

¹⁸³ Kimberley Reid, Research Associate, ARC Centre of Excellence for Climate Extremes, public hearing, Melbourne, 6 December 2023, *Transcript of evidence*, p. 54.

¹⁸⁴ *Planning and Environment Act 1987 (Vic)* s 4(1).

¹⁸⁵ Victorian Government, *Submission 295*, p. 97.

Responding to a question on notice from the Committee, the Department of Transport and Planning expanded on this, stating:

The [Victoria Planning Provisions] and planning schemes are reviewed on an ongoing basis to ensure they continue to respond to state requirements for the mitigation, management and adaptation to climate change, hazard and risk.¹⁸⁶

In 2022, the Minister for Planning amended the Victoria Planning Provisions to support environmentally sustainable development.¹⁸⁷ As a result, several sections of the Victoria Planning Provisions require planning schemes to account for climate change. The Planning Policy Framework, for instance—which planning authorities must include in all schemes¹⁸⁸—lists ‘support[ing] responses to climate change’ as a planning scheme objective.¹⁸⁹ Other climate-related requirements and strategies in the Framework include:

- recognising the need for and contributing to climate change adaptation and mitigation¹⁹⁰
- supporting metropolitan and regional climate change adaptation and mitigation measures¹⁹¹
- minimising the impacts of natural hazards and adapting to the impacts of climate change through risk-based planning¹⁹²
- requiring planning to prepare for and respond to the impacts of climate change¹⁹³
- requiring infrastructure planning to avoid, minimise and offset environmental impacts, and incorporate resilience to natural hazards, including future climate change risks.¹⁹⁴

Additionally, the Planning Policy Framework requires planning authorities to account for and reflect in their decision-making statewide planning policies on climate change and its impacts.¹⁹⁵ These policy documents include the Victorian Floodplain Management Strategy, as well as documents prepared in accordance with the *Climate Change Act 2017* (Vic), such as adaptation action plans¹⁹⁶ and climate science reports.¹⁹⁷

¹⁸⁶ Department of Transport and Planning, Inquiry into the 2022 flood event in Victoria, response to questions on notice received 13 December 2023, p. 1.

¹⁸⁷ Victoria, *Victorian Government Gazette*, No. S 288, 10 June 2022.

¹⁸⁸ See Victoria, *Victorian Government Gazette*, No. S 87, 2 March 2023.

¹⁸⁹ *Victoria Planning Provisions* (Vic) cl 01.

¹⁹⁰ *Ibid.*, cl 11.

¹⁹¹ *Ibid.*, cl 11.01-1S.

¹⁹² *Ibid.*, cl 13.01-1S.

¹⁹³ *Ibid.*, cl 13.

¹⁹⁴ *Ibid.*, cl 19.

¹⁹⁵ Department of Environment, Land, Water and Planning, *Local Government Climate Change Adaptation Roles and Responsibilities under Victorian legislation: Guidance for local government decision-makers*, 2020, p. 16.

¹⁹⁶ *Victoria Planning Provisions* (Vic) cl 13.01-2S.

¹⁹⁷ *Ibid.*, cl 13.01-1S.

Despite Victoria's planning system requiring consideration of climate change, various stakeholders criticised the system's ability to adapt to climate change.

In its joint submission, the Victorian Greenhouse Alliance and Council Alliance for a Sustainable Built Environment contended that whereas municipal councils have an obligation to tackle climate change and its impacts, 'the current planning system restricts the ability of councils to take the required transformational action'.¹⁹⁸ It elaborated that because climate change considerations are not explicit, they are 'overlooked in favour of policy considerations that are more explicitly spelled out within planning schemes'.¹⁹⁹

The Federation of Community Legal Centres levied a similar criticism against the Victoria Planning Provisions' attempt to tackle climate change, arguing that the Provisions should take greater account of the climate resilience of communities:

Victoria's Planning Provisions were amended in June 2022 to oblige all planning schemes to take account of the biophysical impacts of climate change and climate hazards, yet no planning decisions in the state are bound to consider matters of climate justice and the climate resilience of communities affected by planning decisions. With statutory force the Planning Provisions play a fundamental role in setting the parameters of planning decisions, and so an increased role for considerations of justice in all planning legislation would have a substantial and positive impact on the delivery of climate justice in Victoria.²⁰⁰

To overcome the above, the Victorian Greenhouse Alliance and Council Alliance for a Sustainable Built Environment made numerous flood-related recommendations, including that the Victorian Government:

- amend the Planning and Environment Act and Climate Change Act to explicitly address climate change in the planning process
- require planning scheme amendments to include assessments against climate change considerations
- mandate minimum climate change standards in planning schemes
- align the planning system to the most up-to-date climate science.²⁰¹

Alongside these recommendations, the Alliances' submission stressed the need for more regular reviews of flood data to keep up with the increasing impact of climate change.²⁰² The Committee heard similar views from several councils, who stressed the importance of updating flood mapping and other information to take into account the

¹⁹⁸ Central Victorian Greenhouse Alliance, *Submission 503*, pp. 2-3.

¹⁹⁹ *Ibid.*, p. 4.

²⁰⁰ Federation of Community Legal Centres, *Submission 674*, p. 27.

²⁰¹ Central Victorian Greenhouse Alliance, *Submission 503*, p. 4.

²⁰² *Ibid.*, p. 6.

changing climate. Brimbank City Council, for example, called for Melbourne Water to review its data, stating:

Melbourne Water should undertake a review of its flood mapping data within the catchment, with consideration to the type of future flood events anticipated as a result of climate change, and current and future land use and development.²⁰³

The City of Melbourne emphasised the need for regular updates in light of climate change:

There is a need to streamline planning scheme amendments using the best available information about future conditions, including sea level rise and increased climate change rainfall intensity. In high-risk areas, flood models need to be updated regularly as knowledge advances.²⁰⁴

Mitchell Shire Council pointed to the increasingly fluid nature of natural disasters:

With the impacts of climate change resulting in increasing frequency and intensity of extreme weather events it is essential that land use planning, and the underlying studies which support the planning process, are responsive to the inherently fluid nature of potential natural disasters.²⁰⁵

As well as a statewide review of existing flood overlays, the Mitchell Shire recommended that the Victorian Government '[e]xplore and implement processes ... modelled for the impact of ever-worsening climate change and ensure that these predicted vulnerabilities are applied within the Victorian Planning Process'.²⁰⁶

Mornington Peninsula Shire Council linked a failure to update planning with increased flooding likelihood:

Historical and current design standards and planning do not account for climate change, which means inevitably the design capacity of existing infrastructure will be exceeded more often than now. This means our communities can expect more frequent flooding.²⁰⁷

Citing a report prepared by Hansen Partnership, Disaster Legal Help Victoria argued that planning laws fail to protect Victorians from climate risks, and that planning authorities need to make flood-related planning controls more cautious in light of climate change:

A 2021 report prepared by Hansen Partnership, *Climate Change and Planning in Victoria*, found that existing planning laws do not adequately protect Victorians from climate risks and that reform is needed. For example, much of the data underpinning flood overlays are out of date, with the report authors recommending a statewide review of

²⁰³ Brimbank City Council, *Submission 286*, p. 5.

²⁰⁴ Melbourne City Council, *Submission 296*, p. 20.

²⁰⁵ Mitchell Shire Council, *Submission 521*, p. 20.

²⁰⁶ Ibid.

²⁰⁷ Mornington Peninsula Shire Council, *Submission 531*, p. 3.

all flood mapping in line with the most recent rainfall and runoff projections prepared by the CSIRO. [...] Flood overlays need to become more cautious, not less, in line with the precautionary principle and given the observed and projected impacts of climate change.²⁰⁸

To address the failure of planning schemes to adequately account for climate change, Rural Councils Victoria recommended that the Victorian Government:

Amend the Planning and Environment Act and the Climate Change Act to explicitly mandate addressing climate change at all levels of the planning process.

Require planning amendments at all levels of government, and at all levels of the planning framework, to include an assessment against relevant climate change considerations.

Introduce mandatory climate-change related minimum standards into planning schemes.²⁰⁹

Various other councils' submissions adopted these same or similar recommendations.²¹⁰

The Committee understands that while it is difficult to predict the impact of climate change on Victoria's flooding, climate change brings an increased likelihood of small-scale flash flooding and other extreme weather events. The Government must seek to mitigate against future extreme weather events, including more extreme flood events, such as via strategic land use planning that appropriately accounts for climate change and its potential impacts.

RECOMMENDATION 18: That the Victorian Government introduce amendments to the *Planning and Environment Act 1987* (Vic) and Victoria Planning Provisions so that planning and other authorities must address climate change at all levels of the planning process.

RECOMMENDATION 19: That the Victorian Government work with floodplain management authorities and climate scientists to understand how flood modelling can be used to better predict the impact of climate change on flooding and update its flood management policies in line with this understanding.

²⁰⁸ Disaster Legal Help Victoria, *Submission 622*, pp. 5–6.

²⁰⁹ Rural Councils Victoria, *Submission 559*, p. 13.

²¹⁰ See Gannawarra Shire Council, *Submission 637*.

4.6 Developing in floodplains

As explained in Section 4.5.3, planning authorities use planning schemes to control the use and development of land, including in hazardous areas such as floodplains. The Planning and Environment Act defines ‘development’ to include:

- constructing a building
- altering or decorating the exterior of a building
- constructing or carrying out works
- subdividing or consolidating land
- placing or relocating a building or works on land
- constructing or putting up signs or boardings.²¹¹

One way planning authorities use planning schemes to control the development of land in flood-prone areas is by applying planning controls that restrict the types of development that can occur in these areas without a planning permit.²¹² By permitting or refusing an application for a planning permit, councils and catchment management authorities have the power to limit the development of land in floodplains.

4.6.1 The planning permit process

A planning permit is a legal document that grants temporary, conditional permission for certain uses or development on specified land.²¹³ Most forms of development in flood-affected areas—including land subject to flood zones and/or overlays—require a planning permit.²¹⁴ The process by which an application for use or development in a floodplain is assessed is summarised in Figure 4.9. It is also explained in further detail below.

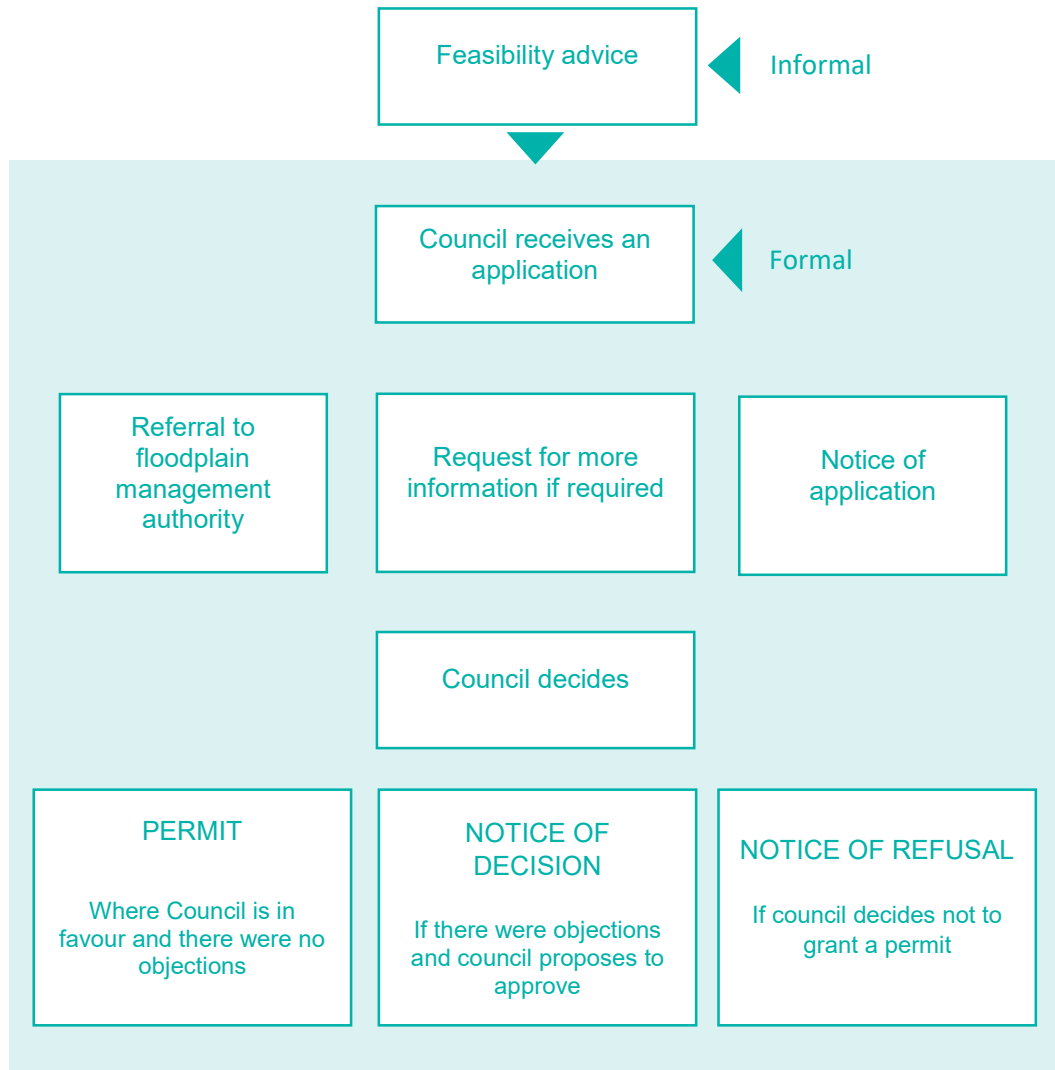
²¹¹ *Planning and Environment Act 1987* (Vic) s 3.

²¹² Department of Environment Land, Water and Planning, *Using Victoria's Planning System*, ch 3, p 1.

²¹³ *Ibid.*

²¹⁴ Department of Environment, Land, Water and Planning, *Guidelines for Development in Flood Affected Areas*, p 23.

Figure 4.9 Application and assessment process for a planning permit in a floodplain



Source: Department of Environment, Land, Water and Planning, *Guidelines for Development in Flood Affected Areas*, February 2019, p. 24.

Applying for a planning permit

Where a planning scheme requires a permit to be obtained for the development of land, an application for the permit must be made to the responsible authority.²¹⁵ An application may go through several steps before it is approved. Firstly, government guidelines recommend consulting the local council, any neighbours, and the floodplain management authority.²¹⁶ This ensures that a planning permit is actually required, avoids objections at the application stage, and allows the applicant to avoid potential rejection.²¹⁷ Anyone affected by the grant of a permit can make a written objection to

²¹⁵ *Planning and Environment Act 1987* (Vic) s 47.

²¹⁶ Department of Environment, Land, Water and Planning, *Guidelines for Development in Flood Affected Areas*, p. 23.

²¹⁷ *Ibid.*

the council, and the council must publish any objections.²¹⁸ Floodplain management authorities can advise applicants what information is needed to help assess their proposal.²¹⁹

If an applicant chooses to proceed with their application, they must submit it to the relevant responsible authority, usually a municipal council. Alongside the Planning and Environment Act, the *Planning and Environment Regulations 2015* (Vic) prescribes the planning permit process. Among other things, the Regulations require that an application for a permit be made in writing, and that it indicates clearly the land affected by the application and the proposed use or development that land.²²⁰

Referral to a floodplain management authority

After a council receives an application, it has a legislated responsibility to refer the application to a referral authority.²²¹ Under the Victoria Planning Provisions, the appropriate referral authority for an application for the use or development of land subject to a flood-related planning control is the relevant floodplain management authority (i.e., Melbourne Water or one of the nine regional catchment authorities).²²² However, a council does not need to refer an application to a floodplain management authority in certain circumstances, including if:

- the proposal satisfies requirements or conditions previously agreed between the council and authority
- the authority has considered the application's proposal within the past three months and stated in writing that it does not object.²²³

If a council refers an application to a floodplain management authority, the Act requires the authority to consider the application.²²⁴ The authority can then object to the application, which it may do so with or without conditions.²²⁵ It may also provide extrinsic advice which it considers relevant to the application, and which may assist the council or Minister to make their decision.²²⁶

The effect of a floodplain management authority's response to a planning permit application depends on the type of development proposed. Under the Planning and Environment Act, there are two types of referral authorities: determining or recommending.²²⁷ If a determining referral authority objects to a permit, the council

²¹⁸ *Planning and Environment Act 1987* (Vic) s 57.

²¹⁹ Department of Environment, Land, Water and Planning, *Guidelines for Development in Flood Affected Areas*, p. 23.

²²⁰ *Planning and Environment Regulations 2015* (Vic) s 13.

²²¹ *Planning and Environment Act 1987* (Vic) s 55.

²²² *Victoria Planning Provisions* (Vic) cl 66.03.

²²³ *Ibid.*, cl 66.

²²⁴ *Planning and Environment Act 1987* (Vic) s 56.

²²⁵ *Ibid.*, s 56.

²²⁶ Department of Transport and Planning, *Referral and Notice Provisions: Planning Practice Note 54*, June 2015, p. 2; Department of Environment, Land, Water and Planning, *Guidelines for Development in Flood Affected Areas*, p. 25.

²²⁷ *Planning and Environment Act 1987* (Vic) s 3.

must refuse to grant that permit.²²⁸ On the other hand, if it is a recommending referral authority, the council must consider the authority's advice but does not need to follow it.²²⁹

Since 2013, the Victoria Planning Provisions have designated Melbourne Water as a determining referral authority for flood-related planning permit applications.²³⁰ On the other hand, it has classified the regional catchment management authorities as recommending referral authorities for the same applications in their respective areas.²³¹

In considering an application for a planning permit, floodplain management authorities assess applications for development against the four objectives described in Table 4.1 below. The Department of Energy, Environment and Climate Action has a detailed explanation of how floodplain management authorities apply these criteria in its Guidelines for Development in Flood Affected Areas.

Table 4.1 Assessment criteria for development in floodplains

Objective	Aim	Relevant applications
Safety	Protect human life and health and provide safety from flood hazard.	Applies to all development proposals. Proposals that are unable to meet the safety objective will be rejected.
Flood damage	Minimise flood damage to property and associated infrastructure.	Applies to building proposals. The objective is usually satisfied by setting floor level requirements as a condition of permit.
Offsite impacts	Maintain free passage and temporary storage of floodwaters.	Applies to buildings and works in flow conveyance and flood storage areas, including those associated with a subdivision. The objective is usually satisfied by siting the works appropriately. Requirements are reinforced through conditions of permit. Sometimes design modifications are necessary.
Waterway and floodplain protection	Protect and enhance the environmental features of waterways and floodplains.	Applies to subdivisions, buildings and works near waterways and those parts of the floodplain that are regularly flooded. The objective is usually satisfied by incorporating works to prevent harm and appropriate vegetation into site plans. Requirements are reinforced through conditions of permit.

Source: Department of Environment, Land, Water and Planning, *Guidelines for Development in Flood Affected Areas*, February 2019, p. 29.

²²⁸ *Planning and Environment Act 1987* (Vic) s 61(2).

²²⁹ *Ibid.*, s 61(2A).

²³⁰ *Victoria Planning Provisions* (Vic) cl 66.03.

²³¹ *Ibid.*

Decision

As explained above, the responsible authority—for example, a municipal council or the Minister for Planning—typically makes the final decision to grant or reject an application for a planning permit to develop on land subject to a flood-related planning control.²³² When Melbourne Water is the relevant authority, the council must reject the application.²³³ However, if it is a regional catchment management authority, then council is only required to consider the authority’s advice.²³⁴

The Planning and Environment Act requires councils to consider several other things before deciding on an application including:

- any objections
- any significant effects on the environment
- any significant social and economic effects.²³⁵

If a council grants a permit, it must include any required conditions from the planning scheme or referral authority, as well as any other conditions it thinks fit.²³⁶ Whether the council grants or rejects an application, it must inform the applicant, any objectors, and relevant referral authorities of its decision.²³⁷

Applicants, objectors and recommending referral authorities can apply to the Victorian Civil and Administrative Tribunal (VCAT) to review a council’s decision.²³⁸ VCAT may direct the council not to grant a permit.²³⁹ Likewise, it may grant a permit, with or without conditions, and direct the council to issue the permit.²⁴⁰

4.6.2 The role of catchment management authorities in planning determinations

As noted, since 2013 the Victoria Planning Provisions have designated regional catchment management authorities as recommending referral authorities. The Committee heard from council stakeholders who recommended that regional catchment management authorities be reinstated as determining referral authorities.

²³² *Planning and Environment Act 1987* (Vic) s 61.

²³³ *Planning and Environment Act 1987* (Vic) s 61(2).

²³⁴ *Planning and Environment Act 1987* (Vic) sub-ss 60(1)(c) and (d).

²³⁵ *Planning and Environment Act 1987* (Vic) s 60(1).

²³⁶ *Planning and Environment Act 1987* (Vic) s 62.

²³⁷ *Planning and Environment Act 1987* (Vic) ss 63, 64, 65 and 66.

²³⁸ Department of Environment, Land, Water and Planning, *Guidelines for Development in Flood Affected Areas*, p. 26.

²³⁹ *Planning and Environment Act 1987* (Vic) pt 4 div 2.

²⁴⁰ *Planning and Environment Act 1987* (Vic) pt 4 div 2.

In its submission, the Northern Victorian Emergency Management Cluster—which consists of five Northern Victorian councils including the Campaspe and Loddon Shire Councils—recommended:

That the State reinstate Catchment Management Authorities (CMAs) as ‘determining referral authorities’ under Section 55 of the Planning and Environment Act and in all planning schemes.²⁴¹

Numerous other councils echoed this recommendation in their evidence.²⁴²

The Committee also heard from catchment management authorities who suggested that councils followed authorities’ advice regardless of their status. In his evidence, Goulburn Broken Catchment Management Authority’s Guy Tierney explained that out of thousands of permit applications for which the Authority provided advice, few resulted in councils rejecting this advice.²⁴³ According to Brad Drust, this was also the experience of the North Central Catchment Management Authority.²⁴⁴

Notwithstanding this, Shannon Maynard from Campaspe Shire Council elaborated on councils’ preference for reinstating catchment management authorities as determining referral authorities, explaining that:

Reinstating them back into that system would effectively allow a bit more rigour in us then saying, ‘Look, that referral authority has said no, and so that’s the reason why you can’t undertake that development’, rather than being a guidance. It would be something that we would be able to have as better grounds to refuse permits, so I think that is certainly what that point was getting towards.²⁴⁵

The Committee understands that, in determining a planning permit application to use or develop land subject to a flood-related planning control, regional councils generally follow the advice of regional catchment management authorities. This is despite the Victoria Planning Provisions designating these catchment management authorities as recommending referral authorities.

Noting many councils’ support for the Victoria Planning Provisions to redesignate regional catchment management authorities as determining referral authorities, the Committee is not convinced that splitting decision-making authority between decision-making bodies will necessarily lead to better outcomes. Doing so could create situations where responsibility is diffuse and dispersed, reducing accountability, rather than ensuring good decisions are made.

²⁴¹ Northern Victorian Emergency Management Cluster, *Submission 515*, p. 12.

²⁴² See Municipal Association of Victoria, *Submission 681*, p. 17.

²⁴³ Guy Tierney, *Transcript of evidence*, p. 54.

²⁴⁴ Brad Drust, *Transcript of evidence*, p. 55.

²⁴⁵ Shannon Maynard, Director, Emergency Management, Campaspe Shire Council, public hearing, Melbourne, 24 August 2023, *Transcript of evidence*, p. 25.

Improving planning decisions in flood-prone regional areas requires all parties involved to better understand, manage, and mitigate risk, rather than viewing assessment of that risk as someone else's responsibility. Regional catchment management authorities should continue to play an important role in providing their expertise to support planning decisions made by local authorities.

RECOMMENDATION 20: That regional local councils work closely with their regional catchment management authorities to better understand, manage, and mitigate the risk of building on floodplains in regional Victoria.

4.6.3 Permitting development on floodplains

Floodplain management strategies under the Victoria Planning Provisions include:

- identifying land affected by flooding
- avoiding intensifying the impact of flood through inappropriately located use and development
- locating emergency and community facilities outside the 1% AEP floodplain.²⁴⁶

Notably, they do not include wholly avoiding or prohibiting development in floodplains. However, the Government's Guidelines for Development in Flood Affected Areas do stress that 'flood risk to people ... should be kept to acceptable safety thresholds', and that 'development in a flood affected area ... should be planned to avoid or minimise the flood damage potential'.²⁴⁷ The Guidelines state that:

Given the future impacts of climate change, and higher densities of residential development, development that relies on new or extended flood mitigation infrastructure to provide flood protection should not occur if alternatives are available. Flood mitigation infrastructure is not fail-safe and is dependent on ongoing management and maintenance.²⁴⁸

For its part, the Victorian Planning Authority—a Victorian Government statutory authority that provides advice to councils in relation to strategic land use planning—explained that:

The VPA's first principle is to avoid development in flood-prone areas. Where this is not practical or there are other planning outcomes to be achieved, it may be possible in some situations to "engineer out" flood risk – for example, by constructing retarding basins, lifting ground levels before development occurs or requiring minimum floor levels be achieved for new buildings. In these situations, the VPA will look to ensure that there is certainty that the required flood-proofing infrastructure or measures will be in place by the time that development on the land is occupied and used.²⁴⁹

²⁴⁶ *Victoria Planning Provisions (Vic)* cl 13.03-1S.

²⁴⁷ Department of Environment, Land, Water and Planning, *Guidelines for Development in Flood Affected Areas*, pp. 6–7.

²⁴⁸ *Ibid.*, p. 7.

²⁴⁹ Victorian Planning Authority, *Submission 818*, p. 4.

The Committee heard from numerous stakeholders who expressed concern about councils and other planning authorities permitting the development of houses and businesses in floodplains.

One Maribyrnong resident, for example, questioned the decision to allow for ‘inappropriate development’ near the Maribyrnong River:

How has development been enabled so close to the Maribyrnong River, i.e. Riverview? How? Other commercial businesses and residents very close to the river also have applications for planning. This needs serious review.

Name Withheld, *Submission 7*, p. 5.

Friends of the Maribyrnong Valley echoed this sentiment, calling for buildings in flood-prone areas to be removed or adapted, stating:

Over the years it has been accepted that a number of bad planning decisions have been made which have allowed houses and other buildings to be constructed in areas affected by flooding. Where possible these should be removed as has happened in other flood prone areas or at least adapted so that they do not impede the river flow.²⁵⁰

Greater Shepparton City Council’s submission posited that:

avoiding development in the most flood prone areas, applying appropriate planning controls in the floodplain, and retiring our most flood prone assets hold the keys to creating a more flood resilient community by reducing the numbers of properties at risk of future flooding.²⁵¹

In his submission, Dr Stuart Strachan contended that Victoria’s planning framework ‘suffers from the ability for Councillors who are not formally schooled in a landuse planning discipline to be swayed by emotional arguments from citizens’.²⁵² He argued that:

- councillors should not be able to exercise discretion when a proposed development will increase permanent population in high-risk and high-hazard areas²⁵³
- exemptions from notice and review should be limited to low-risk locations²⁵⁴
- planners should be certified through the tertiary education system.²⁵⁵

The Municipal Association of Victoria’s submission similarly noted the ‘political pressure placed on councillors from their constituents when proposing new planning controls that may limit development or impact land value’.²⁵⁶

²⁵⁰ Friends of the Maribyrnong Valley, *Submission 465*, p. 1.

²⁵¹ Greater Shepparton City Council, *Submission 654*, p. 10.

²⁵² Dr Stuart Strachan, *Submission 401*, p. 3.

²⁵³ *Ibid.*, p. 4.

²⁵⁴ *Ibid.*

²⁵⁵ *Ibid.*, p. 5.

²⁵⁶ Municipal Association of Victoria, *Submission 681*, p. 14.

Dr Brian Cook, Associate Editor of the Journal of Flood Risk Research, suggested that '[w]e continue to locate homes and capital in floodplains because those who profit can mitigate their financial risk through transfer of indemnity to subsequent owners'.²⁵⁷ To stop encouraging development in floodplains, he recommended:

a mechanism that requires those who approve, build, and sell properties within the 1% AEP to retain shared indemnity for costs of flood disasters – likely via contribution to an insurance program.²⁵⁸

Stakeholders made other recommendations to address this issue. In its submission, the Insurance Council of Australia recommended that the Victorian Government adopt the National Cabinet First Ministers' agreement to end development on floodplains.²⁵⁹ It also suggested that the Government take a more active role in restricting development on floodplains:

The Victorian Government should also consider adopting and specifying an improved risk-based approach to land use for flood and other extreme weather events to protect lives and properties, providing clear direction on where new homes can and cannot be built, within each catchment area, and where mitigation is required.

Any housing development in areas prone to extreme flood risk should not be permitted...²⁶⁰

Likewise, the Northern Victorian Emergency Management Cluster argued there needs to be:

changes to Victoria's planning system to ensure a stronger focus on moving development away from flood-prone areas and the need to safeguard lives, properties and fragile ecosystems.²⁶¹

On the other hand, the Committee heard from residents who felt unduly burdened by overly restrictive planning controls.

As part of his submission, Lee Lanzafame summarised feedback given to him from flood-affected residents of Maribyrnong. One of the suggestions from these flood-affected residents was:

Relaxing over zealous planning restrictions which provide limited value and do not minimise impact. Residents should be able to build and accept risk autonomously (i.e. VRC floodwall)²⁶²

²⁵⁷ Dr Brian Cook, *Submission 533*, p. 2.

²⁵⁸ *Ibid.*

²⁵⁹ Insurance Council of Australia, *Submission 693*, p. 2.

²⁶⁰ *Ibid.*, p. 7.

²⁶¹ Northern Victorian Emergency Management Cluster, *Submission 515*, p. 12.

²⁶² Lee Lanzafame, *Submission 19*, p. 67.

Lanzafame directly called for:

Unhelpful planning restrictions lifted from the area – if we are to bare the cost of clean up following a flood then why are we not allowed to build/extend our homes as we wish with planning mirroring other non-LSIO areas. Or LSIO areas like RiverVue where ground-level homes are constructed/continuing to be constructed²⁶³

Kim Hay, a flood-affected resident from Echuca, expressed frustrations about her council rejecting an application to build a caravan shelter on her property, which is subject to an Urban Floodway Zone:

These rules and legislation needs to be looked at immediately. Telling us we do not want to encourage growth in this zone, and that we were not allowing rebuilding due to chance of inundation! We were purposely inundated and water intentionally diverted to us. How on earth can these restrictions be applied to us, us who went through the flood, us who want to do what ever we can to protect our homes in the future, but we have to follow these mistaken local laws that are contradictory in the least.²⁶⁴

Evidently, restrictive planning controls have the potential to prevent flood-affected Victorians from rebuilding after a flood event. To address this, Justice Connect recommended that:

A review of the planning framework is required in light of barriers resulting from cost and wait times. Applying exemptions for the cost of consents and permits, and expedited pathways to decrease waiting times would address some of the hurdles flood affected Victorians face when rebuilding after flood disaster.²⁶⁵

Provided as part of a third-party submission,²⁶⁶ a presentation by Cardno and Mitchell Shire Council summarising the Seymour Flood Mitigation Project—which sought to build a levee to protect Seymour against a 1% AEP flood event from the Goulburn River—noted the negative impact of planning controls on business development:

The area concerned contains a large part of Seymour’s commercial activities and essential services including the hospital and police station. The flood protection will also allow for the removal of flood-related town planning constrains and is likely to create an impetus for the growth of businesses. The Seymour Chamber of Commerce has previously expressed its belief that the existence of the planning constraints is a major contributing factor to inhibiting business development in this area of Seymour.²⁶⁷

Focusing on Rochester, Leigh Wilson argued that ‘[l]ocal planning laws need more effective control of development to not prohibit, but make it easier for appropriate development by the use of schedules and mapping, to control the type of development and construction techniques’.²⁶⁸

²⁶³ Ibid., p. 41.

²⁶⁴ Kim Hay, *Submission 43*, pp. 1-2.

²⁶⁵ Justice Connect, *Submission 607*, p. 6.

²⁶⁶ Jack Tennant, *Submission 35*.

²⁶⁷ Ibid., p. 4.

²⁶⁸ Leigh Wilson, *Submission 667*, p. 2.

The Committee notes that while the Victoria Planning Provisions, planning schemes, and planning permit process work to minimise development that occurs in floodplains, they do not prohibit all development. Planning should continue to prevent inappropriate new development in floodplain areas.

The Committee understands that, as evidenced by the damage caused by recurring flood events, many existing houses and businesses are located in flood-prone areas. The Victorian Government should balance limiting new development in floodplains with the need for flood-affected Victorians to rebuild in the aftermath of a flood event, and to support rebuilding in a way that improves protections against future flood-related damage.

The Committee recognises that, with the impacts of climate change increasing flood risk across many catchments in Victoria, floodplains will not be free from some form of development, and therefore all steps should be taken to manage risk through mitigation and infrastructure.

FINDING 9: Limiting inappropriate new development in flood-prone areas is an effective first step in minimising future flood risk.

RECOMMENDATION 21: That Victoria's strategic land use planning limit inappropriate new housing and business developments inside 1% AEP floodplains.

RECOMMENDATION 22: That the Victorian Government support residents within 1% AEP floodplains, including with funded programs, to manage the risk facing their existing properties and make their properties more flood resilient.

4.6.4 Building housing in floodplains

As outlined in Section 4.5, the building system plays a role in reducing flood damage to buildings. Alongside the National Construction Code, which prescribes a standard design and construction for buildings in flood hazard areas, the *Building Act 1993* (Vic) and *Building Regulations 2018* (Vic) require developers to attain building permits to carry out building work.²⁶⁹

For any buildings located in an area liable to flooding, the Regulations require the developer to also attain the report and consent of the relevant council.²⁷⁰ They must do so unless a planning permit is also required and the relevant planning scheme

²⁶⁹ *Building Act 1993* (Vic) pt 3 div 1.

²⁷⁰ *Building Regulations 2018* (Vic) reg 153.

regulates minimum floor levels in relation to flood.²⁷¹ The council must consult with the relevant floodplain management authority to assess the flood risk and determine a minimum floor level – this is typically at least 300 mm above a 1% AEP flood, unless the floodplain management authority consents to a lower level.²⁷² Moreover, a council must not give its consent if it believes there is likely to be a danger to the life, health or safety of occupants due to a flooding of the site.²⁷³

In its submission, Maribyrnong City Council contended that in order to capture developments that do not trigger planning permits, building legislation and regulations would also need to be updated:

It must be noted that a change to the planning framework in isolation of changes to construction codes, building regulations and the building permits process will mean that a many developments which currently do not trigger planning permits will not adequately address future flood or climate impacts. It is therefore critical that the relevant legislation and regulations as they relate to building permits is also reviewed and updated at a statewide level.²⁷⁴

Laura Jo-Mellan, Director of Planning and Environment at the Council, elaborated in a public hearing that:

[T]here need to be changes to the planning and the building systems, because where they do not trigger a planning permit they could trigger a building permit, which is another mechanism to deal with some of these issues. I think in terms of changes to the planning scheme, it is probably reviewing what we have at the moment and making sure it is fit for purpose and whether there are any other tools that we can use to try and ensure that mitigation and betterment are factored into any new builds, which would be similar for the building regulations and the building standards as well.²⁷⁵

The Committee notes that while strategic land use planning represents one of the Victorian Government's primary means of mitigating flood, any changes to the system of land use planning must also factor in Victoria's building system. Together, the two systems influence the exposure of Victorian communities and its built environment to flood hazards. Any changes to Victoria's system of land use planning must therefore also factor in any implications for its building system.

FINDING 10: Due to the interconnectedness of the two systems, any flood-related changes to Victoria's planning system should require changes to building standards and regulation to ensure the changes are compatible and effective between the two systems.

²⁷¹ Building Regulations 2018 (Vic) reg 153.

²⁷² Ibid.

²⁷³ Ibid.

²⁷⁴ Maribyrnong City Council, *Submission 530*, p. 9.

²⁷⁵ Laura Jo-Mellan, Director, Planning and Environment, Maribyrnong City Council, public hearing, Melbourne, 11 October 2023, *Transcript of evidence*, p. 35.

FINDING 11: Urban planning changes need to be rapid, statewide, consistent and systemic. Asking local councils and communities to manage land use planning and hazard management alone is unsustainable given the issues regarding climate disasters impact much bigger geographic areas than a single local government area.

4.6.5 Dealing with legacy flood risk

Alongside building standards and regulations, strategic land use planning represents an opportunity for the Victorian Government to improve the state's resilience to flood and, where possible, move development away from floodplains. Yet, despite the potential for Victoria's planning and building systems to mitigate the risk and impact of flood events on new developments, a significant portion of Victoria's existing built environment remains at risk of inundation. This was evidenced in the October 2022 flood event and, given the potential for climate change to increase the likelihood of future flood events, the situation may only get worse.

The issue of legacy risk was most clearly articulated by the Insurance Council of Australia, who contended:

Legacy risk, that is the existing built environment, must be focus for the Victorian Government. There is not clear support for those who find themselves caught in changing land use arrangements, as the majority of the focus is on those who are planning to build. Whilst this is important it is equally vital to support those already living on a floodplain.²⁷⁶

To address the issue, the Insurance Council's Chief Operating Officer Kylie Macfarlane suggested the Government commit to land buybacks, retrofitting and the raising of homes:

Perhaps if I can just comment on the fact that we would want to see the Victorian government focusing on resilience investment, land use planning, building codes and, as I mentioned before, pre-emptive measures to ensure those who are most at risk are provided with either buyback, retrofitting or the raising of their homes to reduce the impact of future flooding events.²⁷⁷

²⁷⁶ Insurance Council of Australia, *Submission 693*, p. 7.

²⁷⁷ Kylie Macfarlane, *Transcript of evidence*, p. 17.

The Committee heard from numerous other stakeholders who suggested ways to deal with the issue of legacy risk. Greater Shepparton City Council, for example, also flagged the potential for a land buy-back scheme:

A buy-back scheme similar to that implemented in the Northern Rivers region of New South Wales, for properties at severe risk of future flooding, should be implemented to protect the community from the hardships of repeated flooding and associated financial loss, and to reduce the breadth of impact and cost of future events.²⁷⁸

This was echoed by the Municipal Association of Victoria who submitted:

Difficult discussions and decisions with communities on retreat, land buybacks and not building in high-risk areas need to be considered.²⁷⁹

Likewise, Shannon Maynard, Director of Emergency Management for Campaspe Shire Council, noted:

[W]e do need to look at it holistically as a system to better protect our residents and make some decisions about whether some people should go back into those areas. Should we be talking about buyback relocations? Should we be talking about the ability to just do a massive lift of properties so that they are Queenslander-style homes so that the water can flow underneath?²⁸⁰

Peter Harriot, Chief Executive Officer of Greater Shepparton City Council, pointed out that the use of pre-emptive measures to deal with the issue of legacy risk would alleviate response and recovery efforts:

Prior to 1990 – it is all about legacy properties that have not been protected by the planning scheme, and we need to do something about it so that when the next flood comes along we will be better prepared and we will be more efficient in response, because we will have the learnings from this committee review here, our own internal learnings and all that sort of stuff. That is great. But it is still going to be a big response, and the relief effort is going to be as big. So we need to reduce the workload, and the best way to do that is through some form of buyback scheme, we believe.²⁸¹

Some other jurisdictions have addressed this issue. In the wake of their own major flood events, both the Queensland and New South Wales Governments have funded resilient homes programs that work to raise, retrofit or buy back homes subject to flood risk.²⁸²

²⁷⁸ Greater Shepparton City Council, *Submission 654*, p. 10.

²⁷⁹ Municipal Association of Victoria, *Submission 681*, p. 16.

²⁸⁰ Shannon Maynard, *Transcript of evidence*, p. 34.

²⁸¹ Peter Harriot, *Transcript of evidence*, p. 1.

²⁸² See NSW Government, *Resilient Homes Program*, <<https://www.nsw.gov.au/departments-and-agencies/nsw-reconstruction-authority/our-work/northern-rivers/resilient-homes-program>> accessed 5 April 2024; Queensland Government, *Resilient Homes Fund: Voluntary Home Buy-Back*, (n.d.), <https://www.qra.qld.gov.au/sites/default/files/2022-08/fact_sheet_for_the_voluntary_home_buy_back_program_0.pdf> accessed 5 April 2024.

The Committee acknowledges that any attempt to resolve the issue of legacy risk to existing properties—for example, via land buybacks—is likely to cost the Victorian Government a considerable amount of money and be contentious within communities. However, it is important that the Government also appropriately considers the lives and livelihoods of Victorians already living within floodplains. Where the planning and building systems have failed to mitigate flood risk to existing properties, the Government should investigate a resilient homes program.

RECOMMENDATION 23: That the Victorian Government fund a resilient homes program to raise or retrofit residential properties at risk of flood inundation, and which prioritises homeowners affected by the 2022 flood event.

4.7 The influence of commercial interest on planning decisions

Whether or not corporate interest influences planning decisions, the Committee understands that planning decisions have the potential to confer commercial benefits on private parties. For example, by amending planning schemes to rezone land once zoned for agricultural use to residential use, planning authorities can improve the value of the land in a way that serves the interests of developers. In a similar way, by changing the status of land subject to a flood overlay and approving permit applications submitted by private parties, planning authorities can unlock development in a way that directly benefits the commercial interests of those parties.

In line with part 8(b) of the terms of reference, the Committee sought to understand how corporate interests may influence planning decisions at the expense of communities. In particular, it sought to understand how corporate interests may have influenced the decisions to:

- permit the construction of a flood wall at the Flemington Racecourse
- remove the Rivervue Retirement Village from the relevant ‘land subject to inundation’ overlay.

The two decisions are considered as case studies in Sections 4.7.1 and 4.7.2 below. The Committee also sought to understand what safeguards are available to prevent undue corporate influence.

While the Government’s submission addressed the Flemington Racecourse flood wall, it did not address part 8(b) of the Terms of Reference. However, the Committee had the opportunity to question various government agencies and departments involved across the flood response in 2022. At a public hearing, the Victorian Planning Authority

was questioned about how it balances corporate or economic interests against the social and environmental interests of communities. The Authority explained that:

In preparing an amendment a planning authority must evaluate and include the strategic consideration of the impacts of any amendment. The matters of consideration are outlined in Ministerial Direction 11 [see Box 4.2 below] and require the planning authority to address, among other matters, any environmental, social and economic effects of the proposed planning scheme amendment proposed.

The consideration of these matters is resolved by undertaking technical and background reports to understand the impact of proposed change and ensuring that any amendment will deliver on the objectives of Planning in Victoria to provide for the fair, orderly and sustainable use and development of land in line with the [Planning and Environment Act].²⁸³

Box 4.2 Ministerial Direction 11

Ministerial Direction 11, which relates to the strategic assessment of planning scheme amendments, requires planning authorities to evaluate and explain a number of things, including:

- why the amendment is required
- how the amendment implements the objectives of planning, and the Planning Policy Framework
- whether the amendment makes proper use of the Victoria Planning Provisions.

As noted in Section 4.6.3, planning and referral authorities consider a number of other matters in relation to the approval of planning permits.

Source: Ministerial Direction No. 11: Strategic Assessment of Amendments, *Planning and Environment Act 1987* (Vic).

Regarding whether the Department of Transport and Planning is undertaking any probity work to strengthen the system against corporate influence, Andrew McKeegan stated:

I think there always needs to be a look in relation to questions that are raised about wanting to keep the planning system clean and the decision-making process very clean. We are very strong in relation to ensuring with any decision-making or processes within our group that conflicts are identified and managed and all of the processes are really sound in relation to that. When any question of integrity comes through, it is taken incredibly seriously by us in the department. I cannot talk to any specifics in relation to responses to things like that, but there are a number of reports that the department

²⁸³ Stuart Moseley, Chief Executive Officer, Victorian Planning Authority, public hearing, Melbourne, 12 October 2023, *Transcript of evidence*, p. 31.

is looking at in relation to questions of who should be the decision-makers within the planning scheme and who should be providing the inputs and how you ensure that that is clean from any undue influence in relation to that process.²⁸⁴

In response to a question on notice as to whether the Department has used the examples of the Flemington Racecourse and Rivervue Retirement Village to strengthen the planning system, the Department noted:

DTP is constantly reviewing and improving its approach to ensure that the amendment process is based on the most up-to-date and accurate information. A key step is the authorisation process where a check is made that supporting material for a proposed amendment is adequate. The exhibition process provides for this supporting material to be scrutinised, and if it is considered by a planning panel that any expert evidence can be tested. These steps in the statutory process for a planning scheme amendment provide for greater surety in the adoption of an amendment by the relevant planning authority and approval by the Minister.

DTP's amendment process has been reviewed by the Auditor General, as well as regular internal audit processes by independent auditors or reviewers. Where areas for improvement are identified, whether by day to day assessments or independent review those matters are implemented as soon as practicable, where feasible, within the scope of the PE Act.²⁸⁵

As outlined throughout this Chapter, there are many processes in place designed to ensure that planning decisions are appropriately justified.

4.7.1 Case study: Flemington Racecourse flood wall

Between 2002 and 2003, the Victoria Racing Club developed a masterplan for the redevelopment of the Flemington Racecourse, which included the development of a flood wall.²⁸⁶ It did so in consultation with the Victorian Government.²⁸⁷

In 2003, a representative of the Victoria Racing Club applied to the Department of Sustainability and Environment (whose planning functions would now sit under the Department of Transport and Planning) for a planning permit that would enable, among other things, construction of the flood wall.²⁸⁸ At the time of the application, the relevant land was covered by an LSIO; therefore, the application had to be referred to Melbourne Water, who advised of no objection subject to 39 conditions including mitigation works.²⁸⁹

²⁸⁴ Andrew McKeegan, *Transcript of evidence*, p. 13.

²⁸⁵ Department of Transport and Planning, *Inquiry into the 2022 flood event in Victoria hearings*, response to questions on notice received 14 November 2023, p. 8.

²⁸⁶ Victoria Racing Club, *Submission 689*, p. 2.

²⁸⁷ *Ibid.*

²⁸⁸ *Ibid.*, p. 3.

²⁸⁹ Victorian Government, *Submission 295*, p. 88.

Despite Melbourne Water's approval, the application received 35 objections, including from the Melbourne, Maribyrnong and Moonee Valley City Councils.²⁹⁰ Objections included concerns that the flood production works may negatively impact the Maribyrnong River floodplain, and requested the construction of the Arundel Retarding Basin.²⁹¹

In 2004, the Minister for Planning issued a notice of decision to grant the permit.²⁹² A number of objecting councils applied for a review of the decision by VCAT. However, the then Minister used powers under the relevant legislation to call in the review.²⁹³ The Minister did so on the basis that the application for review raised a major issue of policy regarding the development of the racecourse, and that the determination of the application may have a substantial effect on achieving planning objectives.²⁹⁴ As a consequence, the review was referred to the Governor in Council, who dismissed the review and directed the Minister to issue a planning permit subject to conditions²⁹⁵

The Minister issued the permit, attaching 49 conditions.²⁹⁶ These included compensating works, such as works at the Footscray Road Bridge Abutment, which were completed in 2006.²⁹⁷ In 2008, the Department provided final confirmation that the Victoria Racing Club had complied with all conditions, and by 2009, the flood wall was completed and handed over to the Club.²⁹⁸

In its submission to the Inquiry the Victorian Government noted that, at the time of the decision, the Minister for Planning believed the proposed development achieved the policy aims and objectives for the area it affected.²⁹⁹ With regard to the Planning Policy Framework, the Minister considered that:

- the development would contribute to Melbourne's role as the major Victorian focus of activity in finance, retail, commerce, tourism, culture and entertainment
- the Minister for Planning had coordinated with Melbourne Water to ensure implementation of measures that would achieve a neutral effect on flood levels.³⁰⁰

Despite these considerations, the Committee received evidence from stakeholders who believed that commercial interest was the primary consideration in the decision to approve the planning permit that enabled the development of the flood wall.

²⁹⁰ Ibid., p. 89.

²⁹¹ Ibid.

²⁹² Victoria Racing Club, *Submission 689*, p. 4.

²⁹³ Ibid., p. 4.

²⁹⁴ Victorian Government, *Submission 295*, p. 89.

²⁹⁵ Ibid., pp. 89–90.

²⁹⁶ Ibid.

²⁹⁷ Ibid., p. 5.

²⁹⁸ Ibid.

²⁹⁹ Ibid., p. 90.

³⁰⁰ Ibid.

In her submission, Alison Joseph suggested that Melbourne Water's permit approval aimed to protect Victoria Racing Club's commercial interests, rather than to prevent flooding:

Melbourne Water's responsibilities for planning approvals in flood prone areas derives from its responsibility to protect its own infrastructure and the prevention of flooding in general. It is a misapplication of these powers to allow the construction of a wall that increases the risk of flooding for the sole purpose of protecting the financial wellbeing of a gambling club. The construction of a levee wall surrounding the Flemington Racecourse had the inevitable consequence of increasing flooding in other areas.³⁰¹

Dr Paul Adams echoed this sentiment in his submission, stating that:

Clearly developers and the VRC are afforded many more rights to protect their assets under current development and planning practices. This is patently unfair. Despite opposition from three councils and local residents, the VRC flood wall was built. It is very clear that there has been significant corporate influence in planning decisions along the Maribyrnong River. This needs to change.³⁰²

The Committee received a significant amount of evidence from submitters and witnesses who suggested the flood wall contributed to the severity of the October 2022 flood event in Maribyrnong and surrounding suburbs. The Second Addendum to the Maribyrnong River Flood Event Independent Review, released in April 2024, also focused on the impact of the flood wall on the flood event. This evidence is summarised in Section 5.4

Melbourne Water advised the Committee that there is no proposal before them to raise the Flemington Racecourse flood wall.³⁰³

4.7.2 Case study: Rivervue Retirement Village

In examining the flooding of the Maribyrnong River, the Committee received considerable evidence relating to the Rivervue Retirement Village.

Located in Canning Street, Avondale Heights, Rivervue sits alongside the Maribyrnong River. During the October 2022 flood event, the site was subjected to significant inundation. The flooding left 45 out of the retirement village's 144 villas uninhabitable and caused minor damage to a further two.³⁰⁴

³⁰¹ Alison Joseph, *Submission 15*, p. 1.

³⁰² Dr Paul Adams, *Submission 628*, p. 10.

³⁰³ Nerina Di Lorenzo, *Transcript of evidence*, p. 13.

³⁰⁴ Tigcorp Pty Ltd, *Submission 524*, p. 1.

Stanislaw Korkliniewski

The floods of October 14, 2022, were devastating for me personally, and for my fellow residents and entire neighborhood as well. At around 7.00am on 14 October 2022, my wife received a phone call from our friends who live in Evergreen Ave, who asked if we could come over to their place and help them move furniture, as the flood waters were beginning to flow over the retarding basin. By around 8.05am, the flood waters had started to overflow over the roads and the drains. There wasn't any kind of mechanism in place to prevent the flood waters from overtopping the Maribyrnong River.

...

By around 8.20am, I told my wife, Cheryl, to start packing, as we were going to be flooded any time soon. She was in total disbelief. We salvaged whatever we could and started to prepare to evacuate our home. When we opened the front door, we were horrified by the volume of water that came into our home. I never dreamt there could be that much water coming through our house! I finally managed to get out, with a suitcase over my head and my wife clinging to me. At this stage, the water had reached approximately three feet. One of the other residents walked into the water to help my wife walk onto safe ground. The flood water was filthy, and we subsequently found out that this was categorized as category 3 black water.

...

The flood had taken everything I held dear, but it was the impact on my personal life that was the most devastating. My home, my sanctuary, had been destroyed. My memories, my photos, and my mementos were gone. All that was left was the sound of rushing water, the stench of mud, and the overwhelming sense of loss.

Source: Stanislaw Korkliniewski, *Submission 625*, pp. 2-3.

Name Withheld

Initially when the flood water kept rising and eventually flooded through my back and front doors and through the garage, it was a surreal feeling of bewilderment and then what to do? The first thing was to quickly retrieve our pet dog's memorial stone containing her ashes and place them high on top of our fridge, next was passports followed by putting furniture chairs, floor rugs and curtains up high. My lounge couches were just too heavy for me to handle. The cars needed to be moved to high ground because the streets were flooded up to at least axle height, but we needed to stuff clothes and anything at hand into the cars.

There was nothing else that could be done other than help others; we had no idea how high the water would rise, so we just watched it all happen. The water was putrid and dirty and black so walking through it to high ground was risky for people our age.

...

My wife has been extremely traumatized by the flood event of the 14th of October 2022. She is suffering emotional stress and depression and has visibly withdrawn into herself. She has been interviewed both for television and newspapers to explain the emotional impacts that the flood has caused her and as a result some of the more insensitive residents at Rivervue are bad mouthing her because they selfishly believe that telling her story has resulted in dropping their property valuations even though these people were unaffected by the flood. This has caused her immense grief and clearly these people will be forever off our Christmas card list. More toxicity because of developers not having a moral compass of what they build and where they build. Shame on Tigcorp.

She worries over her plants dying over summer such as two stags that are more than 40 years old and an Azealia that is about 30 years old that throws a sensational flower display each spring. Little things but a huge part of her life.

Source: Name Withheld, *Submission 541*, pp. 1–2.

Planning permit

In 2004, the previous owners Retirement Services Australia and Metricon Homes applied for a permit to develop a retirement village and nursing home.³⁰⁵ At the time, the land was included in two zones and subject to three overlays including an LSIO.³⁰⁶ At the time, Moonee Valley City Council failed to determine the application in the prescribed time, so the previous owners applied for the application to be determined by VCAT who decided to issue the permit.³⁰⁷

³⁰⁵ Ibid., p. 19.

³⁰⁶ *Retirement Services Australia v Moonee Valley CC* [2006] VCAT 1172, [10].

³⁰⁷ Ibid., [1].

In granting the permit, VCAT considered the relevant policy context. It identified the main issues relevant to the decision as providing accommodation to service an ageing local population and protecting life and property from flood hazard.³⁰⁸

According to VCAT, people contended that the land was unsuitable for housing aged persons due to its proximity to the floodplain.³⁰⁹ However, it rejected these objections on the basis that:

- all accommodation would be above the 1-in-100 year flood level
- subject to minor adjustments, Melbourne Water’s requirement for 600 mm freeboard could be met.³¹⁰

VCAT noted that the issue of protecting life and property from flood hazards is ‘of sensitivity to residents in the Maribyrnong River corridor particularly given the number of properties that are below the 1:100 year flood level and experience inundation’.³¹¹ However, it found it had no basis to reject the application for reasons relating to impact on the operation of the floodway and floodplain.³¹² It did so on the basis of a report produced by Neil Craigie Pty Ltd, Melbourne Water’s lack of objection, and a hydrologist’s evidence based on the Craigie report that:

- any increase in flood level would be minimised or negated by the proposed wetlands
- risk to people would be minimised by building 600 mm above the flood level.³¹³

In granting the permit, VCAT attached a number of conditions, including that:

- no building or works would be commenced until Melbourne Water approved a landscape plan demonstrating that proposed works would not adversely affect the flood capabilities of land within the 1-in-100 year flood level
- finished floor levels would be a minimum of 600 mm above the applicable flood level.³¹⁴

In 2010, Tigcorp Pty Ltd purchased the land with some development in place, and redesigned the site as a retirement village without a nursing home.³¹⁵ In line with a new report prepared by Neil Craigie, which took into account the proposed construction of retarding ponds and land swales, Melbourne Water endorsed Tigcorp’s amended plans to Moonee Valley City Council.³¹⁶

³⁰⁸ Ibid., [15].

³⁰⁹ Ibid., [20].

³¹⁰ Ibid., [21].

³¹¹ Ibid., [58].

³¹² Ibid., [58]-[59].

³¹³ Ibid., [58].

³¹⁴ Ibid., Appendix 1.

³¹⁵ Tigcorp Pty Ltd, *Submission 524*, p. 19.

³¹⁶ Ibid., p. 20.

Planning scheme amendment

In 2015, Melbourne Water sought an amendment to the Moonee Valley Planning Scheme to implement updated flood modelling.³¹⁷ Subsequently, Moonee Valley City Council prepared and exhibited a planning scheme amendment (Amendment C151) that, among other things, altered the LSIO.³¹⁸ The proposed changes added 54 properties to the overlay and removed 152.³¹⁹ The change would not have removed the Rivervue site from the overlay.³²⁰

During the exhibition stage, Moonee Valley City Council received numerous submissions, including eight objections.³²¹ One of these objections was from BMDA Development Advisory (a firm advising on planning and development) on behalf of Tigcorp, who contended that the proposed overlay did not reflect significant flood mitigation works on the Rivervue site.³²² According to a paper prepared by BMDA and attached in Tigcorp's submission, Amendment C151 was an 'opportunity to align the LSIO with the approved works'.³²³ Its submission proposed that the amendment be updated to reflect the works.³²⁴ After conferring with BMDA, Melbourne Water amended the exhibited overlay in accordance with the development plans for the Rivervue site, and the Council confirmed it would support these revisions.³²⁵

Later, a Planning Panels Victoria panel was established to consider issues raised in the submissions.³²⁶ Its Chair and sole member was Nick Wimbush.³²⁷ The Panel recommended that the amendment be adopted subject two changes, one of which was to modify the application of the LSIO over the Rivervue site in line with Melbourne Water's updates to the overlay.³²⁸

Amendment C151 took effect on 4 August 2016 and fully or partially removed 194 properties including the Rivervue site from the LSIO.³²⁹

Speaking to the Committee, Stuart Menzies from the Department of Transport and Planning further explained details of the amendment:

It changed arrangements for around 1500 properties, and that site in Canning Street was one of those. So a submission was made to the council along with a number of submissions made. It considered those. That submission was around that the overlay

³¹⁷ Nick Wimbush, *Transcript of evidence*, p. 69.

³¹⁸ Melbourne Water, *Melbourne Water Summary of Amendment C151*, supplementary evidence received 2 November 2023, p. 1.

³¹⁹ *Ibid.*, p. 2.

³²⁰ *Ibid.*

³²¹ *Ibid.*

³²² Tigcorp Pty Ltd, *Submission 524*, p. 21.

³²³ *Ibid.*

³²⁴ Melbourne Water, *Melbourne Water Summary of Amendment C151*, p. 2.

³²⁵ *Ibid.*

³²⁶ *Ibid.*, p. 3.

³²⁷ *Ibid.*

³²⁸ *Ibid.*

³²⁹ *Ibid.*, p. 4.

should be varied based on mitigation works that had been taking place on the site. And a plan of a new alignment of the overlay, which is referenced in the panel report for the amendment, was a plan prepared – I am not sure if it was prepared or endorsed; I can check that detail by Melbourne Water. So that in the end was the form in which the council adopted the amendment and as it was submitted to the minister for approval. In that process – I can only talk generally about how we manage amendments – if it is based on technical advice from a referral authority, that would be accepted as sufficient for the proposed change.³³⁰

Melbourne Water’s summary confirmed that ‘Melbourne Water’s updated overland flow and drainage modelling was not the grounds on which it was recommended that that the LSIO be removed from the Rivervue site’.³³¹ Rather, it was as a result of the earthworks carried out by Tigcorp.³³²

In evidence at the Committee’s May 2024 hearing, Craig Dixon from Melbourne Water advised, in relation to the 2016 planning application, that:

the property owners actually made a request that that LSIO removal be considered, and that was basically taken into account and picked up through that process.

Sheena WATT: Did Melbourne Water have any contribution to that as part of the engagement process?

Craig DIXON: That was sent back to Melbourne Water to make comment on, and as we have spoken about before, based on the modelling we had at the time and the state of knowledge we had at the time, it was considered appropriate not to object.³³³

Providing further detail in response to a question on notice, Melbourne Water advised that:

Subsequent to the developer completing earthworks as required conditions of the relevant planning permit, which were expected at the time to have removed the development from being subject to flood risk in a 1% AEP event, the developer made formal request of Moonee Valley Council to remove the LSIO pertaining to the site from the relevant planning scheme (C151), as part of a broader planning scheme amendment being progressed by council. The Council then referred this to Melbourne Water as the relevant referral authority for review, following which Melbourne Water notified council of a No Objection, based on the understood effect at the time of the earthworks removing flood risk.³³⁴

³³⁰ Stuart Menzies, *Transcript of evidence*, pp. 6–7.

³³¹ Melbourne Water, *Melbourne Water Summary of Amendment C1511*, supplementary evidence received 2 November 2023, p. 2.

³³² *Ibid.*

³³³ Craig Dixon, Executive General Manager, Service and Asset Lifecycle, Melbourne Water, public hearing, Melbourne, 10 May 2024, *Transcript of evidence*, p. 17.

³³⁴ Melbourne Water, Inquiry into the 2022 flood event in Victoria hearings, response to questions on notice received 29 May 2024, p. 6.

Tim Peggie, one of the members of the Independent Panel that conducted the Maribyrnong River Flood Review, explained that the previous owner of the Rivervue site made a submission to the Moonee Valley City Council to change the LSIO.³³⁵ He claimed that they did so because ‘they were of the opinion they were outside the flood plain’, and that this opinion was ‘based on the fact that the model in the first instance was wrong’.³³⁶ His colleague Mark Babister expanded that ‘[t]he model was not calibrated’, stating:

It would appear they took the parameters from the lower model and just used them in the upper model, and that led to these mistakes.

...

Having that model at the wrong level to begin with meant that the freeboard that is normally applied thereafter was lowered as part of this request. Normally the freeboard would cover what you had lowered and you would not end up flooding, but because the model was too low to begin with, you started to get below, and hence the event.³³⁷

In relation to Rivervue, Tim Peggie also commented that:

Obviously, there was a level that was set by permits, and at one stage or another there was an acceptance that it could be lowered. That is where the error is, but why that was tolerated or allowed we do not know.³³⁸

The Independent Panel explained this error in the model in their initial report:

A combination of the under-prediction of design flood levels by the mid Maribyrnong HEC-RAS model and the lower approved finished floor levels, appears to have resulted in the finished floor levels of the flood-affected properties at the Rivervue Retirement Village corresponding to the water levels produced by a flood with a 2% annual exceedance probability rather than a 1% annual exceedance probability. The minimum floor level for residential dwellings at risk of riverine flooding should correspond to the 1% annual exceedance probability level requiring 600 mm freeboard. While the latter does not eliminate flood risk, it usually ensures that finished floor levels are above 1% annual exceedance probability levels to allow for errors in the modelling used to estimate the requisite water levels.³³⁹

As noted below, Melbourne Water has begun the process of seeking interim planning controls for the Rivervue site.

The Committee heard from various stakeholders, including residents of Maribyrnong, who argued that the planning scheme amendment process was captured by

³³⁵ Tim Peggie, Melbourne Water Review Panel, and Director, Planning, Ethos Urban, public hearing, Melbourne, 10 May 2024, *Transcript of evidence*, p. 32.

³³⁶ Ibid.

³³⁷ Mark Babister, Melbourne Water Review Panel and Managing Director, WMA Water, public hearing, Melbourne, 10 May 2024, *Transcript of evidence*, p. 32.

³³⁸ Tim Peggie, *Transcript of evidence*, p. 26.

³³⁹ Tony Pagone et al., *Maribyrnong River Flood Event Independent Review*, Melbourne Water, 2023, p. 86.

commercial interest. One resident, for example, claimed that the planning panel's decision to recommend Amendment C151 was influenced by commercial 'greed'.³⁴⁰

The submission from the Victoria State Emergency Service Volunteers Association (VicSESVA) likewise argued:

For the Maribyrnong River event, the permission process to allow around 50 additional million-dollar apartments (48 of which were flooded in 2022, with floor levels lower than 6.6 AHD; a '1 in 100' year flood event) to be built as part of the Rivervue development in Avondale Heights might be seen as the worst example of privileging corporate interests at the expense of communities.³⁴¹

Rivervue is discussed further at Section 4.8.2 within the context of the 2024 model of the Maribyrnong River.

The issue of motivating influences on decision making was pursued by Committee members in evidence received from Independent Review Chair Tony Pagone:

Samantha RATNAM: ... In your view in looking into this do you have confidence to rule out any other kind of influence? We are grappling with what happened. Was it that people were pushing for this outcome? Was it the developers pushing for this outcome? Have you ruled that out? Do you have confidence you could rule that out? What else is there to explain this? We are wondering: how did this happen?

Tony PAGONE: As you know, I am a former judge and a lawyer, so my instinct is: what is the probity of evidence? ... I have not seen anything that would indicate that there had been any external influence to kind of get something through, but I had no powers of investigation. We had no powers to compel evidence. I do not have any of the powers that you have got, so we could not pursue it any further.

The best response to community perceptions about the motivations for planning decisions is for decision making to be transparent, supported by evidence, and clearly communicate with affected communities.

FINDING 12: There was inadequate record keeping regarding the planning approvals and decision-making process used by Melbourne Water regarding the Rivervue development resulting in a lack of transparency about the decision-making process.

4.7.3 Committee's reflections on the Flemington Racecourse and Rivervue Retirement Village planning decisions

The Committee notes a lack of clear evidence to conclude there was undue commercial influence relating to the decisions on the Flemington Racecourse flood wall or Rivervue Retirement Village, despite many stakeholders to the Inquiry believing this to be the case.

³⁴⁰ Name withheld, *Submission 541*, p. 29.

³⁴¹ Victoria SES Volunteers Association (VicSESVA), *Submission 539*, p. 56.

The Committee understands that the decision to approve Amendment C151, removing the Rivervue site from the relevant LSIO, was made in order to account for a change in site conditions. Likewise, it understands that the decision to approve the planning permit for the Flemington Racecourse flood wall arose out of a number of policy considerations. Although it is not in a position to comment on whether there was undue corporate influence on the two planning decisions, it notes that there remains a perception among stakeholders that the decisions worsened the impact of the October 2022 flood event in the Maribyrnong area, and that the decisions prioritised commercial interest over community safety.

Both the planning scheme amendment and planning permit processes involve an element of public consultation, allowing for submissions from individual and organisational stakeholders. Therefore, commercial interests have as much standing as community interests to provide feedback on a proposal. Accordingly, there must be appropriate safeguards in place to ensure that planning decisions—including decisions to approve planning scheme amendments and planning permits—are exercised in accordance with the law, and the best interests of the people of Victoria.

4.8 Updated flood maps for the Maribyrnong River area (April 2024 release)

As noted in Chapter 5, in April 2024, Melbourne Water released updated modelling and flood maps for the Maribyrnong River. This Chapter has summarised concerns from stakeholders that the modelling available during the 2022 floods (which was commissioned in 2003) was outdated and had inaccuracies. These are issues the new modelling seeks to address.

In 2021, Melbourne Water commenced re-mapping the Port Phillip and Western Port catchments to ensure consistency with the 2019 *Australian Rainfall and Runoff: A Guide to Flood Estimation* and Melbourne Water Technical Specification. The new modelling incorporates climate change projections to 2100. Melbourne Water fast-tracked modelling for the Maribyrnong catchment following the 2022 flood event but intends to progressively remap the entire Melbourne catchment.

Based on the new modelling, Melbourne Water has produced updated flood maps for the Maribyrnong River. The new flood maps show flood extent for a 2024 scenario (based on 1% AEP) and a 2100 scenario (based on 1% AEP). Box 4.3 below describes the modelling methodology undertaken by Jacobs, who were commissioned by Melbourne Water to develop the new modelling.³⁴²

³⁴² As well as publishing new Maribyrnong River flood model maps to its website, Melbourne Water supplied the Committee three larger maps highlighting similar information. These are examined below.

Box 4.3 2024 Maribyrnong River flood modelling methodology

To undertake the modelling, Melbourne Water used a range of datasets:

- **Rainfall data:** from the Bureau of Meteorology, which provides daily and continuous rainfall information. Data measured rainfall depths across the catchments to understanding varying rainfall patterns.
- **Streamflow:** information on the velocity and volume of water flow in the catchment was accessed from the Bureau of Meteorology's Water Data Online and the Victorian Government's Water Measure Information System.
- **Topography:** using technology such as aerial laser and 3D scanning topographical data of the Maribyrnong River catchment was gathered.
- **Light Detection and Ranging (LiDAR) survey** of the study area measured the height of the ground across the Lower Maribyrnong River.
- **Bathymetry data** of the Maribyrnong River was collected to build a 3D surface bed of the riverbed.
- **Mobile laser scanning survey** was used to collect details of 15 bridges along the length of the Lower Maribyrnong channel.
- **Flood mark survey:** using marks of flood water height from October 2022 flooding, including lines left by debris and photos of the flood event.
- **Observed flood extent 2022.**
- **Land use data.**
- **Infrastructure and hydraulic structures.**

The flood modelling is based on a combination of two models:

1. **Hydrology model,** including an event-based rainfall-runoff model: calculates how rainfall is converted into catchment runoff to determine the amount of water flowing into the Maribyrnong River at various locations throughout the catchment. This is information that is then input into the hydraulic model.
2. **Hydraulic model:** uses data from the hydrology model and information about the catchment's terrain to predict the depth, extent, velocity and flow of the Maribyrnong River during a flood event.

To assess climate change impacts, the flood modelling included a year 2100 scenario. Under the 2100 scenario:

- rainfall intensity was increased by 18.4% based on a high emissions scenario
- sea levels were increased by approximately 0.8 m (as per current Melbourne Water and Australian Rainfall and Runoff guidance).

Source: Melbourne Water, *2024 Maribyrnong River Flood Modelling Project: Summary Report*, prepared by Jacobs, May 2024.

As mentioned, alongside the new modelling, Melbourne Water published a series of maps dividing up the Maribyrnong River area into seven locations (see Figure 4.10).

Under the new modelling, all areas within the flood map boundaries showed some degree of growth in flood extent (under both the 2024 and 2100 scenarios) compared to the pre-existing LSIO boundaries (see Section 4.8.1 below). For most mapped areas, this was minor growth.

The Flemington and Kensington (Map 5) and West Melbourne and Footscray (Map 6) areas have the largest areas of growth in flood extent. The Avondale Heights and Maribyrnong (Map 2) area also showed notable growth in flood extent.

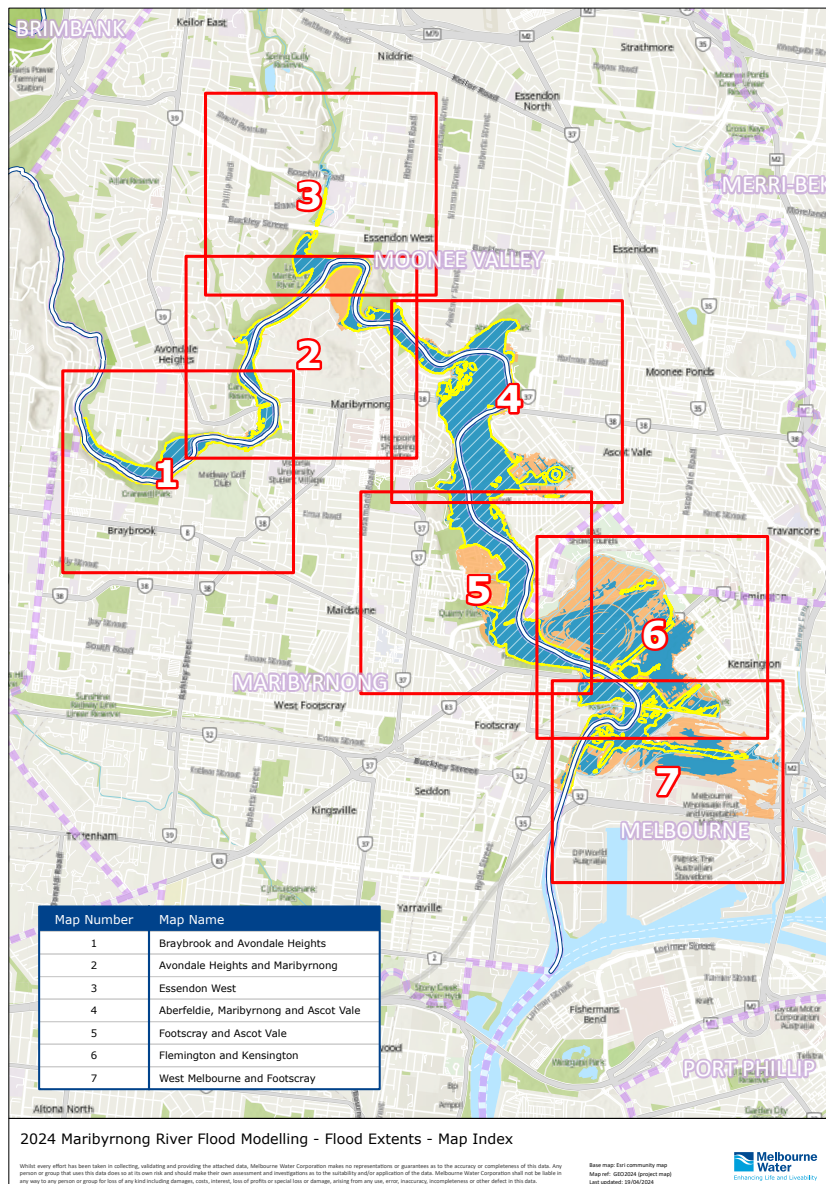
The new mapping includes a reference key for the extent of the 2022 flood event. In some areas (most notably Flemington and Kensington), parts of the flooded areas in 2022 were not within the boundaries of the pre-existing LSIO. The area where the Rivervue Retirement Village is located is also outside the boundaries of the pre-existing LSIO.

As well as new maps, Melbourne Water has published two reports by Jacobs that use the updated modelling to analyse the impact of the Flemington Racecourse flood wall and corresponding mitigation measures. These are considered briefly in Chapter 5.

The remainder of this Chapter:

- summarises the results of the new modelling of the Maribyrnong River
- examines work being done as a result of the modelling
- makes recommendations to the Victorian Government to build on these outcomes.

Figure 4.10 Flood map index, 2024 Maribyrnong River Flood Model



Source: Melbourne Water, 'Map Index', *New Maribyrnong River Flood Model Maps*, May 2024, <<https://letstalk.melbournewater.com.au/maribyrnong-river-flood-model/maribyrnong-river-flood-model-maps>> accessed 8 May 2024.

4.8.1 Results of the new modelling

At a public hearing on 10 May 2024, Melbourne Water presented three maps which were produced using the new modelling. These maps contained information available to the public online through Melbourne Water’s website,³⁴³ but isolated the following pieces of information:

- the extent of the October 2022 flood event compared to the pre-existing LSIO

³⁴³ See Melbourne Water, *New Maribyrnong River Flood Model Maps*, <<https://letstalk.melbournewater.com.au/maribyrnong-river-flood-model/maribyrnong-river-flood-model-maps>> accessed 14 May 2024.

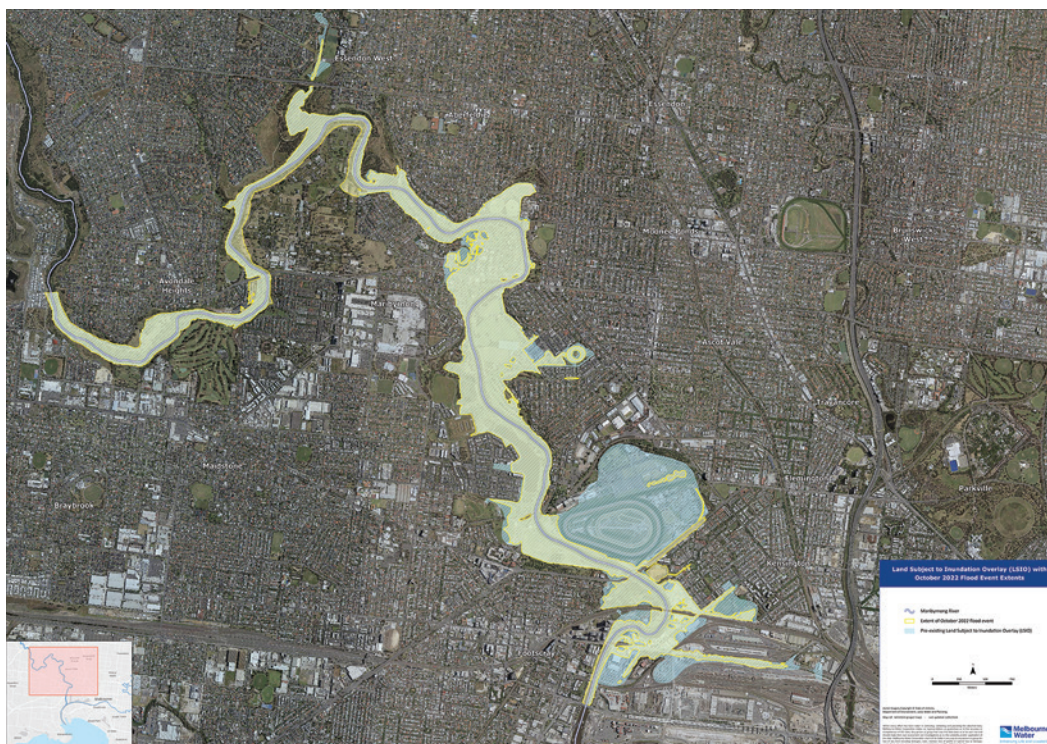
- the extent of the 2024 1% AEP flood compared to the pre-existing LSIO
- the extent of the 2100 1% AEP flood compared to the 2024 1% AEP flood.

The maps—and Melbourne Water’s explanations of them—are explored in turn below. Appendix B provides larger versions of the maps supplied by Melbourne Water to the Committee.

October 2022 flood extent

The first map presented by Melbourne Water shows the extent of the October 2022 flood event in the Maribyrnong River and compares this with the pre-existing LSIO. This is represented in Figure 4.11, which highlights the 2022 flood extent in yellow, and the LSIO in blue.

Figure 4.11 Comparison between the Maribyrnong River flood extent and pre-existing land subject to inundation overlay



Source: Melbourne Water.

The impact of the October 2022 flood is considered throughout this Report. Notably, however, the map shows that despite the 2022 flooding of the Maribyrnong River being approximately a 2% AEP flood,³⁴⁴ some areas outside of the pre-existing LSIO—which broadly reflects a 1% AEP flood—experienced flooding. This included the Rivervue Retirement Village.

³⁴⁴ Tim Wood, *Transcript of evidence*, p. 7.

2024 1% AEP flood extent

The second map presented by Melbourne Water shows the extent of the 2024 1% AEP flood compared to the pre-existing LSIO. This is represented in Figure 4.12, which highlights the 2024 flood extent in dark blue, and the LSIO in light blue.

Figure 4.12 Comparison between the 2024 Maribyrnong River 1% AEP flood extent and the pre-existing land subject to inundation overlay



Source: Melbourne Water.

Nerina Di Lorenzo, Managing Director of Melbourne Water, explained to the Committee that the model ‘tells us the likely area and height of waters in a 1 per cent likelihood event as of 2024’.³⁴⁵ Dr Di Lorenzo elaborated that:

At a high level the 2024 model is similar to the 2003 model but with a number of breakout locations where the area has expanded, so overall there is an increase in land subject to flooding by approximately 5 per cent, which we would attribute to a range of impacts such as continued urbanisation and the beginnings of some climate variability during that period of time.³⁴⁶

As noted, the map shows that the Flemington, Kensington, West Melbourne and Footscray areas have experienced the largest growth in flood extent. Specifically, the map suggests that parts of the lower catchment area would be submerged, affecting low-lying regions including Avondale Heights, Aberfeldie, Maribyrnong Township, Ascot

³⁴⁵ Nerina Di Lorenzo, *Transcript of evidence*, p. 2.

³⁴⁶ *Ibid.*

Vale, and Kensington. Additionally, recreational spaces and the Flemington Racecourse are expected to be impacted.

During public hearings, Melbourne Water stated that there are approximately 850 additional properties in Kensington Banks subject to the 2024 1% AEP flood.³⁴⁷ It also confirmed that 'there is inundation of the [Flemington] racecourse in the 1 per cent AEP event that has been modelled for today, 2024', and that '[t]he future 2100 map obviously shows greater inundation'.³⁴⁸

Melbourne Water commissioned Jacobs to undertake a further assessment of the impact of the Flemington Racecourse flood wall on the 1% AEP 2024 event. Jacobs' report shows that there is around a 3% increase in flood depth in the residential areas of the Maribyrnong Township—38 mm on 1.31 m—due to the flood wall in a 1% AEP flood in 2024. The industrial areas of Kensington see around a 1% increase in flood depth—12mm on 0.86m—due to the flood wall.

For residents in Kensington who are projected by the new model to be at risk of flooding, 'the wall appears to provide a 'shielding' effect through Kensington Banks' at a 1% AEP 2024 event.³⁴⁹ A further preliminary assessment shows that this shielding effect in Kensington Banks is 'also present under [a 2100] scenario'.³⁵⁰

Notably, the Rivervue Retirement Village is also within the 2024 1% AEP flood boundaries, despite being excluded from the previous LSIO. In relation to Melbourne Water's decision not to object to the decision to remove the previous LSIO from the site in 2016, Craig Dixon reiterated that 'based on the modelling [Melbourne Water] had at the time and the state of knowledge [it] had at the time, it was considered appropriate not to object'.³⁵¹ However, Dr Di Lorenzo emphasised the fact that 'now [Melbourne Water] have new models'.³⁵²

The Committee acknowledges that examination of flood risk beyond the 2022 flood event—particularly in relation to areas such as Kensington Banks, which were not affected by the October 2022 flood event—does not fall within the direct scope of the Inquiry's Terms of Reference. Notwithstanding this, and in light of the serious and ongoing risk of flooding across the state including the Maribyrnong River, the Committee felt it important to touch on these matters.

FINDING 13: According to Melbourne Water's updated modelling of the Maribyrnong River, approximately 850 additional properties in Kensington Banks would flood in a 2024 1% AEP flood scenario, and the modelling suggests the Flemington Racecourse flood wall provides a 'shielding' effect to these residents of around 5 cm in flood depth.

³⁴⁷ Tim Wood, *Transcript of evidence*, p. 6.

³⁴⁸ *Ibid.*, p. 5.

³⁴⁹ Jacobs, *VRC Wall & Mitigation Report for the 1% AEP 2024 Event*, prepared for Melbourne Water Corporation, 4 June 2024, p. 42.

³⁵⁰ *Ibid.*, p. 44.

³⁵¹ Craig Dixon, *Transcript of evidence*, p. 17.

³⁵² Nerina Di Lorenzo, *Transcript of evidence*, p. 17.

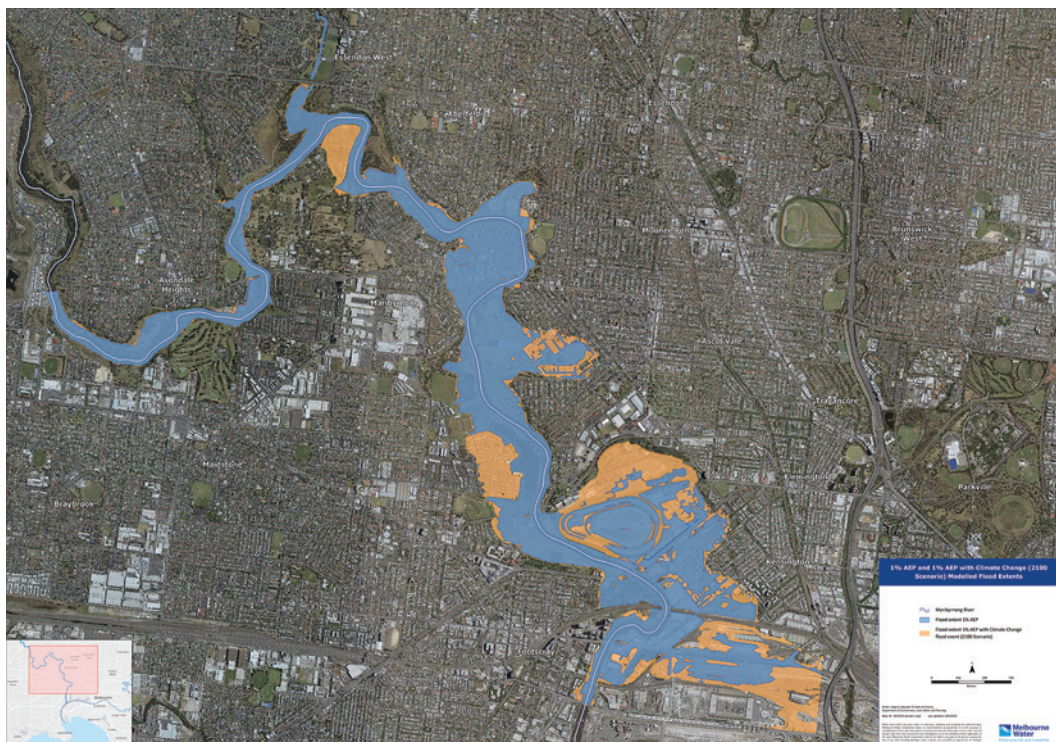
FINDING 14: Although it was not within the pre-existing land subject to inundation overlay, the Rivervue Retirement Village would flood in a 2024 1% AEP flood scenario, and there is a likelihood that its exclusion from the pre-existing overlay was due to an error in the calibration of the previous model.

FINDING 15: Modelling of the Maribyrnong River shows that, despite the Flemington Racecourse flood wall, the racecourse will flood in both a 2024 and 2100 1% AEP flood scenario.

2100 1% AEP flood extent

As well as the 2024 1% AEP flood extent, the updated model predicts the extent of the 2100 1% AEP flood, accounting for climate change. The third map presented by Melbourne Water (Figure 4.13) shows the extent of the 2024 1% AEP flood (blue) compared to the 2100 1% AEP flood (orange).

Figure 4.13 Comparison between the 2024 Maribyrnong River 1% AEP flood extent and the 2100 Maribyrnong River 1% AEP flood extent



Source: Melbourne Water.

When compared to the 2024 scenario, the modelling found that the 2100 1% AEP scenario is predicted to be larger and have greater impacts on residential areas. Nerina Di Lorenzo told the Committee that '[t]he 2100 model shows a more significant

– 42 per cent – increase in the land area that we project would be subject to flooding in 70 years time’.³⁵³

The projected flood extent for the 2100 scenario indicates that low-lying areas such as Avondale Heights, Maribyrnong Township, Ascot Vale, Aberfeldie, Footscray, and Kensington would be affected. Additionally, recreational spaces in Footscray and the Flemington Racecourse are expected to experience flooding in this scenario.

As well as extent, the updated modelling predicts greater flood depths throughout the Port Phillip and Westernport region. Figure 4.14 shows predicted flood depth information for key areas in the region.

Figure 4.14 Predicted flood depth information for key areas

Sample points within a given area:	2022 Event (nominal depth)	2024 1%AEP (nominal depth)	2100 CC 1%AEP (nominal depth)
Kensington Banks	Not flooded	0.84 m	1.57m
Maribyrnong Township (Centre)	1.2 m	1.75m	2.36m
Maribyrnong Township (Edge of flood extent)	0.4m	1.1m	1.7m
Ascot Chase	Not flooded	0.17m	0.8m
Edgewater	Not flooded	Not flooded	1.24m

Source: Melbourne Water.

Dr Di Lorenzo commented on the ‘longer term challenge posed by climate change and its impacts’, stating:

Melbourne Water’s work is closely linked to all parts of the natural water cycle, and we are closely attuned to climate impacts. Climate science tells us to expect greater variability and extremes – wetter wets and drier dries and higher intensity storms that are less predictable. We are already seeing some aspects of climate change at play, with more events starting to be highest on record. For example, the October 2022 event is acknowledged as the wettest month on record, so we are already starting to see that happen. We are also seeing this science starting to find its way into standards. For example in 2019 the *Australian Rainfall and Runoff* national guide to flood estimation was updated to take climate change impacts into consideration.³⁵⁴

Tony Pagone, Chair of the independent panel for the Maribyrnong River Flood Review, also noted the significance of climate modelling:

[T]he impression I had was that one of the upsides of this otherwise disaster is that there has been a substantial modernisation of the programming material. That had not been the case for a long time. Although things are getting worse for the reasons that were explained in terms of climate change, the fact I think is that Melbourne Water now

³⁵³ Nerina Di Lorenzo, *Transcript of evidence*, p. 2.

³⁵⁴ *Ibid.*, p. 3.

has available to it through the new programming materials better resources to be able to map and model and understand what is happening.³⁵⁵

Mark Babister, Managing Director of WMAwater and member of the independent panel, in turn commented on the significant impact climate change has had on flood risk:

I just think it would be useful to highlight that this review has really brought home the climate change implications from flooding. Climate change used to be considered a future problem with flooding, but it is a 'now' problem with the amount of warming. This flood, based on the latest research, is probably 50 per cent more likely – the 2022 flood – than it would have been historically, because of warming. That is something we should dwell on and factor into planning.³⁵⁶

He elaborated that:

The chance of the 2022 flood occurring, say, back in the 60s, 70s, 80s or 90s was about 2 per cent each year. That is the risk each year, a 2 per cent chance. Because of the warming already today it is about 50 per cent more likely. By 2030 it will be about 60 per cent more likely. Depending on what CO₂ emission scenarios we end up on, it could end up, at 2060, at two times more likely and in 2090 it could end up as bad as three times. That is based on the latest research that is about to be rolled out as national practice. They are horrendous numbers. And that is not just this catchment; all catchments are going to be something similar.³⁵⁷

Given the technical complexity of the hydraulic modelling that underpins the flood mapping and the decisions that arise from it in terms of future land use planning decisions and decisions around risk, it is important that there is confidence in the modelling undertaken. The Committee specifically asked the technical experts on the Independent Review Panel their opinion on the quality of the new model and the associated work undertaken:

The CHAIR: So you have got confidence in the modelling and the work of Jacobs?

Mark BABISTER: The Jacobs work is very good quality – very confident.

The CHAIR: So you think the committee can be confident in the advice we have received from Melbourne Water and obviously in the advice we are receiving from you about the substantive questions that need to be resolved?

Mark BABISTER: Yes.³⁵⁸

FINDING 16: Updated modelling of the Maribyrnong River demonstrates that climate change has had a profound impact on flood risk in the area since 2003 and is predicted to worsen flood depth and extent into the year 2100.

³⁵⁵ Tony Pagone, Chair, Melbourne Water Review Panel, public hearing, Melbourne, 10 May 2024, *Transcript of evidence*, p. 23.

³⁵⁶ Mark Babister, Melbourne Water Review Panel and Managing Director, WMA Water, public hearing, Melbourne, 10 May 2024, *Transcript of evidence*, p. 22.

³⁵⁷ *Ibid.*, p. 30.

³⁵⁸ Mark Babister, *Transcript of evidence*, p. 22.

4.8.2 Using the updated modelling to manage flood risk

Melbourne Water's Managing Director Nerina Di Lorenzo described flood data and modelling as 'the key enabler' of 'three important levers' for managing flood risk, namely:

- awareness and preparedness
- land use planning and building design
- mitigation infrastructure.³⁵⁹

Dr Di Lorenzo stated that Melbourne Water would be using the information received through the updated modelling to 'reduce flood risk using those three important levers'.³⁶⁰

Awareness, preparedness, land use planning and building design are discussed more broadly throughout this Chapter. Mitigation infrastructure—including in relation to the Flemington Racecourse flood wall—is explored in Chapter 5.

Awareness and preparedness

The Committee was informed that using information from the 2024 model, Melbourne Water intends to:

- work with the Victoria SES and councils to update municipal flood emergency management plans and local flood guides
- enable relevant communities to make or update their own individual flood emergency management plans.³⁶¹

In relation to communicating the information received from the 2024 and 2100 scenarios, Dr Di Lorenzo noted that a 'comprehensive engagement plan is ... underway', and that Melbourne Water:

[has] notified all of the affected properties and are holding a range of in-person sessions and webinars regarding the new model information. And we are working closely with the VICSES and councils on flood awareness.³⁶²

In doing so, Dr Di Lorenzo emphasised the potential of using information to manage flood risk:

For some residents this will be new information, and there will be many questions and concerns. It is really important to hold in mind that the information itself is not the risk; however, it provides property owners and authorities a means to help manage that risk. And we are committed to working with community members to help them understand

³⁵⁹ Nerina Di Lorenzo, *Transcript of evidence*, p. 2.

³⁶⁰ *Ibid.*

³⁶¹ *Ibid.*, pp. 2–3.

³⁶² *Ibid.*, p. 3.

and interpret the information, knowing that this will be new information to some people. The full updated Maribyrnong flood model and supporting information is available on the Melbourne Water website and has been provided to the committee.³⁶³

Melbourne Water's Craig Dixon highlighted the importance of raising awareness of updated flood risk:

The most immediate thing that we can do, and we have actually started doing it already, is deploy this into the community. The best thing we can do to support community right now, today, as opposed to what we can do in the coming period, is make sure the community are aware of their flood risk, so individual people in the community affected understand what their risk is. They understand what that means in their setting. They understand what they need to do – what they can do to prepare for flood risk should it eventuate. And they understand when a flood event occurs what they need to look for and listen for, what the trigger is and then when to enact their flood response plan.³⁶⁴

4

Land use planning and building design

We have a national process that all of the states follow to look at mitigating and managing flood risk, and Melbourne Water follows that process. But as I said earlier, there are very few things you can do to mitigate the floods – to lower the flood level – and pretty much everything that would work on this catchment would have huge environmental consequences. You could build a big dam upstream – nobody is going to sign on for that. You could channelise the river and make it really ugly – nobody is going to sign on for that. So you are really left with planning and helping people make their properties more flood-resilient. Raising people's houses in those really flood-prone areas would make a big difference. Buying back the houses in the extreme risk areas would make a big difference. Grants for people to make their houses more flood resilient would make a big difference. Changing the planning policies, which often gets overlooked, to encourage people – sometimes you can encourage further densification but smarter housing. If you let people densify but you put houses up higher, you actually can get a more resilient community without having to pay for it. So there are options, but they are all hard and they are complex, and they often involve government funding.

Source: Mark Babister, Melbourne Water Review Panel and Managing Director, WMA Water, public hearing, Melbourne, 10 May 2024, *Transcript of evidence*, p. 35.

As well as using the 2024 scenario to enhance communities' awareness and preparedness, Melbourne Water intends to use the 2100 model to 'guide land use planning and building design'.³⁶⁵ Specifically, Dr Di Lorenzo outlined that Melbourne Water will:

be working with the state government, councils and the community to move this information into planning schemes as efficiently as possible, which will guide floor

³⁶³ Ibid., p. 3.

³⁶⁴ Craig Dixon, *Transcript of evidence*, p. 5.

³⁶⁵ Nerina Di Lorenzo, *Transcript of evidence*, p. 2.

heights and building design. We will also be able to use this information to continue providing guidance on how individual property owners can do further flood-proofing of their homes.³⁶⁶

Regarding planning schemes, Craig Dixon explained that Melbourne Water is preparing a planning scheme amendment request that would ask for the 2100 1% AEP flood to be reflected in relevant planning controls.³⁶⁷

Using Kensington Banks as an example, Dr Di Lorenzo highlighted the impact of incorporating the updated modelling into the relevant planning scheme:

Going into the planning scheme will mean if there is a development on that property, it then gets referred to us. It means that we can take into consideration what the height of water is in the setting floor levels and making sure that building design for anything that happens in the future takes that into account. That is the main impact, and recognising it is 800 properties as opposed to 800 homes. It just depends on what the existing floor levels are of homes there. But effectively it guides future development.³⁶⁸

Noting that Melbourne Water has moved from a 'modelling platform that was two generations old' to a more sophisticated, up-to-date model, Mark Babister explained that:

There will be changes in flood levels because they will become more accurate. They will not be perfect, but we will have much more accurate spatial representations of flood levels, and that will lead to better planning.³⁶⁹

In light of climate change, he further recommended that:

we need to be basing our planning decisions on some plausible future climate scenario, not historical information, because otherwise we are just plain wrong and then we have to live with those decisions.³⁷⁰

In relation to the Rivervue Retirement Village, Dr Di Lorenzo noted that Melbourne Water has been 'instigating an LSIO for that site based on the current information and the new information that we have'.³⁷¹ This is in line with a recommendation from the Independent Panel for the Maribyrnong River Flood Review, which asked that Melbourne Water:

seek the approval of the Minister for Planning to apply the interim planning controls designating the LSIO in locations where flooding occurred, pending the update to the Mid Maribyrnong flood model.³⁷²

³⁶⁶ Ibid., pp. 2-3.

³⁶⁷ Craig Dixon, *Transcript of evidence*, p. 5.

³⁶⁸ Nerina Di Lorenzo, *Transcript of evidence*, p. 15.

³⁶⁹ Mark Babister, *Transcript of evidence*, p. 23.

³⁷⁰ Ibid., p. 33.

³⁷¹ Nerina Di Lorenzo, *Transcript of evidence*, p. 17.

³⁷² Tony Pagone et al., *Maribyrnong River Flood Event Independent Review*, p. 120.

In its 6-month progress update, Melbourne Water explained that it:

submitted a request to the Minister for Planning to apply the interim LSIO on 6 December 2023, and has subsequently been working with the Department of Transport and Planning (DTP) to support processing of the request.³⁷³

Accepting that, as a result of mitigation, properties may be added or removed from LSIOs, Dr Di Lorenzo emphasised the importance of more frequent updates to modelling:

Similar to the previous example, there are times where properties come in and out, depending on what has happened locally, and that again is the point-in-time risk analysis, each time. So again, the critical thing, I think, that has come out of the changes in standard and also the continued collective focus on this is the frequent updates, or the more frequent updates, because we think, as one of the members said earlier, there are so many moving parts that as they change we need to be able to capture them. But it is a point in time, and that basically is what will continue happening every time there is a new model. It will increase in some places and it may decrease in others, depending on localised mitigation works, and so it would not be unusual to see a circumstance where things might also come out of an LSIO.³⁷⁴

Responding to a question about how residents whose properties now sit within the 1% AEP flood should respond to this information, Mark Babister noted that:

that is a real issue for those properties that have moved from being on one side of a line to the other. They will struggle to get insurance at affordable prices. So there are real consequences for those people, but also if they do renovate, plan, knock down, rebuild, or other people buy those houses, they can buy those houses or change those houses on an informed basis. But it is also important to keep in mind that it is not like there is a line and there is no flood risk above it and there is flood risk below it; it is just where we have drawn a line and are saying, 'The risk above that is probably acceptable, the risk below that is probably not acceptable.' That line will keep going up in the future with climate change, so we need to factor that in as well.³⁷⁵

In light of worsening floods, Tony Pagone called for greater caution in developing on floodplains:

But I think from what Mr Babister said earlier on in response, and adding that in response to your question, the lessons really are that it is going to get worse; we need to be more cautious. But that will give rise to people saying, 'Well, you're imposing unrealistic hurdles.' Government will be told, 'You should be more willing to allow construction to be built. You should allow more developments to take place.' And eventually you will end up with another big problem.³⁷⁶

³⁷³ Melbourne Water, *Melbourne Water's response to Independent Review Panel's recommendations: Progress update – April 2024*, 2024, p. 5.

³⁷⁴ Nerina Di Lorenzo, *Transcript of evidence*, pp. 17–18.

³⁷⁵ Mark Babister, *Transcript of evidence*, p. 24.

³⁷⁶ Tony Pagone, *Transcript of evidence*, p. 25.

On the other hand, Mark Babister highlighted the complexities of permitting—or not permitting—development in flood-prone areas:

A really good example of the challenges you have in this area: you could have a house in Maribyrnong that is a little bit low or a lot low. It could be a three-bedroom house and they have now got an extra child and they want to put a fourth bedroom on. Do you let those people build a fourth bedroom at a low level or do you say, 'No. You'll have to squeeze into three bedrooms or you'll have to move somewhere else'? You cannot be absolute about these things. I think it is probably reasonable to let somebody have an extra bedroom for their family, but they should be doing it in a very informed way about their flood risk.³⁷⁷

To protect homes, he proposed using a lower design flood event for non-residential areas such as racecourses:

We use this 1 per cent standard for everything – for houses, for businesses and for racecourses. It would be much more sensible if we actually had things like the racecourses at a lower level, so they were inundated, and when the houses were inundated, any impact on people's houses built at the correct level they were told to was minimal. And I would say the same for major bridges and motorways and other things as well. If people have built their houses at the appropriate level in accordance with government guidance, we should try and make sure other uses do not impact them.³⁷⁸

He went on to suggest that had the Flemington Racecourse been built against the 2% AEP flood and the surrounding houses against the 1% annual exceedance flood, the impact of the 2022 flood event on those houses would have been reduced.³⁷⁹

The appropriateness of using the 1% AEP flood as the default design flood event is considered at Section 4.5.

Regarding flood risk in planning schemes, the Committee asked the Maribyrnong River Flood Review panel whether the following recommendation from its Report should be applied outside of the Port Phillip and Westernport region:

Melbourne Water should take account of the change in land use and projected changes to land use when setting flood levels for planning and development and the application of the Land Subject to Inundation Overlay.³⁸⁰

Despite indicating that this was outside of the terms of reference of the Maribyrnong River Flood Review, Tony Pagone stated:

And it is not rocket science, is it? All planning authorities that have an impact on giving approvals should take into account everything that bears upon the decision that they are likely to make – simple as that.

³⁷⁷ Mark Babister, *Transcript of evidence*, p. 35.

³⁷⁸ *Ibid.*, p. 25.

³⁷⁹ *Ibid.*, p. 26.

³⁸⁰ Tony Pagone et al., *Maribyrnong River Flood Event Independent Review*, p. 119.

...

I mean, you can extrapolate from that. If Melbourne Water should do it, everybody else who is going to have an impact should do it too.³⁸¹

Notwithstanding this recommendation, Mark Babister explained that it is his understanding that the 2100 scenario does not take urbanisation into account.³⁸² While acknowledging that it is difficult to factor in urbanisation, ‘because that might not be government policy’, he proposed that if he had to account for urbanisation ‘[he] would speak to a planner, and [he] would ask them to speculate on where we will end up under the current proposed future’.³⁸³ He elaborated that:

[Y]ou could come up with a high growth and a low growth scenario, just like we do with population projections. You could run both and you could see how much difference it makes. Urbanisation has been quite a problem, but it is a much smaller problem going forward than climate change just because climate change is such a big problem.³⁸⁴

He stressed the importance of factoring in urbanisation:

They really do need to do this. If you think about the question we had earlier, if everybody builds their house at the appropriate level they are told to and then we have a bit more urbanisation and a bit more run-off, we are setting ourselves up for failure, because all those people will move from one side of that line to another. We are much better off factoring in a reasonable amount of future urbanisation and a reasonable amount of future planning and making people build their houses that little bit higher so they do not end up with very large insurance policies. That is our recommendation: they should have a planning horizon that these flood levels are worked out. The response back will always be, ‘We don’t know exactly where the urbanisation will occur,’ and that is true, but you can still have a fair guess at it.³⁸⁵

In light of urbanisation, Tim Peggie and Mark Babister also emphasised the importance of taking catchment-wide approaches to flood modelling and land use planning.³⁸⁶

The Committee acknowledges that, while it is difficult to predict the exact impact of climate change on flood risk into the future, it is highly likely that climate change will worsen the depth and extent of flooding in certain catchments over time. This was evidenced in Melbourne Water’s 2100 model and requires the Victorian Government to ensure that strategic land use planning accounts for the effects of climate change over time. Flood modelling and planning decisions based on modelling should also account for changes to land use and urbanisation over time, to ensure that the planning system is looking at realistic scenarios and mitigating flood risk as effectively as possible.

³⁸¹ Tony Pagone, *Transcript of evidence*, p. 29.

³⁸² Mark Babister, *Transcript of evidence*, p. 36.

³⁸³ *Ibid.*, p. 38.

³⁸⁴ *Ibid.*, p. 39.

³⁸⁵ *Ibid.*, p. 28.

³⁸⁶ *Ibid.*; Tim Peggie, *Transcript of evidence*, p. 39.

FINDING 17: The use of strategic land use planning to mitigate flood risk requires the Victorian Government and planning authorities to consider the effects of climate change as well as projected changes to land use over time.

RECOMMENDATION 24: That the Victorian Government require planning authorities, floodplain management authorities and other relevant actors to take account of the change in land use and especially projected changes to land use when setting flood levels for planning and development and the application of the land subject to inundation overlay.

Mitigation infrastructure

At a public hearing, Dr Di Lorenzo indicated that Melbourne Water would be undertaking ‘a comprehensive study of potential mitigation options ... for the Maribyrnong catchment to determine what is feasible and effective, utilising the new 2100 model’.³⁸⁷ Craig Dixon further stated that:

[W]e have started a process now to do an extensive review, a restudy, of mitigation options for the Maribyrnong catchment. We are sending that out to the specialist market, and that will be beyond just local as well, to seek the most contemporary expertise we can. That will be a significant piece of work. But the most important thing to note is it will now be based on a model projecting a 2100 risk, which we have never had before. We have not had that forward projection-type modelling, so we can consider what options are available that not only provide that mitigation today but will have the resilience against climate change in the future.³⁸⁸

In light of the failure of the Flemington Racecourse flood wall, Mark Babister called for greater caution when it comes to mitigation infrastructure:

Lessons – I think with mitigation works it always pays to be cautious, and that is probably what was not applied at the time. The technology at the time made it hard for them to be definitive, but nobody erred on the side of caution, which was probably the biggest mistake.³⁸⁹

Later in the public hearing, he elaborated that mitigation infrastructure should be underpinned by appropriate modelling of its impact:

I would really strongly caution against jumping into mitigation measures without actually thoroughly modelling the system. We see this all round the country, where people believe a particular thing will solve their problem, and it might move the problem down the river a little bit, or it might not be anywhere near as effective. We have a process to look at mitigation where we first understand in a very reliable way

³⁸⁷ Craig Dixon, *Transcript of evidence*, p. 3.

³⁸⁸ *Ibid.*, pp. 9–10.

³⁸⁹ Mark Babister, *Transcript of evidence*, p. 24.

the existing flood behaviour before we look at solutions, because often solutions do not work as people intended or there are unintended consequences. It is really hard to mitigate flooding without transferring that burden across to another property.³⁹⁰

In relation to the racecourse flood wall and corresponding compensatory works, Tony Pagone questioned why the Victoria Racing Club were not required to determine whether its mitigation works were effective:

Some of it really is a funding issue, and the only thing I would add to the funding issues is a bit more attention to governance kind of questions. I mean, I do think it is odd that when an event occurs you do not have faster answers to how it happened. I know this will doubtlessly upset the VRC, but I do think it is a bit odd that the VRC does not really have an obligation to find out whether what it did and the mitigation works that it had done were effective, because the VRC is not a private individual. I might be able to get away with it around my house, but when it has gone to the trouble of building a wall which will inevitably have an impact, you would think that governance issues might require that there would be some additional requirement to come up with monitoring, answering, to make sure that what it has sought to achieve, subject to a condition, is working in the right kind of way, and that maybe there ought to be additional obligations imposed upon it.³⁹¹

As noted, Chapter 5 explores the use of mitigation infrastructure to manage flood risk, including in relation to the Flemington Racecourse flood wall.

³⁹⁰ Ibid., p. 27.

³⁹¹ Tony Pagone, *Transcript of evidence*, p. 33.

Chapter 5

Flood mitigation infrastructure

5.1 Introduction

The challenge is the event was of such significance that even local basins which were meant to be overflow completely overflowed and were inundated, so there is I think an extent to which local infrastructure can deal with events of this scale

Evan Counsel, General Manager, Strategy, Planning and Climate Change, City of Melbourne, public hearing, Melbourne, 11 October 2023, *Transcript of evidence*, p. 36.

Flood mitigation infrastructure refers to the structural measures which are used to protect against or lessen the effects of flooding, including levees, channels, floodways, retention basins, dams and floodgates.

According to the Victorian Floodplain Management Strategy, flood mitigation infrastructure is now considered less effective at preventing damage from flooding than it was in the past. Evidence suggested that land use planning and building controls are more reliable in the long term. Large-scale rural flood mitigation infrastructure is 'no longer considered best practice', and there is more recognition of the public benefits of environmentally healthy floodplains. The Strategy states:

Attempts over the past century to use engineering solutions to mitigate flooding have had mixed results. The risks associated with unmaintained, low-construction-standard levee systems are high. Spending funds on levees, and other flood mitigation infrastructure, without understanding their full costs and benefits doesn't make sense. It is time to rethink and reset the approach, working more with the environment to allow wetlands to reduce the impacts of flooding by holding and slowing floodwater at appropriate times.¹

The floods of 2010–12 exposed deficiencies with some of the existing rural flood mitigation infrastructure, much of which was built before planning controls and modern engineering standards. As a result, the Victorian Floodplain Management Strategy envisioned that much of Victoria's current 4,000 km of levees should be left without formal maintenance until they no longer have utility.

However, there are existing settlements, towns and cities which were built in flood-prone areas before flood risk was understood and sufficient planning controls were in place. In some of these cases, flood mitigation infrastructure is appropriate. The utility of flood mitigation infrastructure to save parts of towns from flooding was made clear with the construction of the makeshift levee in Echuca during the

¹ Victorian Government, *Victorian Floodplain Management Strategy*, 2016, p. 14.

October 2022 flood event. The levee was effective, however its location meant that parts of the town were protected and other parts were inundated.

This Chapter will examine mitigation measures in place during the 2022 flood event and their adequacy in minimising harm and damage. The Committee has considered metropolitan and regional and rural infrastructure in flood-impacted communities.

5.2 Effectiveness of the Victorian Floodplain Management Strategy (2016)

As discussed in Chapter 3, the Victorian Floodplain Management Strategy (the Strategy) sets out the roles and responsibilities of government agencies and authorities in flood management. The Government explained the Strategy, released in 2016:

aligns with the Victorian Government’s response to the *Victorian Floods Review* (2011), the *Parliamentary Inquiry into Flood Mitigation Infrastructure* (2012) and the broader emergency management framework set out in the *Emergency Management Act 2013*.²

The Government’s submission further noted that ‘all 56 actions in the [Strategy] are either completed or embedded in business-as-usual practice’ but that it will ‘continue to inform decisions and actions for managing flood-related issues’.³

At a public hearing, the Victorian Government expanded on the role of the Victorian Floods Review (2011) and report on the parliamentary *Inquiry into Flood Mitigation Infrastructure* (2012) in developing the intentions and purpose of the Strategy. Andrew Fennessy, Deputy Secretary of Water and Catchments at the Department of Energy, Environment and Climate Action, told the Committee:

[T]hose reviews highlighted the need to clarify the roles and responsibilities and accountabilities for flood warning systems and the management of flood infrastructure. The reviews also highlighted gaps in the flood warning system that needed to be addressed, that improvements in flood planning were needed, that capabilities needed an overhaul, that the entire approach to flood intelligence needed updating and that Victoria needed a clearer framework for future and sustained investment in flood mitigation. The Victorian government responded to the 2010–12 floods and these reviews by acting on recommendations through business planning and incorporated learnings and recommendations into the development of the Victorian Floodplain Management Strategy, which was released in 2016 after two extensive rounds of consultation on earlier drafts.⁴

² Victorian Government, *Submission 295*, p. 56.

³ Ibid.

⁴ Andrew Fennessy, Deputy Secretary, Water and Catchments, Department of Energy, Environment and Climate Action, public hearing, Melbourne, 25 October 2023, *Transcript of evidence*, p. 2.

The efficacy of the Strategy will be discussed throughout this Chapter and the rest of the Report where relevant. This Section addresses general considerations from stakeholders about the Strategy's effectiveness.

Some stakeholders argued that the Strategy has not been implemented fully and effectively, and that the shortcomings exposed by the 2022 flood event were evidence of this. In particular, concerns were raised about the adequacy of emergency warning systems (see Chapter 6) and mitigation infrastructure.

In its submission, the Northern Victorian Emergency Management Cluster stated:

Given the impact of the 2022 flood, we do not consider that the Strategy has been implemented to its full intent. Implementation in relation to the 2022 flood event needs to consider the issues experienced in rural areas and the major impact flooding has on agriculture, productivity, economic and social wellbeing.

The Strategy does not consider:

- Remediation of breaches to rural levee banks that have the greatest impact.
- Standing water removal.
- A plan to manage hyper-saline lakes.
- Significant cultural heritage sites.
- Strategic drainage outlet locations.

Furthermore, the Strategy has failed in its aim to work in partnership with communities to be better prepared for future floods and to improve sharing of high-quality flood risk information.⁵

The Committee also received evidence that some councils were concerned they did not have sufficient capacity or resources to properly implement their parts of the Strategy under the regional floodplain management strategies. The Municipal Association of Victoria explained that while councils were involved in developing the regional strategies, it had received feedback suggesting:

councils are not confident in their capacity to implement relevant parts of the strategies, including mapping, planning scheme amendments and flood mitigation infrastructure.⁶

Similarly, Swan Hill Rural City Council noted that:

The 2016 Victorian Floodplain Management Strategy (VFMS) has not been adequately resourced for success. Significant responsibility has been shifted to small rural Councils who have neither the financial/human resources nor expertise to meet the strategy recommendations and with the introduction of rate capping there is no capacity to raise the necessary funding.⁷

⁵ Northern Victorian Emergency Management Cluster, *Submission 515*, p. 9.

⁶ Municipal Association of Victoria, *Submission 681*, p. 3.

⁷ Swan Hill Rural City Council, *Submission 642*, p. 12.

Many stakeholders who discussed the Strategy considered it to be a living document despite all its actions being considered by the Government to be either completed or incorporated into practice.⁸ There were recommendations for the Strategy to be continuously updated and adapted to incorporate new information, including data from the 2022 flood event, to ensure that flood risk management strategies remain effective and responsive to changing conditions and challenges.

In its submission, the Loddon Shire Council called for a full review of the Strategy that includes 'consultation with the community and local government'. The Council specifically recommended that any review 'carefully consider the resource capacity of rural small councils'.⁹

The Salvation Army Australia also supported a review of the Strategy to 'assess whether it remains fit-for-purpose'.¹⁰

In contrast, some other stakeholders believed that the Strategy did operate as intended in October 2022 and continues to work. Chris Cumming, Chief Executive Officer of Goulburn Broken Catchment Management Authority, told the Committee:

Our observations from the flood event are that the Victorian Floodplain Management Strategy is working. While legacy areas were badly impacted by the 2022 flood, new growth corridors operated as designed, including for a one-in-100 flood event, with allowance for climate change built in since the early 2010s and additional freeboard requirements for buildings.¹¹

In the Committee's view, the significance of the October 2022 flood event may warrant a re-examination of the Victorian Floodplain Management Strategy. The Strategy acknowledges that updates should occur if required. It is also due for replacement in 2026. It notes the 2016 Strategy was wrought from observations of earlier flood events. The scale of the 2022 flood event and the damage it caused indicates that the Strategy must be revisited to ensure that it is fit for purpose.

The Committee notes in Chapter 3 that development of the next iteration of the Floodplain Management Strategy for Victoria should consider the findings and recommendations contained in this Report.

RECOMMENDATION 25: As part of the development of the new Victorian Floodplain Management Strategy, that the Victorian Government review the operation of the last Strategy, in consultation with local councils, community representatives, expert advisory groups and other relevant stakeholders.

⁸ See: Department of Environment, Land, Water and Planning, *Implementation Snapshot: 2016–2022 Six Years of Delivery*, 2022.

⁹ Loddon Shire Council, *Submission 749*, p. 9.

¹⁰ The Salvation Army Australia, *Submission 619*, p. 17.

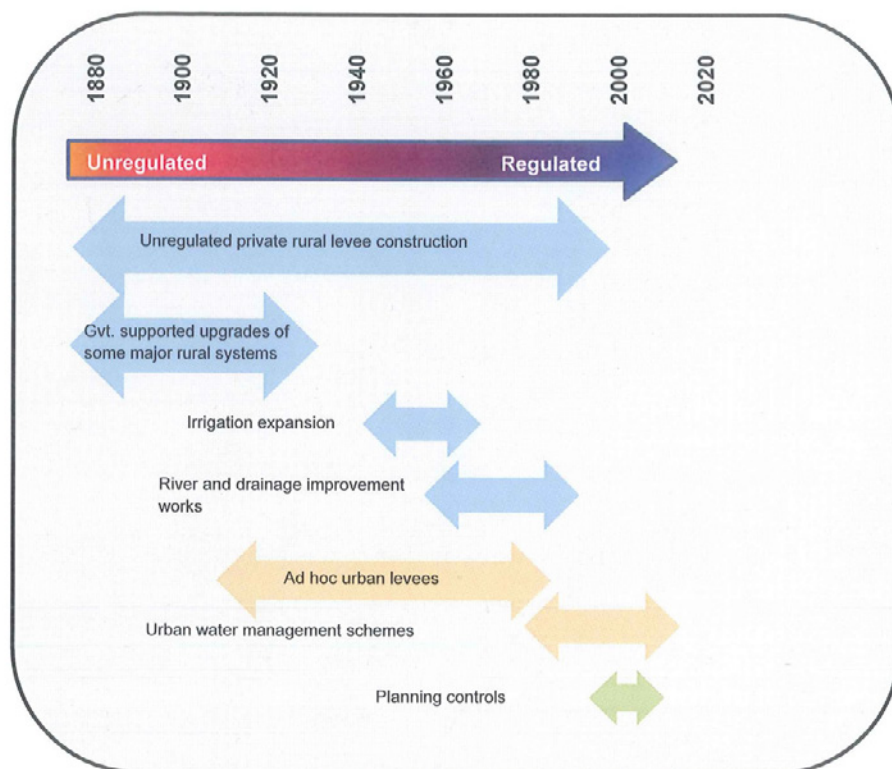
¹¹ Chris Cumming, Chief Executive Officer, Goulburn Broken Catchment Management Authority, public hearing, Melbourne, 25 October 2023, *Transcript of evidence*, p. 50.

5.3 Levees

In Victoria, approximately 4,000 km of permanent levees have been identified.¹² Levees are an important part of Victoria's approach to flood mitigation and one of the key mitigation infrastructure options, when constructed and maintained appropriately. Levees can be highly effective at containing flood waters and reducing risks to properties by confining water flows to its channel and preventing spillover. They are 'usually constructed close to a watercourse (river or creek)'.¹³

Over time, levee construction in Victoria has shifted from unregulated to regulated, as shown in Figure 5.1 below.

Figure 5.1 Levee construction in Victoria



Source: M Edwards and I Gauntlett, *Getting levee management right in Victoria*, paper presented at Floodplain Conference, 2014, p. 2.

In its levee management guidelines, the Victorian Government explained that the 'full confinement of floods by levees will not always be possible or desirable', stating:

During extreme floods, water levels may overtop any levee and even the best-quality levees could breach and fail. For example, a levee designed and built to exclude a 1-in-100-year flood may be overtopped by a larger flood. Levee systems provide protection from the more frequent smaller floods.¹⁴

¹² Department of Environment, Land, Water and Planning, *Levee Management Guidelines*, Victorian Government, 2015, p. 11.

¹³ *Ibid.*, pp. 6-7.

¹⁴ *Ibid.*, p. 7.

The guidelines outline several ‘essential principles’ for levee systems (Box 5.1 below describes the different types of levees):

- levees reduce flood risk, but do not eliminate it
- levees protect properties, not lives
- levees are expensive structures which need to be appropriately managed – levees cannot be relied upon for flood mitigation if they are not ‘diligently maintained’
- levees protect assets which exist at the time, but their construction typically encourages further development so plans should be regularly reviewed
- levees should have ‘minimal impact’ on:
 - the property and livelihood of others
 - flood storage and conveyance capacity
 - the environment
- relevant plans should reference the location and management of levee systems.¹⁵

Box 5.1 Types of levee systems

Levees are divided into two main categories:

1. **Public:** levees funded by government (federal, state or local, or a combination). They are constructed to protect assets important from a broader or strategic point of view, such as urban areas, large areas of rural land or critical infrastructure public assets.
 - a. **Urban:** public urban levees are managed by local councils or Melbourne Water.
 - b. **Rural:** constructed under various government programs, primarily in the first half of 20th century. These levees are ‘generally built to a lesser standard and offer a lower level of protection’.
2. **Private:** levees which are privately funded and constructed. Most of these systems are in rural areas. Private landholders are responsible for maintaining their levees.
 - a. **Urban:** constructed by individual landowners to protect home or business.
 - b. **Rural:** constructed by individuals or groups to protect properties. Typically, most have been constructed in the ‘absence of formal approval processes, without proper design, using poor construction techniques and are consequently of low quality’.

(Continued)

¹⁵ Ibid.

Box 5.1 Continued

There are two main types of levee systems:

- **Permanent** (see Figure 5.2 below): most commonly earthen embankments but can take other forms –
 - requires minimal operational activity to provide flood protection
 - technically most reliable protection system.
- **Temporary** (see Figure 5.3 below): a system which is removable so it is ‘wholly installed shortly before or during a flood, and removed completely when floodwaters have receded’.
 - Temporary levees are ‘quickly constructed using temporary materials’, such as sandbags.
 - Demountable levees are a ‘moveable system that is either fully or partially pre-installed and requires operation during a flood’.

Source: Department of Environment, Land, Water and Planning, *Levee Management Guidelines*, Victorian Government, 2015, pp. 13–17.

Figure 5.2 Examples of permanent levee systems



Top-left: Earthen embankment; Top-right: Crib wall; Bottom-left: Concrete retaining wall; Bottom-right: House protection levee (or ring levee).

Source: Department of Environment, Land, Water and Planning, *Levee Management Guidelines*, Victorian Government, 2015, pp. 14–16.

Figure 5.3 Example of a temporary levee



Source: Department of Environment, Land, Water and Planning, *Levee Management Guidelines*, Victorian Government, 2015, p. 17.

The Committee was informed there are many issues impacting the effectiveness of levees as a flood mitigation tool. In particular, the Committee heard in submissions and at hearings that the complex regulatory environment has meant many levees are not being maintained to a suitable standard. As suggested by the levee guidelines, it is important that levees are maintained to a good standard to ensure they provide the highest quality of mitigation protection during a flood event.¹⁶ However, the Committee notes the general ability of existing levees to mitigate flooding problems varies greatly across Victoria and is determined by location and quality, with many levees only providing low to moderate mitigation.

5.3.1 Owning and maintaining levees

Some levee banks are inappropriately located and some appear to have no person or authority responsible for care and maintenance. The consequence is that wrongly sited banks constrict flood flows and cause overtopping or breaches and unmaintained banks lead to panic sand bagging and community stress and unrest as a flood approaches.

Bill Baxter, *Submission 81*, p. 1.

The responsibility for levee maintenance and ownership is complex, involving various stakeholders including private landowners, local councils and state authorities. Stakeholders generally called for clearer guidelines on ownership and maintenance responsibilities in relation to levees.

Several issues were raised about levee ownership arrangements in Victoria being complex and ambiguous. Stakeholders suggested this has led to difficulties with determining responsibility for maintenance. This is the case for both public and private levees. Private levees are the responsibility of private owners on whose land they are constructed. However, a privately owned levee can have an impact on multiple properties. This raised questions about who should be responsible for maintenance and repair.

¹⁶ Department of Environment, Land, Water and Planning, *Levee Management Guidelines*.

In its submission, Swan Hill Rural City Council expanded on this issue, stating:

Rural levees are a subject complex enough to demand their own inquiry. The current situation is untenable. Levees have been constructed for decades on public and private land. Ownership and maintenance responsibility is opaque or not defined. When breaches occur, it can leave thousands of hectares of productive land exposed even at minor flood level. The coordination between agencies with interests in or responsibility for rural levees needs improvement.¹⁷

Other stakeholders also expressed concern over the lack of clear responsibility lines, noting the lack of a statewide or catchment-wide coordination of levee repairs. This issue is complicated by levees that are in various states of disrepair or made from mixed materials, which may call into question their potential effectiveness for flood mitigation.

Cr Geoff Dobson, Board Member of the Murray Darling Association, told the Committee that ambiguous levee responsibility processes contributed to flood impacts in October 2022, because of levees left unmaintained:

Who takes responsibility? Nobody really wants to. It is there. From a council point of view, we have had some community consultation out there, and of course council, the catchment management authority and Goulburn–Murray Water have all taken the heat about the levee banks. What has happened out at Undera is that the levee banks have been there for so long that they have been worn down et cetera, and they breached. What happened then is there were a number of farms out in the Undera area that were inundated – houses and what have you. It is the angst that that caused. We as the council have gone out there to try and placate and try and get answers. Can we do anything about levee banks? No, it is not in our remit to do that sort of stuff. What is happening is the local communities are doing it themselves. They are either illegally restoring levee banks to a higher capacity or reviewing the banks that have been damaged.¹⁸

Cr Dobson advocated for the Victorian Government to assume full responsibility for maintaining and upgrading levee banks. It was further suggested that the Government could explore acquiring land surrounding flood-prone areas. By controlling the levee banks and leasing the land in rural areas on a no-liability basis (e.g., to farmers), this approach could ensure more responsible maintenance of levees and provide better flood resilience.¹⁹ These suggestions were also raised by several other stakeholders, including the Victorian Farmers Federation.²⁰

¹⁷ Swan Hill Rural City Council, *Submission 642*, p. 14.

¹⁸ Cr Geoff Dobson, Board Member, Murray Darling Association, public hearing, Mooroopna, 13 September 2023, *Transcript of evidence*, pp. 33–34.

¹⁹ Ibid.

²⁰ For example, see: Emma Germano, President, Victorian Farmers Federation, public hearing, Seymour, 14 September 2023, *Transcript of evidence*; Stuart Locke, President, Go Seymour: Business and Tourism Group, public hearing, Seymour, 14 September 2023, *Transcript of evidence*; Graeme Dove, Committee Member, Go Seymour: Business and Tourism Group, public hearing, Seymour, 14 September 2023, *Transcript of evidence*.

In its submission, the Victorian Government explained the management arrangements for unmanaged levees:

Policies in the VFMS state that any flood mitigation infrastructure outside Melbourne Water's region not currently under formal management will remain that way unless the relevant LGA decides this should change. A Regional Floodplain Management Strategy or local assessment can help determine that formal management arrangements are required.

Where flood mitigation infrastructure is not being formally managed:

- the relevant municipal planning scheme must not assume the infrastructure will provide flood protection
- the municipal flood emergency plan must have provisions in case there is a sudden and complete failure of that infrastructure.²¹

At a public hearing, Michael Jenz, Executive Director of Statewide Infrastructure and Rural Strategy at the Department of Energy, Environment and Climate Action, expanded on the responsibilities of local councils:

as part of the Victorian Floodplain Management Strategy, it was determined the most appropriate agencies to look after the long-term assets would be local councils, because they already have town levees et cetera, going forward. There would be a process of them, through flood studies, identifying risks to communities and then what mitigation actions they would have to protect those areas, such as levees or flood warning systems et cetera. In doing that, we have been providing obviously funding for the flood studies to identify those risks. Through regional flood plain management strategies, CMAs have helped coordinate with councils and SES et cetera to look at issues around levees, in particular rural levees, as well as around whether or not councils would be willing to take on the formal ownership and management of those levees.²²

Local councils expressed concern about current levee management arrangements, telling the Committee they did not have sufficient resources to properly maintain levees. Several councils noted the significant funding and resources required to maintain the structural integrity of levees so that they can properly mitigate flooding.

Cr Liam Wood, Mayor of Mildura Rural City Council, told the Committee that if local councils are to continue being primarily responsible for levees then they will require 'an abundance of funding for that because they are such a huge infrastructure asset'.²³

Several submissions from local councils noted that without adequate funding for maintenance councils were 'warned' by insurers about 'the liability of assuming this authority'.²⁴

²¹ Victorian Government, *Submission 295*, p. 66.

²² Michael Jenz, Executive Director, Statewide Infrastructure and Rural Strategy, Department of Energy, Environment and Climate Action, public hearing, Melbourne, 25 October 2023, *Transcript of evidence*, p. 9.

²³ Cr Liam Wood, Mayor, Mildura Rural City Council, public hearing, Melbourne, 11 October 2023, *Transcript of evidence*, p. 10.

²⁴ See: Swan Hill Rural City Council, *Submission 642*; Loddon Shire Council, *Submission 749*. See also: Murray River Group of Councils, *Submission 747*.

Levees, even if perfectly maintained, might not always provide the optimal level of protection during significant flood events. The effectiveness of levees can be limited by their condition, design, and the scale of the flood event. Maintenance arrangements are being challenged by the complex regulatory environment, with ownership and maintenance responsibilities unclear. This can mean that levees fall into disrepair.

It is important that there are clear guidelines indicating responsibility for maintaining levees. The Committee notes this is a key component of the Victorian Floodplain Management Strategy. Clarity around roles and responsibilities for mitigation infrastructure is discussed further in Section 5.8.1 below.

5.3.2 Beneficiary pays model

The Victorian Floodplain Management Strategy outlines a ‘beneficiary pays’ model for maintaining levees, particularly in rural areas. On rural levees, the Strategy states:

Most of Victoria’s flood mitigation infrastructure is in rural areas, where it provides private benefits by protecting agricultural production.²⁵

In its submission, the Government explained the rationale for its beneficiary pays approach to maintaining mitigation infrastructure:

In recognition of the high capital costs associated with designing and constructing flood mitigation infrastructure, the VFMS sets out cost sharing arrangements. If new large-scale flood mitigation infrastructure meets government investment criteria costs can be shared equally between the Australian and Victorian Governments and relevant LGAs.

The ‘beneficiary pays’ principle is applied more fully to the maintenance and management of new flood mitigation infrastructure. Formal arrangements, agreed to prior to construction, ensure that this is funded by beneficiaries, through the relevant LGA.

New, large-scale rural flood mitigation infrastructure can only attract government funding if it satisfies the investment criteria outlined in the VFMS.²⁶

Chris Cumming, Chief Executive Officer of the Goulburn Broken Catchment Management Authority, described the circumstances of the categorisation of levees through a beneficiary pays model. He raised a number of issues that highlight the complexity of current arrangements:

In terms of whether the process is working to maintain the levees, there is no process to actually maintain the levees, so I guess that is not there. And I think the issue around safety – look, to me, you see community and people have farmed or made decisions around where they are and positioned themselves on the basis of those levees that are there, so there is true and real pain, concern and worry about this, absolutely. In the conversations with local government, at the time in 2016 when the first categorisation of those levees occurred, part of that was identifying with DEECA whether there were

²⁵ Department of Environment, Land, Water and Planning, *Victorian Floodplain Management Strategy*, 2016, p. 41.

²⁶ Victorian Government, *Submission 295*, p. 63.

any of these that were actually critical to the protection of human life and safety and the continuation of social services that need to happen in flood events, and at that time those rural levees were not identified as providing those services.²⁷

Some stakeholders expressed concerns about the beneficiary pays model for levee maintenance, noting the difficulty in accurately determining a 'beneficiary'. Levee maintenance can be expensive, and it can place an undue financial burden on individuals or groups to maintain levee infrastructure. This has led to some levees falling into disrepair because responsible beneficiaries have not maintained upkeep.

Geoff Rollinson, Chief Executive Officer of Gannawarra Shire Council, provided an example of how complicated it can be to deal with levee breaches because identifying responsible beneficiaries is challenging:

the 'beneficiary pays' process is too hard to work out in our particular case in Gannawarra because when there is a breach, the breach could be 10 kilometres away from where your affected property is. So when you are saying that we need someone to actually fund this and the beneficiary needs to be identified as to who pays, you cannot identify them, because there could be multiple properties.²⁸

Cr Geoff Dobson, a Board Member of the Murray Darling Association, expressed concerns about the model, telling the Committee that:

When a levee bank breaks, the water goes everywhere. It does not discriminate; it goes everywhere. So if we are going to consider levee banks as a state or a national asset, which they should be for the protection of taxpayers, therefore they must be controlled not by poor farmers out there having to find the funds because they cannot get insured, getting them to do it all – so who then controls whether it is up to standard? What type of soil is it? Is it the proper soil? All those sorts of issues. So it should be one authority. In my opinion, it would not be a community responsibility – it has got to be better than that.²⁹

This was echoed by Emma Germano, President of the Victorian Farmers Federation, who believed that the cost of infrastructure upkeep should be 'managed by the state':

When we are considering a levee to protect a town, we think about the cost of that infrastructure being shared across multiple businesses or multiple home owners, but when it comes to levees that are potentially protecting farmland, you have got a small number of farmers who are being asked now to repair the levee. It is either state infrastructure or it is not, and where it was the state that put them in place in the first instance, they should be maintained by the state.³⁰

The Committee notes that the purpose of the beneficiary pays model is to recognise that there are high capital costs associated with managing flood mitigation infrastructure. In the case of levees, there are varying degrees of reliability in terms of

²⁷ Chris Cumming, *Transcript of evidence*, p. 61.

²⁸ Geoff Rollinson, Chief Executive Officer, Gannawarra Shire Council, public hearing, Echuca, 24 August 2023, *Transcript of evidence*, pp. 20–21.

²⁹ Cr Geoff Dobson, *Transcript of evidence*, p. 37.

³⁰ Emma Germano, *Transcript of evidence*, pp. 64–65.

their value as mitigation. The beneficiary pays model acknowledges that some parties seek flood mitigation but are responsible for decisions about the levels of services to be derived from levees.

The concerns raised by stakeholders about the current model of levy management related to the difficulty of determining beneficiaries, in turn leading to complicated or uneven financial arrangements. Further, the complicated policy environment surrounding levee management has been difficult for communities to understand. During the Inquiry, the Committee received feedback from community members who could not understand why some levees are managed by the Victorian Government and others by the council or private citizens. This caused a great deal of frustration following the October 2022 floods and significant confusion about who was responsible for managing levees and other mitigation infrastructure.

The Committee believes that there is benefit in revisiting levee funding and management arrangements under the Floodplain Management Strategy to determine if they remain fit for purpose.

RECOMMENDATION 26: That the Victorian Government's review of the last Victorian Floodplain Management Strategy (and development of the new Strategy) examine levee funding and management arrangements to determine if they are still fit for purpose based on new information and insights from the October 2022 flood event.

5.3.3 Urban levees

In Victoria, approximately 2% of levee systems across the state are in urban areas.³¹ Like in rural areas, there are a mix of public and private levee systems in metropolitan areas.

Public urban levee systems are managed by relevant local councils or Melbourne Water. Most of these levees are government-funded, constructed to relevant standards, and offer adequate flood mitigation protection.³² The Levee Management Guidelines explain that:

Urban levees protect relatively small areas and are likely to have only a small impact on floodplain storage and flow conveyance. The potential changes to water levels and flows upstream and downstream may be minor.³³

The Committee did not receive extensive evidence on urban levees or their effectiveness in mitigating flooding in Maribyrnong in October 2022. The Committee did receive evidence about the Flemington Racecourse flood wall, which despite being a distinct type of flood mitigation infrastructure does operate similarly to levees.

³¹ M Edwards and I Gauntlett, *Getting levee management right in Victoria*, paper presented at Floodplain Conference, 2014, p. 1.

³² Department of Environment, Land, Water and Planning, *Levee Management Guidelines*, p. 11.

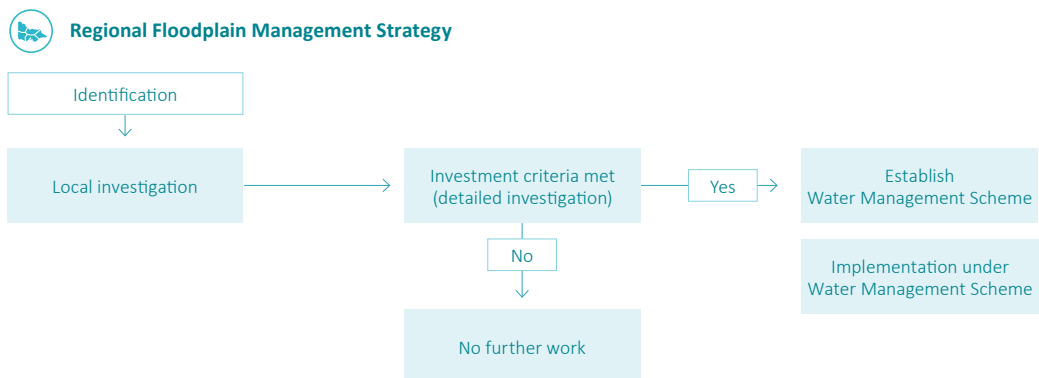
³³ *Ibid.*, p. 7.

The Committee notes that the Maribyrnong River Flood Review Panel’s report suggested that levees could be a component of additional flood mitigation strategies to protect the area in future flood events.³⁴ However, levees were generally outside the scope of the review.

5.3.4 Rural levees

Of the estimated 4,000 km of levee systems around Victoria, around 98% are rural levees.³⁵ Under the Victorian Floodplain Management Strategy, large-scale flood mitigation infrastructure is no longer considered best practice for rural areas, and the Government has indicated that it will not fund or maintain levees except in exceptional circumstances. For example, a new rural levee system is considered best practice under the Strategy if it ‘might be necessary for environmental watering or to reduce the risk of avulsions’.³⁶ The focus of the Strategy is on urban areas because of the more demonstrable community benefits of levees, such as the need to protect residential suburban areas. It is the responsibility of rural councils or private landowners to manage, maintain and fund rural levees.

Figure 5.4 New flood mitigation infrastructure, regional floodplain management strategy



Source: Department of Environment, Land, Water and Planning, *Victorian Floodplain Management Strategy*, 2016, p. 71.

As a consequence of a policy shift away from the construction of new rural levee systems, the Strategy establishes specific criteria to determine if the Government will fund the construction of new rural levee systems. See Box 5.2 below for a summary of criteria. Otherwise, the expectation is that councils and beneficiaries will manage new and existing systems.³⁷

³⁴ Tony Pagone et al., *Maribyrnong River Flood Event Independent Review*, Melbourne Water, 2023, p. 116.

³⁵ M Edwards and I Gauntlett, *Getting levee management right in Victoria*, paper presented at Floodplain Conference, 2014, p. 1.

³⁶ Department of Environment, Land, Water and Planning, *Victorian Floodplain Management Strategy*, p. 71.

³⁷ Ibid.

Box 5.2 Government investment criteria for flood mitigation infrastructure

The Victorian Floodplain Management Strategy explains ‘the criteria each level of government will apply in deciding whether to invest in flood mitigation infrastructure for public benefits’.

In deciding whether to invest in flood mitigation infrastructure designed to confer community benefits, the Government is guided by the following principles:

- due process, ensuring communities are consulted
- due diligence, making sure decision-making processes set clear objectives, are evidence-based, and examine all reasonable mitigation options
- cost effectiveness, making certain benefits are greater than total costs
- supporting analysis, including consideration of economic value to local economies
- community benefits, specifically the protection of
 - human life and safety
 - community safety
 - community welfare
 - existing dwellings
- accountability for ongoing management, ensuring accountability arrangements are agreed, clearly documented, and allow for measurable outcomes.

In deciding whether to invest in flood mitigation infrastructure designed to confer environmental benefits, the Government is guided by the following principles:

- If a levee is required solely to protect against managed floods, the Victorian or Commonwealth Government bears all capital and ongoing maintenance costs.
- If a formally managed levee is used for a managed flood, the Victorian or Commonwealth Government negotiate to pay an appropriate share of maintenance costs.
- If an unmanaged levee on Crown land is required for a managed flood, the environmental water manager can upgrade the levee through the catchment management authority licensing framework.
- If an unmanaged levee on private land is required for a managed flood, the environmental water manager obtains obtain permission from the landholder to carry out maintenance.
- If an existing unmanaged levee is being used for a managed flood, the environmental water manager needs to be assured it is fit-for-purpose in terms of risk management.

Source: Department of Environment, Land, Water and Planning, *Victorian Floodplain Management Strategy*, 2016, pp. 67–69.

RECOMMENDATION 27: That the Victorian Government fund floodplain managers to develop maps modelling scenarios demonstrating the impact on landholders of specified levee breaches.

Evidence to the Inquiry suggested that regional floodplain management strategies have also adopted beneficiary pays principles for funding rural levees. As a result, many levees are not managed by local councils but funded by private landowners or are unmanaged entirely. An example of this approach can be seen in Goulburn Broken Regional Floodplain Management Strategy 2018–2028, which states:

Section 17.2.1 of the [Strategy] sets out the investment criteria including, amongst other things, how community and private benefits are considered. As such LGAs are unlikely to play a role in the management of rural levees in the region. Whilst it can be argued that there will always be some “community benefit” around “rural” levee management (i.e. major access routes being maintained, large businesses remaining operational), it is considered relatively small compared with the “private” benefits. Therefore, the beneficiary principle for rural levees, such as the lower Goulburn and the Public Works Levee would remain with the rural landowners.³⁸

Further, where councils have responsibility over local levees the Committee heard concerns that the current funding and management arrangements are untenable, with local councils unable to resource them properly. This was largely due to the significant financial burden of repairing levees. In October 2022, a number of levees around Victoria experienced significant breaches and many councils have been unable to pay for their repairs, leaving them ineffective against future flood events. Box 5.3 is an example of a critical levee breach and the associated costs, provided by Gannawarra Shire Council.

³⁸ Goulburn Broken Catchment Management Authority, *Goulburn Broken Regional Floodplain Management Strategy 2018–2028*, 2018, p. 35.

Box 5.3 Rural levee breaches in Gannawarra Shire

During the October 2022 floods, there was approximately 50–60 levee breaches in Gannawarra Shire. The Council reported that of these breaches, 25 were deemed to be strategic breaches.

In its submission the Council explained:

Without urgent repair of these 25 strategic breached rural levee banks by government, re-flooding will occur, impacting vast areas of productive agricultural land, private and public assets, infrastructure, and homes.



Levee breach in Gannawarra Shire

The Council also reported that the estimated cost of repairs is **\$500,000**.

Source: Gannawarra Shire Council, *Submission 637*, p. 4.

Chris Cumming, Chief Executive Officer of Goulburn Broken Catchment Management Authority, noted the rural levee system and breaches in the region in October 2022:

There is one managed rural levee scheme, Loch Garry, and around 500 kilometres of unmanaged rural levees. Some 46 rural levee breaches were recorded. Rural levees would be expected to fail or overtop with a flood of this magnitude. The failure of levees impacts the time it takes water to move through the system. In terms of flood intelligence, pre-flood mapping is carried out, including for a range of levee breach scenarios. During the event live information, including verbal reports and aerial observations on levee breaches, was collected to support the flood analyst role.³⁹

Cumming also explained that many landowners have ‘positioned themselves on the basis of those levees that are there’. This has caused some concern but rural levees ‘were not’ identified as being critical to ‘protection of human life and the continuation of social services’ following a flood event. These are important factors under the Victorian Floodplain Management Strategy when determining whether government will fund and manage levees, as discussed above.⁴⁰

³⁹ Chris Cumming, *Transcript of evidence*, p. 50.

⁴⁰ Chris Cumming, *Transcript of evidence*, p. 62.

Geoff Rollinson, Gannawarra Shire Council

The Kerang township levee, which was indicated before about the island of Kerang, is a 17-kilometre ring levee effectively that runs right around the Kerang township. In the town of Quambatook we have got a levee bank that goes for about 2 k's that actually protects the township of Quambatook from flooding. They are the responsibility of council, where there is a defined community benefit, and going forward we are reviewing and looking to construct a levee bank with natural disaster resilience funding or disaster-ready funding to protect the town of Koondrook. That too will become – once it is constructed – council maintained, owned and operated and go on our books. That will become our levee bank. But the broader rural community – as I said before, there are about 4000 kilometres of levee banks in rural Victoria, approximately 2000 of which sit between Loddon and Gannawarra. There is no way that the community or council could afford to take on ownership and responsibility and ongoing maintenance for that extensive network.

Source: Geoff Rollinson, Chief Executive Officer, Gannawarra Shire Council, public hearing, Echuca, 24 August 2023, *Transcript of evidence*, p. 21.

FINDING 18: That of the 4,000 kilometres of levee banks in rural Victoria, approximately half occur in the Loddon and Avoca catchments where, in the absence of sufficient levee protection, flood waters will remain for extended periods impacting agricultural land.

Many rural levees are privately owned and managed. A complex regulatory environment has resulted in a lack of awareness of private rural levees and there are no clear processes for ensuring they are appropriately maintained. In its submission, Loddon Shire Council contended that:

There is a lack of detailed understanding of where these levees legitimately exist and where new levees have been constructed without proper planning approvals. This has resulted in water volume and flows being changed, pushing water into new areas where it has not previously been impacted. Unfortunately Council does not have the resources or expertise to fully enforce the requirements of the Planning Scheme at the scale of this problem. The cost burden and cost shift means many of these levees go un-policed. Significant resources and coordination with State agencies would be required to rectify the situation.⁴¹

Rural local councils told the Committee that generally rural levees are poorly constructed and there is a lack of proper provision for maintenance and reconstruction. Gannawarra Shire Council explained that:

Once a levee breaches, damage is extensive and there is no way for the water to re-enter the river system, other than via mechanical pumping. Our residents find it difficult to source pumps and, in some cases, the cost of fuel was significant.⁴²

⁴¹ Loddon Shire Council, *Submission 749*, p. 9.

⁴² Gannawarra Shire Council, *Submission 637*, p. 29.

The Council further discussed rural levees, identifying deficiencies in the current management system and made suggestions for improvement, including:

- that there is ‘broader’ community confusion about ownership of rural levees and there is a need for ‘clear identification’ of owners who are responsible for maintenance
- more understanding is needed about recovering from flood mitigation damage, including the broader economic impact and community impacts if levees are not repaired properly
- that ‘inspections of rural levees should be carried out regularly by a legislated authority’.⁴³

The Council indicated that it ‘does not accept [that] ... the State Government takes no responsibility for rural levees on Crown Land’.⁴⁴

Undera Flood Group

We have made approaches to all levels of government and authority seeking the restoration of the levee banks following the floods. To our astonishment and alarm, we discovered that there was no intention by government to fund the restoration of these banks as we had experienced in the past. Section 17 of the Victorian Floodplain Management Strategy of 2016 refers to levee banks providing ‘private benefits by protecting agricultural production’ and a further reference to the role in protecting human life and safety, yet also declaring the flood mitigation infrastructure is no longer considered best practice for rural communities ... As we were unable to acquire funding to repair the breaches, the community have privately funded the works. So for members of the community, who had just experienced the ravages of the flood – its impact on family, on home, business, farm and ongoing financial loss, apart from the physical and mental stress of emergency and disaster – then to self-fund significant works to structures to provide them with some confidence to resume living and working in their communities is a very big ask. It came at a cost of over \$200,000 on top of the individual losses experienced.

Judith Clements, Undera Flood Group, public hearing, Melbourne, 13 September 2023, *Transcript of evidence*, p. 42.

Some local councils also noted that the Strategy does not consider the ‘remediation of breaches to rural levee banks that have the greatest impact’.⁴⁵

⁴³ Ibid., pp. 29–30.

⁴⁴ Ibid., p. 30.

⁴⁵ See: Campaspe Shire Council, *Submission 650*; Gannawarra Shire Council, *Submission 637*.

Greater Shepparton City Council advocated that the policy framework surrounding rural levee management should be clarified:

Clarification of the legal and policy issues relating to rural levees is required to give greater certainty to property owners and authorities engaged in water and property management in rural areas.⁴⁶

Given the effectiveness of rural levees varies across Victoria based on a variety of factors, several stakeholders suggested that ring levees might be an alternative flood mitigation approach in rural and regional Victoria.

Figure 5.5 Ring levee protecting farm house and private infrastructure from flood water



Source: Department of Environment, Land, Water and Planning, *Victorian Floodplain Management Strategy*, 2016, p. 78.

The Victorian Floodplain Management Strategy notes that ring levees could be an ‘alternative way’ to reduce flooding risks for private assets in rural areas, stating it allows landholders to:

protect individual buildings and curtilages (the enclosed area of land adjacent to a building or dwelling). These are often small enough not to have significant third party or environmental impacts. However, individual levee protection should not be a substitute for setting floor levels above the 1% AEP flood level for new dwellings.⁴⁷

This was echoed by stakeholders to the Inquiry, who similarly contended that ring levees could provide effective flood mitigation to rural properties. At a public hearing, Brad Drust, Chief Executive Officer of the North Central Catchment Management Authority, noted the effectiveness of a ring levee pilot program post-flooding in 2011:

I think our view on the ring levees is that they are very effective. We saw in the order of 80 per cent of the ring levees that were established through that program worked and they protected houses and farming infrastructure in a rural landscape. In some ways they are another line of defence and a more reliable line of defence beyond the rural levees that we were talking about earlier, where the landholder has good control over

⁴⁶ Greater Shepparton City Council, *Submission 654*, p. 11.

⁴⁷ Department of Environment, Land, Water and Planning, *Victorian Floodplain Management Strategy*, p. 72.

the ring levee. So yes, we have had a good experience with those types of levees and would support future work in that area.⁴⁸

Similarly, Guy Tierney, Statutory Planning and Floodplain Manager at Goulburn Broken Catchment Management Authority, argued that rural levees are not a ‘silver bullet’ and ring levees ‘generally offer agricultural protection’:

we do get a benefit, getting rid of that nuisance flooding, if you like, from agricultural production. So the idea of protecting the engine room or a home in some of the properties ... does make sense to me, because that ring levee would have a much higher level of protection for those critical assets for the farmer. What I am trying to highlight is they are not a silver bullet, these rural levees. They are only going to give you a certain amount of protection, which is nothing like the one in 50s or the one in 70s or what we experienced.⁴⁹

It is clear under the Floodplain Management Strategy that rural levee schemes are deprioritised with management shifted largely to councils and private landowners, but that managing this infrastructure remains important.

The Committee acknowledges the emphasis in the Victorian Floodplain Management Strategy on the ‘beneficiary pays’ principle, placing the onus of levee management and funding of rural levees on rural councils and private landowners. The 2022 floods highlighted challenges in the management and funding of levee infrastructure according to this model. This is evident in the extensive breaches in rural levees during the floods and the resources and effort that are required to rebuild these. The current policy framework raises concerns regarding the sustainability of rural flood mitigation efforts, the clarity of legal and policy guidelines concerning levee management, and the overall effectiveness of rural levees in protecting communities and agricultural lands from flood risks.

FINDING 19: The existing policy framework under the Victorian Floodplain Management Strategy places a significant responsibility on rural councils and landowners to manage their own levee systems. This has resulted in inadequately maintained levees, contributing to extensive breaches in October 2022 and greater financial pressure on councils and landowners for repairs.

RECOMMENDATION 28: That the Victorian Government review the Victorian Floodplain Management Strategy to examine issues around rural levee management. This should include the roles and responsibilities of local councils and private landowners and consider the adequacy of taxpayer support for maintaining these systems.

⁴⁸ Brad Drust, Chief Executive Officer, North Central Catchment Management Authority, public hearing, Melbourne, 25 October 2023, *Transcript of evidence*, p. 64.

⁴⁹ Guy Tierney, Statutory Planning and Floodplain Manager, Goulburn Broken Catchment Management Authority, public hearing, Melbourne, 25 October 2023, *Transcript of evidence*, p. 68.

A submission from Gannawarra Shire Council further discussed ring levees:

Ring levees or other property resilience measures would be needed around homes in this vicinity to protect them from future flooding...⁵⁰

Rodney Harrison, a Rochester resident, during a public hearing further endorsed ring levees:

Fortunately, 35 years ago, after our first flood that we experienced, we put a levee bank just around our house – not around our property, just around our house. If you put it around the property, you would stop the water flowing. The water has got to keep going. We did that, and miracles of miracles plus lots of sandbags that we got from here in Rochy and from Moama – we were able to get them; we just had to keep going – that saved our mudbrick home. Right on the Campaspe River, our mudbrick home would have been completely washed away if it was not for the old levee bank that we have had there for 35 years.⁵¹

RECOMMENDATION 29: That the Victorian Government fund the pilot of a ring levee development program in Northern Victoria to protect house and curtilage in flood-prone areas.

The example of the Echuca Levee

Following significant rainfall and flooding, on 17 October, Emergency Management Victoria made the decision to construct a temporary levee in Echuca. The purpose of the levee was to protect as much of the town as possible from flood damage. Within 48 hours, a 3 km temporary levee was constructed along the eastern side of the town facing the Murray River.⁵²

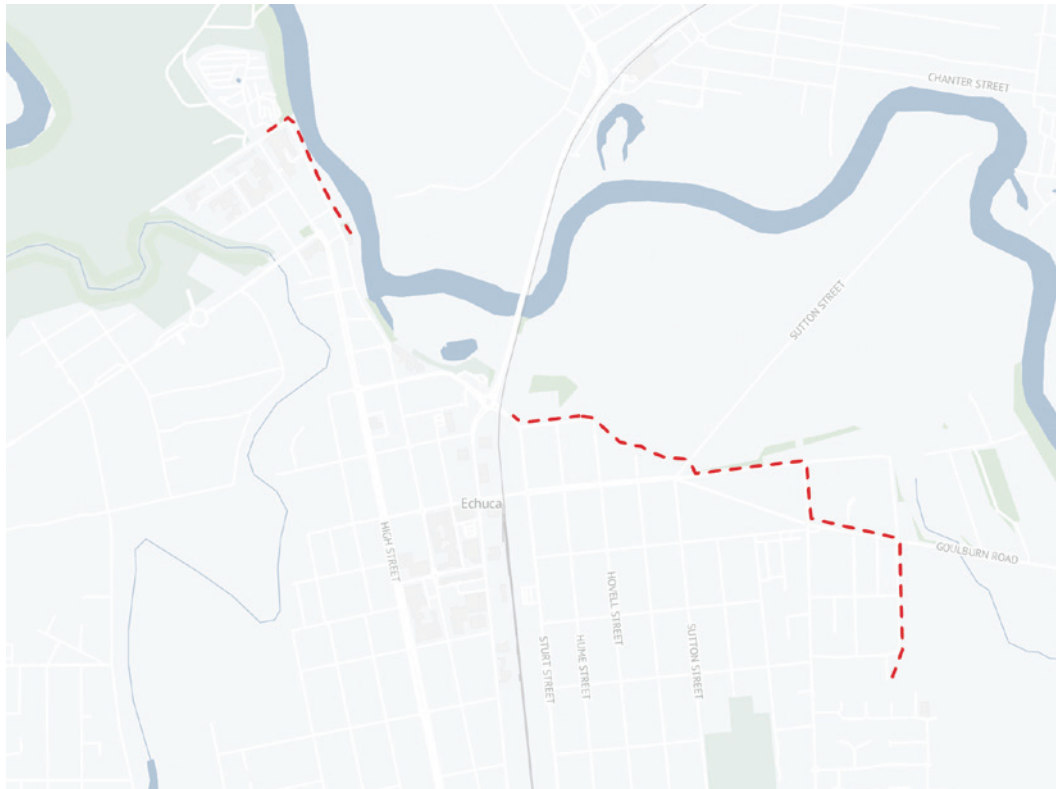
Figure 5.6 below shows the location of Echuca's temporary levee.

⁵⁰ Gannawarra Shire Council, *Submission 637*.

⁵¹ Rodney Harrison, public hearing, Rochester, 23 August 2023, *Transcript of evidence*, p. 77.

⁵² Campaspe Shire Council, *A statement from Campaspe Shire Council regarding the Echuca levee*, Media release, 25 October 2022, <<https://www.campaspe.vic.gov.au/Our-council/News-media/Latest-news/Statement-Echuca-Levee>> accessed 22 March 2024.

Figure 5.6 Temporary levee in Echuca, October 2022 flood event



Source: Bianca Hall and Patrick Hatch, 'Line in the sand: How a makeshift levee divided a country town', *Sydney Morning Herald*, 2 November 2022, <<https://www.smh.com.au/interactive/2022/echuca-levee/index.html>> accessed 29 March 2023.

The levee protected the majority of the town from flooding. However, approximately 190 properties on the other side of the levee were inundated.

The decision to construct a temporary levee has been highly divisive among community members. Many Echuca residents on the river side of the levee—colloquially described as the 'wrong side' of the levee in Inquiry evidence and the media—described feelings of abandonment and neglect. There was a perception that the protection of residences and people on the other side of levee was prioritised at the expense of their own properties and wellbeing. This was compounded by a sense that those on the 'wrong side' did not receive proper support or adequate communication and were left to manage the flooding alone.⁵³

The Committee heard alarming anecdotes from residents on the 'wrong side' of the levee who said that they did not receive proper warning, resources or support in relation to the inevitable inundation they were to experience. This Section includes examples of the concerns raised with the Committee.

⁵³ For example, see: Brett McMurdo, *Submission 414*.

In their submission, Shelley Mitchell, a resident of Echuca, explained:

We did not know this Levee bank was to be built until 11 am meeting @ Echuca East P.S. public meeting. The prediction that we were in a 1 in 1,000 year flood event with a peak above 96 AHD shocked all and created chaos. NO sandbags were available. I spoke to the Mayor and requested sand bags for residents behind the levee, reply, "sorry".⁵⁴

Brett Thomson

On Monday 17 October 2022 2:00am SES told us that the Echuca East levy would be built the next day and then laughed when we told him that was where our house was. We moved what we could from the restaurant into storage, packed up our house which is in the flood zone side of the Echuca East levy and moved our family into the restaurant where we stayed for the next 2 weeks. Even though the whole of Echuca was under an evacuation order for some reason the residents on 'the wrong side of the levy' were told they would be given no assistance and would have to fend for themselves. That was just cruel and unlawful as there are emergency services that operate specifically in this field.

Source: Brett Thomson, *Submission 723*, p. 1.

Another Echuca resident, Annie Gilbert, described the emotional toll of the levee saying it 'divided' the town:

It was very difficult seeing a levy being built in Echuca that divided the east part of Echuca in half. Why did some get to save their homes and others didn't. It was very upsetting to see what those on the wrong side of the levy were going through. We had friends living in Barmah who were unable to leave and come into Echuca for 9 weeks. The community spirit across our towns and our communities were incredible and everyone who could pitch in and help did. The trauma of not only the flood event but also the recovery and rebuild process is having long lasting effects on people.⁵⁵

Kim Hay described the impact of the levee on the flooding their property experienced, also noting the inundation was worsened due to sandbagging along the Murray Valley highway diverting water:

Our chance of avoiding inundation was non-existent, due to the mis-management of the Campaspe shire and whomever else had an input about the temporary levee being placed down Goulburn Road.

Then we found out they also had water from the creek directed towards our area, due to sand bagging along from the Murray Valley highway down past the water treatment plant to Goulburn Road and the temporary levee.

⁵⁴ Shelley Mitchell, *Submission 694*, p. 1.

⁵⁵ Annie Gilbert, *Submission 850*, p. 1.

The diversion of the creek water only had 1 place to go, which was our way, due to the Murray being so backed up, it created a bottle neck, inundating so many homes, some that in 65 years had never had flood water further than their back boundary.⁵⁶

Jodi Ujimoto questioned the rationale for constructing the temporary levee, criticising the lack of appropriate warning of its construction:

- a. why residents on the wrong side of the temporary levee bank only given fifteen minutes to evacuate when the stated flood warning time was at least between three to five days?
- b. since the temporary levee bank was erected in 48 hours, it would be useful to understand the reasons why it couldn't be built before the floodwater reached Echuca due to the Goulburn flowing into the Murray⁵⁷

Campaspe Shire Council acknowledged the community discontent caused by temporary levees:

Temporary levees placed in Campaspe created significant community angst and anger. While they were effective in some capacity, and placed with the best of intentions, they always have unintended consequences or are placed with the understanding that they will save much property at the detriment to some.⁵⁸

Many stakeholders were critical of the decision to construct the temporary levee in Echuca, and the Committee was informed that local council was the focus of this frustration. In its submission, the Federation of Community Legal Centres emphasised the frustration of residents by noting that a class action was being considered:

The threat of litigation relating to the flood events of 2022 is already materialising. One example from the 2022 floods is the Echuca residents left on the other side of a three-metre makeshift flood levee who are reportedly considering legal action against local authorities. Resident Erin McCann reported that the residents left on the 'wrong' side of the levee were assembling to "talk about class action".⁵⁹

Residents queried the council's decision to construct the levee in evidence to the Committee.

However, the Committee was told that the decision to construct the levee was not made by Campaspe Shire Council. Council representatives contended there is a lack of clarity around the roles and responsibilities of various agencies during the emergency response to a natural disaster. This led to confusion and uncertainty. At a public hearing, the Mayor of Campaspe Shire Council Cr Rob Amos recommended better

⁵⁶ Kim Hay, *Submission 43*, p. 1.

⁵⁷ Jodi Ujimoto, *Submission 725*, p. 1.

⁵⁸ Campaspe Shire Council, *Submission 650*, p. 9.

⁵⁹ Federation of Community Legal Centres, *Submission 674*, p. 8.

communication and planning to ensure roles and responsibilities are clearly defined and articulated:

The decision to establish a temporary levee in Echuca – where it was located and the size of that levee – was not made by the Campaspe shire. This is an example of clarity in the community about who performs what role and who makes decisions during the emergency response phase of a disaster. This became a divisive issue in the community and put council in the firing line ... there is need for clear planning around temporary levees and broad communication so that there is wider community acceptance and understanding of temporary levees, when they would be required and who is responsible for their placement and ultimate repatriation post the event.⁶⁰

Campaspe Shire Council further stated:

Residents have little understanding of who is the control agency in an event and hold Council responsible for the construction of temporary levees to help save properties. Temporary levees then become incredibly contentious, as some residents want them retained in perpetuity, even when they cross or damage critical infrastructure. Council is at the behest of the [Incident Control Centre] as to when temporary levees go in and where they are placed.⁶¹

The Committee understands the important role temporary levees can play in flood mitigation. However, it is concerned that the decision to construct a temporary levee in Echuca was not communicated well to residents. Further, there were clear opportunities to ensure residents on the side of the levee where there would inevitably be inundation had additional support to mitigate the impact of the flood and additional inundation created by the new structure.

The Committee believes that during emergency events communication channels should be established, including by establishing and articulating lines of responsibility.

FINDING 20: While the temporary levee in Echuca did mitigate flooding for most of the town, approximately 190 properties were significantly negatively affected. The lack of proper warning, inadequate support, and insufficient resources for those facing inevitable inundation contributed to a sense of abandonment among affected residents.

FINDING 21: The construction of the temporary levee in Echuca exhibited clear deficiencies in communication and planning surrounding the levee's construction. The decision-making process was not transparent, and the roles and responsibilities of various agencies during the emergency response were unclear, leading to confusion and uncertainty among residents.

⁶⁰ Cr Rob Amos, Mayor, Campaspe Shire Council, Echuca, 24 August 2023, *Transcript of evidence*, p. 2.

⁶¹ Campaspe Shire Council, *Submission 650*, p. 9.

5.4 Flood walls

Flood walls are another component of Victoria’s flood mitigation infrastructure system, designed to achieve a similar purpose to a levee, in an urban setting. While levees are most often built out of natural materials, a flood wall is an engineered structure designed to prevent the encroachment of flood waters in a protected area.

Figure 5.7 Flemington Racecourse flood wall during the October 2022 floods



Source: Tom Cowie, Cara Waters and Marta Pascual Juanola, “It’s why we campaigned against it’: Flemington racetrack flood wall sparks anger”, *The Age*, 15 October 2022, <<https://www.theage.com.au/national/victoria/maribyrnong-locals-fume-as-flood-wall-stops-waters-reaching-racecourse-20221015-p5bq08.html>> accessed 21 March 2024.

The Committee received evidence related to the Flemington Racecourse flood wall, particularly its impact on the severity of flooding in residential areas in October 2022.

5.4.1 Flemington Racecourse flood wall

Chapter 4 examined the planning decision to construct a flood wall at Flemington Racecourse, including canvassing community objections to the flood wall. This Section discusses the impact of the flood wall on flooding in surrounding areas.

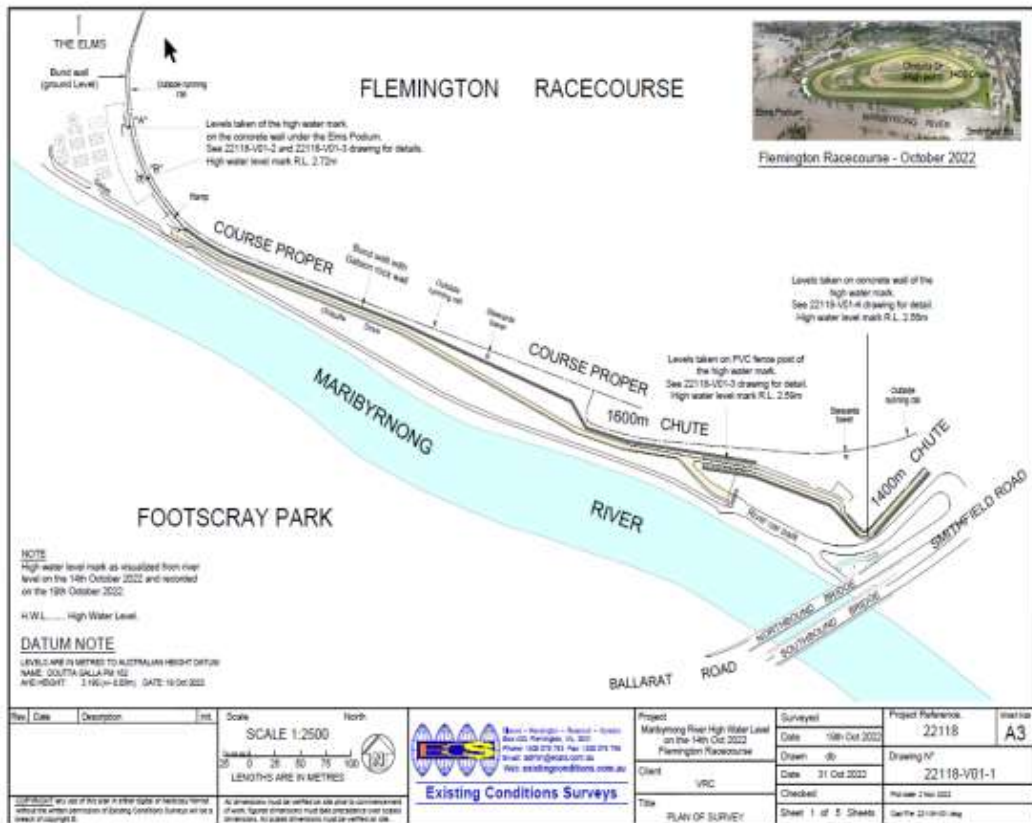
Box 5.4 Flemington Racecourse flood wall

The Flemington Racecourse flood wall is located approximately 7 km northwest of the Melbourne CBD and has a direct interface with the Maribyrnong River. The racecourse area occupies 32 acres.

Construction of the flood wall commenced in 2007, abutting the southern boundary of the racecourse adjacent to the river. The wall is approximately 900 m in length.

Source: Tony Pagone et al., *Maribyrnong River Flood Event Independent Review*, Melbourne Water, 2023, pp. 94–95.

Figure 5.8 Flemington Racecourse flood wall



Source: Tony Pagone et al., *Maribyrnong River Flood Event Independent Review*, Melbourne Water, 2023, pp. 94–95.

The flood wall is just one of several developments which have altered the hydrology of the Maribyrnong River (see Figure 5.9 below).

Figure 5.9 Approximate extent of Maribyrnong River flooding adjacent to the Flemington Racecourse in October 2022



Source: Nino Bucci, 'Did the wall that saved the Melbourne Cup racetrack contribute to the flooding of 245 homes?' *The Guardian*, 22 October 2022, <<https://www.theguardian.com/australia-news/2022/oct/21/did-the-wall-that-saved-the-melbourne-cup-racetrack-contribute-to-the-flooding-of-245-homes>> accessed 5 April 2023.

In the 20 years since the flood wall was approved, new housing estates (such as the Rivervue Retirement Village), urban densification, and major infrastructure such as Metro Tunnel in Kensington have been developed in surrounding suburbs (see Figure 5.10). Many of these developments have involved flood mitigation works to reduce the risk of inundation which have had implications for the movement of water downstream during a flood event. For example, the construction of the Flemington Racecourse flood wall was accompanied by the removal of an abutment under the

Footscray Road bridge and of a road embankment to ease the passage of floodwater down river away from suburbs. Likewise, the Metro Tunnel is protected by a 350 m long, 3 m high floodwall which aims to redirect flood water into a basin designed to hold it.⁶²

Figure 5.10 Maribyrnong River surrounds circa Feb 2001 versus October 2022



Source: Sophie Aubrey and Clay Lucas, 'Metro Tunnel among projects that may have exacerbated flood', *The Age*, 27 February 2023, <<https://www.theage.com.au/national/victoria/metro-tunnel-among-projects-that-may-have-exacerbated-flood-20230222-p5cmig.html>> accessed 15 March 2023.

Much of this development has been controversial and some planning approvals have been contested. For example, the Rivervue Retirement Village development was originally rejected by the City of Moonee Valley, but the decision was overturned at the Victorian Civil and Administrative Tribunal in 2006.⁶³

The Committee received evidence that suggested the flood wall contributed to the severity of flooding in surrounding suburbs. This was largely from residents in the Maribyrnong area.

The initial August 2023 report from the Maribyrnong River Flood Review panel noted that with the information at hand it was not possible to unequivocally determine whether the flood wall caused flooding in surrounding residential areas. It noted that the modelling available at the time was 'out of date' and 'not suitable for assessing the impact of specific infrastructure', including the flood wall and compensatory measures. The panel acknowledged that new modelling was being undertaken which could allow them to assess the impact more effectively:

The degree to which the Floodwall contributed to the duration and extent of the Flood Event cannot be assessed directly, as there is no modelling of the Event that includes the Floodwall. The current HEC-RAS model is out of date, and while suitable for determining

⁶² Sophie Aubrey and Clay Lucas, 'Metro Tunnel among projects that may have exacerbated flood', *The Age*, 27 February 2023, <<https://www.theage.com.au/national/victoria/metro-tunnel-among-projects-that-may-have-exacerbated-flood-20230222-p5cmig.html>> accessed 15 March 2023; 'Going's wet as racing hits 2km stone wall', *The Age*, 31 October 2004, <<https://www.theage.com.au/national/goings-wet-as-racing-hits-2km-stone-wall-20041031-gdywft.html>> accessed 6 March 2023.

⁶³ Sophie Aubrey and Clay Lucas, 'Maribyrnong inquiry chair backed flood rules removal – then the waters hit', *The Age*, 7 February 2023, <<https://www.theage.com.au/politics/victoria/maribyrnong-inquiry-chair-backed-flood-rules-removal-then-the-waters-hit-20230205-p5ci2m.html>> accessed 15 March 2023.

design flood levels, it is not suitable for assessing the impact of specific infrastructure, such as the Floodwall and its downstream compensatory measures, on flood duration and extent. Melbourne Water have indicated that a modern hydraulic model that is capable of performing such an assessment is being developed, but this will not be available until April 2024.⁶⁴

Following the release of modelling by Melbourne Water in April 2024, the Review Panel subsequently released a second addendum to its report in April 2024. This addendum examined the new modelling from Melbourne Water to determine the impact of the flood wall in 2022. This is discussed further in Chapter 4 and below.

The importance of up-to-date modelling in allowing panel experts to properly determine the role the flood wall had in October 2022 was acknowledged by Melbourne Water. At a public hearing, Nerina Di Lorenzo, Managing Director of Melbourne Water, told the Committee:

Regarding the Flemington flood wall, the review established some key facts. It established that the mitigating works that were put in place to offset its impacts appeared to have functioned, and when we overlay the actual flood extent against the flood model, it shows that the extent of flood before and after the wall were very close – appeared to be very close. We also recognise what a significant issue this historical decision is for communities. We will re-run the impact of the wall after April 2024, and we will reconvene the panel to reconsider that one issue, and that will be publicly available, in recognition of how significant this historical decision has been.⁶⁵

The modelling released in April 2024 is discussed further below.

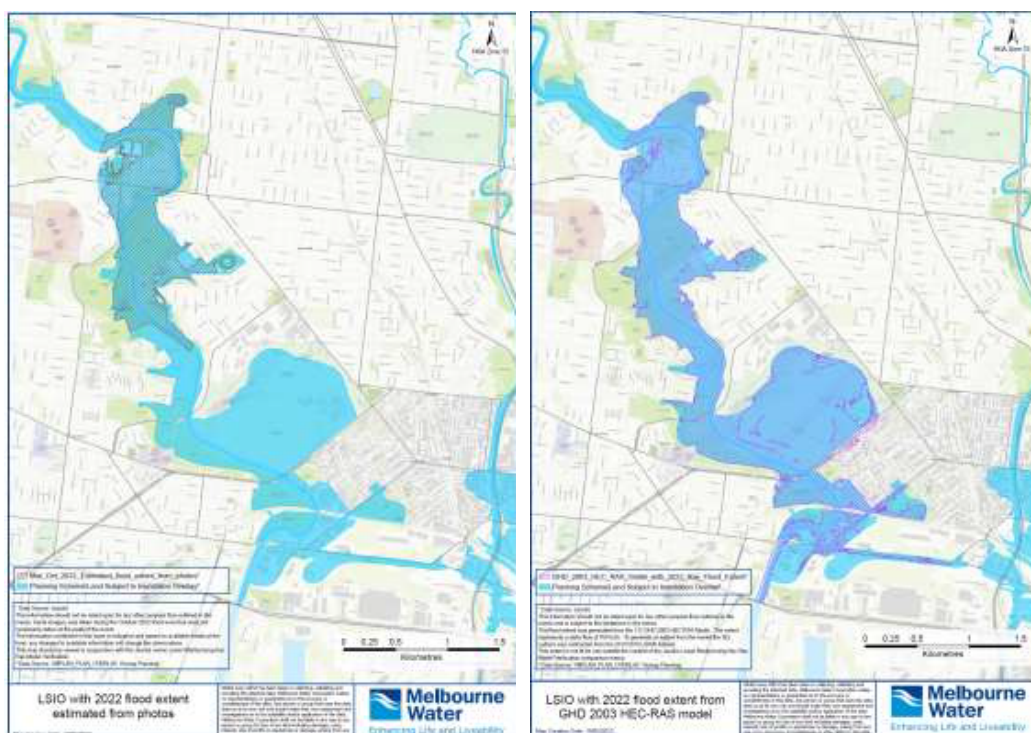
The independent review did note that a ‘high-level visual comparison’ of the actual extent of the flood wall and the modelled extent showed that the ‘two extents look very similar’. The report suggested that, ‘Based on this high-level visual comparison, the impact of the Floodwall on the extent of the flooding would not appear to be significant’ (see Figure 5.11 below).⁶⁶

⁶⁴ Tony Pagone et al., *Maribyrnong River Flood Event Independent Review*, pp. 94–95.

⁶⁵ Nerina Di Lorenzo, Managing Director, Melbourne Water, public hearing, Melbourne, 11 October 2023, *Transcript of evidence*, p. 84.

⁶⁶ Tony Pagone et al., *Maribyrnong River Flood Event Independent Review*, p. 102.

Figure 5.11 Comparison of the estimated extent of the flood event, which included the flood wall (left panel) and the extent of the modelled extent of the flood event, which did not include the flood wall (right panel)



Source: Tony Pagone et al., *Maribyrnong River Flood Event Independent Review*, Melbourne Water, 2023, p. 103.

However, at a public hearing Tony Pagone, Chair of Maribyrnong River Flood Review, provided context to this high-level visual comparison:

It is just a matter of, you look at it and you see the width of the river and you see how high the thing has gone up the flood wall and you look across to the other side of the river and you think, 'Well, if it's gone up that much, the impact overall is unlikely to have been a major factor.' But that is guesswork in the most extreme. I have got no idea, and until the Jacobs report modelling comes out we will have no idea whether it is a bit or a lot.⁶⁷

In response to the independent review, Melbourne Water stated:

Melbourne Water's investigation to date has established some important facts; that the modelling assumptions on which decisions were based were accurate for this location and that the mitigating works designed to offset the Flemington Wall impacts were implemented as designed.⁶⁸

Melbourne Water further noted its commitment to finalising hydraulic modelling to confirm the overall impact of the flood wall. This modelling and its implications are discussed further below.

⁶⁷ Tony Pagone, Chair, Maribyrnong River Flood Review, public hearing, Melbourne, 6 December 2023, *Transcript of evidence*, p. 26.

⁶⁸ Melbourne Water, *Response to the Maribyrnong River Flood Review report*, response received 6 October 2023, p. 5.

The Inquiry's evidence was received prior to the release of modelling data by Melbourne Water, and prior to the Independent Review Panel's assessment of the modelling. Nevertheless, the experiences of Maribyrnong residents and the information they provided are considered alongside the technical assessments by Melbourne Water and the Independent Review Panel.

Many residents who live near the Maribyrnong River believed that the racecourse's flood wall had a moderate to significant impact on flooding in the area. Evan Counsel, General Manager of Strategy, Planning and Climate Change at the City of Melbourne, said of the views of residents:

I think we have definitely had some strong views from some residents, a proportion of our community. They definitely feel like the flood wall pushed floodwaters into other areas to protect the racecourse to the detriment of some other local areas, where our local level parks were then used and inundated by floodwaters to the extent where it then extended into those local residential areas and roads.⁶⁹

The Flemington Racecourse remained dry during the flood. We have no data to draw upon, but common-sense tells us removal of this flood plain displaced water that backed up water from upstream.

Essendon Canoe Club, *Submission 581*, p. 3.

Other stakeholders held similar views, many of them Maribyrnong residents directly affected by the floods. Box 5.5 below provides an excerpt of some of the evidence received which demonstrates the serious concerns held that the flood wall worsened the flooding in Maribyrnong. These represent a snapshot of the evidence received.

Box 5.5 Stakeholders' views on the impact of the Flemington Racecourse flood wall on the October 2022 flood in Maribyrnong

The construction of a levee wall surrounding the Flemington Racecourse had the inevitable consequence of increasing flooding in other areas.

The preservation of open areas to absorb flood volumes is a recognized strategy for flood protection, and is the reason why Flemington Racecourse is a racecourse and not a housing development. By approving the obstruction of the flood plain, Melbourne Water worsened the flood, rather than meeting its legal obligations to minimize it.

Alison Joseph, *Submission 15*, p. 1.

(Continued)

⁶⁹ Evan Counsel, General Manager, Strategy, Planning and Climate Change, City of Melbourne, public hearing, Melbourne, 11 October 2023, *Transcript of evidence*, p. 37.

Box 5.5 Continued

In the past when the Maribyrnong swelled. The water would seep into a natural flood plain, Flemington Racecourse. Due to the wall, the water had no where to go so it swelled at a different location impacting the Maribyrnong community. Perhaps, Navigator street would still have flooded to a small extent. Perhaps the water would have caused only surface level damage. Perhaps the \$60,000 damage to my ground floor unit could have been prevented. The loss of the hot water systems to my owner occupier unit could have been prevented.

Mary De Bono, *Submission 65*, p. 2.

In the October flood, we see a significant and rapid increase in the river height at Keilor which peaked at 8.63m at 8:00am. As the water moved downstream, the Maribyrnong also saw a rapid increase in river height which peaked at 12:00pm. In our view, the Flemington wall was an impediment to the volume of water moving downstream and this caused more severe flooding than would have been the case pre-wall.

Essendon Canoe Club, *Submission 581*, p. 2.

As for the Flemington Racecourse flood wall, how could it not have had a significant impact on the flooding in Kensington? That amount of area could have held quite a lot of water and mitigated at least some of the impact on Kensington residents and businesses.

Name Withheld, *Submission 238*, p. 2.

I started to feel envious of Flemington Racecourse who managed to get a flood wall built to protect the grass that took a quarter of the 1974 floodwater, and the photo of a dry Flemington Racecourse was very painful to see. Especially as I picked up all of mine and my children's belongings which were ruined.

Name Withheld, *Submission 516*, p. 3.

As noted in Chapter 4, at the time of the flood wall planning stage there was significant opposition to its construction. Much of the concern was centred on the potential impact of the wall to increase flooding upstream during an event. This was discussed by Maribyrnong City Council who stated:

With Moonee Valley City Council, we cited concern relating to the provision of levee banks at Flemington Racecourse as a flood mitigation measure and the potential to negatively impact our community upstream during floods, particularly the Maribyrnong Township. Together we jointly commissioned experts and legal advisors to review the modelling work undertaken for the Victorian Racing (VRC) site and the conditions included in the Notice of Decision. We highlighted that there were significant shortcomings in the modelling, which may result in increased flooding to residential properties. The expert evidence advised that Melbourne Water's proposed conditions

and mitigating works need to go much further to ensure the flooding situation in the Maribyrnong River valley is not made worse for residents within the flood plain.⁷⁰

Other stakeholders were also opposed to the construction of the flood wall. Essendon Canoe Club told the Committee that:

The club was opposed to the building of the flood wall as it significantly reduced the flood plain of the river. There did not appear to be significant offsets that compensated for the loss of the flood plain, and in our view, there was the potential for the river to back up and make flooding upstream worse than would otherwise be the case. We made this observation based on the short duration of Maribyrnong River floods which historically see the river rising and subsiding quickly.⁷¹

Stakeholders' views of the planning decision for the Flemington Racecourse flood wall are discussed further in Chapter 4.

The Committee was informed that it was likely that the flood wall had limited impact on the severity of the flooding in surrounding areas. Chair of the Maribyrnong River Flood Review, Tony Pagone, told the Committee 'it is probable that the Flemington wall had relatively little impact itself – probable. At least I am prepared to assume that'.⁷²

However, Mr Pagone further stated that it was 'really odd' that the Victoria Racing Club or other entity did not have anything in place to properly evaluate the wall's capacity for flood mitigation.⁷³ At a public hearing, he told the Committee:

I thought it was really odd there was no system in place within the VRC, or anywhere else for that matter, to evaluate whether the Flemington wall had the impact that it was supposed to have beyond the racecourse. So they are happy enough to say the racecourse was saved – tick – but mitigation work was being done in order to mitigate the impact. I do not wish to say that it was not effective, because the impression was that it was effective and did not produce much damage itself. But that there was nothing in place within the VRC or elsewhere in government to ensure that what was done to mitigate actually mitigated struck me as a potential deficiency that one should, from the point of view of legislatures and government, want to look at.⁷⁴

FINDING 22: A range of stakeholders along the middle and lower Maribyrnong catchment believe that the Flemington Racecourse flood wall exacerbated flooding in surrounding areas.

⁷⁰ Maribyrnong City Council, *Submission 530*, p. 8.

⁷¹ Essendon Canoe Club, *Submission 581*, p. 2.

⁷² Tony Pagone, 6 December 2023, *Transcript of evidence*, p. 24.

⁷³ Ibid.

⁷⁴ Ibid.

New flood modelling (impact of the Flemington Racecourse flood wall) — April 2024 release

[I]t is 240 residential homes which were subject to 80 centimetres prior to flood wall, and we found that the flood wall contributed an average of 1.7 centimetres to 80 centimetres of pre-existing flood depth... it is a 2 per cent difference.

Nerina Di Lorenzo, Managing Director, Melbourne Water, public hearing, Melbourne, 10 May 2024, *Transcript of evidence*, p. 9.

On 19 April 2024, the independent Melbourne Water Review Panel published an addendum to its final report. This addendum considered the implication of newly developed hydraulic modelling commissioned by Melbourne Water to evaluate the impact of the Flemington Racecourse flood wall on the flood extent in 2022. Chapter 4 discusses the new modelling which was released and consequential changes to flood maps for the Maribyrnong catchment. For context, Box 5.6 provides a summary of the modelling approach.

Box 5.6 Melbourne Water's new hydraulic modelling (Maribyrnong)

Melbourne Water utilised an array of datasets to conduct flood modelling for the Maribyrnong River catchment:

- Rainfall: Obtained daily from the Bureau of Meteorology to monitor varying rainfall patterns across catchments.
- Streamflow: Data on water velocity and volume gathered from the Bureau's Water Data Online and the Victorian Water Measure Information System.
- Topography and LiDAR: Employed aerial laser scanning and 3D technologies to map the topography and ground heights using Light Detection and Ranging surveys.
- Bathymetry and mobile laser scanning: Collected three-dimensional riverbed data and bridges along the river.
- Flood mark and observed flood extent surveys: Utilised markers from the October 2022 flood to gauge water heights and extents, supported by debris lines and photographs.

Modelling approach:

- Hydrology Model: Calculates how rainfall translates into runoff within the catchment, providing crucial input for the hydraulic model.
- Hydraulic Model: Predicts flood depth, extent, and flow characteristics using terrain and runoff data.

(Continued)

Box 5.6 Continued

Climate projections:

- For the 2100 scenario only, the model incorporated increased rainfall intensity (18.4%) under a high emissions scenario and a sea level rise of approximately 0.8 metres.

Design event modelling:

- Employed a dual-model strategy to define flood boundaries and depths based on their likelihood of occurrence annually, examining both current conditions and future climate impacts for various annual exceedance probability scenarios (1%, 2%, 5%, 10%, and 20%).

Source: Jacobs, *2024 Maribyrnong River Flood Modelling Project Summary Report*, prepared for Melbourne Water, 24 April 2024.

The addendum made determinations on two key issues:

- the impact of the Flemington Racecourse flood wall on the Maribyrnong River flooding in October 2022
- the efficacy of compensatory measures in offsetting any impacts of the flood wall on surrounding areas.

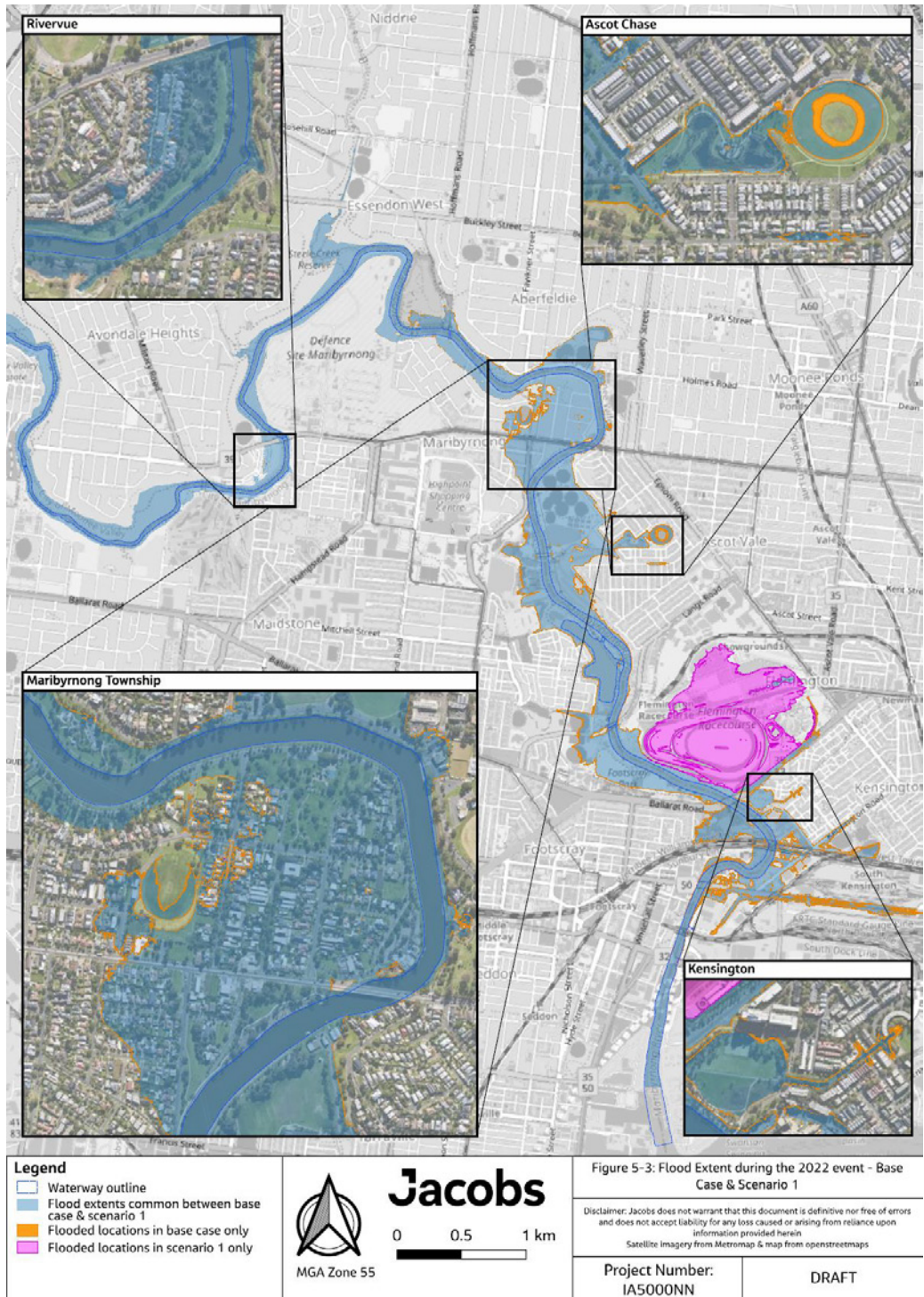
Based on the new hydraulic modelling, the review found that while the flood wall protected the racecourse, it marginally increased the flood extent by about 1% and 2% in depth in nearby areas. However, the duration of flooding remained largely unchanged except at the very edges of the flood extent.⁷⁵

Figure 5.12 below, from the independent panel's addendum, shows the impact of the flood wall and associated compensatory works on the 2022 flood extent. In the Figure, areas in orange indicate 'additional flood extent' compared to pink areas which indicate areas which are 'no longer flooded'.⁷⁶

⁷⁵ Jacobs, *VRC Wall & Mitigation Report*, prepared for Melbourne Water, 14 March 2024, p. 15.

⁷⁶ Tony Pagone et al., *Maribyrnong River Flood Event Independent Review: Flemington Racecourse Floodwall Second Addendum*, Melbourne Water, 19 April 2024, p. 17.

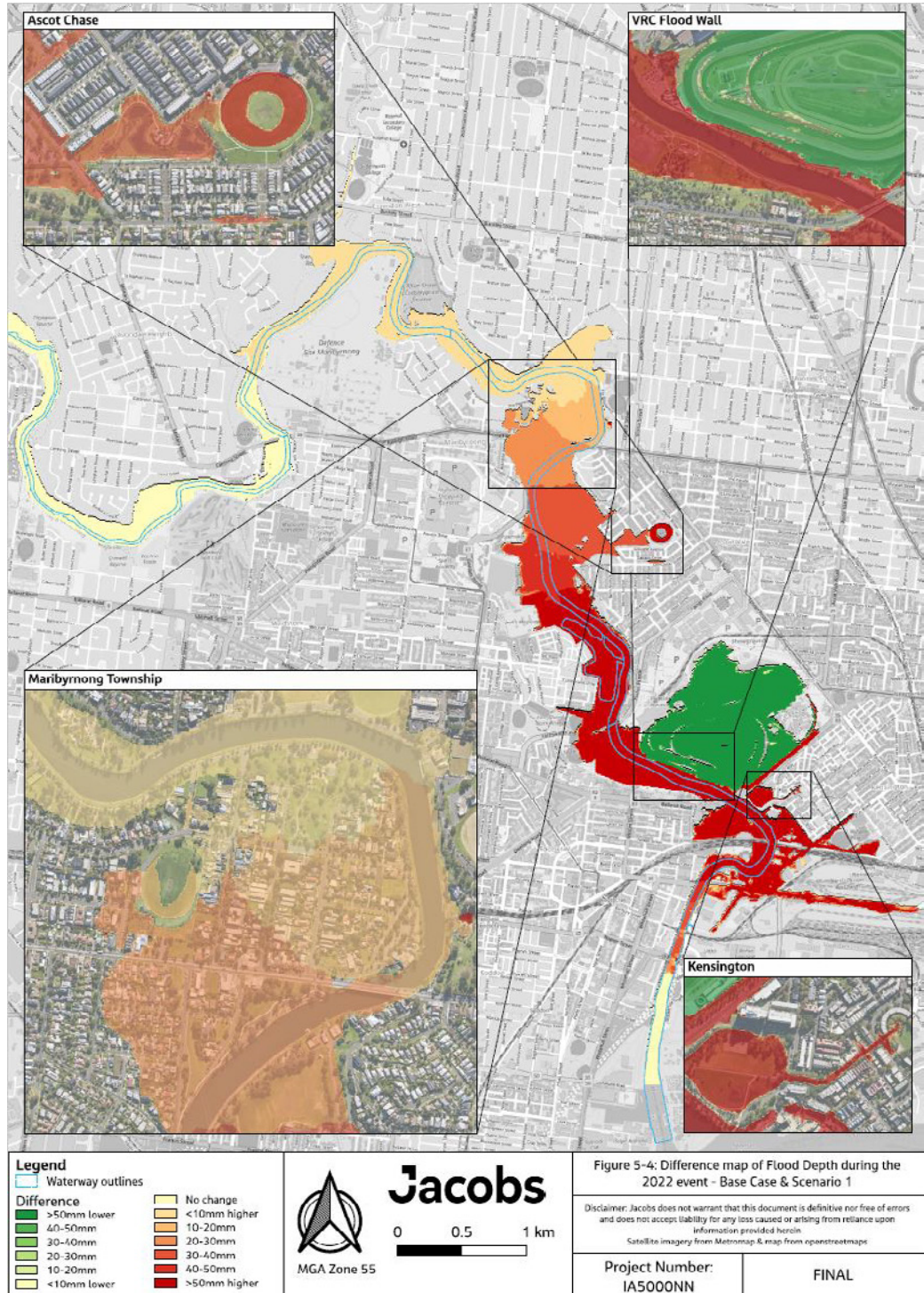
Figure 5.12 Modelled changes in the extent of the October 2022 flood event due to construction of the Flemington Racecourse Flood Wall and associated compensatory works



Source: Tony Pagone et al., *Maribyrnong River Flood Event Independent Review: Flemington Racecourse Floodwall Second Addendum*, 19 April 2024, p. 17.

Figure 5.13 below shows the difference in flood depth during the 2022 flood event. The Figure indicates that flood depth increases in areas closest to the flood wall and continuously decreases as the Maribyrnong River moves away from the racecourse area.

Figure 5.13 Modelled changes in flood depth along the Maribyrnong River during the October 2022 flood event as a result of the construction of the Flemington Racecourse flood wall and associated compensatory works



Source: Tony Pagone et al., *Maribyrnong River Flood Event Independent Review: Flemington Racecourse Floodwall Second Addendum*, 19 April 2024, p. 19.

At a public hearing, Nerina Di Lorenzo, Managing Director of Melbourne Water, explained the key findings for the flood wall stemming from the updated modelling in relation to the role of the wall in leading to an increase in flood depth:

[T]he Flemington flood wall contributed to an increase in flood area of 1 per cent and an increase in depth of approximately 2 per cent, and that there are 240 properties which had a pre-existing flood depth of 80 centimetres on average, which is increased by 1.7 centimetres on average as a result of the wall. They are average numbers, but the depth increase in residential areas is between 0.8 centimetres and 3 centimetres; that is the range.⁷⁷

When the Flemington Racecourse flood wall was constructed, compensatory measures such as hydraulic improvements to Footscray Road Bridge and the Northern Railway Culverts were implemented to mitigate the flood wall's impact on flood behaviour. The review found these measures to be 'largely ineffective'.⁷⁸ The review highlighted the need for Melbourne Water to revisit and enhance the flood mitigation strategies associated with infrastructure like the Flemington Racecourse flood wall.

The mitigation measures were intended to neutralise the impact of the flood wall by facilitating better water flow and reducing flood levels. However, the actual mitigation achieved was minimal, reducing flood levels by only a few millimetres, far less than the reductions projected in initial models.⁷⁹

Consequently, the independent panel determined in relation to the compensatory works that:

based on the modelling results of Jacobs, the Floodwall compensatory works did not "neutralise" or "overcompensate" for the impacts of the Floodwall as had been stated by GHD in 2003.⁸⁰

Representatives from Melbourne Water discussed the findings of the independent review in relation to the performance of compensatory measures around the flood wall at a public hearing in Melbourne:

[T]he mitigation works put in place to offset the wall's impact did not perform as well as expected at the time of its design and approval in 2004. Prior to the new model, Pagone noted that the wall did not appear to make a significant increase to flood risk based on the area maps but held off on a finding at the time subject to the new model. This new model now gives us more granular understanding of that impact, and it now provides us with data to quantify that. As noted previously, we will now be considering mitigation options as part of our work across the Maribyrnong catchment, and we would consider whether the offsetting works could be strengthened also as part of that work.⁸¹

⁷⁷ Nerina Di Lorenzo, Managing Director, Melbourne Water, public hearing, Melbourne, 10 May 2024, *Transcript of evidence*, p. 3.

⁷⁸ Tony Pagone et al., *Maribyrnong River Flood Event Independent Review: Flemington Racecourse Floodwall Second Addendum*, p. 21.

⁷⁹ Ibid.

⁸⁰ Ibid., p. 22.

⁸¹ Nerina Di Lorenzo, 10 May 2024, *Transcript of evidence*, p. 3.

On the review of mitigation options for the Maribyrnong catchment, Craig Dixon, Executive General Manager of Service and Asset Lifecycle at Melbourne Water, further explained:

we have started a process now to do an extensive review, a restudy, of mitigation options for the Maribyrnong catchment. We are sending that out to the specialist market, and that will be beyond just local as well, to seek the most contemporary expertise we can. That will be a significant piece of work. But the most important thing to note is it will now be based on a model projecting a 2100 risk, which we have never had before. We have not had that forward projection-type modelling, so we can consider what options are available that not only provide that mitigation today but will have the resilience against climate change in the future.⁸²

When asked about lessons relating to the ineffective mitigation works around the flood wall, Mark Babister, Panel Member and Managing Director of WMA Water, told the Committee that he believed more caution about what the measures could achieve should have been exercised at the time of construction of the flood wall:

I think with mitigation works it always pays to be cautious, and that is probably what was not applied at the time. The technology at the time made it hard for them to be definitive, but nobody erred on the side of caution, which was probably the biggest mistake.

The CHAIR: So looking forward, thinking about the future works, future mitigation, obviously the implications of this study are going to lead to a whole lot more work in terms of mitigation measures. There are clearly limits to the extent to which mitigation measures can ameliorate risk. Is that –

Mark BABISTER: Yes. It will lead to some measures, but the reality is with flooding it is really hard and generally very expensive to mitigate flooding and it is really easy to avoid flooding by putting things in the right place. So you have got to get the decision right at the start, and it is very hard to fix it afterwards, particularly on a river. On a little, tiny urban drain it might be possible, but on a river it is nearly impossible.

The CHAIR: A big river like the Maribyrnong.

Mark BABISTER: Yes.⁸³

As noted in Chapter 4, the October 2022 flood event in Maribyrnong was classified as a 2% Annual Exceedance Probability (AEP) flood event (refer to Chapter 4 for a detailed explanation of AEP). As noted already, the modelling conducted demonstrates that the flood wall did influence the extent and depth of the 2022 flood event. However, it is important to highlight that the initial proposal for the flood wall was primarily based on its ability to manage a 1% AEP flood event.⁸⁴

⁸² Craig Dixon, Executive General Manager, Service and Asset Lifecycle, Melbourne Water, public hearing, Melbourne, 10 May 2024, *Transcript of evidence*, pp. 9–10.

⁸³ Mark Babister, Panel Member, Maribyrnong River Flood Review, public hearing, Melbourne, 10 May 2024, *Transcript of evidence*, p. 24.

⁸⁴ Victoria Racing Club, *Flemington Racecourse Flood Protection: Investigation of Maribyrnong River Flood Protection*, prepared by GHD, 2003, p. 8. See: Victoria Racing Club, *Submission 689*, Attachment 6.

The 2003 report prepared by GHD proposing the flood wall discussed that additional compensatory measures were an opportunity to ‘mitigate against the effects of the proposed floodwall’.⁸⁵ On the compensatory measures proposed, the report noted that:

[proposed] mitigation works have been aimed at improving the capacity of the Maribyrnong River to cater for increased flows. The mitigation works will provide some benefit for a range of events however their performance for floods greater or smaller than the 100 year ARI event has not been assessed.⁸⁶

The Committee understands this to mean that the proposed compensatory works were modelled under the 1% AEP scenario.

In its second addendum, the Maribyrnong River Flood Review panel explained:

The executive summary of the 2003 GHD report *Flemington Racecourse Flood Protection: Investigation of Maribyrnong River Flood Protection May 2003* for VRC stated “... the mitigation works proposed in the report involve providing additional conveyance and thereby ‘neutralising’ the afflux” and “If additional mitigation works at the Railway culverts were implemented the effect would be to over-compensate for the Flemington floodwall, i.e. to lower 100-year ARI flood levels between Footscray Road and Maribyrnong Village.” Consequently, construction of the Floodwall and associated compensatory works should not have resulted in any increase in flooding.⁸⁷

Hon Tony Pagone, Chair of the Maribyrnong River Flood Review panel, discussed this issue in response to a question from the Deputy Chair:

David ETTERSHANK: Can I ask: in terms of the technical elements of this, the original benchmark that was set for the VRC was the 1 per cent flood. The results that have been provided, in terms of if the flood wall contributed to inundation, were premised on 2022, which was a 2 per cent flood. So does it cause you any concern that in fact we do not have the answer to the original proposition, which is that that flood wall should equate to a 1 per cent flood?

Tony PAGONE: Speaking as (effectively) a layman with only the benefit of what I have done, it does concern me, but I am not speaking as an expert there. It concerns me because you wonder what would happen if you had a 1 per cent event. What does concern me, again, as a layman – and I should not really probably say any of this – is that there seems to have been nothing in place to evaluate the impact.⁸⁸

Mark Babister further expanded albeit from a different perspective:

We use this 1 per cent standard for everything – for houses, for businesses and for racecourses. It would be much more sensible if we actually had things like the racecourses at a lower level, so they were inundated, and when the houses were

⁸⁵ Ibid.

⁸⁶ Ibid.

⁸⁷ Tony Pagone et al., *Maribyrnong River Flood Event Independent Review: Flemington Racecourse Floodwall Second Addendum*, p. 10.

⁸⁸ Tony Pagone, Chair, Maribyrnong River Flood Review, public hearing, Melbourne, 10 May 2024, *Transcript of evidence*, p. 25.

inundated, any impact on people's houses built at the correct level they were told to was minimal. And I would say the same for major bridges and motorways and other things as well. If people have built their houses at the appropriate level in accordance with government guidance, we should try and make sure other uses do not impact them.⁸⁹

The Committee notes that the updated modelling shows the Flemington Racecourse flood wall would be inundated under the new 2024 and 2100 1% AEP scenarios. Refer to Chapter 4 and below for more information.

2024 and 2100 modelling and the impacts of the flood wall and mitigation

As noted, as well as new maps, Melbourne Water has a further report using the updated modelling to analyse the impact of the Flemington Racecourse flood wall on the 1% AEP 2024 event.

Key takeaways from the VRC Wall & Mitigation Report for the 1% AEP 2024 Event are that:

- the flood wall was effective in preventing inundation of the racecourse in 2022
- in a 2100 1% AEP flood event, however, the flood wall is significantly overtopped, and flood levels are only minimally affected
- in a 2024 1% AEP flood event
 - the Flemington Racecourse experiences minor inundation
 - the flood wall results in a minor increase (<1%) in flood extent
 - the flood wall and associated mitigation measures result in
 - an average increase of 38 mm in flood depths in residential areas of the Maribyrnong Township
 - an average increase of 12 mm in flood depths in industrial areas in parts of Kensington
 - a benefit of approximately 52 mm in residential areas within Kensington Banks
 - the flood wall increases the duration of the flood peak by up to 4.5 hours.

The impact of the flood wall

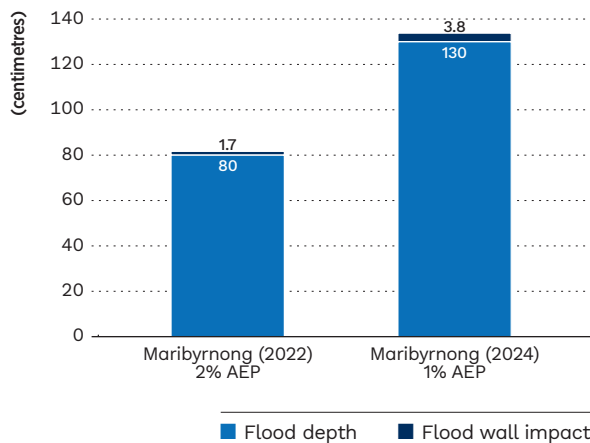
The Flemington Racecourse flood wall contributed to an increase in the flood depth and flood extent during the 2022 flood event for some communities, especially residents in the Maribyrnong Township, and will continue to do so into the future. The level of that impact is summarised in Figure 5.14 below.

⁸⁹ Mark Babister, *Transcript of evidence*, p. 25.

In the Committee’s view, the panel’s findings in the April 2024 addendum report suggest that the compensatory measures as currently designed and implemented do not sufficiently offset the impacts of the flood wall. It is recommended that future flood mitigation efforts include updated and more rigorous hydraulic modelling before implementation to ensure compensatory measures are effective. Furthermore, these strategies should undergo independent peer review to validate their expected performance. The ongoing development and refinement of hydraulic models, as seen with the 2024 Maribyrnong River Flood Model, are crucial for accurately predicting and managing flood risks. Continued investment in these technologies will be vital for improving flood resilience in the region.

Given the further modelling that shows the Flemington Racecourse flood wall would have a ‘shielding’ effect in future flood events for some residents—notably in Kensington Banks—the flood wall’s ongoing efficacy requires consideration in the context of overall mitigation within the Maribyrnong River catchment.

Figure 5.14 Modelled impact of the Flemington Racecourse flood wall on Maribyrnong Township average flood depths



Source: Legislative Council Environment and Planning Committee.

FINDING 23: During the 2022 flood event, the Flemington Racecourse flood wall contributed to an increase of 1% in flood extent and approximately 2% in flood depth in affected areas.

FINDING 24: The compensatory measures implemented alongside the Flemington Racecourse flood wall were largely ineffective. These measures only reduced flood levels by a few millimetres, far less than initially projected, indicating a need for more robust flood mitigation strategies in the future.

RECOMMENDATION 30: That the Victorian Government ensure that future flood mitigation efforts include updated and rigorous hydraulic modelling before implementation, ensuring the effectiveness of compensatory measures. Additionally, these strategies should undergo independent peer review to validate their expected performance.

RECOMMENDATION 31: That the Victorian Government ensure that major flood mitigation measures be assessed and reviewed to ensure they perform as intended.

RECOMMENDATION 32: That the efficacy and impact of the Flemington Racecourse flood wall be considered as part of Melbourne Water’s review of mitigation in the Maribyrnong River catchment announced following the updated flood modelling.

5.5 Dams

There are over 450,000 dams in Victoria ranging from major water storage dams to swimming pool-sized dams on farms and other properties. Smaller privately owned dams are the most common type of dam in the state.⁹⁰

Dams can provide incidental flood mitigation, but it depends on the ‘water level in the dam at the time of flood-inducing rain’. Rather, Victorian dams are primarily designed to provide water supply and irrigation services.⁹¹

According to the Victorian Floodplain Management Strategy:

Dams with regulating gates are operated to protect the safety of the dam and to maximise the storage of water. Fixed spillways also keep large dams at safe operating levels and allow floodwaters to pass. The management arrangements for large flow releases from dams are articulated in an attachment to the State Flood Emergency Plan: Management of flooding downstream of dams.

Although it is unlikely that a well-constructed and maintained dam would fail, this extremely rare event could release large volumes of water. Owners of large dams have produced ‘flood inundation maps’ showing predicted flow paths and levels of the water that could be released in these unlikely circumstances. Dam owners are required to maintain these maps and make them available to Incident Controllers during emergencies.⁹²

⁹⁰ Department of Energy, Environment and Climate Action, *Victoria’s Dams*, 2023, <<https://www.water.vic.gov.au/water-sources/victorias-dams>> accessed 21 March 2024. See also: Victorian Government, *Submission 295*.

⁹¹ Department of Environment, Land, Water and Planning, *Victorian Floodplain Management Strategy*, p. 78.

⁹² Ibid.

During the 2022 flood event, some of the larger Victorian dams played a role in exacerbating flood damage in Northern Victoria. The Committee specifically received extensive evidence on the impact of water releases from Lake Eildon and evidence of the inability of Lake Eppalock to pre-release volumes of water greater than 1600 ML per day.

5.5.1 Lake Eppalock

Box 5.7 Lake Eppalock catchment

Lake Eppalock was constructed between 1960 and 1964 to store water for consumptive use. Water stored at Lake Eppalock is used to:

- supply private diverters (irrigators)
- meet environmental water demands along the Campaspe River
- underpin urban water security for Bendigo and surrounding towns
- meet trade commitments to the River Murray.

The catchment's area is approximately 2,030 km², and Campaspe River catchment between Lake Eppalock and Rochester is approximately 1,370 km².

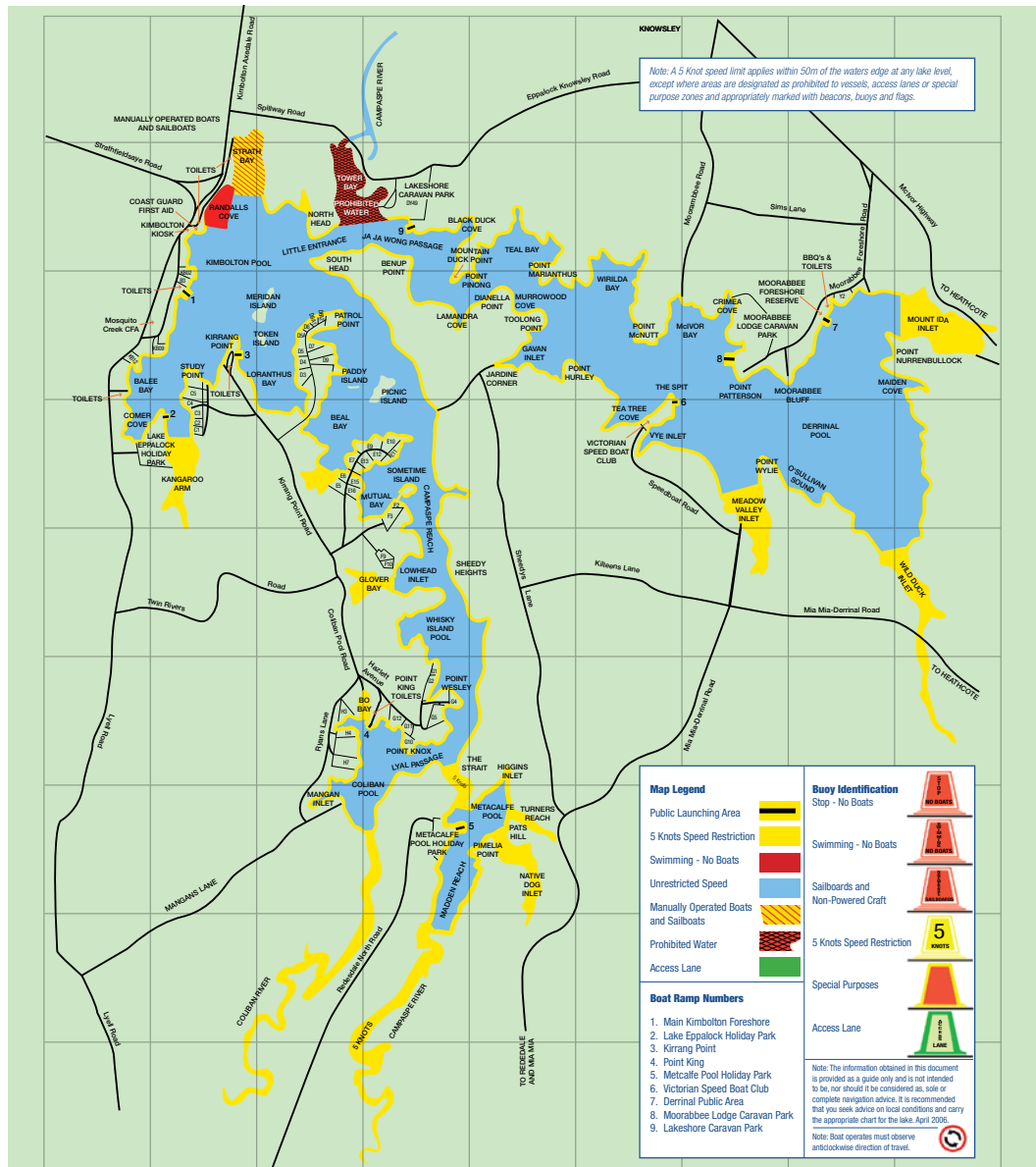
The catchment's full supply level is 193.91 m AHD, with 304,650 ML (304.65 GL) is held in storage. 82% of this capacity is shared: 18% between Goulburn-Murray Water and Coliban Water respectively. The maximum capacity of the outlet for releasing water downstream is approximately 1,600 ML/d.

Source: Department of Energy, Environment and Climate Action, *Operating and infrastructure options for increasing flood mitigation at Lake Eppalock: Technical assessment report*, November 2023, p. iv.

A key concern of stakeholders, particularly in Northern Victoria, was the impact of Lake Eppalock on flooding in the surrounding areas. Many residents who provided evidence believed that water storage at the site was a significant contributor to the degree of flooding experienced. Many expressed a belief that water releases should have occurred prior to the rain event and that the site should have capacity to increase the amount of water released.

Figure 5.15 below shows the Lake Eppalock catchment area.

Figure 5.15 Lake Eppalock

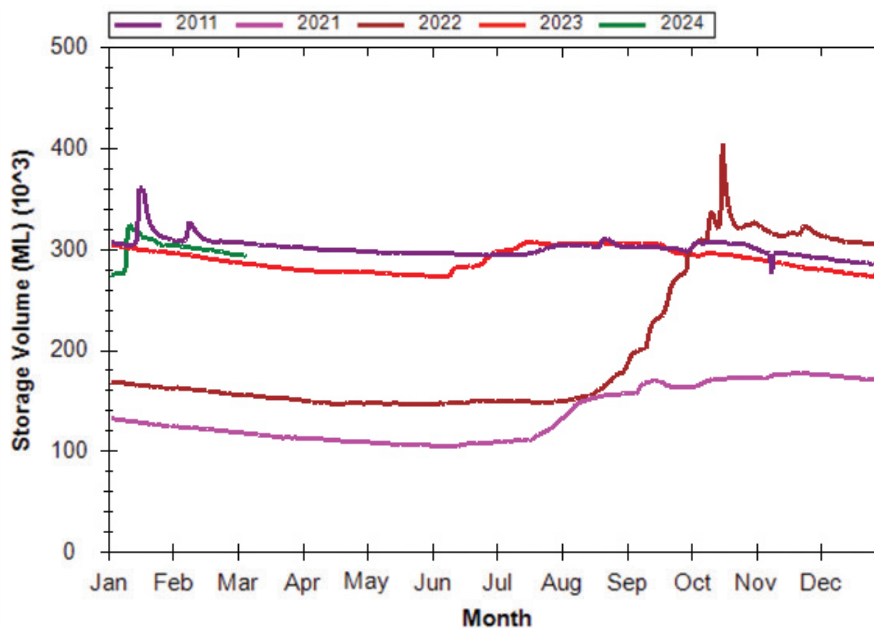


Source: Goulburn-Murray Water, *Lake Eppalock*, 2024, <<https://www.g-mwater.com.au/water-operations/storages/campaspe/lakeeppalock>> accessed 4 March 2024.

Figure 5.16 below shows water storage volumes at Lake Eppalock in 2011, and between 2020 and March 2024. It shows that water storage during the October 2022 flood event was the site’s highest recorded period, nearly 100 ml (10³) more than during the peak of 2011 (when another significant flooding event occurred in the area).⁹³

93 Goulburn-Murray Water, Historical water levels for Eppalock, 2024, <<https://www.g-mwater.com.au/storages/history.asp?ContainerID=lakeeppalock>> accessed 4 March 2024.

Figure 5.16 Water Storage Volume at Lake Eppalock, 2011 and 2021 to March 2024



Source: Goulburn-Murray Water, *Historical water levels for Eppalock, 2024*, <<https://www.g-mwater.com.au/storages/history.asp?ContainerID=lakeeppalock>> accessed 4 March 2024.

Lake Eppalock is a fixed crest spillway meaning that Goulburn-Murray Water is unable to release more water than the outlet valve's capacity of 1,600 ML/d. During spills, the downstream flow is determined by how high the storage levels exceed full supply levels. On its website, Goulburn-Murray Water notes that its 'storages are not specifically for flood mitigation' but 'Lake Eppalock does provide some flood mitigation by storing water above the supply level and water passing over the spillway'.⁹⁴

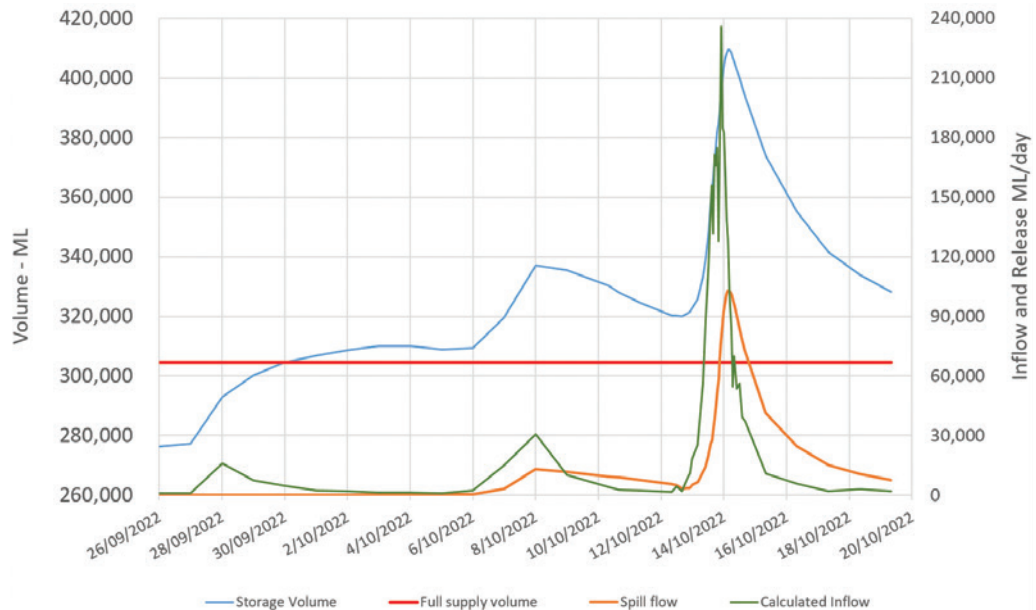
Many stakeholders were concerned about Eppalock's capacity to release excess water during a heavy rain forecast. They believed that the insufficient release of water was a significant contributor to the severity of the flooding in Rochester and surrounding areas.⁹⁵

During the October 2022 flood event, inflows to Lake Eppalock reached a historical high on 13 October to 235,000 ML/d, resulting in storage reaching a capacity of 134%—approximately 3 m above full supply level. This was despite maximum valve pre-releases (around 1,800 ML/d) commencing from 3 October in anticipation of heavy rainfall. As a result, the second spillway was engaged and flows over the spillway peaked at 103,000 ML/d on 14 October (another historical high). Figure 5.17 shows the volume at Lake Eppalock between 26 September to 20 October 2022.

⁹⁴ Goulburn-Murray Water, *Managing Water Storages: Lake Eppalock*, <<https://www.g-mwater.com.au/water-operations/managing-water-storages>> accessed 5 March 2024.

⁹⁵ For example, see: Wayne Park, *Submission 5*; Maree Traill, *Submission 10*; Xavier Kellow, *Submission 21*; Elaine Breen, *Submission 26*.

Figure 5.17 Water storage volume at Lake Eppalock, 26 September to 20 October 2022



Source: Goulburn-Murray Water, *Floods in Focus: Campaspe River System*, <<https://www.g-mwater.com.au/customer-services-resources/flood-recovery/floods-in-focus-campaspe-river-system>> accessed 5 March 2024.

Kevin Long

Eppalock sat at 110 per cent full when we had another 120 millimetres over two days. Two 65-millimetre rain days, it was, nothing out of the ordinary as far as a single-day rain event goes, but that meant that 450,000 megalitres came to Eppalock in the next 24 hours. Eppalock stored 100,000 megalitres while it rose to 136 per cent full, and it passed 150,000 megalitres. It is quite likely that we could have 200 millimetres of rain in two days. We had it back in 2011 in the Bridgewater area in the Loddon Valley. We could have it here in this valley too. If we did get a 200-millimetre rain event in two days, you have got 600,000 megalitres coming through Eppalock. To pass that sort of rain event through safely, you have to have at least 200,000 megalitres of airspace. You have to start releasing water three days before, at 50,000 megalitres a day, so that you gain another 100,000 megalitres. You keep releasing 50,000 megalitres. So over a 10- to 11-day period you can pass your 500,000 to 600,000 megalitres of rain with only 50,000 megalitres.

Source: Kevin Long, public hearing, Rochester, 23 August 2023, *Transcript of evidence*, p. 80.

A common recommendation from stakeholders concerned about Lake Eppalock was to improve water releases, including the maximum daily output capacity.⁹⁶ At a public hearing, Sharon Williams from the Lake Eppalock Working Group and Flood Mitigation Subcommittee explained:

during a high-risk flood period the outlet pipe of Eppalock – 1600 megalitres per day is the maximum output capacity through the current release valve – should be fully opened and left on while the reservoir remains above 90 per cent full, allowing 10 per cent air space. It takes 20 days to release 30,000 megalitres because the total capacity of the lake is 300,000. This can now happen, with an amendment to the water release policy.⁹⁷

Sharon Williams further canvassed long-term options for improving Eppalock's capacity to release water as part of potential flood mitigation activities, stating:

Long-term options such as a permanent infrastructure at Eppalock to allow a much larger volume of water, up to 20,000 megalitres a day, to be released – in the event of a significant weather event or increasing water capacity of the lake, as examples. A new set of operating rules to minimise catastrophic flooding below Eppalock should be mandated, with the aim to never again send uncontrolled flood flows over the emergency spillway – safe and profitable reservoir management that enhances the lifestyle of all floodplain residents – not just maximising water storage and maximising flood damage for the benefit of the irrigation industry and maximising environmental water storage.⁹⁸

A number of stakeholders expressed the view that there was a need to allow increased water releases at Eppalock prior to potentially heavy rainfall. Paul Poort, a resident in Rochester, told the Committee:

We need a better water management system for Eppalock. The system is out of date, and gates or some other system need to be installed to allow more water release when we know that there is a rain event coming and that the levels in Eppalock are too high.⁹⁹

[W]e own the water. If we get a 20 per cent allocation, we get a bill for 100 per cent. We pay whether we get it or not. So letting our water go – like I said, we can manage a drought; we cannot manage a flood. I do not know if they have got to look at making 90 per cent or 85 per cent the new 100 per cent full and letting it go, or if they have got to look at carryover laws that if you do not use it, that is your environmental flow – let it go. Do not try and carry it over, because the airspace is not there to put it next year.

David Christie, Flood Mitigation Subcommittee, Community Recovery Committee, public hearing, Rochester, 23 August 2023, *Transcript of evidence*, p. 24.

⁹⁶ For example, see: Name Withheld, *Submission 44*; Royden and Janet Webb, *Submission 52*; Fay Wolfe, *Submission 58*.

⁹⁷ Sharon Williams, Lake Eppalock Working Group and Flood Mitigation Subcommittee, public hearing, Rochester, 23 August 2023, *Transcript of evidence*, p. 22.

⁹⁸ Ibid.

⁹⁹ Paul Poort, public hearing, Rochester, 23 August 2023, *Transcript of evidence*, p. 71.

Royden Webb noted that Eppalock’s original purpose was irrigation, but it is now used for urban supply. Royden contended that ‘if you can change the use of that water, surely you can change the operation of the dam’. He described how this could occur:

There is a pipeline now from the Waranga channel at Colbinabbin up to Eppalock. It was mentioned last night that you could use that pipeline to put excess water back into the channel. You could fill Greens Lake and Lake Cooper and use that irrigation water along the way rather than let it go to wherever it is going to go and do damage.¹⁰⁰

Simon Pearson suggested a downstream dam or reservoir for additional water storage but noted that it would ‘also have to be able to release water when necessary’.¹⁰¹

Several stakeholders believed that larger water releases from Eppalock would have reduced the flood peak in October 2022. By reducing the flood peak, even by centimetres, these stakeholders contended properties could have avoided flooding. Anne Lawford argued that:

A flood peak 30 cm lower would have prevented water entering my property. I accept that floods will always occur in Rochester, however I believe that flooding entering the vast majority of properties can be prevented ... I understand the original purpose of Lake Eppalock was for irrigation, and that its current infrastructure prevents large releases of water to control level. The management strategy must be reviewed to use the dam to manage the impacts of drought in low rainfall years and mitigate flooding in above average rainfall years.¹⁰²

The Committee notes that the November 2023 technical assessment report into *Operating and infrastructure options for increasing flood mitigation at Lake Eppalock* found that:

Adopting a target storage of 70% or 90% below FSL using the existing infrastructure at Lake Eppalock would not have significantly changed the outcomes observed in January 2011 and October 2022.¹⁰³

The report explained that adopting new target storage percentages would not have feasibly changed the outcome in October 2022 because:

inflows in the months prior to the floods were such that the storage could not have been held at a defined target before either event. Likewise, releasing water from storage in response to rainfall forecasts will not be a feasible way of significantly reducing flood frequencies downstream of Lake Eppalock for the foreseeable future because of forecast uncertainties.¹⁰⁴

¹⁰⁰ Royden Webb, public hearing, Rochester, 23 August 2023, *Transcript of evidence*, p. 77.

¹⁰¹ Simon Pearson, *Submission 416*, p. 1.

¹⁰² Anne Lawford, *Submission 438*, p. 3.

¹⁰³ Department of Energy, Environment and Climate Action, *Operating and infrastructure options for increasing flood mitigation at Lake Eppalock: Technical assessment report*, November 2023, p. 70.

¹⁰⁴ *Ibid.*, p. ix.

Regarding increasing outlet capacity to 5000 ML/d, the technical assessment found that it would involve significant construction efforts, including:

- constructing a temporary cofferdam
- tunnelling below the embankment
- installing a large outlet conduit
- constructing an intake tower and valve house
- adding an approach channel to the lake bed.¹⁰⁵

By increasing the outlet capacity, the model simulations indicated that for floods with different annual exceedance probabilities (AEPs), the peak outflow from Lake Eppalock could be reduced by various percentages. For instance, with a 5% AEP, the peak outflow could see a reduction, contributing to lower downstream flood risks.¹⁰⁶

The assessment report acknowledged the potential benefits of increasing outlet capacity at Lake Eppalock for flood mitigation, such as facilitating a more controlled release of water. However, it also highlighted the need for further investigations to fully understand the implications of such changes. This includes evaluating the environmental impacts, the feasibility of the engineering works required, and the economic cost-benefit analysis of implementing the increased outlet capacity. The findings suggest that while there may be benefits to increasing the outlet capacity, a comprehensive assessment considering all relevant factors is necessary to make an informed decision.¹⁰⁷

In the Committee's view, given the genuine concerns about the management and operational capacity of Lake Eppalock there is a need to address and resolve these issues as soon as possible, before potential future flooding. The Committee believes there should be a thorough investigation into the feasibility of increasing the outlet capacity of Lake Eppalock. This investigation should include:

- a comprehensive cost-benefit analysis to ensure financial viability
- extensive stakeholder engagement
- rigorous environmental risk assessments.

The Committee's recommendations provide a roadmap for future actions that could significantly improve the management of Lake Eppalock, enhancing its capacity to mitigate flooding while ensuring the sustainable and equitable use of water resources. The implementation of these recommendations would require collaboration between government entities, local communities, and stakeholders, underpinned by a commitment to transparency, inclusivity, and environmental stewardship.

¹⁰⁵ Ibid., p. 79.

¹⁰⁶ Ibid.

¹⁰⁷ Ibid.

FINDING 25: There is strong local community sentiment that Lake Eppalock should remain at no more than 90% capacity at times of expected high rainfall.

RECOMMENDATION 33: That the Victorian Government further investigate options for increasing outlet capacity at Lake Eppalock. This investigation should involve:

- conducting a cost-benefit analysis to evaluate financial feasibility
- extensive stakeholder engagement to gather input from affected parties and communities
- examination of environmental effects
- environmental risk assessments to understand potential impacts on local ecosystems, wildlife and water quality
- reviewing water-sharing arrangements to ensure:
 - appropriate adjustments to maintain equitable water distribution and
 - compliance with legal and regulatory requirements.

5.5.2 Lake Eildon

Box 5.8 Lake Eildon

Lake Eildon is located in the upper catchment area of the Goulburn River, immediately below the junction with the Delatite River. Dams at Lake Eildon were constructed in the 1950s to provide water storage for irrigation for farmers along the Goulburn irrigation district. There is also a hydropower station at the lake.

Regarding water storage capacity, Lake Eildon:

- had a main embankment length of 1,085m and height of 84.5m
- water storage capacity of 3,334,158 ML
- 288.9m AHD full supply level.

The capacity of Lake Eildon allows for irrigation supplies to be provided over at least two drought seasons.

On its website, Goulburn-Murray Water noted that ‘Although not intended as a flood control storage, Lake Eildon does have considerable potential to mitigate floods in the Goulburn River, downstream of the storage.’

Source: Goulburn-Murray Water, *Lake Eildon*, <<https://www.g-mwater.com.au/water-operations/storages/goulburn/lakeeildon>> accessed 6 March 2024.

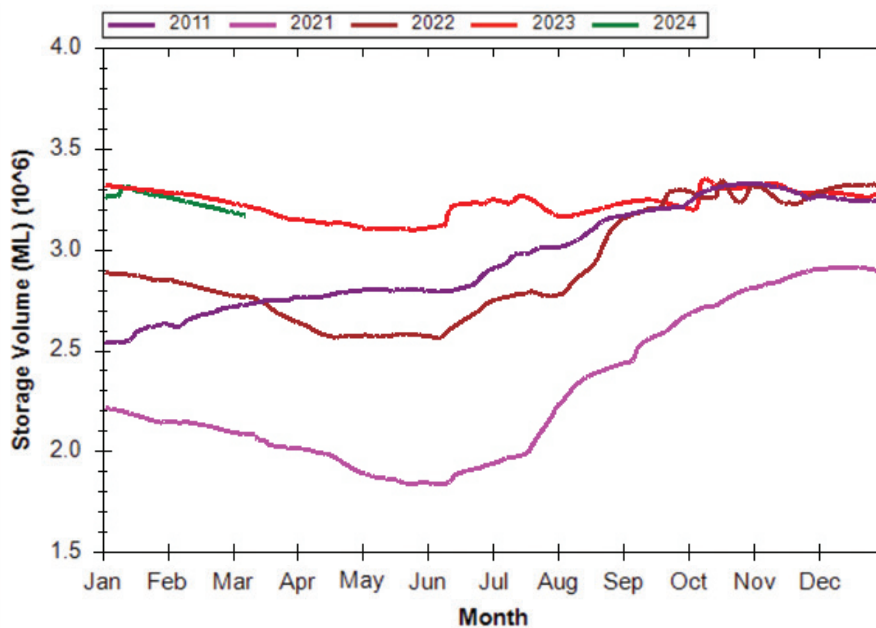
Like Lake Eppalock, the Committee received evidence expressing concern about the impact of water releases from Lake Eildon on flooding in the area. Stakeholders noted that immediately prior to the flooding water, storages were near capacity. Many believed that subsequent heavy rainfall coupled with inadequate, or delayed, releases contributed to the severity of flooding in the Goulburn area.¹⁰⁸ Seymour was one of several towns that was significantly impacted by tributaries downstream of Lake Eildon.

In its submission, the Victorian Government explained that:

Lake Eildon releases were increasing as flood levels at Seymour peaked and flows from the downstream tributaries were decreasing. This resulted in the peak levels experienced at Seymour falling before the releases from Lake Eildon arrived. Inflows to Lake Eildon peaked at 145,000 ML/day while releases were able to be maintained at a peak flow of 38,000 ML/day. This shows the significance of the flows from unregulated tributaries downstream of Eildon on peak flood levels at Seymour.

The flood levels at Seymour dropped to below minor flood level at 14:00 on 23 November 2022.¹⁰⁹

Figure 5.18 Water Storage Volume at Lake Eildon, 2011 and 2021 to March 2024



Source: Goulburn-Murray Water, *Historical water levels for Eildon*, 2024, <<https://www.g-mwater.com.au/storages/history.asp?ContainerID=lakeeildon>> accessed 6 March 2024.

During the October 2022 flood event, inflows to Lake Eildon peaked at 145,000 ML/d while releases maintained a peak of 38,000 ML/d. Goulburn-Murray Water explained that its 'ability to minimise releases to this extent was a result of utilising the available

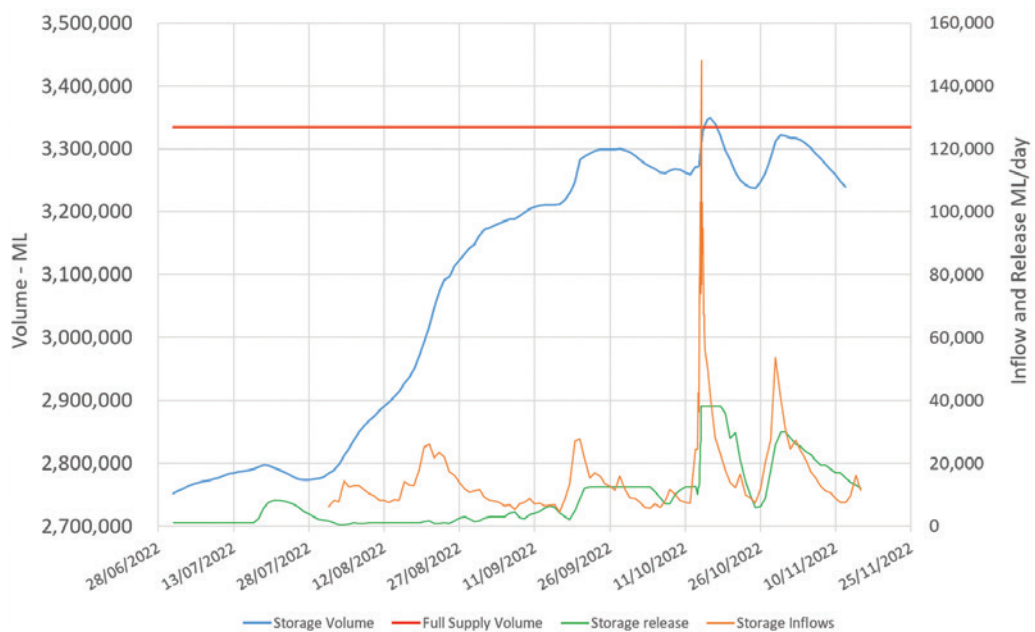
¹⁰⁸ For example, see: Rodney Ridd, *Submission 61*; Name Withheld, *Submission 82*; Name Withheld, *Submission 190*.

¹⁰⁹ Victorian Government, *Submission 295*, p. 77.

airspace that had been maintained through strategic pre-releases'. Pre-releases commenced in August 2022.¹¹⁰

By 13 October, inflows into Lake Eildon were increasing, resulting in increased releases using the spillway gates. To manage increasing inflows, releases were increased from 2,500 ML/hour up to 38,000 ML/d and 'were maintained while the storage level rose above the full supply level'. Inflows were above 38,000 ML/d until 17 October.¹¹¹ Figure 5.19 below shows Lake Eildon storage volume, inflows and releases between 28 June to 25 November 2022.

Figure 5.19 Lake Eildon storage volume, inflows and releases, 28 June to 25 November 2022



Source: Goulburn-Murray Water, *Floods in Focus: Goulburn River system*, <<https://www.g-mwater.com.au/customer-services-resources/flood-advice/floods-in-focus-goulburn-river-system>> accessed 6 March 2024.

Stakeholders from Northern Victoria attributed some blame to the water releases from Lake Eildon for the floods their towns experienced. However, the extent of the impact is unknown. Goulburn-Murray water has acknowledged the risk of flooding wrought by large inflows into the water storage, stating on its website there is a 'risk of flood downstream'.⁶⁹

In its submission, Mitchell Shire Council contended that 'large inflows into Goulburn River downstream of Eildon resulted in major flooding on 13 and 14 October'. It further noted that the 'subsequent releases from Lake Eildon then maintained moderate flooding for a number of weeks following the initial devastation'.¹¹² The Council's

¹¹⁰ Goulburn-Murray Water, *Floods in Focus: Goulburn River system*, <<https://www.g-mwater.com.au/customer-services-resources/flood-advice/floods-in-focus-goulburn-river-system>> accessed 6 March 2024.

¹¹¹ Ibid.

¹¹² Mitchell Shire Council, *Submission 521*, pp. 6-7.

submission described community concern about Lake Eildon's ineffectiveness as a flood mitigation infrastructure and recommended that the site's capacity be reduced:

Both prior to and after the October 2022 floods, there was community sentiment that Lake Eildon was not being effectively used to mitigate flood. It is understood that Lake Eildon is primarily an irrigation dam, however further consideration should be given for its flood mitigation capabilities in high flood risk seasons.

The Minister should recommend, in accordance with s 159E of the *Water Act 1989* (Vic) that the Governor direct the relevant water corporation, in this situation Goulburn Murray Water, that Lake Eildon be held below 95% capacity for the remainder of 2023, or until relevant Parliamentary Inquiries are complete.¹¹³

Derrick Meggitt

When lake levels reached 95 per cent on 1 September, we started preparing for flooding. It was our view the flooding was almost certain; it was just a question of how bad it would be. As it turned out, it was very bad. In the 48 hours of 13 and 14 October, about 100 millimetres of rain fell on the farm. The catchment was sodden, the tributaries above Lake Eildon were already at high levels and the lake was at 98 per cent. But by late afternoon on 13 October, releases from the lake went up through minor to moderate and finally to major, ending up at the release of 30,000 megalitres per day.

Although the rate of increased release was savage, we worked through the night and by early morning on 14 October everything was relatively settled. We had a controlled flow of water passing through the farms, and our flood infrastructure was sound. Everything held for about 72 hours until one of our control structures failed at our Walnut Island site. At this point, the water surged through one of our intake pipes and essentially drowned the farm.

Source: Derrick Meggitt, Director, Goulburn River Trout Pty Ltd, public hearing, Seymour, 14 September 2023, *Transcript of evidence*, p. 22.

The Committee received multiple submissions from stakeholders in the Goulburn area which described the impact of Lake Eildon releases on flooding in the area. A common theme among these submissions is that the very high capacity of the dam at the time of the flood event, which did not leave sufficient remaining capacity to handle large inflows, led to significant releases, in turn contributing to local flooding.¹¹⁴ Marcus Fletcher described the impact of allowing Lake Eildon to reach near 100% capacity, stating:

This means that if inflows in spring reach flood like proportions, as had been predicted leading up to October 2022, the required immediate discharge from Lake Eildon causes an immediate flood. Despite repeated warnings from the farming community during

¹¹³ Ibid., pp. 8–9.

¹¹⁴ Name Withheld, *Submission 640*, p. 7.

the months leading up to October 2022 that devastating floods were inevitable unless substantial winter water were released during winter to create a flood buffer, Goulburn Murray Water went into October 2022 with Lake Eildon levels approaching 100%.¹¹⁵

In its submission, HG Turf Group Pty Ltd described the events surrounding Lake Eildon's impact on flooding in the area:

By the end of September 2022, the Eildon dam was at 98.9% capacity and Goulburn Murray Water's (GMW) aim was to increase it to 100% by October 1, 2022.

Throughout this period, we were given no warning when releases from Eildon were to take place and by how much. On October 13th an increase from 10,000 megalitres per day to 38,000 megalitres per day occurred during the night with no warning given. It takes approximately 4 to 8 hours for the water to reach our farm from the lake depending on outflows, so we were caught off guard by this significant increase that occurred.

We did all we could in preparation for flooding as it seemed likely considering the dam level and the rain that was forecast in coming days and weeks. There was little hope due to the large outflows occurring with no warning. As a result, the river broke its banks and flooded our farm.¹¹⁶

HG Turf Group outlined concerns about Lake Eildon water storage policies and management, noting that at the time of providing its submission the storage was at 93% capacity. Their additional concerns included:

- maintaining 'dangerously high levels' when approaching flood risk periods, particularly in periods where there has been above average rainfall
- fluctuating seasonal demands for water needs to be considered and the site's carryover water policy to be reviewed
- under the Water Act, Goulburn-Murray Water can make releases without an emergency order being issued, but early warning systems are 'imperative'
- operational procedures need to be better focused on spill management by 'lowering Eildon's infill curve to reduce the full supply level'.¹¹⁷

¹¹⁵ Marcus Fletcher, *Submission 553*, p. 1.

¹¹⁶ HG Turf Group Pty Ltd, *Submission 507*, p. 2.

¹¹⁷ *Ibid.*

Cr John Walsh, Mayor, Murrindindi Shire Council

The necessity of releasing water in pulses ignored the downstream consequences of such actions, from erosion to inundation. Sudden surcharges along a watercourse will always result in bank erosion, with sediment, vegetation and other debris being caught up in the flows, which only compounds the events. The major example of that in our case was the heritage bridge at Acheron – the Breakaway Bridge has been severely damaged and will probably take time and cost millions to repair. Meanwhile the community is split in two.

Finally, the bank erosion has reduced the level at which releases and river flows will cause minor flooding, as demonstrated last January when recently replanted pastures were again inundated and farmers lost money through that despite releases being then below what was previously the normal flood levels.

Source: Cr John Walsh, Mayor, Murrindindi Shire Council, public hearing, Seymour, 14 September 2023, *Transcript of evidence*, p. 8.

Many stakeholders questioned the necessity of holding Lake Eildon at almost full supply prior to the flooding in October 2022. Some stakeholders felt the flooding was avoidable if timely releases occurred. Catherine Jessop believed that:

This was avoidable, particularly the traumatic midnight release of water and the duration of the floods. If I was preparing for potential flooding due to the volume of the Lake then the powers that be should have been working to prevent it. If the decision wasn't made early to move the cows and calves, most likely all of them (definitely the calves) would have perished. This property generally has an easy carrying capacity of 100 cows with calves throughout spring, summer and going into autumn with very little supplementing. It was reduced to two bulls and one horse for months.¹¹⁸

Several recommendations were made to the Committee about improving the operation of Lake Eildon. Recommendations included:

- reviewing operational rules for Lake Eildon to ensure they are appropriately adaptive to wet or dry seasons, including restricting full supply level (with suggestions ranging from 90–95% capacity)¹¹⁹
- adopting a conservative infill curve to ensure Lake Eildon is not at full supply in September and October when annual rainfalls are more likely to peak¹²⁰
- abandoning the carryover policy.¹²¹

¹¹⁸ Catherine Jessop, *Submission 571*, p. 3.

¹¹⁹ See: Jan Beer, *Submission 303*, p. 8; Peter Weeks, *Submission 610*, p. 4.

¹²⁰ Jan Beer, *Submission 303*, p. 8.

¹²¹ *Ibid.*

In addition to Lake Eildon being at near capacity coming into the October 2022 flood event (a part of the operational policies of the site), several stakeholders were also concerned about the lack of sufficient warning given when outflow changed. On 14 October, the outflow from Lake Eildon increased from under 'Minor Flood Level' to just under 'Major Flood Level' at 38,000 ML/d. The Committee was informed that residents did not receive adequate warning and were unable to prepare for the implications of increased outflow.

Peter Weeks, a resident of the Goulburn River area, explained:

On the morning of Friday 14th October, I awoke to learn that overnight the outflow from Lake Eildon had increased significantly from just under Minor Flood Level to just under Major Flood Level at 38,000 ML/day. I was very upset that we had no warning that this was to occur, especially after having made contact with GMW at 5pm the night before. I felt that we had let the community down as we hadn't warned them. The Bureau's flood warnings don't trigger Emergency Alerts.

However, I did expect outflows from Lake Eildon to eventually increase, this was based on my previous experience of floods over the years, as did many long-time locals. On Thursday 13th October the inflow to Lake Eildon from GMW figures was consistently above 100,000 ML/day for an extended period prior to starting to increase the outflow from 11pm to 38,000 ML/day, the inflow reached a peak of 145,000 ML/day early on Friday 14th October.

As the increased outflow occurred during the night starting at 11pm there was little or no time for people to react as floodwaters were already at their doorstep in the morning with no prior alert. Downstream of Seymour flood water tends to travel much slower as the lay of the land levels out.

The Alexandra SES performed 7 water rescues by boat saving the lives of 11 people stranded by the floodwater unaware that it had risen rapidly during the night.¹²²

The adequacy of emergency warning systems is discussed further in Chapter 6.

The actual impact of outflows from Lake Eildon on flooding in October 2022 has been questioned. A representative from Goulburn-Murray Water was quoted in a media article stating that only a third of the water that flowed into Lake Eildon was released downstream and the rest was captured in the lake.¹²³ Rory Nathan, professor of hydrology and water resources at the University of Melbourne, was quoted in the same article saying:

the dam releases contributed a "minor part" of the Seymour and Shepparton floods, the principal cause was rainfall below the dam. "Had Eildon not been there, the flood would have been a heck of a lot worse,"¹²⁴

¹²² Peter Weeks, *Submission 610*, p. 2.

¹²³ Chip Le Grand, 'Climate risk for dams revealed as Eildon struggles to hold back floods', *The Age*, 15 November 2022, <<https://www.theage.com.au/politics/victoria/climate-risk-for-dams-revealed-as-eildon-struggles-to-hold-back-floods-20221110-p5bx9p.html>> accessed 21 April 2023.

¹²⁴ *Ibid.*

A technical assessment into *Operating options for increasing flood mitigation at Lake Eildon*, published in March 2024, identified two options to 'increase flood mitigation'. It also considered four other options but determined these were 'not robust ways to increase' mitigation. The possible options to increase mitigation were:

Option 1: Change target filling curves so that Lake Eildon is full later in the year (for example December/January instead of October/November) and under less conservative inflow statistics (for example, reaching full supply in 85 years out of a hundred instead of 95 years).

Option 2: Reduce target storage levels by holding the lake, where possible, at a maximum volume of 78%, 85%, 90%, 95% of Full Supply Level (FSL) all year round.¹²⁵

While these two options have the potential to increase flood mitigation, the technical assessment ultimately found that 'the cost of offsetting supply reliability impacts outweighed the avoided flood damages'.¹²⁶ Therefore, the report concluded that none of the options considered were viable.

The report explained its determination further stating that:

The main reason for the low benefit to cost ratio is that the flood mitigation benefits provided by the changes to target filling curve (option 1) and reduced target storage (option 2) diminish the further downstream the flood frequencies are assessed i.e. the degree of difference between the frequency estimates reduce by Molesworth and the difference is minor at Seymour.¹²⁷

Lake Eildon serves as pivotal infrastructure for irrigation and hydropower but also plays a significant, though unintended, role in flood management for the Goulburn River area. Despite its primary function as an irrigation reservoir, Lake Eildon has inadvertently been involved in flood mitigation. Stakeholders' concerns about the management of Lake Eildon's water storage levels, particularly during high-risk flooding periods, underscore the challenges of balancing water resource management with flood risk mitigation.

The issues arising from the 2022 flooding, where strategic pre-releases might have mitigated the severity, reveal the complex interdependencies between operational policies, weather predictions, and emergency responses. It is clear from the evidence presented that better management practices, including the adjustment of storage levels and improved warning systems, are needed to minimize future flood risks. The technical assessments and submissions from various stakeholders emphasise the necessity for a more adaptable approach to managing Lake Eildon's capacity to both support agricultural needs and reduce flood risks effectively.

¹²⁵ Department of Energy, Environment and Climate Action, *Lake Eildon operating arrangements assessment*, March 2024, <<https://www.water.vic.gov.au/our-programs/floodplain-management/lake-eildon-operating-arrangements-assessment>> accessed 23 April 2024.

¹²⁶ Department of Energy, Environment and Climate Action, *Operating options for increasing flood mitigation at Lake Eildon: Technical assessment report*, March 2024, p. 178.

¹²⁷ Ibid.

FINDING 26: Around the 2022 flood event, inflows to Lake Eildon were significantly higher than releases. While the releases from Lake Eildon contributed to flooding immediately downstream of the storage, the timing of these releases reduced the severity of the flood peak further downstream including at Seymour and Shepparton.

5.5.3 Reviewing operational rules for large dams

Reflecting on the role of Lake Eppalock and Lake Eildon, stakeholders called for the Victorian Government to review operating requirements for large water storage facilities.

Murrindindi Shire Council's submission advocated for a review of operating rules for large dams to improve their flood mitigation capability:

The State Government should review the operating rules for large dams and the water storage policy, so that dams are managed to allow for flood retention mitigation during periods of high rainfall and runoff, in order to protect the vulnerable downstream urban and rural communities.¹²⁸

This suggestion was echoed by several other stakeholders who also contended that had water levels at large dams been better managed prior to the October 2022 flood event, the releases would not have contributed to the severity of flooding in nearby towns.¹²⁹

The Committee shares the concerns of stakeholders about the contributory impact water releases from large dams had in October 2022. The Committee acknowledges that current water release policies are drafted to support the purpose of dams for irrigation and water supply. However, it believes that arrangements need to ensure they balance operational requirements and flood mitigation during heavy rainfall events.

RECOMMENDATION 34: That the Victorian Government ensure that, for future events that are expected to replicate high storage and high rainfall conditions, new temporary operating rules for water storage and release are developed. These new rules must take account of the interest of those who are affected by Eildon and Eppalock's storages including downstream landholders and water entitlement holders.

¹²⁸ Murrindindi Shire Council, *Submission 703*, p. 6.

¹²⁹ For example, see: Central Murray Environmental Floodplains Group Inc, *Submission 740*; Dianne Peace, *Submission 671*; Steven Trevakis, *Submission 41*.

5.6 Culverts

The Committee also received some evidence on the use of culverts in Victoria's flood mitigation infrastructure network. Culverts are structures which channel water past an obstacle or a subterranean waterway.

Figure 5.20 Culverts along the Murray Valley highway



Source: Mikaela Ortolan, 'Farmers call for better road drainage to reduce flood damage after crops lost', *ABC News*, 21 March 2023, <<https://www.abc.net.au/news/2023-03-21/flood-damage-victoria-farmers-want-culverts-managed/102109698>> accessed 21 March 2024.

Poorly managed culverts can contribute to flooding. For example, blockages in the structure of culverts that affect their capacity for drainage can force water to flood roads and other areas. Stakeholders to the Inquiry called for:

1. better maintenance of existing culverts
2. provision of more culverts to assist with drainage during heavy rainfall.

A variety of stakeholders whose towns experienced flooding in October 2022 noted the need for better maintenance of existing culverts, and the effect it can have on increasing water levels or inadequately draining water.¹³⁰

Culverts can play a critical role in flood-prone areas, and it is necessary to ensure there is continuous assessment and adaptation of the infrastructure to meet the challenges of future flood events.

The Committee heard concerns that poor maintenance of culverts meant they did not provide sufficient flood protection. In its submission, Swan Hill Rural City Council explained that:

[T]here has been concerns raised that various water courses and floodways have been poorly maintained and/or blocked culverts across the local and arterial road network and crown land, contributing to the severity of the flood event. Specifically, the Pental Island floodway is congested, potentially blocked culverts under the Murray Valley highway between Swan Hill and Robinvale and various water courses through the Nyah State Forest full of vegetation and branches impacting the effectiveness of the system.¹³¹

¹³⁰ For example, see: Sandra Foweraker, *Submission 604*; Swan Hill Rural City Council, *Submission 642*.

¹³¹ Swan Hill Rural City Council, *Submission 642*, p. 14.

Box 5.9 Culverts along the Pyrenees Highway

The installation of two large culverts under the Pyrenees Highway was part of a broader strategy to manage and mitigate flood waters in the region. These culverts were designed to allow water to pass under the highway, thereby reducing the risk of water backing up and flooding residential areas and farmland.

Despite the installation of these culverts, concerns remained within the community regarding their adequacy and long-term effectiveness in managing significant flood events. The community felt that existing culverts might not be sufficient, particularly in the face of extreme weather conditions or increased water flow from upstream sources.

In October 2022, flooding along the Pyrenees Highway was influenced by two primary flood types: riverine flooding and overland flow. The mitigation works in the area aimed to manage overland flow by holding water behind the highway. However, there was concern that if rainfall in the area was greater there was a considerable risk of road flooding and that the culverts were not sufficient to mitigate against more substantial flooding.

In response to these concerns, there were calls from the community for a comprehensive review of the capacity and effectiveness of culverts. An assessment could consider whether the current infrastructure is sufficient or if there is a need to increase the number of culverts or enhance the existing ones to provide better protection against future floods.

Note: Based on information from stakeholders, for example: Judi McKail, public hearing, Rochester, 23 August 2023, *Transcript of evidence*; Greg Corcoran, public hearing, Rochester, 23 August 2023, *Transcript of evidence*; Camille White, Floodplain Manager, North Central Catchment Management Authority, public hearing, Melbourne, 25 October 2023, *Transcript of evidence*.

Source: Legislative Council Environment and Planning Committee.

Some stakeholders advocated for ongoing review of culverts across Victoria, focusing on areas at high risk of flooding, to ensure that continuous improvement is made.

Buloke Shire Council contended that the 'installation of new culverts to roads that experienced water over roads' would be a good example of a mitigation response focused on betterment or 'continuous improvement'.¹³²

¹³² Buloke Shire Council, *Submission 690*, p. 9.

Rural Councils Victoria echoed the need to construct new as well as expanding existing culverts to ‘ensure they are of the scale adequate to drain projected flood waters’. It stated:

This would help prevent water-penetration of road surfaces and sub-surfaces, thereby minimising any road damage and potentially preventing damage to other infrastructure such as homes, businesses and other buildings.¹³³

Opportunities to expand Victoria’s culvert network as part of a betterment approach to mitigation rebuild was noted by representatives from the Department of Justice and Community Safety. Kate Fitzgerald, Deputy Secretary of Emergency Management at the Department, told the Committee that:

The ability to go above that is where sort of betterment programs come in, but what we are working with – and we have done a lot of work throughout this emergency, and we obviously need to continue to do more – is to be able to qualify and quantify for councils what being able to restore to the predisaster functionality allows them to bring in in terms of modern technology in relation to culverts, depth of treatment of roads and so on, and so that allow them to do what we call a sort of ‘light betterment’ essentially before you sort of step into those major betterment projects where you may be, say, elevating a road asset or adding significant additional culverts or other sort of major betterment works.¹³⁴

A betterment approach to repairing flood mitigation infrastructure is discussed further in Section 5.8.2 below.

Culverts are an important component of flood mitigation. However, the success of the infrastructure in a flood event depends on proper maintenance, especially cleaning to prevent blockages. This is particularly important for culverts placed along important road networks. The Committee notes that during the October 2022 floods 8,400 km of arterial roads were closed due to inundation (representing approximately one-third of state-managed arterial roads). At a public hearing, the Department of Transport and Planning explained the significant consequence this has on Victoria’s supply chain:

these closures had significant impacts on key supply chains and the freight industry and the connection of communities, as was seen in Shepparton and Mooropna where the community was separated by floodwaters for several days.¹³⁵

The Department has responsibilities for drainage activities associated with culverts. Representatives advised the Committee that in late-October 2022 a \$165 million advance was supplied to support flood recovery. As such by November 2023 (when representatives gave evidence), the Department had undertaken 451 drainage

¹³³ Rural Councils Victoria, *Submission 599*, p. 7.

¹³⁴ Kate Fitzgerald, Deputy Secretary, Emergency Management, Department of Justice and Community Safety, public hearing, Melbourne, 12 October 2023, *Transcript of evidence*, p. 27.

¹³⁵ William Tieppo, Deputy Secretary, Network Design and Integration, Department of Transport and Planning, public hearing, Melbourne, 20 November 2023, *Transcript of evidence*, p. 40.

activities across 83 kilometres, including clearing blockages, drainage, culvert repairs and replacement; as well as myriad other road-related works.¹³⁶

The Department further advised that in relation to culverts on arterial roads '[n]ine times out of 10 those culverts are part of the drainage scheme that the councils need to operate and maintain', but that it worked to assist councils with that responsibility.¹³⁷

Culverts, when properly maintained, are crucial for channelling water past obstacles, thereby preventing floodwaters from inundating roads, farmlands and residential areas. However, there is notable concern that too many culverts are not being adequately maintained—evidenced in reports of culverts contributing to floodwaters in October 2022. The Committee believes there should be a review into existing culvert infrastructure, particularly in high-risk flood areas.

FINDING 27: There is notable community concern that the current maintenance of culverts is inadequate and eroding their capacity to provide flood mitigation during an event. In October 2022, there were several instances of blockages or other maintenance issues causing culverts to operate ineffectively.

FINDING 28: Improving the maintenance and implementation of culverts is a potential avenue for embedding a betterment approach to flood mitigation infrastructure updates.

RECOMMENDATION 35: That the Victorian Government ensure that the state's existing culvert infrastructure in high-risk flood areas is fit for purpose, and that the Government also consult with local councils and other relevant stakeholders and prioritise betterment in any upgrade works deemed necessary.

RECOMMENDATION 36: That the Victorian Government audit transport links in and out of disaster-prone areas.

5.7 Other flood mitigation infrastructure

Other types of mitigation infrastructure and tools were also raised in the context of the Inquiry, particularly the use of sandbagging.

Sandbagging is used during flood events to help residents and businesses protect their properties by reducing the amount of water which enters. Bags are placed over drainage holes, doorways and other entry points where possible.¹³⁸ During

¹³⁶ Ibid.

¹³⁷ Ibid., p. 49.

¹³⁸ Victorian State Emergency Service, *Sandbagging: Protecting your home*, <<https://www.ses.vic.gov.au/documents/8655930/8689153/sandbag+guide.pdf>> accessed 21 March 2024.

the October 2022 flood event, the Victorian State Emergency Service was primarily responsible for the distribution of sandbags to affected communities.

The Committee received evidence on the deployment of sandbags during the October 2022 flood event. This issue is discussed further in Chapter 7.

However, the primary focus of many stakeholders was on the need to improve permanent or large-scale mitigation options so that they are more effective in future flood events.

5.8 Effectiveness of Victoria's approach to flood mitigation

As well as issues with maintenance of mitigation infrastructure, stakeholders also raised some general concerns with the approach to flood mitigation in Victoria. In particular, two key areas were identified as areas for improvement:

- confusion around responsibility and management arrangements for infrastructure
- securing funding for rebuilds can be cumbersome and does not prioritise a betterment approach.

5.8.1 Clarity around managing mitigation infrastructure

Several stakeholders expressed concerns about the lack of clarity about who is responsible for managing mitigation infrastructure. As a result, infrastructure can be poorly managed or not utilised effectively during an event. In October 2022, community members indicated that there was a lack of clarity about who was responsible for managing mitigation infrastructure, making it difficult to determine where issues should be raised. This was echoed by local councils and other agencies involved in the flood response.¹³⁹

Floodplain management strategies acknowledge that a lot of mitigation infrastructure is not formally managed with an assumption of private management, and that this has led to some sites degrading and not providing adequate protection. For example, the Goulburn Broken Regional Floodplain Management Strategy 2018–2028 explains that:

Most flood mitigation infrastructure in Victoria is not being formally managed. If no current formal management arrangements are in place, it will be assumed that the infrastructure will be privately managed or not managed at all. A likely consequence of this is that the flood mitigation infrastructure will continue to deteriorate. This will impact on emergency management planning and on land-use planning.¹⁴⁰

Previous inquiries have also identified issues with clarity around roles and responsibilities for the infrastructure. In 2012, the Environment and Natural Resources

¹³⁹ For example: Merri-bek City Council, *Submission 623*.

¹⁴⁰ Goulburn Broken Catchment Management Authority, *Goulburn Broken Regional Floodplain Management Strategy 2018–2028*, p. 33.

Committee's (Parliament of Victoria) report into the *Inquiry into Flood Mitigation Infrastructure in Victoria* found 'there was considerable uncertainty about ownership and maintenance responsibilities' (particularly in relation to levees).¹⁴¹

In response to the 2012 report and other reports, the Victorian Government developed the Victorian Floodplain Management Strategy. One of the key objectives of the Strategy is to clarify ownership and maintenance arrangements. In its submission, the Government explained that the Strategy:

distinguishes between responsibilities and accountabilities to ensure transparency:

- 'responsibility' is about ownership of an endeavour
- 'accountability' is about being answerable for the outcome of those efforts.¹⁴²

At a public hearing, evidence from representatives of the Department of Energy, Environment and Climate Action was that the Strategy effectively documents roles and responsibilities. Speaking more broadly across flood management (not limited to mitigation infrastructure specifically), Andrew Fennessy, Deputy Secretary of Water and Catchments, stated the Strategy 'has been effective in documenting the roles, responsibilities and accountabilities for agencies'.¹⁴³

However, evidence to this Inquiry suggests there is still uncertainty. Stakeholders noted confusion and a lack of clarity regarding the roles and responsibilities of various government agencies and local organisations in flood response and mitigation. This includes who is responsible for initiating mitigation projects, funding them, and ensuring their maintenance and effectiveness over time.¹⁴⁴

I think for each of the parties that are involved, we need to understand the roles and responsibilities – so, who is in charge here? Who is actually making the decisions? Who is authorising the spending of funding to break a road or build a levee or all of those sorts of things? Because it just – it happens, it is quick; someone saying, 'Yeah, just do it,' but in the end that person maybe was not authorised to be able to make that decision. So then, now who is paying? So it is all that sort of stuff. When you are in the middle of it and it is in the middle of the night, quick decisions are made and then you come back weeks later and you go, 'Oh no, we probably shouldn't have done that, because that person' – it is understanding who is doing what and who is authorised to make decisions et cetera.

Wayne O'Toole, Chief Executive Officer, Buloke Shire Council, public hearing, Melbourne, 10 October 2023, *Transcript of evidence*, p. 15.

¹⁴¹ Victorian Government, *Submission 295*, p. 62. See: Parliament of Victoria, Environment and Natural Resources Committee, *Inquiry into Flood Mitigation Infrastructure in Victoria*, 2012.

¹⁴² Victorian Government, *Submission 295*, p. 58.

¹⁴³ Andrew Fennessy, *Transcript of evidence*, p. 3.

¹⁴⁴ For example, see: Merri-bek City Council, *Submission 623*, p. 7; Swan Hill Rural City Council, *Submission 642*, p. 12; Campaspe Shire Council, *Submission 650*, p. 7; Murray River Group of Councils, *Submission 747*, p. 17.

It is important there are clear governance arrangements for flood mitigation infrastructure to ensure effective management and maintenance. Without these, infrastructure can fall into disrepair and, as occurred in October 2022, this can limit capacity to provide the best possible mitigation. Furthermore, as communities rebuild from the floods it is important there is clear understanding about who is responsible for rebuilding damaged mitigation infrastructure and what supports are available to them. The Committee believes that the Government should revise its responsibility framework for flood mitigation infrastructure to ensure it is clear.

FINDING 29: Confusion about the ownership and maintenance of flood mitigation infrastructure has led to ineffective management and upkeep of these assets. The lack of formal or unclear management led some sites to deteriorate, making them ineffective in providing mitigation during the October 2022 flood event.

RECOMMENDATION 37: That the Victorian Government clarify responsibility for flood mitigation infrastructure, with clear accountability and transparency for who is responsible for each asset.

5.8.2 Funding infrastructure rebuilds

When communities and councils are trying to construct flood mitigation infrastructure, where there is a clear community benefit, the government needs to allow this construction to occur for the protection of our communities – instead of putting up blockers, delaying the process, and diverting valuable resources away from communities.

Gannawarra Shire Council, *Submission 637*, p. 31.

According to the Department of Energy, Environment and Climate Action, between 2010 and 2023, \$87 million was invested in locally led flood mitigation projects, with contributions from the Victorian Government (\$33.9 million), the Commonwealth government (\$28 million), and local sources (\$25.6 million). The Department explained that this funding supported the completion of 161 new flood studies, the implementation of 91 flood mitigation measures (including levee projects in Carisbrook and Rochester South), and the establishment of 65 flood warning projects.¹⁴⁵

The list of flood studies completed between 2016 and 2023 are available in Appendix D.

In Victoria, the disaster recovery funding arrangements are for rebuilding critical infrastructure following a disaster, including mitigation infrastructure. The Victorian and Australian Governments are jointly responsible for funding the Commonwealth-State Disaster Recovery Funding Arrangements (see Box 5.10 below).

¹⁴⁵ Andrew Fennessy, *Transcript of evidence*, pp. 2–3.

Box 5.10 Commonwealth-State Disaster Recovery Funding Arrangements

The 'Disaster Recovery Funding Arrangements' is a cost-sharing arrangement between the Australian and Victorian Governments to share the financial burden of responding to a natural disaster.

The funding arrangements are used to provide urgent financial assistance to disaster-affected communities, and can be delivered through a number of assistance measures such as:

- personal hardship and distress assistance
- counter-disaster operations
- concessional loans or interest subsidies for small businesses and primary producers
- loans and grants to voluntary non-profit organisations and individuals in need
- reconstruction of essential public assets
- community recovery funds
- clean-up and recovery grants.

Under the arrangement, the Victorian Government is responsible for activating assistance measures according to the four categories outlined under the initiative. Once a funding arrangement is activated, the Australian Government can reimburse up to 75% of the financial assistance provided.

The categories of assistance are:

1. **Category A:** assistance to individuals to alleviate personal hardship
2. **Category B:** assistance to the Victorian or local governments for the restoration of public assets and certain counter-disaster operations
3. **Category C:** assistance for severely affected communities, regions or sectors, including clean-up and recovery grants
4. **Category D:** exceptional circumstance assistance beyond Categories A, B or C.

Source: National Emergency Management Agency, *Disaster Recovery Funding Arrangements (DRFA)*, <<https://nema.gov.au/Disaster-Recovery-Funding-Arrangements-DRFA>> accessed 16 February 2024.

In its submission, the Victorian Government outlined the activations and support for the 2022 flood event. Relevant to infrastructure rebuilding, the Government said:

The DRFA was activated for 63 local government areas and one alpine resort in response to the Victorian 2022 Flood Event. Funding for eligible services and programs across all categories has been activated Extensive damage was also caused to local essential public assets. Council may claim eligible expenditure under the DRFA. Councils

submit claims providing evidence of damage and direct costs incurred as a result of an event, and are reimbursed for these expenses for eligible activities and expenses once claims are assessed. Advance payments have been provided to 12 councils to mitigate any cash flow issues and eligible claims will be offset against this as they are assessed and approved.¹⁴⁶

Under the Disaster Recovery Funding Arrangements, Category B assistance allows for financial assistance to restore essential public assets. 'Essential public assets' can include flood mitigation infrastructure, for example *Guideline 1 – An essential public asset* explicitly lists levees as an example of an acceptable essential public asset. The arrangements only allow for like-for-like restoration of essential public assets:

Essential public asset reconstruction

- 4.3.10. The reconstruction of an essential public asset must be based on the estimated reconstruction cost developed through market response or cost estimation. Further detail on this measure is outlined in clause 6 of these arrangements.
- 4.3.11. An essential public asset directly damaged by an eligible disaster, or a re-damaged essential public asset may be reconstructed to its pre-disaster function.¹⁴⁷

The efficacy of a 'like-for-like' approach to rebuilding mitigation infrastructure is discussed in the Section below.

Following the 2022 floods, many local government areas had extensive damage to mitigation and other critical infrastructure, such as roads, essential businesses, health services and flood prevention infrastructure. The Committee heard from local councils that current funding arrangements are inadequate.¹⁴⁸

Further, it heard that the administrative process for accessing funding for damaged mitigation assets was onerous and time-consuming, with a significant burden placed on local councils.¹⁴⁹ Council representatives explained that the complicated application process was burdensome, requiring extensive evidence and documentation. As a consequence, some councils have shifted funding from other projects into flood mitigation rebuilding because waiting for dedicated funding is time-consuming and complex, in some cases affecting the councils' capacity to fund business-as-usual activities.

Cr Dan Straub, Mayor of Loddon Shire Council, told the Committee that:

We have continued to face further issues with our recovery programs, making mention of the disaster recovery funding agreements between state and federal governments. The lack of trust in local government is slowing down the recovery process. We need the trust of the state and federal governments to let us get on with the job and get on with our

¹⁴⁶ Victorian Government, *Submission 295*, pp. 101-102.

¹⁴⁷ Department of Home Affairs, *Disaster Recovery Funding Arrangements*, 2018, p. 17.

¹⁴⁸ For example, see: Loddon Shire Council, *Submission 749*; Campaspe Shire Council, *Submission 650*.

¹⁴⁹ Pyrenees Shire Council, *Submission 660*.

core business of rebuilding and reconnecting our communities. The burden-of-evidence requirements are unrealistic and very problematic ... Other issues in our financial modelling indicate that Loddon's funding gap is more than one year's income from our rates and charges, which is unachievable for the rebuild. Because of the need for timely flood repairs and the bureaucratic application of the DRFA, or the disaster recovery funding arrangements, council has reallocated funds from Commonwealth local roads and community infrastructure programs to repair flood damage. Most of our councils utilise this funding to improve their services such as libraries, community centres and recreational assets, and in effect this means that Loddon residents and other municipalities will miss out on services and improvements that other municipalities enjoy because of the funding system failures in the response to the floods.¹⁵⁰

Evidence from local councils also suggested that the disaster recovery funding arrangements were problematic due to the dual audit system. Under the arrangements, councils are required to provide extensive evidence to the Victorian Government about damage. The Victorian government is in turn responsible for seeking reimbursement from the Commonwealth government. Lincoln Fitzgerald, Chief Executive Officer of Loddon Shire Council, explained:

The problem with this fund is that there is a dual audit. The state government do all the work in terms of assessing the applications we put forward, and usually they would bankroll the work. Then the second stage is the state have to recoup their share of the funding from the federal government. If they do not have sufficient evidence, the federal government will not reimburse the state. So of course the logical thing from a state government perspective is to put all that burden of evidence onto local government to say, 'Give us more and more evidence because we're worried we're not going to get reimbursed by the federal government.' Now, what that means is we are fumbling around trying to get so many records ... But it is just a bureaucratic nonsense, quite honestly, when we are just trying to do our job: rebuild roads that are clearly damaged by floods, connect our communities back in and get that stock to port or wherever it needs to be.¹⁵¹

Mitchell Shire Council noted that:

[it had] applied for DRFA funding during the 2022 flood event, over time, evidence requirements for this funding have shifted which has created additional pressure on recovery efforts. This has imposed an increased level of uncertainty surrounding the potential success of future or pending claims.¹⁵²

[T]he Disaster Recovery Funding Arrangements are time consuming, and impossible to recoup all costs, leaving already struggling, rate-capped Councils to find money from other areas of Council.

Grampians Municipal Emergency Management Enhancement Group, *Submission 529*, p. 3.

¹⁵⁰ Cr Dan Straub, Mayor, Loddon Shire Council, public hearing, Echuca, 24 August 2023, *Transcript of evidence*, pp. 6–7.

¹⁵¹ Lincoln Fitzgerald, Chief Executive, Loddon Shire Council, public hearing, Echuca, 24 August 2023, *Transcript of evidence*, p. 26.

¹⁵² Mitchell Shire Council, *Submission 521*, p. 14.

Further, there is some uncertainty if critical and immediate restoration works will be fully or partially reimbursed, leading to situations where local councils are progressing vital restoration without full understanding of how much will be received through the funding arrangements:

We have delivered \$2 million of works. By the end of the year we will have delivered \$4 million. We do not have confirmation that that money will be reimbursed. We will get some of it back, we know that, but we do not know how much – maybe 80 per cent, maybe 100, maybe 50. I am writing blank cheques. The next stage is the ‘restoration of essential public assets’ category, and we have about \$32 million remaining to claim in that. All of those applications have to be in by 30 June next year. We do those in packets of about \$500,000, because if we put that package in, they might question two or three of them because of evidence and so on. That means the whole package is held up.¹⁵³

This concern was echoed in a joint submission from the Murray River Group of Councils, all located in the Northern Victoria region. The submission stated:

Any claim which lacks supporting documentation is not cost shared by the Commonwealth meaning the State may not recover 50% of the cost. As a result of this the State is risk averse has excessively high evidence requirements beyond the capacity of small rural Councils to provide. The outcome of this is that some works will be unfairly deemed ineligible for funding and will be deemed ineligible.

Compounding this issue that rural Councils have the largest infrastructure burden and the lowest capacity to fund.¹⁵⁴

The submission further noted that the funding arrangements have a 2-year lifecycle and applications are up to \$500,000 per application. This makes it extremely difficult for local governments to procure the right amount of funding as multiple applications will be required to fully fund rebuild projects. For example:

For Loddon Shire to submit \$46 million in this way 92 claims will be required. If Loddon Shire submits 5 claims per month it will take over 18 months to submit the claims let alone have them assessed and undertake the works.¹⁵⁵

Furthermore, all works funded under the arrangements are required to be completed within two years, which is not always possible especially when local governments experience issues sourcing contractors.¹⁵⁶

The feedback from councils to the Committee clearly called for a more streamlined, efficient, and transparent disaster recovery funding process.¹⁵⁷ The process should enable local councils to focus on recovery and mitigation without being unduly burdened with administrative hurdles.

¹⁵³ Lincoln Fitzgerald, *Transcript of evidence*, p. 27.

¹⁵⁴ Murray River Group of Councils, *Submission 747*, p. 25.

¹⁵⁵ *Ibid.*

¹⁵⁶ *Ibid.*

¹⁵⁷ For example, Grampians Municipal Emergency Management Enhancement Group, *Submission 529*.

FINDING 30: The application process for funding under the Commonwealth-State Disaster Recovery Funding Arrangements poses a significant administrative challenge for local governments who bare the evidentiary burden. This is compounded by the broader difficulties of councils to sustain recovery efforts, rebuild mitigation infrastructure, and resume business-as-usual activities following a disaster.

RECOMMENDATION 38: That the Victorian Government work with the Commonwealth Government to ensure the Disaster Recovery Funding Arrangements are not unduly burdensome.

Transitioning from like-for-like to a betterment approach

If you go back again to the royal commission and the comment that the commissioner made there about doing the same thing over and over again, just doing it better is not going to get you an outcome. That is the same as building the same wooden bridge in the same place that has been burnt out three times. It is only going to get you burnt out a fourth time, I would have thought. So intuitively you would suggest that betterment is a much better process. But having said that, again there are lots of things that come into that. It is also about cost effect too. It is such a costly process. Someone has to balance that off.

Tony Pearce, Inspector-General, Emergency Management, public hearing, Melbourne, 25 October 2023, *Transcript of evidence*, p. 44.

The Committee heard from many stakeholders that change is required to the process of assessing the impacts of the 2022 floods on affected communities. For example, where infrastructure is damaged the process currently focuses on like-for-like replacement. That has proven to be inadequate to appropriately deal with escalating environmental challenges such as severe flooding. A significant number of stakeholders advocated for a 'betterment' approach, underpinned by strategic investment in enhancing the resilience and capability of infrastructure to withstand future flood events.¹⁵⁸

Cr Rob Amos, Mayor of Campaspe Shire Council, argued that current disaster funding arrangements are limited because funding conditions confine infrastructure restoration to meeting pre-flooding conditions. Cr Amos noted how ineffective this approach is:

The current funding arrangements only allow for like-for-like replacement on damaged critical infrastructure. This means that assets can only be restored to pre-flood condition, which has already shown to either fail or not be able to effectively withstand an event of the magnitude of the 2022 flood. A commitment by the state and federal governments to provide this betterment funding would be a strategic investment by the governments because assets would be better protected against damage from natural disasters into the future. This would also reduce the risk liability for councils by ensuring

¹⁵⁸ For example, see: Northern Victorian Emergency Management Cluster, *Submission 515*.

that assets are not repaired to pre-flood condition which may not be up to the current standards, which is a common thing when we touch an asset: 'Whoops, it needs to come up to standard.'¹⁵⁹

Similarly, Lincoln Fitzgerald, CEO of Loddon Shire Council, highlighted the futility of like-for-like rebuilding in 2011, 2018 and again in 2022. Mr Fitzgerald further stated that:

because betterment was not a part of the package, we are using our own funds and putting off the library upgrades and things like that. Instead of that we are putting culverts in. So there is an issue with betterment.

The other part of this is that there was actually a small betterment package announced last week of up to \$1 million for the most heavily impacted councils. Now, we have got about \$1.2 million worth of betterment projects identified. However, because of the funding guidelines, they are pushing more things into that betterment program, so it is going to be drastically underfunded.¹⁶⁰

Several stakeholders also noted the Australian and Victorian Governments' betterment funding for select council affected by flooding in 2022. In August 2023, both governments jointly announced the \$9.4 million Council Priority Betterment Program where fourteen of the 'most severely impacted councils' from the October 2022 floods would receive funding to improve infrastructure resilience of assets directly affected. The program was jointly funded by the Australian and Victorian Governments through the Commonwealth-State Disaster Recovery Funding Arrangements. Under the program, the following councils were eligible:

- Buloke
- Campaspe
- Central Goldfields
- Gannawarra
- Loddon
- Moira
- Murrindindi
- Benalla
- Bendigo
- Hepburn
- Mildura

¹⁵⁹ Cr Rob Amos, *Transcript of evidence*, p. 11.

¹⁶⁰ Lincoln Fitzgerald, *Transcript of evidence*, p. 28.

- Pyrenees
- Shepparton
- Strathbogie.¹⁶¹

At a public hearing, Hon Jaclyn Symes, Minister for Emergency Services, discussed the Council Priority Betterment Program, stating:

In relation to betterment, 14 of the most severely impacted councils are receiving money for those types of projects – resilience for essential public assets, like roads, bridges and footpaths that were damaged in the floods. We know that it is best to build back better. We know that that is something that we are having conversations with insurance companies about, because if we can make the state more resilient, we are not having to revisit and do the same thing again and again. So there is a program for betterment.¹⁶²

Stakeholders questioned whether such packages would be adequately funded to cope with the high level of need.¹⁶³

Many stakeholders were supportive of shifting funding arrangements from a focus on like-for-like to betterment. These stakeholders emphasised the current difficulties flood-risk communities are experiencing building truly resilient infrastructure and the consequences of poor mitigation infrastructure:

- Infrastructure and response failures: evidence shows a repeated failure of existing infrastructure to withstand flood events. This highlights the necessity for a betterment approach that not only strengthens infrastructure but also ensures more effective and timely response mechanisms in future events.
- Economic and social impacts: under a like-for-like rebuilding strategy there can be significant economic losses suffered by businesses, the displacement of families, and disruption to daily life. A betterment approach could mitigate these impacts by enhancing the resilience of community assets, thereby reducing the time and resources needed for recovery.
- Health and wellbeing concerns: flooding, or other natural disaster, can have profound effects on mental and physical health, with limited access to medical services and the psychological strain placed on residents. A shift towards betterment in rebuilding should include considerations for health services and support systems, ensuring that communities are better equipped to handle the aftermath of such disasters.

¹⁶¹ Hon Murray Watt and Hon Jaclyn Symes, *Priority betterment funding for flood-affected Victorian Councils*, media release, 17 August 2023, <<https://minister.homeaffairs.gov.au/MurrayWatt/Pages/priority-betterment-funding-flood-affected-victorian-councils-17082023.aspx>> accessed 16 February 2024.

¹⁶² Hon Jaclyn Symes, Minister for Emergency Services, public hearing, Melbourne, 6 December 2023, *Transcript of evidence*, p. 41.

¹⁶³ For example, see: Lincoln Fitzgerald, *Transcript of evidence*.

Emma Germano, President of the Victorian Farmers Federation, advocated for a betterment approach to funding disaster resilience, stating:

Betterment is not just about natural disasters, it is also about economic growth. It is about making our regional communities more liveable and putting that infrastructure in place. We have not even repaired the damage that was done, let alone considered what betterment looks like. We also know that where we think about things like even fencing on a farm – if we think about it from a betterment perspective, we know that we should put swing fencing in when we are in flood-prone areas. Swing fencing that was put in place in the 2011 floods stood up to this flood, and that is fencing that you do not have to repair the next time around. So we should always be thinking not just how we repair what we had, which we have not even come close to yet – the entire road budget that was put forth during the last state budget was not enough to even cover the five regional councils whose roads were the most damaged during this flood event, let alone the rest of the state, as we know. So we have got to have that mentality: how do we get better at doing this so that the dollar spent on prevention is worth \$100 on the cure?¹⁶⁴

Other stakeholders also echoed the sentiment that betterment is pivotal for sustainable infrastructure development. Wayne O’Toole, Chief Executive Officer of Buloke Shire Council, argued that the repetitive impact of floods on mitigation infrastructure underlined the urgent need for a more resilient rebuilding strategy.¹⁶⁵ This was recognised by the Victorian Government at public hearings.¹⁶⁶

Stakeholders made recommendations for reforming current disaster-funding arrangements towards a betterment approach, these included:

- increasing existing betterment funding allocation
- implementing thorough and comprehensive risk assessments to identify vulnerable infrastructure and prioritise betterment projects based on potential impact and community benefit
- fostering collaboration between governments, local councils, industry and community representatives to ensure that betterment projects align with local needs and resilience goals
- establishing a framework for ongoing monitoring and evaluation of betterment projects to assess effectiveness, inform future initiatives and ensure accountability.

In February 2023, the Commonwealth Government announced an independent review into Disaster Relief Funding Arrangements. In a media release, the federal Minister for Emergency Management, Hon Murray Watt, explained that the purpose of the review is to ‘ensure government investment in disaster funding is fit-for-purpose’. The Minister

¹⁶⁴ Emma Germano, *Transcript of evidence*, p. 65.

¹⁶⁵ Wayne O’Toole, Chief Executive Officer, Buloke Shire Council, public hearing, Melbourne, 10 October 2023, *Transcript of evidence*, p. 13.

¹⁶⁶ Hon Jacyn Symes, *Transcript of evidence*.

also noted that the review will address recommendations from the Royal Commission into National Natural Disaster Arrangements.¹⁶⁷

The review was due to report to the Commonwealth Government in April 2024; at the time of writing, no report was publicly available.

In the Committee's view, transitioning from a like-for-like replacement model to a betterment-based approach for flood mitigation infrastructure rebuilding is not only strategic but also necessary. Evidence shows that over successive flood events too much of the current infrastructure is being continually damaged. Rebuilding existing infrastructure significantly diminishes its effectiveness as mitigation infrastructure. Focusing on betterment and on enhancing resilience, sustainability and community wellbeing ensures a more effective and long-term solution to the challenges posed by natural disasters.

The Council Priority Betterment Program supported by the Victorian and Commonwealth governments is a key program to contributing to the long-term safety and sustainability of Victoria's communities. It believes the Victorian Government—in collaboration with the Commonwealth Government—should continue to shift its approach to disaster recovery funding towards betterment. It has recommended that both governments jointly prioritise betterment projects when rebuilding vital mitigation infrastructure.

FINDING 31: A like-for-like approach to rebuilding mitigation infrastructure following a flood event is inadequate. There is a clear pattern of infrastructure failing to withstand successive flood events, resulting in repeated damage and economic losses.

RECOMMENDATION 39: That the Victorian Government prioritise investment in betterment projects to improve the resilience of mitigation infrastructure, and in doing so work with the Commonwealth Government to achieve this goal.

RECOMMENDATION 40: That the Victorian Government adapt policies and funding models to prioritise betterment initiatives, including ensuring that financial resources are allocated effectively to meet long-term needs of at-risk communities, and in doing so work with the Commonwealth Government to achieve this goal.

¹⁶⁷ Hon Murray Watt, *Independent review launched into disaster funding*, Department of Home Affairs, 1 February 2023, media release, <<https://minister.homeaffairs.gov.au/MurrayWatt/Pages/independent-review-disaster-funding.aspx>> accessed 20 May 2024.

Chapter 6

Flood emergency warnings

6.1 Introduction

In Australia, the Bureau of Meteorology (the Bureau) has statutory responsibility for predicting and monitoring riverine floods and communicating flood risk to emergency services and the public (with exceptions, including flooding in metropolitan Melbourne catchments and flash flooding).¹

Melbourne Water is responsible for flood forecasting and warning services in Port Phillip and Westernport catchments.² It operates a flood warning system on creeks and rivers within these catchments (Yarra, Maribyrnong, Westernport, Dandenong Creek, Werribee, Diamond Creek, Merry Creek, Kororoit Creek and Plenty River) and provides flood predictions to the Bureau which disseminates flood watches and warnings.³ Victorian state and local governments are responsible for flash flood warnings due to the very localised nature of this kind of flood event.⁴

In Victoria, the Bureau's flood forecasting, monitoring and warning services are also supported by catchment management authorities (CMAs), the Victorian State Emergency Service (VICSES) and other agencies. Activities are coordinated through a Flood Warning Consultative Committee.⁵

These arrangements are also summarised in Chapter 3.

6.2 Predicting and monitoring floods

The Bureau operates a 24-hour National Operations Centre in Melbourne staffed with meteorologists and specialist hydrologists which monitor the state of catchments and rivers across the country and assess the likely impact of forecast rainfall, including predicting possible floods.⁶

In a submission to this Inquiry, the Bureau explained that monitoring commenced months prior to the onset of flooding in October 2022:

-
- 1 Section 6 of the *Meteorology Act 1955* (Cth) outlines the functions of the Bureau of Meteorology. This includes requiring it to 'issue... warnings of gales, storms and other weather conditions likely to endanger life or property, including weather conditions likely to give rise to floods'.
 - 2 Bureau of Meteorology, *National Arrangements for Flood Forecasting and Warning*, 2018, p. 5.
 - 3 Emergency Management Victoria, *State Emergency Response Plan Flood Sub-Plan*, Edition 1, 2016, p. 9.
 - 4 Bureau of Meteorology, *National Arrangements for Flood Forecasting and Warning*, p. 13.
 - 5 Bureau of Meteorology, *Service Level Specification for Flood Forecasting and Warning Services for Victoria - Version 3.4*, 2013, pp. 5, 17.
 - 6 *Ibid.*, p. 5.

In the months preceding the major floods, the Bureau actively communicated the risk of wetter than normal conditions for Victoria during the spring of 2022. This advice was based on the Bureau's long-range forecast for August to October 2022 which predicted above average rainfall across much of Australia. All forecasts for this period, issued twice weekly in May, June and July were highly accurate (forecast skill above 90%).⁷

6.2.1 Flood mapping

Flood mapping is an important tool for predicting and monitoring flood risk in Victoria. It can be used to assist with flood preparedness and response by assisting emergency services and the public to understand what the behaviour of a flood could be.

Chapter 4 considered the importance of flood mapping studies to assist with planning and risk management, determining that:

- Victoria's flood studies are comprehensive technical assessments conducted to understand and model flood behaviour, incorporating various data sources such as aerial photography, historical records, local knowledge, and geological mapping. These studies are crucial for developing accurate predictive models and are carried out by local councils in collaboration with catchment management authorities and emergency services.
- Updated flood modelling has proven effective in preventing damage and guiding development, highlighting the need for continuous funding and support. However, challenges such as inadequate funding for rural councils and the need for more transparent and peer-reviewed modelling processes have been identified, underscoring areas for improvement.
- Despite there being some challenges in implementing the findings of flood studies into planning schemes, the overall effectiveness of these studies in identifying flood risks and guiding mitigation strategies is recognised, affirming their value in Victoria's flood management efforts.

6.2.2 Gauges on rivers or waterways

To support the flood warning system, Victoria has a widespread streamflow-gauging network which includes 780 active river level and rainfall gauges. Currently, gauges are maintained through two regional water monitoring partnerships which include:

- the Department of Energy, Environment and Climate Action
- local councils
- catchment management authorities
- Melbourne Water
- other water corporations with gauge data interest.⁸

⁷ Bureau of Meteorology, *Submission 73*, p. 6.

⁸ Victorian Government, *Submission 395*, p. 36.

Approximately 283 of the gauge sites are used for primary flood warnings, these ‘provide vital, real-time river height data’. The other sites provide backup data and flash flooding information.⁹

Gauge networks feed information straight to the Bureau so that it ‘can predict flood severity and timing of particular levels of flooding’. This information is used by the Bureau to develop warning messages and distribute them to responsible agencies, selected media and the community.¹⁰

During the Inquiry, some local councils emphasised their lack of capacity to maintain gauges. These councils questioned the appropriateness of this responsibility given they have no role in issuing warnings. There was a general consensus among local councils that there should be consistency in relation to roles and responsibilities for gauges and warnings.¹¹

The Municipal Association of Victoria explained that it had raised concerns about council ownership of gauges at the time of release of the Victorian Floodplain Management Strategy. It outlined some of the concerns of its member councils, stating ‘they also queried the appropriateness of councils having this role, as councils are not responsible for delivering warnings’.¹²

This was echoed by the Murray River Group of Councils which stated that:

Rain and water level gauges are a critical part of the early warning system and need to be managed and maintained in a consistent manner. These should all be owned and operated by the BOM who should be adequately funded for this activity.

Council’s capacity to maintain these markers in a rate capping environment is challenging. Local Government are not responsible for early warning systems, which conflicts with having to provide markers and gauges.¹³

As part of the 2023/24 Budget, the Australian Government committed to providing over \$236 million over 10 years (and \$13.9 million per year ongoing from 2032–33) to ‘remediate high priority flood warning infrastructure and address critical reliability risks’. This includes transferring responsibility of rain and river gauges to the Bureau of Meteorology’s existing flood warning network.¹⁴

The Bureau of Meteorology will acquire, upgrade and integrate local and state government-owned rain and river gauges into its existing flood warning network.

Australian Government, *Budget Paper No. 2: Budget Measures, 2023*, p. 69.

⁹ Ibid.

¹⁰ Ibid.

¹¹ For example, see: Municipal Association of Victoria, *Submission 681*; Murray River Group of Councils, *Submission 747*; Campaspe Shire Council, *Submission 650*; Corangamite Shire Council, *Submission 509*.

¹² Municipal Association of Victoria, *Submission 681*, p. 8.

¹³ Murray River Group of Councils, *Submission 747*, p. 11.

¹⁴ Australian Government, *Budget Paper No. 2: Budget Measures, 2023*, p. 69.

Several councils acknowledged and supported the May 2023 federal budget commitment to transfer publicly owned gauges to the Bureau of Meteorology.¹⁵ However, there were some concerns about the delay for rolling out the transfer and lack of information available to councils. Campaspe Shire Council stated:

There are currently no timeframes for local government to understand when handover of responsibility for maintaining high-priority rain and water level gauges will occur. Councils' capacity to maintain these markers in a rate capping environment is challenging. As a sector, local government is not responsible for early warning systems, which conflicts with having to provide markers and gauges.¹⁶

Rain and water gauges are a critical part of Victoria's flood warning system. Local councils agreed that they are not the most appropriate agency to have responsibility for this network. Councils find it hard to look after these gauges, especially given they have no responsibility for issuing warnings. The Australian Government has recognised this issue with its recent policy commitment to transfer ownership of state-owned gauges to the Bureau. The Committee supports this initiative, but affirms it is important that councils are informed of the roll out and that there should not be any undue delays.

FINDING 32: The transfer of State-owned rain and river gauges into the Bureau of Meteorology's existing flood warning network is an appropriate measure to improve the communication of flood warnings.

RECOMMENDATION 41: The transfer of ownership and responsibility for public gauges to the Bureau of Meteorology should be completed as a priority, and the Victorian Government should request the Commonwealth Government provide a public update by the end of 2024 on these transfer timelines.

In relation to gauges, the Committee also received several recommendations from local councils and other stakeholders to expand the existing network.

Corangamite Shire Council contended that:

there is an urgent need for the flood warning network to be strategically reviewed and extended. There are significant gaps in the location of flood gauges meaning that many communities do not receive flood warnings.

There is a significant lack of flood and rain gauges in the south west region. Council understands that [the Department of Energy, Environment and Climate Action] is currently working on a project with [the Bureau] to investigate expansion of monitoring gauges in the region. This project should be fast tracked and include warning services to flood-prone communities in the region.¹⁷

¹⁵ Municipal Association of Victoria, *Submission 681*, p. 6; Corangamite Shire Council, *Submission 509*, p. 1.

¹⁶ Campaspe Shire Council, *Submission 650*, p. 4.

¹⁷ Corangamite Shire Council, *Submission 509*, p. 1.

The Council recommended that flood warning networks should be expanded to all flood prone properties, instead of focusing on townships areas.¹⁸ Similarly, Pyrenees Shire Council also advocated for further funding to install gauges. It noted that the Council does not have capacity for this expansion without financial support.¹⁹

The Committee received several other requests for expanded gauge networks in areas affected by flooding, with most of these stakeholders telling the Committee it would have improved monitoring in 2022.²⁰

The Victorian Government outlined expansion initiatives it is undertaking for Victoria's gauge network:

- **Gauge upgrades:** identifying flood warning gauges with limited or no telemetry service to 'add either radio or satellite-based telemetry' to increase network resilience.
- **New gauges:** installing new rainfall and streamflow gauges in priority locations identified via regional floodplain management strategies.²¹

At a public hearing, the Hon Harriet Shing MLC, Minister for Water, further discussed the Victorian Government's work to expand the gauge network:

[W]hen I have met with councils they have been pretty clear about where and how they might get benefit from a gauge system. We have got around 780 active river-level and rainfall gauges across the state ... the flood plain management strategy does provide that construction of new gauges will be eligible for government funding if a flood study shows that an improved flood warning service for the benefiting community will follow. We have got, for example, through the basin constraints feasibility study an identification of new streamflow gauges and rainfall gauges in the Goulburn catchment – and the Molesworth gauge is one of those sites across 11 sites – and we are working to complete the necessary approvals for that process.²²

The issue of upgrading gauges with telemetric services was raised by several stakeholders. These stakeholders highlighted the importance of telemetry-equipped gauges for effective monitoring and maintenance, ensuring quick detection and response to malfunctions. Andrew Fennessy, Deputy Secretary of Water and Catchments at the Department of Energy, Environment and Climate Action, told the Committee that approximately 65% of Victorian gauges are equipped with telemetry.²³ He further noted that not all gauges require telemetry:

Not all of them need telemetry; I have got to say that up-front as well. We know pretty quickly whether a gauge is not actually working and can go out and fix it. If it is not one with telemetry, it is visited at least once a month to check in on that

¹⁸ Ibid.

¹⁹ Pyrenees Shire Council, *Submission 660*, p. 4.

²⁰ For example, see: Buloke Shire Council, *Submission 690*; Jan Beer, *Submission 303*; Mitchell Shire Council, *Submission 521*, p. 7.

²¹ Victorian Government, *Submission 295*, p. 36.

²² Hon Harriet Shing MLC, Minister for Water, public hearing, Melbourne, 6 December 2023, *Transcript of evidence*, p. 19.

²³ Andrew Fennessy, Deputy Secretary, Water and Catchments, Department of Energy, Environment and Climate Action, public hearing, Melbourne, 25 October 2023, *Transcript of evidence*, p. 19.

as well. The contract that we do have under here for the monitoring network has KPIs associated with it as well, so we manage our service provider there to very tight conditions to ensure that the network is up to scratch and is available when required.²⁴

The impact of good gauge reads was made clear to the Committee. Peter Harriott, Chief Executive Officer of Greater Shepparton City Council, which experienced more accurate predictions from gauge readings, told the Committee:

It all starts with good gauging. If you have got the gauges down the rivers all the way from Seymour all the way through, in the Broken as well as the Seven Creeks, you have got a network of gauges that are accurate, up-to-date and all connected. That is a good starting point, and that tells you how the water is moving as well as how to understand the rainfall and where that is working, through the bureau of course and their modelling. Then it comes to the flood model that you have for your river systems in your area and how you have converted that to your maps based on all that river-gauge information – where the water is going to go to and what depth it is going to go to.²⁵

John Woodland, Melbourne Water

we have a 24/7 staff who are watching how the rivers behave in real time and watching how the rivers flow and the rivers rise, because we have got real-time gauges. In the Maribyrnong we have 10 of these, and we have eight rainfall gauges, so really good intel. If it starts to deviate as to what we predict, we will then make a call. That is exactly what actually happened during the event. At around 12:30 am on the 14th our flood warning duty officer noticed that the river was not behaving as predicted, so they made the right call: they worked with the bureau to issue a major flood warning.

Source: John Woodland, Head of Waterways and Catchment Services, South East, Melbourne Water, public hearing, Melbourne, 11 October 2023, *Transcript of evidence*, p. 88.

Stakeholders believed that telemetric-equipped gauges provided important real time data and advocated for the expansion of upgrades.²⁶ The Committee heard that a number of municipalities impacted by flooding did not have sufficient gauges and this affected water level monitoring during the 2022 flood event. For example, Jan Beer from the Upper Goulburn River Catchment Association described what she believes is an ‘absolute paucity’ of telemetric-equipped gauges in the region:

Currently 45 per cent of the Yea–Murrindindi catchment is not gauged and 57 per cent of the Goulburn catchment from Eildon to Trawool is not gauged, and this denies farmers, businesses and communities any real early warning signs in the system.²⁷

²⁴ Ibid.

²⁵ Peter Harriott, Chief Executive Officer, Greater Shepparton City Council, Mooroopna, 13 September 2023, *Transcript of evidence*, p. 16.

²⁶ For example, see: John Walsh, Mayor, Murrindindi Shire Council, public hearing, Seymour, 14 September 2023, *Transcript of evidence*.

²⁷ Jan Beer, Upper Goulburn River Catchment Association, public hearing, Seymour, 14 September 2023, *Transcript of evidence*, p. 21.

Some stakeholders noted that during the 2022 flood event some gauges failed, affecting forecasting and flood predictions, which has consequences for delivering timely and accurate warnings to communities at risk. For example, Leigh Wilson, Chair of the Community Recovery Committee, told the Committee that some upstream gauges failed during the flood event and that the ‘water was higher than the gauges’ which had effectively ‘stopped broadcasting’. These stakeholders called for a ‘complete overhaul’ of the network.²⁸

Data from gauges is publicly available, however, there were concerns that it may have been unclear how to access the information and in some cases the information may have been inconsistent. Gauge readings can be particularly useful for rural landowners and farmers to manage their flood preparedness and response. Charles Everist, Policy Manager at the Victorian Farmers Federation, told the Committee:

We are progressively seeing it is harder to understand streamflow data. This is important not just in the context of early warning systems; it is also important in the context of, for instance, how we do irrigation and how water markets operate as well and understanding what water is in the river at any given time and what the purpose is of that water. There is a lot of confusion as to what water might be environmental water or what water might be going to South Australia or what water might be used for irrigation, so being able to have that data in real time – for the public to be able to access that in real time by going onto the internet and seeing what the level of the river is at any given time.²⁹

Jan Beer contended that:

people do not know where to go to look for these things. The other thing is some of the gauges are in metres and some are in megalitres, and the metre gauges have to have a rating table. I mean, I cannot interpret the rating table as to the megalitres; that is really a GMW thing. So let us have the gauges all in the one thing, preferably a megalitre flow per day, because we know how quickly that is rising then.³⁰

The Committee acknowledges the critical role of gauges in enhancing flood prediction, management and response efforts. Evidence to the Inquiry underscored the importance of ensuring an expansive gauge network. There is potential for the Victorian Government to work closely with local councils to address any critical gaps in gauge coverage.

FINDING 33: Many stakeholders advocated for the urgent expansion of Victoria’s rainfall and streamflow gauge network. Gaps in gauges can result in inaccurate or delayed flood predictions and flood warnings to communities.

²⁸ Leigh Wilson, Chair, Rochester Community Recovery Committee, public hearing, Rochester, 23 August 2023, *Transcript of evidence*, pp. 11, 17–18.

²⁹ Charles Everist, Policy Manager, Victorian Farmers Federation, public hearing, Seymour, 14 September 2023, *Transcript of evidence*, p. 63.

³⁰ Jan Beer, *Transcript of evidence*, p. 26.

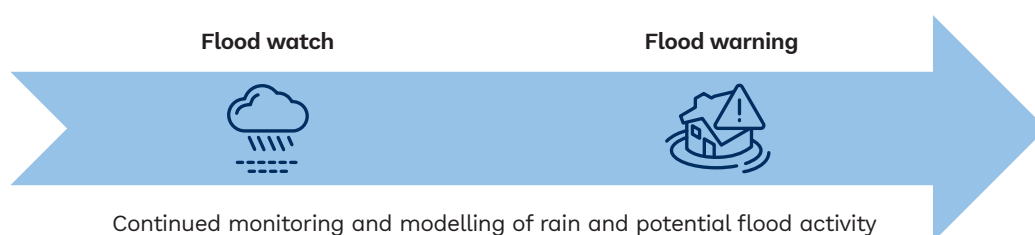
FINDING 34: Telemetric-equipped gauges provide important real-time data to inform flood predictions and response actions. However, in 2022, in parts of Victoria, gauge failures led to inaccurate forecasts potentially hindering community preparedness.

RECOMMENDATION 42: That the Victorian Government identify and fill critical gaps in the state's gauge network. New gauges should be installed in priority locations as soon as possible, and existing gauges should be upgraded with telemetry services. Information from flood gauges and telemetry services should be easily accessible by the public.

6.3 Flood watches and warning levels

Warnings for floods exist on a continuum from 'flood watch' to 'flood warning'. The Bureau issues both flood watches and warnings when modelling indicates that the combination of forecast rainfall and water catchment conditions may result in flooding.

Figure 6.1 Continuum of flood warnings



Source: Legislative Council Environment and Planning Committee.

6.3.1 Flood watches

On 11 October 2022, the first flood watch was issued for Maribyrnong and other catchments affected by heavy rainfall.³¹ According to the Bureau, a 'flood watch' is:

issued when forecast rainfall information suggests that local and/or riverine flooding is possible across the Flood Watch area. A Flood Watch may cover a large area due to uncertainty associated with the location and amount of forecast rainfall. A flood watch may also make reference to the type of flooding that may be experienced in the catchment being highlighted.³²

Flood watches can be issued for local (i.e., areas without a well-defined river) and riverine (i.e., areas with a well-defined river).³³ A flood watch is not a warning of 'imminent' flooding.³⁴

³¹ Bureau of Meteorology, *Submission 73*.

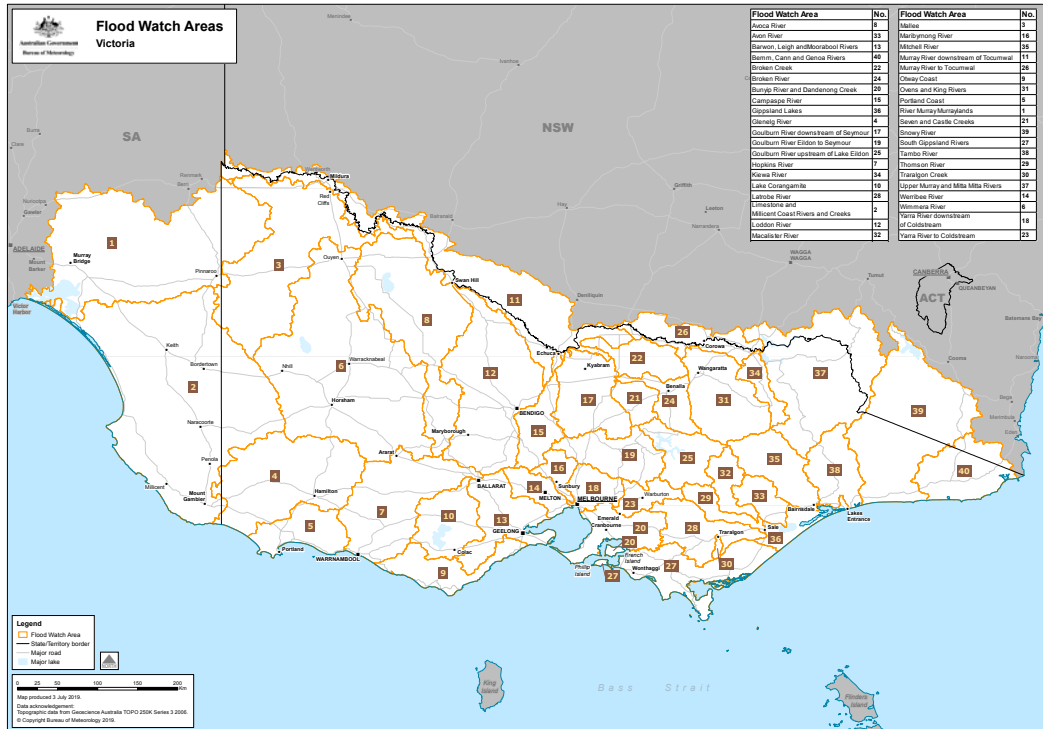
³² Bureau of Meteorology, *Flood Warning Services*, 2024, <<http://www.bom.gov.au/water/floods/floodWarningServices.shtml>> accessed 28 March 2024.

³³ Ibid.

³⁴ Ibid.

In Victoria, the Bureau is responsible for issuing all flood watches. Whilst Melbourne Water is responsible for predicting floods in the Melbourne metropolitan catchment area, the Bureau still issues official watches and warnings.³⁵

Figure 6.2 Flood Watch Areas, Victoria



Source: Bureau of Meteorology, *Flood Warning Services: Flood Watch Areas – Victoria*, 2019, <http://www.bom.gov.au/water/floods/image/BOM_Flood_Watch_Areas_map_Victoria.pdf> accessed 28 March 2024.

A Flood Watch is typically issued 1 to 4 days in advance of an anticipated flood event and is designed to provide early advice to the community and emergency services of the flood risk arising from a developing weather pattern. They are typically issued in relation to a specific region (for example, Mallee or East Gippsland) and updated as a flood event evolves. If at any time the threat of a flood occurring becomes imminent, a flood warning is issued.³⁶

For the 2022 floods, the Bureau advised that:

Flood watches and warnings were issued in advance of major flood levels being reached.

The Bureau clearly identified the potential for river rises in its communications with the emergency services and the community.³⁷

³⁵ Victorian Government, *Submission 295*, p. 33.

³⁶ Emergency Management Victoria, *State Emergency Response Plan Flood Sub-Plan*, p. 10; Bureau of Meteorology, *Service Level Specification for Flood Forecasting and Warning Services for Victoria – Version 3.4*, p. 7.

³⁷ Bureau of Meteorology, *Submission 73*, p. 6.

At a public hearing, Dr Peter Stone, Chief Customer Officer from the Bureau, explained the trajectory of a flood watch when heavy rainfall poses a flood risk:

Just on the lead time given, for the floods in October and November in the vast majority of instances a major flood warning was issued three days before the peak. That was not always the case, but in the majority of cases it was about three days of lead time for major flood warning. Before that, usually a day or two in advance, there was a flood watch issued. And often around the same time as the flood watch is issued there will be a severe weather warning saying, 'Lots of rain'. The typical path is to just do it in forward motion. You typically say, 'Gee, it looks like there's a lot of rain coming.' If we think that there is a possibility that will result in flooding, we tend to go 'flood watch'. It is when the rain is beginning to fall and we are getting a sense of what that will actually mean in terms of river levels that we tend to go into the flood warning side of things. As I said, not in every case, but in many cases for the floods in Victoria, there was about three days between major flood warning and the peak being reached.³⁸

As noted above, flood watches are issued in advance of a flood event. In the majority of cases this will be three days before a peak. However, flood watches can be in place for a varying period of time, ranging from a few days to months. Andrew Perry from Stecher Agricultural Services told the Committee on 14 September 2023 that:

The lake is currently at 97.5 per cent capacity, with six weeks of water harvest left to go. We are still on flood watch—18 months long—and we are exhausted, absolutely exhausted.³⁹

The Committee did not receive any substantive evidence on flood watches other than their role in the warning system. 'Flood warnings', which come next on the warning continuum, are discussed in the following Section.

³⁸ Peter Stone, Chief Customer Officer, Bureau of Meteorology, public hearing, 21 November 2023, *Transcript of evidence*, p. 54.

³⁹ Andrew Perry, Stecher Agricultural Services, public hearing, Seymour, 14 September 2023, *Transcript of evidence*, p. 57.

6.3.2 Flood warnings

Box 6.1 Summary of the Bureau of Meteorology's flood warning activities during 2022 flood event

- A total of 673 flood warnings were issued across 11 flood catchment areas (Avoca, Baron, Broken, Campaspe, Goulburn, Hopkins, Loddon, Murray, Ovens and King, Seven and Castle Creeks and Wimmera rivers).
- Some flood warnings extended over months, for example the Murray River warning extended into January 2023.
- During active warning periods, the accuracy of peak river height forecasts was above 99% for nine catchments.
- Warnings were issued prior to the stated next warning issue time on 88% of occasions.
- Summarised across eleven catchments, the target lead time was achieved 84% of the time for 80 forecast warning locations where major flooding was forecast.

Source: Bureau of Meteorology, *Submission 73*, p. 12.

A Flood Warning is issued, by the Bureau, once it is more 'certain that flooding is expected'. Warnings are:

more targeted and are issued for specific catchments or even sub-catchments in some of the larger river basins. Flood Warnings will generally include specific predictions of the severity of expected flooding.

There will be occasions when a Flood Warning is issued without it being preceded by a Flood Watch, largely due to the complexities of forecasting rainfall accurately. Weather models are excellent at identifying broader scale weather patterns but are not always able to represent the smaller scale features that can cause heavy rainfall, particularly in tropical areas. For this reason there will be times when heavy rainfall leading to flooding occurs but forecast models were not able to accurately identify this beforehand.⁴⁰

Flood warnings are upgraded or downgraded as flood levels rise, peak and then recede.⁴¹

The Victorian Government's submission provided an overview of the roles and responsibilities for flood warnings (see Table 6.1 below for a summary).

⁴⁰ Bureau of Meteorology, *Flood Warning Services*, 2024, <<http://www.bom.gov.au/water/floods/floodWarningServices.shtml>> accessed 28 March 2024.

⁴¹ Victorian State Emergency Service, *Know your hazards - Floods*, <<https://www.ses.vic.gov.au/know-your-hazards/flood>> accessed 5 April 2012; Emergency Management Victoria, *State Emergency Response Plan Flood Sub-Plan*, p. 10; Bureau of Meteorology, *Service Level Specification for Flood Forecasting and Warning Services for Victoria - Version 3.4*, p. 7.

Table 6.1 Roles and responsibilities for flood warnings

Authority/agency	Roles and responsibility
Bureau of Meteorology	<ul style="list-style-type: none"> • Issues warnings for weather conditions which have the potential to endanger life/property or cause flooding. • Provide forecasts for predicted flood levels for some locations in Victoria. • Provide data and services to jurisdictions for strategic, operational and tactical decision-making.
Victoria State Emergency Service (VICSES)	<ul style="list-style-type: none"> • Coordinate community notifications and warnings for floods as well as other hazards <ul style="list-style-type: none"> – VICSES will consider forecasts before issuing warnings – tailors warnings to individual community at risk. • Uses VicEmergency to disseminate information and warnings.
Melbourne Water	<ul style="list-style-type: none"> • Flood prediction agency for larger metropolitan Melbourne catchments, including Maribyrnong. • Undertake modelling to estimate likelihood and extent of modelling. • During a heavy rainfall event, resources a 24/7 flood warning roster. • For floods moderate or above, a Melbourne Water Flood Response Plan is activated <ul style="list-style-type: none"> – runs flood forecast models – frequency of models depends on severity of flooding. • Prepares and sends flood warnings to the Bureau (who is responsible for dissemination).
Water storage owners	<ul style="list-style-type: none"> • Required to advise the Bureau if increased flow is expected above flood thresholds.
Flood analysts	<ul style="list-style-type: none"> • Assist in decision-making before, during and after an event: <ul style="list-style-type: none"> – identification of areas and times of greatest risk – flood extent prediction maps, showing flood progression and potential impact zones – advice on incident objectives, strategies and tactics – information on factors impacting spread and behaviour.

Source: Victorian Government, *Submission 295*, p. 33.

As indicated in the Table above, in Victoria, the Bureau is primarily responsible for issuing flood warnings which are then disseminated to communities via VICSES. For catchment areas falling within Melbourne Water's responsibilities, the Bureau will issue a flood warning within 30 minutes of receiving notification from Melbourne Water that a flood is predicted in one of the metropolitan catchments (for which Melbourne Water has responsibility). The Bureau will also issue a flood warning if it receives a flood prediction from a water storage operator.⁴²

Flood warnings may contain generalised, quantitative, or qualitative predictions about an imminent or already occurring flood event. Typically, a flood warning will initially be comprised of more generalised information and then updated with specifics as data becomes available as the event progresses. However, the Bureau may also issue a flood warning with generalised predictions where it has insufficient data to make

⁴² Bureau of Meteorology, *Service Level Specification for Flood Forecasting and Warning Services for Victoria – Version 3.4*, pp. 7–8.

specific predictions, or it may downgrade a specific prediction to a general one if there is a temporary loss of real time data as the flood event progresses. The Bureau can only provide a quantitative or qualitative flood prediction in relation to a river location if it has access to:

a suitable network of rainfall and river level sites upstream with data coming in real time, sufficient historical data to calibrate the flood forecasting model, a reliable rating table and documented flood impacts and flood classifications.⁴³

Table 6.2 gives examples of flood warning predictions.

Table 6.2 Flood warnings – examples of prediction types

Prediction type	Height prediction	Time of prediction	Example
Quantitative	Numerical prediction <ul style="list-style-type: none"> Any Height Peak Height Can refer to flood class	More specific, typically in blocks of 3 to 6 hours	The Ovens River at Wangaratta will exceed Minor Flood Level (11.9 metres) around 3pm Saturday evening. The Ovens River at Wangaratta is expected to peak near 12.9 metres (Major Flood Level 12.7 metres) around 6pm on Sunday.
Qualitative	Refers to flood class only (minor, moderate or major)	Range of times (6, 12 or 24 hour blocks)	Minor flooding is expected in the Snowy River at McKillops Bridge during Saturday afternoon. The Snowy River at McKillops Bridge is expected to peak above the Major Flood Level (8.0 metres) during Sunday evening.
Generalised	No height prediction <ul style="list-style-type: none"> forecast trend (rising or falling) 	Range of times (24 hour blocks)	Significant flooding is expected in the Genoa River catchments during Saturday with further rises possible due to forecast rainfall.

Source: Bureau of Meteorology, *Service Level Specification for Flood Forecasting and Warning Services for Victoria – Version 3.4*, 2013, p. 9.

More detailed information about the Bureau's forecasting and monitoring activities to support the issuance of flood warnings is outlined in the service level specification for flood forecasting and warning services for Victoria. These service levels set out which river locations the Bureau and Melbourne Water are responsible for monitoring and establish specific flood warning issuance criteria.⁴⁴

In its submission, the Bureau of Meteorology outlined several timelines (including multiple case studies) for its watches, warnings and products issued during the 2022 flood event. It provided the following general timeline of the early warnings and watches prior to the height of the events in October and November (See Table 6.3 below).

⁴³ Ibid., pp. 8, 10.

⁴⁴ Ibid.

Table 6.3 Bureau of Meteorology's flood watch and warning activities (October 2022 and November-December 2022)

October flood event	November flood event
<p>6 October 2022—</p> <ul style="list-style-type: none"> Emergency services' briefing at the State Control Centre highlighted potential for widespread rain and heavy falls developing between 12-14 October. Subsequent daily briefings occurred to provide increasing detail on expected rainfall totals and potential flood impacts. <p>9 October 2022—</p> <ul style="list-style-type: none"> Public weather forecast—including District, State, Precip and Metropolitan areas—included heavy rainfall risks. <p>10 October 2022—</p> <ul style="list-style-type: none"> Flood Scenario Outlook product was released to emergency services for initial planning, including two credible alternative scenarios. Initial outlook indicated a risk of widespread minor to moderate flooding, with major flooding likely in some catchments. <p>11 October 2022—</p> <ul style="list-style-type: none"> First public Flood Watch issued as heavy rainfall guidance became consistent across forecast models. Severe weather warning issued to parts of western and central Victoria, effective from 12 October. <p>12 October 2022—</p> <ul style="list-style-type: none"> Another Flood Watch issued which indicated further widespread major flooding over Northern Victorian catchments and in southwest Victoria. Severe weather warning extended to include remaining parts of central and northeastern Victoria 	<p>6 November 2022—</p> <ul style="list-style-type: none"> Briefings at State Control Centre included the Severe Weather Intelligence Briefing product and risk of rain/storms and moderate to heavy falls in north-eastern Victoria. <p>11 November 2022—</p> <ul style="list-style-type: none"> Public weather forecast included risk of heavy falls. <p>12 November 2022—</p> <ul style="list-style-type: none"> Severe weather warning issued for northeastern Victoria. Murray River to Tocumwal included in a NSW Flood Watch and Flood Outlook Scenario product, which highlighted potential for moderate to major flooding. <p>13 November 2022—</p> <ul style="list-style-type: none"> Major flooding at Albury due to spills from Hume Dam combined with major flooding at Kiewa River and heavy rainfall. <ul style="list-style-type: none"> This created a second major flood peak moving downstream; majority of flow diverted in Edwards River system. <p>17 November 2022—</p> <ul style="list-style-type: none"> 5.07pm: major flood warning issued for Echuca as upstream flows arrived from Murray River and combined with Goulburn River flows. River levels at Echuca remained above moderate flooding until 1 December 2022. <p>5 December 2022—</p> <ul style="list-style-type: none"> Flood level at Echuca fell below minor flooding (93.5m AHD).

Source: Bureau of Meteorology, *Submission 73*, pp. 7, 9.

The Bureau also provided case studies from Northern Victoria (three of which are outlined the Boxes below). The Committee notes that a similar timeline was not provided for Maribyrnong.

Box 6.2 Bureau of Meteorology's flood warning activity: Rochester**10 October 2022:**

- Rochester's flood scenarios product unveiled a credible alternative scenario suggesting a major peak of 115.5 m AHD (only 0.2 shy of the highest recorded flood peak).
- This data was utilised for briefing emergency services and initial emergency planning purposes.

11 October 2022 onwards:

- Most likely scenarios issued indicated major flooding.

12 October 2022:

- Major flood warning issues for Campaspe River at 6:53 pm due to alignment of heavy rainfall forecast guidance over the catchment (two days before major flooding emerged).
- Between initial warning and the peak height of 115.7 m AHD occurring, a total of 10 warnings were issued.

13 October 2022:

- First flood warning forecasting above the 2011 record was released.

15 October 2022:

- Observed flood peak of 115.67 m AHD.

Source: Bureau of Meteorology, *Submission 73*, p. 8.

Box 6.3 Bureau of Meteorology's flood warning activity: Seymour**10 October 2022:**

- Flood scenarios outlined alternative scenarios suggesting a moderate flood peak of 6.2 m was possible.
- This data was utilised for briefing emergency services and initial emergency planning.

11 October 2022 onwards:

- Moderate flooding was anticipated in the higher possible scenario issued.

(Continued)

Box 6.3 Continued**13 October 2022:**

- 12:09 am — a moderate flood warning was issued for the Goulburn River.
- Approximately 12 hours later (12:11 pm), the forecast was upgraded to major flooding due to heavy rainfall around Seymour and its tributaries.

14 October 2022:

- Observed flood peak of 8.26 m (at 2:45 am) (surpassing 1974 flood level).

Source: Bureau of Meteorology, *Submission 73*, p. 8.

Box 6.4 Bureau of Meteorology's flood warning activity: Shepparton**10 October 2022:**

- Flood scenarios included an alternative scenario indicating major flooding with a peak of 11 m was possible.
- This data was utilised to brief emergency services and for initial emergency planning.

11 October 2022:

- Major flooding was anticipated in the higher possible scenario issued.

13 October 2022:

- A major flood forecast was included in the Goulburn River warning issued at 2:53 pm.

16 October 2022:

- Observed flood peak of 12.06 m (below 1974 flood level).

Source: Bureau of Meteorology, *Submission 73*, p. 8.

Further, the Bureau provided an overview of its key performance indicators for key Victorian catchment areas during the 2022–2023 period (see Table 6.4).

Table 6.4 Key performance indicators for key Victoria catchments issued over 2022–2023 spring summer

No. of flood warnings	Initial warning	Final warning	Verification from	Verification to	Lead-time Achieved (%)	Timeliness Achieved (%)	Peak accuracy (%)
Avoca River							
55	6 October	3 November	16 September	16 November	63	90.32	100
Barwon and Moorabool Rivers							
15	13 October	19 October	16 September	16 October	60	92.31	100
Broken River							
23	13 October	19 October	16 September	16 October	100	92.59	100
Campaspe River							
60	12 October	8 December	16 September	16 December	100	91.8	100
Goulburn River							
88	13 October	29 November	16 September	16 December	75	82.29	100
Hopkins River and Mt Emu Creek							
12	13 October	17 October	16 September	16 October	0	77.78	100
Loddon River							
129	9 September	3 December	16 August	16 December	100	88.72	100
Murray River							
147	5 August	21 January	16 August	16 December	79	86.3	99.12
Ovens and King River							
54	12 October	8 November	16 September	16 November	88.89	83.54	94.44
Seven and Castle Creeks							
68	12 October	21 November	16 September	16 December	85.71	90.28	94.44
Wimmera River							
22	13 October	22 October	16 September	16 October	100	90.48	100

Source: Bureau of Meteorology, *Submission 73*, p. 12.

In relation to the Maribyrnong River, the Bureau provided some information of weather warnings and recordings made but noted that ‘forecasts and predictions ... are produced by Melbourne Water’.⁴⁵

⁴⁵ Bureau of Meteorology, *Submission 73*, p. 14.

The Bureau and other agencies were responsible for issuing flood warnings for Maribyrnong. However, these warnings were based on information provided by Melbourne Water through their forecast and prediction work. At a public hearing, Melbourne Water representatives explained that:

If we go back to the flood event in October 2022, the event happened on the 14th. We worked with the bureau for them to issue the first flood watch on the 11th. On the 11th we put out a flood watch that included the Maribyrnong catchment. Then on the morning of the 13th we issued our first major flood warning for the upper catchment in the Maribyrnong, and then we continued on to bring in the lower catchment to a moderate flood warning. Before the event, we had a major in the upper and a moderate in the lower, so we were monitoring.⁴⁶

John Woodland, Head of Waterways and Catchment Services for the South East at Melbourne Water, contextualised the agency's role in warnings:

For flood warnings and the function that Melbourne Water currently does, which is the modelling and the forecasting, we then give those to the bureau, who disseminates that, and also to the SES. We are in the process of transferring the modelling and forecasting function to the Bureau of Meteorology. We have an implementation group working on that and we are working very hard on an implementation plan to make that happen.⁴⁷

Dr Nerina Di Lorenzo, Managing Director of Melbourne Water, also noted that:

We are commencing the work to consolidate flood warnings with the Bureau of Meteorology. We completed a scoping review of potential physical mitigation options for the Maribyrnong catchment and a targeted flood awareness campaign to over 3000 flood-prone households as well as work to help residents more broadly across Greater Melbourne, which had a reach of about 90,000 people, including CALD translations. This is a really important area of focus, because our research and the research of other agencies shows us that flood awareness is low, and we think this is an area where we really need to think the same way about flood as we do for bushfires.⁴⁸

Total Flood Warning System

Since the 1990s, Victoria's approach to flood warning has 'been structured around the concept of the Total Flood Warning System' which is promoted by the Australian Government and 'is widely used in the design of early flood warning systems'.⁴⁹ In its submission, the Victorian Government explained the components of the system as follows:

- monitoring rainfall and river flows which could lead to flooding
- prediction of flood severity and time of onset

⁴⁶ John Woodland, Head of Waterways and Catchment Services, South East, Melbourne Water, public hearing, Melbourne, 11 October 2023, *Transcript of evidence*, p. 88.

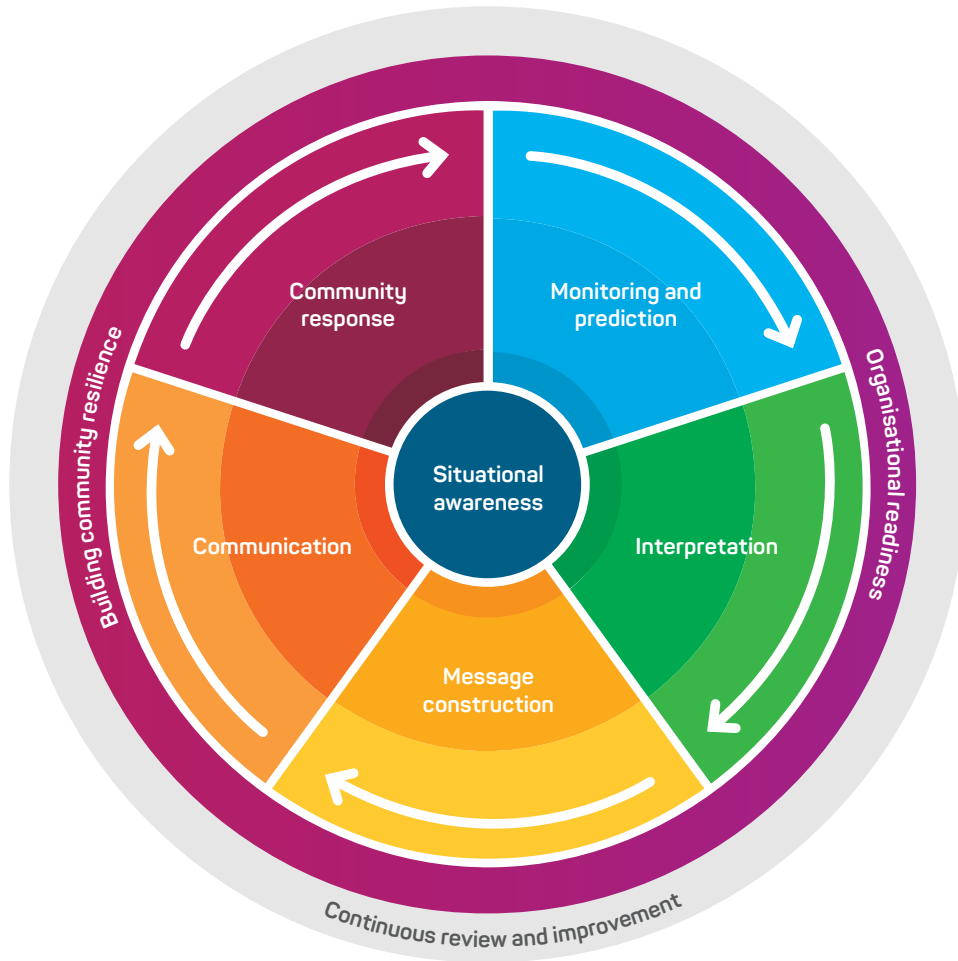
⁴⁷ *Ibid.*, p. 97.

⁴⁸ Nerina Di Lorenzo, Managing Director, Melbourne Water, public hearing, Melbourne, 11 October 2023, *Transcript of evidence*, pp. 83–84.

⁴⁹ Victorian Government, *Submission 295*, p. 32.

- interpretation of predictions to determine likely impacts to affected communities
- construction of warning messages to include what is happening, what will happen, expected impacted and what actions should be taken
- issuing warning messages
- response to warnings by agencies and communities.⁵⁰

Figure 6.3 Australia’s Total Warning System



Source: Australian Institute for Disaster Resilience and National Recovery and Resilience Agency, *Public information and warnings*, Australian Disaster Resilience Handbook Collection, 2021, p. 5.

Table 6.5 below summarises the roles and responsibility for riverine and flash flooding according to the Total Flood Warning System.

50 Ibid.

Table 6.5 Summary of government responsibility for riverine and flash flood warning in Australia

	Monitoring/ prediction	Interpretation	Message construction/ communication	Response lead
Riverine	<ul style="list-style-type: none"> • Commonwealth • State/ Territory • Local 	<ul style="list-style-type: none"> • State/ Territory • Local • Emergency services 	<ul style="list-style-type: none"> • Commonwealth • Local • Emergency services 	<ul style="list-style-type: none"> • Local • Emergency services
Flash flood	<ul style="list-style-type: none"> • State/ Territory • Local 	<ul style="list-style-type: none"> • State/ Territory • Local • Emergency services 	<ul style="list-style-type: none"> • Local • Emergency services 	<ul style="list-style-type: none"> • Local • Emergency services

Source: Australian Institute for Disaster Resilience, *Application of the Total Warning System to Flood*, 2022, p. 9.

In its submission, the Federation of Community Legal Centres criticised the Total Flood Warning System as a ‘top-down, non-participatory approach’. In its view, under the System ‘at-risk community members are the last to be notified’, further reflecting that:

The system instead relies heavily on expertise in the initial observational phases of the system, and emergency services and government in the decision-making phases once a risk has been determined. This highlights the need for more effective engagement of all community members at every stage of the flood warning system in Victoria. A community-based warning system should place communities at the centre of the system’s operation.⁵¹

The 2011 Comrie Review similarly found that the Total Flood Warning System should be tailored to meet local needs:

Accurate and timely emergency warnings to communities are critical in the saving of lives and mitigation of property damage. Improvements are required to Victoria’s Total Flood Warning System which needs to be better tailored to meet local requirements. This requires involvement and contribution from those it is intended to serve.⁵²

At the time, the Review also found there were:

no audit processes with sufficient rigour to identify statewide gaps in flood risk assessments, flood studies, mapping or warning systems or for identifying where linkages and processes are not working as intended.⁵³

It recommended the establishment of such an audit regime.

⁵¹ Federation of Community Legal Centres, *Submission 674*, p. 21.

⁵² Neil Comrie AO, *Review of the 2010–11 Flood Warnings and Response*, Final Report, 2011, p. 4.

⁵³ *Ibid.*, p. 42.

The Victorian Floodplain Management Strategy notes that:

The Inspector General for Emergency Management has developed an assurance regime to meet its obligation to develop an audit framework for the Total Flood Warning System (TFWS) service. The assurance regime includes:

- a mapping process to describe the TFWS service
- a framework to facilitate the collection of consistent, relevant and quantifiable information or data to support rigorous monitoring and assessment of the performance of the TFWS
- a three-year schedule of assurance activities, including proactive and reactive reviews to test all aspects of the TFWS service.⁵⁴

The Committee did not receive a lot of evidence directly on the Total Flood Warning System, but some councils did advocate for changes to the System to shift away from council's being responsible for managing gauges. This issue is discussed in Section 6.2.2 above.

6.4 Alerting the community

Warnings during the 2022 event were extremely broad and created concerns within the community that led to a response and a great deal of effort.

Campaspe Shire Council, *Submission 650*, p. 4.

The Bureau issues its flood watches and warnings directly to Victorian stakeholders with emergency management responsibilities, such as the Victoria SES. It also communicates with the public via its website, the media (particularly the ABC), radio, social media and its telephone weather warning service.⁵⁵

The Bureau also emails flood warning messages to the SES⁵⁶ at the state and regional level. It is SES responsibility to disseminate local flood warnings and safety advice to emergency services, communities at risk and key state, regional and local support agencies. VICSES will maintain regular contact with the Bureau (and Melbourne Water if relevant) until the flood risk has passed.⁵⁷

VICSES uses local flood intelligence to interpret the likely local practical consequences of a flood watch or warning issued by the Bureau and develops detailed local safety advice to issue to communities at risk of flooding in the form of flood bulletins.⁵⁸

⁵⁴ Department of Environment, Land, Water and Planning, *Victorian Floodplain Management Strategy*, 2016, p. 64.

⁵⁵ Bureau of Meteorology, *Service Level Specification for Flood Forecasting and Warning Services for Victoria – Version 3.4*, p. 9.

⁵⁶ In Victoria, the Victoria State Emergency Service is the 'control agency' for floods which means they are primarily responsible for managing the emergency response to a flood event, and for establishing the management arrangements for an integrated response to flood emergencies.

⁵⁷ Emergency Management Victoria, *State Emergency Response Plan Flood Sub-Plan*, p. 15.

⁵⁸ Bureau of Meteorology, *National Arrangements for Flood Forecasting and Warning*, p. 45.

In its submission, the Victorian Government outlined the main platforms and channels used to transmit warnings during a flood event. It noted that the ‘channels the community uses to source information continue to evolve with technology’ and Victoria ‘must ensure systems and processes are built on principles that guide the timely provision of information and warnings’.⁵⁹

Table 6.6 below outlines the various channels and platforms used to transmit flood warnings.

Table 6.6 Platforms and channels for warnings

Platform	Description
VicEmergency	Provides a centralised location for Victorians to access emergency information and warnings. VicEmergency provides information through: <ul style="list-style-type: none"> • website • app • social media • hotline.
Emergency Alert	A national warning system which sends a voice message to landline telephones and a text message to mobile phone to deliver ‘critical warnings’.
Emergency broadcasters	The Victorian Government has formal arrangements with a number of media outlets to broadcast emergency warnings and information. Emergency Management Victoria administers Victoria’s emergency broadcasting policy on behalf of the state’s emergency service, this includes to: <ul style="list-style-type: none"> • 196 regional radio broadcasts • 12 metropolitan radio broadcast • television broadcasting via Sky News.

Source: Victorian Government, *Submission 295*, pp. 38–40.

The 2020 Royal Commission into Natural Disaster Arrangements assessed emergency warnings, determining they should be:

- timely
- locally tailored
- written in plain language
- not too long, but contain enough information to make decisions, including location, type and expected timing of the risk
- able to specify what actions to take
- from a trusted source.⁶⁰

Emergency Management Victoria conducted a review of the performance of emergency services and lessons that can be learned from an extreme weather event in 2021. It surveyed 802 people who were affected and found that there was a perceived

⁵⁹ Victorian Government, *Submission 295*, p. 38.

⁶⁰ Royal Commission into Natural Disaster Arrangements, *Final Report*, 2020, pp. 286–287.

lack of local detail and recommended actions associated with emergency warnings.⁶¹ In addition, the report notes that some felt the warnings were delayed, particularly in the early stages of the event.⁶²

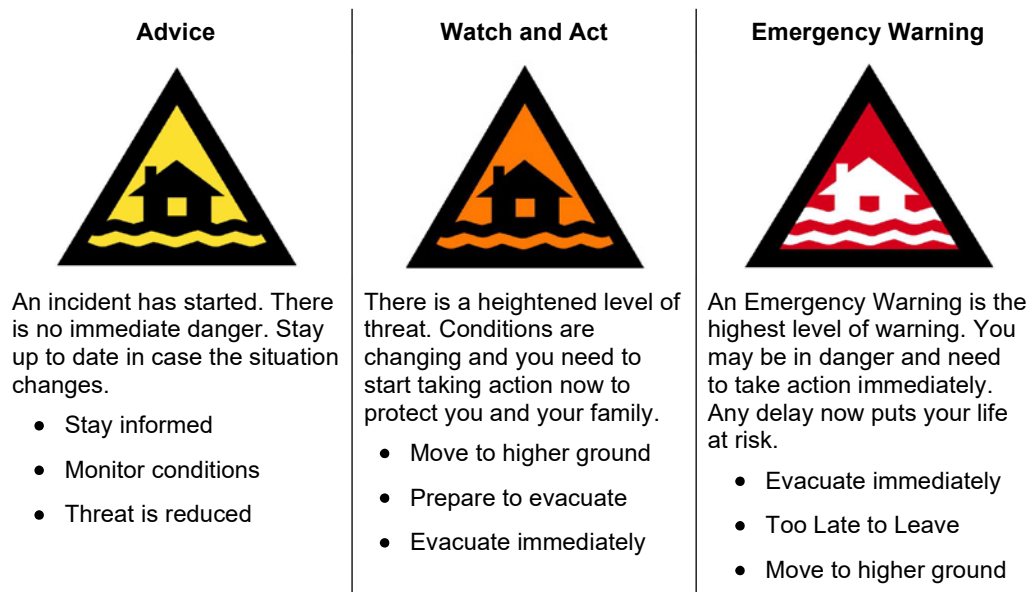
The review also found that it is important that people are aware of where to go for emergency warnings and other information. Half of the 800 people it interviewed as part of the review were not completely confident on how to access warnings and information in a future extreme weather event.⁶³

6.4.1 Australian Warning System

Since December 2021, Victoria has implemented the Australian Warning System for flood hazard warnings. Under the System, there are three warning levels: advice (yellow), watch and act (orange) and emergency warning (red) (see Figure 6.4 below).⁶⁴ Each warning level has three components:

1. Location and hazard type.
2. Action statement to guide protective action (for example, ‘Stay informed’).
3. Warning level on the severity of the hazard.⁶⁵

Figure 6.4 Australian Warning System for floods as employed in Victoria



Source: Victorian Government, *Submission 295*, p. 37.

⁶¹ Emergency Management Victoria, *June 2021 Extreme Weather Event Community Report*, 2022, p. 47.

⁶² *Ibid.*, p. 43.

⁶³ *Ibid.*, p. 47.

⁶⁴ Victorian Government, *Submission 295*, p. 37.

⁶⁵ *Ibid.*, pp. 37–38.

At a public hearing, Tim Wiebusch, Chief Officer Operations at the Victoria State Emergency Service, explained the development of the Australian Warning System:

The Australian Warning System was developed after quite a depth of social research into how people hear and receive those messages. It devised a three-tier warning system, which is advice, watch and act, and emergency warning. With those is then a range of action statements that were undertaken through those community research programs. That is what has now been adopted for flood, fire, storm, et cetera throughout Victoria. We have got the one single VicEmergency website and app to bring that all together so that people have a single place to go, whereas a number of jurisdictions still have multiple websites that people need to visit. But then off the back of that, we build into those warnings I guess tailored information, where available, based on things like flood studies which inform our intelligence cards.⁶⁶

The Committee received some evidence which suggested there is still some public uncertainty about the meaning behind the warnings. This has resulted in affected communities not understanding what actions to take and when.

A submission from the Victoria SES Volunteers Association noted that not everyone understands the differences for each warning level, stating:

Leaving aside local social demographic factors, it cannot necessarily be assumed that an average reader/listener will understand the definitions and differences of this terminology. The similarities of word usage in 'flood watch'(BoM) /'watch and act' (SES) or 'flood warning' (BoM)/'emergency warning' (SES) do not assist the reader in understanding the subtleties of their different meanings.⁶⁷

As one resident asked: "What does 'watch and act' mean? Should I go down and watch the river?"

Victoria SES Volunteers Association, *Submission 539*, p. 26.

The Committee notes that the 2022 flood event was the first time the Australian Warning System protocols were used for large scale flooding.⁶⁸ It did not receive a great deal of evidence directly on the System, but general concerns about public awareness of warnings suggests there is still some uncertainty. The adequacy and effectiveness of warnings during the 2022 flood event is discussed further from Section 6.5 below.

FINDING 35: The 2022 flood event was the first time the new protocols under the Australian Warning System were used for a large scale flood event.

⁶⁶ Tim Wiebusch, Chief Officer Operations, Victoria State Emergency Service, public hearing, Melbourne, 12 October 2023, *Transcript of evidence*, p. 4.

⁶⁷ Victoria SES Volunteers Association (VicSESVA), *Submission 539*, p. 26.

⁶⁸ Victorian Government, *Submission 295*, p. 46.

6.4.2 Number and amounts of warnings

The Victorian Government's submission provided some information about the number of warnings issued in flood affected areas in October 2022. As a high level summary, the Government explained:

Between 12 October and 12 December 2022, VICSES issued 4447 storm and flood-related emergency warnings to the public, with 285 of these on 14 October 2022 alone. This was the highest number of community emergency warnings issued for any single event in Victorian history. The 2022 Victorian Flood Event also marked the first time that new consistent [Australian Warning System] protocols were utilised for widespread flooding.⁶⁹

The Government also provided some information on specific locations, these are summarised in Table 6.7 below.

Table 6.7 Overview of emergency warnings issued in flood areas during October 2022 flood event according to the Victorian Government's submission

Location	First warning issued	Initial warning level	Highest warning level	Peak forecast	Observed peak (date)	Total warnings prior to peak ^a
Avoca River (Charlton)	13 October 2022	Moderate flooding	Major	6.7m	7.87m (17 October 2022)	13
Avoca River (Quambatook)	13 October 2022	Minor flooding	Minor flooding	2.4m	2.36m (21 October 2022)	16
Barwon River	13 October 2022	Moderate flooding	Moderate flooding	3.1m	3.85m (15 October 2022)	9
Broken River	13 October 2022	Minor flooding	Moderate flooding	2.5m	4.49m (14 October 2022)	6
Campaspe River (Rochester)	12 October 2022	Major flooding	Major flooding	Approx. 115.5m AHD	115.5m AHD	18
Goulburn River (Seymour)	13 October 2022	Moderate flooding	Major flooding	Approx. 8.2m	8.26m (14 October 2022)	13
Goulburn River (Shepparton, Mooroopna, Kialla and Murchison)	13 October 2022	Minor flooding	Major flooding	Approx. 12m	12.06m (16 October 2022)	43
Loddon River (Laanecoorie)	12 October 2022	Moderate flooding	Major flooding	Approx. 3m	8.4m (14 October 2022)	7

⁶⁹ Ibid., p. 46.

Location	First warning issued	Initial warning level	Highest warning level	Peak forecast	Observed peak (date)	Total warnings prior to peak ^a
Loddon River (Kerang)	21 October 2022	Minor flooding	Major flooding	77m AHD	77.9m AHD (21 October 2022)	26
Maribyrnong River	11 October 2022	Minor flooding	Major flooding		4.216m (14 October 2022)	6
Murray River (Echuca)	14 October 2022	Major flooding	Major flooding	95m AHD	94.99m AHD (26 October 2022)	24

a. Based on warnings referenced to in submission.

Source: Victorian Government, *Submission 295*.

The Committee wishes to make it clear that the above Table is not an exhaustive account of flood warnings issued during the 2022 flood event. Flood warnings were also transmitted by other channels and means, such as through local councils and social media posts.

The Committee was provided with information about warnings issued in relation to the October 2022 flood event. These have been provided in this report (see Appendix C). The Committee notes that at times information provided by stakeholders was inconsistent.

For example, Melbourne Water provided a summary of forecasts and warnings it and the Bureau issued in relation to the Maribyrnong flood event. Its summary indicated that the flood peak occurred between 8am and 9am on 14 October 2022 (based on information from the Keilor gauge).⁷⁰ In comparison, the Victorian Government's submission indicated the flood peak occurred just after midday on 14 October. This discrepancy of 3 to 4 hours is significant and does not give the Committee confidence in the data provided. The discrepancy in the information could be attributed to reliance on different gauge readings.⁷¹ However this is not articulated in the material provided.

For this Inquiry, the Committee did not receive a comprehensive timeline of warnings issued. This makes it more difficult to evaluate the effectiveness and appropriateness of warnings issued, in particular if warnings were timed so people could act.

FINDING 36: It was difficult for the Committee to determine the adequacy of emergency warnings issued during the 2022 flood event because data is collected across disparate agencies and is not consistent.

⁷⁰ See Appendix C.

⁷¹ Melbourne Water, *Submission to Maribyrnong Flood Review*, pp. 13–14.

As also found in Emergency Management Victoria’s review, evidence to this Inquiry suggested that many people felt there were insufficient warnings and delayed information inhibiting communities to respond quickly.

In its submission, Loddon Shire explained that the volume of warnings undermined their effectiveness:

Due to the warning ‘lifecycle’ in the Vic Emergency application, warnings were issued and reissued a number of times, sometimes after water had long receded. Because of the volume of warnings being issued/reissued both prior, during and after the event, the Vic Emergency notifications were somewhat unvalued, ineffectual and discredited as a source of truth during the event.⁷²

The Shire expanded that a large number of warnings can lead to ‘complacency’ and inaction:

[A] large number of flood warnings on the Loddon River were issued at locations like Bridgewater-on-Loddon and Newbridge townships. These warnings resulted in water levels ranging from no impacts on the community to significant impacts like those experienced in October 2022. This further exacerbates complacency with the warning system. The parameters of the warning categories need a review to make them more meaningful to the community.⁷³

Melbourne City Council’s submission provided feedback from community members about a perceived lack of warnings issued:

City of Melbourne’s community has raised concern about lack of notification and emergency warnings for the Kensington and West Melbourne areas in the lead up to the flooding incident. The following was submitted by a local community member to our Participate Melbourne engagement platform:

“The whole of Hobsons Road (Kensington) was badly affected by flooding in October 2022—far more than the usual standing water after heavy rain - but no notifications from emergency apps were given that action was required.”⁷⁴

At a public hearing, Ken Skinner from the Traralgon Community Recovery Committee, provided an anecdote where ‘too many’ warnings were being received:

If you take the VicEmergency app, for instance, I get messages every hour that the Latrobe River is in flood. As it is going down, if it is above the minor flood level, I continually get those messages, as opposed to the ones when it is going up and going to be flooding.⁷⁵

⁷² Loddon Shire Council, *Submission 749*, p. 4.

⁷³ *Ibid.*, p. 5.

⁷⁴ City of Melbourne, *Submission 296*, p. 7.

⁷⁵ Ken Skinner, Traralgon Community Recovery Committee, public hearing, Melbourne, 21 November 2023, *Transcript of evidence*, p. 37.

However, some stakeholders felt that there was a sufficient number of warnings. The Campaspe River Reserve Committee reflected that:

We knew that the flood was coming as more warning systems had been put in place after the Flood event of 2011 and we were well informed, but the extent of this flood height was the problem.⁷⁶

In the Committee's view, the emergency warning system can be made more effective ensuring that warnings are both impactful and actionable, enhancing community safety and responsiveness during emergency situations. During the 2022 flood event, warnings were transmitted at an inconsistent frequency with people in some areas reporting that they experienced excessive warnings whilst others were concerned that they received only limited or delayed notifications.

FINDING 37: During the 2022 flood event, the transmission of emergency warnings was inconsistent across affected communities. Some areas received excessive warnings from competing sources whilst others received incorrect, limited or delayed warnings. In both circumstances communities experienced a degree of confusion which limited people's capacity to make informed decisions.

In relation to community flood warnings, and as an example of best practice, retired Manager of Emergency Management at Latrobe City Council Lance King AFSM said:

Community expectation is also a key factor in enhancing community resilience.

In 2010 Latrobe City implemented an opt in warning system whereby Latrobe City Council (LCC) contacted all the property owners, businesses and residents within the one in one-hundred-year flood overlay (provided by West Gippsland Catchment Management Authority and used by VicSES in flood planning) to request phone contact details so they could be warned by council in the event of a possible flood. We had over 600 private numbers logged into the system both mobile and home based and proved to be a successful resolution to meet community needs. With the implementation of the State Government Emergency alert system this LCC warning system became redundant as the incident controller had the ability to contact all phones within an impact or possible impact area. This brings me to the issue of Agency empowerment – delegated authority, with the technology available to Incident Controllers, why is direct authority not given to Incident controllers to use this in a timely manner to warn the community? As the incident controller is closest to the impacted area and liaising directly with community local knowledge.⁷⁷

RECOMMENDATION 43: That the Victorian Government use the experience of warnings transmitted during the 2022 flood event to identify and adopt best practice for community warning frequency.

⁷⁶ Campaspe River Reserve Committee, *Submission 384*, p. 2.

⁷⁷ Lance King AFSM, *Submission 283*, p. 2.

6.4.3 VicEmergency

VicEmergency is the official source of emergency information and warnings for Victoria, including for floods. VicEmergency provides information through several channels:

- the VicEmergency app, which can be downloaded on a phone, tablet or other device
- website
- social media channels
- a hotline.⁷⁸

The Victoria SES distributes flood bulletins which describe the possible consequences of flooding, and localised safety advice and recommendations through the VicEmergency website and media outlets.⁷⁹ The SES can also disseminate flood warnings through Emergency Alert, the national telephone warning system which can send a text message to mobiles and a voicemail to landline phones within a specific geographical area.⁸⁰

Data for warnings is supplied by the Bureau of Meteorology, as discussed above.

Table 6.8 below gives examples of the SES' interpretation of BoM's flood warnings.

Table 6.8 Examples of Victoria SES interpretation of Bureau flood warnings

Minor flood warning	Means that floodwater could: <ul style="list-style-type: none"> • Reach the top of the riverbanks. • Come up through drains in nearby streets. • Cover low-lying areas including riverside camping areas. • Affect some low-lying caravan parks. • Cover minor roads, tracks and low level bridges. • Spread across land or go into buildings on some properties and farms.
Moderate flood warning	Means that floodwater could: <ul style="list-style-type: none"> • Spill over riverbanks and spread across low-lying areas. • Start to threaten buildings, roads, rail, power and other developments. • Require evacuation in some areas. • Cover main roads.
Major flood warning	Means that floodwater could: <ul style="list-style-type: none"> • Cause widespread flooding. • Threaten more houses and businesses. • Cause properties and whole areas to be isolated by water. • Disrupt major roads and transport routes. • Require many evacuations.

Source: Victoria State Emergency Service, *Know your hazards – Floods*, <<https://www.ses.vic.gov.au/know-your-hazards/flood>> accessed 5 April 2024.

⁷⁸ Victorian Government, *Submission 295*, p. 38.

⁷⁹ Emergency Management Victoria, *State Emergency Response Plan Flood Sub-Plan*, p. 10.

⁸⁰ Bureau of Meteorology, *National Arrangements for Flood Forecasting and Warning*, pp. 20–21.

The Committee heard concerns from stakeholders that during the 2022 flood event information transmitted from VicEmergency was inaccurate or difficult to understand.⁸¹ In its submission, Campaspe Shire Council said that the updates on VicEmergency were too slow, which meant the information lacked accuracy by the time it was conveyed:

The VicEmergency App and website played a significant role in the confusion of the public and Council staff. Data was inaccurate and slow to be updated. Rather than a single source of truth / or access to factual information, social media became the primary source of information for residents. As is the nature of social media, rumour and misinformation can take the place of authorised information from lead agencies.⁸²

Experiencing the army knocking on your door telling you to evacuate when the VicEmergency app still stated you were in a 'watch and act' zone was confronting and caused significant trauma to our clients and our staff.

Leah Taaffe, Chief Executive Officer, Community living and respite services, public hearing, Echuca, 24 August 2023, *Transcript of evidence*, p. 62.

Councillor Rob Amos, Mayor of Campaspe Shire Council, contended that the VicEmergency app is 'quite good' but in the midst of an emergency can be difficult to interpret information and warnings:

when there is so much going on you open the app and there is this mess of colours on your screen that is very hard to decipher, even to the stage where just a couple of months ago we had another high water event with the Murray, literally a couple of months ago, and there was some minor flooding below Torrumbarry and towards Barham. If you looked on the app, there was just yellow everywhere saying that there was a 'watch and act' on this. This affects us not directly from an emergency point of view but from a tourism point of view, because we are seriously trying to recover. People who are in Melbourne open their app and there is just yellow everywhere saying stuff is going on. 'See you later. We're not coming.'⁸³

Some stakeholders said there was a lack of tailored information on VicEmergency, particularly for rural localities. They suggested that the lack of detail meant it was harder for important response decisions to be made by communities, such as road closures.

⁸¹ For example, see: Swan Hill Rural City Council, *Submission 642*, p. 7.

⁸² Campaspe Shire Council, *Submission 650*, p. 4.

⁸³ Cr Rob Amos, Mayor, Campaspe Shire Council, public hearing, Echuca, 24 August 2023, *Transcript of evidence*, p. 13.

Buloke Shire Council stated:

The VicEmergency App is customer-focussed and not detailed enough for specific localities and councils to use effectively in emergency response. The VicRoads website was unable to update in real time (or indeed, even close to real time) causing major issues with reference to detours and Council-closed roads.⁸⁴

Emma Germano, President of the Victorian Farmers Federation, spoke about the need for rural communities to have confidence in the VicEmergency app:

every Victorian should know that the VicEmergency app can give them the information that they need about whatever is going on and it should cater also to the farm community.⁸⁵

Conversely, other stakeholders contended that the purpose of VicEmergency is to provide generalised warnings, albeit that communities know where to access detailed information to make informed decisions. At a public hearing, Lance King, former Emergency Management Manager at Latrobe City Council, argued that VicEmergency is 'appropriate' for general information:

I know they send out lots and lots of updates in relation to the Latrobe River or whatever river it is and the flood level that it is at, but the critical part of the information flow comes to that scripted 'minor', 'moderate' and 'major' flooding for your location. So the generalised stuff – 'It's flooding from Yallourn all the way to Rosedale' and 'It's dropping' or 'It's rising' or whatever – comes out is fine, but then that targeted scripted stuff is the important stuff for the community; that is the trigger for them to make informed decisions.⁸⁶

A number of stakeholders advocated for a review of VicEmergency to ensure that it provides accurate and timely warnings, including:

- Rural Councils Victoria⁸⁷
- Gannawarra Shire Council⁸⁸
- Campaspe Shire Council⁸⁹
- Northern Victorian Emergency Management Cluster.⁹⁰

⁸⁴ Buloke Shire Council, *Submission 690*, p. 4.

⁸⁵ Emma Germano, President, Victorian Farmers Federation, public hearing, Seymour, 14 September 2023, *Transcript of evidence*, p. 64.

⁸⁶ Lance King, Former Manager, Emergency Management, Latrobe City Council, public hearing, Melbourne, 21 November 2023, *Transcript of evidence*, p. 38.

⁸⁷ Rural Councils Victoria, *Submission 559*, p. 12.

⁸⁸ Gannawarra Shire Council, *Submission 637*.

⁸⁹ Campaspe Shire Council, *Submission 650*.

⁹⁰ Northern Victorian Emergency Management Cluster, *Submission 515*.

The Committee believes there is merit in reviewing the VicEmergency service to ensure it meets best practice principles for emergency warning systems. Evidence to the Inquiry clearly demonstrates that there are areas for improvement, and the Government should endeavour to include stakeholders in its review.

FINDING 38: Stakeholders reported that during the 2022 flood event, delayed or inaccurate information on the VicEmergency service added to the confusion among affected communities making it more difficult to make informed decisions.

RECOMMENDATION 44: That the Victorian Government improve the accuracy, timeliness, and relevance of the VicEmergency service during an emergency. In doing so, the Government should actively seek input from non-government and government stakeholders to ensure that the service can meet the diverse needs of different communities during a crisis.

6.4.4 Emergency Alert

‘Emergency Alert’ is a national warning system which sends a voice message to landline telephones and a text message to mobile phones to deliver critical emergency warnings. The alert message provides information about what actions a community may need to make. It is not deployed in all emergencies; its use depends on the nature and severity of an event.⁹¹

To receive an Emergency Alert, the system considers the phone billing address in a specific location (identified by emergency services) or if a mobile phone recently accessed a phone tower in the area. Alerts are not received if there is no phone service, or a phone is turned off.⁹²

In October 2022, 17 Emergency Alert campaigns were issued. In a response to a question on notice, the Department of Justice and Community Safety provided the date, time and location of each Alert (see Table 6.9 below).

The data supplied in Table 6.9 reveals that Emergency Alerts were not issued for Murchison, Toolamba, Mooroopna or Shepparton between 14–16 October, despite these communities experiencing major flooding during this period. It also reveals an alert was issued for Shepparton on 25 October after flood waters had passed.

⁹¹ Victorian Government, *Submission 295*, p. 39.

⁹² *Ibid.*

Table 6.9 Emergency Alerts issued in October 2022 for flooding

Date	Time	Location
13 October 2022	5:17 pm	Rochester
	7:46 pm	Carisbrook
	9:13 pm	Benalla
	9:36 pm	Seymour
14 October 2022	1:18 am	Wedderburn
	2:25 am	Wangaratta
	3:35 am	Charlton
	3:45 am	Benalla
	4:25 am	Maribyrnong
	6:01 am	Maribyrnong
15 October 2022	4:11 am	Echuca and Echuca Village
16 October 2022	8:28 am	Echuca and Echuca Village
	4:27 pm	Loch Gary Camping Area
	10:12 pm	Iraak
19 October 2022	1:43 pm	Kerang
25 October 2022	2:03 pm	Shepparton
30 October 2022	5:02 pm	Bogong Village Landslide

Source: Department of Justice and Community Safety, *Response to Questions on Notice*, response received 16 November 2023, p. 6.

Some of this information was also included in the Victorian Government’s submission which provided the additional context of number of phones reached by the alerts, namely:

- Rochester—delivered to 1,183 landlines and 6,058 mobile phones
- Seymour—delivered to 1,014 landlines and 7,953 mobile phones
- Echuca—delivered to 1,014 landlines and 7,953 mobile phones.⁹³

At a public hearing, representatives from the Victoria SES explained how the Emergency Alert system operates:

It is certainly a recorded message that gives the alert. Each of those is referring people back to the VicEmergency website, so they are not getting in that text message the full warning. It is alerting you to the fact that there is a warning and that you need to go and seek out further information or listen to your emergency broadcaster. In this event the current emergency alert system can only sustain five campaigns at a time, and that is why the federal government is now investing in a national messaging system – an

⁹³ Ibid., pp. 75, 78, 84.

NMS – which will be more like a phone-based app notification which can get to a much broader number at the same time.⁹⁴

On addressing the limitations posed by campaign caps, Tim Wiebusch, Chief Operations Officer at the Victoria State Emergency Service, told the Committee:

So we need to be selective where we use emergency alerts in terms of making sure that if we need to be alerting different communities – quite often an emergency alert will be quite targeted to where we are doing it. We are not doing it on a broad scale necessarily to every person⁹⁵

In their evidence, the Department of Justice and Community Safety made it clear that the Emergency Alert service is one part of Victoria’s emergency warning toolkit. Whilst there has been feedback in Inquiry evidence and other channels, that the service should have been better utilised, the Department cautioned:

Like all warnings, agencies should be mindful that overuse of Emergency Alert may contribute to community complacency and/or the community becoming desensitised to the importance of the warning content.⁹⁶

It is not necessarily that emergency alert is the silver bullet for delivering the alert. There are a range of tools that we will use to get to those communities to try and make sure they are hearing the message.

Tim Wiebusch, Chief Operations Officer, Victoria State Emergency Service, public hearing, Melbourne, 12 October 2023, *Transcript of evidence*, p. 22.

Evidence received by the Inquiry about warning systems used during the 2022 flood event suggested that digital warnings were hampered by connectivity issues (see Section 6.5.2 below). On this basis, the Committee sought to understand whether this could have also affected the Emergency Alert system. In a response to a question on notice, the Department of Justice and Community Safety advised that:

The sending of emergency messages to mobile phones relies on land-based reception (and does not utilise satellites), if a mobile phone does not have reception, it will not receive an Emergency Alert notification.⁹⁷

Further, the Department outlined initiatives from the Victorian and Australian Governments to address phone connectivity issues during an emergency:

- The Victorian Government has—
 - supported the development of ‘emergency roaming capability’ since the 2019–20 bushfires which can provide a ‘vital link when telecommunication services are impacted’
 - advocated for continued improvements at the national level.

⁹⁴ Tim Wiebusch, *Transcript of evidence*, p. 13.

⁹⁵ *Ibid.*

⁹⁶ Department of Justice and Community Safety, *Response to Questions on Notice*, response received 16 November 2023, p. 20.

⁹⁷ *Ibid.*, p. 7.

- On 23 October 2023, following findings from the Australian Competition and Consumer Commission’s report into regional mobile infrastructure, the Australian Government announced its intention to scope emergency roaming capabilities to ensure Australian are ‘connected during natural disasters’.⁹⁸

The Australian Government has signalled its intention to build a ‘National Messaging System’. As part of its 2023–24 Budget, the Australian Government committed funding over four years to build a system which ‘targets messaging in real time during emergencies’. The National Emergency Management Agency outlined the objectives of the project on its website, stating:

The NMS is intended to reliably deliver telephony-based warning messages to compatible devices, locally, regionally and nationally, in near real-time. Cell broadcast technology enables a point-to-area communication between mobile operator’s radio cell tower(s) and all devices in a specified geographic area.

This system will enable prioritised near real-time messages to mobile devices in defined geographic areas during emergencies such as bushfires, floods, and events affecting national security.⁹⁹

According to the Agency, a National Messaging System is advantageous because:

- Standards based – Cell Broadcast is defined by international standards and supported on carrier networks. The system will be upgraded in line with future changes to the international standards.
- Internationally proven - There are many countries already using Cell Broadcast as the basis for a public warning system. There are 21 of the 33 developed nations that have deployed telephony-based public warning systems are employing Cell Broadcast, including Canada, Japan, Netherlands, New Zealand, South Korea, the United States, and the United Kingdom (in progress).
- Message priority levels - Messages can be sent with varying levels of priority. Priority levels may be used to differentiate how messages of varying levels of importance are displayed on a receiving mobile.
- Message delivery not impacted by network congestion - Cell Broadcast technology is not affected by, nor does it contribute to, network congestion which is a common occurrence during emergency and disaster events. During periods of network congestion, Cell Broadcast messages can still be delivered to mobiles without interruption or delay.
- Speed of delivery - Compatible devices in the coverage area can receive Cell Broadcast messages simultaneously without having to wait for a message to be specifically sent to that device. Messages can be sent and received in near real-time.
- Message length - Cell Broadcast supports messages of up to 1,395 characters.¹⁰⁰

⁹⁸ Ibid.

⁹⁹ National Emergency Management Agency, *National Messaging System: Connecting Australia in times of disaster*, <<https://nema.gov.au/about-us/budget-2023-24/National-Messaging-System>> accessed 3 April 2024.

¹⁰⁰ Ibid.

The Committee acknowledges the important role of the Emergency Alert system within the broader toolkit for emergency warnings during natural disasters. Evidence to the Inquiry showed that it provides important and timely information to at-risk communities. In October 2022, the Alert System was used numerous times to disseminate information and warnings to affected communities.

However, it is clear there are inherent limitations with the current system. Specifically, its reliance on land-based network reception and restrictions on simultaneously managing concurrent alert campaigns. These limitations demonstrate a need to improve phone-based messaging during a crisis.

The Committee notes the recent commitment from the Australian Government to develop a National Messaging System. It hopes that the system will be developed with a clear view of mitigating against existing limitations experienced by the Emergency Alert system.

FINDING 39: The national Emergency Alert system is an important tool for supporting a multi-pronged approach to warnings during a crisis. However, it is subject to some limitations, notably its reliance on land-based reception and limited capacity to sustain multiple alert campaigns simultaneously.

FINDING 40: The development of a National Messaging System is an important forward-looking initiative to improve warnings during a natural disaster, however, any system must ensure it is addressing the constraints and limitations currently experienced under the Emergency Alert system.

6.4.5 Use of social media

During a crisis, it is not uncommon for emergency services to utilise social media to publish information. As noted in Section 6.4.3, social media channels are one platform for VicEmergency information but can also be used by other agencies, local communities and other parties. For example, the Victorian Government noted that sandbag locations were published on social media by government agencies to advise residents of collection points.¹⁰¹ As part of its community communication efforts, social media posts from the Bureau of Meteorology reached over 2.5 million people.¹⁰²

¹⁰¹ Victorian Government, *Submission 295*.

¹⁰² Bureau of Meteorology, *Submission 295*, p. 7.

Committee for Greater Shepparton

Many members highlighted the success of the GV Floods Group Facebook page as a key source of information for them during this emergency. This page included information from both formal and informal sources, including pictures and footage of the flood effected region. This was often described as the go to source for both business and individuals, and even referred to as their single source of truth and was key in sharing information including local intelligence gathered by residents and business for example local road closures and whether roads were suited to heavy vehicles.

Source: Committee for Greater Shepparton, *Submission 393*, p. 10.

Social media can be an effective tool for transmitting information quickly, such as the location of available sandbags, the establishment and location of relief centres, and other information. The Committee for Greater Shepparton emphasised the important role social media played in ensuring the region ‘stay[ed] connected’ during the floods. It noted that whilst it was not a ‘formal channel of communication’ it was a ‘lifeline for many’.¹⁰³ The Committee for Greater Shepparton highlighted the example of a community-led Facebook group and its importance for communicating during the floods:

Many members noted this page became their ‘single source of truth’, in the absence of timely and accurate communications. Many members noted that they learned of key decisions such as the closure of the Causeway, key emergency relief contact numbers and flood impacts via the GV Floods Facebook page.¹⁰⁴

It also noted the usefulness of WhatsApp for employers, particularly its capacity to ‘automatically translate key messages into diverse languages’.¹⁰⁵ The accessibility of warnings and other information is discussed further in Section 6.5.1.

A joint submission from the Ethnic Communities’ Council of Victoria, Neighbourhood Collective Australia and Regional Victorians of Colour also noted that social media was used by community leaders to translate agency information:

Community leaders made hundreds of personal phone calls, as well as interpreting agency messaging into voice and video recordings. These were sent through existing in-language WhatsApp groups and posted on in-language Facebook pages.¹⁰⁶

¹⁰³ Committee for Greater Shepparton, *Submission 393*, p. 10.

¹⁰⁴ Ibid.

¹⁰⁵ Ibid., p. 11.

¹⁰⁶ Ethnic Communities’ Council of Victoria, Neighbourhood Collective Australia and Regional Victorians of Colour, *Submission 697*, p. 7.

Daniella Moore

The Rochester Community Facebook page was the only consistent vehicle to receive information, the admins for this page were the only light in some dark days and they continue to do this every day seven months on.

Source: Daniella Moore, *Submission 608*, p. 1.

However, stakeholders emphasised the need for caution when using social media to provide emergency warnings and information. In a submission provided by Steven Tucker (Emergency Management Coordinator at the Rural City of Wangaratta), he emphasised that volunteer emergency services 'should be encouraged to lead and communicate directly and social media can facilitate this'.¹⁰⁷ Noting that:

care with the choice of words, or tone of the intended message, needs to be at the forefront to ensure that messaging is consistent with the stage of the emergency event, or the level of actual threat, or being forecast.¹⁰⁸

At a public hearing, Cr Rob Amos, Mayor of Campaspe Shire Council, noted that social media 'became a go-to source of information' for residents instead of emergency service applications or services.¹⁰⁹ However, like some of the information on official channels, social media can be outdated or incorrect:

the problem we had – you put messages on Facebook or on the different social medias and so on, but if someone is just working all day doing stuff, filling sandbags and flicks past their feed, by the time they look at it when they are having a beer at 7 o'clock at night it has gone.¹¹⁰

The lack of ubiquitous access to social media was raised by stakeholders as another limitation of using it as the main source of urgent or important information. Julie Golledge discussed social media used for information about the Echuca flooding:

We were able to follow the Echuca Community page and the Campaspe Shire pages on social media for information as to what was happening. Many people do not have access to those forms of communication.¹¹¹

This was echoed by other submitters. Leonie Lomax argued that it was 'ridiculous' to ask people to find emergency information via social media channels, noting for example that elderly residents may not have mobile phones or have social media.¹¹²

¹⁰⁷ Steve Tucker, *Submission 361*, p. 1.

¹⁰⁸ Ibid.

¹⁰⁹ Cr Rob Amos, *Transcript of evidence*, pp. 10–11.

¹¹⁰ Ibid., p. 22.

¹¹¹ Julie Golledge, *Submission 356*, p. 2.

¹¹² Leonie Lomax, *Submission 692*, p. 1.

The issue of digital connectivity during emergencies is discussed further in Section 6.5.2 below.

Social media disinformation

Sadly social media has been in a frenzy with all sorts of rumours being spruiked as the truth (as it does) about roads being closed or opened or predicted levels, and so many things that affect people and no effort has been made from those who do know, to allay the fears or keep people informed.

Community feedback provided to Victoria SES Volunteers Association, *Submission 539*, p. 81.

The issue of false information and rumours spreading during the flood event was noted by several stakeholders.¹¹³ This contributed to greater uncertainty and confusion for affected residents, with some people not treating warnings seriously or not taking action proactively. Some stakeholders attributed the dissemination of false information circulating on social media to inaccurate information on official warning channels.

In its submission, the Swan Hill Rural City Council stated that:

There has been concern expressed that the VicEmergency App was inaccurate.

In some cases, rumours (inaccurate) were reported in the absence of timely information from official sources. Rumours were amplified by social media.¹¹⁴

Campaspe Shire Council also noted the importance of the VicEmergency service but contended that its slow information updates resulted in people using social media as their 'primary source of information'. As a result, residents were at risk of being exposed to 'rumour and misinformation' which was taking the place of 'authorised information from lead agencies'.¹¹⁵ Similarly, the Murray River Group of Councils explained that social media was a source of information for 'anxious residents' but unfortunately these platforms 'can amplify misinformation as much as it disseminates accurate information'.¹¹⁶

Whilst social media played an important role in disseminating information during the 2022 flood event, the Committee heard accounts of disinformation spreading. The Committee notes concerns from stakeholders about inaccurate information on social media affecting the ability of communities to make informed decisions. It stresses that it is imperative for emergency services and official communication channels to adopt proactive communication approaches, including leveraging their own social media channels. This did occur in 2022 with some agencies using social media to update communities.

¹¹³ For example, see: Murray River Group of Councils, *Submission 747*; Gannawarra Shire Council, *Submission 637*.

¹¹⁴ Swan Hill Rural City Council, *Submission 642*, p. 7.

¹¹⁵ Campaspe Shire Council, *Submission 650*, p. 4.

¹¹⁶ Murray River Group of Councils, *Submission 747*, p. 10.

FINDING 41: During the 2022 flood event, social media played an important role in disseminating information. However, its unregulated nature meant it contributed to the spread of misinformation leading to heightened confusion and uncertainty.

FINDING 42: Social media cannot replace official warning channels as the primary source of information during a crisis event. It is important that official sources take a proactive approach to communication to prevent residents relying on social media.

6.5 Adequacy and effectiveness of warning systems

Once flood warnings are issued by emergency services, it is important that people have the right information to act and know what actions to take. Natural disasters such as floods are highly stressful situations that can impact how an individual would normally understand and respond to information. Such situations may require individuals to make difficult decisions in a short amount of time, with limited or non-specific information.¹¹⁷

The Committee received significant evidence which questioned the adequacy and effectiveness of warning systems. A number of stakeholders—such as local councils¹¹⁸—advocated for a review of early warning systems to ensure they are fit for purpose.

In its submission, Murrindindi Shire Council provided an example of where early warnings were inadequate for the region:

An emergency warning was released through the Vic Emergency App, but this did not specify the release volume and only reached those people who use the App and who were proactively monitoring it. What was really needed was notice to the SES of the actual projected megalitres/day to be released and for an urgent text message to go out to everyone within the catchment (like they do in the USA for tornado warnings), and for [Goulburn-Murray Water] to also publish that information on their Facebook account and push it to the local Emergency Broadcaster and SES units. (Publishing on their website is not sufficient, as there is no trigger for people to check. It relies on farmers monitoring their website every hour, which is not practical).¹¹⁹

¹¹⁷ Royal Commission into Natural Disaster Arrangements, Final Report, 2020, p. 286.

¹¹⁸ For example, see: Mitchell Shire Council, *Submission 521*; Maribyrnong City Council, *Submission 530*; Brimbank City Council, *Submission 286*.

¹¹⁹ Murrindindi Shire Council, *Submission 703*, p. 6.

Maribyrnong City Council

In the days leading up to the flood of Friday 14 October 2022, information for the community on VicEmergency and information provided to Council from VICSES, fluctuated between major and minor flooding. The final advice issued to Council on the afternoon of 13 October regarding consequences for Maribyrnong were limited to a flood that would impact the Anglers Tavern and several residential properties.

The first time many residents were told to evacuate was via inconsistently distributed text messages sent in the early hours of 14 October. The river ultimately peaked at 4.2 metres, significantly higher than predicted the night before.

On the morning of the flood, we saw families escaping flood waters by moving to the roof of their home and having to be evacuated by boat given the speed and level of the river rise. This fluctuation and advice meant that residents were confused and were not sure how they should respond, if they should respond at all. The early morning text messages, delivered between 4–6am, meant that most residents were asleep during the key warning period.

Source: Maribyrnong City Council, *Submission 530*, p. 3.

Evidence to the Inquiry on the adequacy of flood warning systems paints a complex picture. The Murray River Group of Councils highlighted the inconsistent nature of flood warnings, noting that they:

varied greatly across the [Murray River Group of Councils] region; not only from municipality to municipality but within Council areas, depending on the type of flooding experienced.¹²⁰

This variability suggested a lack of uniformity in how warnings were issued and understood across different areas.

Maribyrnong City Council emphasised the broader implications of flood events, stating:

Given the immediate and ongoing health and wellbeing, social and economic impacts of environmental disasters on the community, it is critical that a review and assessment of warning systems is undertaken.¹²¹

The Council also stressed the importance of collaboration between various entities 'to ensure that this information is accessible to the community'.¹²²

¹²⁰ Murray River Group of Councils, *Submission 747*, p. 8.

¹²¹ Maribyrnong City Council, *Submission 530*, p. 3.

¹²² Ibid.

Campaspe Shire Council pointed out a significant issue with the clarity of warnings, highlighting that residents expressed ‘confusion in what each warning meant, treating them as advice only rather than an articulated warning to leave the area’. The Council cautioned that this confusion could lead to inaction in critical times, potentially endangering lives.¹²³

The Victoria SES Volunteers Association questioned the accessibility and comprehension of warning information, querying:

While the accuracy and timeliness of the information may be arguable, there are other associated considerations:

- a) Does the community understand the roles and responsibilities of these agencies (do they even know they exist)?
- b) Do they know where to access the information and are the sites easily navigable?
- c) Do they understand the context of the published information, and are able to apply it to their personal circumstances?
- d) Do they speak and read English?
- e) Do they own a computer?¹²⁴

Drawing on his personal experiences rather than his formal role, Cameron David Lovering from Rochester Salvation Army observed that ‘the communicated warning was best case scenario’ but argued that ‘you should always prepare for the worst case scenario’.¹²⁵ This highlighted a gap between the optimistic scenarios often communicated and the need for preparing communities for the worst.

Concerns raised by stakeholders about the adequacy of warning systems underscore the need for a thorough reassessment and enhancement of flood warning systems. These systems must be clear, effective, and accessible to ensure communities are properly informed.

FINDING 43: During the 2022 flood event, the adequacy and effectiveness of early warnings varied from municipality to municipality. Some communities experienced timely and accurate information whilst others lacked sufficient information.

¹²³ Campaspe Shire Council, *Submission 650*, p. 4.

¹²⁴ Victoria SES Volunteers Association (VicSESVA), *Submission 539*, p. 23.

¹²⁵ Cameron David Lovering, RSL Rochester, The Salvation Army Rochester, public hearing, Rochester, 23 August 2023, *Transcript of evidence*, p. 56.

FINDING 44: Early warnings issued during the 2022 flood event demonstrated several issues:

- inconsistent dissemination and clarity of warnings and information
- information was delayed or inaccurate, or did not contain sufficient detail for the public to make informed decisions
- some community members lacked awareness of where to access information, resulting in some over-relying on social media information.

RECOMMENDATION 45: That the Victorian Government improve the flood warning system so that warnings are:

- accurate with the most up-to-date information
- delivered in a timely way
- clear and easily understood
- consistently disseminated across different communities
- accessible in relevant formats and languages, where appropriate.

6.5.1 Accessibility of warnings

We were interpreting the emergency information, providing reassurance, updates, how high is the water, can we drive? And this could be at any time of the day or night, there was no option to clock off. Then there were phone calls when people realised they needed to evacuate but had left it too late or didn't know how. Some had tried calling 000 but had not understood, others didn't know to call 000.

Ethnic Communities' Council of Victoria, Neighbourhood Collective Australia and Regional Victorians of Colour, *Submission 697*, p. 6.

Stakeholder evidence demonstrates an urgent need for enhanced accessibility in flood warning systems to cater for the diverse needs of the Victorian community. Stakeholders called for the development and implementation of more inclusive and accessible warning systems, something that could be achieved in collaboration with at-need communities.

In its submission, the Maribyrnong City Council stressed the ‘need for a more accessible format of emergency warning systems’.¹²⁶ The Council noted a recommendation from the 2011 Comrie Review which called for:

a standard approach to the provision of emergency warnings and information in formats —spoken and written—that recognise diverse community needs, including language and disability.¹²⁷

This is reflective of the broader sentiment that existing emergency communication strategies lack inclusivity, particularly for non-English speakers and individuals with disabilities.¹²⁸

Maribyrnong City Council highlighted the VicEmergency app as one tool which needs to be adapted so that it can cater to linguistically diverse community members:

It is our understanding that the VicEmergency App does not provide warnings in any other language other than English or a format that other than written. Implementing this recommendation in consultation with community members with a disability or from non-English speaking backgrounds would ensure that everyone had access to critical information in a time of emergency.

This approach should also be applied to information sent by text message in the lead up to and during an event. It is acknowledged that these are not necessarily easy solutions to implement but ensuring the public information and warnings are in a format that is accessible to all of the community it critical. Council’s Municipal Emergency Management Plan (MEMP) identifies the diverse community of our City and we would welcome the opportunity to work with the relevant departments across State Government to test and pilot changes to these warning systems.¹²⁹

English is not the first language of many. All the information is often provided in English. How do you get that to those most vulnerable that cannot speak English in a timely fashion when you have got water raging down the river that is going to inundate our community?

Cr Shane Sali, Mayor, Greater Shepparton City Council, public hearing, Mooroopna, 13 September 2023, *Transcript of evidence*, p. 2.

Highlighting specific challenges, the Federation of Community Legal Centres pointed out during the 2022 floods there were situations where ‘people were not properly able to understand the communication of flood risk because it is presented in a language they do not understand’ and when ‘messages were disseminated via a channel with which they were unable to engage’.¹³⁰ This demonstrates that there is a gap in current

¹²⁶ Maribyrnong City Council, *Submission 530*, p. 4.

¹²⁷ Neil Comrie AO, *Review of the 2010–11 Flood Warnings and Response*, Final Report, 2011, p. 7. Also see: Maribyrnong City Council, *Submission 530*, p. 4.

¹²⁸ Maribyrnong City Council, *Submission 530*, p. 4.

¹²⁹ *Ibid.*

¹³⁰ Federation of Community Legal Centres, *Submission 674*, p. 20.

flood warning systems where essential risk communication may not be universally accessible.

At a public hearing, Leigh Findlay, Board Chair, Committee for Greater Shepparton, outlined community frustrations about the:

reach, relevance, length and simplicity of warnings in a regional city where one in six speaks a language other than English, where there are many very different experiences of flooding and where social media translation was relied on to convert the content material.¹³¹

A joint submission from multicultural community organisations¹³² observed that ‘newly arrived communities almost entirely relied on multicultural community leaders for information’.¹³³ The submission contended there was a significant disconnect between emergency services’ communication strategies and the channels through which these communities receive information.¹³⁴

In its submission, the Victorian Government outlined the ways warnings are currently delivered in more accessible formats, namely by:

- For people who would like information in a language other than English, calling the Translating and Interpreting Service to ‘request translated information from the VicEmergency Hotline’.
- For people who require hearing and speech services, contacting the Hotline via the National Relay Service for—
 - teletypewriter services
 - speak and listen services
 - internet relay services.¹³⁵

Our experience of the early warning system was that it was not accessible because you needed to have internet access, and that is patchy; and it was not accessible because we were not able to understand it. The language used in it is confusing and unclear to someone who is fully literate and has no cognitive impairment; it is completely inaccessible to someone who has an intellectual disability, is illiterate or is impacted with cognitive decline. It was wrong, it was incorrect and it was slow to be updated – and it was ineffective, because people lost trust in its efficacy and its accuracy.

Leah Taaffe, Chief Executive Officer, Community living and respite services, public hearing, Echuca, 24 August 2023, *Transcript of evidence*, p. 62.

¹³¹ Leigh Findlay, Board Chair, Committee for Greater Shepparton, public hearing, Mooroopna, 13 September 2023, *Transcript of evidence*, p. 20.

¹³² Ethnic Communities’ Council of Victoria, Neighbourhood Collective Australia and Regional Victorians of Colour.

¹³³ Ethnic Communities’ Council of Victoria, Neighbourhood Collective Australia and Regional Victorians of Colour, *Submission 697*, p. 6.

¹³⁴ *Ibid.*

¹³⁵ Victorian Government, *Submission 295*, p. 39.

The Victorian Government recognised the difficulty of providing ‘warnings in languages other than English’ promptly, due to the very nature of emergencies and the time required for translations. They recognised the importance that Emergency Management Victoria:

maintains a strong focus on improving this access for all communities, with a pilot version of the VicEmergency app currently in development, that focuses on built in accessibility improvements and automated translations.¹³⁶

As suggested above, evidence presented by stakeholders underscores an urgent need for a more inclusive and accessible emergency warning system in Victoria. The challenges faced by non-English speakers and individuals with disabilities during the 2022 flood event highlighted significant gaps in the current systems. The Victorian Government, in partnership with relevant stakeholders, should prioritise the development of a warning system that is adaptable, inclusive, and capable of meeting the diverse needs of all Victorians. By doing so, it will ensure that every member of the community has equitable access to vital information during emergencies, thereby enhancing the safety and resilience of the state.

FINDING 45: There is a disconnect between emergency warning communication methods and the needs of diverse communities, and an urgent need for a more inclusive approach to emergency communications.

FINDING 46: During the 2022 flood event, there were reported instances where people were unable to understand flood warnings and information due to accessibility barriers.

RECOMMENDATION 46: That the Victorian Government ensure the emergency warning system is inclusive and able to be used by all Victorians, and should:

- include real-time translation of warnings into multiple languages during a crisis event
- deliver information in easier to understand ways which meet the needs of people with a disability.

6.5.2 Digital connectivity during natural disasters

In addressing the issue of digital connectivity during natural disasters, evidence to the Inquiry noted the particular challenges for rural communities. Where disasters damage communication infrastructure the issue can be even more widespread.

In its submission, Swan Hill Rural City Council pointed out that where ‘technology is relied upon for communication by authorities, digital connectivity is a barrier to access reliable and up to date information in rural communities’. It noted that many

¹³⁶ Ibid.

rural areas have blackspot areas where connectivity is either absent or deficient. The Council contended that telecommunications are an essential service—especially during a natural disaster—and advocated for coverage reporting based on geography rather than population served.¹³⁷

Gannawarra Shire Council

While technology is relied upon for communication by authorities, digital connectivity is a barrier to access reliable and up-to-date information in rural communities. In Gannawarra, more than 30 per cent of dwellings do not have access to the internet (2021 Census). There are also ‘blackspot’ areas where internet and mobile phone coverage is not available or lacking.

Source: Gannawarra Shire Council, *Submission 637*, p. 23.

Other stakeholders echoed the difficulties of digital connectivity in rural areas, compounded during times of crisis. The Federation of Community Legal Centres highlighted that:

When individuals did not have the capacity to use or access reliable technology to receive warning messages, such as those living in remote areas with compromised capacity to remain updated on flood risks or respond to an immediate flood risk. This includes those without internet access or mobile phones.¹³⁸

Campaspe Shire Council raised concerns about the reliability of internet and mobile reception, noting that it is ‘difficult in rural areas, and relying on an app and website creates challenges for residents’.¹³⁹ This sentiment was reiterated by Campaspe Shire’s Mayor Cr Rob Amos who said:

Digital connectivity and mobile reception are a major barrier to accessing reliable and up-to-date information in rural communities, and this is exacerbated in an emergency situation.¹⁴⁰

The Committee for Greater Shepparton also recognised the impact of digital connectivity issues, especially during power disruptions:

Power disruptions and digital connectivity significantly impacted communications to and with those most impacted by the floods. With communications processes increasingly reliant on online platforms including websites, social media and email, many participants highlighted the importance of digital network capacity and reliability – along with the fundamental need to recharge phones and devices.¹⁴¹

¹³⁷ Swan Hill Rural City Council, *Submission 642*, p. 7.

¹³⁸ Federation of Community Legal Centres, *Submission 674*, p. 20.

¹³⁹ Campaspe Shire Council, *Submission 650*, p. 4.

¹⁴⁰ Cr Rob Amos, *Transcript of evidence*, p. 10.

¹⁴¹ Committee for Greater Shepparton, *Submission 393*, p. 16.

At a public hearing, representatives from the Department of Justice and Community Safety explained that there is work at the federal level to address black spots in rural communities to mitigate against connectivity issues during natural disasters. Kate Fitzgerald, Deputy Secretary of Emergency Management, acknowledged the limitations imposed by current technology and the efforts towards mitigation, stating:

there has been significant investment by the federal government in relation to black spots in terms of telecommunications. There is a significant national program in that space to try to really decrease the number of black spots for communities with a particular view around the criticality of that for emergency warnings.¹⁴²

Amanda Logie, Manager/Coordinator at Rochester Community House, during a public hearing said:

We estimate that 90 per cent of our community was inundated, but 100 per cent of our community has been affected by this devastation... As part of those morning meetings, I just want to shout out to Coliban Water, and you will understand why down the track. They were sending out text messages on our behalf. It was our only way of communicating to our entire community, because our NBN was down and our landlines were down.¹⁴³

Leigh Wilson, Chair of the Rochester Community Recovery Committee, said during a public hearing:

But early on we had volunteers sitting there on their laptops with a mobile phone – because we had no NBN, no phones – processing people’s paperwork to start getting claims underway. People lost everything. They were going back to their homes and walking out with a couple of bags of belongings. That was it. There just were not the boots on the ground.¹⁴⁴

Tom Acocks, a Rochester farmer, said during a public hearing:

A few of the other discussions I have had recently were around critical pieces of infrastructure around the Tatura area that were inundated because there were no levees around them. That meant the substation supplying power to the milk-processing facilities was gone, along with a lot of the telecommunications networks for a period of a series of days.¹⁴⁵

The Committee supports the essential need for robust digital connectivity, especially in rural areas, to ensure timely and effective communication during emergencies.

¹⁴² Kate Fitzgerald, Deputy Secretary, Emergency Management, Department of Justice and Community Safety, public hearing, Melbourne, 12 October 2023, *Transcript of evidence*, p. 23.

¹⁴³ Amanda Logie, Manager, Rochester Community House, public hearing, Rochester, 23 August 2023, *Transcript of evidence*, p. 32.

¹⁴⁴ Leigh Wilson, *Transcript of evidence*, p. 9.

¹⁴⁵ Tom Acocks, public hearing, Echuca, 24 August 2023, *Transcript of evidence*, p. 52.

FINDING 47: Communication of emergency warnings in rural and remote areas can be impeded by digital connectivity issues. Given the growing reliance on digital forms of communication, this is a significant challenge to address to ensure effective communication during natural disasters or other crisis events.

FINDING 48: Telecommunications access was an issue and local residents reported delays in restoration of digital connectivity.

RECOMMENDATION 47: Given the essential role of digital connectivity in emergency management and response, that the Victorian Government, working with the Commonwealth Government as necessary, address connectivity limitations, focusing on rural and remote areas. Potential options to consider are the need for:

- enhanced infrastructure investment
- geographically based coverage
- rapid deployment of temporary satellite vans.

6.5.3 Public response to warnings

I think in Victoria we have seen people work on their emergency plans for bushfire. They have been pretty well drilled into them over many years to get that plan ready, and we are encouraging people obviously to extend that and make sure it is for all emergencies.

Chris Stephenson, Deputy Commissioner, Emergency Management Victoria, public hearing, Melbourne, 12 October 2023, *Transcript of evidence*, p. 4.

Some stakeholders raised concerns that the public response to warnings indicated a lack of awareness or that some people did not treat warnings seriously. In particular, areas where evacuations were advised it was noted that a handful of residents did not heed these warnings and were left unable to evacuate during the 2022 floods.¹⁴⁶ Stakeholder evidence indicated this is a multifaceted problem involving the efficiency of traditional warning methods like doorknocking, community engagement with emergency warnings, and the clarity and effectiveness of communication regarding flood risks and preparedness.

Faye Bendrups, President of the Victoria SES Volunteers Association, discussed the challenges of emergency preparedness, noting that doorknocking can be inefficient

¹⁴⁶ See: Faye Bendrups OAM, President, Victoria SES Volunteers Association, public hearing, Melbourne, 11 October 2023, *Transcript of evidence*; Tim Wiebusch, *Transcript of evidence*.

particularly when compounded by general public unpreparedness. When asked about the extent communities are pre-planning individual flood responses, Bendrups stated:

No. Even when you are being doorknocked – a lot of people in Maribyrnong, for example, did not hear the doorknock. It was 4 am – they did not hear it.¹⁴⁷

Jennifer Chemay

I think living in a flood zone should mean we have drills, so we are prepared for a likely flood event. In the seven years I've lived in my property I've never seen any communication, disaster recovery drills or advice to help me prepare. Council could have done more here! This could be done through a newsletter, website announcements, twitter, Facebook, Instagram, community meetings to name a few options available. Some not costing the council a cent. I wasn't prepared and I take some responsibility for that, however I could not be responsible for a risk assessment without available information that only authorities have at hand.

Source: Jennifer Chemay, *Submission 271*, p. 4.

Name Withheld

We knew the house we bought was not affected by the previous floods so when 2022 floods happened and we had no choice but to leave it was the most scary thing I had ever been through. With a fire you know every summer to be prepared but not with this.

Source: Name Withheld, *Submission 158*, p. 1.

Tim Wiebusch, Chief Officer Operations of the Victoria State Emergency Service, expressed concern over the community's engagement with warnings, noting a persistent underestimation of risks and a delay in taking action:

[T]here is no doubt that we are still not getting the cut-through in some cases with the warnings that we would expect for the community to act towards. We still see people driving through floodwaters and needing to be rescued. We still see people taking the risk of not evacuating.¹⁴⁸

Wiebusch further expanded on the importance of investing in community risk awareness so that the public does respond to warnings:

I think one of the key things that we need to continue to invest in as a state is around our community risk awareness and really helping communities to understand what those heights translate to in terms of impacts on the ground. Where do the roads start

¹⁴⁷ Faye Bendrups OAM, *Transcript of evidence*, p. 58.

¹⁴⁸ Tim Wiebusch, *Transcript of evidence*, p. 4.

to get cut? Because quite often people do leave it too late, as you have indicated, not realising that the road that they need to access is actually the thing that has been cut. The water might not get there around their house or even in their street, but two streets away, which is the way they are trying to get out, may actually be cut. I guess we saw a lot of that in some of the communities that had a number of days – whether it be in and around Rochester or Shepparton or Echuca – where there was lead time for those floods for people to evacuate. Again, people were leaving that too late, so that risk awareness around understanding that flood risk and being able to really materialise that to an impact.¹⁴⁹

Chris Stephenson further added that along with increasing understanding, authorities must also ‘balance warning fatigue’, stating:

I lived in a regional area for a long time, and I know people who through the 2019 and 2020 bushfires were saying, ‘Yep, we have seen it.’ They do not read the information, and it is fatigue. We understand that, so we have got to balance how we issue those warnings very carefully.¹⁵⁰

Inconsistent or unclear emergency warnings can also negatively impact the public’s response to disaster, delaying or confusing response decisions. Councillor Pierce Tyson, Mayor of Moonee Valley City Council, highlighted a critical incident where, despite a downgrade in the severity of the weather forecast, a resident experienced a dramatic and sudden flood, emphasising the unpredictability of such events:

I would probably point to a specific example during the event where, the afternoon and night before, the danger was downgraded from severe to moderate, and I think that has a substantial effect on the community’s thinking. One of the residents actually even said to me yesterday that during that time, within the space of 20 minutes the sports field opposite his house was fine, empty, and within 20 minutes there was 1.1 metres of water within his house.¹⁵¹

Several stakeholders noted there was significant efforts to help community members prepare and pre-plan for flooding in 2022.

The Victorian Government highlighted various initiatives in place during the 2022 flood, including:

- 140 local flood guides
- 4,758 riverine flood warnings
- public campaigns commencing from 9 October 2022, including ‘15 to Float’ and ‘Be Flood Ready Campaigns’.¹⁵²

¹⁴⁹ Ibid., p. 5.

¹⁵⁰ Chris Stephenson, Deputy Commissioner, Emergency Management Victoria, public hearing, 12 October 2023, *Transcript of evidence*, p. 5.

¹⁵¹ Cr Pierce Tyson, Mayor, Moonee Valley City Council, public hearing, 11 October 2023, *Transcript of evidence*, p. 27.

¹⁵² Tim Wiebusch, *Transcript of evidence*, p. 5; Chris Stephenson, Deputy Commissioner, Emergency Management Victoria, public hearing, 12 October 2023, *Transcript of evidence*, p. 4; Victorian Government, *Submission 295*, p. 20.

In relation to the public campaigns, the Government explained:

Both campaigns focused on key protective actions that community members could take to stay safe and protect property. They were delivered across a range of media channels including radio (metro and regional); social media; broadcast video on demand (7Play, 9Now, SBS on demand); and search engine marketing. The radio and social media campaigns were tailored to reach culturally and linguistically diverse communities.¹⁵³

Despite these actions, some stakeholders suggested that clarity around warnings and actions was not as high compared to bushfires.¹⁵⁴ However, Chris Stephenson told the Committee a lack of adherence to warnings was a general issue also experienced during other events, such as bushfires, stating:

We know in bushfire that while we tell people to leave early, a lot of people tell us still they will not leave until they see the smoke. It is a challenge for us.¹⁵⁵

Submissions from community organisations and individuals further underscored the need for improved communication and preparedness strategies. Concerns were raised about the lack of drills and information, especially for new residents unfamiliar with the local flood history, and the need for clear and actionable guidance to foster a culture of readiness. In its submission, the Murray River Group of Councils noted that:

Some residents in our communities have told us that they felt uninformed of the history of flooding and potential impacts to their properties.

While this was particularly true of new residents who had not experienced the 2011 flood event, even some who had lived through the 2011 events assumed that the 2022 event would be of similar impact and felt that they were adequately prepared.

In Rochester, despite door knocking of 700 homes in lead up to the event by local CFA, SES and local Community House members, the majority of residents declined to leave due to what the prediction was and their previous experience in preparedness, the sentiment 'was that we know floods and how to prepare'.¹⁵⁶

Inadequate preparedness or understanding of emergency warnings can differ within municipalities, with some community members having a higher understanding compared to others. Box 6.5 below from the City of Melbourne outlines the results of a 2020 survey on this issue.

¹⁵³ Victorian Government, *Submission 295*, p. 20.

¹⁵⁴ See: Elster Creek Catchment Management Authority, *Submission 664*, p. 2.

¹⁵⁵ Chris Stephenson, *Transcript of evidence*, p. 4.

¹⁵⁶ Murray River Group of Councils, *Submission 747*, p. 9.

Box 6.5 City of Melbourne's 2020 survey into disaster preparedness

In 2020, the City of Melbourne conducted a survey to understand the community's 'awareness and preparedness for extreme weather events, including flooding'. The results showed that some groups are disproportionately impacted by flooding, including:

- elderly people
- people experiencing homelessness
- renters
- people who speak a language other than English.

The survey also found that some areas or groups within the municipality indicated higher incidences of not being prepared for flooding, notably in the Docklands/Southbank area (44%). The northern suburbs (43%) and people who spoke a language other than English (43%) also indicated high levels of unpreparedness for flooding.

The results from this survey are indicative of the inconsistent public awareness of flood preparedness in Victorian communities. As a result, many community members are ill-prepared to manage and respond to flood threats when they occur.

Source: City of Melbourne, *Submission 296*, p. 22.

To better understand Victoria's approach to preparing the public for events such as flooding, the Committee has examined community awareness policy frameworks against those used in Queensland. The jurisdictional comparison has shown that Victoria's approach is focused on integrating community awareness into its core emergency management framework. Box 6.6 below compares the approaches of Victoria and Queensland.

Box 6.6 Different approaches to community preparedness: Victoria and Queensland.

Victoria and Queensland have distinct strategies to ensure communities are well-informed and prepared for disasters, and different methods to achieve these goals.

Queensland's Approach to Public Preparedness and Information:

Queensland emphasises resilience through betterment and community engagement. The Queensland Reconstruction Authority was set up with the role of rebuilding and enhancing the resilience of public infrastructure, which in turn contributes to public preparedness through ensuring essential services and assets are more robust against future disasters.

(Continued)

Box 6.6 Continued

The Authority's initiatives are supported by communication and engagement strategies which aim to have communities informed and involved in the recovery and resilience-building processes. For instance, the Authority's engagement activities, like the Get Ready Queensland program, focus on educating Queenslanders about natural disaster risks and encouraging proactive preparedness behaviours. These initiatives are backed by research to measure their impact and effectiveness, ensuring that public awareness and preparedness campaigns are data-driven and tailored to meet community needs.

Victoria's Approach to Public Preparedness and Information:

Victoria's Preparedness Framework outlines a shared responsibility model, emphasising the collaborative effort required from all sectors of the community for effective emergency management. The framework identifies 'Community Information and Warnings' as one of the 21 core capabilities, underscoring the importance of delivering timely, authoritative, and relevant information to help communities make informed decisions before, during, and after emergencies.

This approach is designed to ensure that communities are not only aware of the risks but also understand the actions they need to take to mitigate those risks and respond effectively to emergencies. Victoria's model also emphasises the use of scenarios based on risk assessments to tailor preparedness activities and information dissemination to the most relevant and plausible emergency situations, ensuring that communities are focused on preparing for the most significant risks they face.

Comparative Analysis:

- **Engagement and Education:** Both Queensland and Victoria prioritise community engagement and education as critical components of their emergency management strategies. Queensland's Get Ready program and Victoria's focus on community information and warnings both aim to empower communities with the knowledge and tools they need to prepare for disasters.
- **Information Dissemination:** Victoria's framework specifically highlights the role of information and warnings, emphasising a systematic approach to ensuring that communities receive timely and actionable information. Queensland, while also focusing on community education through programs like Get Ready Queensland, integrates public preparedness more broadly within its resilience and betterment initiatives.
- **Research and Data-Driven Approaches:** Queensland's use of research to inform and evaluate its public preparedness campaigns indicates a strong commitment to evidence-based strategies. Victoria's scenario-based planning approach, informed by risk assessments, also reflects a data-driven methodology to tailor public preparedness efforts to the most significant and likely risks.

(Continued)

Box 6.6 Continued

- **Shared Responsibility:** Victoria's framework explicitly promotes a shared responsibility model, engaging a wide range of stakeholders in emergency management preparedness. Queensland's approach, through initiatives like Get Ready Queensland, also encourages community involvement but within the broader context of infrastructure resilience and betterment.

While both regions emphasise the importance of community preparedness and information, Victoria explicitly integrates these elements into its emergency management framework through designated core capabilities. In contrast, Queensland's approach, centred around resilience and betterment, includes public preparedness and information as integral components of broader community engagement and infrastructure enhancement initiatives.

Source: Queensland Reconstruction Authority, *Submission 880*; Victorian Government, *Victorian Preparedness Framework: Emergency Management, 2022*.

The challenges of ensuring effective community preparedness for flood events in Victoria are complex, involving issues of communication, engagement, and the intrinsic unpredictability of such natural disasters. However, through targeted recommendations aimed at enhancing community education, improving warning systems, and fostering a culture of proactive preparedness, there is potential to significantly mitigate the impacts of future flood events on Victorian communities. The insights and suggestions provided by stakeholders across the board form a solid foundation for developing more resilient and informed communities, better equipped to face the challenges posed by natural disasters.

FINDING 49: Insights from the public response to emergency information during the 2022 flood event indicated a persistent underestimation of risks by the community which delayed some in taking appropriate action, such as evacuating. This inconsistency was exacerbated by unclear or inconsistent warnings and information, heightening confusion in critical moments.

RECOMMENDATION 48: That the Victorian Government establish long-term community awareness initiatives to ensure the public understand flood risk and actions. Successful bushfire awareness campaigns could be used as a basis for such initiatives.

Chapter 7

Resourcing and response of the Victoria State Emergency Service

7.1 Introduction

Part (3) of the Inquiry's Terms of Reference required the Committee to consider:

resourcing of the State Emergency Service, the adequacy of its response to the Flood Event and the adequacy of its resourcing to deal with increasing floods and natural disasters in the future.

As the control agency¹ for flood events in Victoria, the Victoria State Emergency Service (SES) is the principal emergency service agency responsible for coordinating response and recovery activities. However, the emergency response to flooding is a multi-agency initiative involving various emergency management agencies, including police, fire brigades, government agencies and army.

The focus of this Chapter is on the role of the Victoria SES during the 2022 flood event, especially in the immediate response to the flooding. However, the Committee emphasises that with much of the activity discussed the work was not conducted by the SES in isolation. Providing emergency service support requires the contribution of multiple agencies, such as Victoria Police, Country Fire Authority (CFA), Fire Rescue Victoria (FRV), Life Saving Victoria, Shepparton Search and Rescue, and others. As such, many of the conclusions of the Inquiry on the response of the SES may also be considered to be applicable to the broader emergency service response. Some of these arrangements are outlined in Chapter 3.

FINDING 50: The Victoria State Emergency Service is designated as the lead control agency for flood events under Victoria's *State Emergency Management Plan*. However, the response to events like the 2022 floods is complex and involves coordination across multiple agencies to effectively manage emergency events.

¹ Under the Victoria State Emergency Management Plan, a 'control agency' is primarily responsible for managing the response to a specified form of emergency, including establishing the management arrangements for an integrated and often multi-agency response. See: Emergency Management Victoria, *State Emergency Management Plan: Roles and Responsibilities – Response*, <<https://www.emv.vic.gov.au/responsibilities/state-emergency-management-plan-semp/roles-and-responsibilities/response#Table9>> accessed 17 April 2024.

7.2 The Victoria State Emergency Service

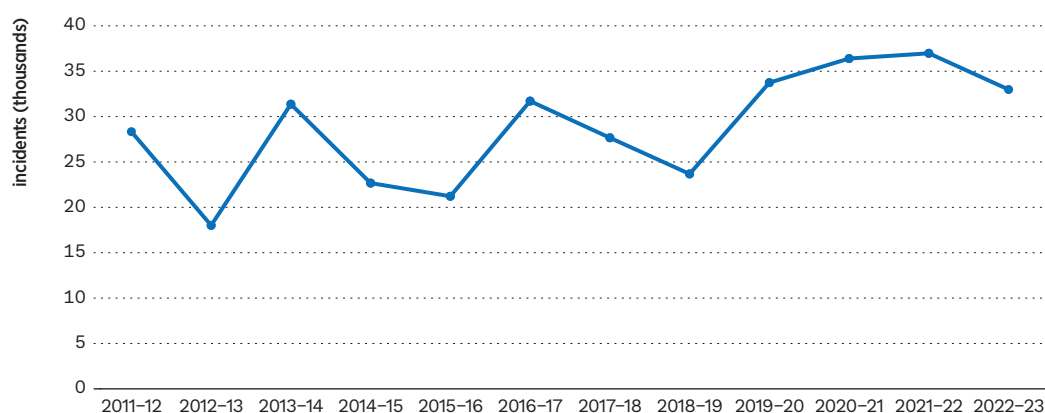
In its submission, the Victorian Government describes the Victoria SES as ‘[a] volunteer-based emergency service operating 24 hours a day, 365 days a year’ that ‘assists communities to minimise the impact of emergencies and strengthen their capacity to plan, respond and recover’.² Under the *Victoria State Emergency Service Act 2005* (Vic), the SES is responsible for emergency response and support, as well as aspects of planning, mitigation and recovery.³

Under the State Emergency Management Plan, the SES is the control agency for most natural events, namely storm, flood, earthquake, tsunami and landslide.⁴ As part of this, it coordinates responses, establishes management arrangements, and provides continuous protection of life, property and the environment.⁵ Chapter 3 discusses the State Emergency Management Plan and flood governance more broadly.

7.2.1 Incident response

The work of the Victoria SES has increased over time. In 2022–23, the SES responded to a total of 32,985 incidents, including 8,362 relating to flood.⁶ This is compared to 28,340 in 2011–12, with 4,734 relating to flood.⁷ Figure 7.1 shows the number of incidents the SES responded to over a 12-year period between 2011–12 to 2022–23.

Figure 7.1 Victoria SES incidents responded to 2012–13 to 2021–22



Source: Victoria State Emergency Service Annual Reports 2011–12 to 2021–23.

² Victorian Government, *Submission 295*, p. 41.

³ *Victoria State Emergency Service Act 2005* (Vic) s 5.

⁴ Emergency Management Victoria, *State Emergency Management Plan: Roles and Responsibilities – Response*, <<https://www.emv.vic.gov.au/responsibilities/state-emergency-management-plan-semp/roles-and-responsibilities/response>> accessed 30 April 2024.

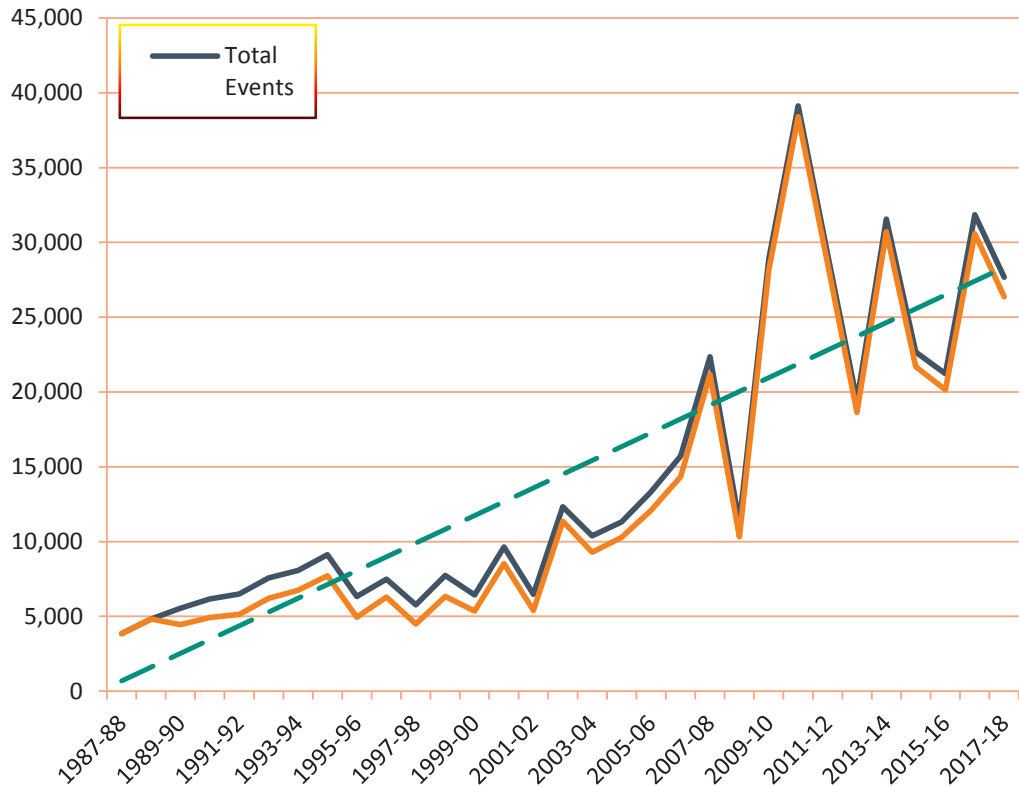
⁵ Ibid.

⁶ Victoria State Emergency Service, *Annual Report 2022–2023*, Victorian Government, 2023, p. 29.

⁷ Victoria State Emergency Service, *Annual Report 2011–2012*, Victorian Government, 2012, p. 18.

Figure 7.2 shows a graph from the Victoria SES *Annual Report 2017-18*, which gives a longer historical perspective of the increasing number of incidents the SES has dealt with until 2017-18. As shown in Figure 7.1, the trend of increasing incidents continued after 2017-18 despite a minor decrease between 2021-22 and 2022-23.

Figure 7.2 Victoria SES incidents responded to 1987-88 to 2017-18



Source: Victoria State Emergency Service, *Annual Report 2017-18*, 2018, p.31.

In its Annual Report for the 2022-23 period, the SES explained that:

With more frequent weather events, population growth, greater diversity of our communities, increased regulatory compliance and continued sector reform, VICSES is experiencing growing complexity and demand for the services we provide, and increased pressure on our current operating model.⁸

Figure 7.3 breaks down incidents over the past five years by type, reflecting the large proportion of flood-related incidents that occurred in the 2022-23 period.

⁸ Ibid., p. 5.

Figure 7.3 Five-year trend of Victoria SES incidents by type

Fin Year	Storm	Flood	T L E	Rescue	Assist agency	Non ops	Total
2018-19	15,668	2,125	31	2,073	2,496	1,289	23,682
2019-20	24,927	2,139	97	2,035	3,086	1,004	33,288
2020-21	28,341	2,181	141	2,248	2,978	510	36,399
2021-22	27,115	3,563	316	2,320	2,978	626	36,918
2022-23	16,927	8,362	227	3,089	3,146	1,234	32,985

Note: TLE refers to tsunami, landslide and earthquake.

Source: Victoria State Emergency Service, *VICSES: An Introduction*, <<https://www.ses.vic.gov.au/documents/8655930/8656626/VICSES+CorporateProfile.pdf/d9a8cd2e-3c98-95b7-6972-ce0e7985d112?t=1711589218430>> accessed 29 April 2024.

As discussed in Chapters 2 and 4, climate change contributes to an increased likelihood of small-scale flash flooding and other extreme weather events. There is a chance that the work of the SES will only grow more complex and demanding. The Victorian Government's submission acknowledged this, stating that:

VICSES has, in recent years, experienced growing and more complex demands for its services due to the increasing frequency, severity and duration of natural disasters driven by climate change. The changing demands are impacting on VICSES volunteers and their ability to deliver services safely and effectively. Continued investment in VICSES is therefore vital to ensure it can meet current and future needs.⁹

FINDING 51: Notwithstanding annual fluctuations, the Victoria State Emergency Service is responding to an increasing number of events over time. Given the link between climate change and increased extreme weather events, this trend will continue.

7.2.2 Resourcing

To better respond to increasing and varied incidents, the Victoria SES has received increased funding, however it is also experiencing increasing expenses.

In its most recent Annual Report, the SES explained that to fund the delivery of its services, it receives grants from the Victorian Government.¹⁰ It also receives gifts, donations, project grants, and sponsorships.¹¹ For example, between 2003 and 2023 it received over \$9 million from general insurance provider AAMI.¹²

⁹ Victorian Government, *Submission 295*, p. 41.

¹⁰ Victoria State Emergency Service, *Annual Report 2022-2023*, p. 77-78.

¹¹ *Ibid.*, p. 77.

¹² *Ibid.*, p. 51.

In 2022, the total revenue the SES received to deliver services was \$78,490,000.¹³ In 2023, it was \$119,183,000.¹⁴ This is shown in Figure 7.4.

Figure 7.4 Victoria SES revenue and income funding the delivery of its services

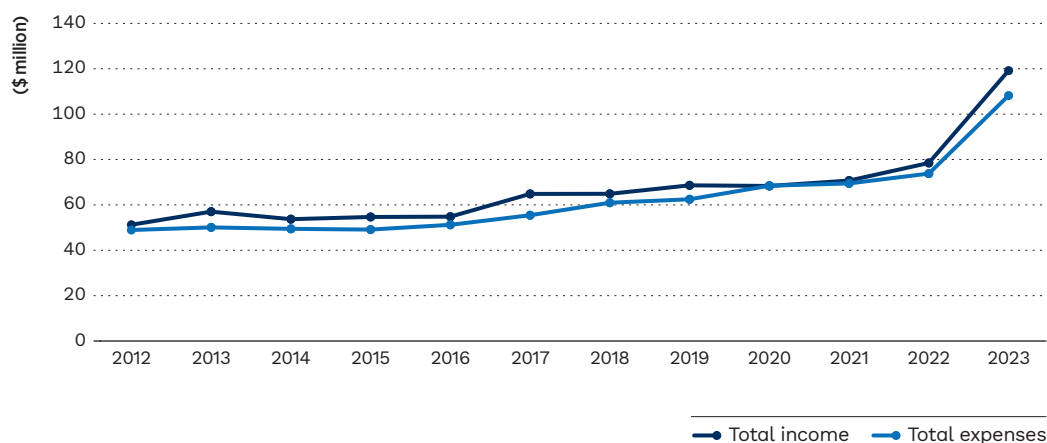
	Notes	2023	2022
		(\$ thousand)	
Grants		115,443	76,792
Fair value of assets and services received free of charge or for nominal consideration		1,227	215
Other income		2,513	1,483
Total revenue income from transactions		119,183	78,490

Source: Victoria State Emergency Service, *Annual Report 2022–2023*, Victorian Government, 2023, p. 77.

As the SES' funding has increased, so have its expenses. In 2022, it incurred \$73,794,000 in total expenses.¹⁵ In 2023, it incurred \$108,193,000.¹⁶

Figure 7.5 below is an overview of the resourcing and expenses of the Victoria SES for the previous 12 years showing a steady increase in both funding and expenses.

Figure 7.5 Total income and expenses of the Victoria SES 2012–23



Source: VICSES Annual reports, *Financial Statements*, 2012–22.

Issues with resourcing

Despite the Victoria SES' resources keeping pace with its increasing expenses, the Committee heard from stakeholders—particularly councils—that the organisation lacks appropriate funding to respond to disasters of the scale of the October 2022 flood event.

¹³ Ibid., p. 77.

¹⁴ Ibid.

¹⁵ Ibid., p. 81.

¹⁶ Ibid.

Goldfields Shire Council argued that the SES has inadequate capacity for the services it is required for:

The capacity of the State Emergency Service (SES), staff and volunteers, is currently inadequate to manage and support the required response to an emergency event of the scale encountered during the 2022 flooding event. Nor does the SES have the continued capacity to manage such an event that continues for an extended period of time. A lack of leadership was also experienced, potentially from the lack of SES personnel trained in leadership roles.

There are currently insufficient numbers in local SES Units to adequately service their area. Some of the most flood prone areas in the shire – including Carisbrook, Dunolly and Talbot – do not have an SES Unit, so they are either serviced by another area or another emergency agency such as the CFA.¹⁷

Gannawarra Shire Council likewise contended that the SES is ‘under-resourced to respond to a widespread and major flood event’. It claimed that ‘[t]here was a clear message by the [Victoria SES] to [the Gannawarra] community ... that the [SES] did not have the resources to respond and that communities were on their own’, stating:

VICSES has several critical roles in Victoria’s emergency management arrangements and the State Government must ensure that it is resourced to fulfill its statutory roles and responsibilities to deal with the risk of increasing floods and natural disasters in the future.¹⁸

Echoing other councils’ views, Campaspe Shire Council told the Committee that the SES is ‘under resourced and unable to adequately respond to a major flood event’, and highlighted the need for greater resourcing of the SES planning functions:

VICSES facilitates Community Emergency Risk Assessments (CERA), addressing all hazards at multi-agency Municipal Emergency Management Planning Committees (MEMPCs), which form the basis of planning priorities documented in Municipal Emergency Management Plans (MEMPs). Currently, risks are identified; however, limited resources and capacity are dedicated to mitigation planning, education and infrastructure.¹⁹

The Council recommended that the Government:

Resource the State Emergency Service to ensure it can sufficiently fulfill its planning and control agency role in response to major flooding, align with delegation and functions with like response agencies, establishing robust plans and processes.²⁰

¹⁷ Central Goldfields Shire Council, *Submission 634*, p. 1.

¹⁸ Gannawarra Shire Council, *Submission 637*, pp. 25.

¹⁹ Campaspe Shire Council, *Submission 650*, pp. 5–6.

²⁰ *Ibid.*, p. 7.

In its submission, Brimbank City Council noted the importance of increasing resources for the Victoria SES in light of increased extreme weather events:

Given the likelihood of increased extreme weather events and their impact on the community, an increased resource base, would be welcomed and definitely provide an increased safeguard against future extreme weather events.²¹

Also noting an increase in natural disasters, Maribyrnong Shire Council called for increased funding for the SES and CFA:

It is unrealistic and unsustainable to continue relying on an organisation which is largely volunteer based to respond to disasters on this scale, particularly given climate predictions show that they will continue to increase in frequency. In this context, all parties across both Federal and State government need to give serious consideration to the resourcing and delivery of the SES. This is equally applicable to the Country Fire Association.²²

The Municipal Association of Victoria summarised feedback from councils over many years, which 'indicates there have been some delivery challenges in the [SES] risk assessment role, as well as the updating of local flood emergency plans in some parts of the state'.²³ This feedback included that, due to resourcing challenges, the Victoria SES have been less able to:

- attend Municipal Emergency Management Planning Committee meetings
- contribute to completing actions in support of Municipal Emergency Management Plans
- provide timely updates to the VicEmergency website
- provide sufficient incident management personnel
- debrief with stakeholders and undertake after-action reviews.²⁴

Corangamite Shire Council shared its experience of the SES not having appropriate funding to attend Municipal Emergency Management Planning Committee meetings:

Outside of the 2022 flood event, a lack of SES resourcing is impacting on municipal emergency planning. SES representatives do not regularly attend the Corangamite MEMPC meetings due to resourcing. For example, SES representatives have not attended a Corangamite MEMPC meeting in almost 12 months due to their resources being directed to the 2022 flood event. This has implications for the Community Emergency Risk Assess (CERA) process which is led by SES. The CERA often does not reflect current risks as it is incomplete or outdated.²⁵

²¹ Brimbank City Council, *Submission 286*, p. 3.

²² Maribyrnong City Council, *Submission 530*, p. 5.

²³ Municipal Association of Victoria, *Submission 681*, p. 9.

²⁴ *Ibid.*, pp. 9-10.

²⁵ Corangamite Shire Council, *Submission 509*, p. 3

The Council suggested that:

the legislative framework may be contributing to SES's resourcing issues. SES are not recognised in legislation like other emergency response agencies such as CFA and this has implications for how they are funded.²⁶

Regarding the inadequacy of Government funding of the Victoria SES, the Municipal Association of Victoria noted:

Unlike the fire services which are supported through the Fire Services Levy, the VICSES is dependent on State funding and localised support or fundraising. Community expectation is that emergency response agencies are appropriately resourced to undertake their role.

...

Greater investment from the Victorian Government is needed to ensure the VICSES central agency and units are properly resourced to undertake their broad and critical roles.²⁷

Stating that '[r]egional capacity and capability are increasingly important' given increasing natural disasters, the Committee for Greater Shepparton called for 'local councils, SES and other front-line agencies to be adequately funded and resourced to maintain up to date Emergency Management Plans that reflect their local regions'.²⁸

To address resourcing issues, Buloke Shire Council recommended:

[c]ross training between VicPol, VicSES, CFA and Council staff as a key enabler to address capability and capacity issues, particularly in situations where a 'surge capacity' is required to deal with multiple and simultaneous emergencies.²⁹

In a public hearing, Mayor of Buloke Shire, Cr Alan Getley, also stressed the need for collaboration between agencies:

[I]n prior Victorian inquiries emergency management and the need for joint agency responses have been recognised and highlighted as necessary for emergency management preparation and response. The creation of silos that impacted the same in the midst of the emergency was keenly felt within Buloke shire and with over-reliance on local volunteers stretched the local agencies beyond capacity.³⁰

In its submission, the Victoria SES Volunteers Association commented on the under-resourcing of the SES Footscray Unit:

The Unit is significantly under-resourced, now lacks experienced members, and is located in an unhealthy work environment. It has a large response territory and –given

26 Ibid.

27 Ibid., p. 10.

28 Committee for Greater Shepparton, *Submission 393*, p. 6.

29 Buloke Shire Council, *Submission 690*, p. 5.

30 Cr Alan Getley, Mayor, Buloke Shire Council, public hearing, Melbourne, 10 October 2023, *Transcript of evidence*, p. 2.

the critical infrastructure and services within its footprint- should be a priority Unit for VICSES and the State Government to support.³¹

Andrew Heinrichs from the Australian Institute of Health and Safety suggested that due to inadequate funding, the SES spends a lot of time fundraising:

[W]e think it is a good thing to have a well-resourced – appropriately resourced – and capable regulator and other emergency service organisations as well, such as VICSES. Through our understanding in forming the submission, VICSES still appear to do a lot of grassroots fundraising, based on historical practices. We think it is time that organisations like those level up and are treated in a more professional way, I guess, through all levels, but that includes funding and resourcing. They appear to invest a significant amount of time just fundraising to keep baseline operations and infrastructure running.³²

The Committee acknowledges the Victorian Government’s work to increase funding for the SES over time. Although this funding has broadly kept pace with the increasing number of incidents, the Committee understands that the SES still lacks the resources to fully participate in important emergency management activities, such as attending Municipal Emergency Management Planning Committee meetings. Ways to address a lack of appropriate funding are considered later in this Chapter.

FINDING 52: Despite increased funding over time, the Victoria State Emergency Service lacks the appropriate resources to prepare and respond effectively to major emergencies such as flood events.

FINDING 53: Cross training across agencies and other forms of cooperation may be helpful to address capability and capacity issues.

7.2.3 Volunteers

Although it employs a small number of operational and support staff, the Victoria SES is a volunteer-based organisation.

On its website, the SES explains the role of a Volunteer Crew Member, working in teams of two or more under the direction of a Crew Leader to, among other things, respond to emergency events and incidents.³³ As well as flood rescue Crew Members, the SES recruits volunteers for community engagement, unit management, office support, and various other tasks.³⁴

³¹ Victoria SES Volunteers Association, *Submission 539*, p. 34.

³² Andrew Heinrichs, Chair, Policy and Advocacy Committee, Australian Institute of Health and Safety, public hearing, Melbourne, 20 November 2023, *Transcript of evidence*, p. 29.

³³ Victoria State Emergency Service, *Flood rescue and Search and rescue*, <<https://www.ses.vic.gov.au/join-us/volunteer-roles/flood-rescue-search-and-rescue>> accessed 30 April 2024.

³⁴ Victoria State Emergency Service, *Volunteer roles*, <<https://www.ses.vic.gov.au/join-us/volunteer-roles>> accessed 30 April 2024.

Given the importance of its members, one of the organisation's key performance measures is the number of volunteers and staff it retains. According to its most recent Annual Report, in 2023 the SES had:

- 94.1 permanent operational staff
- 122 permanent support staff
- 3,304 operational volunteers
- 941 support volunteers.³⁵

By comparison, in 2014 the SES had:

- 57 permanent operational staff
- 131 permanent support staff
- 3,377 operational volunteers
- 626 support volunteers.³⁶

Permanent operational staff and support volunteers have increased since 2014; however, the number of operational volunteers has seen a slight decrease.

Issues around training and attracting volunteers

The Committee received conflicting evidence about whether there is a shortage of volunteers within the Victoria SES.

The SES' Chief Officer Operations Tim Wiebusch told the Committee that there was still a strong commitment to volunteering in Victoria:

If I look at the last 12 months alone, we have had just over 3000 expressions of interest in volunteering. That has converted to around 776 new SES volunteers coming onto the books. But there is also a volunteer life cycle: people do come and go. Lifestyles change – whether it is work patterns, whether it is starting a new family or moving to a different location. But quite often what we see is when people come into our emergency services and they volunteer, they find that camaraderie and they feel that sense of purpose, and whilst they might go away for a number of years, quite often we will see them come back. So we are seeing good numbers express an interest in volunteering, but there is always that opportunity to continue to think about the volunteering model, because the nature of how people volunteer now is changing compared to what we might have seen a decade or even two decades ago in that space.³⁷

³⁵ Victoria State Emergency Service, *Annual Report 2022–2023*, p. 27.

³⁶ Victoria State Emergency Service, *Annual Report 2013–2014*, p. 17.

³⁷ Tim Wiebusch, Chief Officer Operations, Victoria State Emergency Service, public hearing, Melbourne, 12 October 2023, *Transcript of evidence*, p. 17.

The Minister for Emergency Services Jaclyn Symes emphasised the number of Victorians lining up to volunteer with the SES, and in regard to alleged shortages explained:

I think if you asked our emergency services agencies, they would always welcome more volunteers. I guess if you look at the CFA, they have never had to draw on their full complement of operational volunteers, but in pockets we have got concerns where we have got shortages, definitely. VICSES, like all volunteer organisations across the board, across the country, across the world, have seen a decline in their numbers, but they are really doing some innovative ways to attract new members. I think what you will see when you visit SES units is obvious diversity. There are a lot of women in the VICSES. And particularly in the Melbourne units they are really doing a lot of work to attract people from diverse backgrounds as well, from different cultural backgrounds, and are having various successes in relation to that. I know that the new brigade in Fawkner, I think, has a sign out the front that they sometimes put in different languages in relation to trying to attract new volunteers. We as a government certainly want to do everything we can to support their volunteer attraction and retention activities. A lot of them have got waiting lists, and some we would like to have more on their waiting lists. I think if you asked them what their optimum number is, I do not know – I think they will always just say more.³⁸

Conversely, Strathbogrie Shire Council contended that, despite ‘both SES and CFA ... facing the challenge of attracting volunteers’, there is a ‘desperate need to boost SES volunteer numbers, and potentially reconsider the viability and sustainability of the SES as the lead agency for flooding emergency’.³⁹ It stated that:

Regardless of the success the SES may have in this area, the sheer scale of the event would require substantial support from the CFA volunteers supported by the Council to run a successful response campaign in future major flood events.

A review of the terms of reference for CFA and Fire Rescue Victoria may be required to formalise the coordinated approach as outlined above.⁴⁰

This shortage was emphasised to the Committee by reference to the utilisation of CFA staff in the 2022 flood event. In his personal submission, Cameron David Lovering, Captain of the Salvation Army Rochester, explained that while the response in Rochester to the flood event was ‘officially an SES-led operation ... it was overwhelmingly driven by CFA firefighters’.⁴¹ He put to the Committee that:

in the absence of appropriately resourced and trained emergency services locally in Rochester, in the pursuit of the primacy of life, existing emergency services personnel, and some well-meaning community members are endangering themselves in the effort to save at-risk community members in flood events.⁴²

³⁸ Hon Jaclyn Symes MLC, Minister for Emergency Services, public hearing, Melbourne, 6 December 2023, *Transcript of evidence*, p. 50.

³⁹ Strathbogrie Shire Council, *Submission 519*, p. 3.

⁴⁰ *Ibid.*

⁴¹ Cameron David Lovering, *Submission 639*, p. 12

⁴² *Ibid.*

At a public hearing, he elaborated:

I suggest the committee examines the overall emergency response in Rochester thoroughly and not just the resourcing of the SES but equally of the CFA. Through collective desperation, determination and the realisation that no other emergency services were on duty or coming to the aid of the eastern side, firefighters were forced to affect technical floodwater rescues that arguably should have been conducted by SES, FRV or police helicopter flood rescue technicians.⁴³

The role of fire rescue services in responding to the 2022 flood event is examined in greater detail in Section 7.4.1.

As well as potential shortages, the Committee received evidence about the need to provide better training for SES volunteers. For example, President of Shepparton Search and Rescue Nacole Standfield highlighted the need for increased funding to train volunteers:

I think probably the hardest thing is gaining access to training for volunteers. It is restricted by budgets, and when you are restricted by budgets some courses cannot be run. People who have a competency to run a boat in an emergency situation – there are not many of them.⁴⁴

The Victoria SES' Chief Officer Operations Tim Wiebusch likewise stressed the importance of delivering training for volunteers:

[W]e are seeing this reoccurring, increasing volume of major emergencies in Victoria, so the area that we think has a continued need is around supporting volunteers, particularly with delivery of training and quality training. But also volunteer time is precious these days, so being able to reduce administrative and compliance burdens by resourcing that in other ways so they can actually focus on training exercises and community engagement and response is where we think continued investment is needed.⁴⁵

These issues are explored in relation to the 2022 flood event later in this Chapter.

Maintaining a robust volunteer base for the Victoria SES also hinges on fostering a productive relationship between the SES and the Victoria SES Volunteers Association. The operational effectiveness of the SES is underpinned by the dedicated support of its volunteers, which the Volunteers Association represents. Productive communication between these entities is crucial, not only for the efficient execution of emergency responses but also for the wellbeing and satisfaction of the volunteers.

Suitable avenues for raising concerns are equally important, as they foster a transparent and respectful environment where feedback is used constructively to improve both strategy and operations. Such dynamics are essential for maintaining high standards of emergency management and for upholding the morale of

⁴³ Cameron David Lovering, Salvation Army, public hearing, Rochester, 23 August 2023, p. 52.

⁴⁴ Nacole Standfield, President, Shepparton Search and Rescue, public hearing, Shepparton, 13 September 2023, *Transcript of evidence*, p. 72.

⁴⁵ Tim Wiebusch, *Transcript of evidence*, p. 23.

the volunteer workforce, which is the backbone of the Victoria SES' operations. Additionally, effective communication and the ability to address concerns promptly and fairly can have significant positive impacts on volunteer retention.

FINDING 54: Concerns were expressed about the Victoria State Emergency Service's ability to attract and adequately train volunteers.

FINDING 55: A productive relationship between the Victoria State Emergency Service and the Victoria SES Volunteers Association, characterised by effective communication and robust mechanisms for addressing concerns, is crucial for maintaining a strong volunteer base, ensuring operational effectiveness, and enhancing volunteer satisfaction and retention.

RECOMMENDATION 49: That the Victorian Government increase funding for training of volunteers to boost the capacity of State Emergency Service units and Shepparton and Echuca and Moama Search and Rescue squads to respond during emergencies.

7.2.4 Flood response

As well as the planning, preparedness and recovery phases, the SES plays a significant role in the response phase of emergency management. The State Emergency Management Plan specifies that this phase involves:

- readiness—increasing the ability for timely response
- command, control and coordination—combating the emergency and providing rescue services
- relief—providing assistance during and immediately after an emergency.⁴⁶

Control agency

As the control agency for floods, the Victoria SES is responsible for coordinating flood response and establishing management arrangements for an integrated response.⁴⁷

According to Emergency Management Victoria's *Emergency Operations Handbook*, '[r]eadiness and response arrangements are scalable, adaptable and based on risk'.⁴⁸ These arrangements are set out in state and regional plans, including the State

⁴⁶ Emergency Management Commissioner, *Victorian State Emergency Management Plan*, Emergency Management Victoria, Melbourne, 2023, p. 5.

⁴⁷ Emergency Management Victoria, *State Emergency Management Plan: Roles and Responsibilities – Response*, <<https://www.emv.vic.gov.au/responsibilities/state-emergency-management-plan-semp/roles-and-responsibilities/response#Table9>> accessed 17 April 2024.

⁴⁸ Emergency Management Victoria, *Victorian Emergency Operations Handbook (Edition 4.1 – November 2022)*, Emergency Management Victoria, Melbourne, 2022, p. 151.

Emergency Management Plan, regional emergency management plans, and municipal emergency management plans.

In conjunction with the State Emergency Management Plan, the SEMP Flood Sub-Plan outlines operational arrangements for flood response, including relevant readiness triggers. Some of these arrangements are outlined in Box 7.1.

Box 7.1 Response arrangements under the State Emergency Management Plan and Flood Sub-Plan

- The Bureau of Meteorology or State Control Centre advises the SES of a pending flood event. The SES' Chief Officer Operations notifies the Emergency Management Commissioner, who in turn notifies the State Control Team.
- By reference to the SES' *Flood Readiness and Activation Triggers Considerations* and Emergency Management Victoria's *Incident Management Team Readiness Arrangements*, flood events trigger a particular readiness level.
- If the advice indicates a flood event that triggers a readiness level of 1 (Low to Moderate), 2 (High) or 3(A) (Very High), operations are managed by the SES.
 - This situation is sometimes referred to as a 'Business As Usual' response.
 - The SES' Chief Officer Operation or State Agency Commander consults with Regional Agency Commanders to establish control and commence arrangements, and to advise partner agencies.
- Where a flood event triggers a readiness level of 3(B) (Very High), 4 (Severe) or 5 (Extreme), this requires a multi-agency response handled by the State Response Controller.
 - The SES' Chief Officer Operation or State Agency Commander consults with the State Response Controller and Emergency Management Commissioner to establish control and command arrangements.
 - Under the State Emergency Management Plan, the State Response Controller does a number of things, including:
 - establish a control structure
 - confirm agencies are activated and appropriate arrangements are in place
 - confirm positioning of flood analysts and flood rescue resources and command.

Note: The latest version of Emergency Management Victoria's *Incident Management Team Readiness Arrangements* reclassifies readiness levels 3, 4 and 5 as 'High', 'Extreme', and 'Catastrophic'.

Source: Victoria State Emergency Service, *State Emergency Management Plan, Flood Sub-Plan*, Victorian Government, 2022, pp. 24–32; Emergency Management Commissioner, *Victorian State Emergency Management Plan*, Emergency Management Victoria, Melbourne, 2023, pp. 83–84.

Readiness and response arrangements also exist in more localised contexts. As an example, Box 7.2 outlines the response arrangements set out in the City of Maribyrnong's Storm and Flood Emergency Plan.

Box 7.2 Response arrangements in the City of Maribyrnong's Storm and Flood Emergency Plan

The City of Maribyrnong's Storm and Flood Emergency Plans outlines the following response arrangements for flood for the local government area, among others:

- In accordance with the relevant state and regional emergency plans, the Victoria SES regional duty officer, regional agency commander or incident controller will activate flood response arrangements.
- The Incident Emergency Management Team will engage particular agencies to provide support to the SES and the community.
- The Maribyrnong Municipal Emergency Management Officer will determine the function, location, establishment and operation of a Council Emergency Operation Centre, which will be activated for flood events greater than 2.6m Australia Height Datum.
- Although most flood incidents are a local concern, if local resources are exhausted, regional resources will be made available.
- In accordance with the Victoria State Emergency Service Act and State Emergency Management Plan, all flood response activities within the local government area will be under the control of an Incident Controller appointed by the SES.
- Under the direction of the SES, the Incident Controller will establish an Incident Control Centre in Sunshine, Ferntree Gully and/or Dandenong.
- The Incident Controller will establish:
 - as necessary, divisions and sectors to assist with the management of flood
 - an Incident Management Team
 - an Incident Management Emergency Team.
- The Incident Controller will manage media communication, with assistance from the Maribyrnong City Council to disseminate public messaging and/or warnings.
- The SES will coordinate the collection, collation and dissemination of impact assessment information.
- Although evacuation is largely voluntary, the Incident Controller and Incident Emergency Management Team will decide whether to recommend or warn people to evacuate.
- Victoria Police is responsible for coordinating evacuations, with assistance from the SES.
- The SES will identify areas at risk of requiring rescue, and Victoria Police will carry out water rescue.

Source: Victoria State Emergency Service, *City of Maribyrnong Storm and Flood Emergency Plan*, 2021, pp. 4-14.

Protecting life, property and the environment

As well as coordinating flood response and establishing management arrangements, the SES is responsible for providing continuous protection of life, property and the environment.⁴⁹

To fulfil this role, the Victoria State Emergency Service Act enables SES members, in certain circumstances, to:

- enter land or premises without consent⁵⁰
- construct, remove or alter a levee on land or premises⁵¹
- remove debris from land or premises.⁵²

However, Emergency Management Victoria's Operations Handbook limits who can make decisions to do so. For example, only Incident Controllers, Crew Leaders and Agency Commanders can make a decision to enter land or premises without consent.⁵³

The Handbook explains that if the SES (or other emergency service) receives a large number of requests for assistance, it should prioritise the tasking of personnel in the manner outlined in Figure 7.6.

Figure 7.6 Flood triage priorities

1. RESCUE OF PERSONS	<ul style="list-style-type: none"> • Rescue from flood water, trapped in cars or buildings.
2. PROTECTION FROM THREAT TO LIFE	<ul style="list-style-type: none"> • Evacuation of vulnerable people from the flood affected or potential flood affected areas. • Evacuation of people from flood affected or potential flood affected areas. • Restriction of movement of people in flood affected areas (road closures).
3. PROTECTION OF CRITICAL COMMUNITY INFRASTRUCTURE ¹	<ul style="list-style-type: none"> • Installation of protective barrier to reduce the impact of floodwater on infrastructure. • Ensure maintenance of critical community infrastructure and/or services to the community.
4. PROTECTION OF PRIMARY RESIDENCE	<ul style="list-style-type: none"> • Installation of protective barrier to reduce the impact of floodwater on infrastructure.

Source: Emergency Management Victoria, *Victorian Emergency Operations Handbook (Edition 4.1 – November 2022)*, Emergency Management Victoria, Melbourne, 2022, p. 153.

49 Emergency Management Victoria, *Role statement – Victoria State Emergency Services*, <<https://www.emv.vic.gov.au/index.php/responsibilities/state-emergency-management-plan-semp/roles-and-responsibilities/role-statements/role-statement-victoria-state-emergency-services>> accessed 3 May 2024.

50 *Victoria State Emergency Service Act 2005* (Vic) s 32AB.

51 *Ibid.*, s 32AC.

52 *Ibid.*

53 Emergency Management Victoria, *Victorian Emergency Operations Handbook (Edition 4.1 – November 2022)*, 2022, p. 155.

As the control agency for water rescue, Victoria Police coordinates rescues where fast flowing waters threaten physical harm, and may require assistance from support agencies like the SES.⁵⁴ On advice from the State Response Controller, the Emergency Management Commissioner identifies areas at risk of requiring rescue, and notifies the relevant officers.⁵⁵

The next Section examines the SES' response to the 2022 flood event in particular.

7.3 Response to the 2022 flood event in Victoria

As noted above, the Victoria SES is the 'control agency' for flood emergencies under the State Emergency Management Plan, as such it played a 'central role' in responding to the 2022 flood event.⁵⁶

7.3.1 Preparedness activities

Prior to the onset of heavy rainfall and flooding in October 2022, the Victoria SES was involved in preparation activities following confirmation in mid-September 2022 that Australia would experience a third consecutive La Niña weather event.⁵⁷

To prepare for the high risk of flooding, the Victorian Government's submission advised that the Victoria SES conducted the following preparedness activities:

- briefings with State and regional control centres about flood and storm hazards
- conducted a flood scenario exercise with Emergency Management Victoria on 19 September 2022
- 25 regional and state briefings of emergency management personnel
- targeted engagement with over 20 high flood-risk communities
- workshops about cross-border arrangements
- identified 215 sandbag collection points in cooperation with local governments and establishing activation arrangements
- briefings with flood analysts
- trained Emergency Services Telecommunications Authority dispatchers to operate from incident control centres
- provided local flood guides to over 140 locations.⁵⁸

⁵⁴ Victoria State Emergency Service, *State Emergency Management Plan, Flood Sub-Plan*, Victorian Government, 2022, p. 27.

⁵⁵ Ibid.

⁵⁶ Victorian Government, *Submission 295*, p. 43.

⁵⁷ Ibid., p. 43.

⁵⁸ Ibid., p. 44.

At a public hearing, the Hon Jaclyn Symes MLC, Minister for Emergency Services, expanded on the preparedness work undertaken by the Victoria SES, stating:

work tirelessly to strengthen flood defences, evacuate communities and respond to requests for assistance. They developed the state emergency management subplan as well as assisting with preparations of six regional and 45 municipal emergency management flood plans. They have prepared 140 local flood guides to provide information about flood preparedness to at-risk communities and delivered public communication campaigns such as – I am sure you have heard about them – 15 to Float and the Be Flood Ready campaign in relation to ‘Bag it, block it, lift it and leave’.⁵⁹

A number of stakeholders referenced the usefulness of the Local Floods Guides in articulating appropriate response actions. However, there were some concerns about the accessibility of these documents.

Kirsten Tanner, Coordinator of Emergency Management at Maribyrnong City Council, told the Committee the flood guides are only available in English:

Kirsten TANNER: ...The flood guide is in English. The flood guide does not –

Melina BATH: Only in English?

Kirsten TANNER: Only in English – it does not come in other languages. I guess that is another comment around those warnings: they are only in English. We have local plans that, as I said, describe this, but the disconnect is then what happens at a state level.⁶⁰

At a public hearing, Tim Wiebusch, Chief Operating Officer at the Victoria SES, advised the Committee that the organisation is reviewing these guides:

There is a project underway at the moment doing some social research into what did people find most useful in those, what were they looking for that was not available in that. Our intent is that there will be a revised template by February 2024 and then we will transition some of the existing material across into those new flood guide templates based on that social research. But then as the flood studies continue to be developed, and there are quite a range of those underway at the moment, we can actually improve some of the information that is in those local flood guides, again to really help communities understand the likely impact.⁶¹

7.3.2 Reponse activities

they responded to over 20,000 requests for assistance, undertook 1500 flood rescues, deployed 1.5 million sandbags and worked tirelessly to ensure communities were kept informed and that their emergency needs were met.

Hon Jaclyn Symes MLC, Minister for Emergency Services, public hearing, Melbourne, 6 December 2023, *Transcript of evidence*, p. 35.

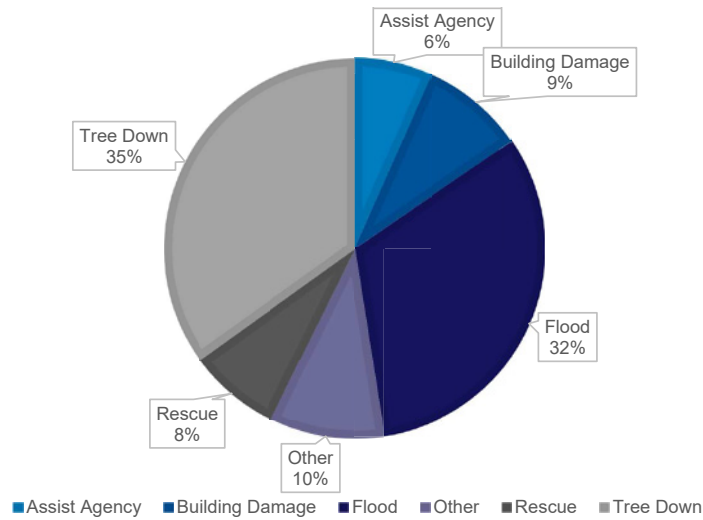
⁵⁹ Hon Jaclyn Symes MLC, *Transcript of evidence*, p. 35.

⁶⁰ Kirsten Tanner, Coordinator, Emergency Management, Maribyrnong City Council, public hearing, Melbourne, 11 October 2023, *Transcript of evidence*, p. 30.

⁶¹ Tim Wiebusch, *Transcript of evidence*, p. 5.

Between 6 October 2022 and 3 January 2023, the Victoria SES received over 20,000 requests for assistance. The SES attended these requests alongside other agencies including the CFA, FRV, Victoria Police and Forest Fire Management Victoria. As shown in Figure 7.7 below, 32% of the requests during this period related to floods. It is unclear if any of the other requests related to damage caused by the floods.

Figure 7.7 Requests for assistance by type (6 October 2022 to 3 January 2023), Victoria SES



Source: Victorian Government, *Submission 295*, p. 45.

The Victorian Government’s submission advised that in October 2022 alone there were 13,689 requests for assistance, the highest ever number of requests for a single month.⁶²

As part of the 2022 flood event response, over 2,500 Victoria SES volunteers from 147 units were involved, contributing to over 145,000 collective volunteer hours.⁶³ As noted in Section 7.2 above, the Victoria SES has a 150 units total and over 4,000 volunteers (60% of which are based in regional and rural areas).⁶⁴ For the flood response, approximately 62.5% of the Victoria SES’s volunteer capacity was used to respond to the 2022 flood event (from 98% of total units).

Based on information from the Victorian Government’s submission Table 7.1 below outlines the unit areas with the highest number of requests for assistance, during the 2022 flood event.

⁶² Victorian Government, *Submission 295*, p. 45.

⁶³ *Ibid.*

⁶⁴ *Ibid.*, p. 51.

Table 7.1 Unit areas with the highest number of requests for assistance

Unit area	Requests for assistance
Shepparton	980
Tatura (including Mooroopna)	576
Echuca	544
Bendigo	520
Rochester	404
Kerang	346
Mildura	304
Seymour	312
Swan Hill	274

Source: Victorian Government, *Submission 295*, p. 45.

According to the Victoria SES' *Annual Report 2022–23*, flood incidents were the second highest incident type but involved the highest number of response hours. In 2022–23, the Victoria SES responded to 8,362 flood incidents which involved 99,463 response hours. When compared to the 2021–22 annual reporting period, that represents a 134% increase in the number of incidents and a 269.5% increase in the total response hours. For 2022–23, flood incidents were 25.4% of all incidents responded to and 34.6% of response hours.⁶⁵

The following Sections consider various facets of the Victoria SES' response to the 2022 flood event, including stakeholder perceptions about the adequacy of the response.

FINDING 56: For the 2022 flood event, approximately 62.5% of volunteers involved with the Victoria State Emergency Service were involved in flood response activities, coming from 98% of the units across the state.

FINDING 57: In the 2022–23 annual reporting period, flood incidents accounted for over 25% of incidents the Victoria State Emergency Service responded to and accounted for over 34% of response hours.

Sandbagging

In response to the 2022 flood, the Victoria SES—working with local councils, the Australian Defence Force, other emergency agencies and volunteers—deployed 1.5 million sandbags.⁶⁶ In its submission, the Victorian Government explained that

⁶⁵ Victoria State Emergency Service, *Annual Report 2022–23*, p. 31.

⁶⁶ Hon Jaclyn Symes MLC, *Transcript of evidence*, p. 35.

sandbagging ‘can help reduce the amount of water entering homes or businesses’ and was used to ‘build temporary levees and protection around thousands of properties’.⁶⁷

At a public hearing, Minister Symes explained that the use of sandbags was at ‘record levels’ and acknowledged some areas experienced shortages during the immediate aftermath of the floods.⁶⁸ She further stated that in response to those shortages the Government:

worked across the national level to ensure that we could access supplies from around the country. We got a lot of supplies from Bunnings, I understand, and the ADF had supplies as well, so we managed to deploy them to where they were needed. I think that that experience certainly demonstrated to me that we need to ensure that as a nation we have got good stockpiles of material that are required for events. We were even talking about sending planes to other countries to secure supply if we needed them – that is the level that we were talking about. It is on the national agenda to make sure we have got the resources we need.⁶⁹

Sandbagging commenced prior to the onset of flooding and continued throughout the peak flood period. The system for filling sandbags differed across municipalities with some areas having access to sandbagging machines⁷⁰ whilst others relied on deliveries or hand-filled bags.⁷¹

Key issues raised about sandbagging focused on the SES’ management of these activities, focusing on several operational and logistical challenges which emerged during the flood event. In its submission, Greater Shepparton City Council noted that there were difficulties in the availability and timely distribution of sandbags, making it harder to ensure sandbags were available to ‘residents in most need of them’.⁷²

The Council further contended that there was a reliance on community volunteers to support sandbagging efforts because the SES was unable to meet the demand. It highlighted that community members, with some assistance from the Australian Defence Force, filled over 235,000 sandbags at Shepparton Showgrounds, emphasising the scale of the logistical effort during the 2022 floods.⁷³

Other councils expressed concern over shortages and delays in sandbag availability from the SES which resulted in insufficient resources to meet immediate needs during peak crisis times.⁷⁴ Some of these councils also argued that because the SES was overstretched, local councils and community members were ultimately responsible for managing their own sandbag needs.

⁶⁷ Victorian Government, *Submission 295*, p. 48.

⁶⁸ Hon Jaclyn Symes MLC, *Transcript of evidence*, p. 50.

⁶⁹ *Ibid.*, pp. 50–51.

⁷⁰ Victorian Government, *Submission 295*

⁷¹ David Cameron Lovering, *Submission 639*.

⁷² Greater Shepparton City Council, *Submission 654*, p. 5.

⁷³ *Ibid.*

⁷⁴ For example, City of Greater Geelong, *Submission 514*; Maribyrnong City Council, *Submission 530*.

City of Greater Geelong contended that it undertook additional responsibilities in relation to sandbagging which ordinarily are the responsibility of the SES:

The City undertook responsibilities that are traditionally the responsibility of the VicSES due to the limited resources available. This included;

- provision of sandbags due to a shortage resulting from resourcing other areas of the State impacted by flooding water
- coordination of sandbag collection points
- Council staff deployed to assist members of the community to fill up sandbags⁷⁵

Maribyrnong City Council explained its expanded role in assisting with sandbagging coordination and also noted that sandbag quantities were not adequate to meet demand:

Earlier in the week of 14 October, there were discussions about where sandbags would be collected from. Council were also asked to assist in handing out sandbags because there were not enough volunteers to support this activity. We were also advised that a small number of [the Victoria SES] staff and volunteers would be doorknocking the local residents of Maribyrnong.

Once the first advice message was released on 11 October, Council started fielding calls from residents asking for sandbags and we were unable to provide any advice until 13 October. Where residents had an understanding of the risk and wanted to prepare and mitigate the impact to their homes, they were unable to do so due to the short notification time and number of sandbags that were allowed for each household.⁷⁶

The limited availability of sandbags in flood affected areas was compounded by resources being shifted around the state to respond to other areas. The scale of flooding across Victoria made it difficult for the SES to keep up with demand and, as such—as per the principles of the State Emergency Management Plan—sandbagging efforts were purportedly focused on the most at-need communities. However, this placed strain on other areas who were experiencing flooding and did not have sandbags available.

The Grampians Municipal Emergency Management Enhancement Group, which is made up of emergency management staff from several municipalities in the region, explained to the Committee that:

Sand for sandbags became scarce as it was being heavily used by Councils. More sand was unable to be quarried due to the weather.

Councils were being criticised by its residents for not supplying the required number of bags needed, even though the provision of bags in many Municipal Flood Emergency Plans is the SES.

⁷⁵ City of Greater Geelong, *Submission 513*, pp. 4–5.

⁷⁶ Maribyrnong City Council, *Submission 530*, p. 4.

When sandbags were requested due to exhaustion of current levels, Councils were told by SES that the remaining sandbags were going to be distributed to the north of the state, leaving residents in Grampians areas without sandbags.⁷⁷

Councillor Sarah Carter, Mayor of Maribyrnong City Council, noted that the SES is ‘woefully under-resourced’ and as such Maribyrnong struggled to meet demands for sandbags:

we could not get sandbags. We had to go to Bunnings and start getting them filled, and we were told, I think it was, they did not have them for metropolitan responses, literally.⁷⁸

Some stakeholders questioned the quantity of households provided to affected residents, which was generally around 25 bags per household. The Victoria SES’ *Guide to Sandbagging* recommends ‘25 sandbags or less per household, depending on your flood risk’.⁷⁹

Box 7.3 Cameron David Lovering, Salvation Army Rochester

Unfortunately, we did sandbag for a number of vulnerable community members, being elderly RSL veterans, war widows and the like; we sandbagged their houses. We know some of them were a three-or four-sandbag rung height. I like to consider myself and our members as professional sandbaggers given our occupations, but even that was not enough – the water just went straight over the top of the sandbags. Had we not been limited to 25 sandbags per house, one day out – again, that is another point for the committee to consider. It was 25 sandbags per residence in the 2011 flood-impacted area. My understanding is that is only a couple of hundred homes that were able to go and get sandbags two days out. One day out, when they realised the severity would considerably improve, it was 25 sandbags per residence. There have been some comments in the community that it might have been better to not have everyone sandbag their house inadequately; it might have been better to have some places sandbagged adequately. But I would put it to the committee that it is that Sophie’s choice. I would put it to the committee: if we had those sandbags, those resources and those machines here, I wholeheartedly believe we would have had an additional day.

Source: Cameron David Lovering, Salvation Army Rochester, public hearing, Rochester, 23 August 2023, *Transcript of evidence*, pp. 56–57.

Evidence to the Inquiry called into question the adequacy of the 25 limit in actually mitigating against flood damage. Box 7.4 below provides excerpts from some of the evidence from residents concerning the 25 sandbag limit.

⁷⁷ Grampians Municipal Emergency Management Enhancement Group, *Submission 529*, p. 2.

⁷⁸ Cr Sarah Carter, Mayor, Maribyrnong City Council, public hearing, Melbourne, 11 October 2023, *Transcript of evidence*, p. 39.

⁷⁹ Victoria State Emergency Service, *Guide to Sandbagging*, <<https://www.ses.vic.gov.au/documents/8655930/8689153/sandbag+guide.pdf/6a144562-4d56-e7be-2f55-46018d33c442>> accessed 18 April 2024, p. 2.

Box 7.4 Stakeholders' views on the 25 sandbag limit per household

We went to the SES yard to get sand bags and all they could give us was 25 they had none prepared we were happy to fill them our self so we could get out of there and back home with them . In hindsight that was a waste of time as 25 sandbags would prove to be ineffective.

Donna Fulton, *Submission 265*, p. 1

Our assistance prior to flood was 25 Sandbags, this was very far from adequate, I sought another 30 Bags to protect our property from a private source. This was still not even close enough to save our property.

Shane Howe, *Submission 316*, p. 1.

We heard that each household could only receive 25 sandbags. Having an older home, we thought 25 would not protect our home or shedding, so left them for other residents closer to the river to use. I have since heard a family in the flood zone was offered 6 sandbags.

Lynne Canavan, *Submission 552*, p. 1.

My husband and I attempted to ready our property for the flood event. We sandbagged the doors with plastic and sandbags, we attempted to cover any vents, but quickly realised the 25 sandbags we received was not going to be anywhere near enough.

Name Withheld, *Submission 603*, p. 1.

Anne-Marie Roberts, the City of Greater Bendigo representative on the Northern Victoria Emergency Management Cluster, discussed that the provision of sandbags was not always accurately targeted to at-need areas:

You know, sandbagging is an issue, and there were lots of times throughout this that there have been so many sandbags put in places where they were not needed. And then there is this whole challenge of getting the resources to and fro, and I think this comes back to the review of plans. Often as municipalities we do reflect back on our flood plans and where impacts are known so that we can plan ahead of time around sandbagging and what it looks like. Even though we cannot always predict the level of water that is coming, for example, we still refer back to those documents. So there is the imperative nature of reviewing those plans, looking at flood studies, looking at where the levees are and how that changes watercourses and looking at cultural heritage sites – because I think that sometimes is an afterthought. Those flood plans are really crucial to us knowing where we deploy initially for our assets but also community assets, which then supports and guides the community and agencies as to where to start with sandbagging.⁸⁰

⁸⁰ Anne-Marie Roberts, City of Greater Bendigo, Northern Victoria Emergency Management Cluster, public hearing, Echuca, 24 August 2023, *Transcript of evidence*, p. 31.

Whether the 25 sandbag limit was adequate or not, some stakeholders reported receiving less than that or no bags at all.⁸¹ At a public hearing, representatives from the Victoria SES were questioned about this assertion, contending supplies were adequate:

Tim WIEBUSCH: Just to give some context to that, Bunnings at Maribyrnong was set up as a sandbag collection point for the community to come to. Where we were pre-filling them was at our Chelsea SES unit as well as Windy Hill. So they were being filled at locations and brought into the Maribyrnong Bunnings site for the community to be able to access. On that morning and even in the lead-up to the event as well, because the sandbag collection point was actually in place on Thursday 13 October, there were just on 7000 sandbags that were provided to the community from that location through emergency services.

David ETTERSHANK: Okay. So you reckon if people needed them, they were there. They could have got up to 25 sandbags if they needed them.

Tim WIEBUSCH: Yes. I guess by the Friday morning sandbagging was probably not going to be the thing that was going to stop the volume of water coming.⁸²

The Committee was also informed that some sandbag sites were inefficiently managed which created additional challenges, such as poor accessibility and traffic delays. For example, Greater Shepparton City Council noted challenges relating to ‘managing public safety, traffic movements, and wait times’ at sandbag sites.⁸³

The Committee is concerned that these logistical challenges could present additional operational difficulties for the broader emergency response, especially if traffic movement is halted and rescue efforts are affected.

Some stakeholders criticised the inconsistent provision of permanent or semi-permanent sandbagging facilities, such as filling machines. In Victoria, regional emergency response plans outline the regional arrangements for responding to emergencies, including what resources and equipment is available. In the context of sandbagging, the regional emergency plans reference the availability of filling machines or filling trailers. Table 7.2 below shows the unit locations for sandbag filling machines or trailers by region.

⁸¹ See for example, Name Withheld, *Submission 7*, p. 1; Olga Morvillo, *Submission 14*, p. 1; Cameron David Lovering, *Submission 639*, p. 8.

⁸² Tim Wiebusch, *Transcript of evidence*, p. 9.

⁸³ Greater Shepparton City Council, *Submission 654*, p. 5.

Table 7.2 Victoria State Emergency Service unit locations for sandbag filling machines or trailer

Region	Equipment (no. ^a)	Unit location
Central Region	Sandbag filling machine (1)	Pakenham
East (Gippsland) Region	Sandbag filling trailer (1)	Stratford
North East (Hume) Region	Sandbag filling trailer (1)	Not provided
North West (Loddon Mallee) Region	Sandbag filling trailer (1)	Not provided
Mid West (Grampians) Region	Sandbag filling machine (1)	Stawell
South West (Barwon) Region	None	None

a. According to latest versions of regional emergency management plans at the time of writing.

Source: Victoria State Emergency Service, *State and regional emergency plans*, <<https://www.ses.vic.gov.au/about-us/state-and-regional-emergency-plans>> accessed 16 April 2024.

In some communities, community members, including emergency volunteers outside the SES, were unexpectedly burdened with managing sandbag distribution during the floods, a task normally handled by the SES. Stakeholders contended there were significant coordination challenges and resource mismanagement, exacerbating the community's stress and highlighting the need for better support and planning.⁸⁴

Commenting in a personal capacity, Cameron David Lovering from the Salvation Army Rochester, advocated that the Australian Defence Force or other agency should be responsible for coordinating sandbagging, pointing to the SES' significant resource strains:

it would have been good if defence was requested to assist organising and coordinating, potentially, the sandbagging point. What I personally witnessed was our exhausted SES membership were exhausted by the time the second day had rolled around. They were there sandbagging for unbelievably long hours, but because there was no-one to backfill them they then on the final night rather than sandbag and defend their own homes had to go out and canvass and doorknock the community. So if we had had reinforcements from outside of the community, those members – and an alarmingly high amount of our CFA and SES members lost their own homes, and their homes are to be demolished and they have lost the entirety of their possessions, and some of those members have young children as well. So if we had had reinforcements deployed to the area to help us in the defensive operations of the town, that would have been entirely encouraging and worthwhile.⁸⁵

In the Committee's view, the 2022 flood event revealed several concerns with the current approach to the management and distribution of sandbags across Victoria. Despite the record deployment of 1.5 million sandbags, evidence from stakeholders highlighted issues with shortages and misallocation of resources. These operational challenges were exacerbated by a perception of inadequate coordination between the

⁸⁴ See: Darrell Phillips, Captain, Echuca Village Country Fire Authority, public hearing, Echuca, 24 August 2023, *Transcript of evidence*, pp. 24–35.

⁸⁵ Cameron David Lovering, *Transcript of evidence*, p. 55.

Victoria SES, local councils, and other emergency agencies, leading to delayed and insufficient sandbagging efforts in critical areas. The reliance on community volunteers and the inconsistent availability of sandbagging machines further compromised the effectiveness of the flood response.

The Committee recommends that the Victorian Government investigates options for a more centralised and streamlined sandbag management system. This system should include the implementation of scalable sandbagging stations equipped with automated filling machines in strategically identified flood-prone areas across the state. Additionally, the Committee advises that emergency management plans should be regularly updated to ensure they accurately reflect current resources and logistical capabilities.

FINDING 58: The 2022 flood event in Victoria saw a record deployment of 1.5 million sandbags, marking an unprecedented effort to mitigate flood impacts.

FINDING 59: During the 2022 flood event, the Victoria State Emergency Service experienced some challenges in sandbag management and distribution, with local councils noting shortages and coordination issues, affecting timely support in critical areas.

RECOMMENDATION 50: To improve the management and distribution of sandbags during a flood event, that the Victorian Government:

- ensure that there is sufficient supply quantity of sandbags available for preparation for floods in a wet year.
- assess the benefits of a coordinated sandbag management system in Victoria. This system could include capacity for scalable sandbagging stations and address resource gaps in high-risk flood areas.
- ensure that emergency management plans are regularly updated to reflect current resource and logistical capabilities.
- explore options for supplementing reliance on sandbags with innovative new products such as floodgates or water inflated barriers.

Temporary emergency works

During the 2022 flood event, the Victoria SES undertook emergency works in several locations across Northern Victoria: Echuca, Torrumbarry, Mildura, Merbin and Yelta. Emergency works are undertaken if the SES ‘reasonably believes that such works is required to protect life and property’ and can include constructing/removing/altering temporary levees or removing debris.⁸⁶

⁸⁶ Victorian Government, *Submission 295*, p. 48.

According to the Victorian Government's submission, the 2022 flood event was the 'first widespread use of emergency works' since amendments were made to the Victoria State Emergency Service Act.⁸⁷

One of the more prominent examples of temporary emergency works undertaken during the 2022 flood event was the construction of a temporary levee in Echuca. This issue is discussed in detail in Chapter 5.

Chapter 8 examines flood recovery, including the removal of waste and debris from flood-affected areas,

The Victorian Government's submission noted that the Victoria SES is 'undertaking an after-action review of the application for emergency works framework' for the 2022 flood event.⁸⁸

Rescues

Box 7.5 Peter Weeks

I was attending to a rescue with my Alexandra SES rescue boat crew and Vic Police for three people stranded in floodwater in a house at King Parrot Creek near Strath Creek, where the creek was a raging torrent, this was the initial flood water that combined with the Yea River and later Acheron River that flooded Seymour peaking at around 140,000 ML/day, prior to any release from Lake Eildon.

Source: Peter Weeks, *Submission 610*, p. 2.

Ultimately, Victoria Police is responsible for coordinating flood rescues, with the 'assistance of trained personnel' from the SES and other agencies, such as the CFA, FRV and Life Saving Victoria.⁸⁹ During the 2022 flood event, the Victoria SES participated in over 1,500 flood rescues.⁹⁰ Over 95% of the flood rescues undertaken by the SES were conducted by the 'land-based swift water rescue teams and boats' (see Box 7.6). During the flood event, the SES deployed 85 rescue boats and an additional 20 were provided by Life Saving Victoria.⁹¹

Between 6 October 2022 to 3 January 2023, rescue assistance requests accounted for 8% of the requests received by the Victoria SES (see Figure 7.7 above).⁹²

⁸⁷ Ibid. Also see, *Victoria State Emergency Service Act 2005 (Vic)* s 32AC. Amendments were made under *Emergency Management (Control of Response and Other Matters) Act 2015 (Vic)* s 27.

⁸⁸ Victorian Government, *Submission 295*, p. 48.

⁸⁹ Ibid., p. 42.

⁹⁰ Ibid., p. 46; Hon Jaclyn Symes, *Transcript of evidence*, p. 35.

⁹¹ Victorian Government, *Submission 295*, p. 46.

⁹² Ibid., p. 45.

Box 7.6 Swift water rescue

Swift water rescues refer to the rescue of persons from fast moving water. It can involve techniques such as throwing rope lines or other devices to the at-risk person. The rescues can be land-based or conducted via a boat.

Following recommendations from the 2011 *Victorian Floods Review*, the Victoria SES has led a 'state-wide capability building project' to improve swift water rescue arrangements. Since 2014, the SES has trained over 500 members in land-based swift water rescue, with nearly 300 members active in 43 units across Victoria.

The SES has also 'developed a surge swift water rescue cache' which was deployed in response to the 2022 flood event (and was allocated to the Victoria Police Search and Rescue and Water Police).

Source: South Australian State Emergency Service, *Flood and Swiftwater Rescue*, <<https://www.ses.sa.gov.au/about-us/what-we-do/flood-and-swiftwater-rescue>> accessed 17 April 2024; Victorian Government, *Submission 295*, p. 47.

The Victorian Government's submission provided data on the number of rescues performed in the SES' busiest unit areas during the 2022 flood event, the majority of which are in Northern Victoria. Table 7.3 shows this data.

Table 7.3 Rescues performed in the highest request unit areas during the 2022 flood event period

Unit area	Rescues performed
Shepparton	Over 180
Tatura	133
Ballarat	None
Echuca	Over 30
Bendigo	None
Rochester	Over 210
Kerang	None
Mildura	None
Seymour	None
Swan Hill	None

Source: Victorian Government, *Submission 295*, p. 45.

For Maribyrnong, the Government noted that on 14 October 2022 (the day flooding peaked) the Victoria SES boat crew conducted 31 rescues for 60 people and some pets.⁹³

⁹³ Ibid., p. 82.

In relation to the Victoria SES, the Government also provided an overview of the operating arrangements for coordinating rescue activities during the flood event, explaining:

- SES flood rescue managers were positioned in the Shepparton and Swan Hill Incident Control Centres
- a Marine Coordinator was positioned at the regional control centre
- SES water rescue cells were deployed in the incident and regional control centres
- Water rescue coordination centres were set up in Bendigo, Shepparton and Swan Hill.⁹⁴

The Committee received evidence from Victorians affected by flooding acknowledging the efforts of the SES and other emergency agencies—such as local fire brigades—in undertaking rescues. Many of these stakeholders noted that many of the SES volunteers were also personally impacted by flooding but continued to assist communities.⁹⁵ For example, a submitter described the work of the SES in rescuing residents in Maribyrnong:

It was at [redacted] Maribyrnong, that we were able to seek shelter, along with our other neighbours. We waited in that house for close to two and half hours when finally, a SES boat came at 11.30am. That sole SES boat made 3 rescue trips from that house. We were dropped off at the Maribyrnong bridge at 11.45am. By the time we were evacuated, only the top of my car was visible.⁹⁶

Evidence to the Inquiry highlighted several operational challenges faced by the Victoria SES during its rescue activities, including timeliness, resource allocation and coordination of rescue operations. Stakeholder's raised concerns that the lack of volunteer capacity and resources jointly strained the SES' capacity to participate in rescues.

Box 7.7 Name Withheld

At 9:00am I started to lose it - physically and emotionally exhausted with stress levels I've never felt before. The upstairs apartment we were sheltered in had no water, I thought the first floor might flood too and that my cats would drown. I couldn't recognise what was overreaction vs. a real-life possibility.

It was at this point I called the SES and asked they please rescue me, my husband, four neighbours and our two cats. We needed to get out of this situation, who knew how long we were going to be trapped without water, a toilet, electricity etc.

(Continued)

⁹⁴ Ibid., p. 46, 49.

⁹⁵ See for example Lindsey Macague, *Submission 191*, p. 1; Leigh Wilson, *Transcript of evidence*, p. 5.

⁹⁶ Name Withheld, *Submission 696*, p. 1.

Box 7.7 Continued

I spent quite a bit of time on that landing, watching the waves rocking inside the locked common property foyer, thinking about how those waves were rocking around inside my own home and all over my personal belongings and furniture. Time watching my car be devoured by the water, watching the beautiful Maribyrnong River flow down my street at speeds over 40 kilometres per hour like an uncontrolled beast unleashed from years of confinement...

I called the SES again, I really can't remember what time it was but they said they were on their way and would get to us as soon as possible.

I think it was around 11:00am when they arrived - it'd all become a nightmarish blur by now. At least 4 steps were now submerged on the stairs up to the first floor, so I assumed the water level was at about one meter from ground level at this stage. The SES volunteers in the boat were basically at eye-level with the window of the first floor...

Our ground floor foyer entry door works on an intercom system, thankfully, the electricity to this was still working and we were able to remotely unlock the door from upstairs - it was another story trying to open it. The man that was able to open the door was sensational and calm. He came up the stairs, assessed the situation and decided that all six humans could fit in the boat - I advised that I wouldn't leave without the cats, and he told me he'd get the humans in first and go back for them. My absolute hero.

After walking up to our stomachs in that rancid, sewerage filled water, we got into the boat with the cats and were bound for take-off down the treacherous streets that were now fast flowing rivers. The SES delivered us to the Raleigh Road bridge and went back out to do their amazing work.



Image of submitter's rescue.

Source: Name Withheld, *Submission 549*, p. 2.

The scale of rescue efforts during the 2022 flood event meant the SES faced considerable challenges effectively allocating resources and coordinating rescue efforts. For example, the Campaspe Shire Council noted that:

Due to the unprecedented impact on Rochester, more than 100 swift water rescues occurred over a period of four days post the initial impact, relocating over 400 Rochester residents to both Echuca and Bendigo Emergency Relief Centres.⁹⁷

Friends of the Earth (Melbourne) also highlighted the overwhelming number of rescue requests the SES received:

the State Emergency Service (SES) was overwhelmed with requests for assistance. The committee notes that ‘the SES received 3049 calls for help in a 24-hour period in mid-October, including 1766 flood incidents and 128 rescues’.⁹⁸

The Committee received evidence that some units were overwhelmed and rescue demands far exceeded response capacity. Stakeholders noted that this was compounded for some areas because resources were shifted to other communities or there was a pre-existing lack of resources.

On the latter concern, the Victoria SES Volunteers Association and some other stakeholders pointed out resource constraints in Maribyrnong which made it more difficult to respond to rescues. For example, stakeholders noted that not enough Inflatable Rescue Boats were available to the local SES to conduct rescues.⁹⁹ The Victoria SES Volunteers Association explained this, stating that:

The Footscray Unit has two IRBs (Inflatable Rescue Boats) with trained boat rescue crews and coxswains, and until recently had two 4WDs to tow them, and two medium rigid rescue trucks. Our two trucks had been removed by SES because of a statewide issue with the SES fleet (as explained to me: the supply company had given the cheapest quote but cracking had appeared in the sub frame and some parts of the body, as they used wooden packing instead of nylon, then used with bolt clamps, which have decayed and pressed it in, they snapped). That night, volunteers from another Unit came to take away one of our IRBs to Pakenham Unit as their boat was being serviced.¹⁰⁰

The Association noted that as a result the Footscray unit was left with one inflatable rescue boat and two four-wheel drive vehicles (one of which was required for towing the boat).¹⁰¹

Other stakeholders also provided examples of SES rescue equipment being shifted to other areas, making it more difficult to conduct rescues.

Alongside this concern, some areas had pre-existing limited resources or rescue expertise which hampered efforts. Several stakeholders discussed the lack of

⁹⁷ Campaspe Shire Council, *Submission 650*, p. 4.

⁹⁸ Friends of the Earth (Melbourne), *Submission 46*, p. 2.

⁹⁹ Victoria SES Volunteers Association, *Submission 539*; Jennifer Chivilo, *Submission 590*.

¹⁰⁰ Victoria SES Volunteers Association, *Submission 539*, pp. 72–73.

¹⁰¹ *Ibid.*, p. 73.

permanent SES rescue equipment available in Rochester and the implications for rescuing residents. The Committee notes that during the 2022 flood event there were over 200 requests for rescues in Rochester alone.¹⁰²

Cameron David Lovering, Captain of the Salvation Army in Rochester, discussed in detail the lack of equipment and expertise available to Rochester in his submission. Captain Lovering explained to the Committee that:

Despite Rochester appearing to have recorded far more floodwater rescues than Echuca, I now confirm for the committee Rochester hosts no local floodwater rescue technicians, nor were any posted in the area of operation at the onset and immediate impact of the flood, nor were any stationed on the eastern flank until the priority four recovery were confirmed by the only emergency service asset on the eastern side, being a CFA light tanker. Despite all assurance, Rochester would receive a flood rescue capability for this flood event, it did not.

Even after the temporary assistance of an SES floodwater rescue barge, and a FRV fire boat rescue crew on day two of the event, these assets only remained in Rochester temporarily, once they departed the CFA resumed primary response to any call for assistance to 000 once again.

Concerningly, the overwhelming state-based resources were not deployed in Rochester, nor were the SES themselves responsible for the overwhelming majority of flood rescues locally. Despite the dire predictions, the SES did not receive any additional resources for floodwater rescues, especially swift water rescues.¹⁰³

As a result, Captain Lovering contended that although it was ‘officially an SES-led operation’ rescues in Rochester were ‘overwhelmingly driven’ by local CFA firefighters:

The lived experience in Rochester showed it was largely a frantic ad hoc CFA rescue mission, by volunteer firefighters, using firefighting appliances, without adequate flood rescue training or proper equipment in conditions largely considered ‘swift water’ according to SES determinations. Being fastmoving flood water deeper than 15 cm.

CFA led the primary response to floodwater rescues in and around Rochester during the 2022 flood event.¹⁰⁴

The CFA had only 2 members and one appliance on the east side of the river throughout the flood event to provide assistance to residents located over that side ... Those 2 men, did rescue and provide assistance to multiple residents who would otherwise have possibly been injured or deceased as a result. One of those 2 men even took a resident who had advanced dementia into his own home, and his wife then provided assistance.

On CFA-led rescue efforts in Rochester, Name Withheld, *Submission 336*, p. 1.

¹⁰² Victorian Government, *Submission 295*, p. 45.

¹⁰³ Cameron David Lovering, *Submission 639*, p. 13.

¹⁰⁴ *Ibid.*, p. 12.

The Committee was told that communication problems compounded these issues. Kate Murphy from Rochester argued that ‘rescues were required due to inadequate warnings’.¹⁰⁵ In a similar vein, Faye Bendrups OAM, President of the Victoria SES Volunteers Association, pointed to a lack of communication to SES volunteers meaning they were not on stand-by, delaying the coordination of rescues once they were deployed:

they had pre-positioned some boating units and some boat operators – rescue operators – at our unit too, but they had not alerted the unit. I was very concerned on the morning of Thursday the 13th. I am no longer the controller of the unit, but I rang our controller on Thursday the 13th saying, ‘Shouldn’t we put out an email to all our members saying, “Come on, look, let’s all be on standby because we don’t know what’s going to happen. Let’s all get on standby”?’ Because we had not received any communication to put us on standby.¹⁰⁶

The Committee acknowledges that natural disasters, particularly of the magnitude of the 2022 flood event, are often rapidly evolving and complex situations. The rapidly changing nature of flood events was articulated by Tim Wiebusch, Chief Officer Operations at the Victoria SES, using the Maribyrnong flood as an example:

it was quite rapid and developing, and so our people were seeing exactly what the community was seeing as well, that the water was rising a lot quicker, and that information was being passed back to the incident control centre, who have Melbourne Water as part of their emergency management team, albeit virtually in those early hours. That is what then pushed the button in terms of deploying rescue boat resources into the area ... They rescued from 31 properties in the floodwaters in that space, and obviously some of those were in the area that we had not necessarily anticipated were going to be impacted by that level of flooding, but others were actually in places that we had doorknocked and people had chosen not to leave.¹⁰⁷

However, the Committee also notes that preparedness activities occurred months prior to the onset of flooding, so SES units in high-risk areas should be sufficiently prepared.

In some areas, constraints on the Victoria SES to undertake rescues resulted in individual community members undertaking rescues, or remaining in situations which were potentially unsafe.

Kahla Else, a resident from Rochester, provided a personal account of their experience during the flood. Kahla recounted her family’s difficult decision to stay in their home which was being inundated with flood waters, because they did not want to ‘put strain on the already limited emergency rescue services, leaving them for those who were more at risk’.¹⁰⁸

¹⁰⁵ Kate Murphy, *Submission 635*, p. 3.

¹⁰⁶ Faye Bendrups OAM, President, Victoria SES Volunteers Association, public hearing, Melbourne, 11 October 2023, *Transcript of evidence*, pp. 58–59.

¹⁰⁷ Tim Wiebusch, *Transcript of evidence*, p. 8.

¹⁰⁸ Kahla Else, *Submission 602*, p. 1.

It is a night I will never forget - I didn't sleep a wink, the water was not touching my mattress when we got into bed, but a few hours later it was slowly seeping into the bottom and the water had reached the power points.

Kahla Else, *Submission 602*, p. 1.

Furthermore, the Salvation Army Australia detailed the community-driven response that often arose in some areas because formal emergency services were overwhelmed. Its submission noted that some community members were involved in 'carrying out flood rescues'. As well as other recovery efforts, including offering temporary accommodation and helping others protect properties.¹⁰⁹

The Committee received evidence from other stakeholders, including community members who personally conducted rescues. Box 7.8 below highlights some of the evidence on this issue, presenting excerpts from evidence received to the Inquiry.

Box 7.8 Stakeholder evidence on community-led rescue efforts

I heard amazing rescue stories from non emergency service people. I think this could be better utilised. Many residents had tractors and boats etc that could be utilised to safely help the swamped SES.

David Kellett, *Submission 724*, p. 1.

My family and I were not prepared for such a dangerous and unsafe event that unfolded and neither was the Maribyrnong community. We rescued two families with their animals in our neighbourhood. Both families had no belongings other than the clothes they wore.

Name Withheld, *Submission 761*, p. 1.

During the flood the SES couldn't get to us. A total of 11 people, including myself, were rescued by my son in a large John Deere tractor towing a boat between 9–10 pm with a police helicopter overhead using spotlight to guide him.

Brian Wilson, *Submission 844*, p. 2.

local farmers banded together and, at risk to their own lives, rescued people and no less than 1400 head of cattle and sheep and horses

Catherine Jessop, *Submission 571*, p. 2.

¹⁰⁹ The Salvation Army Australia, *Submission 619*, p. 43.

The Federation of Community Legal Centres Victoria raised concerns about the legal implications for individuals forced to undertake rescue activities due to the inadequacy of official emergency responses. The Federation cautioned that:

Private individuals undertaking rescue activities or giving emergency assistance to their community due to the inadequate service provision of SES and other Emergency Management teams may face legal issues of liability as well as claims relating to potential harms and risks to these individuals.¹¹⁰

Another facet of community-led rescue efforts was the role of independent rescue organisations in responding to the 2022 flood event. This issue is discussed further in Section 7.4 below.

The Committee acknowledges the efforts of the Victoria SES and its volunteers during the 2022 flood event. Despite facing considerable challenges, including limited resources and coordination issues, the SES successfully executed over 1,500 flood rescues—a clear indication of their commitment. Nevertheless, the intense demands during this period exposed deficiencies in resource distribution and operational capability.

The Committee recommends that the Victorian Government urgently implement a strategy for improving the provision of rescue resources across Victoria. Priority should be given to augmenting the supply of rescue equipment and the availability of trained personnel in areas identified as high-risk. This would ensure a more efficient and effective response in future emergencies, supporting the SES and other emergency services to address and mitigate the severe impacts of such natural disasters. This strategic reinforcement would also safeguard the wellbeing of the community and the dedicated volunteers who serve them.

FINDING 60: The Victoria State Emergency Service demonstrated remarkable commitment and resilience during the 2022 flood event, successfully conducting over 1,500 flood rescues. This considerable effort underscores the dedication of both the staff and volunteers who, despite personal impacts from the flooding, continued to provide crucial support to affected communities.

FINDING 61: During the 2022 flood event, the Victoria State Emergency Service faced substantial challenges in conducting rescues, such as:

- insufficient volunteer capacity and inadequate resource availability, particularly in severely affected areas like Rochester
- communication issues impeding the readiness and timeliness of the SES' rescue response.

¹¹⁰ Federation of Community Legal Centres Victoria, *Submission 674*, p. 20.

FINDING 62: During the 2022 flood event, there were numerous examples of community-led rescue efforts, where locals used personal resources to rescue neighbours and other community areas. This grassroots response not only highlights community resilience and willingness to assist but also raises concerns about the reliance on informal rescue efforts due to the constraints and limitations faced by official emergency services.

RECOMMENDATION 51: That the Victorian Government develop a strategic rescue plan in areas at high risk of flooding, so that they have appropriate resources and expertise for rescues during a crisis event. This plan should include consideration of procurement, expansion of reserve caches and processes for rapid deployment of resources.

Evacuations

During the flood event, the Victoria SES provided support to Victoria Police to conduct community evacuations. SES volunteers assisted with evacuation in various locations, particularly in the Loddon Mallee and Hume regions.¹¹¹ The Victorian Government submission to this Inquiry provided a general list of flood-affected areas where evacuations took place:

- Melbourne suburbs near the Maribyrnong River
- communities along the Campaspe, Goulburn and Murray Rivers, including Shepparton, Rochester and Echuca.¹¹²

Table 7.4 outlines the locations, timing and where possible details of evacuation alerts during the 2022 flood event. Emergency warnings, more generally, are discussed in Chapter 6.

Table 7.4 Evacuation alerts during the 2022 flood event

Location	Date and timing	Evacuation details
Rochester	5.15 pm, 13 October 2022	<ul style="list-style-type: none"> • VicEmergency warning issued • targeted doorknocking to 'possible affected properties (approximately 700)'
Seymour	2.15 pm, 13 October 2022	<ul style="list-style-type: none"> • VicEmergency warning issued
Shepparton	7.19 am, 14 October 2022	<ul style="list-style-type: none"> • VicEmergency warning issued
Maribyrnong	4.00 am, 14 October 2022	<ul style="list-style-type: none"> • targeted doorknocking to at risk properties (60 total)
Echuca	2.28 pm, 15 October 2022	<ul style="list-style-type: none"> • VicEmergency warning issued

Source: Victorian Government, *Submission 295*.

¹¹¹ Victorian Government, *Submission 295*, p. 47.

¹¹² *Ibid.*, p. 68.

A lot of the evidence the Committee received about rescue efforts during the flood event, which is discussed above, can be applied to evacuations. This Section examines some of the specific themes raised by stakeholders on the SES' involvement in evacuations.

The Committee received evidence that indicated there were inconsistent levels of preparedness for evacuations across flood-affected communities. Some stakeholders explained some residents did not have any plans in place for evacuation,¹¹³ whereas others stated they prepared their evacuation plans prior to the onset of flooding and were ready.¹¹⁴ Nonetheless, it is clear that the process of evacuating is complex.

Karen Laing, Chief Executive Officer of the Rochester and Elmore District Health Service, conveyed the complexity of evacuating a health facility to underscore why proactive measures were a necessity for her team:

[W]e anticipated that if we did need to evacuate it was going to be huge, because we had 60 residents as well as our acute inpatients. So we electively found beds and did this ourselves for 17 of our residents. That took all of the aged care beds that were in the immediate vicinity that were empty at the time. We transferred them electively 48 hours before, so we had 17 less residents to have to contend with were we ultimately required to evacuate. At that point, we did not think we were going to have to evacuate but, in case, we did that. And then it was 48 hours before it became clear to us, because we were monitoring the situation and because we were attending the community meetings here – so my director of clinical services and I were attending the meetings in this room. It was only 48 hours before that we came to the recognition ... We're going to have to evacuate.¹¹⁵

[N]obody directed us, nobody told us. We came to the realisation: 'We're going to have to evacuate. The water level is going to inundate our facility.'

Karen Laing, Chief Executive Officer, Rochester and Elmore District Health Service, public hearing, Rochester, 23 August 2023, *Transcript of evidence*, p. 42.

Similarly, representatives from the Community Living and Respite Services (a disability services and support organisation) in Echuca highlighted the complexity of evacuating their facility. Leah Taaffe, Chief Executive Officer of the facility, explained:

We supported 29 people to evacuate during the flood, and the remaining 10 people stayed with family members in a safe location. We did that evacuation with no support from any emergency management agency; the Department of Families, Fairness and Housing, who have a statutory responsibility for three of those young people; the national disability insurance scheme; local governments; or state governments. We determined who needed to leave. We identified a safe location. We established it.

¹¹³ See for example: Faye Bendrups OAM, *Transcript of evidence*, p. 58.

¹¹⁴ See for example: Ross Turner, Secretary, Committee of Management, Restdown Retirement Village Incorporated, public hearing, Rochester, 23 August 2023, *Transcript of evidence*, p. 67.

¹¹⁵ Karen Laing, Chief Executive Officer, Rochester and Elmore District Health Service, public hearing, Rochester, 23 August 2023, *Transcript of evidence*, p. 42.

We supported other providers to access it. Not only did we secure a safe location for our own clients, we also did this for 15 other people with disability who are supported in other residential homes or other homes impacted by the flood in our area. We brought all of the equipment that we needed with us, which included hoists, wheelchairs, shower chairs and commodes.¹¹⁶

Other stakeholders also emphasised the complexities of their evacuation efforts to underscore why preparedness is necessary. For organisations with evacuation plans in place, the process was still complex, but they did experience a greater deal of certainty when the SES' or VicEmergency app official evacuation warnings were issued.

City of Greater Geelong

A warning was issued through VicEmergency. Verbal advice was also provided to residents and tourists of possible inundation and levy breach. VicSES provided a recommendation to evacuate and/or move to higher ground. This was facilitated by a doorknock by VicSES and Victoria Police. This decision was collectively made by the Incident Controller, Victoria Police and the Municipal Emergency Management Officer present in the ICC taking into consideration local knowledge and flood mapping intelligence. There were no formal broadcast public messaging or Emergency Alert deployed to areas of concern.

Source: City of Greater Geelong, *Submission 513*, p. 4.

For community members without evacuation plans, the importance of timely and accurate warnings is arguably even more important. During the 2022 flood event, the Committee heard that communities received inconsistent warnings or warnings that were too early or too late. For example, the Victorian Government's submission advised that a major flood warning for the Maribyrnong at 2:16 am on 14 October 'triggered the evacuation of approximately 60 houses in the Maribyrnong area at 04:00'. With the Maribyrnong River peaking by midday that same day.¹¹⁷

Issues with community preparedness were particularly stark among vulnerable populations, as Lauren Davy of Community Living and Respite Services described '[they] had a couple of people who needed to seek medical advice while [they] were evacuated... When you move out of that environment, that brings a lot of challenges'.¹¹⁸

¹¹⁶ Leah Taaffe, Chief Executive Officer, Community Living and Respite Services, public hearing, Echuca, 24 August 2023, *Transcript of evidence*, p. 62.

¹¹⁷ Victorian Government, *Submission 295*, p. 82.

¹¹⁸ Lauren Davy, Director of Operations, Community living and respite services, public hearing, Echuca, 24 August 2023, *Transcript of evidence*, p. 69.

This was echoed by Maribyrnong City Council in the context of their municipality's evacuation. The Council discussed the importance of evacuation preparedness and timely warnings to ensure residents have appropriate provisions, especially those with medical needs:

a number of people were evacuated into the relief centre who arrived without critical essential medical aides and medication. Some carers were unsure of what to do and clearly had not undertaken emergency planning with their client prior to the flood.¹¹⁹

In situations where community preparedness is lacking, or where certain cohorts have not been included in plans, the role of accurate and timely evacuation warnings becomes even more crucial to protect residents during emergencies. However, the Committee received evidence that many residents did not perceive evacuation warnings as genuine directives and delayed taking action. Cameron David Lovering from the Salvation Army Rochester noted the disconnect between official alerts and public perception:

When we were rescuing and evacuating people – even the people I knew personally from the Salvation Army and the RSL that I wanted to evacuate who I knew had not evacuated – they did not seem to grasp the seriousness of the event. For one reason or another, they missed the doorknock, or they just did not have the technology to access.¹²⁰

The Murray River Group of Councils discussed that some residents were confused about the meaning of warnings and treated them as 'advice' rather than directives:

In some cases, residents were unclear about what the different warning meant. As a result some treated them as advice only rather than (in the case of evacuation orders) an official requirement to leave the area.¹²¹

The Victoria SES Volunteers Association also noted the shortcomings of the transmission of evacuation warnings during the 2022 flood event, spotlighting Maribyrnong. The Association stated:

- a) Some residents with the VicEmergency App reported they did not receive any warnings
- b) Some received them too late
- c) Some were not aware of warnings being issued as they had not heard about anything which affected them (e.g. the whole of Woods St, Ascot Vale, who were flooded)
- d) Most residents were not doorknocked in advance (days before the flood)
- e) At the actual time of the flood, most residents were not doorknocked by SES and [Victoria Police] with directions to evacuate¹²²

¹¹⁹ Maribyrnong City Council, *Submission 530*, p. 7.

¹²⁰ Cameron David Lovering, Salvation Army Rochester, public hearing, Rochester, 23 August 2023, *Transcript of evidence*, p. 56.

¹²¹ Murray River Group of Councils, *Submission 747*, p. 10.

¹²² Victoria SES Volunteers Association, *Submission 539*, p. 33.

Leah Taaffe from Community Living and Respite Services also noted the discrepancy between digital and verbal evacuation advice and warnings, contending that this inconsistency can be traumatic:

Experiencing the army knocking on your door telling you to evacuate when the VicEmergency app still stated you were in a ‘watch and act’ zone was confronting and caused significant trauma to our clients and our staff.¹²³

Chapter 6 of the Report examines the provision of emergency warnings during the 2022 flood event in more detail, including recommendations for improvement.

The Committee acknowledges the crucial efforts made by the Victoria SES in assisting with evacuations during the 2022 flood event. However, evidence presented to the Committee highlighted there was a clear inconsistency in preparedness for evacuations among flood-affected communities. This varied preparedness impacted the effectiveness of the evacuations, emphasising the need for robust, pre-established evacuation plans that can be implemented quickly in times of crisis.

Furthermore, it is essential that the evacuation warnings issued on platforms such as VicEmergency are timely and accurate. Where preparedness is lacking, this information is often the only source of information for people to self-evacuate or seek assistance to evacuate.

FINDING 63: There was inconsistency in evacuation preparedness across communities affected by the 2022 flood event, which compromised response effectiveness. It is crucial to ensure individuals and businesses are being encouraged to develop robust evacuation plans, and that the Victoria State Emergency Service issues timely, accurate and informative evacuation warnings.

RECOMMENDATION 52: That the Victorian Government, in collaboration with the Victoria State Emergency Service, review its approach to evacuation warnings to identify opportunities for improvement and increased community responsiveness.

Maribyrnong evacuation

we felt totally unprepared by only receiving the first text message at about 4am on Friday 14th

Name Withheld, *Submission 48*, p. 1.

A key issue raised from the Maribyrnong community was the inappropriate timing of evacuation orders on 14 October 2022, compounded by the short timeframe between the order and the onset of peak flooding (a matter of hours).

¹²³ Leah Taaffe, Chief Executive Officer, Community Living and Respite Services, public hearing, Echuca, 24 August 2023, *Transcript of evidence*, p. 62.

In its submission, the Victorian Government provided a high-level timeline of events from the issuance of a major flood warning to the evacuation process (see Box 7.9 below).

Box 7.9 Issuance of major flood warning to commencement of evacuation process for the Maribyrnong River

- **2:16 AM:** Melbourne Water prepared and sent an update to the Bureau of Meteorology that floods were levels exceeding major flood status for the lower Maribyrnong catchment.
- **2:27 AM:** The Bureau issued an updated major flood warning based on the information received from Melbourne Water.
- **2:27 AM to 4:00 AM:** Melbourne Water continued to monitor the situation and regularly update its modelling and forecasting throughout the flood event.
 - The Incident Control Centre conducted an intelligence briefing with Melbourne Water to determine impacted areas, timing, flow rates, and time to impact. They also identified priority areas for door knocking and helped in creating warning polygons to identify the areas at greatest risk more specifically.
 - The Victoria Police Evacuation Manager and Traffic Management Officer began planning for evacuations and road closures immediately.
 - The Victoria SES activated several units in Essendon, Footscray, Port Phillip, Hobsons Bay, Heidelberg, and Fawkner for door knocking. Essendon, Footscray, Port Phillip, Monash, Chelsea, and Pakenham were also mobilised for deploying flood rescue boat and swift water rescue crews.
- **4:00 AM:** The major flood warning led to the evacuation of approximately 60 houses in the Maribyrnong area. The SES and Victoria Police doorknocked the at-risk residents again to ensure evacuation.
- **Just After Midday:** The Maribyrnong River reached its peak at a height of 4.216 meters.

Source: Victorian Government, *Submission 205*, p. 82.

The timeline provided by the Government suggests there were approximately 8 hours between evacuation procedures commencing and peak flooding occurring.

FINDING 64: On 14 October 2022, residents of Maribyrnong in the evacuation zone had approximately 8 hours to evacuate from when the evacuation process was underway to the Maribyrnong River reaching its peak flooding height.

The Maribyrnong City Council's statement highlighted the timing and distribution issues of the evacuation warnings, noting, 'the first time many residents were told to evacuate was via inconsistently distributed text messages sent in the early hours of 14 October', and added that 'the early morning text messages, delivered between 4–6am, meant that most residents were asleep during the key warning period'.¹²⁴

Given the timing of the situation, the Victoria SES supplemented digital warnings with doorknocking to residents in the highest risk areas. However, the Victoria SES Volunteers Association reported that:

- Some of those who were doorknocked on 14 October, first knew of the flood between 4am and 6am when they were being alerted to evacuate immediately; others had no warning at all and woke up to find themselves flooded
- Doorknocking at c. 4am found most residents asleep, or they did not hear the door, or were reluctant to open the door to a stranger at that time¹²⁵

Faye Bendrups, President of the Association, echoed this at a public hearing.¹²⁶

a lot of people in Maribyrnong, for example, did not hear the doorknock. It was 4 am – they did not hear it.

Faye Bendrups OAM, President, Victoria SES Volunteers Association, public hearing, Melbourne, 11 October 2023, *Transcript of evidence*, p. 58.

The lack of effective warning mechanisms was further underscored by the Association's observation that 'there were no audible warnings like emergency vehicle sirens, car horns, loudspeakers, amplified announcements'.¹²⁷ The Committee notes that as part of Victoria's emergency warning framework there is capacity for Community Alert Sirens.¹²⁸ These sirens are managed by the CFA or Life Saving Victoria. However, this siren capability is not active in Maribyrnong.

The Victoria SES Volunteers Association noted the Community Alert Siren system, noting that:

less than 40 Victorian communities have them and they have been utilised mainly by CFA for fire alerts. They are designed, nevertheless, for an all-hazards approach. Melbourne CBD has a public address system at 90 sites, to be used primarily by [Victoria Police].¹²⁹

Stakeholders' views on the emergency warning system, including the expanded use of community sirens, is discussed further in Chapter 6.

¹²⁴ Maribyrnong City Council, *Submission 530*, p. 3.

¹²⁵ Victoria SES Volunteers Association, *Submission 539*, p. 33.

¹²⁶ Faye Bendrups OAM, *Transcript of evidence*, p. 58.

¹²⁷ Victoria SES Volunteers Association, *Submission 539*, p. 33.

¹²⁸ Emergency Management Victoria, *Community Alert Sirens*, <<https://www.emv.vic.gov.au/responsibilities/victorias-warning-system/community-alert-sirens>> accessed 18 April 2024.

¹²⁹ Victoria SES Volunteers Association, *Submission 539*, p. 33.

The Maribyrnong City Council recounted evidence of what some witnessed during the evacuations:

On the morning of the flood, we saw families escaping flood waters by moving to the roof of their home and having to be evacuated by boat given the speed and level of the river rise.¹³⁰

The Committee also received evidence from Maribyrnong residents involved in the evacuation. A resident recounted, 'The first I knew of the severity of the flood was at 4am in the morning when an SES worker and a female police officer (who was excellent) came to my door'.¹³¹ Another, Selin Lanzafame, shared her experience when introducing herself to the Committee:

I come to you today as the mother of a child clutched from his sleep to evacuate with barely an hour's notice before our home was inundated with filthy silt and sewer contamination, losing access to his beloved garden and toys.¹³²

Sarah Marshall described a similar scene:

What I woke to the next morning is now burned in my memory – pounding at my door was the SES saying, 'You need to leave and you need to leave now.' I went back inside to throw together a bit of a bag, cat food, to try and work out what it was I was meant to do now. By the stage I went back outside, it was very clear that the water had already begun to come up the street and there was no way I could get my vehicle out. Given that we were still under the impression that that river was going to peak at 2.4, there was no sense of urgency. It became a bit of a situation of: 'We can stay, water is probably going to come up the street – it'll be okay. It'll probably be a few hours, a few days while it all clears – we're okay.' With that in mind, I made a decision to stay, which I often reflect on. I do not think to this point I would do anything differently, because it was based all on the information that I had on that day; I did not know what was coming.¹³³

Reflecting on the evacuation process, Tim Wiebusch, Chief Officer Operations of the Victoria SES, provided insight into the challenges of a rapidly evolving situation, and noted that the escalation to evacuation measures occurred quickly, and was compounded by the difficult timing in the early hours of 14 October.

Wiebusch explained to the Committee that:

The response was around about 2:30 in the morning – that we started to receive that information that what was originally thought to be anticipated as that moderate flooding that you alluded to was actually going to be major flooding. That comes in at a level of about 2.9 metres. We started doorknocking through the Maribyrnong community there from around 3 am with police and SES, basically going through to communities in that space. We were looking at a height of 3.2 metres at that point in time, in terms of what was being anticipated. That forecast or prediction continued

¹³⁰ Maribyrnong City Council, *Submission 530*, p. 3.

¹³¹ Name Withheld, *Submission 8*, p. 1.

¹³² Selin Lanzafame, public hearing, Melbourne, 18 October 2023, *Transcript of evidence*, p. 2.

¹³³ Sarah Marshall, public hearing, Melbourne, 18 October 2023, *Transcript of evidence*, p. 8.

to grow as the morning went on. We also then effected an emergency alert, being the phone alerting system, to back up the doorknocking that was underway. But obviously what resulted was a height much more significant than that. We ended up with a peak at around midday on that day of 4.216 metres. So I guess the response that was mounted during that morning was in response to the escalation that occurred.¹³⁴

Tim Wiebusch's detailed description of emergency response efforts highlights the challenges faced by emergency services during the Maribyrnong flood. The situation escalated rapidly, requiring immediate action in a timeframe that significantly complicated the evacuation process.

The experiences of the SES and residents underscore the complexity of effectively evacuating at-risk residents during a crisis. The Committee emphasises the importance of ensuring an effective and responsive alert system and best practice protocols for emergency evacuations in such rapidly evolving situations.

FINDING 65: The evacuation of Maribyrnong residents on 14 October 2022 was challenging because of rapid flooding that strained early morning evacuation efforts and inconsistent flood warning advice the previous evening. Nonetheless, the Victoria State Emergency Service adapted, intensifying their response as the situation escalated.

FINDING 66: Maribyrnong residents affected by the evacuation reported significant trauma associated with the process, further exacerbated by the overall impact of the major flooding event. The timing of the evacuation warnings led to some residents receiving insufficient notice, leaving them unprepared to evacuate promptly.

Relief operations

In partnership with the Australian Red Cross and a 'range of local relief agencies', the Victoria SES was also involved in relief operations for flood-affected communities. As part of its relief operation, the SES:

- delivered medical and food supplies
- assisted local government relief centres.¹³⁵

Chapter 8 examines the work of relief centres during the 2022 flood event as well as the broader recovery response.

¹³⁴ Tim Wiebusch, *Transcript of evidence*, pp. 7-8.

¹³⁵ Victorian Government, *Submission 295*, p. 50.

Cross-border coordination

The Victoria SES undertook cross-border coordination activities with the New South Wales SES two months preceding the 2022 flood event. The purpose of cross-border coordination was to:

- train field observers
- establish common social media tiles and warning messages applicable to respective border sides
- jointly information share with communities through meetings and briefings
- update the Public Information and Warnings protocol.¹³⁶

The Victorian Government noted that the two SES organisations had daily teleconferences from 12 October through to 12 December 2022, with the South Australian emergency services joining from 18 November. From 12–30 December 2022, teleconferencing occurred every third day. The purpose of the teleconferences was to ‘resolve differences in warning and media messages, coordinate response activities and coordinate community meetings’.¹³⁷

The Committee received some evidence from stakeholders reflecting on the adequacy of cross-border arrangements for towns near state borders, in particular the Victoria–New South Wales border. These stakeholders highlighted the need for improved protocols and formal arrangements to ensure emergency services either side of the border are operating seamlessly and collaboratively to respond to a crisis.

A lot of the evidence received discussed the issue of cross-border cooperation more generally than the specific remit of the Victoria SES. However, the principles of consistent communication, resource sharing and collaborative community responses are highly pertinent to the work of the emergency services. The Committee notes that the *Loddon Mallee Regional Emergency Management Plan* references a ‘draft’ memorandum of understanding between the Victoria SES and NSW SES to formalise arrangements.¹³⁸ However, the Committee was unable to find a publicly accessible copy of the memorandum or evidence it had been finalised. The Plan also noted some other cross-border arrangements for bushfire response, resource deployment, and aircraft arrangements.¹³⁹

In its submission, the Campaspe Shire Council provided a general overview of the approach of the emergency management sectors across Australia to cross-border cooperation:

¹³⁶ Ibid.

¹³⁷ Ibid.

¹³⁸ Emergency Management Victoria, *Loddon Mallee Regional Emergency Management Plan*, 2024, <<https://files.emv.vic.gov.au/2024-02/Loddon%20Mallee%20Regional%20Emergency%20Management%20Plan.pdf>> accessed 18 April 2024, p. 32.

¹³⁹ Ibid.

The emergency management sector nationally relies on individual and varying structures that are not equipped to manage the new ‘normal’ for natural disasters and emergencies, and lack a unified, coordinated approach to disaster management and risk reduction. As a sector, it is acknowledged that disasters have no boundaries, making it challenging and complex to navigate across state and territory borders. Lack of consistency in approach to disaster management and risk reduction reduces the focus on consequence management, impacting community relief and recovery.¹⁴⁰

Local councils along the border emphasised the ‘critical’ importance of effective communication and collaboration from cross-border emergency services. For example, Graeme Emonson, Administrator of Moira Shire Council, told the Committee that border communities ‘operate as one, and we need in these crisis times to be able to operate seamlessly’.¹⁴¹ Councillor Liam Wood, Mayor of Mildura Rural City Council, discussed the resource sharing between cross-border councils but felt that communication at ‘a state level was lacking’.¹⁴²

Some evidence was provided about communication issues between cross-border emergency services, including the Victoria SES. Swan Hill Rural City Council provided an example of where NSW residents increased an existing levee which had an impact on flooding levels on the Victorian side of the border:

The cross-border impacts of levees and flood mitigation structures should be considered seriously. An example was Council’s observation and potential impact created by NSW Landholders who used three excavators to increase the height of an existing levee as the water arrived at Swan Hill, across the Murray River at Murray Downs. Council raised the matter with the ICC, who appeared powerless to do anything as the works were occurring¹⁴³

Focusing more specifically on emergency alerts from the SES, Dr Kate Saunders, Chief Investigator at the ARC Centre of Excellence for Climate Extremes, examined the shortcomings in emergency warnings because they were spatially divided across borders. Dr Saunders explained that:

The VicAlert system did not communicate the spatial extent of the flooding across the Victoria/New South Wales state border. This made it more difficult for the public to make optimal decisions around their risk. The state-based web application, VicAlert is one of the primary means of communicating warning information during a natural hazard in Victoria. In general, VicAlert is very good for communicating warnings to the public, however for hazard events that have impacts across state borders, such as the October flooding, the warning information provided does not reflect the full geographical extent of the event.¹⁴⁴

¹⁴⁰ Campaspe Shire Council, *Submission 650*, p. 16.

¹⁴¹ Graeme Emonson, Administrator, Moira Shire Council, public hearing, Melbourne, 10 October 2023, *Transcript of evidence*, p. 11.

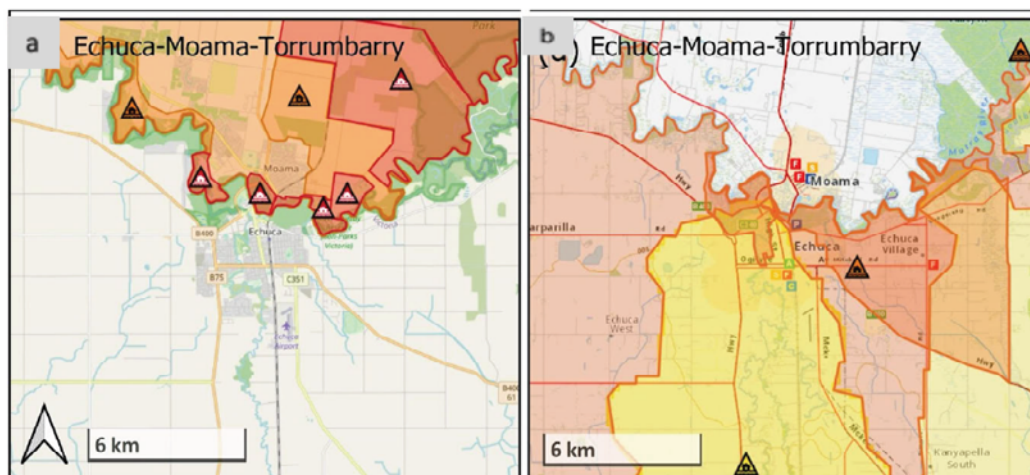
¹⁴² Cr Liam Wood, Mayor, Mildura Rural City Council, public hearing, Melbourne, 10 October 2023, *Transcript of evidence*, p. 11.

¹⁴³ Swan Hill Rural City Council, *Submission 642*, p. 15.

¹⁴⁴ Dr Kate Saunders, *Submission 675*, p. 2.

Figure 7.8 below, provided by Dr Saunders, is an example of the spatial delineation in emergency warnings from the Victoria SES and NSW.

Figure 7.8 Screenshots showing the warning information provided to the public during the Echuca-Moama-Torrumbarry flooding



Note: (a) NSW Hazard Watch; (b) VicAlert.

Source: Dr Kate Saunders, *Submission 675*, p. 3.

The Committee concludes that while the Victorian and New South Wales State Emergency Services have established commendable initiatives for cross-border collaboration, the full potential of these efforts is yet to be realised due to the absence of formalised agreements and consistent protocols.

The evidence presented underscores the critical importance of seamless and effective communication and collaboration across borders, particularly in times of crisis. The Committee strongly recommends the finalisation of formal agreements, such as the Memorandum of Understanding between Victoria and NSW SES. This would enhance the operational effectiveness of emergency services and significantly improve disaster management outcomes, ensuring better preparedness and response during crises affecting border communities.

FINDING 67: Despite structured coordination efforts between the Victoria and New South Wales State Emergency Services, including daily teleconferences and shared resources, there remains a significant need for formalisation of these arrangements.

RECOMMENDATION 53: That the Victorian Government and the Victoria State Emergency Service work with:

- a. New South Wales to finalise the MOU that has been initiated, and to make it publicly available
- b. South Australian counterparts to initiate and establish a MOU or other mechanisms for cross-border cooperation in relation to shared emergency events, and to make this publicly available.

Other response activities

The Victorian Government's submission also outlined several other response activities undertaken by the Victoria SES during the 2022 flood event, including:

- deployment of flood analysts (see Chapter 4)
- deployment of field observers
- operational communications.

The Committee did not receive a great deal of evidence on the adequacy of these response functions from stakeholders.

7.3.3 Adequacy of the response

The Victoria SES played a pivotal role in managing the emergency response to the significant flooding events that affected numerous regions across Victoria in 2022. The floods prompted extensive evacuations, emergency rescues, and widespread community support initiatives. The SES' efforts were critical in mitigating immediate threats to life and property, providing flood warnings, and coordinating with other emergency services and community groups.

The Committee commends the dedication and resilience of Victoria SES staff and volunteers in responding to the flood event. Nonetheless, evidence to the Inquiry identified several areas where improvements could enhance future responses:

- **Communication and coordination:** Effective communication is essential in managing large-scale emergencies. Improvements are needed in the way evacuation and other warnings are communicated to ensure they are timely, clear, and lead to those affected taking timely action. Additionally, coordination between the Victoria SES and other agencies, including cross-border coordination, needs enhancement to ensure a seamless response.
- **Community preparedness and engagement:** Engagement with local communities prior to the floods was instrumental in initial emergency response success. However, feedback indicates a need for greater proactive measures and training opportunities for community members.

- **Resource availability and distribution:** There was a clear issue with the management and distribution of resources such as sandbags or swift water rescue equipment, which are crucial in a flood response. Ensuring adequate availability of rescue equipment and trained personnel, particularly in regions known for high flood risks, to handle the volume and complexity of rescue operations during peak periods is vital.

Underscoring these operational issues was considerable concern for the strain on volunteers, especially in areas where SES personnel are low. Reflecting general trends across the volunteering sector, volunteer numbers for the Victoria SES are in decline.

Although a large portion of the SES volunteer force was mobilised, there were still challenges with volunteer fatigue and allocation. Strategies for better management of volunteer resources, including adequate rest, rotation, and support, are crucial, especially during extended emergencies.

Many stakeholders referenced dwindling volunteer forces in the SES as the key challenge affecting the adequacy of the agency's response to the floods. In its submission, the City of Greater Geelong noted there was evidence of resourcing issues with the SES in 2022 and a resulting loss of personnel to the region and a lack of support for flood-affected residents:

There was evident of lack of [SES] resourcing due to the relocation of [SES] resources to Northern areas of the State. This left skeleton staff available to respond to the impact on the City of Greater Geelong and Barwon South West region ... The limited [SES] resources increased waiting times and/or response for Greater Geelong residents.¹⁴⁵

Other local councils also discussed the impact of SES personnel shortages on the adequacy of the agency's response to the floods. Several of these noted that volunteer shortages meant other agencies, including councils themselves, became responsible for some of the duties normally undertaken by the SES.

Councillor Pierce Tyson, Mayor of the Moonee Valley City Council, described assisting with sandbag filling:

In speaking with our local SES representatives, they were all across the state at the same time, so they were under-resourced, like everyone else. I know, even on the day I think, we were helping fill sandbags at Windy Hill to assist them. So they were definitely under-resourced; they always are.¹⁴⁶

The Rural City of Wangaratta contended that the operational personnel for the Victoria SES is 'much fewer' compared to other emergency response agencies. As a result, during the flood event volunteers 'worked very long shifts, often working more consecutive days than other partner agencies'.¹⁴⁷

¹⁴⁵ City of Greater Geelong, *Submission 513*, pp. 4–5.

¹⁴⁶ Cr Pierce Tyson, Mayor, Moonee Valley City Council, public hearing, Melbourne, 11 October 2023, *Transcript of evidence*, p. 39.

¹⁴⁷ Rural City of Wangaratta, *Submission 361*, p. 1.

The creation of ‘silos’ and the impact of same in the midst of an emergency was keenly felt within the Buloke Shire where over-reliance on local volunteers stretched local agencies beyond capacity. It is noted 6 [Victoria SES] volunteers were available to support the Buloke Shire.

Buloke Shire Council, *Submission 690*, p. 4.

Some stakeholders expressed concern about the capability of the Victoria SES to lead the emergency response to floods because of resourcing issues. At a public hearing, Wayne O’Toole, Chief Executive Officer of Buloke Shire Council, expressed his belief that the SES lacks the necessary personnel to serve as the lead agency in the Buloke region.¹⁴⁸

Whilst the Gannawarra Shire Council emphasised the vital role of the SES within Victoria’s emergency management framework, it also expressed concern about the agency’s resource shortfall:

There was a clear message relayed by the VICSES to our community even before floodwaters arrived in Gannawarra that the VICSES did not have the resources to respond and that communities were on their own. This is a failure in the Victorian emergency management system.¹⁴⁹

Rural Councils Victoria considered there may be a need to reassess the Victoria SES’ role as the lead agency for flood emergencies in some rural areas. It pointed out the low volunteer numbers and lack of resources, suggesting that the agency’s current setup might not be sustainable without significant changes. Rural Councils Victoria emphasised a need for more volunteers and better resources, such as vehicles and other equipment, to improve the SES’ operational capacity during natural disasters.¹⁵⁰

Whilst the Committee believes that the Victoria SES is the appropriate agency to be the control lead on floods, it does acknowledge that evidence to the Inquiry suggests a strategic review of the agency’s resources and personnel may be appropriate. To ensure the Victoria SES can effectively fulfil its emergency management responsibilities, it is essential that they are adequately resourced, both in terms of equipment and increasing operational volunteers.

FINDING 68: The Victoria State Emergency Service was a pivotal part of the emergency response to the 2022 flood event. The exceptional dedication and resilience of the staff and volunteers in supporting communities and mitigating risks to life and property is commendable.

¹⁴⁸ Wayne O’Toole, Chief Executive Officer, Buloke Shire Council, public hearing, Melbourne, 10 October 2023, *Transcript of evidence*, p. 10.

¹⁴⁹ Gannawarra Shire Council, *Submission 637*, p. 25.

¹⁵⁰ Rural Councils Victoria, *Submission 559*, p. 5.

FINDING 69: The Victoria State Emergency Service is the appropriate control agency for flood emergencies, however strategic improvements are necessary in communication, resource allocation, and volunteer support to enhance its overall effectiveness and sustainability in managing such crises.

RECOMMENDATION 54: That the Victoria State Emergency Service undertake a strategic review of its resources, leadership and personnel allocation. This review should focus on enhancing communication systems, ensuring adequate availability of essential resources like rescue equipment, and implementing robust volunteer recruitment processes, support and training programs.

RECOMMENDATION 55: That the Victorian Government increase funding and support for the Victoria State Emergency Service to enable a comprehensive upgrade of emergency communication technologies, ensure a steady supply of critical response resources, and expand volunteer recruitment and retention programs, thereby bolstering the agency's capability to manage and respond to emergencies effectively.

In relation to incident control response, Lance King provided the following insight:

Capability and capacity are crucial factors in the safe and expedient management of a flood event thereby allowing Incident controllers the knowledge and training to efficiently deploy staff and volunteers to lessen the impact of a flood event where possible.

Incident controllers need to have a local knowledge training component/availability at their call to heed the advice given.

Where an Incident Controller (IC) has no experience in a new flood environment because they have been deployed from a different area or are new to the role, it becomes critical to take stock of local advice given.

This is where training of Incident Controllers becomes critical to local conditions and learned experiences with the advice from local trusted persons.¹⁵¹

RECOMMENDATION 56: That the Victorian Government ensure that incident control centres include a mechanism for local expertise to be included in their operations and help inform processes to assist managing localised warnings and response.

¹⁵¹ Lance King AFSM, *Submission 283*, p. 3.

7.4 Response of other emergency service organisations

VICSES was the primary responder, with volunteers contributing over 400,000 hours of services during the event. Numerous other agencies played significant roles: CFA, FRV, FFMV, VicPol, Shep search and rescue, Life Saving Victoria, Ambulance Victoria, ESTA, fisheries came along as well and the ADF, as well as interstate emergency services agencies.

Hon Jaclyn Symes MLC, Minister for Emergency Services, public hearing, Melbourne, 6 December 2023, *Transcript of evidence*, p. 34.

Responding to a major emergency often requires a multi-agency emergency response. This was certainly the case with the 2022 flood event. A multitude of agencies were involved in the emergency response, alongside the SES, including:

- Victoria Police
- fire rescue brigades
- interstate emergency services
- independent emergency service organisations
- Australian Defence Force personnel
- many community volunteers.

The Committee heard that the constraints on the Victoria SES meant that in some areas there was a greater reliance on other emergency services.

This Section considers the emergency response role other agencies played in the 2022 flood event.

7.4.1 Fire rescue services and the role of the Country Fire Authority

Under the State Emergency Management Flood Sub-Plan, fire rescue services are designated as a response agency.¹⁵² Response agencies provide services, personnel or material to support the control agency.¹⁵³

In consideration of the role of the fire services in major flood events, the Committee heard from Darrell Phillips, a member of the Echuca Village community and CFA member who said:

We did not have a great deal to do with the SES out at Echuca Village – they did not come out there and see us at all, I do not believe. But on the first night of the floods when the Campaspe was coming up and Rochester was under flood, on the Thursday evening, we were part of a strike team that assembled in Strathallan Road – which is

¹⁵² Victoria State Emergency Service, *State Emergency Management Plan, Flood Sub-Plan*, pp. 14–15.

¹⁵³ Emergency Management Victoria, *State Emergency Management Plan (SEMP): Roles and responsibilities – Response*, <<https://www.emv.vic.gov.au/responsibilities/state-emergency-management-plan-semb/roles-and-responsibilities/response#Table9>> accessed 19 April 2024.

probably about 7 k's that way – and in the first 10 minutes of that I realised we were in a bit of trouble because we had not followed the CFA protocol and training we do by having a SMEACS briefing. We had no idea what we were going to do out there and we had not been tasked with what we were actually going to do or achieve.

...

Before we go into any bushfire we get given one of these SMEACS, and it tells us what time the weather is going to change, who is the leading agency, what radio channel we will be using, what time we will be having lunch and what sorts of things to watch out for. You do not go anywhere without it. We can go all the way to Brisbane in a fire truck, and we will still have this SMEACS system implemented. The Brisbane fire chief up there might tell us what we are going to do and task us with a briefing, and our CFA commanders or strike team leaders will then come and brief us on what we do. It is a standard thing. I have been in the CFA for 20 years, seven years as a captain, and I carry it in my book, as you see here.

...

I think it was being run by the SES out of Echuca div com – but we did not have a great lot of detail.¹⁵⁴

Wayne O'Toole, Chief Executive Officer from Buloke Shire Council, said:

Certainly for us the SES is not best equipped to be the lead agency in Buloke, because they just do not have the people.¹⁵⁵

The Victoria SES Volunteers Association in its submission stated:

It appears that VICSES underestimated the scale of the event, failed to adequately warn the local community and gave misleading public advice which put people and property at risk.¹⁵⁶

The Committee again acknowledges the selfless work and tireless efforts of all independent rescue squads, SES volunteers and paid staff during the crisis. It is noted that the CFA, which has more than 1,200 stations throughout Victoria, also played a critical role, and also worked selflessly and tirelessly, especially in locations without local SES units.

Much of the evidence received from people directly impacted by flooding refers to the presence of local fire brigades alongside the Victoria SES volunteers, particularly in rescue and evacuation efforts. The breadth of evidence discussing the presence of the CFA and FRV speaks to the important and prominent role they played in the 2022 flood response. Box 7.10 below outlines some of the evidence discussing the role of the fire brigades in helping residents.

¹⁵⁴ Darrell Phillips, *Transcript of evidence*, pp. 33–34.

¹⁵⁵ Wayne O'Toole, *Transcript of evidence*, p. 10.

¹⁵⁶ Victoria SES Volunteers Association, *Submission 539*, p. 19.

Box 7.10 Stakeholder evidence on the presence of fire services during the 2022 flood response

Around 9:30 pm, we heard a CFA truck along our street. My brother went out to the truck and asked if it could evacuate my parents, and they said they could take everyone in the house as well. They were amazing.

Katie Rasmussen, *Submission 328*, p. 1.

The local CFA brigades, particularly in the flood impacted areas came together with Council and the SES to help fill and distribute sandbags.

Strathbogrie Shire Council, *Submission 519*, p. 2.

an SES floodwater rescue barge, and a FRV fire boat rescue crew on day two of the event, these assets only remained in Rochester temporarily, once they departed the CFA resumed primary response to any call for assistance to 000 once again

Cameron David Lovering, *Submission 639*, p. 13.

The CFA took a lead role in educating the public about AHD levels, community infrastructure, how to lay sandbags, installing pumping systems that the local shire did not have (although part of the Flood Emergency Plan) and general direction and guidance to the plan.

Name Withheld, *Submission 673*, p. 3.

My husband is a member of the CFA and he spent the better part of 4 days helping to evacuate and then support community members. He carried elderly people from their homes, loaded residents into canoes, hoisted countless individuals onto trucks and ferried them out of the water.

Name Withheld, *Submission 794*, p. 1.

The brigade and the community have effectively always been the boots on the ground managers of the response to all flood events in and around Carisbrook.

Carisbrook Fire Brigade, *Submission 746*, p. 2.

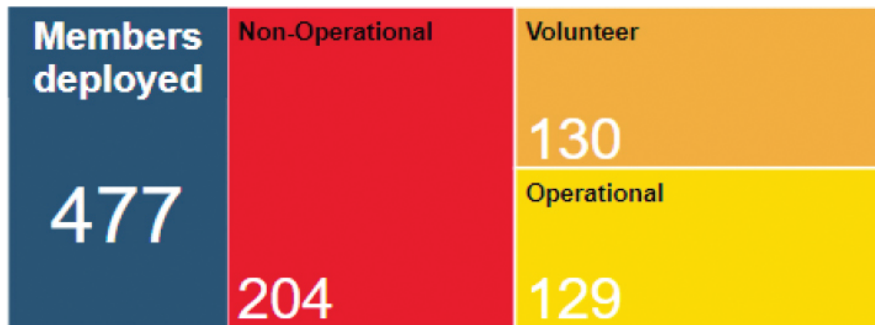
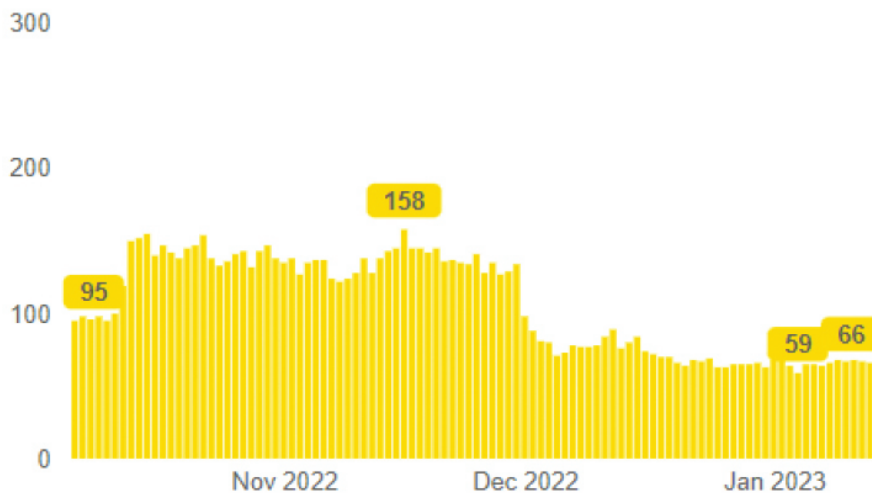
During the 2022 flood event, fire rescue crews were utilised across Victoria, engaging in a variety of important emergency response roles. In its submission, the United Firefighters Union of Australia (Victoria Branch) outlined the various roles of firefighters during the flood event:

Throughout the 2022 Victorian floods, professional firefighters were systematically deployed and utilised in Victoria. Additionally, fire service support personnel performed crucial work in Incident Control Centres and Regional Control Centres, as well as in the ESTA “000” call centres.

Professional firefighters were predominately deployed in “strike teams” or “task forces” to floods around the State to engage in numerous duties such as, impact assessment and post-incident analysis (such as Rapid Impact Assessment, Swift Water Rescue, Ground Observer, RPAS (Aviation Unit) as well as within Incident Control Centres and Regional Control Centres. It should be noted that the majority of these tasks are specialist and require additional training, qualifications and skills maintenance.¹⁵⁷

Figure 7.9 below, provided by the Volunteer Fire Brigade Victoria, shows the deployment of CFA members during the 2022 flood event.

Figure 7.9 CFA members deployed to the 2022 flood event



Source: Volunteer Fire Brigade Victoria, *Submission 669*, p. 14.

In its submission, Friends of the Earth Melbourne discussed the deployment of the North West CFA:

[I]n the North West CFA region, there was a response commitment to Flood Operations which began on 7 October and did not conclude until 28 December, when the focus shifted towards recovery. As with any major emergency, it is the recovery that takes the longest, and while CFA is primarily a response agency, the fact that it had large

¹⁵⁷ United Firefighters Union of Australia (Victoria Branch), *Submission 704*, p. 6.

numbers of trained and organised volunteers, with strong connections to their local community meant that it could provide support in both the disaster response and recovery efforts.¹⁵⁸

In a submission, Hamish Toll, ‘on behalf of the people in the area including Torrumbarry, Patho, Gunbower and Cohuna townships’, stated:

The job was huge, with 18km of levee bank to build, water already breaching parts of the bank and most of the works being carried out in areas only accessible via clay bush tracks and a sodden mud pit along the length of the river. Local earthworks contractors, large agricultural contractors, single operators and farmers were individually keen to contribute, but it was quickly identified this scale job would require serious co-ordination. There is no local SES branch, and the SES and other agencies were under immense pressure in Rochester and Echuca. It was deemed the Torrumbarry CFA be the most appropriate location to headquarter the initiative.

...

CFA were great, local volunteers came from other stations to man the radios and be a central point of communication.

...

The CFA headquarters were a hive of activity, by the second day the walls were covered in maps of work areas displaying the sections and works, QR codes for check-ins to site and safe work practices. In the engine room equipment such as pumps, buggies, markers, hoses etc were arriving for tagging and distribution.

A commercial kitchen was set up in Gunbower and commenced supplying up to 200 meals a day which were then distributed to the front line on the levee with the buggies as part of the surveillance checks. This was key to supporting the constant and intense activity - people needed to be fed to keep them efficient but also safe.

We identified early that support was needed from a modelling and engineering perspective. Catchment management were leaned upon for modelling data to help identify the level required for the levee so the team on the ground had an informed goal to work to rather than reactively working to where the levee ‘appeared low’. This enabled the team to obtain surveying support and the length of the levee was marked out to the modelled height + appropriate freeboard. Engineering expertise was provided by the City of Bendigo due to the load on local engineering in other flood mitigation efforts. The project’s engineering group was tasked with identifying the sections of the levee that needed the greatest attention structurally to provide an efficient works plan as the levee was being built to height.¹⁵⁹

Much of the evidence which discussed the involvement of fire rescue services in responding to the event noted similar concerns to those raised about the Victoria SES.

¹⁵⁸ Friends of the Earth Melbourne, *Submission 46*, p. 2.

¹⁵⁹ Hamish Toll, *Submission 686*, pp. 6–9.

Stakeholders had a perception that the effectiveness of fire rescue involvement was hampered by issues such as:

- communication delays or inconsistencies, including between crews, from leadership and in community information¹⁶⁰
- demand for emergency services exceeded the capacity of personnel and availability of resources¹⁶¹
- response coordination challenges.¹⁶²

The floods required fire rescue services to undertake a significant mobilisation of personnel well ahead of when they typically mobilise ahead of peak fire danger period, with activities starting in October. The Volunteer Fire Brigades Victoria said that 'fortunately' the 2022/23 fire season was 'relatively mild' because had it not been fire rescue services would have gone into the 2022/23 fire season considerably fatigued from an extended flood campaign that began in October.¹⁶³

Alongside concerns about personnel fatigue was the issue of the sustainability and resourcing of fire rescue services, an issue also noted in relation to the Victoria SES (see Section 7.3.3). For instance, Volunteer Fire Brigades Victoria discussed the resourcing challenges for fire rescue services:

We are aware from our regular interaction with VICSEVA, that they hold serious concerns about the resourcing of the State Emergency Services.

We share and fully support them in those concerns.

They are not dissimilar to the concerns we hold regarding the inadequate resourcing and sustainability of CFA.

...

The fact that it has continued to achieve an equally comparable high standard as other agencies that are much better funded and resourced is testament to the hard work, skill and goodwill of volunteers, and the dedicated staff who support them.¹⁶⁴

The Committee acknowledges the pivotal role of fire rescue services during the 2022 Victorian floods, a point reinforced by various stakeholders. Designated under the State Emergency Management Flood Sub-Plan as a response agency, both the CFA and FRV were instrumental in rescue and evacuation efforts, often working in coordination with Victoria SES and local councils. That collaboration and the direct involvement of fire brigades significantly bolstered the emergency response. Numerous stakeholders described the swift and compassionate actions of fire service personnel in their evidence to the Committee.

¹⁶⁰ See: Peter Mitchell, *Submission 662*, p. 2.

¹⁶¹ See: Volunteer Fire Brigades Victoria, *Submission 669*, p. 3.

¹⁶² See: Murray River Group of Councils, *Submission 747*, p. 15.

¹⁶³ Volunteer Fire Brigades Victoria, *Submission 669*, p. 13.

¹⁶⁴ Volunteer Fire Brigades Victoria, *Submission 669*, p. 11.

However, while the dedication and efficacy of these services were clear, they were not without challenges. Issues such as resource availability, personnel fatigue, and communication delays were noted, reflecting broader concerns about the sustainability and capacity of emergency response infrastructure. These insights highlight the critical need for adequate support and resources to maintain their readiness and effectiveness in future emergencies.

FINDING 70: Both volunteer brigades and career firefighters played a crucial role in response efforts during the 2022 flood event, demonstrating their capability and commitment under challenging circumstances. However, the recurring issues of available resources and personnel fatigue highlights a significant area for improvement in emergency response management, infrastructure and support.

7.4.2 Shepparton Search and Rescue

In Shepparton, the Shepparton Search and Rescue Squad is an independent emergency service organisation separate to the Victoria SES.¹⁶⁵ The organisation was founded in 1971,¹⁶⁶ and is one of two independent organisations recognised by the Victorian Government. The second is the Echuca and Moama Search and Rescue Squad.

Along with the Echuca and Moama squad, Shepparton Search and Rescue works alongside other emergency service agencies including Victoria SES, Victoria Police, and the CFA. It is an incorporated association under the *Associations Incorporation Act 1981* (Vic) but is not governed by standalone legislation specifying its powers and roles in an emergency service response. However, Shepparton Search and Rescue is named as an independent road crash rescue provider in Emergency Management Victoria's *State Road Crash Rescue Arrangements*.¹⁶⁷

The Victoria SES and Shepparton Search and Rescue have an ongoing commitment to collaborate on responding to emergencies in Shepparton through a MOU. This MOU was in place during the 2022 floods and was renewed in 2023.¹⁶⁸ In a media release reflecting on the MOU applicable to the 2022 flood period, the Victoria SES explained that:

The agreement will ensure that we can work as one, regarding day-to-day planning and emergency response, particularly when we see large scale emergencies affecting the Shepparton area.¹⁶⁹

¹⁶⁵ Echuca and Moama Search and Rescue Squad, *Echuca Moama Search & Rescue Squad*, <<http://emsr.org.au/index.php>> accessed 1 May 2023; Shepparton Search and Rescue, *About Us*, <<https://www.sheppartonrescue.com.au/about-us>> accessed 1 May 2023.

¹⁶⁶ Echuca and Moama Search and Rescue Squad, *Echuca Moama Search & Rescue Squad*, <<http://emsr.org.au/index.php>> accessed 1 May 2023.

¹⁶⁷ Emergency Management Victoria, *State Road Crash Rescue Arrangements*, 2017, p.9.

¹⁶⁸ Victoria State Emergency Service, *VICSES and Shepparton Search and Rescue work as one*, media release, 13 May 2019, <<https://www.ses.vic.gov.au/w/vicses-and-shepparton-search-and-rescue-work-as-one>> accessed 19 April 2024; Victoria State Emergency Service, *VICSES and SS&RS work together for Shepparton*, 31 July 2023, <<https://www.ses.vic.gov.au/-/shep-mou>> accessed 19 April 2024.

¹⁶⁹ Victoria State Emergency Service, *VICSES and Shepparton Search and Rescue work as one*, media release, 13 May 2019, <<https://www.ses.vic.gov.au/w/vicses-and-shepparton-search-and-rescue-work-as-one>> accessed 19 April 2024.

At a public hearing, Nacole Standfield, President of Shepparton Search and Rescue, informed the Committee about its operational capacity during the 2022 flood event:

[W]e have a membership of 25 members who run a rotation of 24-hour, seven-day-a-week shifts over a nine-day period. In that time we had three boat crews running through the day, four road crews and four people in our divisional command point, and on the night crew we had two boats, two road crews and two people in the divisional command point.¹⁷⁰

She further expanded on the scale of the assistance provided by the independent organisation, alongside other emergency services:

During the floods we attended 1162 requests for assistance in that eight-day period, which meant our calls were constantly going, from the Thursday morning right through to the following week, which did not leave much time to have a breather or a break and know what was really happening outside of what we were doing.¹⁷¹

The floods were very busy for us. It was very stressful. It was very chaotic. It was a high pressure situation that many of them wish that we never have to go through or see again, and we are very grateful for VICSES for allowing us to access their peer and critical assessment teams to be able to provide mental health support back to our members after those floods.

Nacole Standfield, President, Shepparton Search and Rescue, public hearing, Mooroopna, 13 September 2023, *Transcript of evidence*, p. 71.

One of the key aspects of the response Shepparton Search and Rescue assisted with was the distribution of sandbags (Section 7.3.2 above discusses sandbagging in more detail, focusing on the Victoria SES' role). Reflecting on sandbag distribution, Nacole Standfield stated this was one of the 'biggest improvements' to be made:

[O]ne of the most difficult things we had was the initial set-up of the sandbagging location. It was not in a great place for the public to access, and it also delayed our response once the pager started going off, because we had to work out who was going to man it and who had to leave. That did not leave a lot. We had cars lining up, and we had cars waiting for long periods of time while we were waiting for sandbags to be dropped off that were already filled, because it takes time to hand-fill a sandbank. When you have 25 members – and at that point half of them were still at their ordinary jobs – we were running off three people to fill sandbags, so we were very lucky that the council and Dhurringile Prison managed to work together to fill out the sandbags. But getting it delivered through the traffic of cars took time.¹⁷²

Like other emergency service organisations, Shepparton Search and Rescue noted its capacity to assist is constrained by resourcing, equipment and personnel limitations. The Committee was informed that the organisation does not receive direct funding

¹⁷⁰ Nacole Standfield, *Transcript of evidence*, p. 70.

¹⁷¹ *Ibid.*, p. 71.

¹⁷² *Ibid.*, p. 72.

from the Government, but it does have access to grants for equipment and training. For costs incurred during the flood event, Nacole Standfield explained that under the MOU the Victoria SES covers:

costs for fuel and electricity and food. For anything we incur during that time they reimburse us those funds.¹⁷³

Linked to limited funds, access to training was highlighted as another issue affecting the capacity of Shepparton Search and Rescue to assist with emergencies. Nacole Standfield discussed:

I think probably the hardest thing is gaining access to training for volunteers. It is restricted by budgets, and when you are restricted by budgets some courses cannot be run. People who have a competency to run a boat in an emergency situation – there are not many of them.

Gaelle BROAD: Okay. So in that situation what are the requirements for training, and how long are these wait periods that you are talking about?

Nacole STANDFIELD: I have actually had members wait up to six years to gain access to boating courses.

Gaelle BROAD: Okay. In an emergency situation, if there is someone that you know who has not done the course, does that mean you cannot get them to help?

Nacole STANDFIELD: No. If you do not hold a competency and you are not trained in a certain area, I cannot get you to do that task. Members who did not hold a boat qualification were either tasked as local knowledge navigators to the deployment crews – because obviously they were coming in from an outside area and they did not know the town – or they were tasked as land-based crews, so they would go out and do the sandbagging or they would pick up the people who had been evacuated from their homes and take them to the evacuation centre so they did not have to find their own way.¹⁷⁴

Shepparton Search and Rescue played an important role in supporting the emergency response to flooding in Greater Shepparton during the 2022 flood event. Despite their effectiveness in response efforts, the organisation operated under considerable constraints, such as managing resource limitations. These challenges not only affect their operational readiness but also the scope of training available to volunteers, which is critical in preparedness for emergency situations.

FINDING 71: Shepparton Search and Rescue demonstrated significant operational effectiveness during the 2022 floods, despite operating under resource constraints. These challenges underscore the need for enhanced structural and resource-based support for independent emergency services to ensure optimal response capabilities in future emergencies.

¹⁷³ Ibid., p. 71.

¹⁷⁴ Ibid., p. 72.

RECOMMENDATION 57: That the Victorian Government increase funding to Shepparton and Echuca and Moama Search and Rescue squads to ensure optimal response capabilities in future emergencies.

7.4.3 Australian Defence Force

On 13 October 2022, the first ADF resources were deployed to respond to flooding in Victoria. States and territories can request ADF assistance under the *Defence Assistance to the Civil Community* arrangements.¹⁷⁵

By 20 October 2022, there were approximately 400 ADF personnel and high clearance vehicles assisting residents in flood-affected areas, including with the distribution of sandbags.¹⁷⁶

It was made clear to the Committee that many stakeholders felt strongly that the ADF has a critical role in effective disaster management and recovery, especially for disasters the scale of the 2022 floods. Some stakeholders expressed concern about what they perceived as a delayed decision for deployment of ADF personnel to flooded communities.

Councillor Fiona Stevens, Mayor of the Mitchell Shire Council, which is located 10 minutes from the Puckapunyal Military Area, noted the delayed activation of the ADF to the area. Despite the proximity of military resources, the community of Seymour did not receive ADF assistance until days after the onset of flooding. Mayor Stevens suggested this illustrated possible flaws in the activation process and underscored the need for a review to ensure quicker response times in future emergencies.¹⁷⁷

Similarly, Leigh Wilson, Chair of the Rochester Community Recovery Committee, reported that it also took several days for ADF personnel to arrive in Rochester. When they did arrive, the structure of their operation—wherein all coordination went through a single ADF contact—proved effective. However, the initial delay meant that significant time was lost during which more proactive measures could have been taken to mitigate the effects of the flooding.¹⁷⁸

The ADF provided good support when they eventually arrived.

Community feedback received by Committee for Greater Shepparton, *Submission 393*, p. 13.

The Committee for Greater Shepparton and the Mitchell Shire Council supported the sentiment that while the ADF's contribution was ultimately beneficial, the timing of their arrival was not optimal. Given the proximity to military resources, there were

¹⁷⁵ Victorian Government, *Submission 295*, p. 22.

¹⁷⁶ Ibid.

¹⁷⁷ Cr Fiona Stevens, Mayor, Mitchell Shire Council, public hearing, Seymour, 14 September 2023, *Transcript of evidence*, p. 3.

¹⁷⁸ Leigh Wilson, Chair, Rochester Community Recovery Committee, public hearing, Rochester, 23 August 2023, *Transcript of evidence*, p. 9.

substantial opportunities for a quicker and more comprehensive response, which were not realised.¹⁷⁹

The Committee notes that the recent *Defence Strategic Review (2023)* made the following recommendation about the defence force's involvement in supporting domestic disasters:

Defence should be the force of last resort for domestic aid to the civil community, except in extreme circumstances.¹⁸⁰

Similarly, the Senate Select Committee's Interim Report on Australia's Disaster Resilience recommended:

that the Independent Review of National Natural Disaster Governance Arrangements (Glasser Review) look at the current COMDISPLAN and the triaging of emergencies in light of its impact on the Australian Defence Force.¹⁸¹

Some stakeholders expressed concern about these determinations, especially given the effectiveness of the ADF where it was used during the 2022 flood event.¹⁸²

Some stakeholders did question the decisions about where the ADF was deployed, contending that the neediest communities did not receive support or it was delayed.¹⁸³ A commonly referenced situation was the deployment of the ADF at Echuca but not in Rochester, despite the latter having a higher number of assistance requests. In his submission, Cameron David Lovering stated:

An observation that was evident in the community sentiment, was the presence of a large number of ADF members around the state in the media reports, particularly in Echuca, however, none were visible in Rochester before the flood and only a limited presence after the flood. Had the ADF been able to assist Rochester at the sandbag collection and production points, arguably it would have been of significant advantage to the community.¹⁸⁴

This sentiment was supported by Leigh Wilson, Chair of the Rochester Community Recovery Committee, who said during a public hearing:

That first week it was us here on our own, and we watched Chinook helicopters fly overhead to Echuca. You have no comprehension of seeing people getting around for three or four days in the same clothes – no ambulance, no medical. The police – the ones that were working – had done countless hours back to back. Our local organisations were trashed, the businesses were trashed, not knowing where people were. And there were no government people here to help. Local government – council – had so much

¹⁷⁹ Committee for Greater Shepparton, *Submission 393*; Mitchell Shire Council, *Submission 521*, p. 9.

¹⁸⁰ Australian Government, *National Defence Strategic Review, 2023*, p. 41.

¹⁸¹ Parliament of Australia, Senate Select Committee on Australia's Disaster Resilience, *Interim Report*, September 2023, p. 15.

¹⁸² For example, see: Concerned Residents of the Tyntynder Flats, *Submission 367*, p. 6.

¹⁸³ See: Cameron David Lovering, *Submission 639*; Cr Laura Binks, Mayor, Strathbogie Shire Council, public hearing, Seymour, 14 September 2023, *Transcript of evidence*.

¹⁸⁴ Cameron David Lovering, *Submission 639*, p. 9.

going on; it is hard to criticise them. Could they have done better, could they have done more? Yes, but with what? Plenty of their staff were flooded as well. We needed state assistance – it was not here. Not here – the hurt.¹⁸⁵

Councillor Laura Binks, Mayor of Strathbogje Shire Council, told the Committee that they:

contacted federal and state ministers trying to get support from the ADF because we were so impacted in this area. Normally we will help each other out, travel down the road and help our neighbours, but because of the broad impact we were so short on personnel to be able to step up and assist. We just kept being told, ‘No, you’re not significant enough to warrant getting the ADF’ – basically that they could go elsewhere. You just sort of feel like you get left out.¹⁸⁶

In the Committee’s view, the deployment of the ADF during the 2022 floods led to concerns among some stakeholders about resource distribution. For example, some highlighted the differing levels of ADF visibility and support in Echuca compared to Rochester. Where other emergency services have determined ADF support is not necessary, this should be clearly articulated to the community so residents understand priorities for deployment.

The deployment of the ADF by local ADF liaisons with relevant incident control centres in response to the 2022 floods highlighted the views of the community in relation to their role in disaster management. While the ADF’s assistance was seen as effective by many, the timing of its deployment to areas like Seymour and Rochester was criticised.

It is essential that Victoria is resilient and prepared to respond to natural disasters and that the response is State-driven. As noted in discussions above, according to the ADF leadership, the ADF should not be leading the response, and their resources should only be deployed as a last resort. The Committee believes given the scale of the 2022 flood event, the activation of the ADF was welcome and helpful.

FINDING 72: The scale of Victoria’s flood event in 2022 meant the activation of Australian Defence Force resources was necessary to assist ongoing response efforts from state-based emergency services.

FINDING 73: The Committee heard that many Rochester community members were devastated when they observed the Australian Defence Force passed them by on route to other flood-affected towns.

¹⁸⁵ Leigh Wilson, *Transcript of evidence*, p. 7.

¹⁸⁶ Cr Laura Binks, *Transcript of evidence*, p. 10.

FINDING 74: The timing of the activation of the Australian Defence Force to some flood-affected communities caused community concern about disaster response efforts. However, the emergency response to events such as floods should be led and coordinated at the state level and not be reliant on Australian Defence Force support.

7.4.4 Interstate emergency service organisations

Victoria also received assistance from several interstate emergency service agencies. From 24 October 2022, personnel from the Queensland Fire and Emergency Services, the Western Australia Department of Fire and Emergency Services and South Australia Emergency Services were deployed across Victoria to assist with 'response, relief and recovery efforts'.¹⁸⁷ Interstate assistance was requested through the Australasian Arrangement for Interstate Assistance, Fire and Emergency Services.¹⁸⁸

¹⁸⁷ Victorian Government, *Submission 295*, p. 22.

¹⁸⁸ *Ibid.*

Chapter 8

Flood recovery

8.1 Introduction

The process of recovery from the 2022 flood in Victoria has been complex and ongoing.

The Interim Report, tabled by the Committee at a regional sitting of the Legislative Council in Echuca on 18 April 2024, discussed the process of flood recovery. Tara Atley, School Captain of Rochester Secondary College, addressed the Legislative Council about local issues. Her address to the Council focused primarily on the ongoing challenges of recovery from what was a devastating flood in Rochester. The Environment and Planning Committee Chair and members had the opportunity over the days before the sitting and during the event to hear from Northern Victorians about their recovery goals and progress, and the barriers that remain for them in establishing their livelihoods and community. Even though the flood is over, the recovery needs of communities remain. Tara urged the Council, and the Government, to continue with their efforts to rebuild flood-affected communities.

Whether you live in a house, a caravan or a shed, whether enduring losses of pets, livestock or property, Rochester collectively continues its recovery process. In various natural disasters such as the October floods and the bushfires across Australia the media typically highlights the initial crisis. We understand that the reconstruction process is not always as newsworthy, but we live it every day.

Tara Atley, School Captain of Rochester Secondary College in Victoria, Legislative Council, 18 April 2024, *Parliamentary Debates*, p. 1124.

In Maribyrnong many issues remain of concern, not least of all the insurance challenges facing residents as they continue in their efforts to renovate and rebuild their homes and reestablish their lifestyles.

The Committee commends the work of communities, emergency services, health services, police and councils in dealing with the October 2022 flood and its aftermath. It also acknowledges the Victorian Government's commitment to aiding flood-impacted communities. However, the Committee has heard clearly from stakeholders—communities, individuals and agencies—that the events of October 2022 and the response to them, have taught us valuable lessons.

The Committee calls attention to the need for a more streamlined, community centred and accessible approach to recovery. The experiences shared by the community, from the frustration with bureaucratic processes to the heartfelt accounts of ongoing hardship, underscore the imperative for continual improvement of disaster recovery strategies to ensure they are attuned to the immediate and long-term needs of those affected.

A critical concern has been the need for financial support, where affected individuals, businesses, and local councils continue to grapple with the economic aftermath of the floods, ranging from property and infrastructure damage and disruptions to livelihoods. Insufficient or delayed financial assistance can be a significant barrier on the road to recovery, exacerbating the hardship faced by those trying to rebuild their lives.

The Victorian Government offered financial support, temporary accommodation, mental health and wellbeing support and business support to those affected by the October 2022 floods. There were also Commonwealth Government programs in place to assist those who have lost income or experienced major damage to their home or assets because of the floods. This Chapter examines evidence submitted to the Inquiry concerning whether these services have been accessible and effective in addressing the needs of flood-affected individuals and communities. It begins with a discussion of the establishment of relief centres by councils.

Leesa Hodgens in the extract from her evidence below highlights the nuances of what faced her community during the flood and the ongoing challenges of recovery. Leesa reveals how all members of the community were affected in some way.

Leesa Hodgens, Wellbeing Co-ordinator, Rochester Primary School

We have only just moved back into our school after 3 portable school set ups post flood. The devastation I have witnessed in our community and the post flood mental health concerns with our students and families has been huge. I have definitely seen an increase in worries and mental health concerns now the weather has turned cooler and leading into winter, families cramped in cold caravans and now can't use their outside areas like they could in summer. For our staff, the changes in teaching conditions and moving was huge, all the time supporting some very traumatised kids (when many of our staff were also flooded). If staff weren't flooded themselves then they have been supporting a flood-affected family member as well. My parents in their 80's were flooded and the time it has taken to firstly find a rental for them and supporting their mental health was huge. So very hard for them do not want to see them go through this again. We cannot go through this again, our community and school just cannot go through another flood. Please please help us to come up with a long term plan that will ease the minds of all of our town.

Source: Leesa Hodgens, *Submission 161*.

8.2 Relief and recovery centres

Under the *Victorian State Emergency Management Plan*, local councils are responsible for:

- establishing Emergency Relief Centres to provide 'immediate and basic services to people affected by an emergency'

- coordinate local recovery work, including—
 - oversight of recovery environments and activities
 - provide recovery related information to the community
 - coordinate community recovery services
 - coordinate local recovery activities.¹

Other agencies and bodies, including charity organisations, also assist with providing recovery services and support.

8.2.1 Emergency Relief Centres

Bill Chisholm

the service groups were instrumental in supplying support and assistance. At the Emergency Relief Centre situated at the Seymour Sports and Aquatic centre, they supplied equipment and assistance in a whole range of areas. They helped and supported Council staff and were critical in the smooth functioning of the support centre.

Source: Bill Chisholm, *Submission 334*, p. 1.

The Victorian State Emergency Management Plan outlines the functions and role of Emergency Relief Centres established by local councils following a disaster:

A relief centre is at a place (such as a town hall or community centre) a council establishes to provide immediate and basic services to people affected by an emergency.

Provide services including as required shelter, food and water, non-food items (such as bedding and clothing) reconnecting friends and families services and health services including psychological first aid.²

The relief centres can also include agencies which provide outreach activities, typically for more isolated people and communities.³

1 Emergency Management Victoria, *State Emergency Management Plan: Roles and responsibilities – Councils*, <<https://www.emv.vic.gov.au/responsibilities/state-emergency-management-plan-semp/roles-and-responsibilities/role-statements/role-statement-councils>> accessed 22 April 2024.

2 Emergency Management Victoria, *State Emergency Management Plan*, November 2023, <[https://files.emv.vic.gov.au/2023-12/State%20Emergency%20Management%20Plan%20\(SEMP\).pdf](https://files.emv.vic.gov.au/2023-12/State%20Emergency%20Management%20Plan%20(SEMP).pdf)> accessed 22 April 2024, p. 60.

3 Emergency Management Victoria, *State Emergency Management Plan*, November 2023, <[https://files.emv.vic.gov.au/2023-12/State%20Emergency%20Management%20Plan%20\(SEMP\).pdf](https://files.emv.vic.gov.au/2023-12/State%20Emergency%20Management%20Plan%20(SEMP).pdf)> accessed 22 April 2024, p. 60.

Maribyrnong City Council

At 3 am on 14 October 2022 council was directed by the Victoria State Emergency Service to activate and open an emergency relief centre to support the evacuation of residents from rising floodwaters in the Maribyrnong River. Working with the Salvation Army, Cohealth and Highpoint management, the emergency relief centre provided a hot breakfast, warm clothes for those who had been rescued from floodwaters and the coordination of support services for the complex needs of residents impacted by the sudden and devastating onset of this extreme weather event ... the relief centre was a central point for residents seeking advice, guidance and support, with a number of agencies there, including Services Australia; the Department of Families, Fairness and Housing; Disaster Relief Australia, Emergency Recovery Victoria, Victoria insurance agents, the Victorian Council of Churches; and the Australian Red Cross. We transitioned to a recovery centre on 31 October and continued to provide the support to residents.

Source: Cr Sarah Carter, Mayor, Maribyrnong City Council, public hearing, Melbourne, 11 October 2023, *Transcript of evidence*, p. 23.

The Committee was informed that relief centres are typically open for seven days following an incident such as flooding. However, in 2022 many of the relief centres were opened for longer due to the scale of damage and displacement and upheaval experienced by individuals and communities.

Throughout the 2022 Floods across Loddon Mallee region, 34 Emergency Relief Centres were set up and run for varying lengths of time, 1 day to 35 days.

Northern Victorian Emergency Management Cluster, *Submission 515*, p. 14.

Councillor Rob Amos, Mayor of Campaspe Shire Council, told the Committee that ‘the 2022 October flood event was the worst experienced by Campaspe Shire communities in more than 150 years’.⁴ He highlighted the uniqueness of this event, stating, ‘there are some key things around the 2022 event that made Campaspe Shire’s experience a little different to the experience of other municipalities’, including the extended operation of their Echuca emergency relief centre for 35 days, compared to the normal timeframe of around seven days.⁵

⁴ Cr Rob Amos, Mayor, Campaspe Shire Council, public hearing, Rochester, 24 August 2023, *Transcript of evidence*, p. 2.

⁵ Cr Rob Amos, Mayor, Campaspe Shire Council, public hearing, Rochester, 24 August 2023, *Transcript of evidence*, p. 2.

Emergency relief centres operated by the Campaspe Shire Council operated over different timeframes, placing demands on councils to be vigilant and responsive to community needs. In its submission, Campaspe Shire Council explained:

The Echuca Emergency Relief Centre (ERC) (Basketball Stadium) was opened for 35 days with approximately 340 residents presenting to the site. About 220 residents were relocated to the regional based Bendigo Emergency Relief Centre (Bendigo Showgrounds) to manage the increased numbers, emerging health crisis and limited resources within the isolated town of Echuca.

The Bendigo Emergency Relief Centre was open for 16 days, catering for residents across the region; predominantly Campaspe, Loddon and Gannawarra, with extensive services within the centre to manage the flood and evolving (mental & physical) health crisis.⁶

In Mitchell Shire, Mayor Fiona Stevens described their response: 'Council activated the relief centre at Chittick Park sports stadium in Seymour at 4 pm on Thursday the 13th'. She reported that 'within the first 24 hours 150 people attended the centre', which remained operational for seven days.⁷

Greater Shepparton City Council managed a significant response with four relief centres operating during the peak of the flooding. During this period, 'over 800 evacuees were accommodated on a single night at the height of the emergency'. The Council described these centres as 'complex and sometimes pressurised environments' which relied on 'the positive contribution of many government and community agencies to effectively meet the needs of community members'.⁸

Emergency relief centres provided support to up to 800 community members in any one night during the height of the emergency with multi-agency recovery hubs recording 1,100 visits.

Committee for Greater Shepparton, *Submission 393*, p. 4.

Other local councils also described the operation of relief centres during the flood, these are shown in Box 8.1 below to further highlight the varying experiences during the 2022 flood event.

⁶ Campaspe Shire Council, *Submission 650*, p. 13.

⁷ Cr Fiona Stevens, Mayor, Mitchell Shire Council, public hearing, Seymour, 14 September 2023, *Transcript of evidence*, p. 2.

⁸ Greater Shepparton City Council, *Submission 654*, p. 6.

Box 8.1 Evidence on relief centres

Another example was the Bendigo relief centre. In Bendigo we did not have a significant amount of people needing to evacuate, but what we saw across the region was the need to support people to leave early, to have some options. In Loddon, for example, we had some people come in because all their family members were flooded. That relief centre was open, again, for 16 days, and that had people from Gannawarra, Campaspe shire and Loddon shire and some from Bendigo and further afield as well; we had some people from Swan Hill shire.

Ann-Marie Roberts, City of Greater Bendigo, Northern Victorian Emergency Management Cluster, public hearing, Echuca, 24 August 2023, *Transcript of evidence*, p. 9.

Council opened a relief centre in Euroa from 7 pm on Thursday the 13th and a relief staging area at Avenel for displaced residents who could not get to Euroa because, as I mentioned, the Hume was closed, as were other minor roads. We had 20 people attend across the two sites, and the Euroa relief centre remained open until Saturday, 16 October at 10 am.

Cr Laura Binks, Mayor, Strathbogie Shire Council, public hearing, Seymour, 14 September 2023, *Transcript of evidence*, p. 4.

Stakeholders raised concerns about the capacity of councils to run relief centres, noting the requirement and the importance of ensuring they are efficiently activated to avoid unnecessary delays in relief support.

Some stakeholders argued that some relief centres were not activated quickly enough, and evacuated or rescued residents were being sent to facilities which were not yet operational. Jennifer Chivilo, a Maribyrnong resident, explained that when she arrived at the Maribyrnong Community Centre (the activated site for emergency relief in Maribyrnong) it was not fully set up:

I drove to the Maribyrnong Community Centre and arrived at approximately 0600hrs. It appeared to be just opening up and was chaotic. Displaced people like myself were arriving, some with children in tow others with pets. Some still had pyjamas on, others managed to carry a bag full of belongings. They congregated in various parts of the centre. SES and VicPol were all standing around changing. A few other agencies began to slowly arrive. Eventually we were able to get something to eat and were registered.

Why wasn't the community centre set up the night before if they were anticipating the Maribyrnong River to flood?⁹

Discussing resource challenges experienced by local councils, the Campaspe Shire Council explained that 'given the length of time in operation, Council and its support

⁹ Jennifer Chivilo, *Submission 590*, p. 4.

partners struggled to ensure it could supply adequate resources and personnel'.¹⁰ It contended that state-based organisations and support agencies can be 'unpredictable' in their commitment and presence at relief centres.¹¹ As such, it advocated for:

State/Federal government support, resource and fund local government to ensure Emergency Relief Centres (ERCs) are fit for purpose and support complex community needs, including planning for escalation of requirement for regional based ERCs to support vulnerable communities.¹²

Mitchell Shire Council emphasised the lack of 'comprehensive funding programs which enable identified ERC-capable facilities to be uplifted to a standard which would see them function in a safer, more effective manner', advocating for the development of 'statewide standard operating guidelines for Emergency Relief Centres'.¹³

At a public hearing, Brett Luxford, Chief Executive Officer of Mitchell Shire Council, discussed the location of the Seymour relief centre to highlight that depending on the facility there can be extra running requirements, adding more challenges for local councils. He explained:

I think if you look at our relief centre, which was in our basketball stadium, which is connected to our gym, which is connected to our sporting complex, we had to have lifeguards on duty 24 hours a day so that people could go in and use the toilet, just because the toilet is within the gym, within the pool area, and is a facility that people pay a membership for to go to the gym. So we are not really often resourced enough to deal with those expectations that are coming through as well.¹⁴

Name Withheld

The Community Centre was open which provided a place to go to have questions answered (Once we had capacity to leave the clean up and go and visit the centre). The community centre was a really helpful hub to go to sort out government support payments, organise emergency accommodation, grab lunch, a snack or piece of fruit when needed and I really appreciated a chat and hug one day when it all just felt too hard.

Source: Name Withheld, *Submission 728*, p. 1.

The 2022 floods tested the resilience and capability of Emergency Relief Centres across various municipalities, highlighting both strengths and critical areas for improvement. The extended duration and intensity of the floods required centres to operate beyond their usual capacity, placing substantial demand on council and support agency

¹⁰ Campaspe Shire Council, *Submission 650*, p. 13.

¹¹ Campaspe Shire Council, *Submission 650*, p. 13.

¹² Campaspe Shire Council, *Submission 650*, p. 13.

¹³ Mitchell Shire Council, *Submission 521*, pp. 15–16.

¹⁴ Brett Luxford, Chief Executive Officer, Mitchell Shire Council, Seymour, 14 September 2023, *Transcript of evidence*, p. 13.

resources, and personnel. The experiences shared by local councils underscore the necessity for robust, well-coordinated support systems to effectively manage large-scale emergency situations. The varying operational periods and the rapid escalation of needs during the floods illustrate the complex logistics and significant strain faced by councils when activating Emergency Relief Centres.

FINDING 75: In many communities, including Rochester, support in the days directly after peak floods was from local first responders, community and spontaneous volunteers.

FINDING 76: During major flood events or crises, Emergency Relief Centres operated by local councils are crucial for providing residents with immediate support in a safe environment.

FINDING 77: During the 2022 flood event, some Emergency Relief Centres activated by local councils experienced some challenges in readiness and efficiency.

RECOMMENDATION 58: That the Victorian Government, working with local councils, establish statewide operating guidelines for Emergency Relief Centres. These guidelines should include protocols on rapid activation, streamlined communication and resource mobilisation. Local councils should remain empowered to tailor protocols to meet local needs.

RECOMMENDATION 59: In line with Recommendation 58, that the Victorian Government, working with local councils, investigate options for emergency funding arrangements to assist operating Emergency Relief Centres and include these arrangements in statewide operating guidelines.

8.2.2 Recovery hubs

Recovery hubs can be activated following an event where affected residents require longer-term support.¹⁵ Generally, local councils are responsible for activating recovery hubs; a responsibility articulated under municipal emergency management plans. In its *Municipal Emergency Management Plan*, the City of Melbourne explained that:

- recovery centres are focused on long-term issues, compared to relief centres which focus on immediate needs
- the location of recovery centres is determined distinctly from relief centres, but the same location can be used if appropriate

¹⁵ City of Melbourne, *Municipal Emergency Management Plan*, <<https://www.melbourne.vic.gov.au/SiteCollectionDocuments/municipal-emergency-management-plan.pdf>> accessed 23 April 2024, p. 39.

- depending on the scale of the emergency, relief and recovery assistance could be ‘provided from one location’
- where possible, recovery centres should be a ‘one stop shop’ to deliver as many services as possible.¹⁶

At a public hearing, the Hon Jaclyn Symes, Minister for Emergency Services, outlined the importance of recovery hubs after a crisis:

The local recovery hubs are a really good initiative. It is a place where you can get real-time support, and what we know is that some people are only seeking support for the first time 12 months after the event, so having a local recovery hub is a really good way to ensure that people can get the help when they need it – not necessarily the experiences during the emergency, it can be sometime after. That is the experience of the amazing staff that are in those hubs.¹⁷

The evidence received from stakeholders highlighted their critical role in long-term local disaster response and recovery efforts. Mariela Diaz, Chief Executive of Emergency Recovery Victoria, emphasised the ongoing impacts of floods and the importance of ensuring communities can access recovery services.¹⁸ At a public hearing on 12 October 2023 (12 months from the beginning of the flood event), Emergency Recovery Victoria representatives stated some recovery hubs were still active and many community members still had ‘pressing needs’.¹⁹

Greater Shepparton City Council’s submission reported robust engagement with their recovery hub, noting in November 2022 it received over 1,100 visits. The Council advised, since then, it had established a flexible ‘mobile hub’ to extend services directly into affected communities.²⁰

Some stakeholders raised concerns regarding the sustainability and permanence of hubs. Mayor Fiona Stevens of Mitchell Shire Council stressed that the termination of such initiatives could lead to communities feeling abandoned, underlining the necessity for continued funding to bolster infrastructure and community resilience.²¹

The recovery hub, which we speak in today, has provided a coordinated space to help build resilience and recovery. However, this is not permanent. Once it closes, we will be forgotten again. Funding needs to be delivered so infrastructure can support the community to build resilience.

Cr Fiona Stevens, Mayor, Mitchell Shire Council, public hearing, Seymour, 14 September 2023, *Transcript of evidence*, p. 3.

¹⁶ City of Melbourne, *Municipal Emergency Management Plan*, <<https://www.melbourne.vic.gov.au/SiteCollectionDocuments/municipal-emergency-management-plan.pdf>> accessed 23 April 2024, p. 39.

¹⁷ Hon Jaclyn Symes MLC, Minister for Emergency Services, public hearing, Melbourne, 6 December 2023, *Transcript of evidence*, p. 35.

¹⁸ Mariela Diaz, Chief Executive, Emergency Recovery Victoria, public hearing, Melbourne, 12 October 2023, *Transcript of evidence*, p. 3.

¹⁹ Mariela Diaz, public hearing, p. 3.

²⁰ Greater Shepparton City Council, *Submission 654*, p. 7.

²¹ Cr Fiona Stevens, Mayor, Mitchell Shire Council, public hearing, Seymour, 14 September 2023, *Transcript of evidence*, p. 3.

Mitchell Shire Council's submission also discussed the municipality's efforts to maintain a recovery centre for residents impacted by flooding. It advised the Committee that to 'ensure continuity of relief and recovery' it had established a 'pop-up Recovery Hub in Seymour Library'. It has since entered into a lease agreement to continue the hub at a new facility, but the Council expressed concern that beyond this its ability to deliver support services will cease.²²

Minister Symes advised the Committee that the Victorian Government had allocated \$22 million to establish recovery hubs to assist flood victims.²³ A November 2022 media release outlining this funding explained:

More than \$22 million will help establish up to 16 regional recovery hubs with access to vital services to make sure people can keep getting in-person help for relief payments and other support they need.²⁴

Recovery hubs are a vital resource for ensuring there is sustained, long-term support to communities affected by disasters. These hubs, as articulated by stakeholders, serve as critical infrastructure for long-term recovery. However, there are some concerns about their sustainability and permanence in the absence of ongoing government support and funding. The continued operation and accessibility of recovery hubs ensures that affected residents can maintain wrap-around services to meet their acute needs, which often continue past the immediate event.

FINDING 78: Recovery hubs play a crucial role in supporting communities long after the immediate aftermath of a disaster, providing a central point for longer-term assistance and services.

FINDING 79: The absence of computers and internet access impeded members of the community from applying for individual relief grants.

RECOMMENDATION 60: That the Victorian Government plan and resource recovery hubs (including online access) sufficiently to fulfil their role in long-term community recovery and resilience building.

8.3 Recovery initiatives in the 2024–25 Budget

On 7 May 2024, the Victorian Government delivered the 2024–25 State Budget. According to the Budget Papers, the Budget 'provides \$302 million to Victorian

²² Mitchell Shire Council, *Submission 521*, p. 23.

²³ Hon Jaclyn Symes MLC, Minister for Emergency Services, public hearing, Melbourne, 6 December 2023, *Transcript of evidence*, p. 39.

²⁴ Premier of Victoria, *More Support for Flood-affected Victorians to Recover*, media release, 1 November 2022, <<https://www.premier.vic.gov.au/more-support-flood-affected-victorians-recover>> accessed 23 April 2024.

communities that have been affected by recent floods, storms and bushfires'.²⁵ This consists of various disaster relief and recovery initiatives funded across 2023–24 and 2024–25,²⁶ including:

- for the 2022 flood event, temporary accommodation support for impacted community members (\$1.7 million)
- for the summer 2023–24 floods and storms
 - a Personal Hardship Assistance Program (\$0.3 million)
 - psychosocial, mental health and wellbeing support (\$0.5 million)
 - additional recovery support (\$54.8 million in output initiatives, and \$6.1 million in asset initiatives).²⁷

The Budget Papers explained that '[e]stimates of the Commonwealth's potential contribution' to additional recovery support for the summer 2023–24 flood and storms 'are yet to be determined', and that these allocations are 'yet to be agreed with the Commonwealth on eligibility for cost-sharing arrangements'.²⁸ However, they do not provide further information on what these additional initiatives might be.

8.4 Financial recovery

Sandi Marsh

I live 10km north of Rochester at Strathallan. Our farm was totally flooded and we lost all our crops and hay. We have received one grant of \$25k but that doesn't cover the money we have lost. We have had no help in our area

Source: Sandi Marsh, *Submission 154*.

Financial assistance from the Victorian Government has been made available to many including individuals, families, students, farmers, and business owners affected by the floods. The assistance initiatives include:

- emergency payments and financial relief for families with school-aged children
- re-establishment assistance for those who do not have insurance and are experiencing financial hardship (this payment covered clean-up, emergency accommodation, repairs and replacing damaged contents)
- grants for students and their families to replace school items lost during the floods such as books or uniforms

²⁵ Department of Treasury and Finance, *Victorian Budget 2024–25 Paper No.2: Strategy and Outlook*, Melbourne, 2024, p. 14.

²⁶ Department of Treasury and Finance, *Victorian Budget 2024–25 Paper No.3: Service Delivery*, Melbourne, 2024, pp. 1–2.

²⁷ *Ibid.*, pp. 8–11.

²⁸ *Ibid.*, pp. 8–9.

- grants for farmers including:
 - Primary Producer Recovery Grants of up to \$75,000 to cover the cost of recovery
 - Rural Landholder Grants of up to \$25,000 to cover the costs of disaster impacts for small-scale producers
 - Primary Producer Concessional Loans of up to \$250,000 to restore or replace damaged equipment and infrastructure, or to cover short-term business expenses
 - Primary Producer Transport Subsidies of up to \$15,000 to support the transport of emergency fodder or stock drinking water, and the movement of livestock
- business and community sport flood recovery grants of up to \$50,000 to cover expenses resulting from direct flood damage to property, assets, stock or equipment.²⁹

The Commonwealth also provided two financial assistance programs to individuals affected by the floods:

- The Disaster Recovery Allowance for those who lost income due to the flooding. It provided top-up payments for people whose income had fallen below the national average because of the flooding. This was discontinued on 28 May 2023.
- The Disaster Recovery Payment provided one-off financial assistance to eligible Australians adversely affected by the floods in Victoria. The rate of the payment was \$1,000 per eligible adult and \$400 per eligible child. This was discontinued on 16 June 2023.³⁰

For more information on financial and other assistance programs that were run by the Victorian and Commonwealth Governments, refer to: <https://www.vic.gov.au/2022-flood-recovery> and <https://www.disasterassist.gov.au/Pages/disasters/current-disasters/Victoria/victoria-floods-06102022.aspx>.

For information about recovery assistance offered by the Victorian Government in relation to the 2023–24 floods, refer to: <https://www.vic.gov.au/2023-24-victorian-storms-and-floods>.

Witnesses informed the Committee about the difficulty in obtaining financial assistance from the Victorian Government and urged for more efficient and empathetic disaster recovery assistance programs. They noted that amidst the chaos of disaster,

²⁹ Business Victoria, *Business and Community Sport Flood Recovery Grants*, 2023, <<https://business.vic.gov.au/grants-and-programs/business-and-community-sport-flood-recovery-grants>> accessed 14 March 2024.

³⁰ Department of Home Affairs, *Victorian floods: 6 October 2022 – 13 January 2023*, 2023, <<https://www.disasterassist.gov.au/Pages/disasters/current-disasters/Victoria/victoria-floods-06102022.aspx>> accessed 14 March 2024.

a cumbersome process requiring considerable time and paperwork hindered access to immediate aid. Tracie Kyne from Rochester explained that:

In the midst of cleaning up after a disaster and feeling utterly overwhelmed, our community was faced with a ridiculous amount of time and paperwork required to apply for recovery grants. These bureaucratic hurdles seemed insurmountable at a time when immediate action was needed, and people were grappling with loss and devastation. We urgently needed government assistance on the ground to help complete these applications, to alleviate the strain and to provide tangible support when it was most crucial. The disconnect between immediate needs and the cumbersome process only exacerbated the crisis, underscoring the necessity for more efficient and empathetic assistance during such trying times. Many people just threw their hands in the air and did not apply at all.³¹

Tracie further added that the challenge of navigating bureaucratic red tape under conditions of duress had rendered the application for grants insurmountable for some:

Apart from the mental health, the stress and the anguish of them going through the process of cleaning up and maybe not having the product to sell, just going through that red tape to apply for grants has just not been possible.³²

While some did acquire funding from grants, the process involved navigating numerous challenges and requirements.

Tracie Kyne explained:

The issue we have had from a business point of view is that some small businesses that are not GST-registered were not eligible for a lot of grants. For businesses that were eligible that were registered for GST, the paperwork they had to go through to actually get that funding – huge red tape to jump through. For our agribusiness farmers, they have had to spend the \$70,000 to then apply to get it back, and in some instances they were not eligible for the \$70,000 they had just spent. We have had instances where farmers cannot even afford to spend the \$70,000 to get the money back. They are the issues we have been grappling with. Apart from the mental health, the stress and the anguish of them going through the process of cleaning up and maybe not having the product to sell, just going through that red tape to apply for grants has just not been possible.³³

Leigh Wilson further noted that additional hands on the ground would be beneficial to facilitate access to financial support. Improved coordination, assistance with paperwork, and a government official conducting immediate assessments using pre-sorted business classifications could expedite the process significantly.³⁴

³¹ Tracie Kyne, Lake Eppalock Working Group, Rochester Business Network, public hearing, Rochester, 23 August 2023, *Transcript of evidence*, p. 4.

³² *Ibid.*, p. 8.

³³ *Ibid.*, pp. 7-8.

³⁴ Leigh Wilson, Chair, Community Recovery Committee, public hearing, Rochester, 23 August 2023, *Transcript of evidence*, p. 15.

The Victorian Caravan Parks Association noted that businesses faced delays in essential funding due to flaws in government grant processes, requiring multiple applications and causing post-flood financial struggles:

Flaws in the government's business grants' application processes prevented caravan parks from quickly funding essential works necessary to reopen. Caravan park operators were required to complete multiple applications and evidence that the business had been impacted by the floods multiple times. Seven months after the floods, several caravan park operators had not received full grant payments.

The Business Recovery Grants tiered claim system greatly impeded caravan parks' recovery. 'Tier 1' claim acquittal was required prior to applying for 'Tier 2' grants. 'Tier 2' claims were only paid as a reimbursement. This meant that operators of closed caravan park businesses with no income needed to draw upon often limited business or personal reserves to fund works. In some cases, caravan park operators without access to capital were prevented from undertaking essential works over \$25,000 and remain impeded in their ongoing recovery efforts.³⁵

Moreover, the Committee heard evidence from some concerned about the distribution of state support to small businesses. The Victorian Caravan Parks Association explained that the Government's relief grants, based on turnover, failed to adequately meet the significant clean-up and recovery costs faced by larger small businesses:

The Victorian Government's Small Business Immediate Flood Relief and Business Recovery Grants did not meet most caravan parks' essential clean-up, relief and recovery costs. On average, flood impacted caravan park businesses sustained clean up and asset repair and replacement costs exceeding \$300,000. At least several caravan parks require multimillion dollar remediation works. Business turnover was used as a very basic, and completely unfair, means of classifying business eligibility for government support. This meant that caravan parks were classified as small businesses and only able to access \$50,000 relief and recovery funding.³⁶

The Victorian Caravan Parks Association stated that an absence in suitable and personalised assistance for caravan park proprietors is critical to:

- ensure the viability and success of businesses in the industry
- foster a fair and supportive economic environment for caravan park operators
- acknowledge the unique challenges they face
- provide the necessary resources for their growth.³⁷

The Victorian Caravan Park Association maintained that future business support programs should:

- consider the extent of damage and interruption

³⁵ Victorian Caravan Parks Association Inc. (VicParks), *Submission 820*, p. 2–3.

³⁶ *Ibid.*, p. 2.

³⁷ *Ibid.*

- be promptly accessible with proof of disaster-caused damage
- align with businesses' insurance coverage
- provide upfront funds for repairs
- streamline delivery to avoid unnecessary bureaucratic obstacles.³⁸

The Association urged for additional measures for easier access to essential funding, specifically tailored to aid recovery and cover remediation expenses. It put forward the following requests:

An appropriate concessional loan scheme(s) to be made available immediately after a natural or other disaster event to properly support business owners with significant asset damage.

That the Victorian Government ensure that future concessional loan schemes are devised so that all caravan park owners, including those operating on Crown Land, are eligible for funding. That eligibility must be included in the requirements of the scheme itself and the financier's requirements.

The government makes available, in circumstances where very significant asset damage has occurred to uninsurable businesses, and which badly impacts the business's capacity to trade, guaranteed loans of up to \$5 million similar to the Australian Government's SME Recovery Loans Scheme.³⁹

8.4.1 Community services funding

The Committee was informed that community organisations faced resource challenges and increased demand for services following the flood disaster. The Victorian Council of Social Services stated that:

The organisations who provided relief and recovery services rapidly mobilised after the floods but were unsure if this additional work would be funded. Formal contracts and funding agreements came weeks to months later but in the meantime, organisations were spread thin and faced high demand for their services with no extra resources.⁴⁰

To remedy this, the Victorian Council of Social Services recommended that strategic investment in long-term community services is needed:

Instead, disasters should automatically trigger immediate funding offers to local community services including case managers, Neighbourhood Houses, community health organisations, community legal centres, and family violence workers. This would help the sector recruit additional staff without relying on donations or redirecting funds from other critical service streams while they wait for funding agreements to arrive.⁴¹

³⁸ Ibid., p. 3.

³⁹ Ibid., pp. 3–4.

⁴⁰ Victorian Council of Social Services, *Submission 851*, p. 10.

⁴¹ Ibid.

The Committee was informed that long-term funding is crucial as communities require years to recover from prolonged impacts of extreme weather events, such as floods, stating:

Many organisations were initially funded for less than 12 months and only received a year extension, which has exacerbated the community's stress about the future and made recruitment more difficult because short-term roles are less desirable.⁴²

Moreover, the Victorian Council of Social Services explained that it was difficult to retain trained staff without stable long-term funding:

In many cases the community sector's relief and recovery efforts after the floods had to start from scratch. This is because a lot of the expertise gained from previous emergencies was lost due to the short-term, stop-start nature of funding. This delayed action while agencies rushed to pivot existing staff, recruit new employees and train team members with limited experience in disasters.

Organisations instead need ongoing funding to retain a permanent workforce of disaster resilience experts across the state. These staff members could act immediately when a disaster strikes to establish a case management system for impacted households, recruit employees for a surge workforce, and help coordinate local services with government agencies.⁴³

In non-crisis periods, this workforce would remain active, contributing to community preparedness and mentoring employees.

Funding for disability advocacy

The Committee was also informed that sustainable funding for disability advocacy is essential. The Victorian Council of Social Services stated that people with disabilities face increased risks and barriers in emergencies, including unsuitable housing and inaccessible information. It further highlighted that people with disabilities are often considered an 'afterthought' in emergencies making the work of disability advocates all the more important:

Disability advocates have been playing a crucial role in flood-affected communities by helping people with disability apply for government payments, access recovery services, and assert their rights. This support is particularly important because communities were bombarded with information after the floods, services were rolled out quickly, and payment applications are often not designed with disability in mind.⁴⁴

42 Ibid.

43 Ibid., p. 12.

44 Ibid., p. 16.

Amidst increasing demand, disability advocacy organisations, even outside emergency situations, grapple with unpredictable and unsustainable funding. The Victorian Council of Social Services stated:

Disability advocacy organisations struggle under the weight of demand even in non-emergency contexts. The sector has welcomed bursts of boost funding in recent years, but this is unpredictable and unsustainable. Meanwhile, base funding is too low and has not increased to meet the significant growth in demand.

Core funding for organisations funded through the Victorian Disability Advocacy Program should be increased to reflect the level of demand, quantum of unmet need and complexity of cases – and should be locked in via longer contracts. This will allow disability advocacy organisations to continue building the disaster resilience of people with disability and help them recover after emergencies.⁴⁵

The Victorian Council of Social Services noted the critical role played by advocates in emergencies, underscoring the urgency for stable, higher core funding and longer contracts.⁴⁶

Leah Taaffe, CEO at Community Living and Respite Services, noted that the floods exposed systemic gaps in emergency preparedness, particularly concerning vulnerable populations. She informed the Committee that coordination among emergency agencies was lacking, leaving her organisation and staff to navigate evacuations and support alone. She maintained that communication breakdowns and inadequate resources compounded the situation, illustrating a critical need for disability-inclusive disaster planning and response frameworks. The experience highlighted disparities in support for vulnerable people between states, with New South Wales offering more comprehensive assistance than Victoria:

The resourcing of the state emergency service and the adequacy of its response and the adequacy of its resourcing to deal with increasing floods and natural disasters in the future was also something we thought was important to address. The VICSES, as we know, holds critical roles in Victoria's emergency management arrangements, including flood planning and response, and it is a volunteer-led organisation with members in every area impacted by the flood. They did the best that they could, which was not good enough, and that is not a reflection on the personnel involved at all; rather, it reflects the under-resourcing, the poor training and the insufficient systems in place which would enable a robust, coordinated approach in response to any emergency event. It is also clear that there are significant gaps at every level of government in relation to planning, response and recovery. It was demonstrated that the framework in place is not effective, it does have significant gaps and it absolutely does not consider vulnerable people and how to ensure they are supported through emergencies and natural disasters. A vulnerable persons' register exists, but it is not kept up to date, it is not utilised and it is not properly understood.⁴⁷

⁴⁵ Ibid.

⁴⁶ Ibid.

⁴⁷ Leah Taaffe, Chief Executive Officer, Community Living and Respite Services, public hearing, Echuca, 24 August 2023, *Transcript of evidence*, pp. 62–63.

Moving forward, she stressed the need to embed disability-inclusive practices into emergency management systems nationwide.

The Committee acknowledges that there are several financial recovery programs in place post-flooding for supporting flood impacted communities. However, there are significant gaps and inefficiencies which have hindered the effectiveness of these programs. Evidence from stakeholders, many of whom were eye witnesses and directly affected by the 2022 floods, underscored a pressing need for a more streamlined, community centred and accessible approach to disaster recovery funding.

FINDING 80: The complexity of processes associated with flood recovery financial supports exacerbated the distress of some flood-impacted individuals, families and businesses. Some communities experienced delays to immediate relief and some were potentially deterred from claiming assistance which would have facilitated recovery.

FINDING 81: Despite the availability of a wide range of grants and financial support programs, it is challenging to effectively align support that is broadly available with the different needs of affected individuals.

RECOMMENDATION 61: That the Victorian Government simplify the application process for disaster recovery funding. This could include reducing paperwork, providing hands-on assistance and investigating technology to streamline processes.

RECOMMENDATION 62: That the Victorian Government evaluate the criteria and funding arrangements for financial assistance post-disaster with a view to:

- a. better aligning support with costs of recovery
- b. proposing options for quickly deploying support mechanisms according to the scale and complexity of the event.

8.5 Temporary accommodation

Following the 2022 flood event, temporary accommodation was made available for people who could not stay in their homes due to the floods. This was primarily through hotels, motels and caravan parks and other temporary accommodation near towns and cities affected by the floods.

One of the largest facilities for temporary accommodation was the Centre for National Resilience in Mickleham, which was built as a quarantine isolation facility during the COVID-19 pandemic. The Centre welcomed flood-affected people from all parts of the state, and each person was offered a recovery support worker to provide referrals

to financial, mental health or housing support.⁴⁸ Approximately 300 people used the accommodation. Emergency accommodation ceased at the Centre in March 2023, and those who were still there were moved to alternative accommodation including social housing, private rental, hotels, motels and caravan parks.⁴⁹

Media reports alleged that some residents in the Mickleham facility were posing as flood victims to access the accommodation and that a process for vetting people was not put in place 'until weeks after the centre was open'.⁵⁰ However, the CEO of Emergency Recovery Victoria (the organisation responsible for post-disaster recovery) said that the bar for accessing services was intentionally low. She added that they hoped in the future to have the support to be able to establish a vetting process in the immediate aftermath of a disaster.⁵¹ It is unclear whether policies were in place to ensure people accessing accommodation at other venues across the state were genuinely flood-affected.

The Elmore Events Centre provided accommodation for those affected by the floods in Rochester. The facility provided a mix of modular units and repurposed caravans. Places were allocated on the basis of greatest need. The Victorian Government worked with local service providers to ensure support services were available to those at the site.⁵² Accommodation at this site ceased on 15 August 2023.⁵³

In Shepparton, a pilot program called Homes at Home was established to support people to live at their properties in temporary accommodation while their homes were repaired. The program was free for the first 12 months and after that residents were asked to contribute towards their accommodation hire cost. There were 40 places available under the scheme.⁵⁴

Flood-affected people in Shepparton were also eligible to be housed in temporary accommodation in hotels, motels and caravans. A recovery support worker was also assigned to people accessing the program to provide them with support to move into longer-term accommodation.⁵⁵

48 Josie Taylor and Joanna McCarthy, 'After the Mickleham quarantine hub was used for flood victims, documents show violence and drug use were rife', *ABC News*, 29 March 2023, <<https://www.abc.net.au/news/2023-03-29/victorian-flood-crisis-accommodation-police-drugs-violence/102154102>> accessed 16 April 2023.

49 Victorian Government, *Centre for National Resilience in Mickleham*, <<https://www.vic.gov.au/temporary-accommodation-mickleham-centre-national-resilience>> accessed 13 April 2023; Sophie Aubrey, 'Flood victims booted out of Mickleham centre ahead of its closure', *The Age*, 16 February 2023, <<https://www.theage.com.au/national/victoria/flood-victims-booted-out-of-mickleham-centre-ahead-of-its-closure-20230216-p5cl2m.html>> accessed 16 April 2023.

50 Josie Taylor and Joanna McCarthy, 'After the Mickleham quarantine hub was used for flood victims, documents show violence and drug use were rife'.

51 Ibid.

52 Victorian Government, *Relief update for Rochester community*, <<https://www.vic.gov.au/relief-update-for-rochester-community>> accessed 16 April 2023.

53 Emma D'Agostino, 'Flood-affected Victorians to relocate as centres at Mickleham and Elmore prepare to close', *ABC News*, 14 March 2023, <<https://www.abc.net.au/news/2023-03-14/support-for-flood-victims-as-recovery-centres-prepare-to-close/102091778>> accessed 16 April 2023.

54 Victorian Government, *Temporary accommodation in Greater Shepparton*, <<https://www.vic.gov.au/temporary-accommodation-greater-shepparton>> accessed 16 April 2023.

55 Ibid.

Despite these arrangements, the Committee was informed about the critical shortage of housing for impacted communities. Many residents fatigued from the ordeal of the floods and their aftermath, continue to wait for home repairs:

Six months down the track and we're tired. Most of us are living in caravans, a temporary fix while we wait for our houses to be gutted and repaired, while some have been forced to move out of town. It's estimated that 90% of homes in Rochester were impacted, which for us included our parents, grandparents, aunts and uncles, and siblings. It's a confronting feeling to have so many lifelines taken away from you, and without the incredible generosity of people outside our immediate family, we would have found ourselves with four anxious children and nowhere to go.⁵⁶

Larissa Anderson

My parents house was flooded in Rochester by the Campaspe river in the Oct22 flood disaster. They are still not in their home (May 23) They are in their late 60's/70's and have been living in a small room off the shed with mice no air conditioning and unsafe heating. They are also using our caravan to shower which means we have been unable to go away on family holidays. (Family of 5 with 3 children) I'm so concerned if nothing is done to prevent flooding in Rochester again that all this work that is being done will be for nothing. My great Aunty who was living in her own home was forced out home and is now seeing out her days in a nursing home in Echuca as all her children's homes flooded too.

Source: Larissa Anderson, *Submission 199*.

The Northern Victorian Emergency Management Cluster noted that:

Rochester (in Campaspe Shire) had over 800 homes damaged or uninhabitable, with more than 70% of residents still not back in their home some 7 months after the event. Residents have either been placed in caravans on their impacted properties, with 250 households in this category, living in makeshift accommodation in sheds or currently living outside of the municipality.⁵⁷

For others, uncertain long-term accommodation plans and financial aid have added stress and anxiety. Leonie Stokes discussed their experiences in maintaining accommodation following the flood event:

We are now living at the temporary Elmore relief centre soon to be evicted a week after we are due for our second child whom we have now found out has a heart condition plus other health concern's. We have no certainly in regards to where our family will go next as the plans for long term accommodation from recovery Victoria has not actually been devised other than "we need numbers of people that would use

⁵⁶ Eliza Watson, *Submission 85*, p. 1.

⁵⁷ *Submission 515*, p. 2.

a caravan so we can put this forth to seek financial approval and we are unsure if we will receive this help". We are not eligible for emergency housing funding as we [technically] own a house.⁵⁸

Sarah Peake explained that:

The 2022 floods in the Campaspe region have shown gaps in the following areas: ... The lack of infrastructure, such as storage units for saving household goods from flood damage and emergency housing to enable immediate evacuations. Local residents and businesses bear the financial burden due to flood damage which could have been lessened by planning and preparation.⁵⁹

Amy Robinson noted:

Here in Mooroopna and Shepparton we operate out of seven sites, and for us, with the increased cost-of-living crisis, we are continually supporting families through the hardship that this flooding has caused. Housing affordability and availability is obviously a massive one.⁶⁰

Mayor Sarah Carter highlighted persistent challenges in Maribyrnong a year after flooding occurred, where residents endured temporary accommodation and half-restored homes. She observed that the community now comprises of many new occupants unaware of the consistent flood risk:

Twelve months on we continue to see a broad range of ongoing impacts across the Maribyrnong community. Some residents are still in temporary accommodation, some are living in half-restored homes and others have sold their properties and moved on. We now see a community with new home owners and tenants who may not understand the flood risk – that it is the same today as it was on 14 October 2022 – and they will be in the same position as flood-affected residents were last year.⁶¹

Maribyrnong resident Lisa Quinsee described the difficult living arrangements her family and neighbours have experienced after the floods damaged their homes:

My house has not been fixed, i have not had a 'make safe', the mould remains, driers were brought in over a month later, the walls stripped of plaster, the laundry ripped out. My loss adjustor was on personal leave, then would refuse to return calls. I was too patient too accommodating and not in my best interest.

It is now June, the insurance are trying to pay out accommodation until October. I have started to repair my own house with my content's insurance, I have also had to use this insurance to pay AIR Bnb costs. I have not received housing reimbursement since December 2022. The insurance attempting to locate short term housing when only air bnb's are available, some of my friends have put campers in their driveway. My girls

⁵⁸ Leonie Stokes, *Submission 629*, p. 2.

⁵⁹ Sarah Peake, *Submission 66*.

⁶⁰ Amy Robinson, Executive Officer, Greater Shepparton Lighthouse Foundation, public hearing, Mooroopna, 13 September 2023, *Transcript of evidence*, p. 21.

⁶¹ Cr Sarah Carter, *Transcript of evidence*, p. 23.

and I are the lucky ones, we still have our house, so many of their friends and neighbours do not.⁶²

Stakeholders' concerns about the insurance claim process are discussed further in Section 8.9 below.

In contrast to Maribyrnong, the riverfront in Moonee Valley is less densely residential. Nevertheless, there are residents who were evacuated from the area, and have had to leave their homes. The Mayor highlighted the health and wellbeing consequences for some Moonee Valley residents:

Many residents have been in temporary accommodation, some for up to 12 months, and the trauma of being evacuated from and the subsequent destruction of their homes has had a significant detrimental effect on their health and wellbeing. Residents have experienced social isolation, financial stress, emotional trauma and harm to welfare.⁶³

The situation in Rochester reflects the significant and prolonged impact on the community, with a large portion of the community still grappling with the challenges of finding suitable and permanent housing after the event. Moreover, the aftermath of disasters is marked by prolonged displacement, especially when hindered by insurance complications, a scarcity of contractors, and difficulties in obtaining essential building materials. These factors collectively contribute to the extended recovery period for affected individuals and communities.

Stuart Locke

Loss of beds - housing. Motels wiped out and still not fully recovered as resources to do so are stretched. Visitation numbers reduced - emergency accom numbers reduced - emergency housing needs have greatly increased due to a section of Seymour being flooded = again weigh up this economic and social cost v a levee

Source: Stuart Locke, *Submission 47*.

Ross Turner briefed the Committee on the impact of the floods on Restdown Retirement Village in Rochester, revealing that 11 out of its 18 units were flooded from the rising river and adjacent depression on the village-owned land. Despite expecting some damage from floods, the extent was surprising, and residents have sought varied accommodations, including caravans, units, staying with friends or family, or facilities outside town. Mr Turner noted that a significant challenge arose from the fact that six committee members of the Village, including himself, were personally impacted by the floods:

The problem we have with the committee as well - and I am offering this to you so you understand how we operate - is that six of the members of the committee, like myself,

⁶² Lisa Quinsee, *Submission 700*, p. 3.

⁶³ Cr Pierce Tyson, Mayor, Moonee Valley City Council, public hearing, Melbourne, 11 October 2023, *Transcript of evidence*, p. 24.

are affected by the floods. So we have got volunteer work to do for the committee and we have got to fix our own place as well.⁶⁴

In the aftermath of the floods, Jacqui Kiss and Jan Phillips echoed ongoing challenges a year later, expressing concerns about individuals still unable to return home. Jacqui estimated that approximately 70% remained displaced, with Jan suggesting this figure may be conservative.⁶⁵ In other instances, vulnerable women and families in crisis, have been forced to leave hometowns to find accommodation, especially domestic violence victims. Shelley Hamilton explained:

At that time, after the flood and with finance, it was causing a lot of people that were looking for accommodation in Seymour to have to go to Shepparton, especially the domestic violence victims.

What I have heard so far is that now, because we are unable to provide that accommodation, most of them have moved to Shepparton. So Shepparton has been providing that support. I guess, for me, it is very important to support all these victims.⁶⁶

John Oakley

During the flood I was evacuated. I went to Bendigo hospital by ambulance. Somehow I got in there and got a bed for a night. I felt like some of the staff at times; I was not. I had an MRI on my brain – ‘Time you left. No reason to be here.’ I went to Mickleham, the emergency evacuation centre for flood-affected victims. Over 1000 people were housed there, paid for by the state government. Mickleham was built after COVID, because Mr Andrews – it is on federal land, actually. There was a variety of rooms there – families, individual people. The car park for the staff was car park 1. I was a resident – car park 2. We had guards on the gate – you are allowed out; you are allowed in – and they made sure that you said when you were going and who you were going with. Meals were provided in bags the night before – breakfast, lunch. There was transport from Mickleham into Craigieburn, which is under contract. Now it is closed, I know that – I have a couple of contacts there – but I pray to God we do not have to use it again.

Source: John Oakley, public hearing, Rochester, 23 August 2023, *Transcript of evidence*, pp. 73–74.

8.5.1 Housing issues following the 2022 flood event

The wide range of people impacted by displacement mirrors diverse housing circumstances and the challenges confronted by homeowners, renters, and individuals facing homelessness in the aftermath of the disaster. Both the Victorian Council of

⁶⁴ Ross Turner, Secretary, Committee of Management, Restdown Retirement Village Inc, public hearing, Rochester, 23 August 2023, *Transcript of evidence*, p. 64.

⁶⁵ Jacqui Kiss, Administration, Mooroopna Education and Activity Centre, public hearing, 13 September 2023, *Transcript of evidence*, p. 56.

⁶⁶ Shelley Hamilton, Committee Member, Go Seymour: Business and Tourism Group, public hearing, Seymour, 14 September 2023, *Transcript of evidence*, pp. 41, 50.

Social Services and the Youth Affairs Council Victoria maintained that the housing crisis requires targeted and sustained interventions.⁶⁷ The prolonged impact on the community, coupled with challenges in supply, demands a comprehensive intervention, emphasising affordable housing solutions and addressing the distinct vulnerabilities of social groups in disaster planning.

The Victorian Council of Social Services spotlighted that despite dedicated efforts by services to assist displaced individuals, their effectiveness was impeded by the restricted availability of accommodation options at their disposal:

The government provided additional funds to assist with this surge in demand including more Housing Establishment Fund resources. This extra funding was necessary and welcome but services' capacity to meet the housing needs of all flood-impacted community members was constrained by pre-existing supply challenges.⁶⁸

The Victorian Council of Social Services further noted that emergency housing for flood-affected individuals mainly relied on motel rooms and caravans. However, these options presented challenges like overcrowding, lack of essential facilities, and safety concerns for domestic violence survivors. Motel rooms and caravans proved unsuitable for prolonged stays and individuals may endure displacement for years.⁶⁹ Moreover, motel room availability faced competition during holidays and seasonal work, while caravans posed accessibility issues and inadequate insulation for varying weather conditions.⁷⁰

Proposing an alternative to motel rooms and caravans for housing flood-affected individuals and families, the Victorian Council of Social Services suggested that the Victorian Government consider investing in a fleet of high-quality modular homes:

Instead of relying on unsuitable motel rooms and caravans, the Victorian Government should invest in a fleet of high-quality modular homes. These homes can be deployed after a disaster and provided to affected-people free of charge, so everyone has somewhere safe to live before they move to a permanent option. They can also be used to house the high number of out-of-town contractors needed to rebuild damaged homes and infrastructure.⁷¹

The housing challenges arising from the floods were worsened by a shortage of affordable housing. This situation left displaced renters and individuals experiencing homelessness without viable long-term housing solutions. The Victorian Council of Social Services maintained that there is a pressing need for comprehensive and sustainable intervention to address the issue:

VCOSS continues to call for at least 60,000 new social housing properties over the next 10 years for Victoria to meet the national average. The rising frequency of disasters

⁶⁷ Youth Affairs Council Victoria (YACVic), *Submission 497*; Victorian Council of Social Services, *Submission 851*.

⁶⁸ Victorian Council of Social Services, *Submission 851*, p. 18.

⁶⁹ *Ibid.*, pp. 18–19.

⁷⁰ *Ibid.*

⁷¹ *Ibid.*

is increasing the urgency of growing this important housing stock. By committing to sustained, large-scale investment in growing social housing supply, we can ensure that everyone displaced by future emergencies can transition to a permanent home after evacuating to crisis accommodation, as well as meeting other housing needs in the community.⁷²

The Committee was informed that the broader issue of a statewide lack of affordable housing and available land was a challenge faced by many regional areas in Victoria. While programs like the Homes at Home project provided mental health and security benefits, addressing this issue necessitates freeing up additional land to improve housing affordability. Peter Harriott, Chief Executive Officer of Greater Shepparton City Council, explained:

the broader issue I guess is the lack of stock of affordable housing, the lack of stock of land available for housing. That is a bigger statewide planning issue that not only flood-impacted communities are going through, but nearly every regional city or council in Victoria is going through. Somehow, we have got to free up more land and make it available for housing so that housing is more affordable.⁷³

The Committee was also told that disasters uniquely affect young people, impacting their work, studies, and social connections. The Youth Affairs Council Victoria highlighted the distinctive challenges encountered by young people and youth workers in rural and regional settings. Their submission was informed by surveys and consultations conducted by Youth Affairs Council Victoria as well as insights and evidence drawn from the experience of previous natural disasters. The results noted that the flood event worsened challenges for vulnerable individuals, hindering access to housing services:

The Flood Event also significantly exacerbated issues for people already struggling, including impacting their ability to access services and supports. Many youth workers reported that, through the Flood Event, housing services were overwhelmed as so many people had their homes affected by flood damage. Many young people also had no options except to live in overcrowded dwellings. In rural and regional areas where accessing housing services is already difficult, the Flood Event put a significant strain on access to safe housing.⁷⁴

The Youth Affairs Council Victoria further suggested that young individuals facing challenges in accessing safe and affordable housing require special consideration in disaster planning.⁷⁵

⁷² Ibid., p. 21.

⁷³ Peter Harriott, Chief Executive Officer, Greater Shepparton City Council, public hearing, Shepparton, 13 September 2023, *Transcript of evidence*, p. 9.

⁷⁴ Youth Affairs Council Victoria, *Submission 497*, p. 10.

⁷⁵ Ibid.

For people with disability, finding accessible accommodation proved both difficult and part of a broader problem of a lack of inclusion in emergency flood planning:

Finally, I would like to reiterate that our experience as a cross-border provider of essential services clearly demonstrated the lack of inclusion in emergency planning processes for people with a disability, both in Victoria and New South Wales. This was evidenced by the lack of accessible transport and there being no accessible accommodation and no accessible information being provided to people.⁷⁶

As one resident of Northern Victoria stated:

My personal opinion is that many of the residents with mobility and chronic health issues would have evacuated earlier if they knew that temporary accommodation was disability friendly. Concerns voiced about not being able to get on and off stretchers, not being able to access toilet / shower facilities with appropriate aides and equipment to ensure safety and the ability to bring pets.⁷⁷

For others, limited insurance coverage meant that individuals and families were required to cover temporary accommodation costs:

One of the big issues was we were insured for contents, we were not insured for accommodation.

Over the days that followed, we along with residents were appalled and shocked to find that Tigcorp had not enough insurance to pay for all the flooded residents to live in temporary accommodation. And also we found out that Tigcorp had completely underinsured the village, as they had \$5 million of building insurance for the entire village, which represents roughly 6 per cent on an asset of \$80 million, which had to cover temporary accommodation costs too. This should not be possible. Like others, Cheryl and I had to urgency find and pay for our own temporary accommodation, all because Tigcorp had failed to get proper insurance for Rivervue and had never revealed it to the residents.

We were told if we were unable to find accommodation we would be sent to Mickleham, a quarantine hub reminiscent of the worst experiences from Germany and Cowra. As someone who had suffered from displacement, loss and unstable living conditions in the past, this prospect filled me with terror.⁷⁸

Stakeholders also discussed the importance of ensuring that temporary accommodation facilities remain operational. David Pratt, President of the Victorian Caravan Parks Association, noted that 'caravan parks are the largest providers of short-term accommodation in the state and provide residential accommodation for over 12,000 people'.⁷⁹ Scott Parker, Chief Executive Officer of the Victorian Caravan

⁷⁶ Leah Taaffe, *Transcript of evidence*, p. 64.

⁷⁷ Name withheld, *Submission 32*, p. 1.

⁷⁸ Stanislaw Korkliniewski, Resident, Rivervue Retirement Village, public hearing, Melbourne, 12 October 2023, *Transcript of evidence*, pp. 47-48.

⁷⁹ David Pratt, President, Victorian Caravan Parks Association, public hearing, Melbourne, 20 November 2023, *Transcript of evidence*, p. 1.

Parks Association, further added, ‘it is no good a park being underwater, as it cannot provide that crisis accommodation or be a staging point for authorities to use’.⁸⁰

The 2022 flood event has underscored not only the immediate necessity for temporary accommodation but also the deeper, systemic issues within housing policy and disaster preparedness. Addressing these challenges requires a multifaceted approach, combining immediate action with long-term strategic planning to foster resilience and ensure the wellbeing of all Victorians in the face of future disasters.

The Committee is concerned by media reports suggesting that some individuals exploited the provision of housing for individuals and families genuinely affected by the floods. Whilst the Committee appreciates the need to prevent bureaucratic processes impeding or preventing timely access to housing, this must be balanced against appropriate oversight measures to ensure housing is being provided with a genuine need.

FINDING 82: In Northern Victoria, the broader issues of housing availability, affordability and suitability in the region created additional issues for housing flood-affected people. These issues underscore a systemic challenge extending beyond the immediate emergency response.

FINDING 83: In Maribyrnong, ongoing housing challenges following the 2022 flood event include long-term displacement of residents, with many still in temporary accommodation or living in partially restored homes.

RECOMMENDATION 63: That the Victorian Government review its framework for providing housing support following an environmental disaster. In particular, the Government should assess the application system to ensure that genuinely affected households are provided support in a timelier manner and to mitigate the risk of fraudulent claims.

RECOMMENDATION 64: That the Victorian Government recognise caravan parks as essential businesses in disaster-prone areas as providers of housing and emergency support and ensure support is available (including grants) under Disaster Recovery Funding Arrangements to caravan park operators, including those operating on Crown Land.

⁸⁰ Scott Parker, Chief Executive Officer, Victorian Caravan Parks Association, public hearing, Melbourne, 20 November 2023, *Transcript of evidence*, p. 10

8.6 Debris and structural damage to infrastructure

Frances Weidener

The flood lasted for three months – we had land underwater for three months. Because the damage was so long, there was erosion. Great big old trees fell in the river. Fences were damaged – because the water was running across for so long, it dragged logs and wood onto the fences. It pushed them over. Loss of wildlife – you can imagine how much wildlife was lost when the farm was underwater for three months. We had pasture, now we have got weeds ... The clean-up afterwards was huge – dead trees all over the place, on fences, in the river. Where we had pasture, now we have got weeds, so we will have years of spraying weeds, sewing new pastures. We estimate it cost in excess of \$300,000. If they had not filled the weir in a wet season, in July–August, it would not have happened.

Source: Frances Weidener, public hearing, online, 18 October 2023, *Transcript of evidence*, p. 7.

In its submission, the Victorian Government noted that the 2022 flooding ‘caused devastation across much of Victoria and affected thousands of people’. Reflecting on the damage, the Government stated that:

Two Victorians tragically lost their lives. Hundreds of homes and buildings across the state were inundated, displacing residents and closing businesses. It isolated people and communities, damaged their homes, disrupted essential services, disrupted and disconnected their social supports and systems, and impacted mental health, wellbeing, personal property, businesses, and livelihoods.⁸¹

According to estimates from Agriculture Victoria:

- approximately 12,230 agricultural properties were affected
- 1,545 residential and commercial buildings suffered damage from the flooding, with 976 rendered uninhabitable.⁸²

Chapter 2 discusses the 2022 flood event in more detail.

The Victorian Government provided support to local councils to clear and collect debris in flood-affected areas. The Government also helped volunteers to clear debris and silt from the inside of buildings and homes. Emergency Recovery Victoria (ERV) emerged in October 2022 as a response to the Inspector-General for Emergency Management’s inquiry into the ‘Black Summer’ bushfire season. ERV is Victoria’s dedicated agency

⁸¹ Victorian Government, *Submission 295*, p. 68.

⁸² *Ibid.*

mandated to lead state and regional coordination and state relief on behalf of the Victorian Government. Mariela Diaz, Chief Executive Officer of ERV, stated:

ERV's clean-up program commenced within days. ERV provided coordination and operational support to councils, collecting and disposing of more than 13,000 tons of flood debris.⁸³

Greater Shepparton City Council's submission noted the disposal of approximately 13,500 tonnes of flood-affected waste, excluding state-contracted collections, to the Cosgrove 3 Landfill:

The Environment Protection Authority waived the levy fee at Cosgrove 3 Landfill and to date has seen an approximate of 13,500 tonnes of flood-affected waste received. These volumes do not include the volumes collected by the state-appointed contractors.⁸⁴

In evidence to the Committee, the Hon Jaclyn Symes, Minister for Emergency Services, highlighted the Government's dedicated funds for the post-flood cleanup emphasising the holistic significance of this initiative. Minister Symes stated:

To date, we have allocated more than \$35 million for clean-up, and we know that that is not only important for a variety of reasons – for safety, visual aesthetics – but it can help mental wellbeing and recovery as well. When you see debris still piled up, it can have a pretty negative impact on your community morale.⁸⁵

In terms of the volume of debris, Minister Symes further noted that:

To date crews have removed, my notes say, over 11,955 tonnes – I think we can just say 12,000 tonnes – of flood debris, and the work certainly complemented council responsibilities to ensure that waste was removed.⁸⁶

The Victorian Government is also providing free structural assessments to buildings damaged by the floods.

In Northern Victoria, residents noted that the sheer scale of the cleanup was enormous. Aimee Lindrea told the Committee that:

There was rubbish and debris absolutely everywhere and we even had a couch stuck on our front fence.⁸⁷

Similarly, Leigh Wilson, Chair of the Community Recovery Committee in Rochester, stated on 23 August 2023:

It is 313 days since the flood. The best information that we have to hand is that there were 988 houses that were flooded over floor. Now, that work has been done by

⁸³ Mariela Diaz, *Transcript of evidence*, p. 3.

⁸⁴ Greater Shepparton City Council, *Submission 654*, p. 7.

⁸⁵ Hon Jaclyn Symes, *Transcript of evidence*, p. 49.

⁸⁶ *Ibid.*, p. 39.

⁸⁷ Aimee Lindrea, *Submission 57*, p. 1.

Rochester Community House. If it was not for them, there would be no other agency that would know how many houses were flooded over floor. The waste that was removed in the early days, the debris and clean-up from the houses – this is prior to Christmas over a period of two months – exceeded 500 B-double loads of waste. If you parked all of those trucks end to end and you drove past them on the highway, it would last for 7 kilometres.⁸⁸

Tracie Kyne noted that local businesses in Rochester volunteered trucks for debris removal, incurring significant financial losses without reimbursement:

Can I also mention that we have got local businesses, earthmoving: Nichol Trading, Ward Bros, even Dwyer's earthmoving – they all brought trucks into town to move debris from the nature strips of our homes. If not for them – And they lost hundreds of thousands of dollars paying employees and were not reimbursed for that rubbish removal.⁸⁹

Moreover, a Northern Victorian resident noted that the community rallied together to help with the debris clean-up and restoration.⁹⁰ Another stated that while the aftermath of the floods revealed the resilience of the town of Rochester, the community was still being confronted with the wreckage and the debris-filled aftermath:

Seeing the debris from all the homes dumped in every single nature strip. It goes on. But I want you to also know where we're at now ...6 months later and the town is a ghost town at night. There are shells (houses) but you can see through them They're gutted And not much is changing.⁹¹

In Seymour, Cr Fiona Stevens, Mayor of Mitchell Shire, noted that the town's central business area faced over-floor flooding, becoming inaccessible and impacting businesses in the area. She explained that the debris and flood damage in riverfront parks left them visibly destroyed:

The primary business area in the middle of town was inundated with over-floor flooding or cut off so that businesses could not be accessed or operated. The economic impacts are obvious. The 24-hour police station for the area was inaccessible, unless by boat, and the underground level was totally flooded. Two major riverfront parks were totally destroyed, with hundreds of trees uprooted. Many were huge 100-year-old red gums. Wildlife was lost. Infrastructure was damaged by water and debris. When the water receded, these prized riverfront parks looked like ghostly, abandoned and totally destroyed battlefields. Those I have mentioned are only a snapshot of the total impact to our community and what they suffered.⁹²

⁸⁸ Leigh Wilson, *Transcript of evidence*, p. 2.

⁸⁹ Tracie Kyne, *Transcript of evidence*, p. 13.

⁹⁰ Hannah Taylor, *Submission 22*, Attachment A, p. 1.

⁹¹ Eileen McNeilly, *Submission 102*, p. 1.

⁹² Cr Fiona Stevens, *Transcript of evidence*, p. 2.

Name Withheld

Some of the flood waters couldn't drain from Tallarook Street as the drains were blocked by debris. As soon as some of our volunteers ascertained the situation, the drains were cleared and waters could recede. This is one of the many things the Mitchell Shire could be advised of so that it is on a "tick list" for next time. Such a simple thing to fix but it took a while for somebody to think of it.

At some point after the floods started to recede, Mitchell Shire was able to give assistance for the removal of flood-damaged items via free pick up from our home. We weren't able to use this for some time as we were trying to save everything but we were very grateful for the Shire's extension of time for the free pick up as it wasn't until after Christmas that there were items we just had to get rid of due to the unexpected appearance of mould. The staff were wonderful and it saved us a great deal of money at a time when every cent has been precious to us.

Source: Name Withheld, *Submission 640*.

In Rochester, Tracie Kyne made a similar point that the protracted and lengthy clean-up process prolonged disruptions to the community with adverse consequences for people and businesses:

The clean-up has been a strenuous and heart-wrenching process. Businesses took weeks, some months, to reopen their shopfront premises, and some remain closed even now, 10 months down the track. Others have been forced to close permanently due to a reduction in income, with two-thirds of the community having been relocated to other towns and cities. The emotional and financial toll is still very present, with most businesses still requiring improvements to their buildings and many home-based businesses operating from caravans.⁹³

Leigh Wilson stated that essential to post-disaster clean-up efforts is the need for additional human resources on the ground:

So when the clean-up starts, it is the local community getting together, local contractors in particular, to start going into people's houses. We know what we need to do – start getting the furniture out, carpet. ... So I know from my work with community house that they were already making contacts to government agencies to get people in on the ground to start – and this is all the culmination of a few days. ... We needed the human resources here to assist with the clean-up.⁹⁴

⁹³ Tracie Kyne, *Transcript of evidence*, p. 4.

⁹⁴ Leigh Wilson, *Transcript of evidence*, p. 9.

Cheryl Hicks, urged for government support, proposing the deployment of the army to aid in cleaning essential government buildings:

The Community as a whole worked above and beyond any persons expectations to try and get things back to any sort of normality. I thought the Army could have been deployed to help the schools and hospital clean up seeing as they are Government buildings.⁹⁵

The devastating flooding led to a significant loss of staff for businesses and overwhelming challenges for those who remained as they attempted to balance the clean-up of their workplace or business with clean-up efforts for their own homes and properties. Leigh Wilson explained:

So when we look at something like the supermarket, it was absolutely devastated. Overwhelmingly their staff left town, and the staff that were available were trying to work between helping at the supermarket and cleaning up their own properties. ... We needed physical bodies. I go to that scenario of coming back into the CBD area on the Sunday morning when the water was starting to recede. I was the only person around, and I started to contact some of the business owners and send them photos of their properties so they had an understanding of what to prepare for. There was no-one around.⁹⁶

Councillor Sarah Carter, the Mayor of the City of Maribyrnong, noted that, contrary to the initial projection of three affected homes, 512 residences in Maribyrnong were damaged by flood waters. The subsequent clean-up involved extensive efforts by the local council and collaborators and caused significant structural damage:

To put this in some perspective, 150,000 cubic metres of mud, silt, household material and other flood debris were removed from private property and public land. The flood displaced well more than 1000 residents overnight, impacting 31 kilometres of local roads, 30 kilometres of stormwater drains, 70 kilometres of footpaths, 8 kilometres of walking trails, three treasured playgrounds and two sports pavilions that are home to a local youth club and taekwondo, soccer and cricket clubs.⁹⁷

In Melbourne, Evan Counsel, General Manager at the City of Melbourne, stated that three businesses were severely affected, five with lighter impact, and a residential apartment block faced basement flooding from the October floods. He explained that the clean-up costs exceeded \$100,000:

The costs direct to council were mainly focused on cleaning up of debris on roads, footpaths and public spaces as well as mud in council pit and pipe infrastructure, which was required to be cleaned in the weeks following the event, and we incurred costs directly of just over \$100,000.⁹⁸

⁹⁵ Cheryl Hicks, *Submission 270*, p. 1.

⁹⁶ Leigh Wilson, *Transcript of evidence*, p. 9.

⁹⁷ Cr Sarah Carter, *Transcript of evidence*, p. 23.

⁹⁸ Evan Counsel, General Manager, Strategy, Planning and Climate Change, City of Melbourne, public hearing, Melbourne, 11 October 2023, *Transcript of evidence*, p. 25.

In Northern Victoria, residents emphasised the substantial impact of floods on local infrastructure. Cynthia Williams described Rochester as a ‘warzone’ in the aftermath of the floods where ‘all the infrastructure had been affected’.⁹⁹ Xavier Kellow stated that ‘Houses still unliveable, infrastructure destroyed and unusable, even the roads in the area are undrivable’.¹⁰⁰ Wayne Vincent noted that while the reconstruction of schools, hospitals, police stations, roads, and infrastructure imposes considerable costs on the government, council, and residents, the ongoing and potentially unrecoverable financial and mental toll on residents remains significant.¹⁰¹

While sandbags were invaluable to the mitigation of flood waters, Ann-Marie Roberts noted that the aftermath of sandbag clean-up posed significant challenges to the community due to waste accumulation:

At the other end of it, the clean-up of sandbags is horrific – the disposal of it, the waste, more waste and more waste. You know, we see hessian sandbags initially, then we see shopping bags and plastic bags, and then the long-term impacts of that sandbagging are a challenge. So I think again it comes back to reviewing plans, knowing that on the get-go in our preparedness: ‘This is where we’re going to start with the sandbagging. This is how we’re going to do it. This is the level we are going to.’ If the defence force, for example, are deployed in, they are very structured. We can then say, ‘This is where we need it; this is what we need to do,’ and deploy that in. So, sandbags are a massive issue, not just having some infrastructure to support that, but it goes much broader into the plan and knowing that in the preparedness phase and understanding the impact of where the water is coming from.¹⁰²

Frank Bowles

Seven months after the 2022 floods there are far too many roads awaiting repair. For example, Midland Hwy opposite the lake in Mooroopna, Echuca Rd just up from KFC and McClennan St intersection with Archer St. An area of significant concern is Echuca Rd at Mooroopna North where many cars have been damaged and there have been many close misses of a collision. It was advertised that Victoria had allocated significant funds to repair its rural roads but we haven’t seen much action in the local area.

Source: Frank Bowles, *Submission 505*.

The devastating flooding in 2022 resulted in extensive damage to both the natural and built environments of affected communities. Evidence presented by affected residents painted a vivid picture of the damage endured by communities. As a result, recovery has been complex and significant.

⁹⁹ Cynthia Williams, *Submission 30*, p. 1.

¹⁰⁰ Xavier Kellow, *Submission 21*, p. 1.

¹⁰¹ Wayne Vincent, *Submission 301*, p. 1.

¹⁰² Ann-Marie Roberts, City of Greater Bendigo, Northern Victorian Emergency Management Cluster, public hearing, Echuca, 24 August 2023, *Transcript of evidence*, pp. 32–33.

The Committee notes the substantial effort—particularly from residents—in debris removal and clean-up in flood-affected areas, which is an ongoing logistical challenge. The prolonged clean-up effort is having a financial and psychological toll on these communities.

FINDING 84: In Northern Victoria, the October 2022 flood event has seen the prolonged submersion of land and infrastructure resulting in extensive damage and erosion. The damage of the floods has been widespread including the tragic loss of life, displacement of residents and damage to thousands of homes and businesses.

FINDING 85: The flooding in Maribyrnong exceeded initial damage projections, affecting over 500 residences and necessitating extensive clean-up efforts, significantly impacting local infrastructure and community facilities.

RECOMMENDATION 65: That the Victorian Government, noting that repair of natural environment is often overlooked in disaster recovery, assess and make funding available for natural environment and restoration.

RECOMMENDATION 66: To assist with ongoing clean-up of flood-affected areas following disasters, that the Victorian Government establish a dedicated financial support program for local businesses involved in debris removal and restoration efforts. This should include reimbursement mechanisms for businesses, such as earthmoving companies, that contributed equipment and personnel to the clean-up but suffered significant financial losses doing so.

RECOMMENDATION 67: That the Victorian Government pay its bills on time, especially following natural disasters.

RECOMMENDATION 68: That the Victorian Government work to support better collaboration between local communities, contractors, and government agencies, ensuring swift deployment of additional human resources for efficient post-disaster clean-up efforts.

RECOMMENDATION 69: That the Victorian Government collaborate with local authorities and community groups to develop and implement a debris management strategy and ensure that it aligns with broader disaster management plans as part of future-proofing for environmental events.

8.7 Community support

Name Withheld

Prior to, during and post floods I and my community have received very limited support from with the Campaspe Shire nor emergency agencies involved in the flood event. There has been a missed opportunity to connect with this section of the Echuca community - 'we' literally organised our own meetings creating an opportunity for communication - noting that no actions detailed in the minutes has been addresses. This has been a poor example of a Victorian Government response during an emergency situation. I have and continue to feel frustrated with the lack of action and any learnings being applied to improve any future responses.

Source: Name Withheld, *Submission 657*.

A submitter affected by the Maribyrnong flooding highlighted the value of community support during a natural disaster and its profound impact on communities:

Living through a natural disaster, I have learnt that people are so much more. They lift you through the worst time of your life. The volunteers that came to our house every 20mins to offer, coffee, food, hugs, tape, boxes, holistic care, beers, the Red Cross hand sewn teddy, cleaning material, the list goes on. I'm not joking, this was continuous every 20minutes, consecutively for a week. The manual labour that was provided from friends, family and complete strangers. The kindness the I have witness was like no other.¹⁰³

David Hutchinson, another resident impacted by the Maribyrnong flood, described his experiences assisting neighbours:

I was just in shock at the sight of flood damaged possessions lining the street, and the same look of shock on the face of everyone I met. So, I just stopped a few doors down, introduced myself to a man shovelling mud from his driveway and offered to help. I soon realised the initial gracious response was usually "no, we are ok but thankyou". After a bit more conversation most people would welcome some assistance depending on their needs and what I could offer. Shovelling mud and sludge, pressure washing, and shifting furniture alongside others were common activities for myself over the ensuing 3 days.¹⁰⁴

Residents continue to support one another a number of years after the flooding occurred in Victoria. Nevertheless the challenges that faced residents continue to be relevant and the Committee has heard that in some instances they have threatened to diminish community spirit. As one submission noted:

It is a fantastic community with lots to offer and we have enjoyed living here. It is sad to see what the recent flood has done to our town. Most of the houses in town, including ours, are currently inhabitable. Every second house that you drive by has a caravan

¹⁰³ Name Withheld, *Submission 359*, p. 2.

¹⁰⁴ David Hutchinson, *Submission 429*, p. 1.

parked in the property and there are shipping containers on the side of the road used as temporary storage. We are a strong community but people are tired, some of whom have gone through 2 major floods in the last 11 years, and cannot survive another major flood. Like many of the residents, we are contemplating about leaving the area if no plans are put in place to mitigate such weather events in the future.¹⁰⁵

Another resident similarly stated that the enduring emotional toll persists even after the town's semblance of normalcy. While community resilience prevails, the prospect of a repeat is daunting and must be avoided:

The pain, stress, confusion, sadness, grief and frustration did not end once the town looked 'normal' again. It is not normal and these emotions and feelings will continue for many moments to come. Yet the community strength continues to prevail and we will get through this. Without our people we could not have got through this but I just know we can NOT do it again.¹⁰⁶

A resident of Rochester expressed concern that a recurrence in the next decade may jeopardise the town's survival:

The community have pulled together and worked hard as a town, but they're tired. And this is going to take years to recover from. Another flood like this in the next 10 years and the town won't survive.¹⁰⁷

Amanda Logie, also a resident of Rochester and coordinator of Rochester Community House, noted that the community feels let down by various levels of government. She spotlighted the plight of those living in caravans, sheds, or tents amid harsh weather as unacceptable:

We are now nearly eight months in and there are still so many people displaced, still waiting for insurance companies, builders, flood support workers, so many people. We are all tired, our community is so broken, the houses and the people and it is not good enough. This situation that our community finds itself in is not ok and we are feeling so let down by so many levels of government and we realise that Rochester is not the only place that was flooded but it was certainly by far the worst hit in the state. I mean, I don't know about you but I cannot imagine for a minute how it must feel to be living in a caravan, shed or tent in this god damn awful weather. I challenge any of you to give it and try and then think, how is that ok for hundreds of people to currently be living that way right here in Rochester.¹⁰⁸

One resident shared the harsh realities of living in a caravan, deeming it devastating and mentally challenging:

Living in a caravan is not my idea of fun and even less so with winter looming. It is hard to describe but to use a few words try DEVASTATING, OVERHWELMING, MENTALLY CHALLENGING, FRUSTRATING, DISTRESSING, TRAUMATIC.

¹⁰⁵ Zaw Htut, *Submission 11*, p. 1.

¹⁰⁶ Hannah Taylor, *Submission 22*, p. 1.

¹⁰⁷ Mat Keyzer, *Submission 38*, p. 1.

¹⁰⁸ Amanda Logie, *Submission 710*, p. 1.

Rochester is a small regional town in Victoria. We're resilient to a point but at the moment that point is getting weaker and weaker. I am sitting in my caravan writing this listening to the hum of dryers in my home, a small milestone in the eventual rebuild, after 6 months. It has taken over 4 months to have my home stripped.¹⁰⁹

Early on during the Inquiry, residents highlighted the need for community support, particularly in practical terms. As Tracie Kyne stated:

I trust this inquiry will lead to decisive action to ensure that our community does not suffer through a flood of this magnitude again. Inaction is not an option, as it would inevitably result in more devastation, a scenario I am confident the government does not want to see unfold, especially if it leads to future loss of life.¹¹⁰

The Committee was informed about the importance of instilling confidence within a community to ensure a more effective and coordinated response in the event of future emergencies and utilising the valuable lessons learned from their recent experiences.¹¹¹ Residents emphasised the critical necessity for support mechanisms that address and facilitate recovery from the emotional and mental impacts on the broader community, acknowledging the trauma inflicted by the event and its enduring effects on daily life.¹¹²

One local noted that the overwhelming impact of the flood touched every resident, and many required immediate medical attention. They urged that a medical team, including a doctor, emergency nurse, and wound nurses, be deployed during future crises:

Everyone had been affected, every single person. They were occupied caring for their community and family. Where was Bendigo health? Bendigo I thought was meant to be medical support for Rochester. The ambulance service was in attendance to assist with emergencies but the community needed us (a team of wound nurses). I would like to see a 4WD bus set up ready to go in times of these emergencies. The township of Rochester should have had a face to face medical response within days of this crisis. They should not have had to ask for support. My future recommendation would be to have a doctor, emergency nurse, and wound nurses to support in these situations. As a past first responder, this was something that was lacking. The appreciation from the community for our assistance was overwhelming. We were needed for not only wound care but medical and emotional support. A listening ear. And confirmation that they weren't forgotten, that we gruelling care about our neighbours and that the Echuca Hospital would do everything they could to support the community.¹¹³

Residents also underscored the need for assistance in reconnecting the community after displacement, loss of possessions, and separation from family and friends, particularly for children who bear a heightened sense of vulnerability and anxiety, often struggling to comprehend the post-event reality.¹¹⁴

¹⁰⁹ Name Withheld, *Submission 44*.

¹¹⁰ Tracie Kyne, *Transcript of evidence*, p. 5.

¹¹¹ Leigh Wilson, *Transcript of evidence*, p. 2.

¹¹² *Ibid.*

¹¹³ Cynthia Williams, *Submission 30*, p. 2.

¹¹⁴ Elizabeth Trewick, Principal, St Joseph's School, public hearing, Rochester, 23 August 2023, *Transcript of evidence*, p. 3.

Residents and community leaders emphasised that rebuilding goes beyond physical structures. It entails nurturing and reconstructing the social fabric of their community, solidifying the bonds that form the backbone of their community.¹¹⁵

There are plenty of examples of the overwhelming kindness and support from neighbouring towns and strangers. However, the Committee was told that even this support was not sufficient to fully address the enormous challenges faced by residents. Sharon Williams stated:

In the lead-up to the flood the Rochester community, surrounding communities and strangers came and sandbagged and others helped prepare homes and businesses – but it was not enough. Once the water receded, it was the locals who took control of our recovery. We were so grateful for the help and support from neighbouring communities. They came into town with trucks, tractors and manpower and wrapped their arms around us with kindness.¹¹⁶

Brooke Ryan

There was lengthy support from within the community. I do believe that the community banded together, but we were let down by emergency services. I cannot say that strongly enough. There are things that we need to learn out of this.

Source: Brooke Ryan, public hearing, Rochester, 23 August 2023, *Transcript of evidence*, p. 78.

The varying accounts of community response to flooding in Victoria underscore the significant role that community support plays, particularly where formal emergency services are insufficient or delayed. However, while community support is invaluable, there remains a crucial need for consistent and effective emergency service response across all affected areas. A more integrated approach with enhanced collaboration between government entities, emergency services, and community groups is essential to ensure that communities are effectively supported.

FINDING 86: There is a pressing demand for comprehensive community support, including practical measures, and a critical necessity for increasing support mechanisms addressing emotional and mental impacts for an effective emergency response.

RECOMMENDATION 70: That the Victorian Government develop community-based initiatives and resource-sharing mechanisms, fostering resilience and solidarity among towns facing challenges from environmental disasters. These should ensure timely and effective responses to future crises, leveraging collective strength and kindness to aid in the recovery process.

¹¹⁵ Ibid., p. 4.

¹¹⁶ Sharon Williams, Lake Eppalock Working Group, public hearing, Rochester, 23 August 2023, *Transcript of evidence*, p. 21.

8.8 Mental health and wellbeing referral

Amira Smyrk

Eight months on and the trauma is real, walking along Oakland Street is now accompanied by a sickening feeling and a fear arises when it rains.

Source: Amira Smyrk, *Submission 672*, p. 1.

Flood-affected residents grappled with distress, loss, displacement, and disrupted routines long after the 2022 flood event was over. The traumatic aftermath challenged their resilience, amplifying stress and anxiety. The prolonged recovery process, coupled with the emotional toll of witnessing homes and community structures destroyed, served to exacerbate mental health challenges. Adequate resources and counselling services are crucial to foster resilience, facilitate healing, and address the persistent mental health needs of affected populations.

The Committee was informed about the unforgettable night that brought rising flood waters, sleeplessness, and imminent danger:

It is a night I will never forget - I didn't sleep a wink, the water was not touching my mattress when we got into bed, but a few hours later it was slowly seeping into the bottom and the water had reached the power points. The walls were gurgling, helicopters were circling, the water had reached the base of the toilet seats and the water came in waves through the house when each vehicle passed. Our mental health was suffering - we knew we needed to get out as there was no end in sight, no revised predicted peak and therefore no light at the end of the tunnel. At 4am we made the very risky decision to evacuate, this was completely out of necessity as the risk of this outweighed the additional trauma which would be experienced if we were to stay any longer.¹¹⁷

Residents noted that trauma lingers as individuals and families grappled with the enormity of the disaster. For many, rescue efforts during the flood involved heartbreaking decisions, with individuals facing perilous conditions to save their homes, loved ones and livelihoods, including stranded animals. A submission from Leonard and Marion Barry, who were affected by the Maribyrnong flooding, also underscored that the trauma and loss can linger:

As time goes on one hopes that some of the pain experienced in the flood would start to recede, but for us it is all very real.¹¹⁸

Their submission also emphasised that this trauma may also particularly impact older people.¹¹⁹

¹¹⁷ Kahla Else, *Submission 602*, p. 1.

¹¹⁸ Leonard and Marion Barry, *Submission 717*, p. 3.

¹¹⁹ Leonard and Marion Barry, *Submission 717*, p. 3.

The Committee was informed that flood damage, both to property and livelihoods, necessitates accountability and compensation. Geoff Kyval, a resident of Northern Victoria, noted:

- having to choose which cattle to rescue and who can't be saved
- basically, being assigned with the responsibility of their fate
- watching cattle and calves suffer
- having to submerge some cattle by standing on their heads, with them looking deep into my eyes for help to free them off log jammed timber in fast flowing water to try and save their lives
- all while trying to drive a tinnie solo.

Others also risking their lives on land locked islands and in boats swimming cattle off land locked islands in fast flowing waters complicated by trees and distance to land, drowning cattle caught in fences, trees and log jams and fast flowing rivers.¹²⁰

Stakeholders informed the Committee that the prolonged impact of trauma in community recovery is unpredictable, necessitating sustained mental health and social support post-flood. Gillian Krenzin stated:

Our previous experience supporting community recovery shows that the effect of trauma can take many months to emerge and that this can manifest in different ways. Trauma can exacerbate existing issues or be the catalyst for new challenges emerging. It is therefore vital that governments ensure the provision of ongoing adequate mental health and other social supports to flood-affected communities to meet an expected increase in demand for services. This includes services to assist people experiencing substance use disorders, family violence and mental health concerns, as well as relationship support and youth services.¹²¹

Residents also noted that the flood's impact has undermined their ability to enjoy life, including cherished activities for exercise and mental wellbeing:

Loss is the only way to describe the impact of the flood. -loss of contents and personal items -loss of home and while not totally displaced, I'm living upstairs with no kitchen and no laundry -loss of car, insured yea but lease payout swallowed any possible avenue to purchase another vehicle atm -loss of immediate future plans and loss of ability to retire in near future -loss of ability to relax and enjoy life, including the joy of previously walking around the river for exercise and mental health.¹²²

The emotional toll of losing their homes has created a challenging environment for parents, impacting their ability to provide a sense of security and stability for their children, adding an additional layer of difficulty to the already complex post-flood recovery process:

¹²⁰ Geoff Kyval, *Submission 614*, p. 2.

¹²¹ Salvation Army, *Submission 619*, p. 23.

¹²² Gillian Krenzin, *Submission 624*, p. 1.

My eldest daughter has significant mental health issues at the moment and was on her way home from Port Hedland in October, thinking she would just come home to Rochester and I had to tell her she couldn't, that all her things were gone and I was living with Nan in Kyabram. A mother is supposed to be able to provide a safe place for her children to come to, the flood has taken that from me.¹²³

Elizabeth Trewick, Principal at St Joseph's School in Rochester, expressed frustration at the lack of government support for children's mental health post-flood. Despite securing corporate funding for resilience programs like the Resilience Project and Dogs Connect, she highlighted the absence of government initiatives:

We have not heard from the government at all as far as mental health for our children goes. I have been successful yesterday in managing to attain corporate funding to bring the Resilience Project to St Joseph's for next year, and we are about to start a Dogs Connect program, all of which we have had to do and source for ourselves. I am fairly confident the only thing that the other two schools have received, as we have, is the student wellbeing funding boost, which for us was a \$15,000 grant. Leigh has been helping me canvass the education minister to bring forward the mental health in primary schools funding that is being rolled out across the state in the next few years. At the minute it is in a pilot phase. Our region is not due to receive the funding for the first time until 2025. My request is that we need that and we need that now, if not 2024. That will enable us to have a wellbeing person on the ground five days a week, which is what we need.¹²⁴

Tracie Kyne stressed the broader consequences on communities, extending beyond those related to property and land to mental health and the impact on the emotional wellbeing of community members:

We talk about the environmental impact of using water that way – it is a waste. But what is the environmental impact on our community – not just property, not just land but the mental health of our community members? It is enormous – enormous.¹²⁵

Leigh Wilson echoed a similar point:

At the outset, we identified mental health as our paramount concern, yet we lack a comprehensive mental health plan. While numerous service providers express intentions, a cohesive strategy is absent. Meetings occur, but accountability remains elusive. The real impact on us, each individual, is profound, with no one willing to take responsibility if things go awry.¹²⁶

Leigh added:

Surety of funding and continuity of funding. We had mental health services offering onemonth contracts to employees. You cannot secure an employee for mental health

¹²³ Leonie Stokes, *Submission 629*, p. 1.

¹²⁴ Elizabeth Trewick, *Transcript of evidence*, p. 8.

¹²⁵ Tracie Kyne, *Transcript of evidence*, p. 14.

¹²⁶ Tracie Kyne, *Transcript of evidence*, p. 15.

services with a one-month contract. We need long-term plans. Mental health, recovery and funding for council for infrastructure.¹²⁷

Cameron David Lovering stated that a failure to alleviate stressors on individuals and the community can escalate into widespread anxiety and depression:

If they do not address that stress, that can then potentially develop into anxiety and depression. I am not a mental health professional, but this is my understanding of what the mental health professionals say. It is my opinion, in the capacities that I represent, that I have seen and been witness to people in sustained states of distress.¹²⁸

Pauline Gordon, Chief Executive Officer of Campaspe Shire Council, noted that even though mental health remains a significant challenge in the region, securing funding, particularly for Echuca Regional Health, remains an issue:

Mental health has been a massive issue right across all of our shires and still is to this very day. We simply cannot get enough mental health workers or support, or where we can, we do not actually get the funding. For example, Echuca Regional Health I know for a fact has available on hand now some staff that can come on board, but we have not been able to attract the funding for them. So as the Murray River Group of Councils, we have been advocating fairly hard for them to receive that funding. It certainly is not a council role other than in programs that we might be able to also deliver, and we are trying to attract funding for that as well.¹²⁹

The Committee was informed that while mental health was recognised as a significant issue, the challenge of securing assistance persists:

So it was flagged very early on that mental health was going to be a significant impact of this coming off the pandemic, droughts et cetera. One of the challenges within council operationally is understanding what is available, how to activate it and how to link that in and then to deploy that out.¹³⁰

Stakeholders said that local health services require increased support to provide ongoing services for the long-term mental health and wellbeing of the community:

If you parachute people in, they are there for three months or six months and then they are gone. And mental health and wellbeing is not a short-term thing. Our local health services need more support to deliver that service. People trust them, and they provide an amazing service.¹³¹

Following the floods, the dairy industry experienced many challenges to recovery, with individuals grappling with the loss of stock, infrastructure, and the sense of control

¹²⁷ Leigh Wilson, *Transcript of evidence*, p. 17.

¹²⁸ Cameron David Lovering, The Salvation Army Rochester, public hearing, Rochester, 23 August 2023, *Transcript of evidence*, p. 58.

¹²⁹ Pauline Gordon, Chief Executive Officer, Campaspe Shire Council, public hearing, Echuca, 24 August 2023, *Transcript of evidence*, p. 18.

¹³⁰ Ann-Marie Roberts, *Transcript of evidence*, p. 18.

¹³¹ Lincoln Fitzgerald, Chief Executive Officer, Loddon Shire Council, public hearing, Echuca, 24 August 2023, *Transcript of evidence*, p. 19.

integral to farming practices. For farmers in Northern Victoria, Lincoln Fitzgerald stated that financial stability, the impact on livestock, and mental health were all directly interconnected:

It was a significant impact, and even coming back to the mental health side, when you lose \$100 million worth of cropping and you lose your animals that you care for on a daily basis, that has a huge impact on the wellbeing of our farmers as well as the financial impact.¹³²

Similarly, Mayor Rob Amos highlighted the reluctance of farmers to seek help despite enduring significant hardship and emotional distress:

Can I just add something to that as well, please – and this is from a mental health point of view: our farmers really care for their animals. They are really important to them, and it added stress to farmers that they were underwater, they could not get anywhere and that they had their animals who were calving, lambing. Their feet were rotting in the paddocks. They were having to go out with their rifles and euthanise animals. That is highly distressing to the farmers when they are having to deal with those sorts of things as well. And we know that farmers do not reach out for that help. Not all but a lot do not reach out for help.¹³³

Tom Acocks, a farmer from Rochester, noted that morale in the farming industry in Northern Victoria has been low and that recovery will take time:

Yes. It is a difficult and a long process. A dairy farming colleague of ours who is, you know, 20k's from the river fed his livestock on the road out the front of his dairy for two days because that was the only dry spot he had on his property – and he is not on the river. We have heard stories of people basically putting their cows on the yard at the dairy because that is the dry spot on the farm – everything went underwater. It takes its toll, you know, and as farmers, in particular dairy farmers, we like to be in control. We build infrastructure and we feed our cows in a way that we can control what is happening. When you lose control and when that is taken away from you because of an event, some people take a long time to process that, and I think a lot of people still have not processed it.¹³⁴

He elaborated on the availability of support services, emphasising the individual farmer's choice to utilise them:

There is loads of support, you know. There are any number of support services out there. Ultimately, it is up to an individual as to whether they want to avail themselves of that support. At a community level people are pretty tired, and at an industry level we seem to go from one crisis to another, so people are tired. But the support is out there, and it is well documented. It is well publicised. It is just whether the individuals are ready to take it on or not and at what point in the journey they are on in that recovery. I mean, everyone is a little different.¹³⁵

¹³² Ibid.

¹³³ Cr Rob Amos, *Transcript of evidence*, p. 25.

¹³⁴ Tom Acocks, Dairy farmer, public hearing, Echuca, 24 August 2023, *Transcript of evidence*, p. 55.

¹³⁵ Ibid.

Kate Burke emphasised the need to recognise industry advisers like agronomists and animal-nutritionists who often bear significant mental burdens supporting farmers:

Can I just add to that: I think one of the under-recognised cohorts – I guess not so much me now that I do not do a lot of direct one-to-one with farming – is the advisers in the industry, so the agronomists, the animal nutritionists. We are a cohort that gets missed in terms of offering support. People feel responsible for all their clients, and unless they have learnt strategies like I have – and I actually teach these strategies about disassociating your role, and what is your emotion to hang onto when you are stressed – it is a massive mental load for anybody who is, you know, like me an accidental leader in the community or for people for whom it is their day job to be out there in farmer land, because farmers use us like their psychologists. They will open up to us before they go and see anyone¹³⁶

Darrell Phillips, Captain of the Echuca Village Country Fire Authority (CFA), also stated that mental health support for him and his team had also been limited. However, he praised the CFA for their camaraderie, highlighting the crucial role friends played in providing assistance, watchfulness and acknowledging the challenges of his role as captain:

We did not get as much mental health support as we wanted. That is a bit of an interesting one. The CFA is fantastic. There is always somebody. They are like little Jack Russells chasing you around, you know. Sometimes I speak at something, and I think that the bus is going to come to my place with the two blokes in the white suits and they are going to throw me in the back. But being a captain, I have got some fantastic mates in the CFA. They are like my watchdogs, and I am the same for them. They will tip me off, or they will tip somebody else off if I need it. I have got a great mate who is our first lieutenant. I have got a mother that has got dementia, and it was giving me a bit of problem in the head with all the CFA stuff. He went away around Australia a few months ago. On the Monday I got a phone call from a lady from the CFA, and she started chatting to me: 'How are you going, Darrell? What's going on?' And I was like, 'Who have you been talking to?' She said, 'So-and-so gave me a ring and said maybe to give you a call.' That is how the CFA family look after each other. That is part of the problem with the floods. Why wasn't all that CFA family looking after each other? We all wear the same yellow overalls. You know, you can give someone half your sandwich in bloody Bega or wherever you are. We need to have that solidarity. We are all the same – one CFA – so if we can help anyone in any way, we should.¹³⁷

The Committee was informed by a mental health expert that post-disaster recovery varies uniquely for everyone. Jane Nursey, Head of Clinical Services at Phoenix Australia, explained:

We know that following disaster there can be a significant increase in anger in the community, and that often translates into higher levels of domestic violence in families in those communities. That differentially impacts women in particular and children, and

¹³⁶ Kate Burke, Think Agri, public hearing, Echuca, 24 August 2023, *Transcript of evidence*, p. 55.

¹³⁷ Darrell Phillips, Captain, Echuca Village Country Fire Authority, public hearing, Echuca, 24 August 2023, *Transcript of evidence*, pp. 41–42.

that has been shown in number of studies both in Australia and overseas. Recovery will be different for everyone. As much as the reactions might look different in everyone, the recovery trajectory will look different in everyone as well.¹³⁸

She further emphasised the importance of social and community connectedness with those who are well-connected experiencing better support:

Social connectedness and community connectedness are really very good predictors of recovery and probably the best support that people can have. Those that are perhaps living alone or are more isolated within their communities or even within their families might be more likely to struggle than those who are well connected. We also know that there are multiple risk factors though for perhaps having a less favourable recovery, and they can happen at an individual level. It depends on the nature of their disaster experience, what they witnessed, how soon help was available, whether or not they thought they were going to die, whether or not they witnessed other people being harmed or injured and what their own coping skills are but also what their experience of the response was for them as an individual.¹³⁹

Jane Nursey maintained that in disaster response and recovery, a systematic and trauma-informed approach is crucial:

That I guess brings me to one of the key points that perhaps is relevant to most of your terms of reference really in that the nature of the emergency response can have a significant impact on the level of recovery of individuals and the community as a whole. What we have noticed is as a state, as a government and as a community we are getting much better at providing systematised approaches to emergency response and recovery, but in the past that has definitely not been the case. What happens is that you get very fragmented responses. You get multiple agencies coming in with no understanding of how trauma and disaster might impact on individuals and how they might respond to direction or to what they are saying. It is very difficult for the members of the public to actually find out where to go and get help, how to access help and what that help might provide for them, and if there is no good infrastructure in terms of providing that support, if there are people waiting days or hours for support and safety, then that is definitely going to have an impact on their recovery as well.¹⁴⁰

She further emphasised that inclusive and respectful support enhances overall community recovery:

So I think in terms of thinking about how to improve and learn from experiences in each disaster we need to be taking an all-hazards approach. We do not just go from one disaster to the next, but we are taking an overall approach that says we are preparing for disaster, because it is potentially going to happen very regularly in our communities from now on. But we are also thinking about, for each agency that might come in to help in that response, (a) there is communication between agencies, and (b) there is a common understanding about trauma and its impacts, so those responders actually get

¹³⁸ Jane Nursey, Head, Clinical Services, Centre for Posttraumatic Mental Health, Phoenix Australia, public hearing, Melbourne, 6 December 2023, *Transcript of evidence*, p. 79.

¹³⁹ *Ibid.*

¹⁴⁰ *Ibid.*

training in understanding trauma impacts, in things like psychological first aid, which I will talk about in a minute, and in a trauma-informed care approach to supporting the community. What I mean by that is that it is coordinated, that it is done with the view of trying to do it in the safest way possible and in the most inclusive and respectful way possible and that it is done informed by knowing the impacts on trauma.¹⁴¹

Annie Gilbert

The trauma of not only the flood event but also the recovery and rebuild process is having long lasting effects on people. This needs to be considered to ensure that people are given hope and faith that everything that can be done is being done to prevent this tragedy from happening again.

Source: Annie Gilbert, *Submission 850*, p. 1.

The evidence presented to the Committee vividly illustrates the profound and lasting trauma inflicted by the 2022 floods on individuals, families, and communities across affected areas.

Evidence to the Committee revealed that the implementation of a systematic, inclusive, and well-coordinated response to address complex and varied mental health needs is needed. Many communities were challenged for resources in this area prior to the flood event which then exacerbated needs.

The need for a comprehensive and proactive approach to support the mental health and overall wellbeing of communities cannot be overstated, as the impacts of such disasters reach far beyond the immediate physical damage, deeply affecting the psychological health and stability of those affected.

FINDING 87: The 2022 flood event caused significant and enduring trauma to many of those affected, manifesting in mental health challenges that require comprehensive support and intervention.

RECOMMENDATION 71: That the Victorian Government provide long-term funding contracts for mental health services in flood-affected regions, with a focus to securing dedicated mental health professionals and effective service delivery in communities impacted by natural disasters.

¹⁴¹ Ibid, pp. 79–80.

8.9 Insurance

Susan Joyce

The insurance companies have been difficult to work with, they are so happy to take your money for years and years but not so forthcoming when you put in a claim. They stated Mums house was fixable but they wouldn't fix it and she only received a minimal amount. I mean it's either a right off and you get the whole amount it's insured for or it's fixable and they fix it

Source: Susan Joyce, *Submission 567*.

Insurance was an issue that was raised in evidence as well as the media.¹⁴² Issues with insurance include:

- slow claims processes and denied claims
- expensive premiums before the floods, leading to a lack of flood cover
- rising premiums after the floods, leading to lack of flood cover for future events.

Insurance premiums have risen in recent years and one of the reasons is an elevated frequency of natural disasters. The Reserve Bank of Australia noted in the Royal Commission into Natural Disaster Funding Arrangements that in the past decade, insurance claims for natural disasters were more than twice as much as the previous decade. This elevated frequency of disasters has led to a rise in premiums.¹⁴³ Climate change may accelerate this trend. Insurance premiums are estimated to continue to rise significantly under climate change scenarios of 3 degrees rise in global temperatures by 2050.¹⁴⁴

Insurance companies set premiums based on the risk of flooding, most use data supplied from state and territory governments in the National Flood Information Database.¹⁴⁵ However, other factors such as claims history, building type, location and flood history may also have an impact.¹⁴⁶

Insurance costs are already high for many. Currently, 10% of Australians who take out an insurance policy are classed with having high affordability problems, with their insurance policy costing seven weeks of their pre-tax wage.¹⁴⁷

¹⁴² Emma D'Agostino, *Fiona Parker and Rebecca Norman, Insurance companies questioning Rochester flood pay-outs angers residents, MP*, Tue 21 Feb 2023 <<https://www.abc.net.au/news/2023-02-21/insurers-questioning-rochester-flood-pay-outs/101996926>> accessed 16 April 2023.

¹⁴³ Royal Commission into Natural Disaster Arrangements, 2020, p. 417. Financial Rights Legal Centre, *Flood Premiums*, <<https://financialrights.org.au/factsheet/flood-premiums>> accessed 12 April 2023.

¹⁴⁴ Actuaries Institute, *Home Insurance Affordability And Socioeconomic Equity In A Changing Climate*, 2022, p. 29

¹⁴⁵ Insurance Council of Australia, *Flood insurance explained*, <<https://insurancecouncil.com.au/resource/flood-insurance-explained>> viewed 12 April 2023.

¹⁴⁶ Insurance Council of Australia, *Flood insurance explained*, <<https://insurancecouncil.com.au/resource/flood-insurance-explained>> viewed 12 April 2023.

¹⁴⁷ Actuaries Institute, *Home Insurance Affordability And Socioeconomic Equity In A Changing Climate*, 2022, p. 29

Increased premiums are an issue in flood-prone areas because they may lead to increased rates of people opting out of flood insurance. In the event of subsequent floods, this could lead to financial hardship for those who do not have cover. It can also lead to higher costs for government and charities to provide assistance to those people.¹⁴⁸ At a larger scale, it can lead to dwellings that are left unrepaired and uninhabited, damaging the economies of towns.¹⁴⁹

Regulation of the consumer insurance industry is a Commonwealth matter and the principal regulator for consumer insurance is the Australian Securities and Investments Commission.¹⁵⁰

In response to cyclones in northern Australia, in 2022 the Commonwealth Government established a cyclone and cyclone-related flood damage reinsurance pool, which is administered by the Australian Reinsurance Pool Corporation.¹⁵¹

The intention of the pool is to reduce the cost of consumer premiums by providing reinsurance at reduced rates for insurance companies, who may in turn pass the discounts onto consumers.¹⁵² The Australian Competition and Consumer Commission will monitor the effect of the pool on consumer prices. It noted that as of December 2022, no insurer was yet using the reinsurance pool and premiums in northern Australia remained high. A follow up report was due before the end of 2023.¹⁵³

8.9.1 Insurance activities from the 2022 flood event

In a submission to the House of Representative's *Inquiry into insurers' responses to 2022 major flood claims*, Emergency Recovery Victoria reported from the 2022 flood event there were (as at September 2023):

- 4,023 residences damaged or destroyed across 34 local government areas, including:
 - 2,331 primary residences (32% were destroyed and 68% were damaged)
 - 1,692 other residences

¹⁴⁸ Australian Competition and Consumer Commission, Northern Australia Insurance Inquiry - Final Report, 2020, p. 265.

¹⁴⁹ Climate council, Compound Costs: How Climate Change Impacts the Australian Property Sector, <<https://www.climatecouncil.org.au/wp-content/uploads/2019/05/costs-of-climate-change-report-v3.pdf>> viewed 12 April 2023.

¹⁵⁰ Australian Securities and Investments Commission, Insurance, <<https://asic.gov.au/for-consumers/insurance>> viewed 12 April 2023.

¹⁵¹ Commonwealth Government Australian Reinsurance Pool Corporation, About us, <<https://arpc.gov.au/about>> accessed 12 April 2023.

¹⁵² Hon Michael Sukkar MP, Assistant Treasurer, Minister for Housing and Minister for Homelessness, Social and Community Housing, House of Representatives, Hansard, Wednesday 9 February 2022, p. 115; Antonia Settle, After the floods comes underinsurance: we need a better plan, the Conversation, March 3 2022, <<https://theconversation.com/after-the-floods-comes-underinsurance-we-need-a-better-plan-178143>> accessed 12 April 2023.

¹⁵³ Australian Competition and Consumer Commission, Insurance monitoring First report following the introduction of a cyclone and cyclone-related flood damage reinsurance pool, December 2022, p. 2.

- 12,000 agricultural properties were impacted
- half a million hectares of farmland were impacted.¹⁵⁴

Further, as part of opt-in structural assessments conducted alongside the flood clean-up program, the Victorian Government found:

Of the more than 1,900 structures assessed, 444 were deemed habitable, 1,243 fixable, 70 fixable but not necessarily cost effective, and 145 requiring demolition. Where structures have been assessed as requiring demolition, property owners can opt to have demolition undertaken through the clean-up program free of charge, regardless of insurance status.¹⁵⁵

Emergency Recovery Victoria also advised the federal inquiry that:

Almost one year after the floods, 4,073 households have engaged with the Flood Recovery Support Program (as at 5 October 2023). In comparison, around 2,000 households had engaged with the Bushfire Recovery Support Program one year on from the 2019–20 Eastern Victorian Bushfires.¹⁵⁶

The Flood Recovery Support Program recorded household insurance data for 1,528 households, determining:

- 42% (638) households had home and contents insurance
- 38% (578) had no insurance
- 20% (312) had either home or contents insurance only, not both, or generally identified as underinsured.¹⁵⁷

Emergency Recovery Victoria reported on the number of storm and flood-related insurance claims lodged:

- 5,600 residential property claims
- 2,500 household contents claims
- 752 motor vehicle claims.¹⁵⁸

In total, there were 10,877 claims totalling \$489 million.¹⁵⁹ The Insurance Council of Australia reported that by the end of September 2023, 87% of all claims from the flood event were closed (but 75% if reduced to residential and commercial property claims). Further, 747 were through internal dispute resolution and 55 through external dispute resolution.¹⁶⁰

¹⁵⁴ Emergency Recovery Victoria, Submission to the Inquiry into insurers' responses to 2022 major flood claims, *Submission 31*, p. 4.

¹⁵⁵ *Ibid.*

¹⁵⁶ *Ibid.*

¹⁵⁷ *Ibid.*

¹⁵⁸ *Ibid.*, p. 5.

¹⁵⁹ *Ibid.*

¹⁶⁰ *Ibid.*

FINDING 88: By September 2023, there were over 10,000 insurance claims from the 2022 flood event, totalling \$489 million; 87% of all claims have been closed, with a lower closure rate for residential and commercial property claims.

8.9.2 Stakeholders' views on insurance processes

The Committee was informed that timely insurance processing can alleviate financial strain and expedite rebuilding efforts. However, delays or inadequate coverage exacerbate hardship, hindering recovery for affected individuals and communities.

In a submission, Angelina De-Simone, a resident of Maribyrnong, explained that eight months after flooding her home was still damaged despite having insurance:

My house is still damaged nearly 8 months later nothing has been done still, even though I have insurance and despite contacting them regularly.¹⁶¹

Similarly, a submitter also affected by the flooding in Maribyrnong said:

Trying to get on with life, work, kids after school activities and all of that, while calling insurance every day and trying to organise our house repair. It's been almost 8 months since the flood occurred and the repair of our home has only just begun today.¹⁶²

In the aftermath of the October 2022 floods, a submitter noted that for their elderly mother-in-law, worsening mental health and insurance delays were closely connected:

My 80 year old mother-in-law lost her home in the October 2022 floods This has been devastating for her in losing her home and contents. Her mental health has deteriorated enormously due to the stress of everything and having to relocate away from family and friends We are over 6 months passed and still no work on the home and still waiting on the insurance company.¹⁶³

Paul Macague noted that inadequate insurance coverage and assistance led to payment delays and caused significant stress to his health and finances:

We made a insurance claim to have the house repaired only to be told that the house had pre existing damage and would receive a cash payment and to arrange our own repairs. No make safe or strip out was supplied by the insurance company. We made the decision to strip out the house ourselves and begin the rebuild. 6mths on we have finally received the cash payment after a lot of negotiations with the insurance company. The floods have effected myself mentally, physically, emotionally and financially. Some thing has to be done so this event never happens again.¹⁶⁴

¹⁶¹ Angelina De-Simone, *Submission 757*, p. 1.

¹⁶² Name Withheld, *Submission 728*, p. 1.

¹⁶³ Name Withheld, *Submission 113*.

¹⁶⁴ Paul Macague, *Submission 175*.

Nicki Henderson stated that she felt abandoned by insurance companies:

Maybe you could come up to Rochy and spend some time in a caravan or shed?? 6 months on, they are still out of there homes and people are getting cold, angry, upset and feeling abandoned by not only the insurance companies but by you the government. Please ask yourself if this happened in Melbourne, would you still be out of your home?? I think not.¹⁶⁵

James Walsh found the lack of support from insurers frustrating:

Our family house was inundated with water due the major flooding in Rochester. Nothing has been done for community since, We have my parents living in a caravan with no walls in the home. It's bloody crazy living arrangements and the insurance companies couldn't do less to help.¹⁶⁶

As Rochester residents relive flood trauma, insurance hassles continue to cause profound emotional distress:

Residents of Rochester are forced to face the reality of that night again and again as they deal with issue after issue. It is heart breaking. Trying to rebuild their properties and their lives, the emotional pain, coupled with the financial pain, and the stresses associated with dealing with insurance companies, all the while living in temporary accommodation is something people are unable to comprehend unless they were directly impacted.¹⁶⁷

Another submitter noted that receiving no assistance from their insurance company severely limited their ability to maintain their relationship with their mother who suffers from dementia:

My partner and I bought our retirement house in Rochester way back in 2018. We chose a house that did not flood in 2011 supposedly the great flood. I moved my mum with dementia into the local nursing home so we could maintain our relationship for as long as possible. She has now been relocated twice, first to Bendigo now Echuca. I have fortunately been given a rental property in Marong by friends. We have had absolutely no assistance or offer of assistance by our insurance company at any stage. My ability to see and maintain a loving relationship with my mum has been severely limited.¹⁶⁸

Navigating the insurance process added to the already challenging post-flood ordeal. Holly Foster, for instance, stated that:

For the next 2 weeks we threw out the majority of our life time belongings and furniture. We then had to deal with our insurance company, which was totally overwhelming, confusing and exhausting.¹⁶⁹

¹⁶⁵ Nicki Henderson, *Submission 177*.

¹⁶⁶ James Walsh, *Submission 178*.

¹⁶⁷ Deanne McNair, *Submission 165*.

¹⁶⁸ Name Withheld, *Submission 183*.

¹⁶⁹ Holly Foster, *Submission 257*.

Insurance failures also jeopardised a multigenerational family business in Seymour:

We had no time or warning to move stock and customers property from the premises because of the Wallis St drain inundation and road closure early on Thursday morning. We are still locked in a battle with our insurance company who is failing to acknowledge this basic fact. Without an insurance pay-out acknowledging this damage we are facing a difficult future for our family run businesses that has been passed down through a generation. Insurance companies' premiums are so high and will always deem us a major risk due to the lack of flood mitigation infrastructure in Seymour.¹⁷⁰

Other stakeholders believed that insurance companies' disorganisation led to disjointed coordination among trades and repair services, delaying progress, increasing costs, and causing further inconvenience for homeowners:

Insurance companies are very disorganised. Trades come and do a small part, then the next one comes and so it continues. When we ask about this disjointed coordination the tradies says; "it's not my job to do that." Their job brief/order only covers certain tasks. Every single job order must be more paperwork, more time, slowing progress and cost more money. This is the homeowner's money not the insurance company. Our shower bases were left installed. Common sense would tell you having half a metre of flood water in your home for up to 72 hours, the water got under the floor tiles the water would have to be under the shower bases. The bases started to popup due to flood damage. The builder ordered them to be removed, the hygienist returned. Another week in the rebuild lost due to poor coordination.¹⁷¹

The Committee was also informed that future insurance cover for flood-prone areas remains a concern:

One of our big issues will be getting insurance for flood in the future. Will there be an embargo on our town for flood cover, and if not, will we be able to afford it, if we can even get cover? What, if anything, will our governments do to ensure that we are not disadvantaged by this event, regarding insurance cover?¹⁷²

Furthermore, flood insurance coverage for farmers emerged as a significant concern:

The entire country needs our farmers. Ironically, before the flood and even now, these farmers are not even covered for flood damage. It is a harsh reality that no farm can insure itself against such an event. This disparity between the actual risk and the available insurance coverage amplifies the difficulties encountered by our farming community [...] highlighting the pressing need for immediate action.¹⁷³

Assessment happens pretty quick. Insurance delays – for the average person they have only got to flutter their eyes, and then it is another two weeks or another month. Scopes of works are incompetent at best – missing entire rooms. A lot of people out of despair

¹⁷⁰ Courtney Carroll, *Submission 293*, p. 1.

¹⁷¹ Aimee Lindrea, *Submission 57*.

¹⁷² Paul Poort, public hearing, Rochester, 23 August 2023, *Transcript of evidence*, p. 71.

¹⁷³ Tracie Kyne, *Transcript of evidence*, p. 4.

are just taking whatever it is and just agreeing with it. The building outcome for a lot of people, if they are navigating through the insurance program, is not necessarily the best outcome. They are having substandard results.¹⁷⁴

These insights underscore the necessity of proactive insurance management post-flood, aligning with earlier discussions on trauma's enduring impact and the pivotal role of timely support services. Ensuring efficient insurance processes and comprehensive coverage is a key determinant in facilitating smoother recovery trajectories.

FINDING 89: Timely insurance processing is crucial for easing financial strain and expediting post-disaster rebuilding. Delays or inadequate coverage prolong hardships, hindering recovery for individuals and communities.

8.9.3 Addressing insurance issues

Insurance is one of the biggest issues that people raise after emergencies, particularly in floods.

Hon Jaclyn Symes, Minister for Emergency Services, public hearing, Melbourne, 6 December 2023, *Transcript of evidence*, p. 45.

The Committee was informed that in Australia's competitive insurance market, insurers aim to offer optimal policies based on risk assessments, sometimes opting out of high-risk areas or price premiums accordingly. Rising premiums are driven by three factors:

1. increased frequency of extreme weather events
2. inflation
3. higher reinsurance costs, prompting some reinsurers to reconsider their investments.

In this case, premiums are influenced by extreme weather events, inflation, and rising reinsurance costs, with some reinsurers reconsidering their investments due to increasing weather risks globally.¹⁷⁵

The flooding events in 2022 were exacerbated by COVID-related challenges, tight labour markets, and material shortages. Insurance processes faced unprecedented strain, revealing shortcomings in planning, resources, and technology. Deloitte's review of eight insurers exposed the industry's struggle to handle the scale of the catastrophe, with plans overwhelmed by three times the anticipated claims. Kylie Macfarlane, Chief Operating Officer of the Insurance Council of Australia, explained:

The scale of the flooding events in 2022 tested claims processes at a scale never before seen and exposed vulnerabilities in insurers' claims and complaints handling responses,

¹⁷⁴ Leigh Wilson *Transcript of evidence*, p. 19.

¹⁷⁵ Kylie Macfarlane, Chief Operating Officer, Insurance Council of Australia, public hearing, Melbourne, 20 November 2023, *Transcript of evidence*.

particularly in catastrophe planning, resourcing, processes, technology, communications and governance.¹⁷⁶

Minister Jaclyn Symes addressed the complexity of post-flood insurance issues, citing concerns such as policyholders feeling pressured to accept lump sum payouts and delays in repairs due to trade shortages:

we were hearing stories which I guess you have received evidence on in relation to people being confused about whether to take payouts or get the insurance company to undertake the repairs and people feeling pressured in relation to those issues. It is something that is always on the agenda at the national ministers meeting, because around the country we are concerned about the difficulty for people of obtaining insurance. There is a general understanding that insurance companies cannot operate if they take on risk that means that they cannot pay out premiums, so we understand the business model of insurance companies can be challenging.¹⁷⁷

She emphasised the importance of engaging with the Insurance Council of Australia to address these challenges and ensure fair outcomes. While Minister Symes acknowledged that insurance matters primarily fall under federal jurisdiction, she highlighted efforts to advocate for affected individuals, such as encouraging insurers to conduct in-person meetings with policyholders in Rochester to facilitate better communication and resolution of issues:

When it comes to the issues about insurance, the minister with the state government responsibility I guess or more appropriately placed to have these conversations is the Assistant Treasurer. He and I have met with the Insurance Council of Australia. I wanted to bring to them again some of that experience on the ground. ... Obviously it does sit more at the Commonwealth level, and there is a federal inquiry into insurance responses to the major floods claims of 2022. It is not just Victoria that have these concerns. I think future insurability is a big concern. We have seen it in fire-impacted areas. It has certainly impacted the storm-impacted areas of June 2021. Ultimately it is outside my scope of responsibility as Minister for Emergency Services, but we do put as much pressure as we can on the insurance council to ensure that companies are behaving appropriately. In Rochester in particular, through intervention, the Insurance Council of Australia encouraged companies to go and meet with people in person, and a lot of people had greater success in one-on-one meetings with their insurance providers. Some were better than others, and those that were not so good we reported back to ICA saying, 'Can you help them do better?', and we saw improvements through that intervention.¹⁷⁸

Media reports and evidence to the Inquiry discussed the supports provided by financial advocacy, social service and other organisations to assist people with their insurance claims.¹⁷⁹ For example, Jennifer Leddra, a Rochester resident, described intervention from the Insurance Council of Australia when she visited a disaster relief centre:

¹⁷⁶ Ibid., pp. 15–16.

¹⁷⁷ Hon Jaclyn Symes, *Transcript of evidence*, pp. 45–46.

¹⁷⁸ Ibid.

¹⁷⁹ For example, see: Amanda Murphy, *Submission 812*; Jennifer Leddra, *Submission 437*.

I liked many, was having trouble with my Insurance company, (Australian Seniors) with my numerous phone calls constantly being re directed to South Africa. My frustration was growing when the same fellow each time said there must be a leak in the house that will need investigating. I had no idea where this was going and just wanted to speak to someone in Australia. I visited the Disaster Relief people and was speaking to a lady about my problem, when a representative from The Insurance Council of Australia overheard our conversation and said he wished to help me. This was 11.30 am and by 2.30pm that same day, I had an Insurance Claims person ringing me... I do believe my man from the Insurance Council of Australia was the driving force for my claim and will be forever grateful for his assistance.¹⁸⁰

To support flood-affected communities, the Victorian Government provided funding for flood recovery financial counselling. This funding was provided under the 2022 Flood Recovery Support Program.¹⁸¹ In a submission to a federal inquiry, Financial Counselling Victoria—the peak body for Victorian financial counsellors—outlined the Flood Recovery Financial Counselling Program, noting that:

- it initially comprised of 9.2 full-time equivalent (FTE) financial counsellors
- a further 5.1 FTE financial counsellors were diverted to support small businesses from July 2023
- counsellors provided ‘response and recovery services to communities’.¹⁸²

Financial Counselling Victoria highlighted that even with this support many flood-affected individuals struggled navigating insurance claims. It emphasised that:

the complex insurance issues encountered by financial counselling clients are barriers to wellbeing recovery, and have been considered a worse experience than the trauma impact of the extreme weather event itself. Financial counselling services, in collaboration with community legal services and other case support services, are in contrast, vital enablers in the recovery journey.¹⁸³

Stakeholders acknowledged the importance of financial counselling in the aftermath of the disaster, particularly advice on navigating insurance claims. The Victorian Council of Social Services stated:

Financial counsellors have been an important resource after the floods, helping people navigate these monetary challenges. This includes assisting with complex grant applications and negotiating with banks and utility companies. They also collect information from their clients and relay it to third parties to avoid duplication and traumatisation... Insurance is the most common issue financial counsellors help clients with after emergencies.¹⁸⁴

¹⁸⁰ Jennifer Leddra, *Submission 437*, p. 2.

¹⁸¹ Financial Counselling Victoria, *Financial Counselling and Disaster Recovery*, <<https://fcvic.org.au/wp-content/uploads/Financial-Counselling-info-2022-flood-recovery.pdf>> accessed 30 April 2024.

¹⁸² Financial Counselling Victoria, *Submission to Inquiry into insurers' responses to the 2022 floods*, p. 1.

¹⁸³ *Ibid.*, p. 8.

¹⁸⁴ Victorian Council of Social Service, *Submission 851*, p. 23.

The Committee acknowledges there is an important role for state governments to ensure appropriate insurance processes and supports are in place for Victorians following a natural disaster. However, as noted by stakeholders, insurance matters largely fall within the federal jurisdiction and require a national response.

In 2023, the House of Representatives established an *Inquiry into insurers' responses to 2022 major flood claims*, including for the Victorian flood event. The Terms of Reference for the federal inquiry are outlined in Box 8.2 below.

The Committee notes that Victoria has provided evidence to this inquiry based on its experience in the 2022 floods, notably Emergency Recovery Victoria. The agency noted that:

Access to affordable and appropriate levels of insurance will continue to play a critical part in risk management and will reduce the burden and pressure on governments to provide financial support for impacted communities following major emergencies. National leadership on insurance matters remains crucial in addressing some of the challenges being experienced by the insurance industry and policyholders.

ERV, in coordinating and supporting recovery from the October 2022 Victorian floods, has noted various issues relating to insurance that have been identified during our engagement with impacted communities. There are several key emerging and common themes, including the need for improved communication and messaging, greater understanding of insurance policies, and insurance affordability and cover. We envisage that these issues are not exclusive to Victoria and its communities and would benefit from national coordination and a consistent approach across jurisdictions.¹⁸⁵

¹⁸⁵ Emergency Recovery Victoria, Submission to the Inquiry into insurers' responses to 2022 major flood claims, *Submission 31*, p. 9.

Box 8.2 Terms of Reference: Inquiry into insurers' responses to 2022 major flood claims

1. Responses of insurers to the claims resulting from major 2022 floods, including the:
 - a. south-east Queensland and northern New South Wales (NSW) floods of February and March 2022;
 - b. Hunter and greater Sydney floods of July 2022;
 - c. Victorian, NSW and Tasmanian floods of October 2022; and
 - d. central west NSW floods of November and December 2022.
2. The inquiry shall have regard to the following matters in respect of the aforementioned floods:
 - a. the experiences of policyholders before, during and after making claims;
 - b. the different types of insurance contracts offered by insurers and held by policyholders;
 - c. timeframes for resolving claims;
 - d. obstacles to resolving claims, including factors internal to insurers and external, such as access to disaster-hit regions, temporary accommodation, labour market conditions and supply chains;
 - e. insurer communication with policyholders;
 - f. accessibility and affordability of hydrology reports and assessments to policyholders;
 - g. affordability of insurance coverage to policyholders;
 - h. claimants' and insurers' experiences of internal dispute resolution processes; and
 - i. the impact of land use planning decisions and disaster mitigation efforts on the availability and affordability of insurance.
3. The inquiry shall also have regard to insurer preparedness for future flood events.
4. The inquiry will take into consideration findings from other reports such as Deloitte's external review of insurers' responses to the 2022 floods, and ASIC's claims handling review.

Source: Parliament of Australia, House of Representatives Standing Committee on Economics, *Inquiry into insurers' responses to 2022 major floods claims*, 2023, <https://www.aph.gov.au/Parliamentary_Business/Committees/House/Economics/FloodInsuranceInquiry/Terms_of_Reference> accessed 26 April 2024.

At the time of finalising this Report, the federal inquiry was still collecting evidence. The following Sections outline key findings from the Deloitte and ASIC reports, referred to in the House of Representatives' Terms of Reference.

Deloitte's external review of insurers' response to the 2022 floods

In October 2023, Deloitte published its report *The new benchmark for catastrophe preparedness in Australia* which examined insurers' response to the 2022 floods in South Australia and New South Wales. The report made several recommendations to improve the performance of Australian insurance agencies in response to disasters so that they meet community expectations.

Table 8.1 below summarises these recommendations.

Table 8.1 Summary of recommendations, Deloitte's review of insurers' response to the 2022 floods

Recommendation No.	Area of focus	Summary of recommendation
Recommendation 1	Catastrophe preparedness	Five key areas to improve in catastrophe preparedness: <ul style="list-style-type: none"> • catastrophe response plans • scenario planning and stress testing • post event reviews • design of policies for catastrophes • ICA planning.
Recommendation 2	Customer experience	Four areas to improve customer experience: <ul style="list-style-type: none"> • communication • claim handling • customer treatment strategy • external voice of customer.
Recommendation 3	Resourcing capability	Three areas to improve resourcing: <ul style="list-style-type: none"> • workforce planning • catastrophe resource modelling • catastrophe onboarding, training and competency management.
Recommendation 4	Operational response	Five areas to improve the operational response: <ul style="list-style-type: none"> • reduction in manual processes • accelerated triage • a single claims (customer) view • customer application • advanced technologies.
Recommendation 5	Governance and transparency	Two areas to improve governance and transparency: <ul style="list-style-type: none"> • data capture, modelling and reporting • ICA data capture.
Recommendation 6	Coordination with government	Three areas for more effective coordination with government: <ul style="list-style-type: none"> • government funding eligibility • clean-up and debris removal • co-incentivise resilience investments.
Recommendation 7	Code review in the context of catastrophes	Review the <i>General Insurance Code of Practice</i> , including consideration of: <ul style="list-style-type: none"> • objective definition • type of relief.

Source: Deloitte, *The new benchmark for catastrophe preparedness in Australia*, October 2023, pp. 116-121.

ASIC's claims handling review

In August 2023, ASIC released its report on *Navigating the storm: ASIC's review of home insurance claims*, which examined the consumer experience in home insurance claims since 1 January 2022.

Table 8.2 below summarises the key insights from ASIC's review.

Table 8.2 ASIC's findings on areas for improvement of claims handling practices

Area for improvement	What insurers must do
Better communications – for transparency and timeliness	Insurers must be clear, proactive and transparent in communications to prevent or overcome confusion of consumers. Insurers should proactively inform consumers of their claim progress and decisions, outlining any further steps in the claims process.
Better project management – for minimum intrusion and burden	Insurers must maintain adequate oversight of insurer-appointed third parties and manage the claims process for consumers. This extends to notifying consumers about the purpose, order and timing of assessors and trades attending their home.
Better treatment of vulnerability – for fairness	Insurers must recognise consumers experiencing vulnerability and tailor their services to consumers who are experiencing vulnerability and treat them accordingly.
Better resourcing – for timeliness and fairness	Insurers must have adequate resourcing to enable their claims handling and dispute resolution functions. This extends to ensuring that staff are properly trained and skilled to handle claims efficiently, honestly and fairly, as well as to identify expressions of dissatisfaction and vulnerability.

Source: Australian Securities and Investments Commission (ASIC), *Navigating the storm: ASIC's review of home insurance claims*, August 2023, p. 9.

Evidence to the Inquiry, and to other recent reviews, has revealed a complex landscape of insurance-related issues emerging from the 2022 flood event and the many claims made. Managing insurance following a natural disaster extends beyond state boundaries and requires intergovernmental coordination. While insurance is predominantly a federal matter, the significant role played by the Victorian Government in providing evidence to federal reviews and supporting affected communities cannot be overstated.

The Committee, therefore, strongly supports the continuation of the federal inquiry into insurers' responses to the 2022 major flood claims. It is imperative that the Victorian Government continues its active involvement, ensuring that the unique challenges faced by its residents are addressed in the national discourse. This collaborative approach will not only bolster the inquiry's effectiveness but also ensure that the solutions developed are comprehensive and inclusive, offering sustainable benefits to all Australians affected by similar challenges.

FINDING 90: The significant challenges faced by insurers and policyholders during the 2022 flood event underscore the urgent need for enhanced national coordination and reform in disaster insurance practices.

RECOMMENDATION 72: That following the outcomes of the House of Representatives' *Inquiry into insurers' responses to 2022 major floods claims*, the Victorian Government advocate to the Commonwealth Government that it take action to ensure that residents and businesses in flood-affected areas can obtain and maintain necessary insurance.

RECOMMENDATION 73: That the Victorian Government's response to this Inquiry identifies the responsible authorities for each recommendation and provides a timeframe for action and reports back to Parliament on progress made implementing the recommendations.

**Adopted by the Legislative Council Environment and Planning Committee
Parliament of Victoria, East Melbourne
21 June 2024**

Appendix A

Inquiry overview

A.1 Submissions

1	Mr Dennis Luke	30	Mrs Cynthia Williams
2	Mr Phil Whatley	31	Mr Adam Bruzzese
3	Mr Brett Thomson	32	Name withheld
4	Miss Sydney Rose	33	Mr Ken Skinner
5	Mr Wayne Park	34	Aftershock PC
6	Mr Wayne McKail	35	Mr Jack Tennant
7	Name withheld	36	Mr Graham Matthews
8	Name withheld	37	Name withheld
9	Mrs Sharon Farnsworth	38	Mr Mat Keyzer
10	Maree Traill	39	Rochester Community House
11	Mr Zaw Htut	40	North East River Alliance Inc
12	Mr Colin Irwin Smith	41	Mr Steven Trevaskis
13	Mr Barry Goldsmith	42	Confidential
14	Mrs Olga Morvillo	43	Mrs Kim Hay
15	Ms Alison Joseph	44	Name withheld
16	Name withheld	45	Name withheld
17	Mr Paul Williamson	46	Friends of the Earth (Melbourne)
18	Ms Joan Griffin	47	Mr Stuart Locke
19	Lee Lanzafame	48	Name withheld
19a	Lee Lanzafame	49	Name withheld
20	Ms Lynn Cresswell	50	Mr Damien Connors
21	Mr Xavier Kellow	51	Name withheld
22	Mrs Hannah Taylor	52	Mr Royden and Janet Webb
23	Mr Gabriel Brillantes	53	Kaye McBride
24	Goulburn River Trout	54	Dr Anthony Ashton
25	Mr Jonah Gruner	55	Name withheld
26	Mrs Elaine Breen	56	Carol Lambert
27	Name withheld	57	Mrs Aimee Lindrea
28	Ms Leonie Borger	58	Mrs Fay Wolfe
29	Mrs Jess Jeffery	59	Mrs Jacqueline McEvoy

60	Confidential	97	Mrs Caroline Watson
61	Mr Rodney Ridd	98	Mrs Kylie Moroney
62	Mrs Janice Childs	99	Name withheld
63	Mr Wayne Bamford	100	Confidential
64	Name withheld	101	Miss Madeline Mackrill
65	Miss Mary De Bono	102	Ms Eileen McNeilly
66	Echuca Neighbourhood House	103	Mrs Tara Harris
67	Ms Thuc Truong	104	Name withheld
68	Mrs Sonya James	105	Mrs Virginia Ross
69	Mrs Cheryl Darren White	106	Name withheld
70	Name withheld	107	Mrs Karen Ballantyne
71	Name withheld	108	Name withheld
72	Mrs Carolyn Braun	109	Mrs Trish Clark
73	Bureau of Meteorology	110	Mrs Marg Rasmussen
74	Mr Mitchell Thomas	111	Name withheld
75	Name withheld	112	Name withheld
76	Name withheld	113	Name withheld
77	Name withheld	114	Mrs Rebecca Pearse
78	Susan Savle	115	Confidential
79	Mr Doug Fehring	116	Name withheld
80	Dr Ian Wright	117	Ms Jean Holmberg
81	Mr Bill Baxter	118	Mrs Wyn Hodgens
82	Name withheld	119	Name withheld
83	Ms Anne Williams	120	Mrs Rebecca Threlfall
84	Name withheld	121	Mr Bruce Bryant
85	Ms Eliza Watson	122	Name withheld
86	Mrs Carmen Moon	123	Name withheld
87	Mrs Fran Hodgens	124	Ms Madeline Keenan
88	Mr Chris Sanders	125	Mr Stanley Rasmussen
89	Miss Lillian Bartlett	126	Mrs Jenny Fehring
90	Mrs Becky Baker	127	Mrs Helen Moroney
91	Name withheld	128	Mr Mark Macfarlane
92	Mrs Christie Howe	129	Mrs Leanne Pickens
93	Mrs Courtney Umbers	130	Mrs Melanie Fattore
94	Name withheld	131	Miss Rachael Else
95	Name withheld	132	Name withheld
96	Mrs Jacinda Rasmussen	133	Miss Maddy Madill

134	Name withheld	171	Mrs Ciaron Burke
135	Mrs Faye Montague	172	Name withheld
136	Mrs Maree Macague	173	Dr Milton Speer
137	Mrs Nicole Gray	174	Mr Bruce Watson
138	Name withheld	175	Mr Paul Macague
139	Mrs Eloise Cuttriss	176	Miss Maddie Frawley
140	Name withheld	177	Ms Nicki Henderson
141	Ms Cristel Lucas	178	Mr James Walsh
142	Mrs Patricia Christiansen	179	Mr Daryl Baker
143	Name withheld	180	Mrs Sharelle Riordan
144	Name withheld	181	Mrs Trish Baker
145	Mr Lachlan Watson	182	Mrs Lynette Anderson
146	Name withheld	183	Name withheld
147	Confidential	184	Ms Sue McGill
148	Mr Stefan Moore	185	Mrs Carmen Mann
149	Name withheld	186	Ms Kerryn Moroney
150	Name withheld	187	Mr Maurie Finn
151	Mr David Harris	188	Name withheld
152	Ms Donna Hansen	189	Confidential
153	Name withheld	190	Name withheld
154	Mrs Sandi Marsh	191	Mrs Lindsey Macague
155	Name withheld	192	Mrs Leanne Thompson
156	Mrs Caitlin Doolan	193	Mrs Renee Clymo
157	Mrs Jodi Dobson	194	Name withheld
158	Name withheld	195	Ms Judy Nutbean
159	Mrs Narelle Robertson	196	Ms Sigaal Nicholson
160	Name withheld	197	Mrs Leanne Gledhill
161	Mrs Leesa Hodgens	198	Name withheld
162	Mrs Hannah Sultana	199	Ms Larissa Anderson
163	Ms Emily Smolenaars	200	Name withheld
164	Name withheld	201	Ms Bree McInnes
165	Mrs Deanne McNair	202	Confidential
166	Mrs Claire Tuohey	203	Mrs Danniella Larkins
167	Ms Maree Thompson	204	Miss Stephanie Else
168	Confidential	205	Mrs Emma Grant
169	Name withheld	206	Mrs Tina West
170	Miss Tracey Wall	207	Mrs Merryn Murray

208	Ms Monique Whitehead	245	Name withheld
209	Mrs Louis Toohey	246	Miss Melanie Pyle
210	Name withheld	247	Name withheld
211	Name withheld	247a	Name withheld
212	Name withheld	248	Name withheld
213	Mr Wayne & Maria Whitehead	249	Ms Tania Else
214	Mr David Fuller	250	Mrs Michelle Gibson
215	Ms Megan Fox	251	Mr Darren Smolenaars
216	Mr Chris Murray	252	Confidential
217	Name withheld	253	Confidential
218	Mrs Jan Windridge	254	Name withheld
219	Name withheld	255	Lynne Horsfall
220	Ms Catriona Jenkins	256	Mrs Kristine Rosaia
221	Mrs Elizabeth Trewick	257	Ms Holly Foster
222	Confidential	258	Mrs Simone Walsh
223	Mrs Helene Perry	259	Name withheld
224	Mrs Ann Bell	260	Mrs Maureen Tobin
225	Name withheld	261	Name withheld
226	Mrs Lorraine Lawrence	262	Ms Shelley Nichol
227	Mrs Anne Wils	263	Name withheld
228	Name withheld	264	Mr Isaiah Miller
229	Name withheld	265	Mrs Donna Fulton
230	Mr John McKee	266	Name withheld
231	Name withheld	267	Mrs Janet O'Neill
232	Mrs Brooke Walkley	268	Mrs Vicki Laffy
233	Linda McGillivray	269	Mr David Wood
234	Mrs Mandy Keenan	270	Mrs Cheryl Hicks
235	Ms Kim Dingwall	271	Ms Jennifer Chemay
236	Mrs Shannyn Nichol	272	Mr Adam Dee
237	Mr Geoff Jowett	273	Mr Graham Jensen
238	Name withheld	274	Ms Jocelyn Webster
239	Ms Sharnee Sinclair	275	Mrs Raelene Mold
240	Miss Toni Shea	276	Mr John Pettigrew
241	Mrs Annette Briggs	277	Mr William Pearce
242	Mr Frank Godden	278	Mr John Mooney
243	Mr Peter Conway	279	Mr Gerard Peck
244	Confidential	280	Stephan and Ruth Carr

281	Mr Greg Johnstone	316	Mr Shane Howe
282	Mr Peter Whelan	317	Mr Paul Monigatti
283	Mr Lance King AFSM	318	Mr Rob Barrett
284	Mr Graeme Dove	319	Mr Stuart Hanham
285	Mrs Sarah Brock	320	Mrs Jan Grant
286	Mr Tom Razmovski	321	Mr David Baker
287	Margaret Ross	322	Mrs Cathy Campbell
287a	Margaret Ross	323	Mrs Lisa Juffs
288	Name withheld	324	Name withheld
289	Therese & Patrick Bradshaw & Hayes	325	Mrs Marlene Clayton
290	Mr Mark Lawrence	326	Name withheld
291	Mr Ivan Carnegie	327	Merryn O'Leary
292	Name withheld	328	Miss Katie Rasmussen
293	Mrs Courtney Carroll	329	Name withheld
294	Ms Sasha Andersen	330	Name withheld
295	Victorian Government	331	Mrs Leesa Hodgens
296	City of Melbourne	332	Name withheld
297	Ms Elisha Johnson	333	Name withheld
298	Mrs Leonie Willis	334	Mr Bill Chisholm
299	Amy Soyka	335	Ms Anne Chirnside
299a	Amy Soyka	336	Name withheld
300	Ms Fiona Chique	337	Name withheld
301	Mr Wayne Vincent	338	Mrs Julia Hastilow
302	Mr Simon Lunn	339	Mrs Peta Kay
303	Jan Beer	340	Name withheld
304	Mr Sanjay Gosai	341	Ms Samantha Carnie
305	Name withheld	342	Ms Megan Connelly
306	Name withheld	343	Miss Brittany Hawkett
307	Name withheld	344	Miss Nikita Frawley
308	Mr Trent Riordan	345	Name withheld
309	Ms Alice Wilson	346	Mr Stewart Frost
310	Mr Colin Fenton	347	Confidential
311	Sarah Watkins	348	Miss Brittany Stather
312	Mr Edward Kaye	349	Emma Miller
313	Mr Frank Freschi	350	Mrs Julie Campbell
314	Confidential	351	Mrs Andrea Windridge
315	Bronwyn Moon	352	Ms Becky Crawford

353	Confidential	390	Name withheld
354	Lily	391	Not used
355	Name withheld	392	Prana Properties Pty Ltd
356	Mrs Julie Golledge	393	Committee for Greater Shepparton
357	Sol	394	Mark McIntosh
358	Miss Mia D'Agostino	395	Ms Jane Trewin
359	Name withheld	396	Name withheld
360	Ms Annie Cowx	397	Ms Francene Howe
361	Mr Steven Tucker	398	Name withheld
362	Name withheld	399	Name withheld
363	Phillip Johnson	400	Rennies at Acheron
364	Ms Catherine Elms	401	Dr Stuart Strachan
365	Mrs LisaAnne Dickson	402	Mrs Yvonne Wolfe
366	Mr Tim Bubb	403	RW & LP Trimble P/L
367	Mr Geoff Carson	404	Mrs Julianne Hand
368	Mrs Eunice Cartner	405	Mr Sebastian D'Agostino
369	Ms Nella Interlandi	406	Confidential
370	Mrs Jenny Reid	407	Mrs Heather Darbyshire
371	Kim Mundie	408	The Winery Kitchen
372	Name withheld	409	Mr Bryan Griffiths
373	Mrs Sally Parker	410	Ms Elissa McDonald
374	Leslie Moon	411	Mrs Jennifer Major
375	Mr Jim Theresa Bereton	412	Confidential
376	Name withheld	413	Margaret and Bob Knight
377	Confidential	414	Mr Brett McMurdo
378	Meg and April Beach-Stower	415	Mr Terry Grasby
379	Name withheld	416	Mr Simon Pearson
380	Miss Madeline McMillan	417	Rochester Secondary College
381	Mrs Sharon Oliver	418	Mr Darren Pain
382	Name withheld	419	Steven Reed
383	Mrs Rachel Whipp	420	Miss Ebony Gordon
384	Campaspe River Reserve Committee	421	Name withheld
385	Name withheld	422	Name withheld
386	Mrs Linda Rasmussen	423	Name withheld
387	Con and Trish Boekel	424	Mrs Fay Kellett
388	Mrs Rachael Major	425	Name withheld
389	Mrs Dianne McMahon	426	Miss Joanne Potter

427	Mrs Genevieve Jess	464	Name withheld
428	Name withheld	465	Friends of the Maribyrnong Valley
429	Mr David Hutchinson	466	Mrs Sharon Williams
430	Name withheld	467	Mrs Karen Mose
431	Name withheld	468	Mrs Tracey Roberts
432	Mr Tim Quinlan	469	Name withheld
433	Mrs Sally Bogie	470	Ms Lynda Newton
434	Name withheld	471	Name withheld
435	Vicki and Geoff Woodhouse	472	Mrs Jodie Watson
436	Name withheld	473	Name withheld
437	Jennifer Leddra	474	Ms Catherina Toh
438	Anne Lawford	475	Ms Sharon Herne
439	Mr John Haitisma	476	Ms Kylie Whittard
440	Mrs Jean Haitisma	477	Name withheld
441	Mrs Lyn Marhney	478	Mr Brian Crawley
442	Mrs Elizabeth Broucek	479	Sonya Else
443	Miss Debbie Harvey	480	Name withheld
444	Mrs Jeanette Dempsey	481	Name withheld
445	Name withheld	482	Mrs Lorraine Harris
446	Mrs Lynette Brown	483	Carol and Lawrie West
447	Mr Dylan Cuttriss	484	Robyn McCluskey
448	Clover Dale Motors	485	Mr Andrew Prout
449	Mrs Fiona Cuttriss	486	Mr Hedley Moon
450	Mr Brendan Moyle	487	Mr Fran Palling
451	Ms Marriane Avis	488	Name withheld
452	Name withheld	489	Mr Kevin Cartwright
453	Mrs Belinda Gordon	490	Mr Clancy Philippe
454	Name withheld	491	Russell Crichton
455	Name withheld	492	Mrs Leah Weston
456	Mr Justin Gordon	493	Mr Neville Borger
457	Name withheld	494	Mrs Louise Eeles
458	Mr Luke Ryan	495	Mrs Bev Hoffman
459	Confidential	496	Russ and Andrea Phipps
460	Mrs Nic Sweeney	497	Youth Affairs Council Victoria (YACVic)
461	Colin and Shirley Atkins	498	Restdown Retirement village Incorporated
462	G J Quinn and Sons	499	Name withheld
463	Mrs Anne Shaw		

500	Mr Davin Else	535	Name withheld
501	Name withheld	536	Name withheld
502	Ms John Phillips	537	Name withheld
503	Central Victorian Greenhouse Alliance (CVGA)	538	Name withheld
504	Linda Dimsey	539	Victoria SES Volunteers Association (VicSESVA)
505	Mr Frank Bowles	540	Confidential
506	Mrs Nell Bywaters	541	Name withheld
507	HG Turf Group Pty Ltd	541a	Name withheld
508	Nicholas Dean	542	Murray Darling Association Inc.
509	Corangamite Shire Council	543	Mr Alan Rothacker
510	Mr Marshall Eastman	544	Ms Pauline Ashton
511	Mrs Heather Acocks	545	Mr Gary Testro
512	Gunbower Landcare	546	Name withheld
513	City of Greater Geelong	547	Mr Rodney Harrison
514	Name withheld	548	Mr Brett Sinapius
515	Northern Victorian Emergency Management Cluster	549	Name withheld
516	Name withheld	550	Mrs Jo Pedler
517	Murray-Darling Basin Authority (MDBA)	551	Mrs Beverley Peake
518	Kensington Association	552	Mrs Lynne Canavan
519	Strathbogie Shire Council	553	Mr Marcus Fletcher
520	Wellington Shire Council	554	Kyabram Racecourse & Recreation Reserve Inc
521	Mitchell Shire Council	555	Mr David Vink
522	Confidential	556	Mr Francis Cinanni
523	Volunteering Victoria	557	Mr Charlie
524	Rivervue Retirement Village, Tigcorp Pty. Ltd.	558	Ron Sutherland
525	Mrs Katherine Mcwhinney	559	Rural Councils Victoria
526	Name withheld	560	Mrs Rosemary Murray
527	Mr Glenn Carrington	561	Mr Russell Major
528	Ms Cindy May	562	Mrs Pamela Joyce
529	Golden Plains Shire Council	563	Confidential
530	Maribyrnong City Council	564	Mr Rocky D'Agostino
531	Mornington Peninsula Shire Council	565	Mrs Dianne Dimovski
532	Name withheld	566	Jim and Sue White
533	Dr Brian Cook	567	Ms Susan Joyce
534	Name withheld	568	Newbridge Recreation Reserve
		569	Ms Allison Baumgart

570	Mr Rodney Dimsey	607	Justice Connect
571	Miss Catherine Jessop	608	Ms Daniella Moore
572	Ms Gerard Ryan	609	Mr George Wyatt
573	Ulupna/Barmah floodwatch group	610	Mr Peter Weeks
574	Mr Robert Ralph	611	Name withheld
575	Miss Lynnette Newton	612	Mr Colin Myers
576	Miss Emily Shaw	613	Mr Mick Banfield
577	Mr Alistair Chessells	614	Mr Geoff Kyval
578	Name withheld	615	Rochester and Elmore District Health Service (REDHS)
579	Name withheld	616	John C Scott
580	Mr Steven Threlfall	617	Mrs Joanne Florance
581	Essendon Canoe Club	618	Mr Scott Hore
582	Name withheld	619	The Salvation Army Australia
583	Ms Lesley M Smith	620	Dr Peter Mitchell
584	Miss Clare Sands	621	Ms Colleen Hartland
585	Name withheld	622	Disaster Legal Help Victoria (DLHV)
586	Mrs Leigh-Ann Stokan	623	Merri-bek City Council
587	Ms Kerry Bruce	624	Ms Gillian Krenzin
588	Mrs Jodie Hay	625	Mr Stanislaw Korkliniewski
589	Ms Monica Brereton	625a	Mr Stanislaw Korkliniewski
590	Jennifer Chivilo	626	Peri Urban Councils Victoria (PUCV)
591	Viet	627	Mrs Amanda Holland
592	Nam	628	Dr Paul Adams
593	Barmah Rural Fire Brigade	629	Ms Leonie Stokes (Blow)
594	Mr Ian Faircloth	630	Name withheld
595	Ms Julie Chairul	631	Ms Linda Coote
596	Mrs Maureen Blair	632	Name withheld
597	Mr John Allen	633	Name withheld
598	Ms Bridget Frawley	634	Central Goldfields Shire Council
599	Mrs Gayle Kerlin	635	Rochester Motorcycles
600	Mr Ben Hodgens	636	Elster Creek Flood Management - Community Advisory Panel
601	Tanya Coghill	637	Gunnawarra Shire Council
602	Miss Kahla Else	638	Name withheld
603	Name withheld	639	Mr Cameron David Lovering
604	Mrs Sandra Foweraker	640	Name withheld
605	Fiona Francis	641	Confidential
606	Mrs Linda Riding		

642	Swan Hill Rural City Council	678	Yorta Yorta Nation Aboriginal Corporation
643	Name withheld	679	Name withheld
644	Confidential	680	Ms Nicole McKay
645	Mr Ken Pattison	681	Municipal Association of Victoria
646	Mr Kevin Long	682	Port Phillip Emergency Climate Action Network
647	Mr Michael Caridi	683	Name withheld
648	Mrs Jill Gallaway	684	Colin and Gail Grinter
649	Confidential	685	Newbridge Recreation Reserve Committee of Management
650	Campaspe Shire Council	686	Mr Hamish Toll
651	IAG	687	Miss Meg Pethybridge
652	Ms Sarah Marshall	688	Mr Stelios (Tass) Gavalakis
653	Mr Chris Harrison	689	Victoria Racing Club Limited
654	Greater Shepparton City Council	690	Buloke Shire Council
655	Mrs Lorraine Appleby	691	Ms Rachel Cairns
656	Name withheld	692	Ms Leonie Lomax
657	Name withheld	693	Insurance Council of Australia
658	Mr David Friswell	694	Mrs Shelley Mitchell
659	Stop North East Link Alliance (SNELA)	695	Macedon Ranges Shire Council
660	Pyrenees Shire Council	696	Name withheld
661	Name withheld	697	ECCV-NCA-RVOC: (joint submission by: Ethnic Communities Council of Victoria, Neighbourhood Collective Australia and Regional Victorians of Colour)
662	Mr Peter Mitchell	698	Neighbourhood Houses Victoria
663	Mrs Peta Thornton	699	Mr Simon Gnieslaw
664	Gouburn Murray Resilience Taskforce	700	Ms Lisa Quinsee
665	Mr Clinton Toth	701	Campaspe Port Enterprise
666	Murray Regional Tourism Board	702	Mrs Sharon Kellett
667	Mr Leigh Wilson	703	Murrindindi Shire Council – ALEXANDRA, VIC
668	Ms Joanne Heaver	704	United Firefighters Union of Australia (Victorian Branch)
669	Volunteer Fire Brigades Victoria (VFBV)	705	Name withheld
670	Name withheld	706	Ms Jane Boal
671	Mrs Dianne Peace	707	Name withheld
672	Mrs Amira Smyrk	708	Mrs Madeline Foott
673	Name withheld	709	Mr Mark Lia
674	Federation of Community Legal Centres Victoria	710	Ms Amanda Logie
675	Dr Kate Saunders		
676	Confidential		
677	Max Fehring		

711	Confidential	746	Carisbrook Fire Brigade
712	Confidential	747	Murray River Group of Councils
713	Name withheld	748	Ms Brydie Hill
714	Confidential	749	Loddon Shire Council
715	Miss Bianca Else	750	Emma Sbriglio
716	Miss Beck Kellett	751	Ian Smith
717	Mr Len Barry	752	Victorian Farmers Federation
718	Name withheld	753	Maribyrong Community Recovery Committee
719	Mr Andrew Lewis	754	Australian Institute of Health and Safety
720	Alistair Chessells, Judith Clements, Bart van Ruiswyk (Undera Flood Group)	755	Name withheld
721	Mrs Barbara Walker	756	Allan Hooper
722	Confidential	757	Mrs Angelina De-Simone
723	Mr Brett Thompson	758	Grant Shawcross
724	Mr David Kellett	759	Lindsay Ross Poxon
725	Mrs Jodi Ujimoto	759a	Lindsay Ross Poxon
726	Mr Andrew Perry	760	Mr Isaac Hermann
727	Confidential	761	Name withheld
728	Name withheld	762	Mitchell J Wright
729	Mr Stuart Grinter	763	Confidential
730	Mrs Kerrie Dean	764	Name withheld
731	Mrs Barbara McCarty	765	Mr Geoy Ringin
732	Mr Geoff Crapper	766	Mr David Stone
732a	Mr Geoff Crapper	767	Ms Dianne Howell
733	Confidential	768	Name withheld
734	Ms Antoinette Bufalino	769	Ms Jenna Oliver
735	Name withheld	770	Name withheld
736	Confidential	771	Mrs Julie Leahy
737	Mrs Tania Essex	772	Mr Matt Keating
738	Mr Andrew Prout	773	Ms Michelle Rasmussen
739	Barbara Pascoe	774	Miss Amber Sullivan
740	Central Murray Environmental Floodplains Group Inc	775	Mrs Katrina Christie
741	Mr Anthony F Scott	776	Name withheld
742	Ms Narelle Fraser	777	Mrs Gabrielle Hunt
743	Mr Peter McKee	778	Mrs Leah Williams
744	Mr Maxwell Turner	779	Marlene Hodgens
745	Mr Joseph Sofra	780	Mrs Sarah Flaherty

781	Mrs Teaghan Vallely	818	Victorian Planning Authority (VPA)
782	Mrs Tania Barkby	819	Mr Greg Else
783	Mrs Karen Griffiths	820	Victorian Caravan Parks Association Inc. (VicParks)
784	Mrs Rhonda Dwyer	821	Mrs Joan Jenkins
785	Mrs Irene Aitken	822	Mrs Christine Carty
786	Shelley Fehring	823	Chris and Deb Wolfe
787	Mrs Emma Todd	824	Mr Merv Connor
788	Mr Luke Baker	825	Name withheld
789	Rochester Christian Fellowship	826	Name withheld
790	Mrs Beck Wolfe	827	Rochester Business Network and Nichol Trading Pty Ltd
791	Name withheld	828	Name withheld
792	Miss Lydia McWhinney	829	Confidential
793	Confidential	830	Jeff Bray
794	Name withheld	831	Mrs Suzie Perry
795	Mr Shane Broucek	832	Mrs Naomi Riordan
796	Name withheld	833	Mr David Campbell
797	Miss Trudee Leahy	834	Mrs Catherine Kyne
798	Mrs Rhiannan Brennan	835	Rhiannon Gavalakis
799	Miss Shae Murphy	836	Ms Jenelle Holmberg
800	Mrs Annaleise Williams	837	Mrs Wendy Craft
801	Mrs Danielle Mundie	838	Susan and Kevin Glover
802	Mrs Jenna Anderson	839	Terry Johnston
803	Lyn Fisher	840	Mr Norm Moon
804	Ms Amanda Phillips	841	Mrs Tracie Kyne
805	Pauline Frawley	842	Mrs Justin Kyne
806	Name withheld	843	Name withheld
807	Ms Emma Solomano	844	Mr Brian Wilson
808	Karen McMullan	845	John Boyd
809	Mrs Trudy Cooke	846	Miss Jaye McMillan
810	Name withheld	847	Mr John Cox
811	Mrs Belinda Cooper Green	848	Mrs Barbara Kestle
812	Mrs Amanda Murphy	849	Mr Paul Newman
813	Mr Anthony Leddin	850	Mrs Annie Gilbert
814	Jenny Howlett	851	Victorian Council of Social Service (VCOSS)
815	Geoff Dwyer	852	Alan and Debbie Matthieson-Harrison
816	Ms Naidene Parry	853	Mrs Wendy O'Dwyer
817	Mary and Michael McCormick		

854	Mr Brendan Rasmussen	868	Name withheld
855	Name withheld	869	Confidential
856	Mrs Judi Burgin	870	Name withheld
857	Ms Naomi Clark	871	Peter
858	Name withheld	872	Valerie Kennedy
859	Name withheld	873	Confidential
860	Regal Park Stud	874	Name withheld
861	Name withheld	875	Ruth Angel
862	Miss Linh Nguyen	876	John Guegan
863	Name withheld	877	Confidential
864	Miss Lily Cox	878	Traralgon Community Recovery Committee (TCRC)
865	Name withheld	879	L Ralph Barraclough
866	Name withheld	880	Queensland Reconstruction Authority
867	Ms Judith Woolstencroft		

A.2 Public hearings

10 May 2024

Davui Room, G1 & G2, East Melbourne, VIC

Witness	Position	Organisation
Dr Nerina Di Lorenzo	Managing Director	Melbourne Water
Craig Dixon	Executive General Manager, Service and Asset Lifecycle	Melbourne Water
Tim Wood	General Manager, Service Programs	Melbourne Water
Hon Tony Pagone AM KC	Chair	Maribyrnong River Flood Review
Tim Peggie	Panel Member	Maribyrnong River Flood Review
	Director, Planning	Ethos Urban
Mark Babister	Panel Member	Maribyrnong River Flood Review
	Managing Director	WMA Water

6 December 2023

Davui Room, G1 & G2, East Melbourne, VIC

Witness	Position	Organisation
Hon Harriet Shing MLC	Minister for Water	-
Hon Tony Pagone AM KC	Chair	Maribyrnong River Flood Review
Hon Jaclyn Symes MLC	Minister for Emergency Services	-
Chris French	General Manager – Victoria	GHD
Amanda Gilfoyle	Business Group Leader – Water Resources	GHD
Professor Julie Arblaster	Deputy Director	ARC Centre of Excellence for Climate Extremes, Monash University
Dr Kimberley Reid	Research Fellow, School of Earth Atmosphere and Environment, Faculty of Science	ARC Centre of Excellence for Climate Extremes, Monash University
Jane Nursey	Head, Clinical Services	Phoenix Australia, Centre for Posttraumatic Mental Health

21 November 2023

Davui Room, G1 & G2, East Melbourne, VIC

Witness	Position	Organisation
Sam Quigley	Acting Chief Fire Officer	Department of Energy, Environment and Climate Action
Dougal Purcell	Executive Director, Agriculture Sector Development and Services	Agriculture Victoria
Sarah-Jane McCormack	Executive Director, Agriculture Policy and Programs	Agriculture Victoria
Carolyn Jackson	Deputy Secretary, Regions, Environment, Climate Action and First Peoples	Department of Energy, Environment and Climate Action
Sara Harbidge	Executive Director, Biodiversity	Department of Energy, Environment and Climate Action
Daniel McLaughlin	Executive Director, Conservation and Planning	Parks Victoria
Dr Peter Stone	Chief Customer Officer	Bureau of Meteorology
Dr Chantal Donnelly	General Manager Decision Support Services	Bureau of Meteorology
Lance King AFSM	Former Manager, Emergency Management	Latrobe City Council
Ken Skinner	-	Traralgon Community Recovery Committee

20 November 2023

Davui Room, G1 & G2, East Melbourne, VIC

Witness	Position	Organisation
David Pratt	President	Victorian Caravan Parks Association Inc. (VicParks)
Scott Parker	Chief Executive Officer	Victorian Caravan Parks Association Inc. (VicParks)
Kylie Macfarlane	Chief Operating Officer	Insurance Council of Australia
Andrew Heinrichs	Policy and Advocacy Committee Chair	Australian Institute of Health and Safety
William Tieppo	Deputy Secretary	Department of Transport and Planning
Anthony Judd	Executive Director	Department of Transport and Planning
Jimmy O'Connell	Executive Director	Department of Transport and Planning

25 October 2023

Davui Room, G1 & G2, East Melbourne, VIC

Witness	Position	Organisation
Andrew Fennessy	Deputy Secretary, Water and Catchments	Department of Energy, Environment and Climate Action
Michael Jenz	Executive Director, Statewide Infrastructure and Rural Strategy, Water and Catchments	Department of Energy, Environment and Climate Action
Jesse Rose	Executive Director, Water Resource Strategy, Water and Catchments	Department of Energy, Environment and Climate Action
Tony Pearce	Inspector-General for Emergency Management	-
Brad Drust	Chief Executive Officer	North Central Catchment Management Authority
Rohan Hogan	Executive Manager, Strategy and Partnerships	North Central Catchment Management Authority
Camille White	Floodplain Manager	North Central Catchment Management Authority
Chris Cumming	Chief Executive Officer	Goulburn Broken Catchment Management Authority
Guy Tierney	Statutory Planning and Floodplain Manager	Goulburn Broken Catchment Management Authority
Joel Leister	Manager Floodplain Implementation	Goulburn Broken Catchment Management Authority
Charmaine Quick	Managing Director	Goulburn Murray Water

Witness	Position	Organisation
Andrew Shields	River Operations Manager	Goulburn Murray Water
Peter Clydesdale	Manager Diversions, Groundwater & Streams	Goulburn Murray Water

18 October 2023

Davui Room, G1 & G2, East Melbourne, VIC

Witness
Frances Weidener
Tony Goddard
Michael Bagnall
Vula Kerr
Sarah Marshall
Greg Corcoran
Geoff Kyval
Michael Wickham
David Keenan
Stephanie Munroe
Naomi Clark
Ian Hundley
Isaac Hermann
Maree Maher
Sharon Bathman
Nicole McKay
Johanne Appleby
Selin Lanzafame
Roger Byrne

12 October 2023

Davui Room, G1 & G2, East Melbourne, VIC

Witness	Position	Organisation
Kate Fitzgerald	Deputy Secretary, Emergency Management	Department of Justice and Community Safety
Chris Stephenson	Deputy Commissioner, Emergency Management Victoria	Department of Justice and Community Safety
Tim Wiebusch	Chief Officer Operations, VICSES	Department of Justice and Community Safety
Mariela Diaz	Chief Executive, Emergency Recovery Victoria	Department of Justice and Community Safety
Stuart Moseley	Chief Executive Officer	Victorian Planning Authority (VPA)
Bonnie Mather	Director, Planning Services	Victorian Planning Authority (VPA)
Colin Waters	Resident	Rivervue Retirement Village
Stanislaw Korkliniewski	Resident	Rivervue Retirement Village
Thu-Trang Tran	Chief Executive Officer	Volunteering Victoria
Nick Wimbush	-	-
Madeleine Serle	Chair	Maribyrnong Community Recovery Committee
Darren Lewis	General Manager, Finance	Rivervue Retirement Village, Tigcorp Pty. Ltd.

11 October 2023

Davui Room, G1 & G2, East Melbourne, VIC

Witness	Position	Organisation
Andrew McKeegan	Deputy Secretary, Planning and Land Services	Department of Transport and Planning
Stuart Menzies	Director, State Planning Services	Department of Transport and Planning
Phil Burn	Acting Executive Director, Planning and Building Reform	Department of Transport and Planning
Cr Sarah Carter	Mayor	Maribyrnong City Council
Celia Haddock	Chief Executive Officer	Maribyrnong City Council
Laura-Jo Mellan	Director, Planning and Environment	Maribyrnong City Council
Kirsten Tanner	Coordinator, Emergency Management	Maribyrnong City Council
Cr Pierce Tyson	Mayor	Moonee Valley City Council
Helen Sui	Chief Executive Officer	Moonee Valley City Council
Brett Walters	Director, Strategy and Planning	Moonee Valley City Council

Witness	Position	Organisation
Ben McManus	Manager, EPMO & Accountability	Moonee Valley City Council
Evan Counsel	General Manager, Strategy, Planning and Climate Change	City of Melbourne
Dean Robertson	Director, City Safety, Security and Amenity	City of Melbourne
Ron Sutherland	-	-
Geoff Crapper	-	-
Dr Faye Bendrups OAM	President	Victoria SES Volunteers Association (VicSESVA)
Steve Rosich	Chief Executive Officer	Victoria Racing Club Limited
James Reid	Executive General Manager, Flemington Operations	Victoria Racing Club Limited
Dr Nerina Di Lorenzo	Managing Director	Melbourne Water
Craig Dixon	Executive General Manager, Service and Asset Lifecycle	Melbourne Water
Tim Wood	General Manager, Service Programs	Melbourne Water
John Woodland	Head of Waterways and Catchment Services, South East	Melbourne Water

10 October 2023

Meeting Room G6, East Melbourne, VIC

Witness	Position	Organisation
Cr Alan Getley	Mayor	Buloke Shire Council
Wayne O'Toole	Chief Executive Officer	Buloke Shire Council
Kathryn Doroshenko-Pempel	Emergency Management Coordinator	Pyrenees Shire Council
Jane Bowker	Flood Recovery Coordinator	Pyrenees Shire Council
Dr Graeme Emonson	Administrator	Moira Shire Council
Kate Goldsmith	Emergency Management Coordinator	Moira Shire Council
Cr Liam Wood	Mayor	Mildura Rural City Council

14 September 2023

Recovery Hub, Seymour, VIC

Witness	Position	Organisation
Cr Fiona Stevens	Mayor	Mitchell Shire Council
Brett Luxford	Chief Executive Officer	Mitchell Shire Council
Kellie Massouras	Flood Recovery Manager	Mitchell Shire Council
Cr John Walsh	Mayor	Murrindindi Shire Council
Andrew Paxton	Acting Chief Executive Officer	Murrindindi Shire Council
Peter Bain	Manager, Sustainability & Assets	Murrindindi Shire Council
Cr Laura Binks	Mayor	Strathbogie Shire Council
Amanda Tingay	Director, People and Governance	Strathbogie Shire Council
Rachael Frampton	Acting Director, Community and Planning	Strathbogie Shire Council
Jan Beer	-	Upper Goulburn River Catchment Association
Derek Meggitt	Director	Goulburn River Trout Pty Ltd
Neil Beer	Co-Chair	Community recovery committee
Ken Hall	Chairperson	Kings Park Committee of Management
Pam Beerens	Secretary	Seymour Agricultural and Pastoral Society
Stuart Locke	President	Go Seymour: Business and Tourism group
Shelley Hamilton	Committee member	Go Seymour: Business and Tourism group
Graeme Dove	Committee member	Go Seymour: Business and Tourism group
Emma Germano	President	Victorian Farmers Federation
Charles Everist	Policy Manager	Victorian Farmers Federation
Richard Stecher	Managing Director	Stetcher Agricultural Services
Nick Stecher	-	-
Andrew Perry	-	-

13 September 2023

Sir Ian McLennan Centre, Shepparton, VIC

Witness	Position	Organisation
Cr Shane Sali	Mayor	Greater Shepparton City Council
Peter Harriott	Chief Executive Officer	Greater Shepparton City Council
Mark Lamb	Chief Executive Officer	Murray Darling Association
Judith Clements	-	Undera Flood Group
Alastair Chessells	-	Undera Flood Group
Bart van Ruiswyk	-	Undera Flood Group
Jan Phillips	Manager	Mooroopna Education and Activity Centre
Jacqui Kiss	Administration	Mooroopna Education and Activity Centre
Maria Brown-Shepherd	President	Ethnic Council of Shepparton and District
Sam Atukorala	Manager	Ethnic Council of Shepparton and District
Amy Robinson	Executive Officer	Greater Shepparton Lighthouse Foundation
Jenny Wilson	Chief Executive Officer	Murray Dairy
Leigh Findlay	Board Chair	Committee for Greater Shepparton
Jane Macey	Board Deputy Chair	Committee for Greater Shepparton
Linda Nieuwenhuizen	Chief Executive Officer	Committee for Greater Shepparton
Taylor Hall	General Manager	Valley Pack
Kate Steenvoorden	Founding Board Member	Neighbourhood Collective Australia and Regional Victorians of Colour
Cr Geoff Dobson	Board Member	Murray Darling Association
Nacole Standfield	President	Shepparton Search and Rescue

24 August 2023

Mercure Hotel, Echuca, VIC

Witness	Position	Organisation
Cr Rob Amos	Mayor	Campaspe Shire Council and Murray River Group of Councils
Pauline Gordon	Chief Executive Officer	Campaspe Shire Council
Cr Charlie Gillingham	Mayor	Gannawarra Shire Council
Geoff Rollinson	Chief Executive Officer	Gannawarra Shire Council

Witnessy	Position	Organisation
Cr Dan Straub	Mayor	Loddon Shire Council
Lincoln Fitzgerald	Chief Executive Officer	Loddon Shire Council
Ann-Marie Roberts	City of Greater Bendigo	Northern Victorian Emergency Management Cluster
Luke Ryan	Mount Alexander Shire	Northern Victorian Emergency Management Cluster
Darrell Phillips	Captain	Echuca Village Country Fire Authority
Kate Burke	Managing Director	Think Agri
Tom Acocks	Dairy farmer	-
Jay Whittaker	Engagement and Coordination Manager	Yorta Yorta Nation Aboriginal Corporation
Shannon Maynard	Director, Emergency Management	Campaspe Shire Council
Leah Taaffe	Chief Executive Officer	Community Living and Respite Services
Lauren Davy	Director of Operation	Community Living and Respite Services

23 August 2023

Rochester Shire Hall, Rochester, VIC

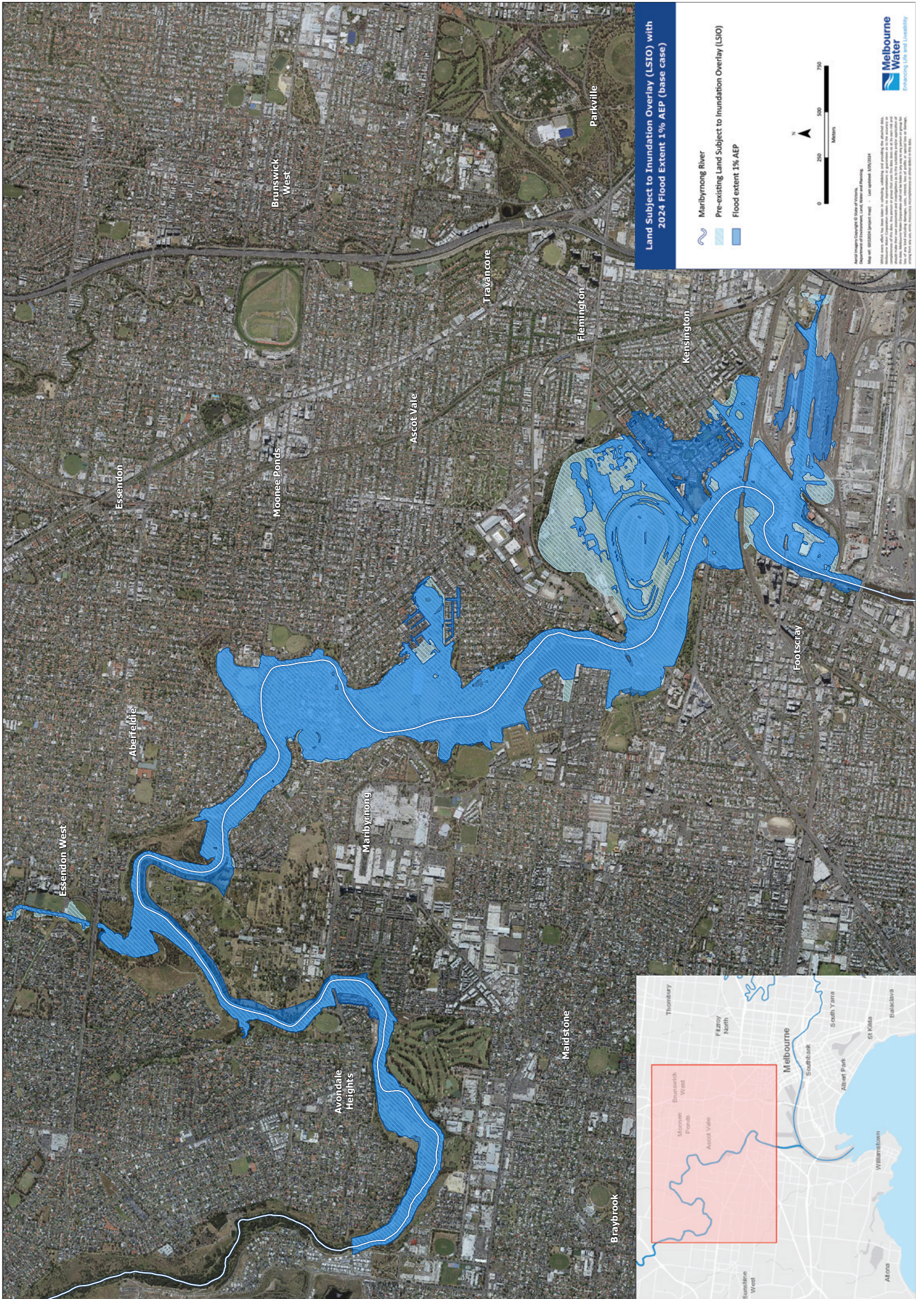
Witness	Position	Organisation
Leigh Wilson	Chair	Rochester Community Recovery Committee
Elizabeth Trewich	Principal, St Joseph's School	Rochester Community Recovery Committee
Tracie Kyne	-	Lake Eppalock Working Group, Rochester Business Network
Sharon Williams	-	Lake Eppalock Working Group, Flood Mitigation Subcommittee
David Christie	Christie Dairy Farm	Community Recovery Committee
Amanda Logie	Manager	Rochester Community House
Karen Laing	Chief Executive Officer	Rochester and Elmore District Health Service
Cameron David Lovering	-	The Returned Services League Rochester Sub-Branch Inc, The Salvation Army, Rochester
Ross Turner	Secretary	Committee of Management, Restdown Retirement Village Incorporated
Christopher White	Board Chair	Rochester and Elmore District Health Service
Judi McKail	-	-

Witness	Position	Organisation
Wayne Park	-	-
Shelley Nichol	-	-
John Oakley	-	-
Cassandra Evans	-	-
Tuesday Browell	-	-
Maree Traill	-	-
Royden Webb	-	-
Rodney George Harrison	-	-
Brooke Ryan	-	-
Peter G Conway	-	-
Paul Poort	-	-
Elaine Breen	-	-
Kevin Long	-	-
Veronica Groat	-	-
Catriona Jenkins	-	-

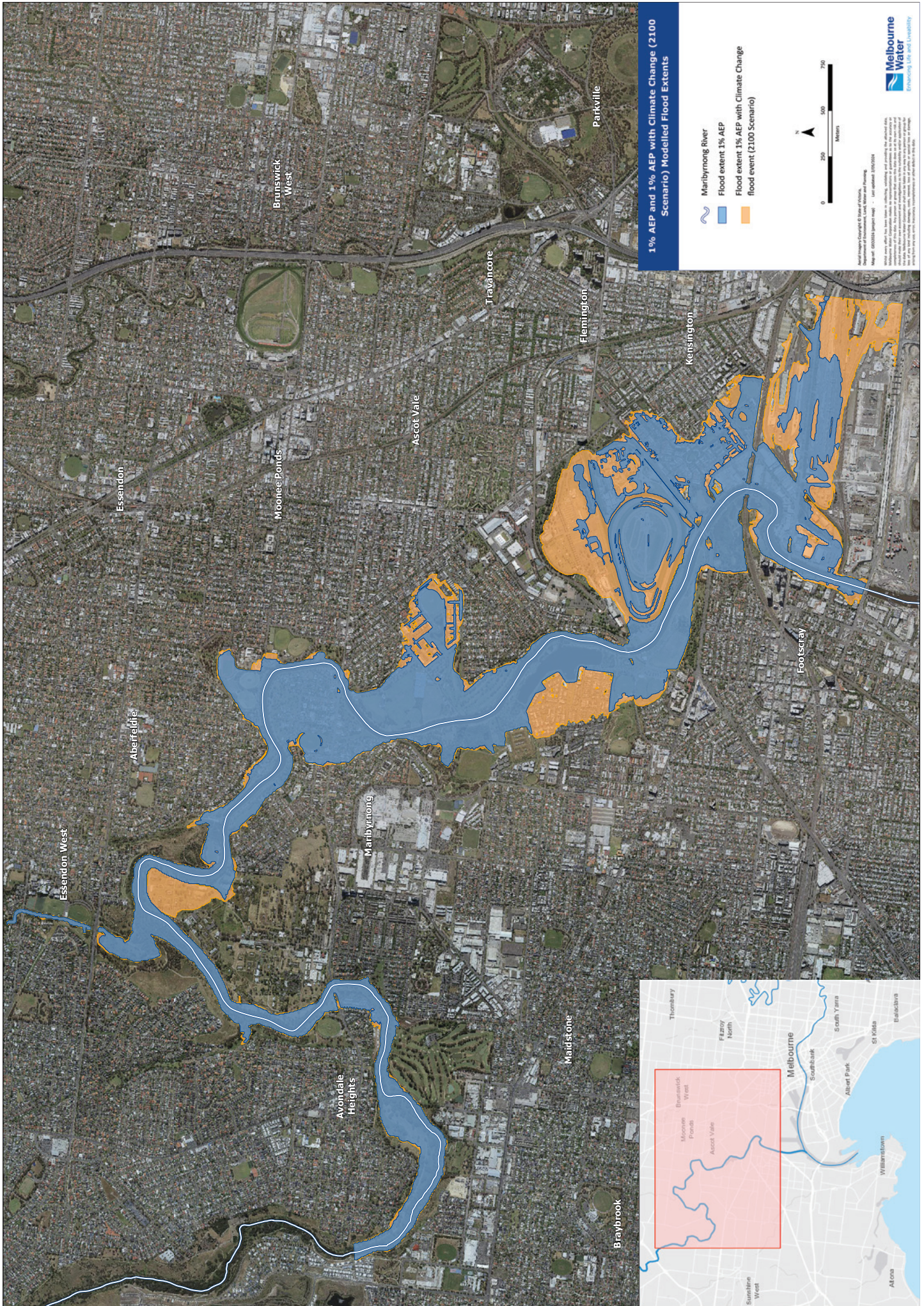
Appendix B

New Maribyrnong River flood model maps

B.2 1% AEP 2024 scenario



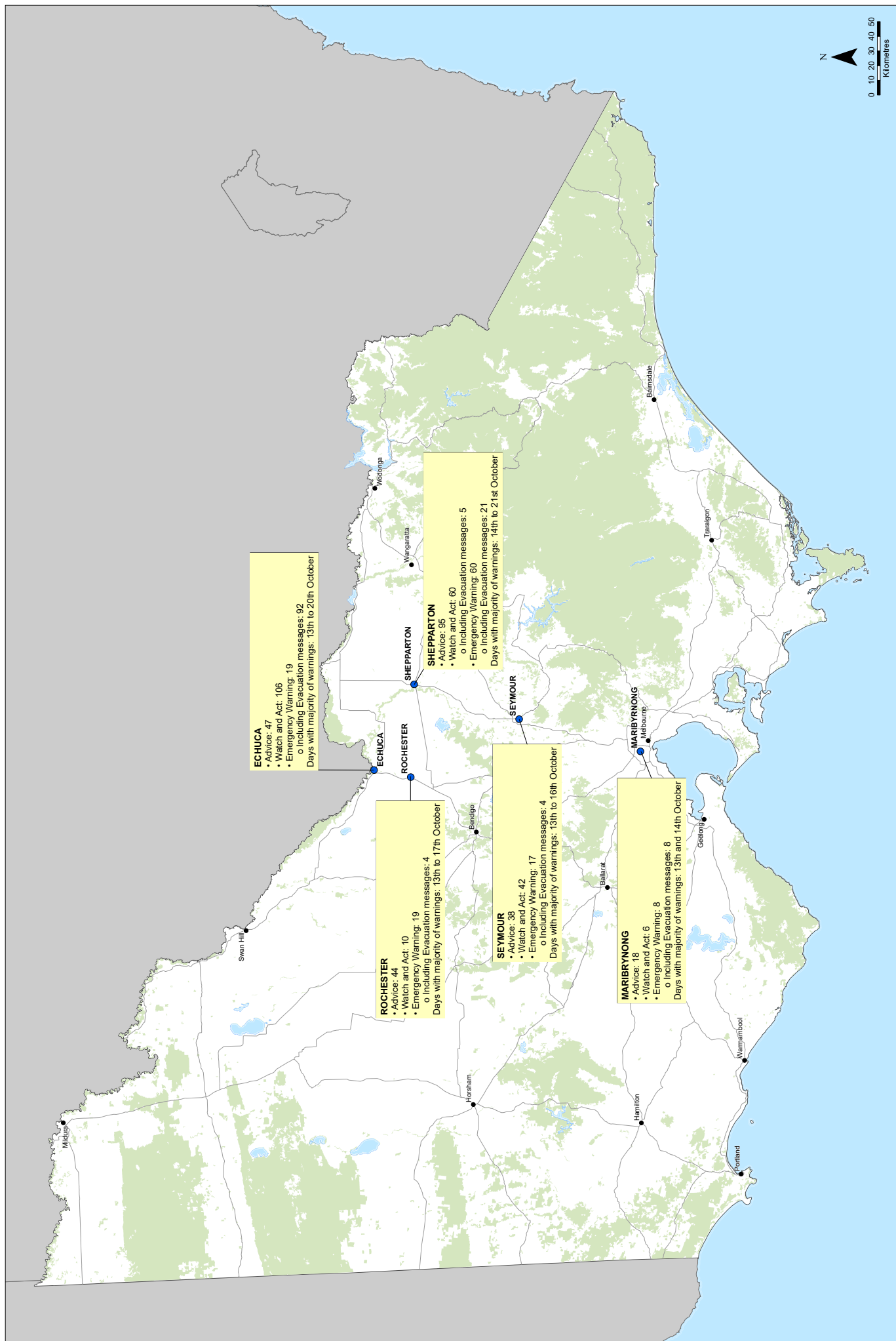
B.3 1% AEP 2100 scenario



Appendix C

Emergency warning timelines

C.1 Emergency Management Victoria



Warnings during the Victorian 2022 Spring Floods

OFFICIAL

Melbourne Water’s Summary of Forecasts and Warnings issued by Melbourne Water and the Bureau of Meteorology for the October 2022 Flood Event in the Maribyrnong

Melbourne Water provided the first major flood warning for the Maribyrnong catchment at 8.15am on 13 October 2022.

The issuing of this major warning triggered Melbourne Water and the Bureau of Meteorology to move to a cycle of 6 hourly updates. The service level agreement between the Bureau of Meteorology and Melbourne Water requires 6-hourly updates for major warnings, 12-hourly updates for moderate warnings and 24-hourly updates for minor warnings.

Subsequent updates for the Maribyrnong River were provided in alignment with the timeframes for a major flood warning. Updates provided separate warning information for the upper and lower catchments as detailed below.

We appreciate that warnings include technical language and can pertain to specific parts of the river or the whole river catchment. As part of transitioning riverine flood modelling and forecasting services to the Bureau we will seek to make this language simpler and clearer.

Date and time	Agency/Data source	Action or warning type	Comment
Prior to 11 October at 12:11pm	Melbourne Water	Consulting with Bureau	Melbourne Water consulted with the Bureau about the need for an initial flood watch to be issued.
11 October at 12:11pm	Bureau of Meteorology	Flood Watch	Includes wording that minor to moderate flooding is expected across the flood watch areas, and that major flooding is likely in some catchments. Maribyrnong River is specifically listed as likely to be affected.
After 11 October at 12:11pm	Melbourne Water	Increased forecasting modelling and daily flood watch updates	Increased flood forecasting, modelling and flood outlook scenario development.
11 October at 4:57pm	Bureau of Meteorology	Severe weather warning for heavy rainfall	Issued for districts including Maribyrnong River catchment. Warning included wording that heavy rainfall may lead to flash flooding.

Appendix D

Government-funded flood studies since 2016

Financial year	CMA	Project Manager	Project Name	Project type
2016–2017	WG CMA	Wellington SC	Briagolong flash flood study	Flood Study
2016–2017	NC CMA	Campaspe Shire Council	Echuca flood study	Flood Study
2016–2017	WG CMA	South Gippsland SC	Foster flood study	Flood Study
2016–2017	C CMA	C CMA	Identifying potentially flood prone land in Corangamite CMA region	Flood Study (regional scale)
2016–2017	GH CMA	Southern Grampians SC	Coleraine flood study	Flood Study
2016–2017	GH CMA	Moyne SC	Cudjee flood investigation	Flood Study
2016–2017	C CMA	Golden Plains SC	Inverleigh flood study	Flood Study
2016–2017	WG CMA	WG CMA	Lower Thomson River Regional Flood Mapping	Flood Study (regional scale)
2016–2017	NC CMA	Central Goldfields SC	Maryborough flood study	Flood Study
2016–2017	GH CMA	Warrnambool City Council	Nth Warrnambool post construction works and mapping update	flood study
2016–2017	GB CMA	Mitchell SC	Sunday and Dry Creeks regional flood study, Broadford	Flood Study (regional scale)
2017–2018	GB CMA	GB CMA	Goulburn and Broken Rivers Regional Flood Mapping	Flood Study
2017–2018	NE CMA	Wodonga City Council	House Creek Wodonga hydrology study	Flood Study
2017–2018	C CMA	City of Greater Geelong	Lara flood study	Flood Study
2017–2018	EG CMA	DELWP	Mitchell River regional flood mapping	Flood Study
2017–2018	GH CMA	DELWP	Fitzroy River variation	Flood Study
2017–2018	GH CMA	DELWP	Fitzroy River variation Flood intell for MFEP	Flood Study
2017–2018	NC CMA	DELWP	Swan Hill Regional Flood Study	Flood Study
2017–2018	GB CMA	Mitchell SC	Whiteheads Creek Floodplain Management Study	Flood Study
2018–2019	M CMA	M CMA	Birchip December 2018 flood data collection project	Flood Study
2018–2019	C CMA	Colac Otway SC	Birregurra Flood Study and Floodplain Management Plan	Flood Study
2018–2019	EG CMA	East Gippsland SC	Estimating flood frequency in Lakes Entrance	Flood Study
2018–2019	NE CMA	Wodonga City Council	Flood Studies Jack in the Box and Felltimber Creek Wodonga	Flood Study

Financial year	CMA	Project Manager	Project Name	Project type
2018-2019	NE CMA	Indigo SC	Flood Study and Evaluation of Flood Mitigation Works - Chiltern	Flood Study
2018-2019	NC CMA	Gannawarra SC	Koondrook Township Flood Study	Flood Study
2018-2019	NC CMA	Campaspe Shire Council	Kyabram Flood Study	Flood Study
2018-2019	M CMA	M CMA	Murray River Flood Study from Nyah to SA	Flood Study (regional scale)
2018-2019	GH CMA	GH CMA	Upper Mount Emu Creek flood study	Flood Study (regional scale)
2018-2019	NC CMA	Pyrenees SC	Raglan Flood Study	Flood Study
2018-2019	NC CMA	NC CMA	Rapid Flood Risk Assessments across the North Central CMA region	Flood Study (regional scale)
2018-2019	GB CMA	GB CMA	Shepparton Urban flood study final payment	Flood Study
2018-2019	NC CMA	Northern Grampians SC	St Arnaud Flood Study	Flood Study
2018-2019	NC CMA	Pyrenees SC	Upper Avoca River Flood Study	Flood Study (regional scale)
2018-2019	GB CMA	Moirra SC	Upper Broken and Boosey Creek Flood Study	Flood Study (regional scale)
2018-2019	NC CMA	Macedon Ranges SC	Woodend Flood Study	Flood Study
2019-2020	NC CMA	Campaspe Shire Council	Echuca-Moama Torrumbarry Flood Study	Flood Study
2019-2020	NE CMA	NE CMA	Kiewa Flood Study	Flood Study
2019-2020	GB CMA	DELWP	Yarrowonga and Kyabram LiDAR collection for flood studies	Flood Study
2020-2021	C CMA	C CMA	Flood hazard assessment mapping sea level rise scemario in Barwon Heads/Lake Connewarre, Breamlea and Ocean Grove areas.	Flood Study
2020-2021	NE CMA	Alpine SC	Flood study for Myrtleford and the Ovens and Buffalo Rivers	Flood Study
2020-2021	NC CMA	Mount Alexander SC	Harcourt Flood Study	Flood Study
2020-2021	GB CMA	Greater Shepparton City Council	Katandra West flood scoping study	Flood Study
2020-2021	NC CMA	Loddon SC	Korong Vale Flood Study	Flood Study
2020-2021	NC CMA	Northern Grampians SC	Marnoo Flood Study	Flood Study
2020-2021	NC CMA	NC CMA	Rapid flood risk assessments across the North Central CMA region	Flood Study (regional scale)
2020-2021	GH CMA	GH CMA	Port Fairy Flood Data Collection Project	Flood Study
2020-2021	GH CMA	Warrnambool City Council	South Warrnambool Flood Investigation	Flood Study
2020-2021	W CMA	Northern Grampians SC	Stawell Flood Investigation	Flood Study
2020-2021	C CMA	Golden Plains SC	Teesdale Flood Study	Flood Study

Financial year	CMA	Project Manager	Project Name	Project type
2020-2021	WG CMA	LaTrobe City Council	Waterhole Creek and Tributary Flood Study	Flood Study
2020-2021	GB CMA	Benalla Rural City Council	Winton flood scoping study	Flood Study
2021-2022	GB CMA	Greater Shepparton City Council	Tallygaroopna Flood Scoping Study	Flood Study
2021-2022	NC CMA	Hepburn SC	Creswick Flood Mitigation Project (flood study update)	Flood Study
2021-2022	GB CMA	Mansfield Shire Council	Mansfield flood study	Flood Study
2021-2022	GB CMA	Murrindindi Shire Council	Alexandra Flood Scoping Study	Flood Study
2022-2023	NC CMA	Campaspe Shire Council	Rochester Flood Management Plan	Flood Study
2022-2023	NC CMA	Campaspe Shire Council	Echuca Moama Flood Study	Flood Study
2022-2023	NC CMA	Mount Alexander SC	Newstead Flood Management Plan	Flood Study
2022-2023	NC CMA	Pyrenees SC	Lexton Flood Management Plan	Flood Study
2022-2023	GB CMA	Mitchell SC	Sunday and Dry Creek Flood Model Calibration	Flood Study
2022-2023	GB CMA	GB CMA	Goulburn and Broken Rivers Flood Model Calibration	Flood Study
2022-2023	W CMA	West Wimmera Shire Council	Edenhope Flood Study	Flood Study
2022-2023	W CMA	West Wimmera Shire Council	Apsley Flood Study	Flood Study
2022-2023	C CMA	Corangamite SC	Lower Curdies flood study	Flood Study
2022-2023	M CMA	M CMA	Southern Mallee - Flood Mapping and Intelligence Project	Flood Study (regional scale)
2022-2023	GB CMA	Mansfield Shire Council	Upper Catchment Tributaries Flood Study	Flood Study
2023-2024	NC CMA	Campaspe Shire Council	Rochester Flood Management Plan Update & Review - Project Variation	Flood Study
2023-2024	C CMA	Colac Otway SC	Barham River in Apollo Bay flood study	Flood Study
2023-2024	C CMA	Corangamite SC	Corangamite Shire Regional flood mapping project - Curdies River	Flood Study (regional scale)
2023-2024	C CMA	Surf Coast SC	Painkalac Creek flood study	Flood Study
2023-2024	GB CMA	Strathbogie SC	Avenal Floodplain flood study	Flood Study
2023-2024	GB CMA	Murrindindi Shire Council	Yea River flood study	Flood Study
2023-2024	GB CMA	Murrindindi Shire Council	Lower King Parrot Creek flood study	Flood Study
2023-2024	GH CMA	GH CMA	Lower Mount Emu Creek flood study	Flood Study
2023-2024	M CMA	M CMA	Murray River Flood Study from Nyah to SA - Update 2022 flood data	Flood Study (regional scale)
2023-2024	NC CMA	Central Goldfields SC	Carisbrook flood study update	Flood Study
2023-2024	NC CMA	Bendigo City Council	Goorong flood study	Flood Study

Appendix D Government-funded flood studies since 2016

Financial year	CMA	Project Manager	Project Name	Project type
2023-2024	NE CMA	Wangaratta RCC	Ovens River - Rocky Point to Markwood flood study	Flood Study
2023-2024	W CMA	Northern Grampians SC	Great Western flood study	Flood Study
2023-2024	WG CMA	LaTrobe City Council	Narracan Creek Moe flood study	Flood Study

Source: provided to the Legislative Council Environment and Planning Committee by the Department of Energy, Environment and Climate Action.

Extracts of proceedings

Legislative Council Standing Order 23.20(5) requires the Committee to include in its report all divisions on a question relating to the adoption of the draft report. All Members have a deliberative vote. In the event of an equality of votes, the Chair also has a casting vote.

The Committee divided on the following questions during consideration of this report. Questions agreed to without division are not recorded in these extracts.

Committee Meeting—21 June 2024

Chapter 2: The October 2022 flood event

Ms Bath moved that, in Chapter 2, line 324, the words ‘climatic drivers’ be omitted and replaced with ‘weather patterns’.

The question was put. **The Committee divided.**

Ayes 4	Noes 4
Melina Bath	Ryan Batchelor
Gaëlle Broad	Jacinta Ermacora
Wendy Lovell	Samantha Ratnam
Rikkie-Lee Tyrrell	Sheena Watt

The Ayes and Noes being equal, the Chair gave his casting vote with the Noes.

Question negatived.

Chapter 4: Planning and flood risk

Mr Batchelor moved that, in Chapter 4, Section 4.2, in the Recommendation commencing ‘That, in the next iteration of the Victoria Floodplain Management Strategy’, omit all words after ‘That’ and insert: ‘the Victorian Government require peer review of publicly funded flood modelling as part of the next Victorian Floodplain Management Strategy’.

The question was put. **The Committee divided.**

Ayes 6	Noes 2
Ryan Batchelor	Melina Bath
Jacinta Ermacora	Gaelle Broad
Wendy Lovell	
Samantha Ratnam	
Rikkie-Lee Tyrrell	
Sheena Watt	

Question agreed to.

Mr Batchelor moved that, in Chapter 4, Section 4.8.2 (2024 1% AEP flood extent), at the end of the Finding commencing ‘According to Melbourne Water’s updated modelling’, insert ‘and the modelling suggests the Flemington Racecourse flood wall provides a ‘shielding’ effect to these residents of around 5 cm in flood depth’.

The question was put. **The Committee divided.**

Ayes 4	Noes 4
Ryan Batchelor	Melina Bath
Jacinta Ermacora	Gaelle Broad
Rikkie-Lee Tyrrell	Wendy Lovell
Sheena Watt	Samantha Ratnam

The Ayes and Noes being equal, the Chair gave his casting vote with the Ayes.

Question agreed to.

Chapter 7: Resourcing and response of the VICSES

Ms Bath moved that, in Chapter 7, Section 7.3.3, to omit the following text:

‘Whilst the Committee believes that the Victoria SES is the appropriate agency to be the control lead on floods, it does acknowledge that evidence to the Inquiry suggests a strategic review of the agency’s resources and personnel may be appropriate. To ensure the Victoria SES can effectively fulfil its emergency management responsibilities, it is essential that they are adequately resourced, both in terms of equipment and increasing operational volunteers.’,—

and replace with:

‘The Committee acknowledges significant evidence received suggests a strategic review of the SES’s resources, personnel and leadership is appropriate.’

The question was put. **The Committee divided.**

Ayes 2	Noes 5
Melina Bath	Ryan Batchelor
Gaelle Broad	Jacinta Ermacora
	Wendy Lovell
	Rikki-Lee Tyrrell
	Sheena Watt

Question negated.

Ms Bath moved that, in Chapter 7, Section 7.3.3, to omit the Finding commencing with ‘The Victoria Emergency Service is the appropriate control agency for flood emergencies’ and replace with:

‘The Victoria State Emergency Service plays an integral role in flood emergencies, however strategic improvements are necessary in communication, resource allocation, volunteer support and leadership to enhance its overall effectiveness and sustainability in responding to such crises.’

The question was put. **The Committee divided.**

Ayes 2	Noes 5
Melina Bath	Ryan Batchelor
Gaelle Broad	Jacinta Ermacora
	Wendy Lovell
	Rikki-Lee Tyrrell
	Sheena Watt

Question negated.

Ms Bath moved that, in Chapter 7, Section 7.4.1, after Finding ending with ‘emergency response management, infrastructure and support’ insert new recommendation: ‘That the Victorian Government investigate if the Country Fire Authority is better equipped to lead local emergency flood response in regional Victoria.’

The question was put. **The Committee divided.**

Ayes 2	Noes 5
Melina Bath	Ryan Batchelor
Gaelle Broad	Jacinta Ermacora
	Wendy Lovell
	Rikki-Lee Tyrrell
	Sheena Watt

Question negated.

Minority reports

Inquiry into the 2022 Flood Event in Victoria

Minority Report: - David Ettershank – Western Metropolitan Region

In February 2023, the Legislative Council tasked the Environment and Planning Committee to report on the state's preparedness for and response to Victoria's major flooding event of October 2022.

The Committee has sought to undertake a rigorous analysis of the issues and derive findings and recommendations that are relevant to the broad cross section of Victorians who were, in many cases, profoundly effected by the October floods.

The work of the Committee was informed by the large number of Victorians, both city and country, who generously came forward to frankly tell their stories of the flood and its aftermath. The Committee also heard from a range of dedicated first responders, institutional stakeholders and subject experts.

The findings and recommendations contained in the final report of the Inquiry, reflect the overwhelmingly bipartisan approach adopted by Committee members to glean the truth of the flood event and provide practical and meaningful responses.

As such, I commend the report.

There are, however, a couple of issues that I feel warrant further comment. These issues relate to:

- Perceptions of undue commercial influence and planning decisions at the Flemington Racecourse flood wall and the Rivervue Retirement Village.
- The updated flood modelling for the middle and lower Maribyrnong River released by Melbourne Water in the closing stages of the Inquiry.

Undue Commercial Influence in planning processes

In its Terms of Reference for the Inquiry, the Committee was tasked to consider:

- (8)(b) how corporate interests may influence decision-making at the expense of communities and climate change preparedness

In considering planning decisions effecting the Flemington Racecourse flood wall and the Rivervue Retirement Village At 4.7.3 the report states:

The Committee notes a lack of clear evidence to conclude there was undue commercial influence relating to the decisions on the Flemington Racecourse flood wall or Rivervue Retirement Village, despite many stakeholders to the Inquiry believing this to be the case.

The Committee understands that the decision to approve Amendment C151, removing the Rivervue site from the relevant LSIO, was made in order to account for a change in site conditions. Likewise, it understands that the decision to approve the planning permit for the Flemington Racecourse flood wall arose out of a number of policy considerations. Although it is not in a position to comment on whether there was undue corporate influence on the two planning decisions, it notes that there remains a perception among stakeholders that the

decisions worsened the impact of the October 2022 flood event in the Maribyrnong area, and that the decisions prioritised commercial interest over community safety.

While it is correct that there was no “smoking gun” confirming undue commercial influence, both the Flemington Racecourse flood wall and the Rivervue Retirement Village outcomes demonstrate flawed or bad decision making.

- In the case of the Flemington Racecourse flood wall, it is now clear that the decision of then Planning Minister, Mary Delahunty to unilaterally terminate a VCAT process appealing against approval of the Floodwall, was atrocious.

The appeal would have considered the opposition from all three local Councils (Melbourne, Maribyrnong and Moonee Valley) to the floodwall, based on expert assessments that directly contradicted the claims of Melbourne Water, their consultants GHD and relevant State departments.

As we now know, serious errors were made in the flood modelling, including a failure to correctly calibrate the model, and assumptions around the effectiveness of proposed mitigation works which were simply wrong.

- Both the Pagone Review and the Committee sought to understand how the decision was made to reduce the flood and finished floor levels at the Rivervue Retirement Village, resulting in the inundation of 48 units at the estate.

Recommendation 13 of the Pagone Review stated:

Melbourne Water should investigate how it came to be satisfied with the reduction of the flood levels and finished floor levels at the Rivervue Retirement Village as specified in the endorsed plans dated 2 June 2009.

Melbourne Waters April 2024 response was that:

Melbourne Water has been investigating the reduction of flood levels and finished floor levels at Rivervue to the extent possible based on the information available to it. Melbourne Water is only one of the many parties involved in the decisions relating to the site and only has access to its own information. There are things that we still don't know and we accept that we may never know given that these are historical events.

Notwithstanding the convoluted decision-making process around the Rivervue approval, it is hardly likely to encourage public confidence that “lost in the mists of time” barely extends back 15 years.

In both the Flemington Racecourse flood wall and the Rivervue Retirement Village cases, profoundly flawed decisions were made that had dire and lasting consequences. More than that, the processes employed in making those decisions were at best opaque and incompetent and at worst, reeking of political and financial manoeuvring.

So, it is correct that, within the scope and resources of the Committee, there was a “*lack of clear evidence to conclude there was undue commercial influence*” but it is little wonder that public scepticism exists broadly among affected communities and extends to the findings of Melbourne Waters 2024 flood modelling exercise.

Melbourne Water revised flood modelling

The public's scepticism is shared by this Committee member when it comes to the Melbourne Water 2024 flood modelling results, or more specifically, the timing of their release.

It is highly regrettable that Melbourne Water chose to not release the updated modelling until the effective deadline for the Committee. This meant that time to assess both the modelling data and the analysis of the Pagone Review Panel, was extremely tight and precluded effective, wider discussion and analysis.

This is not to say that the results of the modelling are necessarily wrong, but rather to record that the method and timing of release, further undermines public confidence in the planning process. So, for example, the finding that the Flemington Racecourse flood wall will, in a 1% flood, actually reduce flooding in Kensington Banks by 5 centimetres, correct or not, is widely seen as either "failing the pub test" or gallows humour.

That said, and as noted in the Committees final report, the updated flood modelling for the Maribyrnong provides a confronting truth as to the future impact of climate change across the State; areas already subject to inundation, face larger floods more often and large swathes of land, adjoining those areas, will face flooding into the future.

This will of course be no comfort to the many Victorians, be they in Rochester or Maribyrnong Township, who have dealt with flooding over many decades, or those who are just discovering the future threat.

In seeking some directions forward to the issues raised above, there are two major opportunities ahead:

Inquiry into Climate Change Resilience: The Inquiry into the 2022 floods event has provided a sound platform for the Committee's next inquiry into Climate Change Resilience and Adaptation. This will give the Committee the opportunity to more thoroughly explore the practical implications for responding to climate change, supporting effected communities, reviewing current initiatives and revisiting the questions identified previously in this minority report.

Ombudsman Referral: On the 19th of June 2024, the Legislative Council endorsed a referral to the Ombudsman to investigate a range of key issues associated with the Kensington Banks estate, the veracity of Melbourne Water flood modelling, the Rivervue Retirement Village flood level decision and the implications for both future policy and support of effected residents.

The referral to the Ombudsman was overwhelmingly supported by the Government, Opposition and the majority of the Cross Bench.

In concluding, I would like to express my sincere appreciation to the many community members who generously shared their stories, to the Secretariat for their outstanding work and support, and to my colleagues on the Committee.

David Ettershank 15/7/2024

Environment and Planning Committee Inquiry into the 2022 Flood Event

Minority Report - Samantha Ratnam Member for Northern Metropolitan

This inquiry was made possible by the determination of the community to get answers about the 2022 flooding event that impacted many Victorian communities. The Maribyrnong township and northern Victoria were most detrimentally affected and continue to suffer from the long-lasting impacts of the damage and trauma of these climate disaster events.

The impact of climate change is now with us. As global temperatures increase, our climate is destabilised and more frequent and severe weather events are occurring. While still needing to do everything possible to guard against the worsening impacts of climate change, including by ending our dependence on fossil fuels, our communities are confronted with the realities and demands of mitigation and adaptation. The 2022 flooding event in Victoria exposed the weaknesses in both the state's capacity to model and predict climate disaster events as well as its ability to properly respond to the needs of communities facing emergency situations and coordinate the recovery and repair that is required.

I wanted to thank the many community members who made submissions and appeared before the inquiry. Your observations and reflections were invaluable in shaping the outcomes of this inquiry. Your contributions were even more significant given that you often provided evidence while still experiencing the distress that these events caused and, in many instances, were still involved in lengthy challenging processes to secure home repair and restoration works that would allow you to move back home. The inquiry heard harrowing stories of what it was like to confront the flood emergency in 2022 and how more than a year later, many people were still not able to go back to their homes and continued to live in cramped caravans.

I also want to thank the committee chair, members and secretariat staff for the thorough work that has gone into producing this final report of the inquiry. It accounts for the severity of the 2022 flooding event and makes some important recommendations about how our systems of emergency response and disaster recovery can be improved. It is now critical that these recommendations are heeded by the Victorian state government before another climate disaster event occurs.

While the final report canvasses most areas that were investigated well, there are a few additional remarks I wish to raise on behalf of the Greens in this minority report as follows:

1. **Victoria's Planning System** - the report accounts for the complexity of Victoria's planning system that governs approvals for new developments of homes or structures. While this complexity is in itself an issue that may have exacerbated the impacts of the floods experienced by residents of affected areas, there were other areas of concern identified through the course of this inquiry. This includes the use of Ministerial call-in powers to approve the Flemington racecourse floodwall despite community and council opposition and the influence of private developer interests to expedite planning approvals that are of material benefit to their projects and profits, but which too often result in local communities and residents bearing the significant cost for poor government decisions.

2. **Flemington Racecourse Floodwall** - The decision to approve the flood wall around the racecourse needs to be interrogated more deeply. The intervention of the Minister for Planning at the time to override the opposition of the community to the flood wall begs further questions about how state governments respond to private interests that are at odds with a community benefit. The history of political donations from private commercial and corporate interests to political parties must also be investigated because of the potential to influence planning and other decisions made by governments.
3. **The Rivervue Retirement Village** - the planning approvals sought by Tigcorp and the subsequent decisions to revise the flood overlay (LSIO) and planning permissions also requires further investigation. The inquiry was hampered by poor or inadequate record keeping by relevant authorities that could provide enough information about the rationale that was used for planning permissions being altered over years. Of most concern was the inadequate system of checks and balances that should exist when planning permissions and flood overlays get changed to ensure that future residents are not placed at risk.
4. **Statutory Authorities and Outsourcing Standards** - a theme that emerged through the course of the inquiry concerned the community's confidence in the advice and modelling issued by statutory authorities such as Melbourne Water. It seems there was a change in the way Melbourne Water conducted its modelling and analysis and a greater reliance on outsourcing this analysis rather than using in-house resources. Several questions remain about how consistent standards of verification and peer review can be strengthened to ensure that the community has confidence in the modelling that is produced by statutory authorities.
5. **Kensington Banks** - given the re-modelling by Melbourne Water of the flood risk in the Maribyrnong catchment only occurred at the end of the inquiry's work, this decision and the significant implications for residents in this catchment, but especially Kensington Banks, could not be fully interrogated by the committee, which was unfortunate. Many questions remain and will need to be further interrogated to ensure that affected residents, especially Kensington Banks residents, get the answers and action they are seeking. I hope that the Ombudsman inquiry will help to shed some light on this issue but it will also require more than this - it will require a concerted effort by the state government, working with other levels of government, to ensure that residents in Kensington Banks and right across the catchment are protected, compensated or otherwise supported through what is a situation that has come about through no fault of the residents themselves.