

MINUTES

FOR THE
GREATER SHEPPARTON CITY COUNCIL

ORDINARY COUNCIL MEETING

HELD ON
TUESDAY 19 MARCH, 2019
AT 5.30PM

IN THE COUNCIL BOARDROOM

COUNCILLORS:

Cr Kim O'Keeffe (Mayor)
Cr Shelley Sutton (Deputy Mayor)
Cr Seema Abdullah
Cr Dinny Adem
Cr Bruce Giovanetti
Cr Chris Hazelman
Cr Les Oroszvary
Cr Dennis Patterson
Cr Fern Summer

VISION

*A THRIVING ECONOMY IN THE FOODBOWL OF VICTORIA WITH
EXCELLENT LIFESTYLES, INNOVATIVE AGRICULTURE
A DIVERSE COMMUNITY AND
ABUNDANT OPPORTUNITIES*

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**CHAIR
CR KIM O'KEEFFE**

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RISK LEVEL MATRIX LEGEND

Note: A number of reports in this agenda include a section on “risk management implications”. The following table shows the legend to the codes used in the reports.

Likelihood	Consequences				
	Negligible (1)	Minor (2)	Moderate (3)	Major (4)	Extreme (5)
Almost Certain (5) Would be expected to occur in most circumstances (daily/weekly)	LOW	MEDIUM	HIGH	EXTREME	EXTREME
Likely (4) Could probably occur in most circumstances (i.e. Monthly)	LOW	MEDIUM	MEDIUM	HIGH	EXTREME
Possible (3) Reasonable probability that it could occur (i.e. over 12 months)	LOW	LOW	MEDIUM	HIGH	HIGH
Unlikely (2) It is not expected to occur (i.e. 2-5 years)	LOW	LOW	LOW	MEDIUM	HIGH
Rare (1) May occur only in exceptional circumstances (i.e. within 10 years)	LOW	LOW	LOW	MEDIUM	HIGH

Extreme	Intolerable – Immediate action is required to mitigate this risk to an acceptable level. Event/Project/Activity is not to proceed without authorisation
High	Intolerable – Attention is needed to treat risk.
Medium	Variable – May be willing to accept the risk in conjunction with monitoring and controls
Low	Tolerable – Managed by routine procedures

PRESENT: Councillors Kim O’Keeffe, Seema Abdullah, Dinny Adem, Bruce Giovanetti, Chris Hazelman, Les Oroszvary and Dennis Patterson.

OFFICERS: Peter Harriott – Chief Executive Officer
Phillip Hoare – Director Infrastructure
Geraldine Christou – Director Sustainable Development
Chris Teitzel – Director Corporate Services
Kaye Thomson – Director Community
Rebecca Good – Official Minute Taker
Tina Irvine – Deputy Minute Taker

1. ACKNOWLEDGEMENT

“We the Greater Shepparton City Council, begin today’s meeting by acknowledging the traditional owners of the land which now comprises Greater Shepparton. We pay respect to their tribal elders, we celebrate their continuing culture, and we acknowledge the memory of their ancestors.”

2. PRIVACY POLICY

This public meeting is being streamed live via our Facebook page and made available for public access on our website along with the official Minutes of this meeting.

All care is taken to maintain your privacy; however as a visitor in the public gallery, it is assumed that your consent is given in the event that your image is broadcast to the public. It is also assumed that your consent is given to the use and disclosure of any information that you share at the meeting (including personal or sensitive information) to any person who accesses those recordings or Minutes

3. APOLOGIES

Moved By Cr Oroszvary
Seconded by Cr Patterson

That the apologies from Cr Summer and Cr Sutton be noted, and a leave of absence granted.

CARRIED UNOPPOSED.

4. DECLARATIONS OF CONFLICT OF INTEREST

In accordance with sections 77A, 77B, 78 and 79 of the *Local Government Act 1989* Councillors are required to disclose a “conflict of interest” in a decision if they would receive, or could reasonably be perceived as receiving a direct or indirect financial or non-financial benefit or detriment (other than as a voter, resident or ratepayer) from the decision.

Disclosure must occur immediately before the matter is considered or discussed.

Cr Hazelman declared a direct conflict of interest in relation to Item 16.2 – Cultural Heritage Awards 2019. Cr Hazelman is a Manager at the Ethnic Council of Shepparton and District Inc, which is a nominee for the Cultural Heritage Awards 2019.

5. CONFIRMATION OF MINUTES OF PREVIOUS MEETINGS

Moved by Cr Giovanetti
Seconded by Cr Abdullah

That the minutes of the Ordinary Council meeting held 19 February 2019 and the Special Council Meeting held 26 February 2019, as circulated, be confirmed.

CARRIED UNOPPOSED.

6. PUBLIC QUESTION TIME

7. COMMUNITY DIRECTORATE

7.1 Volunteer Strategy 2019-2022

Disclosures of conflicts of interest in relation to advice provided in this report

Under section 80C of the *Local Government Act 1989* officers and persons engaged under a contract providing advice to Council must disclose any conflicts of interests, including the type and nature of interest.

No Council officers or contractors who have provided advice in relation to this report have declared a conflict of interest regarding the matter under consideration.

Council Officers involved in producing this report

Author: Community Development Officer

Proof reader(s): Manager Neighbourhoods

Approved by: Director Community

Executive Summary

Greater Shepparton City Council recognises the pivotal role that volunteers play in our community. With the conclusion of the Volunteer Strategy and Action Plan 2014-2018, Council, with the support of the Volunteer Managers Network and relevant Council departments, the Volunteer Strategy 2019-2022 has been developed. This Strategy will further enhance Council's commitment to volunteers and the organisations that utilise and manage them. The Strategy also aims to build on the work already undertaken by Council and the community. Four strategic directions have been identified through consultation and these frame the focus of the Volunteer Strategy 2019-2022. An associated Action Plan has defined priorities for achievement, review and evaluation and will form the development of new Council priorities in following years. The draft Volunteer Strategy 2019-2022 was released for public exhibition throughout December and January and is now presented to Council for adoption.

Moved by Cr Abdullah

Seconded by Cr Patterson

That the Council adopt the Greater Shepparton City Council Volunteer Strategy 2019-2022.

CARRIED UNOPPOSED.

Background

Volunteering is an essential community resource which promotes active citizenship, strengthens community connectedness and social inclusion. Social connections, such as those developed through volunteering, can provide meaning, purpose and satisfaction in people's lives. The experience of helping others can lead to stronger social ties with different groups of people brings health and wellbeing benefits and better physical and mental health. Volunteering extends value to our communities to make them safe, robust, inclusive and culturally rich. It provides a vehicle for individuals or group to address human, environmental and social needs.

The Volunteer Strategy 2019-2022 has been developed to build upon the partnerships and initiatives of the previous Volunteer Strategy 2014-2018 and address emerging needs identified by stakeholders and the community. The aim of the strategy is to:

- Promote Volunteer opportunities
- Engage volunteers
- Ensure standards of best practice and consistency in supporting volunteers
- Recognise and celebrate volunteers

7. COMMUNITY DIRECTORATE

7.1 Volunteer Strategy 2019-2022 (continued)

Four strategic directions have been identified to frame the directions Council will undertake to support volunteering in Greater Shepparton.

Promotion

1. Promote and inform on the benefits of volunteering; this focus area will raise the profile of volunteering in Greater Shepparton to ensure all facets of the community have a greater understanding of the benefits of volunteering, with the ultimate goal of facilitating greater participation.

Recruitment

2. Implement leading practices and high quality standards; this focus area will support an active infrastructure that is essential to inclusive and sustained volunteer involvement. Issues that impede volunteering through regulatory requirements have the potential to impact volunteering.

Supporting Volunteers

3. Ongoing commitment to volunteer participation, support and development; this focus area will identify the scope of demand for volunteering with the view to offer more opportunities to existing volunteers, expand opportunities for volunteers and build capacity and identify training and development opportunities for volunteers.

Celebrate and Recognise

4. Volunteers are appreciated, acknowledged and celebrated

Through the consultation process the draft strategy was released for public exhibition and is now ready for Council to formally adopt the Volunteer Strategy 2019-2022.

Council Plan/Key Strategic Activity

- Council Plan 2017-2021
- Social 2.6: Volunteering is promoted and encouraged along with other measures to improve community resilience.

Risk Management

Consideration has been given to risk management issues during the development of the Volunteer Strategy 2019-2022. Any risks identified have been addressed through the action planning process.

Policy Considerations

The Volunteer Strategy 2019-2022 will support existing Council policies

Financial Implications

The Volunteer Strategy 2019-2022 is set within the Council context and existing financial constraints and staff capacity. Actions will be subject to annual budgetary processes and external funding opportunities will also be explored to implement projects.

Legal/Statutory Implications

The Volunteer Strategy 2019-2022 is consistent with the *Victorian Charter of Human Rights and Responsibilities Act 2009* and the *Local Government Act (1989)*.

Environmental/Sustainability Impacts

There are no environmental or sustainability impacts associated with this report.

7. COMMUNITY DIRECTORATE

7.1 Volunteer Strategy 2019-2022 (continued)

Social Implications

Greater Shepparton City Council recognises the pivotal role that volunteers play within the community. Many community organisations, programs, clubs and sports would simply not exist without the dedication of volunteers; Volunteering is an essential community resource which promotes active citizenship and social inclusion. Volunteering extends value to our communities to make them safe, robust, inclusive and culturally rich as volunteers come from all walks of life and come together to achieve a common goal. Volunteering provides a vehicle for individuals or groups to address human, environmental and social need and increase community participation. The Volunteer Strategy 2019-2022 reflects this.

Economic Impacts

The economic impact of volunteers is unmeasurable. Their hard work and dedication equates to large volumes of work. ABS statistics indicate that volunteering yields a 450% return for every dollar invested. Nationally, this is an estimated annual contribution of \$290 billion.

Consultation

The Volunteer Strategy 2019-2022 has been developed through extensive consultation with volunteers, external volunteer managers and internal Council departments including volunteer managers.

A number of mechanisms were used to engage and consult with the volunteer community. A survey was developed and distributed in hard copy format and electronically and placed on Council website. Over 100 surveys from community members were received. This survey was distributed widely through Greater Shepparton volunteer network and social media. Additional hard copies were distributed to Neighbourhood Houses and volunteer involving organisations such as Meals on Wheels kitchen.

Consultation workshops with Council Volunteer Managers and the Volunteer Managers Network were undertaken to provide input into the development of the Volunteer Strategy. Throughout the consultation phase four strategic directions were identified for Council to continue to build on and undertake to support the volunteering sector and strive for best practice for the volunteers of Greater Shepparton.

Following the endorsement of the draft Volunteer Strategy 2019-2022 the Strategy was released for public exhibition in late December 2018 with submissions closing in January 2019. During this time, the draft was distributed throughout Council advisory committees and networks, Volunteer Managers Network and via Council's online platforms.

Officers believe that appropriate consultation has occurred and the strategy is now ready for Council to formally adopt.

Strategic Links

a) Greater Shepparton 2030 Strategy

Direction 2 – Community Life

b) Other strategic links

Community Engagement Strategy

Community Development Framework

7. COMMUNITY DIRECTORATE

7.1 Volunteer Strategy 2019-2022 (continued)

Conclusion

The Greater Shepparton City Council Volunteer Strategy 2019-2022 has been developed through extensive consultation and will demonstrate Council's continued commitment to volunteers and volunteer involving organisations. This strategy is presented to Council for final adoption.

Attachments

Volunteer Strategy and Action Plan 2019-2022 [↓](#) Page 53

7. COMMUNITY DIRECTORATE

7.2 Volunteer Policy 07.POL.3 Review

Disclosures of conflicts of interest in relation to advice provided in this report

Under section 80C of the *Local Government Act 1989* officers and persons engaged under a contract providing advice to Council must disclose any conflicts of interests, including the type and nature of interest.

No Council officers or contractors who have provided advice in relation to this report have declared a conflict of interest regarding the matter under consideration.

Council Officers involved in producing this report

Author: Community Development Officer

**Proof reader(s): Acting Community Development Coordinator,
Manager Neighbourhoods**

Approved by: Director Community

Executive Summary

The Volunteer Policy was developed and first adopted in April 2016 through extensive consultation with Councils internal Volunteer Managers and Responsible officers during the development of Councils Volunteer Strategy. The Volunteer Policy outlines Councils commitment to volunteers and alignment with the National Standards of Volunteering.

As part of the review process minor amendments have now been made to reflect the Councils newly adopted Volunteer Strategy 2019-2022. This also includes Councils policies and Corporate procedures that have been reviewed in line with the Local Government Act 1989.

**Moved by Cr Giovanetti
Seconded by Cr Hazelman**

That the Council adopt the Volunteer Policy 07.POL.3

CARRIED UNOPPOSED.

Background

The Volunteer Policy was first adopted in April 2016. Council relies heavily on volunteers to run many essential programs. This policy is to ensure volunteers across the municipality are supported with standards of best practice. Council supports the common understanding of the Definition of Volunteering, Principles of Volunteering, National Standards of Volunteering and the strategic directions of the Volunteer Strategy 2019-2022.

The Principles of Volunteering was developed by Volunteering Australia as a result of national consultation. Extensive consultation at a national level has resulted in the development of National Standards for Volunteering consisting of eight key elements. These elements represent the main activities that typically occur in organisations that involve volunteers regardless of their size or function.

The objective of the Volunteer Policy is to ensure the following:

- Best standards and best practice and a consistent approach in supporting volunteers within Council and the community. This adheres to the National Standards of Volunteering.
- Provide a consistent approach to recruitment of volunteers across Council
- Engage and retain volunteers
- Recognise and celebrate volunteers across the municipality
- Respond to emerging trends and issues in the Volunteer sector

7. COMMUNITY DIRECTORATE

7.2 Volunteer Policy 07.POL.3 Review (continued)

The Volunteer Policy compliments the Managing Volunteers Procedure 46.PRO.1

Council Plan/Key Strategic Activity

Council Plan 2017-2021: Social 2.6: Volunteering is promoted and encouraged along with other measures to improve community resilience.

Risk Management

No risks have been identified for this policy document. A risk assessment is not required at this time.

Policy Considerations

There are no identified conflicts with existing Council policies.

Financial Implications

There are no financial implications associated with the endorsement of the Volunteer Policy 07.POL.3. This policy supports the existing Council volunteer programs and their associated budgets. Council commits funds each financial year towards the implementation of the Volunteer Strategy 2019-2022.

Legal/Statutory Implications

There are no legal or statutory implications associated with this report.

Environmental/Sustainability Impacts

There are no environmental or sustainability impacts as a result of the Volunteer Policy 07.POL.3.

Social Implications

Greater Shepparton City Council recognises the pivotal role that volunteers play within the community. Volunteering is an essential community resource which promotes active citizenship and social inclusion. Volunteering extends our values to our communities to make them safe, robust, inclusive and culturally rich as volunteers come from all walks of life to achieve a common goal.

Economic Impacts

There are no economic impact associated with this report.

Consultation

Officers believe that appropriate consultation has occurred and the matter is no ready for Council consideration.

Strategic Links

a) Greater Shepparton 2030 Strategy

Objective 2: Community life

b) Other strategic links

Greater Shepparton City Council Plan 2017-2021

Greater Shepparton City Council Volunteer Strategy 2019-2022

Greater Shepparton City Council Community Development Framework

Greater Shepparton City Council Community Engagement Strategy

Conclusion

Re-adopting this policy Volunteer Policy 07.POL.3 including some amendments will ensure Councils commitment to Volunteering in alignment with the National Standards of

7. COMMUNITY DIRECTORATE

7.2 Volunteer Policy 07.POL.3 Review (continued)

Volunteering. Volunteering is an essential community resource which promotes active citizenship and social inclusion. Greater Shepparton City Council as a local government body reflects the definitions, principles and National Standards in their commitment to volunteers across the municipality through the re-adoption of the Volunteer Policy.

Attachments

Volunteer Policy 07.POL.3 [↓](#) Page 76

7. COMMUNITY DIRECTORATE

7.3 Greater Shepparton Multicultural Strategy 2019-2022

Disclosures of conflicts of interest in relation to advice provided in this report

Under section 80C of the *Local Government Act 1989* officers and persons engaged under a contract providing advice to Council must disclose any conflicts of interests, including the type and nature of interest.

No Council officers or contractors who have provided advice in relation to this report have declared a conflict of interest regarding the matter under consideration.

Council Officers involved in producing this report

Author: Multicultural Development Officer

Proof reader(s): Manager Neighbourhoods

Approved by: Director Community

Executive Summary

Greater Shepparton City Council adopted its second Cultural Diversity and Inclusion Strategy and associated Action Plan in 2015. The Cultural Diversity and Inclusion Strategy and Action Plan 2015-2018 was due to be completed last year and Council officers reviewed the strategy's achievements and conducted conversations with the community, service providers, local organisations, education providers and different levels of government to develop the Multicultural Strategy 2019-2022 for the next four years.

The change of Strategy name, Multicultural Strategy 2019-2022 and associated action plan has been designed to better reflect the community that Council will work with on this plan and place a stronger emphasis on acceptance and understanding. It will also build on achievements already gained by Council and the communities' involvement in past initiatives including Localities Embracing and Accepting Diversity (LEAD) pilot program, Racism. It Stops With Me campaign, Refugee Welcome Zone, MILS (Multilingual Information Line Service), Our Community, Our Culture calendars and the support of many cultural events including large scale events such as Converge on the Goulburn and the St George's Rd Food Festival.

The strategy and action plan is now ready for adoption.

Moved by Cr Abdullah

Seconded by Cr Patterson

That the Council adopt the Multicultural Strategy 2019-2022

CARRIED UNOPPOSED.

Background

Greater Shepparton enjoys significant cultural, spiritual and historical heritage both new and old from our long history of migration to the region. Based on the 2016 census, 14.8% of the Greater Shepparton population identified as being born in a country other than Australia. Whilst the ABS is the only formal measure of population, anecdotal evidence from local sector organisations suggest that the overall numbers of people born overseas is likely to be under represented for Greater Shepparton.

The Multicultural Strategy 2019-2022 and associated action plan is intended to continue and also build on existing initiatives and partnerships developed throughout the first strategy. This strategy and action plan is inclusive of all multicultural communities

7. COMMUNITY DIRECTORATE

7.3 Greater Shepparton Multicultural Strategy 2019-2022 (continued)

regardless of age, socio economic status, sexuality and gender and is based on valuing communities, recognising their contribution to our society and celebrating the many cultures and the diversity it brings to the area.

Council officers have utilised many forms of information in the development of the strategy and action plan. Information has been incorporated from official statistics and anecdotal evidence of local demographics, current relevant legislation and consultation that engaged the community, service providers, education providers, government and local organisations.

The Multicultural Strategy 2019-2022 and associated action plan aligns with the Municipal Association of Victoria's (MAV) Statement of Commitment to Cultural Diversity that aims to promote and facilitate good multicultural practice and leadership within and across Victorian local government. This Strategy is also encompassed within the social theme of the Council Plan 2017-2021 and linked directly to objective 2.7 'Greater Shepparton is valued for cultural celebrations, inclusion and engagement of our diverse communities'.

Council Plan/Key Strategic Activity

Goal 1: Social

Develop resilient, inclusive, healthy communities that make Greater Shepparton a safe and harmonious place to live, work, learn, and play.

Risk Management

Consideration has been given to risk management issues during the development of the Multicultural Strategy 2019-2022. Any risks identified have been addressed through the action planning process.

Policy Considerations

The Multicultural Strategy 2019-2022 will support existing Council policies.

Financial Implications

The Multicultural Strategy 2019-2022 is set within the Council context and existing financial constraints and staff capacity. This is subject to annual budgetary processes. External funding opportunities will also be explored to implement projects.

Legal/Statutory Implications

The Multicultural Strategy 2019-2022 is consistent with the *Victorian Charter of Human Rights and Responsibilities Act 2009* and the *Local Government Act (1989)*

Environmental/Sustainability Impacts

There are no environmental or sustainability impacts associated with this report.

Social Implications

The Multicultural Strategy 2019-2022 has been informed by significant consultation with a range of individuals and organisations throughout the Greater Shepparton municipality. Cultural diversity and inclusion is about respecting and living within a society with multiple communities and creating a socially cohesive community that celebrates multiculturalism.

Economic Impacts

There are no negative economic impact related to this report.

7. COMMUNITY DIRECTORATE

7.3 Greater Shepparton Multicultural Strategy 2019-2022 (continued)

Consultation

The Multicultural Strategy 2019-2022 has been developed based on engagement with community, current research and literature and other related strategies and plans of Council. Community events and broader consultations were used to connect with and discuss the future of multiculturalism in Greater Shepparton.

Level of public participation	Promises to the public/stakeholders	Examples of techniques to use
Inform	The community, service providers, education providers, government and local organisations were informed by various techniques regarding the development of a new strategy and the opportunity to provide feedback	Public notice given to media outlets, online and hard copies of the survey, email, consultation with service providers, committee meetings.
Consult	Council used a variety of consultation methods to ensure a diverse range of community and organisations were consulted and part of the planning process.	Public notice given to media outlets, online and hard copies of the survey, email, consultation with service providers, committee meetings.
Involve	Feedback from individuals and organisations is an important input into decision making	Draft strategy placed on public exhibition to ensure feedback is gathered
Collaborate	Feedback will be incorporated into decisions to the maximum level possible.	Community consultations in partnership with local service providers was held regarding the draft document.

Officers believe that appropriate consultation has occurred and the matter is now ready for Council consideration.

Strategic Links

a) Greater Shepparton 2030 Strategy

Direction 2 – Community Life

b) Other strategic links

Council Plan

Public Health Strategic Plan

Volunteer Strategy and Action Plan

Community Safety Strategy

Youth Strategy and Action Plan

Universal Access and Inclusion Plan

Conclusion

Following the successful implementation of the 2015-2018 Cultural Diversity and Inclusion Strategy it is timely for a new strategy and action plan to be adopted. The Multicultural Strategy 2019-2022 and associated action plan has been developed through extensive consultation. Once the draft Multicultural Strategy 2019-2022 was developed, the community was invited to provide further comment and feedback on the draft strategy to ensure that it is reflective of the needs of the community. The Multicultural Strategy 2019-2022 and action plan is now ready for adoption.

7. COMMUNITY DIRECTORATE

7.3 Greater Shepparton Multicultural Strategy 2019-2022 (continued)

Attachments

Multicultural Strategy 2019-2022 [↓](#) Page 82

7. COMMUNITY DIRECTORATE

7.4 Greater Shepparton Public Health Strategic Plan 2018 -2028

Disclosures of conflicts of interest in relation to advice provided in this report

Under section 80C of the *Local Government Act 1989* officers and persons engaged under a contract providing advice to Council must disclose any conflicts of interests, including the type and nature of interest.

No Council officers or contractors who have provided advice in relation to this report have declared a conflict of interest regarding the matter under consideration.

Council Officers involved in producing this report

Author: Team Leader Healthy Communities

Proof reader(s): Manager Active Living

Approved by: Director Community

Executive Summary

The Greater Shepparton Public Health Strategic Plan 2018 – 2028 is presented to Council for endorsement following three weeks of community consultation held from Wednesday 17 October 2018 – Wednesday 7 November 2019.

Integrated Public Health planning for Greater Shepparton is delivered and reported at three levels that have been developed to meet statutory requirements of the Public Health and Wellbeing Act 2008 and the Local Government Act 1989.

1. Greater Shepparton Public Health Strategic Plan 2018 – 2028
 - This plan reflects the long-term approach to guide the direction of collective public health efforts across the region. This Strategic Plan has been developed in consultation with the Greater Shepparton Public Health Advisory Committee and is focus of this report.
2. Greater Shepparton Council Plan 2017 – 2021
 - Councils four year strategic plan that now incorporates health and wellbeing as part of its design.
3. Greater Shepparton Public Health Implementation Plan (Draft)
 - Developed annually, this plan identifies key targets, actions and measures relevant to the achievement of public health outcomes aimed at addressing the strategic direction and priorities outlined in the Greater Shepparton Public Health Strategic Plan and Council Plan.

The Greater Shepparton Public Health Strategic Plan 2018 – 2028 incorporates the strategic objectives of the Victorian Public Health and Wellbeing Outcomes Framework, the Victorian Public Health and Wellbeing Plan and has taken a liveability based approach on local data derived from Regional Cities Victoria Liveability Index completed by Deloitte Access Economics (2017) and the Neighbourhood Liveability Assessment of Shepparton completed by RMIT University (2018).

Moved by Cr Abdullah

Seconded by Cr Oroszvary

That the Council endorse the Greater Shepparton Public Health Strategic Plan 2018 – 2028.

CARRIED UNOPPOSED.

7. COMMUNITY DIRECTORATE

7.4 Greater Shepparton Public Health Strategic Plan 2018 -2028 (continued)

Background

The Public Health and Wellbeing Act 2008 (The Act) reinforces the statutory role of councils to *'protect improve and promote public health and wellbeing within the municipal district'* and requires Victorian municipalities to produce a Municipal Public Health and Wellbeing Plan (MPHWP).

Under The Act, MPHWP's must address the following:

- Consideration of the directions and priorities of the *Victorian Public Health and Wellbeing Plan 2015–2019*.
- Be consistent with Council's corporate plans and Council's land use plans as required by the Municipal Strategic Statement.

Greater Shepparton City Council obtained exemption from the Department of Health and Human Services to incorporate health and wellbeing matters into the Council Plan as opposed to developing a separate MPHWP. The Council Plan 2017 – 2021 is shaped by the Environments for Health Framework 2001.

The Environments for Health Framework 2001 aims to make public health a central focus for local government and to increase capacity to prevent ill health and increase wellbeing. It is based on a social model for health which recognises the impact of the *social, built, economic and natural environments* on community health and wellbeing.

The Environments for Health Framework 2001 is complementary to addressing 'Liveability' in the region. There are essential factors for a liveable community. A liveable community is one where residents feel safe, socially connected and included; residents have access to affordable and diverse housing options linked via public transport, walking and cycling infrastructure to employment, education, local shops, public open space and parks, health and community services, leisure and culture; as well as environmental sustainability.

Deloitte Access Economics completed a Liveability assessment on behalf of Regional Cities Victoria (November 2017). The Liveability Index compares the 10 Regional Cities on the following liveability domains; Human Capital, Physical Capital, Social Capital, Health and Safety, Housing Affordability, Visitor Attraction and Local Amenities. This assessment aimed to highlight strengths of each regional city in a bid to attract and retain residents to live, work and play there. It can also be used to identify and understand potential opportunities for regional cities to improve on existing liveability performance.

The Department of Health and Human Services engaged RMIT University to complete a Neighbourhood Liveability Assessment of Shepparton (March 2018). Data and spatial mapping was completed providing a comparative assessment between Shepparton and our smaller towns and neighbourhoods across the following liveability domains; SEIFA, Housing Affordability, Housing Diversity, Unemployment, Employment, Education, Access to Food, Access to Services of Daily Living, Access to General Practitioners, Access to Services for Older People, Walkability, Public Transport and Distance to nearest Public Open Space.

It is envisaged that in time, a comparative assessment of liveability will be calculated across regional Victoria on a range of liveability domains through the development of a 'Liveability Index'. DHHS and RMIT University are currently working in this space. Liveability rankings and awards can provide welcome global recognition and marketing tools. Such rankings can operate to attract (or deter) people to a community.

7. COMMUNITY DIRECTORATE

7.4 Greater Shepparton Public Health Strategic Plan 2018 -2028 (continued)

The Environments for Health Framework 2011, Victorian Public Health and Wellbeing Outcomes Framework, Victorian Public Health and Wellbeing Plan and Liveability research has been used to develop the Greater Shepparton Public Health Strategic Plan 2018 – 2028 (The Strategic Plan).

The Greater Shepparton Public Health Strategic Plan has been developed in consultation with the Greater Shepparton Public Health Advisory Committee (The Committee) and will remain the responsibility of The Committee to review and update the Strategic Plan on an annual basis.

The Strategic Plan details data on our demographics, health and wellbeing priorities and liveability domains.

Health Goals have been set to drive the strategic focus of Greater Shepparton's public health effort and are reflected under the Environments for Health Framework 2001 namely Social, Built, Economic and Environment. These Environments of Health are also the themes of the 2017 - 2021 Council Plan.

The Liveability domains have been aligned to these four environments and include:

1. Social Environment
Liveability Indicators – Arts and Culture, Access to Food, Community Participation, Crime and Safety, Health and Social Services
2. Built Environment
Liveability Indicators – Housing, Transport, Recreation, Facilities and Open Space
3. Economic Environment
Liveability Indicators – Education, Employment and Income
4. Natural Environment
Liveability Indicator – Sustainable Practices

The Strategic Plan also details the consultation process, governance structure and partnerships, financial investment in health in Greater Shepparton, delivery approaches, measuring achievement and recommendations for future action, one of which includes the development of a liveability index for Greater Shepparton.

The Greater Shepparton Public Health Advisory Committee will work towards achieving the strategies and actions detailed in the Implementation Plan aligned to the Strategic Plan and Council Plan. The Implementation Plan identifies targets and measures of achievement within allocated timeframes specifying a lead agency and partner organisations.

Council Plan/Key Strategic Activity

Greater Shepparton Council Plan 2017 – 2021 (pages 8 – 9) detail Council's commitment to health and wellbeing. The 2017 - 2021 Council Plan has been designed around these environments of health.

Across the social, economic, built and natural environments, key activities of focus include access to early childhood education, access to transport, access to safe and affordable housing, reducing harmful alcohol and drug use, chronic disease management, community safety, completion of education, employment, family violence, immunisation rates, life expectancy, improving mental wellness, healthier eating, physical activity, obesity, tobacco free living including smoking during pregnancy rates.

7. COMMUNITY DIRECTORATE

7.4 Greater Shepparton Public Health Strategic Plan 2018 -2028 (continued)

Risk Management

Insignificant to low risks have been identified for the adoption of this plan. For Council actions identified within the plan, risk assessment will be considered as part of project planning and delivery.

Policy Considerations

This report has been prepared for information to meet statutory requirements of the Local Government Act 1989 and Public Health and Wellbeing Act 2008.

Financial Implications

There are no additional financial implications associated with this report. Delivering outcomes as identified in the plan have been considered as part of operational and capital works budget planning and are a shared responsibility with the wider health, business and community of Greater Shepparton.

Legal/Statutory Implications

This project is consistent with the Local Government Act 1989, Public Health and Wellbeing Act 2008 and the Victorian Charter of Human Rights and Responsibilities Act (2006).

Environmental/Sustainability Impacts

The Strategic Plan and Implementation Plan outlines the following commitment to the natural environment and details actions, strategies and targets to achieve this outcome:

- Greater Shepparton residents have access to sustainable natural environments

Social Implications

The Strategic Plan and Implementation Plan outline the following commitment to the social environment and details actions, strategies and targets to achieve these outcomes:

- Greater Shepparton residents can safely identify with their culture and identity
- Greater Shepparton residents have access to affordable healthy food
- Greater Shepparton residents are socially engaged and live in inclusive communities
- Greater Shepparton residents live in a community that is safe and secure
- Greater Shepparton residents have good physical health
- Greater Shepparton residents have good mental health
- Greater Shepparton residents act to promote and protect health

Economic Impacts

The Strategic Plan and Implementation Plan outline the following commitment to the economic environment and details actions, strategies and targets to achieve these outcomes:

- Greater Shepparton residents participate in learning and education
- Greater Shepparton residents participate in and contribute to the economy

Consultation

The draft Greater Shepparton Public Health Strategic Plan 2018 – 2028 and Greater Shepparton Public Health Implementation Plan have been developed in consultation with the Greater Shepparton Public Health Advisory Committee including the Department of Health and Human Services.

7. COMMUNITY DIRECTORATE

7.4 Greater Shepparton Public Health Strategic Plan 2018 -2028 (continued)

The draft Greater Shepparton Public Health Strategic Plan 2018 – 2028 was on public display from Wednesday 17 October – Wednesday 7 November 2018 seeking community feedback. Copies were published on Council's website and highlighted in a media release. Copies were also distributed to each member of the Public Health Advisory committee and a number of additional department representatives.

No additional feedback was received on the draft plan.

Officers believe that appropriate consultation has occurred and the matter is now ready for Council consideration.

Strategic Links

a) Greater Shepparton 2030 Strategy

A focus on the Community Life aspect is most relevant: focusing upon enhancing the health of the community both through services and facilities and participation.

b) Other strategic links

Victorian Public Health and Wellbeing Plan 2015 – 2019

Outlines the government's key priorities to improve the health and wellbeing of all Victorians across the following priority areas, healthier eating and active living, tobacco free living, reducing harm from alcohol and drug use, improving mental health, preventing violence and injury, improving sexual and reproductive health.

Victorian Public Health and Wellbeing Outcomes Framework 2016

The five key domains for action are Victorians are healthy and well, Victorians are safe and secure, Victorians have the capabilities to participate, Victorians are connected to culture and community and Victoria is liveable.

VicHealth's Action Agenda for Health Promotion 2013–2023

Focuses on five strategic imperatives with associated goals; promoting healthy eating, encouraging regular physical activity, preventing tobacco use, preventing harm from alcohol and improving mental wellbeing.

Conclusion

The Greater Shepparton Public Health Strategic Plan together with the annual Implementation Plan have been developed in accordance with both Councils and State Governments strategic planning framework.

Together, they will provide a long term public health focus for Greater Shepparton and provide clear goals for partnership efforts and prevention models, beyond the current timeframe of each Council Plan term.

Following recent consultation for which there was no additional feedback, the Greater Shepparton Public Health Strategic Plan 2018 – 2028 is now ready for adoption by Council.

Attachments

Greater Shepparton Public Health Strategic Plan 2018 - 2028 [Download](#) Page 120

8. CORPORATE SERVICES DIRECTORATE

8.1 Contract 1872 - Provision of Temporary Placements and Contractors

Disclosures of conflicts of interest in relation to advice provided in this report

Under section 80C of the *Local Government Act 1989* officers and persons engaged under a contract providing advice to Council must disclose any conflicts of interests, including the type and nature of interest..

No Council officers or contractors who have provided advice in relation to this report have declared a conflict of interest regarding the matter under consideration.

Council Officers involved in producing this report

Author: Manager People and Development

Proof reader(s): Team Leader People and Workforce

Approved by: Director Corporate Services

Executive Summary

All Council directorates from time to time require temporary staff or contractors to backfill vacant positions or provide short term assistance in times of peak workloads. Council previously had Contract 1429 which expired in October 2018, therefore this contract is for the provision of a panel of suppliers to supply various expertise and temporary human resources over the following three years.

Moved by Cr Giovanetti

Seconded by Cr Oroszvary

That the Council:

1. accept the tender submitted by Recruitment Select, 1987, Programmed Skilled Workforce Limited, Chandler Macleod, Intowork Australia, CNC Projects and CAF Consulting Services for Contract No. 1872 Provision of Temporary Placements and Contractors – Panel of Suppliers.
2. note that the contract term is for a period of three years, with an estimated total value of \$2,000,000 (GST inc)
3. authorise the Chief Executive Officer to sign and seal the contract documents.

CARRIED UNOPPOSED.

Contract Details

This contract is for the provision of temporary staff and contractors, from a variety of sources, to deliver human resources where there is either an unexpected increase in workload or specific expertise or project work is required. In addition, in a number of sectors of Council's activities there is often a shortage of high quality candidates. Having a pre-qualified supplier will enable Council to find the best suitable candidate to fill these gaps.

8. CORPORATE SERVICES DIRECTORATE

8.1 Contract 1872 - Provision of Temporary Placements and Contractors (continued)

Tenders

Tenders were received from:

Tenderers
Recruitment Select
1987
Programmed Skilled Workforce Limited
Chandler Macleod
Into Work Australia
CNC Projects
CAF Consulting Services Ltd

Tender Evaluation

Tenders were evaluated by:

Title	Branch
Manager People and Development	People and Development
Team Leader People and Workforce	People and Development
Manager Finance and Rates	Finance and Rates

Evaluation Criteria

Tenders were evaluated on the following criteria:

Evaluation Criteria	Weighting
Price	50%
Database of temporary staff or contractors	10%
OH&S Systems	10%
Benefit to the local region	20%
Environmental Sustainability	10%

Council Plan/Key Strategic Activity

This procurement is consistent with the strategic objective of Leadership and Governance outlined in the Council Plan 2017 – 2021, especially;
1.5 Council is high performing; customer focused and is marked by great people and quality outcomes.

Risk Management

The risk of not procuring this panel of suppliers is that workload demands may not be met and Council may be in breach of the Local Government Act 1989 by utilising non contracted suppliers.

Policy Considerations

Any engagement of external labour hire will be undertaken in accordance with Council's Recruitment and Selection Procedure, and Enterprise Agreement.

8. CORPORATE SERVICES DIRECTORATE

8.1 Contract 1872 - Provision of Temporary Placements and Contractors (continued)

Financial Implications

The annual figure spent on external labour hire has decreased over the past few years with better management and provision of internal resources. It is expected this trend to continue, however if needed, each supplier on the Panel will have their own pricing, some based on Council's Enterprise agreement rates and others based on specific negotiated project consultancy rates.

Legal/Statutory Implications

Tender process has been carried out according to the requirements of *Section 186* of the *Local Government Act 1989*.

Environmental/Sustainability Impacts

There are no environmental or sustainability impacts directly related to awarding this tender, however all tenderers have been evaluated on their experience in managing and commitment to environmental sustainability.

Strategic Links

a) Greater Shepparton 2030 Strategy

This procurement relates to the Greater Shepparton 2030 Strategy as the provision of external labour hire may be utilised in order to deliver services to the Community.

Conclusion

The Tender Evaluation Panel are satisfied that all tenderers are able to offer value for Council and have the appropriate resources, skills and qualifications to provide external labour hire for temporary placements and contractors. Therefore the recommendation is to award each tenderer a contract on the panel of suppliers.

Attachments

Nil.

8. CORPORATE SERVICES DIRECTORATE

8.2 Contracts Awarded Under Delegation and Contracts Advertised but yet to be Awarded

Disclosures of conflicts of interest in relation to advice provided in this report

Under section 80C of the *Local Government Act 1989* officers and persons engaged under a contract providing advice to Council must disclose any conflicts of interests, including the type and nature of interest.

No Council officers or contractors who have provided advice in relation to this report have declared a conflict of interest regarding the matter under consideration.

Council Officers involved in producing this report

Author: Team Leader Contracts and Procurement

Proof reader(s): Manager Corporate Governance

Approved by: Director Corporate Services

Executive Summary

To inform the Council of the status of requests for tenders that have been awarded under delegation and those that have been publicly advertised but are yet to be awarded.

Moved by Cr Hazelman
Seconded by Cr Patterson

That the Council note:

1. tendered contracts awarded under delegated authority by the Chief Executive Officer;
2. contracts awarded under delegated authority by a Director;
3. requests for tenders advertised but not yet awarded.

CARRIED UNOPPOSED.

Tendered Contracts Awarded under Delegated Authority by the CEO

Contract Number	Contract Name	Contract details, including terms and provisions for extensions	Value inclusive of GST	Awarded to
		NIL		

Tendered Contracts Awarded under Delegated Authority by a Director

Contract Number	Contract Name	Contract details, including terms and provisions for extensions	Value inclusive of GST	Awarded to
1891	Construction of Hawdon Street Temporary Bus Interchange	Lump Sum Contract for the Construction of Hawdon Street Temporary Bus Interchange	\$142,468.70	Jarvis Delahey Construction Pty Ltd
1926	Consultancy Services for The Greater Victoria	Lump Sum Contract for the Consultancy Services for The Greater Victoria	\$79,840.00	Otium Planning Group

8. CORPORATE SERVICES DIRECTORATE

8.2 Contracts Awarded Under Delegation and Contracts Advertised but yet to be Awarded (continued)

Contract Number	Contract Name	Contract details, including terms and provisions for extensions	Value inclusive of GST	Awarded to
	Commonwealth Games Bid Prefeasibility Study (Re-scoped)	Commonwealth Games Bid Prefeasibility Study (Re-scoped)		

Requests for Tenders advertised but not yet awarded

Contract No.	Contract Name	Contract detail, including terms and provisions for extensions	Status
1864	Provision of Asphalt Surfacing and Associated Works – Panel of Suppliers	Schedule of Rates Contract for the Provision of Asphalt Surfacing and Associated Works – Panel of Suppliers	Tender closed on 12 December 2018 Tender currently being evaluated
1871	Provision of Early Intervention Services	Schedule of Rates Contract for the Provision of Early Intervention Services	Tender closed on 28 November 2018. Tender currently being evaluated
1872	Provision of Temporary Placements and Contractors – Panel of Suppliers	Panel of Suppliers Contract for the Provision of Temporary Placements and Contractors	Tender closed on 10 October 2018. Tender being considered within this Agenda.
1875	Construction of Traffic Calming Works, Corio Street and North Street, Shepparton	Lump Sum Contract for the Construction of Traffic Calming Works, Corio Street and North Street, Shepparton	Tender closes on 20 March 2019.
1883	Construction of Kialla Park Recreation Reserve - Main Oval Redevelopment	Lump Sum Contract for the Construction of Kialla Park Recreation Reserve - Main Oval Redevelopment	Tender closed on 28 November 2018. Tender currently being evaluated.
1885	Provision of Cleaning Services for Key Operational, Recreation & Minor Operations Facilities	Lump Sum and Schedule of Rates Contract for the Provision of Cleaning Services for Key Operational, Recreation & Minor Operations Facilities	Tender closed on 9 January 2019 Tender currently being evaluated

8. CORPORATE SERVICES DIRECTORATE

8.2 Contracts Awarded Under Delegation and Contracts Advertised but yet to be Awarded (continued)

Contract No.	Contract Name	Contract detail, including terms and provisions for extensions	Status
1889	Construction of Balaclava Road – Verney Road Intersection Stages 1 & 2 Upgrade	Lump Sum Contract for the Construction of Balaclava Road – Verney Road Intersection Stages 1 & 2 Upgrade	Tender closed on 23 January 2019. Tender currently being evaluated.
1895	Design of Signalisation, Landscape, and Upgrade of Wyndham and Fitzjohn Streets	Lump Sum Contract for the Design of Signalisation, Landscape, and Upgrade of Wyndham and Fitzjohn Streets	Tender closed on 28 November 2018. Tender currently being evaluated
1899	Design and Construction of Merrigum Splash Park	Lump Sum Contract for the Design and Construction of Merrigum Splash Park	Tender closed on 23 January 2019. Tender currently being evaluated
1901	Provision of Corporate Travel and Accommodation Booking Service	Schedule of Rates Contract for Corporate Travel and Accommodation Booking Service	Tender closed on 2 February 2019. Tender currently being evaluated
1902	Provision of Learning Management System	Schedule of Rates Contract for Learning Management System	Tender closed on 2 February 2019. Tender currently being evaluated
1906	Provision of Architectural Design for the Redevelopment and Expansion of the Shepparton Sports and Events Centre	Lump Sum Contract for the Provision of Architectural Design for the Redevelopment and Expansion of the Shepparton Sports and Events Centre	Tender closed on 19 December 2018 Tender currently being evaluated
1907	Provision Of Cleaning Services For Aquamoves Aquatic Centre Shepparton	Lump Sum and Schedule of Rates Contract for the Provision Of Cleaning Services For Aquamoves Aquatic Centre Shepparton	Tender closed on 9 January 2019 Tender currently being evaluated
1908	Provision Of Cleaning Services For Key Community Hubs, Children Childcare Centres & Maternal Child Health Services, Preschools and Youth Services	Lump Sum and Schedule of Rates Contract for the Provision Of Cleaning Services For Key Community Hubs, Children Childcare Centres & Maternal Child Health Services, Preschools and Youth Services	Tender closed on 9 January 2019 Tender currently being evaluated

8. CORPORATE SERVICES DIRECTORATE

8.2 Contracts Awarded Under Delegation and Contracts Advertised but yet to be Awarded (continued)

Contract No.	Contract Name	Contract detail, including terms and provisions for extensions	Status
1917	Refurbishment of Toolamba Bridge	Lumps Sum Contract for the Refurbishment of Toolamba Bridge	Tender closed on 13 March 2019. Tender currently being evaluated
1925	Design Consultant for Architectural Design of Tatura Library Refurbishment Extension	Lump Sum Contract for the Design Consultant for Architectural Design of Tatura Library Refurbishment Extension	Tender closed on 10 December 2018. Tender currently being evaluated
1927	Refurbishment of Watt Road Bridge, Mooroopna	Lump Sum Contract for the Refurbishment of Watt Road Bridge, Mooroopna	Tender closed on 13 March 2019. Tender currently being evaluated
1932	Provision Of After-Hours Animal Emergency Service	Schedule of Rates Contract for The Provision Of After-Hours Animal Emergency Service	Tender closes on 20 March 2019.
1934	Supply & Installation of Replacement Pool Heating	Lump Sum Contract for the Supply & Installation of Replacement Pool Heating	Tender closed on 30 January 2019. Tender currently being evaluated
1937	Provision of Affordable Housing Policy Development (Select) (Private)	Lump Sum and Schedule of Rates Contract for the Provision of Affordable Housing Policy Development (Select) (Private)	Tender closed on 22 February 2019. Tender received no submissions

Policy Considerations

Through the *Instrument of Delegation to the Chief Executive Officer* the Council has delegated authority to the Chief Executive Officer to award a contract up to the value of \$500,000 including GST.

The Council through the *Exercise of Delegations* Policy has delegated authority to the Director Corporate Services to approve a contract up to the value of \$500,000 and the Director Infrastructure, Director Community and Director Sustainable Development to approve a contract up to the value of \$150,000 for goods and services and \$200,000 for works.

Legal/Statutory Implications

Section 186 of the *Local Government Act 1989* (the Act) establishes the requirements for tendering and entering into contracts.

Section 186(1) of the Act requires that before Council enters into a contract for the purchase of goods or services to the value of \$150,000 or more, or for the carrying out of works to the value of \$200,000 or more, it must give public notice of the purpose of the contract and invite tenders or expressions of interest from any person wishing to undertake the contract.

8. CORPORATE SERVICES DIRECTORATE

8.2 Contracts Awarded Under Delegation and Contracts Advertised but yet to be Awarded (continued)

Conclusion

It is important that decisions and actions taken under delegation be properly documented and transparent in nature. The report details the publicly advertised contracts awarded by the Chief Executive Officer and Directors under delegated authority of the Council during the period 1 February 2019 to 28 February 2019.

Attachments

Nil

8. CORPORATE SERVICES DIRECTORATE

8.3 February 2019 Monthly Financial Report

Disclosures of conflicts of interest in relation to advice provided in this report

Under section 80C of the *Local Government Act 1989* officers and persons engaged under a contract providing advice to Council must disclose any conflicts of interests, including the type and nature of interest.

No Council officers or contractors who have provided advice in relation to this report have declared a conflict of interest regarding the matter under consideration.

Council Officers involved in producing this report:

Author: Team Leader Management Accounting

Proof Reader: Manager Finance & Rates

Approved by: Director Corporate Services

Executive Summary

The report presents Council's actual financial performance compared to the budget for eight months ended 28 February 2019.

Moved by Cr Oroszvary
Seconded by Cr Patterson

That the Council receive and note the February 2019 Monthly Financial Report.

CARRIED UNOPPOSED.

Background

The 2018/2019 Budget was adopted at the Ordinary Council Meeting held 19 June 2018. The 2018/2019 Budget provided for an operating surplus of \$19.17 million with revenue of \$143.83 million and expenditure of \$124.66 million. The 2018/2019 Budget also provided for capital works of \$46.36 million.

On 16 October 2018, Council adopted the 2018/2019 Q1 Forecast Review with an accounting surplus of \$14.83 million which is \$4.34 million less than the 2018/2019 Adopted Budget. The capital works program of \$48.13 million is forecast to be expended during the 2018/2019 financial year which is an increase of \$1.77 million from the Adopted Budget.

On 19 February 2019, Council adopted the 2018/2019 Q2 Forecast Review with an accounting surplus of \$16.72 million, an increase of \$1.89 million on the Q1 Adopted Forecast, however, a \$2.25 million decrease on 2018/2019 Adopted Budget. The capital works program is at \$52.6 million an increase of \$4.47 million from the Q1 Adopted Forecast and an increase of \$6.24 million on the 2018/2019 Adopted Budget.

Council's actual financial performance compared to the budget is presented to Council on a monthly basis.

The February 2019 Monthly Financial Report incorporates the following sections which are presented for Council's consideration:

- Operating Performance
- Capital Works Performance
- Income Statement
- Balance Sheet
- Cash Flow Statement
- Capital Works Statement

8. CORPORATE SERVICES DIRECTORATE

8.3 February 2019 Monthly Financial Report (continued)

Council Plan/Key Strategic Activity

The report is consistent with the leadership and governance goal “High Performing Organisation” as included in the *Council Plan 2017-2021*.

Risk Management

There are no risks identified in providing this financial report.

Policy Considerations

There are no conflicts with existing Council policies.

Financial Implications

There are no financial implications arising from this proposal.

Legal/Statutory Implications

Section 137 of the *Local Government Act 1989* provides that Council maintain a budgeting and reporting framework that is consistent with the principles of sound financial management. In addition Section 138 requires that at least every 3 months a statement comparing the budgeted revenue and expenditure for the financial year with the actual revenue and expenditure to date is presented to the Council at a Council meeting which is open to the public. This report satisfies that requirement.

Environmental/Sustainability Impacts

There are no environmental or sustainability impacts associated with this report.

Social Implications

There are no social implications associated with this report.

Economic Impacts

There are no economic implications in providing this financial report.

Consultation

Officers believe that appropriate consultation has occurred and the matter is now ready for Council consideration.

Conclusion

The report presents Council's actual financial performance compared to the budget for eight months ended 28 February 2019.

Attachments

February 2019 - Monthly Financial Statements [↓](#) Page 213

9. SUSTAINABLE DEVELOPMENT DIRECTORATE

9.1 Rename - Flanagan Place, Tatura

Disclosures of conflicts of interest in relation to advice provided in this report

Under section 80C of the *Local Government Act 1989* officers and persons engaged under a contract providing advice to Council must disclose any conflicts of interests, including the type and nature of interest.

No Council officers or contractors who have provided advice in relation to this report have declared a conflict of interest regarding the matter under consideration.

Council Officers involved in producing this report

Author: Building and Planning Support Officer

Proof reader(s): Manager Building and Planning

Approved by: Director Sustainable Development

Executive Summary

The purpose of this report is to approve the proposed renaming of “Flanagan Place”, Tatura to “Memorial Place” in line with Naming Rules for Places in Victoria 2016.

Council received a letter from Tatura Senior Citizens requesting Flanagan Place be renamed as Flanagan Drive is also located in Tatura and is creating confusion for emergency services.

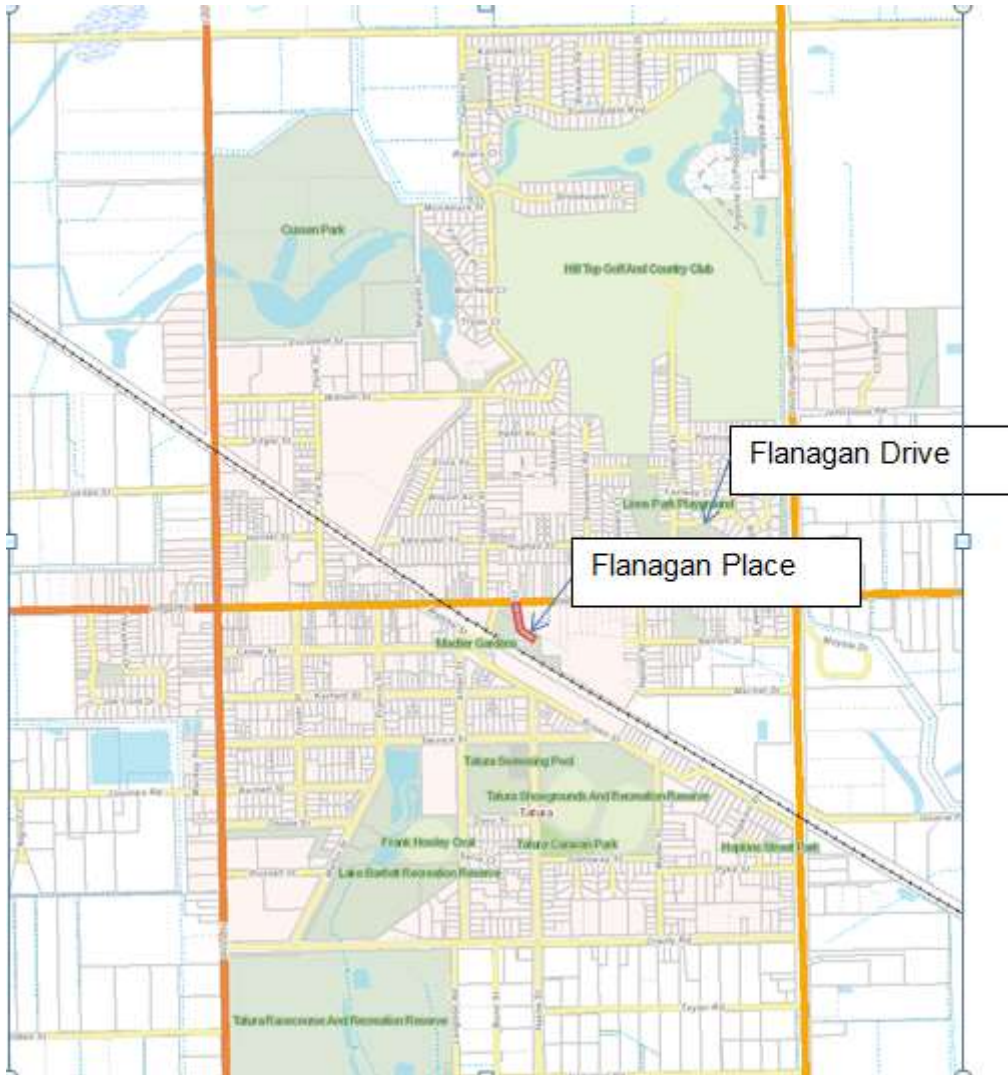
The Tatura Senior Citizens Club raised this issue with the Tatura Community Plan Committee, who fully support the name change. The club have also been in contact with the Flanagan family and they support the name change as Flanagan Drive and Flanagan Park still exist in the town.

At the 19 February ordinary council meeting the Council approved the proposed renaming of Flanagan Place to be placed on public notice.

The proposed name “Memorial Place” was placed on public notice in the Tatura Guardian and no submissions were received.

9. SUSTAINABLE DEVELOPMENT DIRECTORATE

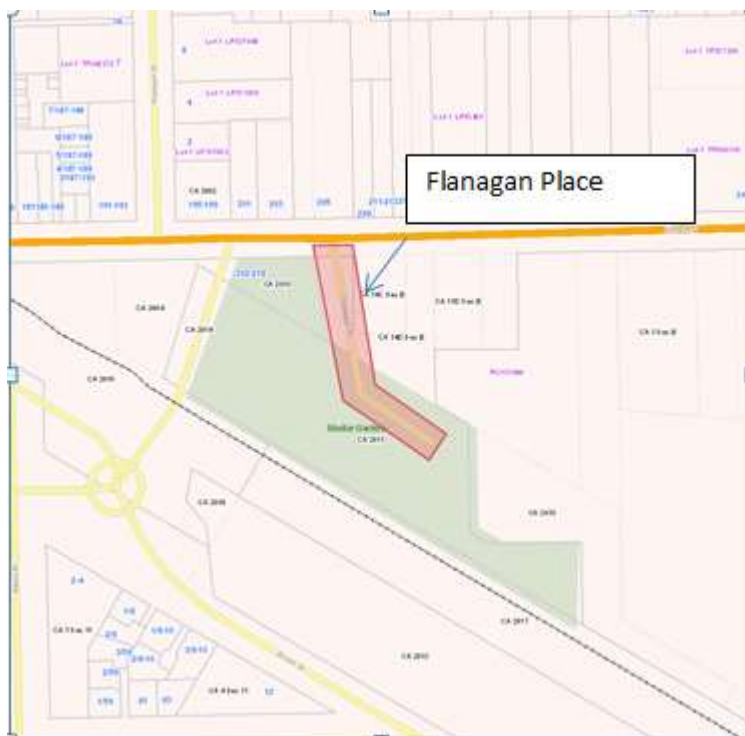
9.1 Rename - Flanagan Place, Tatura (continued)



Locality Plan

9. SUSTAINABLE DEVELOPMENT DIRECTORATE

9.1 Rename - Flanagan Place, Tatura (continued)



Specific location

Moved by Cr Adem
Seconded by Cr Oroszvary

That the Council approve the renaming of Flanagan Place to Memorial Place in accordance with the *Naming Rules for Places in Victoria 2016 - Statutory requirements for naming roads, features and localities 2016*.

CARRIED UNOPPOSED.

Background

The purpose of this report is to seek approval for the proposed renaming of “Flanagan Place”, Tatura to “Memorial Place” in line with Naming Rules for Places in Victoria 2016.

Council received a letter from Tatura Senior Citizens Club requesting Flanagan Place be renamed as Flanagan Drive also exists in Tatura and is creating confusion for emergency services.

The Senior Citizens Club raised this issue with the Tatura Community Plan Committee, who fully support the name change. The club have also been in contact with the Flanagan family and they support the name change as Flanagan Drive and Flanagan Park still exist in the town.

The *Naming Rules for Places in Victoria 2016, Statutory requirements for naming roads, features and localities – 2016* (the naming rules) includes step-by-step information on naming, renaming or changing the boundaries of roads, features and localities in Victoria.

9. SUSTAINABLE DEVELOPMENT DIRECTORATE

9.1 Rename - Flanagan Place, Tatura (continued)

The naming rules uphold the guidelines provided for in the *Geographic Place Names Act 1998*. They are mandatory for naming authorities in Victoria.

The notice requirements:

As per the *Naming rules for places in Victoria 2016* the Council is required to place the proposed renaming of “Flanagan Place” to “Memorial Place” on public notice by way of advertisement in the local newspaper. The notice period is 30 days after which if no submissions are received the name then gets approved for use by way of formal Council resolution and then gazetted by the Geographic Names Victoria.

Any submission received during the public consultation period must be considered by the naming authority. The naming authority is responsible for deciding the weight to be given to competing submissions, having regard to these naming rules and any other relevant matters it identifies.

All submissions must be included in an assessment report, stating the objection or support for a proposal, indicating relevance to the naming rules and the naming authority’s consideration/response to the submission.

The decision about whether or not to proceed with a renaming proposal resides with the naming authority.

Note: The naming authority need not consider objections that don’t explain reasons for the objector opposing the name.

On 19 February 2019, Council at the ordinary council meeting approved the proposed renaming of Flanagan Place to be placed on public notice.

The name was placed on public notice in the Tatura Guardian and no submissions were received.

Council Plan/Key Strategic Activity

Community / Public Safety

Risk Management

Risks	Likelihood	Consequence	Rating	Mitigation Action
Not proceeding with the name change creates confusion for emergency services staff, delaying response times	C	4	Low	Renaming to avoid confusion for emergency services

Policy Considerations

Road naming and/or renaming requests are assessed under Naming Rules for Places in Victoria 2016.

Financial Implications

The financial implications to Council for this road name change will be for street signage only.

Legal/Statutory Implications

There are no legal/statutory implications associated with street naming.

9. SUSTAINABLE DEVELOPMENT DIRECTORATE

9.1 Rename - Flanagan Place, Tatura (continued)

Environmental/Sustainability Impacts

There are no environmental and sustainability impacts.

Social Implications

There are minimal social implications given that the proposal is to change a road name only, but there could be significant emergency service delays if this is not acted upon, given the duplication of the road name within the town.

Economic Impacts

There are no known significant economic impacts associated with this proposal.

Consultation

The following consultation process was completed.

Level of public participation	Promises to the public/stakeholders	Examples of techniques to use
Consult	Community Consultation	Public notice in the Tatura Guardian

On 19 February 2019, Council at the ordinary council meeting approved the proposed renaming of Flanagan Place to be placed on public notice.

The name was placed on public notice in the Tatura Guardian and no submissions were received.

Strategic Links

a) Greater Shepparton 2030 Strategy

There are no strategic link relating to road naming

b) Other strategic links

There are no strategic link relating to road naming

Conclusion

As Flanagan Place is not within a residential area the road name change should not impact on any individual resident in relation to changing address details. The family has also been consulted.

The renaming of the road is imperative to the safety of the local residents and the wider community.

Attachments

Renaming of Flanagan Place, Tatura [↓](#) Page 226

9. SUSTAINABLE DEVELOPMENT DIRECTORATE

9.2 Adoption of the Shepparton Mooroopna Flood Mapping and Flood Intelligence Project March 2019 and the Greater Shepparton City Council Municipal Flood Emergency Plan August 2018

Disclosures of conflicts of interest in relation to advice provided in this report

Under section 80C of the *Local Government Act 1989* officers and persons engaged under a contract providing advice to Council must disclose any conflicts of interests, including the type and nature of interest.

No Council officers or contractors who have provided advice in relation to this report have declared a conflict of interest regarding the matter under consideration.

Council Officers involved in producing this report

Author: Manager Environment

Proof reader(s): Director Sustainable Development

Approved by: Director Sustainable Development

Executive Summary

The *Shepparton Mooroopna Flood Mapping and Flood Intelligence Project Report March 2019* (the Report) and the *Greater Shepparton City Council Municipal Flood Emergency Plan August 2018* (the Plan), see Attachments 1 & 2, were funded by the Federal and State governments, and Council. The report and the plan seek to update the existing information on flood risk within the Shepparton-Mooroopna area. This involved detailed hydrology and hydraulic modelling of the Goulburn River, Seven Creeks and the Broken River for flood mapping, assessing flood risk and the treatment of flood risk.

The Report is an important update of flood intelligence and mapping tools contained within the existing *Shepparton Mooroopna Floodplain Management Study: Floodplain Management Plan, October 2002*.

The Report has been peer reviewed by the Department of Environment, Land, Water and Planning and data from the Report is currently being used operationally by the Goulburn Broken Catchment Management Authority.

The draft Report and the Plan were released for public comment during October and November 2018. Meetings were held with eight interested parties. A total of three submissions were received during the public consultation stage and these submissions have been responded to by Council officers and Water Technology Pty. Ltd. One change was made to the Report as a result of these submissions. Subsequent to the submissions, all submitters and interested parties were invited to present their concerns to a meeting of Councillors on 12 February. This offer was taken up by two submitters and the two interested parties. Documentation that was provided by two of the submitters from that meeting is included as attachments to this report.

In addition, the *Greater Shepparton City Council Municipal Flood Emergency Plan August 2018 (the Plan)* has been prepared, see Attachment 2. The purpose of the Plan is to detail arrangements agreed for the planning, preparedness/prevention, response and recovery from flood incidents within the City of Greater Shepparton.

It is now recommended that Council adopt the *Shepparton Mooroopna Flood Mapping and Flood Intelligence Project Report March 2019*, the *Greater Shepparton City Council Municipal Flood Emergency Plan August 2018 (Plan)*, and to resolve to prepare and exhibit a planning scheme amendment to include the findings and recommendations of

9. SUSTAINABLE DEVELOPMENT DIRECTORATE

9.2 Adoption of the Shepparton Mooroopna Flood Mapping and Flood Intelligence Project March 2019 and the Greater Shepparton City Council Municipal Flood Emergency Plan August 2018 (continued)

the *Shepparton Mooroopna Flood Mapping and Flood Intelligence Project Report March 2019* into the Greater Shepparton Planning Scheme.

**Moved by Cr Patterson
Seconded by Cr Hazelman**

That the Council:

1. adopt the *Shepparton Mooroopna Flood Mapping and Flood Intelligence Project Report, March 2019*;
2. prepare and exhibit a planning scheme amendment to include the findings and recommendations of the *Shepparton Mooroopna Flood Mapping and Flood Intelligence Project Report March 2019*, into the Greater Shepparton Planning Scheme; and
3. adopt the *Greater Shepparton City Council Municipal Flood Emergency Plan August 2018*.

Cr Adem called for a division.

Those voting in favour of the motion: Cr Patterson, Cr Hazelman, Cr Abdullah, Cr Giovanetti and Cr O'Keeffe.

Those voting against the motion: Cr Oroszvary and Cr Adem.

The motion was put and carried.

Background

The *Shepparton Mooroopna Floodplain Management Study: Floodplain Management Plan, October 2002* was prepared and implemented through the introduction of a Total Flood Warning System and Flood Warning Charter. It was implemented through Amendment C23 to the Greater Shepparton Planning Scheme (Planning Scheme) in 2004. Amendment C23 updated the flood controls (Urban Floodway Zone, Floodway Overlay and Land Subject to Inundation Overlay) contained within the Planning Scheme.

Shepparton Mooroopna Floodplain Management Study: Floodplain Management Plan, October 2002

Following the spring 1993 floods, a Scoping Study was prepared that identified the need for a comprehensive study for Shepparton-Mooroopna. In June 1999, Sinclair Knight Merz Pty Ltd was commissioned by the Council to undertake a comprehensive floodplain management study for Shepparton-Mooroopna.

The main objective of the floodplain management study was to minimise the economic and social impacts of flooding on the community. This was achieved by investigating the existing nature of flooding and investigating a range of flood mitigation measures. The mitigation measures investigated included both structural (e.g. levees, floodways, etc.) and non-structural options (land use planning, emergency responses, etc.).

9. SUSTAINABLE DEVELOPMENT DIRECTORATE

9.2 Adoption of the Shepparton Mooroopna Flood Mapping and Flood Intelligence Project March 2019 and the Greater Shepparton City Council Municipal Flood Emergency Plan August 2018 (continued)

The study was developed in two stages, Stage 1 comprised of an investigation of flooding and determining of the likelihood and consequences for existing conditions, and Stage 2 comprised of an investigation of measures to reduce economic and social consequences from flooding.

Shepparton Mooroopna Flood Mapping and Flood Intelligence Project Report

In 2010, a flood of significance was observed allowing for additional data to be gathered on flood behaviour in the Shepparton and Mooroopna area. This event gave rise to the opportunity to update the *Shepparton Mooroopna Floodplain Management Study: Floodplain Management Plan, October 2002*. Significant advancements in hydrology and hydraulic computer modelling have also been made since this Study was prepared in 2002 as well as updated intelligence on flooding behaviour upstream of Shepparton and Mooroopna.

At the Ordinary Council Meeting held on 19 June 2012, Council resolved to engage Water Technology Pty Ltd to prepare the *Shepparton Mooroopna Flood Mapping and Flood Intelligence Project Report* (Contract No.1370), see Attachment 1. The delay in finalising the Report was as a result of the need for a flood study at Murchison to reconcile hydrologic data and to reach agreement between Water Technology Pty Ltd and the Goulburn Broken Catchment Management Authority (GBCMA) on the hydraulic model calibration of the 1974, 1993 and 2010 flood events, which included a substantial further modelling process for the Murchison area upstream of Shepparton.

The Report:

- collects and reviews data relevant to flooding within the study area;
- provides a rigorous hydrologic analysis to develop robust design flood estimates for the study area including consideration for the timing and potential combinations of Goulburn River, Broken River and Seven Creeks riverine flooding;
- develops and calibrates a detailed hydraulic model that can predict flood impacts across the complex floodplain;
- provides flood mapping of many potential design flood scenarios;
- develops an online flood mapping portal, www.floodreport.com.au;
- quantifies flood risk at a property specific level; and
- reviews flood warning and emergency response, and an update to the *Municipal Flood Emergency Plan*.

Study Area

The study area considered in the Report is upstream of Shepparton to Toolamba, downstream of Shepparton to Loch Garry on the Goulburn River, upstream of Shepparton to Kialla East on the Broken River and upstream of Shepparton to Kialla West on Seven Creeks, see Figure One.

9. SUSTAINABLE DEVELOPMENT DIRECTORATE

9.2 Adoption of the Shepparton Mooroopna Flood Mapping and Flood Intelligence Project March 2019 and the Greater Shepparton City Council Municipal Flood Emergency Plan August 2018 (continued)

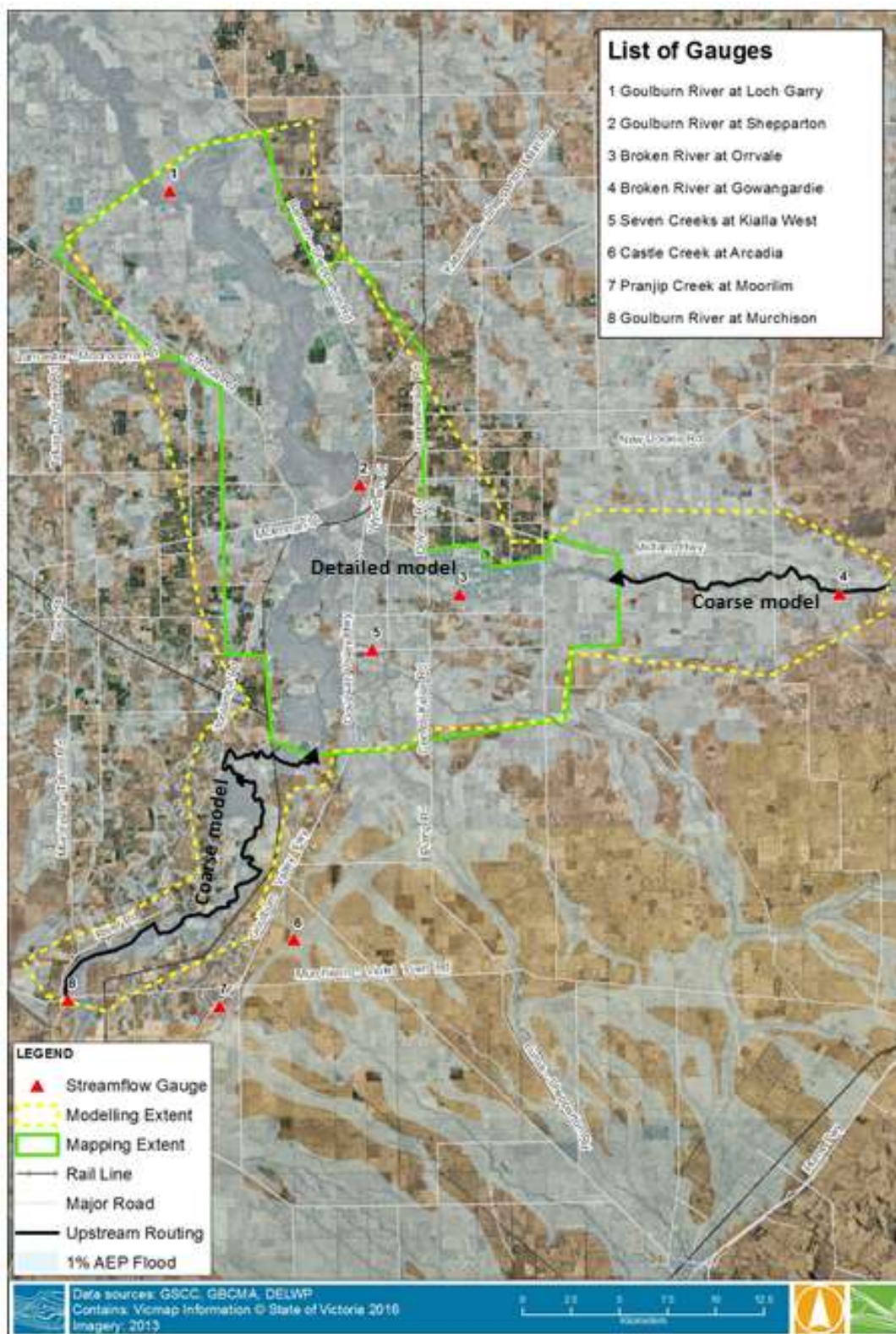


Figure One: Study Area Extent.

9. SUSTAINABLE DEVELOPMENT DIRECTORATE

9.2 Adoption of the Shepparton Mooroopna Flood Mapping and Flood Intelligence Project March 2019 and the Greater Shepparton City Council Municipal Flood Emergency Plan August 2018 (continued)

For detail relating to Council's consideration of the draft reports please refer to Attachment 3 which is an extract of the Council report considered by the Council in September 2018.

The Draft *Shepparton Mooroopna Flood Mapping and Flood Intelligence Project Report* and the *Greater Shepparton City Council Municipal Flood Emergency Plan 2018*, were released for public comment in October and November 2018. Council officers met with a total of eight different parties and received three submissions. Council officers have reviewed all feedback, comments and submissions received. A copy of the submissions received (Attachments 6, 10 & 12) has been provided to Councillors together with an analysis of the matters raised in the submissions (Attachment 4), the Officer's response to those matters (Attachments 7, 11 & 13). As a result of the submissions received a small change was made to the mapping contained within the report and a reference to the *Shepparton East Overland Flow Urban Flood Study 2017* was deleted from the report.

Subsequent to the above process, the three submitters and two other interested parties were invited to make further representations to the Council on 12 February 2019. Two of the submitters and the two interested parties took up this invitation and spoke to Council. Further written material was provided by two of the submitters at that meeting and these documents have been included as attachments to this report. (Attachments 14 & 15). As a result of the further submissions to Councillors on 12 February no further changes have been made to the Report or the Plan.

The Report and the Plan are now ready for adoption.

Greater Shepparton City Council Municipal Flood Emergency Plan August 2018

The *Greater Shepparton City Council Municipal Flood Emergency Plan August 2018* (Plan) was prepared by the Shepparton Flood Sub Committee and with the authority of the Greater Shepparton City Council Municipal Emergency Management Planning Committee pursuant to Section 20 of the *Emergency Management Act 1986 and Emergency Management Act 2013* (as amended), see Attachment 2.

The MFEP is a sub plan to the *Greater Shepparton City Council Municipal Emergency Management Plan* (MEMP). It is consistent with the *Emergency Management Manual Victoria* (EMMV) and the *Victorian Floodplain Management Strategy* (DELWP, 2016), and takes into account the outcomes of the Community Emergency Risk Assessment (CERA) process undertaken by the Municipal Emergency Management Planning Committee (MEMPC).

The Plan is consistent with the *Regional Flood Emergency Plan* and the *State Flood Emergency Plan*. The purpose of the Plan is to detail arrangements agreed for the planning, preparedness/prevention, response and recovery from flood incidents within the City of Greater Shepparton. As such, the scope of the Plan is to:

- identify the Flood Risk within the Greater Shepparton municipal area;
- support the implementation of measures to minimise the causes and impacts of flood incidents within the Greater Shepparton municipal area;
- detail Response and Recovery arrangements including preparedness, Incident Management, Command and Control; and

9. SUSTAINABLE DEVELOPMENT DIRECTORATE

9.2 Adoption of the Shepparton Mooroopna Flood Mapping and Flood Intelligence Project March 2019 and the Greater Shepparton City Council Municipal Flood Emergency Plan August 2018 (continued)

- identify linkages with Local, Regional and State emergency and wider planning arrangements with specific emphasis on those relevant to flood.

The Plan is complemented by two other guides, which provide the public with additional information specific to their area:

- Local Flood Guide; and
- Community Information Guide.

As a result of submissions received no changes were made to the Plan.

Council is now being requested to consider the adoption of the *Shepparton Mooroopna Flood Mapping and Flood Intelligence Project Report March 2019* and the *Greater Shepparton City Council Municipal Flood Emergency Plan August 2018* and to resolve to prepare and exhibit a planning scheme amendment and to include the findings and recommendations of the *Shepparton Mooroopna Flood Mapping and Flood Intelligence Project Report March 2019* into the Greater Shepparton Planning Scheme.

Council Plan/Key Strategic Activity

Environment: clean, green environment that makes Greater Shepparton the unique place it is.

Objective 5.6: minimises the consequences of flooding to life, property, community wellbeing and the economy.

Risk Management

The outputs of the *Shepparton Mooroopna Flood Mapping and Flood Intelligence Project Report March 2019* and the *Greater Shepparton City Council Municipal Flood Emergency Plan August 2018* will help minimise risk and damage to property and will ensure that arrangements are agreed for the planning, preparedness/prevention, response and recovery from flood incidents within the Greater Shepparton municipal area.

Financial Implications

The *Shepparton Mooroopna Flood Mapping and Flood Intelligence Project Report March 2019* and the *Greater Shepparton City Council Municipal Flood Emergency Plan August 2018* were undertaken utilising existing Council, State and Federal resources. A planning scheme amendment will incur expenses which will be covered in normal budgetary considerations.

Legal/Statutory Implications

Advice received from Russell Kennedy Pty Ltd (Attachment 5) has shown that the *Shepparton Mooroopna Flood Intelligence and Flood Mapping Project Report March 2019* has no overarching legislation or regulation mandating how a flood study should be undertaken.

An important result of adoption of the Reports is the preparation of modifications to the Greater Shepparton Planning Scheme in relation to flood controls. This is also a process that Councils should undertake in keeping with Council's obligations under the *Planning and Environment Act 1987*.

9. SUSTAINABLE DEVELOPMENT DIRECTORATE

9.2 Adoption of the Shepparton Mooroopna Flood Mapping and Flood Intelligence Project March 2019 and the Greater Shepparton City Council Municipal Flood Emergency Plan August 2018 (continued)

The adoption of the Reports is considered to accord with the *Victorian Charter of Human Rights and Responsibilities Act 2006* (the Charter).

The Charter recognises that reasonable restrictions may be placed on the use and development of land, and that there may on occasion be reasonable and acceptable offsite impacts on others. Provided these issues are properly considered, it would be a rare and exceptional case where the exercise of a planning decision in accordance with the regulatory framework is not Charter compatible.

Environmental/Sustainability Impacts

The recommendation will not result in any negative environmental/sustainability impacts and will improve flood prone areas from development thereby increasing environmental outcomes from a floodplain management viewpoint.

Social Implications

Endorsement of the Reports will lead to a strategic approach to the identification of flood prone areas around Shepparton and Mooroopna which will improve flood emergency planning and lead to a removal of flood damages in areas that may otherwise have been allowed to develop. It will assist in improving safety and resilience within the Community in regards to flooding.

The recommendation will not result in any negative social implications.

Economic Impacts

It is not expected that the recommendation will have any adverse economic impacts although Council will incur costs in preparation of a Planning Scheme amendment.

Consultation

During the consultation stage Council officers, a GBCMA officer and a representative from Water Technology Pty Ltd met with 8 persons and organisations to discuss the reports. Three submissions were received following these meetings. A copy of the submissions has been attached to this report together with the responses that were provided to each of the submitters. Letters seeking further comment and offering the submitters an opportunity to present to Councillors were forwarded to the submitters and to two other interested parties.

General issues raised in the submissions included:

- questions in relation to the *Shepparton East Overland Flow Urban Flood Study 2017*
- no inclusion of a planning scheme amendment; and
- exclusion of information that should have been included as part of modelling.

The specific matters are contained within the submissions and the responses to these have been provided to the submitters.

As a result of the submissions received a small change was made to the mapping contained within the report and a reference to the *Shepparton East Overland Flow Urban Flood Study 2017* was deleted from the report.

All submitters and any interested parties were also invited to present to Councillors on 12 February 2019 and two submitters and two interested parties accepted this opportunity.

9. SUSTAINABLE DEVELOPMENT DIRECTORATE

9.2 Adoption of the Shepparton Mooroopna Flood Mapping and Flood Intelligence Project March 2019 and the Greater Shepparton City Council Municipal Flood Emergency Plan August 2018 (continued)

As a result of these further presentations no changes were made to the final Report or the Plan.

If the recommendation is adopted by Council there will be a further opportunity for consultation during the planning scheme amendment process.

Strategic Links

a) Greater Shepparton 2030 Strategy 2006

Topic: Environment

Theme: Floodplain management

Objective 1: To recognise the constraints of the floodplain on the use and development of land and minimise the future economic impacts of flooding.

b) Other strategic links

Victorian Floodplain Management Strategy 2016

Goulburn Broken Regional Floodplain Management Strategy 2018-2028

Conclusion

The *Shepparton Mooroopna Flood Mapping and Flood Intelligence Project Report March 2019* is an important update of flood intelligence and mapping tools to allow Council to undertake improved planning and emergency management tasks for the community of Shepparton and Mooroopna.

The *Shepparton Mooroopna Flood Mapping and Flood Intelligence Project Report March 2019* seeks to update the existing information on flood risk within the Shepparton-Mooroopna area. This involved detailed hydrology and hydraulic modelling of the Goulburn River, Seven Creeks and the Broken River for flood mapping, assessing flood risk and the treatment of flood risk. It is expected that the adoption of the Report and the Plan, and the subsequent preparation of an amendment to the Greater Shepparton Planning Scheme, will improve safety and resilience in the Community through better flood planning and emergency management.

The Report complements the recommendations of *the Victorian Floodplain Management Strategy 2016* and the *Goulburn Broken Regional Floodplain Management Strategy 2018-2028*.

The Council released the Draft Report and the Plan for public consultation and as a result three submissions were received. As a result of the submissions received a small change was made to the mapping contained within the report and a reference to the *Shepparton East Overland Flow Urban Flood Study 2017* was deleted from the report. The Report and the Plan are now ready for Council consideration.

Council officers recommend that the final *Shepparton Mooroopna Flood Mapping and Flood Intelligence Project Report March 2019* be adopted and that a planning scheme amendment be prepared to implement the findings and the recommendations of the report.

Council officers further recommend that the Council adopt the *Greater Shepparton City Council Flood Emergency Plan August 2018*.

9. SUSTAINABLE DEVELOPMENT DIRECTORATE

9.2 Adoption of the Shepparton Mooroopna Flood Mapping and Flood Intelligence Project March 2019 and the Greater Shepparton City Council Municipal Flood Emergency Plan August 2018 (continued)

Attachments

- | | |
|--|----------|
| 1. Shepparton Mooroopna Flood Mapping and Flood Intelligence Final Report - March 2019 ↓ | Page 228 |
| 2. Greater Shepparton City Council Municipal Flood Emergency Plan - August 2018 ↓ | Page 341 |
| 3. Draft Shepparton Mooroopna Flood Mapping and Flood Investigation Project 2018 and Draft Greater Shepparton City Council Municipal Flood Emergency Plan - September 2018 Ordinary Council Meeting Report ↓ | Page 562 |

9. SUSTAINABLE DEVELOPMENT DIRECTORATE

9.3 Goulburn River Valley Tourism Memorandum of Understanding (MOU) and Greater Shepparton City Council

Disclosures of conflicts of interest in relation to advice provided in this report

Under section 80C of the *Local Government Act 1989* officers and persons engaged under a contract providing advice to Council must disclose any conflicts of interests, including the type and nature of interest.

No Council officers or contractors who have provided advice in relation to this report have declared a conflict of interest regarding the matter under consideration.

Council Officers involved in producing this report

Author: Team Leader Tourism and Major Events

Proof reader(s): Manager Economic Development

Approved by: Director Sustainable Development

Executive Summary

A Memorandum of Understanding (MOU) between Goulburn River Valley Tourism (GRVT) and the Council has been developed for years 2018 to 2021. The MOU details how both parties will support each other to achieve common outcomes as part of a regional tourism alliance for the municipalities served by Greater Shepparton City Council, Mitchell Shire Council, Murrindindi Shire Council and Strathbogie Shire Council. The MOU was developed to allow Council to further develop and achieve mutually beneficial objectives and goals in relation to the tourism and visitor economy sectors and increasing visitation to the region.

At the 19 June 2018 Ordinary Council Meeting Council endorsed entering into an amended MOU with GRVT commencing on 1 July 2018 for one year until 30 June 2019 with the option of a one year extension.

With the MOU renewal approaching, Council officers have reviewed its position in relation to being part of GRVT. Due to administration and governance challenges, outcomes and return on investment not being met and differences in strategic goals alignment with member councils; Council officers are recommending the MOU not be renewed. This would allow Council to further control appropriate regional tourism positioning, realign and manage goals in economic development initiatives, activities and activations, tourism product development, destination marketing, major events attraction which all relate to the enhancement of the visitor economy within the region.

Moved by Cr Patterson

Seconded by Cr Adem

That the Council;

1. Not proceed with the proposed Memorandum of Understanding (MOU) between the Greater Shepparton City Council and Goulburn River Valley Tourism (GRVT).
2. Work with the local tourism industry to investigate the future regional tourism positioning direction for Greater Shepparton.

CARRIED UNOPPOSED.

9. SUSTAINABLE DEVELOPMENT DIRECTORATE

9.3 Goulburn River Valley Tourism Memorandum of Understanding (MOU) and Greater Shepparton City Council (continued)

Background

GRVT was formally established as a legal entity, a company limited by guarantee, in March 2011.

GRVT is the independent peak regional tourism body for the municipalities served by Greater Shepparton City Council, Mitchell Shire Council, Murrindindi Shire Council and Strathbogie Shire Council.

It should be noted that MOU's covering the periods 1 July 2009 – 30 June 2012, 1 July 2012 – 30 June 2015 and 1 July 2015 – 30 June 2018 have been in place by member councils to provide funding to GRVT and its predecessor organisation 'United Approach to Tourism'.

The Current MOU with GRVT is for a one year period (1 July 2018 – 30 June 2019) and allows for an extension of a second year being from 1 July 2019 to 30 June 2020.

The role of GRVT during the existing MOU includes:

- develop and oversee the delivery of the 2018 – 2021 Strategic Plan for the region
- develop and oversee the delivery of the yearly Business Plan for the organisation
- ensure industry relationships are nurtured and developed through communication channels, activities, events, professional development and other appropriate mechanisms
- ensure regular and formal communication with key stakeholders including Member Councils, Visit Victoria, Regional Tourism Boards, Local Tourism Associations, peak industry bodies and relevant government agencies
- develop and coordinate policy and mechanisms to provide a consistent approach and application to tourism activities across the region
- act as an independent voice and advocate on behalf of the tourism industry of the region
- provide Council and key stakeholders with quarterly statistical reports relating to tourism performance in the region
- work with other Regional Tourism Boards, in particular North East Tourism, Murray Regional Tourism, Daylesford Macedon Ranges and Yarra Ranges Tourism (or their successors) to identify and engage in opportunities of benefit to operators in the Goulburn River Valley region
- develop self-generating funding to contribute towards the financial sustainability of the Company
- source, wherever possible, additional funding through industry and funding bodies to support the costs of delivery of projects
- adhere to all financial and legal responsibilities of the Company

The existing MOU with GRVT is attached to this report.

With the MOU renewal approaching, Council officers have reviewed its position in relation to GRVT and are not satisfied that the return on investment warrants entering into the agreement for a further year. Council officers are therefore recommending the MOU not be renewed.

9. SUSTAINABLE DEVELOPMENT DIRECTORATE

9.3 Goulburn River Valley Tourism Memorandum of Understanding (MOU) and Greater Shepparton City Council (continued)

Council Plan/Key Strategic Activity

The strategy is consistent with the vision and strategic goals of the Greater Shepparton City Council: Council Plan 2017-2021. In particular, it relates to the following:

Goal 3: Economic

- 3.1 The Greater Shepparton economy is prosperous, high value and a focus of choice for business, investment and employment.
- 3.2 Strong global, national and local business connection are developed and nurtured.
- 3.3 Greater Shepparton is a major destination for events and tourism.

Risk Management

A major risk of not renewing the MOU with GRVT is the loss of regional tourism partners and the identity that has evolved via the development of GRVT over the last decade with the “Heart of Victoria” tourism branding. Not renewing the MOU however will allow Council to further control appropriate regional tourism positioning, realign and manage goals in economic development initiatives, activities and activations, tourism product development, destination marketing, major events attraction which all relate to the enhancement of the visitor economy within the region. This will also be assisted and guided by being part of the Visit Victoria’s regional tourism review occurring in 2019.

In addition Greater Shepparton City Council by not being part of a regional tourism board could impact potential future major events and tourism projects funding i.e. Regional Events Fund as previously GRVT funding support letters has assisted in government funding applications. If Council decide not to move forward with the MOU, Council officers would work with the local tourism industry and Visit Victoria on future direction positioning to ensure appropriate levels of funding support is not compromised.

Greater Shepparton City Council is currently the most significant financial contributor to Goulburn River Valley Tourism, exiting from GRVT will have a significant impact on the other three Councils contributing to this initiative, and their ability to undertake regional initiatives traditionally delivered through GRVT.

Policy Considerations

The position to not renew the MOU aligns with current policy direction.

Financial Implications

The non-renewal of this MOU between GRVT and Council does have financial implications for Council. In the 2018/2019 budget period Council allocated a budget of \$102,040 to GRVT. Based on the MOU proposed, should Council enter into the MOU the proposal would see a 2.2% increase (in contribution) per annum, which would see, \$104,285 required for 2019/2020 and \$106,579 required in 2020/2021 (should Council enter into a third and a further year of the MOU initially proposed by GRVT).

Legal/Statutory Implications

The recommendations within this report aligns with relevant legal/statutory implications.

Environmental/Sustainability Impacts

There are no environmental implications associated with the recommendations within this report.

9. SUSTAINABLE DEVELOPMENT DIRECTORATE

9.3 Goulburn River Valley Tourism Memorandum of Understanding (MOU) and Greater Shepparton City Council (continued)

Social Implications

The non-renewal of this MOU between Council and GRVT may have some social implications with business and industry within the region who have supported GRVT and have been able to leverage opportunities in the past. Council will continue to work with the Shepparton Chamber of Commerce and Industry, Tourism Greater Shepparton, Shepparton Show Me and with local business and industry to enhance the visitor economy to have positive social implications for the Greater Shepparton region.

Economic Impacts

The MOU between Council and GRVT has been developed with the objective of increasing economic outcomes for GRVT and Greater Shepparton through a combined effort towards growing the visitor economy. With Council not renewing this MOU this will still occur but Council will have the ability to further control and specifically target economic development and tourism initiatives to grow and expand the visitor economy within the region.

Consultation

Officers have discussed this with Visit Victoria who has provided advice including investigating interim and longer term alignment with an accredited Regional Tourism Board to ensure any potential tourism funding, destination marketing and industry development opportunities are available for the Greater Shepparton tourism industry. Visit Victoria will also allow Council further opportunities to be involved in the Victorian regional tourism review occurring in 2019 to further provide guidance on Council's position in relation to regional tourism alliance and positioning.

If Council agree to not continue with this MOU, Council officers will work with the local tourism body Tourism Greater Shepparton to seek feedback from local tourism business and industry about the future direction of Greater Shepparton's regional tourism positioning.

Strategic Links

a) Greater Shepparton 2030 Strategy

This strategy produced in 2006 makes reference to encourage tourism growth with strategy 1.1 stating to support tourism enterprises to achieve an increase in bed stays and visits to the municipality.

b) Other strategic links

Economic Development Tourism and Major Events Strategy 2017 – 2021

Strategy 32 - Implement structural reform for the approach to tourism service delivery including marketing, visitor servicing and product development.

Conclusion

With Council not renewing the MOU between GRVT and Council it will allow Council to further control regional tourism positioning, realign and manage goals in economic development initiatives, activities and activations, tourism product development, destination marketing and major events attraction which will all lead to the enhancement and growth of the visitor economy within the region.

Attachments

Goulburn River Valley Tourism - Memorandum Of Understanding 2018-2021 [↓](#)

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10. REPORTS FROM COUNCILLORS

Nil Received

11. REPORTS FROM SPECIAL AND ADVISORY COMMITTEES

Nil Received

12. NOTICE OF MOTION, AMENDMENT OR RESCISSION

Nil Received

13. DOCUMENTS FOR SIGNING AND SEALING

Nil Received

14. COUNCILLOR ACTIVITIES

14.1 Councillors Community Interaction and Briefing Program

Disclosures of conflicts of interest in relation to advice provided in this report

Under section 80C of the *Local Government Act 1989* officers and persons engaged under a contract providing advice to Council must disclose any conflicts of interests, including the type and nature of interest.

No Council officers or contractors who have provided advice in relation to this report have declared a conflict of interest regarding the matter under consideration.

Councillors' Community Interaction and Briefing Program

From 1 February 2019 to 28 February 2019, some or all of the Councillors have been involved in the following activities:

- Department of Rural Health | Luncheon to Meet Professor Duncan Maskell, Vice Chancellor, University of Melbourne
- Department of Rural Health | 20 Year Celebration
- Heritage Advisory Committee Meeting
- Greater Shepparton Council | Tourism & Events Luncheon - Mayor Speech
- Tatura Park Advisory Committee Meeting
- Meeting with the Hon. Martin Foley MP - Minister for Creative Industries | SAM
- Meeting with the Hon. Jaala Pulford - Minister for Roads | GV Bypass Meeting
- Senior Combined Partners meeting
- GSCC Audit and Risk Management Committee
- 2019 Fairley Leadership Launch
- The Hon Damian Drum - Local Government Leaders Roundtable - Mayors and CEOs
- Site Inspection - Seed Force
- Seed Force | Opening of New Purpose Built Office, Production & Warehouse
- Aerodrome Advisory Committee Meeting
- Waste Regional Recovery Group and CCD Regular Meeting
- Development Hearings Panel
- Shepparton Lawn Tennis Club | Country Week Tennis
- Greater Shepparton Women's Charter Advisory Committee Meeting
- Shepparton Showgrounds Advisory Committee Meeting
- Apology Breakfast - National Apology to the Stolen Generations
- Municipal Association Victoria | Presidential Candidate Forum | Melbourne
- Regional Cities Victoria General Meeting | Melbourne
- RiverConnect Signage Committee Meeting
- Country Week Tennis 2019 – Dinner
- Shepparton East Primary School | Present Badges to School Leaders
- Goulburn Valley Waste Regional Recovery Group Board meeting
- Country Week Tennis | Trophy Presentations
- Mega Swim 2019
- Chinese New Year Event
- Shepparton Show Me Ordinary Committee Meeting
- Goulburn Valley Waste Regional Recovery Group Employment and Remuneration Committee meeting
- Goulburn Broken Greenhouse Alliance Ordinary Meeting | February Meeting
- RiverConnect Implementation Advisory Committee Meeting
- Australian Botanic Garden Special Committee Meeting
- Regional Cities Victoria Delegation | Various Meetings with Federal Ministers | Canberra | Mayor and CEO
- Cricket Australia Function | Canberra

14. COUNCILLOR ACTIVITIES

14.1 Councillors Community Interaction and Briefing Program (continued)

- Meeting with the Hon. David Coleman MP - Minister for Immigration, Citizenship & Multicultural Affairs | Canberra
- Meeting with Mr Guy Ragen - Bill Shorten's Senior Adviser | Regional Policy and Population | Canberra
- Best Start Early Years Partnership Meeting
- Summer City Market | Dunk Tank
- GV Congolese Association | Welcome Ceremony - New Congolese Immigrants
- Opening of Tatura Primary School New Building
- Annual All Abilities Cricket - GV Harmony Cup
- Luncheon | Senator for Victoria - Kimberly Kitching
- Saleyards Advisory Committee Meeting
- Shepparton South Rotary Club | Mayor Guest Speaker
- SAM | Opening of two Exhibitions - sam.education lab & sam.local
- Women of Euroa Group | 'Graze on Clifton' - Cr Abdullah Guest Speaker

In accordance with section 80A of the *Local Government Act 1989* records of the Assemblies of Councillors are attached.

RECOMMENDATION

That the summary of the Councillors' community interaction and briefing program be received, and record of assemblies of Councillors be noted.

Moved by Cr Hazelman Seconded by Cr Adem

1. That the summary of the Councillors' community interaction and briefing program be received, and record of assemblies of Councillors be noted.
2. That the Council acknowledge the resignation of Dr John Lawry from the SAM Advisory Committee, and thank him for his valuable contribution to the Committee over the past 5 years.

CARRIED UNOPPOSED.

Attachments

- | | | |
|--|-------------------|----------|
| 1. Heritage Advisory Committee - 4 February 2019 | ↓ | Page 594 |
| 2. Tatura Park Advisory Committee - 4 February 2019 | ↓ | Page 595 |
| 3. Shepparton Showgrounds Advisory Committee Meeting - 11 February 2019 | ↓ | Page 596 |
| 4. Development Hearings Panel - 8 February 2019 | ↓ | Page 597 |
| 5. Councillor Briefing Session - 5 February 2019 | ↓ | Page 598 |
| 6. CEO and Councillor Catch Up - 5 February 2019 | ↓ | Page 600 |
| 7. Councillor Briefing Session - 19 February 2019 | ↓ | Page 602 |
| 8. CEO and Councillor Catch Up - 19 February 2019 | ↓ | Page 603 |
| 9. Greater Shepparton Early Years Partnership - 13 December 2019 | ↓ | Page 605 |
| 10. RiverConnect Implementation Advisory Committee Meeting - 24 October 2018 | ↓ | Page 606 |
| 11. RiverConnect Signage Committee - 14 February 2019 | ↓ | Page 608 |

14. COUNCILLOR ACTIVITIES

14.1 Councillors Community Interaction and Briefing Program (continued)

- | | |
|---|----------|
| 12. RiverConnect Implementation Advisory Committee Meeting - 20 February 2019 ↓ | Page 609 |
| 13. Councillor Briefing Session - 26 February 2019 ↓ | Page 611 |
| 14. CEO and Councillor Catch Up - 26 February 2019 ↓ | Page 613 |
| 15. Councillor Briefing Session - 25 February 2019 ↓ | Page 614 |
| 16. Shepparton Art Museum Advisory Committee Meeting ↓ | Page 615 |

15. URGENT BUSINESS NOT INCLUDED ON THE AGENDA

Nil Received.

16. CONFIDENTIAL MANAGEMENT REPORTS

16.1 Designation of Confidentiality of Information

Moved by Cr Giovanetti
Seconded by Cr Oroszvary

1. That pursuant to section 89(2)(h) of the *Local Government Act 1989* the Council meeting be closed to members of the public for consideration of confidential item 16.2 – Cultural Heritage Awards 2019.
2. That the Council resolves to lift this declaration of confidentiality effective from 27 April 2019 to enable the public announcement of all winners at the Cultural Heritage Awards Ceremony.

CARRIED UNOPPOSED.

16.2 Cultural Heritage Awards 2019

16.3 Reopening of the Council Meeting to Members of the Public

16.4 Designation of Confidentiality of Information – Report Attachments

Moved by Cr Giovanetti
Seconded by Cr Adem

In accordance with section 77(2)(b) of the *Local Government Act 1989* (the Act) the Council designates as confidential all documents used to prepare the following agenda Item, previously designated by the Chief Executive Officer in writing as confidential under section 77(2)(d) of the Act.

- Report 8.1: Contract 1872 - Provision of Temporary Placements and Contractors.
This document relates to a contractual matter, which is a relevant ground applying under sections 89(2)(d) of the Act.

CARRIED UNOPPOSED.

Meeting Closed at 6.25pm

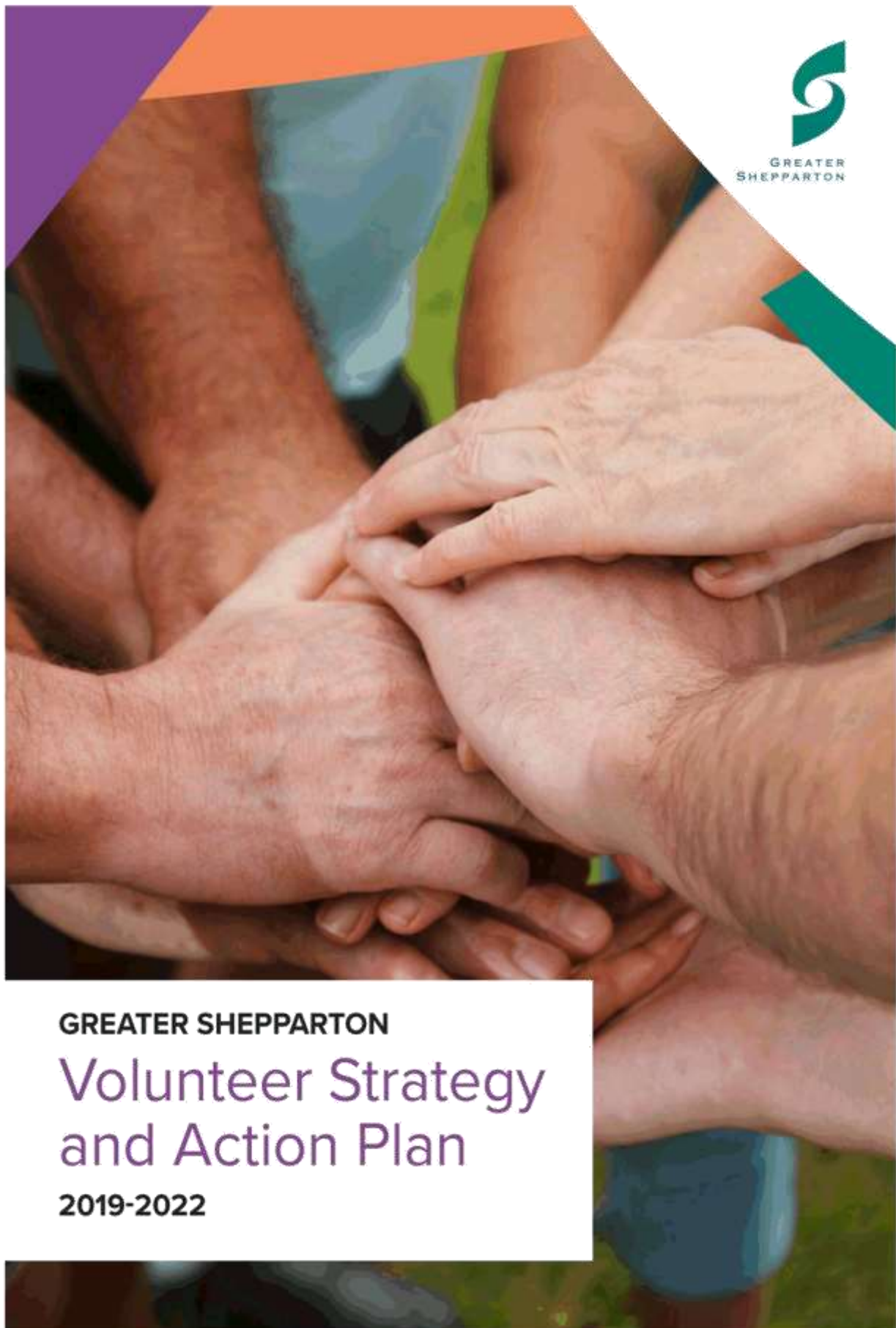
ATTACHMENT TO AGENDA ITEM

Ordinary Meeting

19 March 2019

Agenda Item 7.1 Volunteer Strategy 2019-2022

Attachment 1 Volunteer Strategy and Action Plan 2019-2022 53





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Acknowledgement of Traditional Custodians

"We, the Greater Shepparton City Council, acknowledge the Traditional Owners of the land which now comprises Greater Shepparton. We pay respect to their tribal elders, we celebrate their continuing culture and we acknowledge the memory of their ancestors."

Message from the Mayor

Volunteering is an essential community resource which promotes active citizenship and social inclusion. The benefits of volunteering are significant for our local communities and for individuals. The benefits are economic, social, cultural and environmental.

Council recognises the pivotal role that volunteers play within the community. Many community organisations, programs, clubs and sports would simply not exist without the dedication of volunteers. Greater Shepparton has a vibrant culture of volunteers, our community is stronger due to the inclusiveness volunteering promotes in our community.

Volunteering strengthens community connectedness and social cohesion. Social connections, such as those developed through volunteering, can provide meaning, purpose and satisfaction in people's lives. The experience of helping others can lead to stronger social ties with different groups of people.

The Greater Shepparton Volunteer Strategy 2019-2022 is Council's second Volunteer Strategy and continues to provide a framework for how we promote, recruit, retain, support, celebrate and recognise volunteers across the municipality.

Council looks forward to implementing this strategy in partnership with the Volunteers, Volunteer involving organisations and the wider community who participate in or support volunteers in Greater Shepparton.

I wish to say thank you to everyone who has contributed to the development of this strategy and given the enormous benefits from volunteering, all sectors of society can do more to encourage and support it.

Cr Kim O'Keeffe
Mayor
Greater Shepparton City Council





Executive Summary

The Volunteer Strategy sets out Greater Shepparton City Council's vision and approach to support volunteering in our region. This Strategy builds on the previous Volunteer Strategy and Action Plan 2014-2018 and will further provide a framework for the promotion, recruitment, support, recognition and celebration of Council's volunteers at a local level, encouraging a responsive and supportive environment for all volunteers. Greater Shepparton City Council recognises, where there is a vibrant culture of volunteering, communities are stronger due to the inclusiveness volunteering promotes in the community.

Aims of the Volunteer Strategy:

- Promote volunteers and volunteering opportunities
- Engage and retain volunteers
- Ensure standards of best practice and consistency in supporting volunteers
- Recognise and celebrate volunteers.

As Council moves forward we want to be confident that our contribution to the volunteer sector serves us well. Volunteers are a resource we should nurture, support and celebrate and form a critical role in multiple community services. Through effective collaboration we will continue to review the achievements of the action plan, evaluate new opportunities and monitor the resources available, to ensure we continue to work more effectively in today's complex world.

Vision

"The Greater Shepparton Volunteer Strategy demonstrates Council's continued commitment to the volunteering sector.

Council understands the benefits of volunteering and the significant impact volunteering has throughout the municipality; the benefits are economic, social, cultural and environmental. "



Key Directions and Action Plan

Key Strategic Direction 1: Promotion

Promote and inform the benefits of volunteering.

Key Strategic Direction 2: Recruitment

Implement leading practice and high quality standards.

Key Strategic Direction 3: Support

Ongoing commitment to volunteer participation, support and development.

Key Strategic Direction 4: Celebrate and Recognise

Volunteers are appreciated, acknowledged and celebrated.



Introduction

Greater Shepparton City Council recognises the pivotal role that volunteers play within the community. Many community organisations, programs, clubs and sports would simply not exist without the dedication of volunteers. Volunteering is an essential community resource which promotes active citizenship and social inclusion. Volunteering extends value to our communities to make them safe, robust, inclusive and culturally rich as volunteers come from all walks of life and come together to achieve a common goal for their volunteer organisation.

Volunteering provides a vehicle for individuals or groups to address human, environmental and social needs. Volunteering is often thought of in terms of the benefits it brings to others; however it also benefits the individual, helping them to achieve their own objectives, enhance their skills and extend their experience.

The economic value of volunteers is enormous, their hard work and dedication equates to large volumes of paid work. To use Greater Shepparton as an example, according to ABS statistics 2016, if our 24,000 volunteers, did only one hour of volunteering per year (that is

far from reality), calculated at \$34.89 per hour, the value of that time would equate to \$837,360 annually. This is only a fraction of the incredible contribution to the Greater Shepparton community. Nationally, this is an estimated annual contribution of \$290 billion.

“Volunteers are the lifeblood of our community”

Greater Shepparton City Council - Volunteer Survey - 2018



What is Volunteering

Australia has a strong tradition of volunteering. Volunteers reflect the character of our nation, our distinctly Australian spirit of lending a hand and helping out. Volunteers are critical partners of, and participants in, societies throughout the world. Volunteering can be regular, episodic, formal or informal, pre-planned or a spontaneous response to emergencies. It can be done through an organisation, workplace or individually in person or online.

Definition of Volunteering

In 2015, after significant community consultation, the Peak Body – Volunteering Australia adopted the following definition:

Time willingly given for the common good and without financial gain

The new definition of 'volunteering' covers a wide range of activities, including:

- Formal volunteering that takes place within organisation (including institutions and agencies); and
- Informal volunteering (volunteering that takes place outside an organisational setting).

Source - © 2015 Volunteering Australia

Principles of Volunteering

The principles of volunteering are the result of a national consultation undertaken in 1996 with a wide range of stakeholders;

- Volunteering benefits the community and the volunteer;
- Volunteer work is unpaid;
- Volunteering is always a matter of choice;
- Volunteering is not compulsorily undertaken to receive pensions or government allowances;
- Volunteering is a legitimate way in which citizens can participate in the activities of their community;
- Volunteering is a vehicle for individuals or groups to address human, environmental and social needs;
- Volunteering is an activity performed in the not for profit sector only;
- Volunteering is not a substitute for paid work;
- Volunteers do not replace paid workers nor constitute a threat to the job security of paid workers;
- Volunteering respects the rights, dignity and culture of others; and
- Volunteering promotes human rights and equality.

Source - © 2018 Volunteering Australia

“Environmental volunteering sustains, conserves and regenerates the natural environment for the benefit of all”

Greater Shepparton City Council - Volunteer Managers Survey – 2018



Environmental Volunteers



Statistics

Statistics from the ABS Census 2016 indicate that 1 in 3 people of the Greater Shepparton population, over the age of 15, volunteer. Understanding why people volunteer makes it easier to find and keep volunteers participating. It makes sense to do everything we can to promote, support, grow and recognise volunteering, aiming to increase participation. Council acknowledges the significant contribution from our municipality's young people, in particular, those under the age of 15, that freely give their time to volunteering.

Greater Shepparton	2016		
Volunteer Status	Greater Shepparton	State of Vic	National
Volunteer	22.7%	19.2%	28.2%
Not a Volunteer	77.3%	80.8%	71.8%
Total persons aged 15+	100.0%	100.0%	100.0

Source: Australian Bureau of Statistics 2016.

Who volunteers?

- 5.7 million adult Australians (28.2%)
- Slightly more women (20.9%) than men (17.1%)
- 23.5% of those aged 40 to 49 years volunteer, the highest participation level of any age group

How many hours do they volunteer?

In 2016, there were 8.6 million volunteering involvements nationally. On average, volunteers contributed 128 hours of voluntary work in the previous 12 months or an average of 86 hours per involvement. In 2016, Australia volunteers worked a total of 743 million hours.

What do they do?

Three most common types of agencies in which people volunteer:

- Sport and recreation (31%)
- Education / training (24%)
- Welfare / community (21%)

(Sourced from the Australian Bureau of Statistics 2016.)





Statistics

Why do they volunteer?

- To help others or the community (57%)
- Personal satisfaction (44%)
- To do something worthwhile (36%)
- Social contact (22%)
- To be active / use skills (16%).

Four most common volunteering activities:

- Management/committees/committees (26%)
- Fundraising/sales (23%)
- Preparing and serving food (14%)
- Coaching/refereeing/judging (14%)

(Sourced from the Australian Bureau of Statistics 2016.)



Street Rider Volunteers





How Volunteers Contribute at Council

Greater Shepparton City Council relies heavily on volunteers to run many of our essential programs. The programs utilising volunteers include but are not limited to:

Active Living Department

Active Living is responsible for the delivery of programming that contributes to the improved physical, nutritional and mental health of the Greater Shepparton community and incorporates Aquamoves, Rural Pools, Indoor Sports Facilities and major events such as Activities In The Park and Twilight Stroll.

Events and Tourism Department

The Events and Tourism Department run, assist with events and attend various promotions annually in Greater Shepparton.

Kidstown

Volunteers support Kidsfest and other events held at Kidstown. Volunteers also assist with general maintenance; participate in gardening programs and miniature train driving assistance.

Meals on Wheels – Neighbourhoods Department

Volunteers deliver around 100 meals a day across Shepparton, Mooroopna and Tatura.

Riverlinks

Volunteers for Riverlinks work as ushers and technicians for all performances presented at the Eastbank Centre and Westside Performing Arts Centre.

Shepparton Art Museum

Volunteers provide guided tours of the Shepparton Art Museum for members of the public.

Social Connections Program – Neighbourhoods Department

Social Connections volunteer operate within the community, and provide a comprehensive range of support services for frail aged and people with a disability, who may be socially isolated, as well as their carers.

Street Rider– Neighbourhoods Department

The Shepparton Street Rider initiative provides late night transport from the nightclub district to prevent anti-social behaviour in the Shepparton CBD. This proactive and successful project is a joint partnership between Council and Victoria Police and is actively supported by multiple late night venues, Community Accessibility, Standby Security and Neighbourhood Watch. Volunteers deliver the critical component on this service, providing their time to drive residents of the community safely home.

Visitors Centre (VC) –Tourism and Events Department

Volunteers at the VC provide a first point of welcome and information for visitors to Greater Shepparton. VC volunteers play an important role as ambassadors for the Greater Shepparton area.

Some of the other Council activities that volunteers are involved in include Community Plans, Section 86 Committees, Council programs such as Council's Community Leadership Program and other short term Community Committees.



Developing the Strategy

Process

This strategy has been formed through significant consultation with volunteers and volunteer managers across the Greater Shepparton municipality. This provided an avenue for the volunteers, volunteer managers and the wider community to give feedback regarding resourcing and ideas on strengthening the volunteer sector within the Greater Shepparton municipality. This feedback has been used to shape the key strategic direction for the action plan. The consultation has enriched Council's understanding of the opportunities and challenges faced by the volunteer sector.

Consultations

Volunteers

Consultation provided an understanding of the current environment of volunteering, what is working well and opportunities moving forward. A number of different mechanisms were used to engage and consult with the volunteer community. A survey was developed and placed on the external Council website, hard copies of the survey were distributed to volunteer involving organisations and volunteer networks.

Volunteer Managers external to Council

An extensive volunteer sector engagement project was undertaken to connect with Volunteer Managers from a variety of local organisations. Volunteer managers and coordinators were encouraged to complete an online survey seeking information about the vital elements of maintaining volunteers.

Questions included:

"What is working well for your organisation's volunteers?"

"What can Council undertake to encourage more volunteers?"

The workshop provided an opportunity to give feedback on best and current practices with volunteers and identify opportunities for improvement in the future. This information was utilised to inform the development of the action plan.

Council Staff

Internal volunteer managers, volunteer coordinators and other key Council staff participated in the online survey and also came together for round table discussions to share current practices and to make suggestions on working as a collective to produce a consistent set of standards across Council. Many ideas were generated from these discussions, some highlighting trends across the different volunteering operations and some more specific to individual operations.



Feedback from Surveys

The survey of volunteers asked them to describe their volunteer experience in three words. The results clearly indicated that volunteers found their experience in volunteering rewarding and satisfying. Respondents also highlighted that they felt appreciated for their contribution.

Volunteers say that volunteering is...



"I volunteer because I like to help people and my community"

Greater Shepparton City Council - Volunteer Survey - 2018

"Our community is what it is because of the valuable work of the many volunteers"

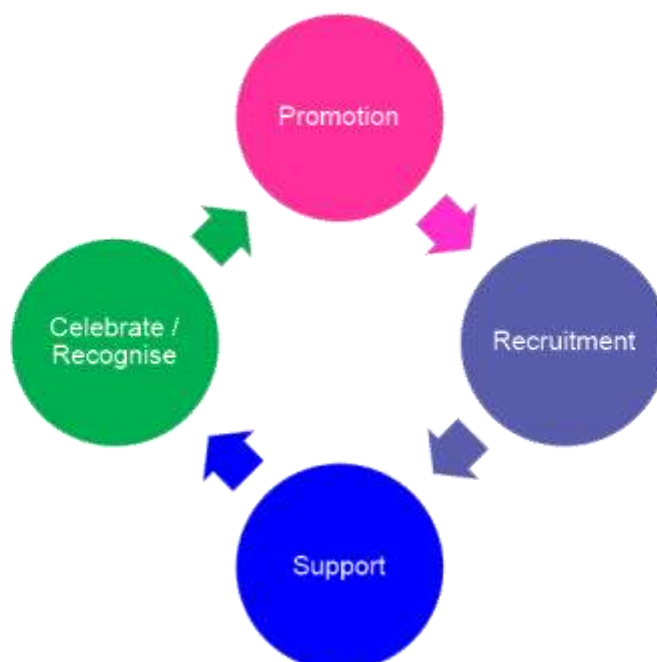
Greater Shepparton City Council - Volunteer Managers Survey – 2018

The Strategy

Key Directions and Action Plan

Through the consultation four strategic directions have been created to highlight the actions that Council will undertake to support the volunteering sector and strive for best practice for the volunteers of Greater Shepparton. The action plan consists of identified activities Council in partnership with the volunteer managers network will undertake during 2019 – 2022 based on these strategic directions.

- 1 Promotion
- 2 Recruitment
- 3 Support
- 4 Celebrate and Recognise.



Monitoring and Evaluation

The implementation of the Greater Shepparton Volunteer Strategy and Action plan will be monitored and reviewed annually. The internal volunteer managers and coordinators together with the external Volunteer Managers Network and Council's Community Strengthening team will be responsible for driving the momentum of carrying out the actions of the strategy. The strategy will be updated and reported against annually by the Council Officers.

The attached Action Plan identifies a lead agency for each action. Where Council has been identified as the lead, they will be responsible for co-ordinating the planning and implementation of the action. Some actions will be led by the Volunteer Managers Network and Council will only report on these.

The following evaluation method's will be undertaken to ensure the strategy achieve its target.

1. Annual reviews with internal volunteer managers/coordinators working group, to review measurements, ensure timelines are being adhered to; and to adjust the process where necessary.
2. Ongoing facilitation of Volunteer Managers Network meetings.
3. Annual report provided to Council outlining achievements and the current status of implementation of actions.



Celebrating and Recognising Our Volunteers



Key Strategic Directions: Action Plan 2019 - 2022



Key Strategic Direction 1: Promotion

Promote and inform on the benefits of volunteering.



Key Strategic Direction 2: Recruitment

Implement leading practice and high quality standards.



Key Strategic Direction 3: Support

Ongoing commitment to volunteer participation, support and development.



Key Strategic Direction 4: Celebrate and Recognise

Volunteers are appreciated, acknowledged and celebrated.



Definitions – Action Plan

Year 1	2019
Year 2	2020
Year 3	2021
Year 4	2022

Lead Agency: This column reflects either the Volunteer Managers Network or Council as the responsible party for coordinating the planning and delivery of the action.

Partnership: The first party listed in this column is the officer or team responsible for coordinating the planning and delivery of the action.

GSCC: Greater Shepparton City Council

VMN: Volunteer Managers Network



Key Strategic Direction 1: Promotion

Promote and inform on the benefits of volunteering.

	Action	Lead Agency	Partnerships	Measurement	Year
1.1	Continue to maintain the Volunteer Manager's Network "Quick Reference Guide" and 'Young People's Volunteer Resource' which outlines volunteering opportunities and youth specific volunteer opportunities across Greater Shepparton	VMN	GSCC - Community Development Officer GSCC - Internal Volunteer Managers	Review and update the guide twice a year or as required.	Year 1 / Ongoing
1.2	Develop a campaign plan to promote volunteering opportunities and volunteer profiles in the community, including print, website and social media.	GSCC	GSCC - Marketing and Communications VMN GSCC - People & Development	Develop campaign plan. Utilise Council's 'Calendar of Events' to highlight vacancies.	Year 1 / Ongoing
1.3	Actively promote the benefits of volunteering in educational settings such as career expos; secondary schools; community services; tertiary campuses; Neighbourhood houses.	VMN	GSCC - Community Strengthening Team GOTAFE Career teachers GSCC - Internal Volunteer Managers	Attend a minimum of two events per year.	Year 1 / Ongoing
1.4	Promote and support volunteer opportunities for young people to volunteer in the community to develop their skills and provide assistance to individuals, groups and initiatives.	GSCC	GSCC - Youth Development Officer Word and Mouth Schools	Attend two events per year or provide young people volunteer resources as required.	Year 2
1.5	To promote and support CALD community volunteering through utilising culturally appropriate methods of communications and existing networks.	GSCC	GSCC – Multicultural Development Officer VMN	Deliver information session on volunteering twice a year or as required.	Year 2 / Ongoing
1.6	To promote and support Aboriginal community volunteering through utilising culturally appropriate methods of communications and existing networks.	GSCC	GSCC - Community Strengthening Team VMN	Deliver information session on volunteering twice a year or as required.	Year 2 / Ongoing
1.7	Promote volunteer opportunities throughout the municipality using "GSCC Volunteer Ambassadors".	GSCC	GSCC - Community Strengthening VMN	Engage volunteers to determine "Volunteer Ambassadors" to promote volunteering during National Volunteer Week or as required.	Year 2
1.8	To promote and raise awareness of volunteering within Council.	VMN	GSCC - Internal Volunteer Managers Volunteer Sector	Advise Council staff, GSCC's support of volunteering through Council's Enterprise Bargaining Agreement.	Year 4 / Ongoing

Key Strategic Direction 2: Recruitment

Implement leading practice and high quality standards.

	Action	Lead Agency	Partnerships	Measurement	Year
2.1	Council will monitor its Volunteer Policy that reflects the national standards of volunteering.	GSCC	GSCC - Community Development officer GSCC - Internal Volunteer Managers	Council will review its Volunteering Policy.	Year 2
2.2	Council will monitor and review its internal volunteering recruitment process across Council.	GSCC	GSCC - Community Development officer GSCC - People & Development GSCC - Volunteer Managers	Update registration forms that are easily accessible for volunteer managers and customer service.	Year 1 / Ongoing
2.3	Create position descriptions for all volunteer positions within Council.	GSCC	GSCC - Community Development officer GSCC - People & Development GSCC - Internal Volunteer Managers	Position descriptions completed for all volunteer positions within Council.	Year 2
2.4	Monitor and review Council Volunteer Induction kit for all volunteers.	GSCC	GSCC - Community Development officer GSCC - People & Development GSCC - Internal Volunteer Managers GSCC - Governance	Update Kits developed and distributed to volunteer managers.	Year 2 / Ongoing
2.5	Explore professional development opportunities for volunteers including links with Council and Volunteer Sector Training programs.	GSCC	GSCC - Community Development officer GSCC - People & Development VMN	Identify Volunteer Manager and Volunteer specific training needs and assist to deliver.	Year 2
2.6	Council will continue to develop and utilise a central management system for the registration of volunteers and mandatory training in OHS and Code of Conduct.	GSCC	GSCC - People & Development GSCC - Community Development Officer	All current volunteers registered on existing central system. New volunteers added on sign up.	Year 2
2.7	Council will monitor emerging volunteer trends and advocate options for the sector.	GSCC	GSCC - Community Strengthening team GSCC - Marketing and Communications	Council Officer to attend regular volunteer professional development. Collect local data on volunteer trends. Evaluation of data collected.	Annually Year 3

Key Strategic Direction 3: Supporting Volunteers

Ongoing commitment to volunteer participation, support and development

	Action	Lead Agency	Partnerships	Measurement	Year
3.1	Support the Volunteer Managers Network to continue to strengthen volunteering within the municipality.	GSCC	GSCC - Community Development Officer All organisations that utilise volunteers.	Coordinate bi-monthly meetings per year hosted by various members of VMN	Year 1 / Ongoing
3.2	Support Internal Volunteer Managers/Coordinators Working Group to strengthen volunteering within council.	GSCC	GSCC - Community Development Officer GSCC - Representatives from all who manage or coordinate volunteers	Conduct a minimum of two meetings per year.	Year 1 / Ongoing
3.3	The VMN will continue to seek feedback from the volunteer sector to strengthen volunteering within the municipality.	GSCC	VMN GSCC - Internal Volunteer Managers	Conduct an annual survey to understand the volunteer experience. Gain regular feedback from Council volunteers specifically post events.	Year 1 / Ongoing
3.4	Investigate the feasibility of creating a volunteer resource space, either a physical or virtual location.	GSCC	GSCC - Community Development officer GSCC - Community Strengthening Team GSCC – Internal Volunteer Managers	Conduct a feasibility study.	Year 3 or 4
3.5	Investigate opportunities to assist volunteers to develop and enhance skills in preparation for the volunteering experience.	VMN	GOTAFE Registered Training Organisations	Identification of appropriate study opportunities. Develop a "Get Ready to Volunteer" information session, to prepare people to volunteer.	Year 2 / Ongoing
3.6	Investigate options for succession planning in the volunteer sector and continue to value volunteers	GSCC	GSCC – Community Development Officer VMN All organisations that utilise volunteers	Identify the opportunity of a Volunteer Mentor Program.	Year 2 / Ongoing
3.7	Support Volunteers as per the Municipal Emergency Management Plan	GSCC	GSCC – Emergency Management Coordinator GSCC – Community Development Officer	Investigate opportunities to provide support to MEMP volunteers. Attend MEMP meetings as required.	Year 1 / Ongoing

Key Strategic Direction 4: Celebrate and Recognise

Volunteers are appreciated, acknowledged and celebrated.

	Action	Lead Agency	Partnerships	Measurement	Year
4.1	Continue to host an annual Greater Shepparton Volunteer Recognition Awards during National Volunteer Week.	GSCC	GSCC - Community Development officer Volunteer Sector	One event per year.	Year 1 – annually in May
4.2	Council will investigate opportunities to reward volunteers through in-kind resources from within Council, other organisations and explore local business discounts for volunteers.	GSCC	GSCC - Arts, Events and Tourism Shepparton Show Me	Identification of sustainable rewards.	Year 3
4.3	Council will advocate for recognition of the municipality's volunteers by profiling local volunteers in the media.	GSCC	GSCC - Internal volunteer managers GSCC - Marketing and Communications	Prepare two media releases per year to celebrate and recognise volunteers.	Year 1 / Ongoing
4.4	Volunteer Manager Network will prepare media releases profiling local volunteers.	VMN	GSCC - Community Development officer Media organisations	Advocate with local media sources for volunteer promotion every two months.	Year 1 / Ongoing
4.5	Investigate volunteer recognition programs and opportunities for Council volunteers	GSCC	GSCC - Community Development officer GSCC - Internal volunteer managers GSCC - People & Development	Development of a CEO directive or guidelines	Year 3 or 4



GREATER
SHEPPARTON

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ATTACHMENT TO AGENDA ITEM

Ordinary Meeting

19 March 2019

Agenda Item 7.2 Volunteer Policy 07.POL.3 Review

Attachment 1 Volunteer Policy 07.POL.3 76

GREATER SHEPPARTON CITY COUNCIL

Policy Number 07.POL.3

Volunteer Policy

Version 2.0

Adopted 19 April 2016

Last Reviewed 26 February 2019

Business Unit:	Community Strengthening
Responsible Officer:	Community Development Officer
Approved By:	Chief Executive Officer
Next Review:	August 2022

PURPOSE

Greater Shepparton City Council recognises, where there is a vibrant culture of volunteering, communities are stronger due to the inclusiveness volunteering promotes in the community. Volunteers play a vital role in the Greater Shepparton community with many clubs, groups and organisations relying heavily on volunteers to continue to deliver the services and functions they provide to the community. Volunteering is an essential community resource which promotes active citizenship and social inclusion. This policy outlines Council's commitment to volunteers across the municipality.

OBJECTIVE

The following list of objectives has been developed for how Council interacts with volunteers:

- Ensure standards of best practice and consistency in supporting volunteers within Council and the municipality
- Provide a consistent approach to recruitment of volunteers across Council
- Engage and retain volunteers
- Recognise and celebrate volunteers across the municipality
- Work to raise the profile of volunteering across the municipality
- Respond to emerging trends and issues in the volunteer sector

SCOPE

Council is committed to the vision of volunteering within our region, recognising that volunteers are essential to all of Council's programs. Council relies heavily on volunteers to run many of our essential programs. This policy ensures volunteers across the municipality are supported with standards of best practice and consistency.

DEFINITIONS

Reference term	Definition
Volunteer	Volunteering is time willingly given for the common good and without financial gain
Greater Shepparton City Council's Volunteer Strategy 2019-2022	This document outlines Council's commitment to volunteers through key directions and action planning.
Volunteering Australia	Peak body in Australia for volunteering organisations and volunteers.
National Standards for Volunteer Involvement	Set of standards created by Volunteering Australia to manage volunteers and volunteer programs.
Principles of Volunteering	Rationale for involving volunteers in projects, activities and or programs

POLICY

1. Definition of Volunteering

Volunteering Australia defines that volunteering is time willingly given for the common good and without financial gain.

Greater Shepparton City Council as a local government body reflects this definition in their commitment to volunteers.

2. Principles of Volunteering

Volunteering Australia developed the Principles of Volunteering in 1996 as a result of national consultation. These principles are a rationale or philosophy for involving volunteers in programs. Greater Shepparton City Council accepts these Principles of Volunteering:

- Volunteering benefits the community and the volunteer
- Volunteer work is unpaid
- Volunteering is always a matter of choice
- Volunteering is not compulsorily undertaken to receive pensions or government allowances
- Volunteering is a legitimate way in which citizens can participate in the activities of their community
- Volunteering is a vehicle for individuals or groups to address human, environmental and social needs
- Volunteering is not a substitute for paid work
- Volunteering respects the rights, dignity and culture of others
- Volunteering promotes human rights and equality

3. National Standards for Volunteer Involvement

Volunteering Australia has developed National Standards for volunteering, consisting of eight key elements. These elements represent the main activities that typically occur in organisations that involve volunteers regardless of their size or function. Greater Shepparton City Council has reflected the below key elements through the Procedure:

- **Leadership and Management:**
The governing body and senior employees lead and promote a positive culture towards volunteering and implement effective management systems to support volunteer involvement. This standard assists the organization to provide clear direction and guidance for the work of volunteers, as well as understand and mitigate any risks related to involving volunteers.
- **Commitment to Volunteer Involvement:**
Setting out its commitment to volunteer involvement ensures that the organisation has a clear idea of why it is involving volunteers, the values and principles it will apply in its work with volunteers, and how the involvement of volunteers will enhance and support the work of the organisation.
- **Volunteer Roles:**
Volunteer are engaged in meaningful and appropriate roles which contribute to the organisations purpose, goals and objectives. This standard assists the organisation to match volunteers with appropriate work roles, provide relevant

and satisfying activities for volunteers and ensure involvement of volunteers contributes to the organisation.

- **Recruitment and Selection:**
Recruitment and selection ensures that the organisation is effective in attracting appropriate volunteers and in screening to maintain safety and security. This standard helps ensure the organisations ensure prospective volunteers are provided with information to make informed decisions about working with the organisation to implement consistent procedures for assessing, selecting and placing new volunteers.
- **Support and Development:**
Volunteers understand their roles and gain knowledge, skills and feedback needed to safely and effectively carry out their duties. This standard assists the organisation to identify and provide orientation, skills development and ongoing support needed by volunteers, and to manage situations fairly and consistently where a volunteer may not be meeting the requirement of their role.
- **Workplace Safety and Wellbeing:**
The health safety and wellbeing of volunteers is protected in the workplace. This standard assists the organisation to meet its obligations for the health and safety of volunteers, manage risk and provide a supportive and responsive workplace for volunteers.
- **Volunteer Recognition:**
Volunteer contribution, value and impact is understood, appreciated and acknowledged. Volunteer recognition ensures that the organisation understands the contribution made by its volunteers and that it lets them know that this contribution is appreciated. This standard assists the organisation to develop and maintain a respectful relationship with its volunteers, ensuring that volunteers are encouraged to actively participate in the business of the organisation, provide feedback and appreciate the way their work benefits the organisation.
- **Quality Management and Continuous improvement:**
Effective volunteer involvement results from a system of good practice, review and continuous improvement. This ensures that the organisation has a way of monitoring how well its involvement of volunteers is working, and identifying and implementing ways of improving the outcomes for both volunteers and organisation. This standard assists the organisation to follow good practice in its policies and procedures, implement processes for review and evaluation, and systematically make ongoing positive change.

4. Council's Key Strategic Directions

Council adopted the Volunteer Strategy and Action Plan 2019-2022. The strategy provides a framework to ensure best practice standards of Council's volunteers at a local level. Below are listed key strategic directions in which Council endeavours to achieve in the volunteer sector.

- **Key Strategic Direction 1: Promotion**
Promote and inform on the benefits of volunteering
- **Key Strategic Direction 2: Recruitment**
Implement leading practices and high quality standards
- **Key Strategic Direction 3: Supporting Volunteers**

Ongoing commitment to volunteer participation, support and development

- Key Strategic Direction 4: Celebrate and Recognise
- Volunteers are appreciated, acknowledged and celebrated

RELATED POLICIES, DIRECTIVES AND GUIDELINES

- Greater Shepparton City Council, Council Plan 2017-2021
Social 2.6: Volunteering is promoted and encouraged along with other measures to improve community resilience
- Community Development Framework
- Community Engagement Strategy
- Greater Shepparton City Council Volunteer Strategy and Action Plan 2019-2022
- Managing Volunteers Corporate Procedure

RELATED LEGISLATION

- N/A

REVIEW

This policy will be reviewed every 4 years by the Community Development Officer in partnership with internal and external stakeholders. It may be reviewed earlier upon recommendation from Greater Shepparton City Council Executive Team.

Peter Harriott
Chief Executive Officer

Date

ATTACHMENTS:

Appendix A: Title of Appendix
Attachment 1: Managing Volunteers Procedure
Volunteer Induction Booklet

ATTACHMENT TO AGENDA ITEM

Ordinary Meeting

19 March 2019

Agenda Item 7.3	Greater Shepparton Multicultural Strategy 2019-2022	
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Acknowledgment of Traditional Owners

We, the Greater Shepparton City Council, acknowledge the traditional owners of the land which now comprises Greater Shepparton. We pay respects to their tribal elders, we celebrate their continuing culture and we acknowledge the memory of their ancestors.



Aboriginal dance by the Dungala Dancers at the launch of Cultural Diversity Week



Mayor Foreword

Greater Shepparton community come from many backgrounds, starting with the rich cultural traditions of the First Australians. For decades, Greater Shepparton has been the home for thousands of migrants, refugees and asylum seekers. Greater Shepparton City Council is proud of our immigration history and the resulting diverse community we now enjoy.

Greater Shepparton's multicultural community is now made up of people from over 50 countries, who speak more than 40 different languages. Our community comes from different places around the world bringing with it many languages, faiths and cultures that enrich the fabric of the community.

Greater Shepparton City Council has been actively involved in the promotion and celebration of cultural diversity in the community for many years and is continually striving to improve the wider community's awareness and understanding of the economic, educational, social and cultural benefits of multiculturalism and to mitigate the effects of racism and cultural isolation for multicultural communities in Greater Shepparton

Greater Shepparton City Council is committed to continuing to work for a vibrant, cohesive community that celebrates and incorporates aspects of cultural diversity within daily life. It values the partnerships we have made with service providers and organisations as well as the relationships with communities and community leaders.

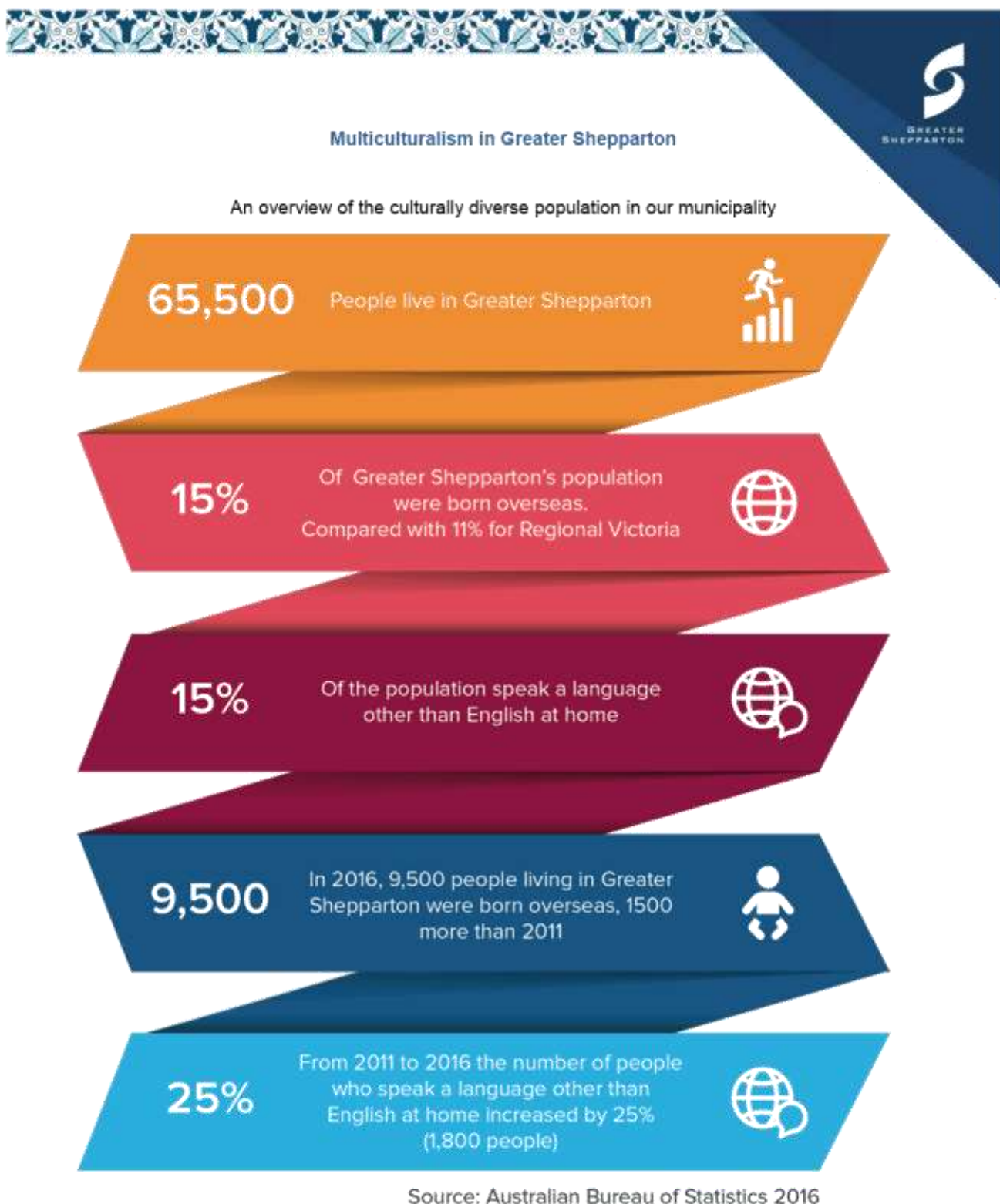
To develop this Strategy Council has undertaken extensive consultation with the community, service providers, educational institutions and a host of other organisations. These consultations have been undertaken in workshop settings, through one-on-one conversations and via surveys. All feedback has been considered and discussed with the relevant parties with a commitment made to drive forward the actions within the strategy.

Greater Shepparton City Council wishes to thank everyone that has contributed to the development of this Strategy and who will be involved in its success. We look forward to working in partnership with our partners and the community to achieve the outcomes identified in this Strategy. Together we can continue to be a welcoming and connected community where everyone feels welcome and encouraged to share their own cultural experiences with others in the community.



Cr Kim O'Keeffe
Mayor
Greater Shepparton City Council





Our Community

Greater Shepparton is a regional hub that enjoys significant cultural, spiritual and historical heritage, both new and old from our long history of migration to the region.

Greater Shepparton has attracted settlement from a wide range of migrants for a variety of reasons dating back to World War I. Greater Shepparton is very proud of a long migration history and the resulting culturally diverse community that call it home.

Australian Bureau of Statistics (ABS) figures show that the 'Total Overseas – Born' statistic for Greater Shepparton is 9,500 persons. Whilst the ABS is the only formal measure of population, anecdotal evidence from local sector organisations suggest that the overall number of people born overseas is likely to be under represented for Greater Shepparton.



Children enjoy dance moves at 'Converge on the Goulburn'

Greater Shepparton City Council's Vision

Greater Shepparton City Council's vision is to promote and facilitate good multicultural practice and leadership within and across the municipality. This vision is aligned with the Municipal Association of Victoria's Statement of Commitment to Cultural Diversity.

Greater Shepparton is one of Victoria's great multicultural areas and our diversity is fundamental to our identity, contributing to our economic, social, political and cultural life. Council shares the vision with our community of providing an embracing, and supportive environment, where everyone can celebrate and share their diverse cultures.

Council will continue to work towards creating a more vibrant, cohesive community that celebrates and incorporates aspects of cultural diversity within daily life. It is essential that we continue to be a welcoming place for migrants and multiculturalism into the future and provide appropriate services specific to multicultural communities.





Background and Key Achievements since 2012

Considering the cultural diversity of our region, it is imperative that Council highlight its commitment to cultural diversity by continuing to develop a strategy that has direct focus on multiculturalism. In the past, Council has supported diversity through a range of means and has dedicated a Multicultural Development Officer whose role is to support multicultural development within the Greater Shepparton municipality and to enhance participation of our culturally diverse community. In 2012 the first Cultural Diversity and Inclusion Strategy was adopted and was based on valuing community, including their opinions and perspectives, recognising and celebrating diversity and fostering social cohesion. The second Cultural Diversity and Inclusion Strategy was launched in 2015 and was designed to build on the achievements already made by Council and the community through the actions of the first Strategy. Some of the key outcomes and activities achieved in the delivery of previous strategies include:

- 'Racism. It stops with me' campaign
- 'Refugee Welcome Zone' status
- St George's Rd Food Festival as an established Council festival
- Annual Our Community, Our Culture calendar
- Annual Cultural Diversity Week launch and calendar of events
- Cultural Bus Tour to places that are culturally and religiously significant
- Annual Refugee Week launch and calendar of events
- 'Speed Date a Muslim' in Greater Shepparton





Sikh Martial Arts performance at 'Converge on the Goulburn'

Development of the Multicultural Strategy 2019-2022

This Strategy has been developed based on engagement with community, current research and literature and other related strategies and plans of Council. Community events and broader consultations were used to connect with and discuss the future of multiculturalism in Greater Shepparton. Council used a variety of consultation methods to ensure a diverse range of community and organisations were consulted and part of the planning process.

This Strategy is encompassed within the social theme of the Council Plan 2017-2021 and linked directly to objective 2.7 'Greater Shepparton is valued for cultural celebrations, inclusion and engagement of our diverse communities'.

The Council plan is the key tool that drives the strategic direction of Council over the next four years and is a requirement under the local Government Act (1989).

The development of this Strategy is designed to build on the work already undertaken and to strengthen partnerships between Council and the regions multicultural communities, service providers and other cultural stakeholders. It is inclusive of the entire community with a special focus on multicultural communities.

As our community in Greater Shepparton continues to embrace inclusiveness and develop a greater understanding of multiculturalism, this Strategy takes a holistic view on all multicultural opportunities. The previous Cultural Diversity and Inclusion Strategies set the foundation for this new Multicultural Strategy. This Strategy places a stronger emphasis on acceptance and understanding whilst encapsulating the celebration of cultural diversity.



Community conversation during the launch of Refugee Week 2018

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The Action Plan

This Strategy complements the significant range of activities that already contribute to building social cohesion through existing council policies, strategies and plans. It identifies directions and actions where a collaborative effort by Council, organisations, groups and individuals jointly deliver outcomes that enhance the social cohesiveness of our community.

This Strategy will be implemented by Greater Shepparton City Council and partners through the associated Action Plan. Council encourages all local organisations and businesses to adopt the values of the Multicultural Strategy and support the implementation of the Plan.

Any actions from the Plan requiring additional resources will be considered through Council's annual budgetary processes.

Priority areas in this action plan will focus the delivery of actions through the following three priority areas:



Valuing Cultural Diversity

Acceptance and recognition of diverse cultures enriches experiences for people from all walks of life. Taking steps to settle and engage new and established residents, and visitors in a matter that welcomes and connects them to the Greater Shepparton community will build a sense of belonging.



Accessing Opportunity

Fostering of relationships, creating opportunities and accessing education, business and employment services will provide for improved skills and career opportunities. The promotion and effective involvement of people from a multicultural background in these activities will support a prosperous future for all.



Enabling Contribution and Participation

Expanding knowledge and fostering an environment that enables people from a multicultural background to actively contribute and participate in community life, will strengthen the cohesiveness of our community.

The Multicultural Strategy 2019-2022 and associated Action Plan is considered a living document and will be reviewed and reported on by Council annually.



Key Agencies

The following are the key agencies that will partner with Greater Shepparton City Council to deliver the actions of the Multicultural Strategy 2019-2022:

- Ethnic Council of Shepparton and District Inc.
- Primary Care Connect
- Shepparton Interfaith Network
- Emergency Services Network
- Goulburn Valley Business Rural and Industry Network
- Department of Health and Human Services
- Greater Shepparton Family Violence Prevention Network
- Multicultural Arts Victoria
- Centre for Multicultural Youth
- Community Hubs
- Other service providers within the municipality who have an interest in certain actions within the Strategy
- Uniting
- Victoria Police
- GOTAFE
- GV Libraries
- Department of Justice
- Beyond Housing
- Berry Street
- FamilyCare
- GV Health
- Youth Services
- Neighbourhood Houses

Definitions

Community People living or working within Greater Shepparton.

Council Greater Shepparton City Council.

Diversity The use of the word diversity in this Multicultural Strategy refers to cultural diversity.

Volunteers People in Greater Shepparton who willingly give up their time for the common good and without financial gain.

Australia's First Peoples A person who is of an Aboriginal descent, a person who identifies as an Aboriginal, or a person who is accepted as an Aboriginal person by the community in which he or she lives.

Local Organisations Local organisation within the municipality with an interest in certain actions within the Strategy.

CALD Community Members of the community that are from a multicultural background and speak a language other than English.

Multicultural Community Members of the community that identify to be from a multicultural background.

Social Cohesion A socially cohesive community is one which works towards the wellbeing of all its members, fights exclusion and marginalisation, creates a sense of belonging, promotes trust and offers its members the opportunity of upward mobility.

Inclusion All people have the right to feel respected and appreciated as valuable members of the community.



Greater Shepparton Multicultural Strategy 2019-2022 – Action Plan - DRAFT

1. Valuing Cultural Diversity

Valuing Cultural Diversity: Acceptance and recognition of diverse cultures enriches experiences for people from all walks of life. Taking steps to settle and engage new and established residents, and visitors in a matter that welcomes and connects them to the Greater Shepparton community will build a sense of belonging.


	ACTION	MEASURE	RESPONSIBILITY/PARTNERS	YEAR
VCD 1.1	Continue to provide significant cultural festivals and events to support the community to showcase their many cultures	Council to continue to coordinate Converge on the Goulburn and St George's Rd Food Festival in partnership with community and funding bodies	GSCC (Events) Shepparton Festival Community Local Organisations	Annually
VCD 1.2		Coordinate a committee of local service providers and organisations to deliver a collaborative event for Cultural Diversity Week and Refugee Week	GSCC (Multicultural Development Officer) Local Service Providers Local Organisations Local Businesses Community	Annually
VCD 1.3		Develop a Cultural Diversity Week and Refugee Week calendar of events highlighting the events and programs taking place across the municipality	GSCC (Multicultural Development Officer) Local Service Providers Local Organisations	Annually
VCD 2.1	Support public events that educate the wider community on cultural and religiously significant days	Council to support community lead events by assisting with planning, promoting and providing access to council owned spaces	GSCC (Multicultural Development Officer) Multicultural Community Local Organisations	Ongoing
VCD 2.2		Conduct a minimum of one information session to guide and support the CALD community to lead their own events	GSCC (Multicultural Development Officer) GSCC (Events) GSCC (Risk and Assurance) GSCC (Marketing and Communications)	Annually





	ACTION	MEASURE	RESPONSIBILITY/PARTNERS	YEAR
VCD 2.3		Investigate the opportunity to create a biannual Multicultural Public Forum	GSCC (Multicultural Development Officer) Ethnic Council of Shepparton and District Inc. Local Organisations Local Businesses	2019
VCD 2.4		Support multicultural community groups to hold events that celebrate their culture in small towns	GSCC (Multicultural Development Officer) GSCC (Community Development Officer) GSCC (Economic Development) Multicultural Community Local Businesses	2021
VCD 3.1	Provide and support public places and spaces that contribute to a sense of belonging for people from multicultural backgrounds	Investigate the opportunity to provide a space in the CBD for communities to showcase their culture	GSCC (Multicultural Development Officer) GSCC (Economic Development) Multicultural Community	2019
VCD 3.2		Investigate the opportunity to showcase the rich history of migration in the area through art	GSCC (Multicultural Development Officer) GSCC (Economic Development) Local Organisations Multicultural Community	2020
VCD 3.3		Promote community spaces within the municipality that are culturally appropriate to multicultural communities	GSCC (Multicultural Development Officer) Ethnic Council of Shepparton and District Inc. African House Philippine House Local Organisations	Annually
VCD 4.1	Promote our multicultural precincts	Coordinate St George's Rd Food Festival	GSCC (Events) Local Organisations Local Businesses GSCC (Environmental Health) GSCC (Multicultural Development Officer)	Annually
VCD 4.2		Introduce the community to our multicultural precincts through tours	GSCC (Multicultural Development Officer) GSCC (Events) Ethnic Council of Shepparton and District Inc. Local Businesses	Annually





	ACTION	MEASURE	RESPONSIBILITY/PARTNERS	YEAR
VCD 5.1	Undertake regular consultation and engagement with the multicultural communities	Investigate the opportunity to establish a community representative committee to consult with on multicultural matters	Ethnic Council of Shepparton and District Inc. GSCC (Multicultural Development Officer) Multicultural Community Local Organisations	2019
VCD 5.2		Attend and support existing consultation and engagement opportunities	GSCC (Multicultural Development Officer) Local Organisations Multicultural Community	Ongoing
VCD 6.1	Celebrate and recognise new citizens	Hold a minimum of two citizenship ceremonies within large scale events	GSCC (Multicultural Development Officer) GSCC (Governance)	Annually
VCD 6.2		Investigate the opportunity to introduce awards that recognise new citizens during the annual Volunteer and Australian of the year awards	GSCC (Multicultural Development Officer) GSCC (Community Development Officer) GSCC (Events)	2020
VCD 7.1	Provide recreational opportunities for multicultural communities that are culturally appropriate	Work with local sport facilities and organisation to identify, promote and engage multicultural communities in active activities	GSCC (Multicultural Development Officer) GSCC (Active Living) Aquamoves Sporting Organisations	Annually
VCD 7.2		Provide a minimum of one education workshop on available free and low-cost recreational opportunities for multicultural communities	GSCC (Multicultural Development Officer) GSCC (Active Living) Sporting Organisations	Annually
VCD 8.1	Promote Council events to multicultural communities	Promote Council events and activities through targeted multicultural media and key community members	GSCC (Multicultural Development Officer) GSCC (Marketing and Communications) Local Organisations	Ongoing
VCD 9.1	Promote local multicultural art, artists and performers	Identify opportunities to collaborate with local organisations to create a Multicultural Art Exhibition	GSCC (Multicultural Development Officer) Local Organisations Shepparton Art Museum	Annually



	ACTION	MEASURE	RESPONSIBILITY/PARTNERS	YEAR
VCD 9.2		Support upcoming performers by involving them in large scale events such as Converge on the Goulburn and St George's Rd Food Festival	GSCC (Multicultural Development Officer) GSCC (Youth) Local Organisations	2021
VCD 9.3		Promote local art workshops to multicultural communities	GSCC (Multicultural Development Officer) Local Organisations Shepparton Art Museum	Ongoing
VCD 10.1	Continue to support initiatives that support reducing racism and discrimination	Support and promote anti-racism initiatives, campaigns and workshops	GSCC (Multicultural Development Officer) Local Organisations Victoria Police	Annually
VCD 11.1	Provide public education on culture and religion to improve knowledge and understanding	Develop annual 'Our Community, Our Culture' calendar highlighting information on important cultural and religious dates and incorporating local images	GSCC (Multicultural Development Officer) Shepparton Interfaith Network Local Organisations Multicultural Community	Annually
VCD 11.2		Provide a minimum of one Multicultural Bus Tour to the public per year	GSCC (Multicultural Development Officer) Local Organisations Multicultural Community	Annually
VCD 11.3		Investigate the opportunity to provide educational presentations to schools and organisations about multiculturalism in Greater Shepparton	GSCC (Multicultural Development Officer) Local Schools Local Organisations	2022

"I am proud of Greater Shepparton's multicultural community. It makes it so much better to live in a community that has such diversity."

Greater Shepparton City Council – Multicultural Strategy Survey - 2018




Greater Shepparton Multicultural Strategy 2019-2022 – Action Plan - DRAFT

2. Accessing Opportunity

Fostering of relationships, creating opportunities and accessing education, business and employment services will provide for improved skills and career opportunities. The promotion and effective involvement of people from a multicultural background in these activities will support a prosperous future for all.

	ACTION	MEASURE	RESPONSIBILITY/PARTNERS	YEAR
AO 1.1	Promote and support multicultural community volunteering to increase social connectedness	Distribute relevant information on volunteering opportunities to multicultural communities	GSCC (Multicultural Development Officer) GSCC (Community Development Officer) Multicultural Community	Annually
AO 1.2		Provide a minimum of one information session per year on volunteering opportunities in Greater Shepparton	GSCC (Multicultural Development Officer) GSCC (Community Development Officer) Volunteer Managers Network	2021
AO 2.1	Promote available aged and disability services to the multicultural communities	Promote Council's aged and disability services	GSCC (Multicultural Development Officer) GSCC (Aged and Disability)	Ongoing
AO 2.2		Distribute relevant information on aged and disability services to multicultural communities	GSCC (Multicultural Development Officer) GSCC (Aged and Disability) Local Organisations	Ongoing
AO 3.1	Raise awareness of Australian Laws within the multicultural communities	Conduct a minimum of one multicultural community awareness session annually to raise awareness of Australian Laws	GSCC (Multicultural Development Officer) GSCC (Community Safety Officer) Victoria Police Local Organisations	Annually
AO 4.1	Create stronger relationships between emergency services and the multicultural communities	Provide opportunities for emergency services and the multicultural community to engage and mutually understand the roles of each party including representation at cultural events	GSCC (Multicultural Development Officer) GSCC (Emergency Management) GSCC (Community Safety Officer) Emergency Service Providers	Ongoing



	ACTION	MEASURE	RESPONSIBILITY/PARTNERS	YEAR
AO 4.2		Support initiatives that educate multicultural communities to better understand emergency hazards and how to connect with the emergency services, information and service providers	GSCC (Multicultural Development Officer) GSCC (Emergency Management) Emergency Service Providers	Annually
AO 5.1	Encourage education programs and initiatives that prevent or reduce Family Violence, including the impact on individuals and community	Support Victoria Police and the Greater Shepparton Family Violence Prevention Network in identifying opportunities to raise awareness of primary prevention of family violence within multicultural communities	GSCC (Multicultural Development Officer) GSCC (Community Safety Officer) Victoria Police Local Organisations Greater Shepparton Family Violence Prevention Network	Annually
AO 6.1	Support the education of the risks of alcohol and other drugs	Explore and apply for external funding opportunities to implement community education sessions for the multicultural community regarding alcohol and other drugs	GSCC (Multicultural Development Officer) GSCC (Community Safety Officer) GSCC (Youth Officer)	Annually
AO 7.1	Assist communities in the establishment of business and social enterprises	Work in collaboration with business industry support agencies to provide opportunities to educate and support multicultural communities to promote entrepreneurship	GSCC (Multicultural Development Officer) GSCC (Business Development Coordinator) Ethnic Council of Shepparton and District Inc. Local Organisations Local Businesses	Annually
AO 8.1	Support leadership within the multicultural communities	Engage with and support the multicultural community to participate in the Greater Shepparton Community Leadership Program	GSCC (Multicultural Development Officer) GSCC (Community Development Officer) Local Organisations	Ongoing
AO 8.2	Develop multicultural communities capacity to apply for funding	Facilitate a minimum of one grants workshop for multicultural communities per year	GSCC (Multicultural Development Officer) GSCC (Community Development Officer) GSCC (Grants)	Annually



	ACTION	MEASURE	RESPONSIBILITY/PARTNERS	YEAR
AO 9.1	Identify and promote work experience programs to the multicultural community	Explore opportunities for work experience to the Multicultural community	GSCC (Multicultural Development Officer) GSCC (People and Performance) Local Businesses	2019
AO 10.1	Maximise participation in interpretation courses to provide more local interpreters	Promote available interpreter courses locally as they become available	GSCC (Multicultural Development Officer) GOTAFE Local Organisations	Ongoing
AO 11.1	Increase the utilisation of local libraries by the multicultural communities	Promote programs, events and services by the local libraries to multicultural communities	GV Libraries GSCC (Multicultural Development Officer)	Ongoing
AO 11.2		Work with and support GV Libraries to run workshops in the libraries	GSCC (Multicultural Development Officer) GV Libraries	2022

“Thank you for supporting the diversity in the community. We need to have more people embrace, the richness multiculturalism bring to us.”

Greater Shepparton City Council – Multicultural Strategy Survey - 2018



Greater Shepparton Multicultural Strategy 2019-2022 – Action Plan - DRAFT

3. Enabling Contribution and Participation

Expanding knowledge and fostering an environment that enables people from a multicultural background to actively contribute and participate in community life, will strengthen the cohesiveness of our community.

	ACTION	MEASURE	RESPONSIBILITY/PARTNERS	YEAR
ECP 1.1	Increase the cultural diversity of staff in Council, local businesses and organisations	Promote Council jobs to multicultural communities	GSCC (Multicultural Development Officer) GSCC (People and Development) GSCC (Marketing and Communication)	Annually
EPC 1.2		Provide an information session on Council's recruitment procedures and job opportunities	GSCC (Multicultural Development Officer) GSCC (People and Development)	2022
EPC 1.3		Support initiatives that promote and support skilled multicultural community members to local business and organisations	GSCC (Multicultural Development Officer) GSCC (Economic Development) Local Organisations Local Businesses	Annually
EPC 2.1	Explore opportunities for work experience, apprenticeship and traineeships for the multicultural communities	Promote work experience, apprenticeship and traineeship opportunities to multicultural communities	GSCC (Multicultural Development Officer) GSCC (People and Development) Local Organisations Local Businesses	Ongoing
EPC 2.2		Explore the opportunity to provide multicultural students with work experience at Council	GSCC (Multicultural Development Officer) GSCC (People and Development) GOTAFE Registered Training Organisations	Annually
EPC 3.1	Provide opportunities for consultation and feedback to ensure that any new or redeveloped public buildings are designed to be more culturally appropriate	Promote consultation opportunities as they arise	GSCC (Multicultural Development Officer)	Ongoing

	ACTION	MEASURE	RESPONSIBILITY/PARTNERS	YEAR
EPC 4.1	Facilitate and educate the multicultural community on the building and planning permit application processes	Provide a minimum of one information session per year on building and planning permit application processes	GSCC (Building and Planning) GSCC (Multicultural Development Officer)	Annually
EPC 5.1	Promote the need for suitable and affordable accommodation options in Greater Shepparton	Advocate for greater availability of housing options in Greater Shepparton for our community	GSCC (Multicultural Development Officer) GSCC (Building and Planning) Department of Health & Human Services Beyond Housing	Ongoing
EPC 6.1	Continue to increase Council staff knowledge, skills and awareness on multiculturalism	Provide new employees with an educational presentation as part of the Council induction process	GSCC (Multicultural Development Officer) GSCC (People and Development)	2019
EPC 6.2		Review of Language Service Procedure four yearly	GSCC (Multicultural Development Officer)	2019
EPC 6.3		Make available cultural awareness training to employees on an annual basis	GSCC (People and Development) GSCC (Multicultural Development Officer)	Ongoing
EPC 6.4		Multicultural Development Officer to attend a minimum of four Council staff department meetings per year	GSCC (Multicultural Development Officer) GSCC (All Departments)	Annually
EPC 7.1	Continue to improve information of Council services	Undertake regular promotions of the MILS to the community	GSCC (Multicultural Development Officer) GSCC (Marketing and Communications)	Annually
EPC 7.2		Undertake annual review of information available on the MILS for accuracy	GSCC (Multicultural Development Officer)	Annually
EPC 7.3		Continue to provide translated Council material to multicultural communities	GSCC (All Departments)	Ongoing



	ACTION	MEASURE	RESPONSIBILITY/PARTNERS	YEAR
EPC 8.1	Continue advocacy and partnerships on key networks and working groups to support the multicultural communities in Greater Shepparton	Maintain representation and attend policy making working groups and key network meetings	GSCC (Multicultural Development Officer) GSCC (Manager of Neighbourhoods)	Annually
EPC 9.1	Ensure that council services are culturally appropriate to multicultural communities	Regularly review work practices to ensure that all services provided by council are culturally appropriate	GSCC (All Departments)	Ongoing

"I believe that the level of multiculturalism in Shepparton is one of its strengths."

Greater Shepparton City Council – Multicultural Strategy Survey - 2018



Notes

[illegible]



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RACISM. IT STOPS WITH ME

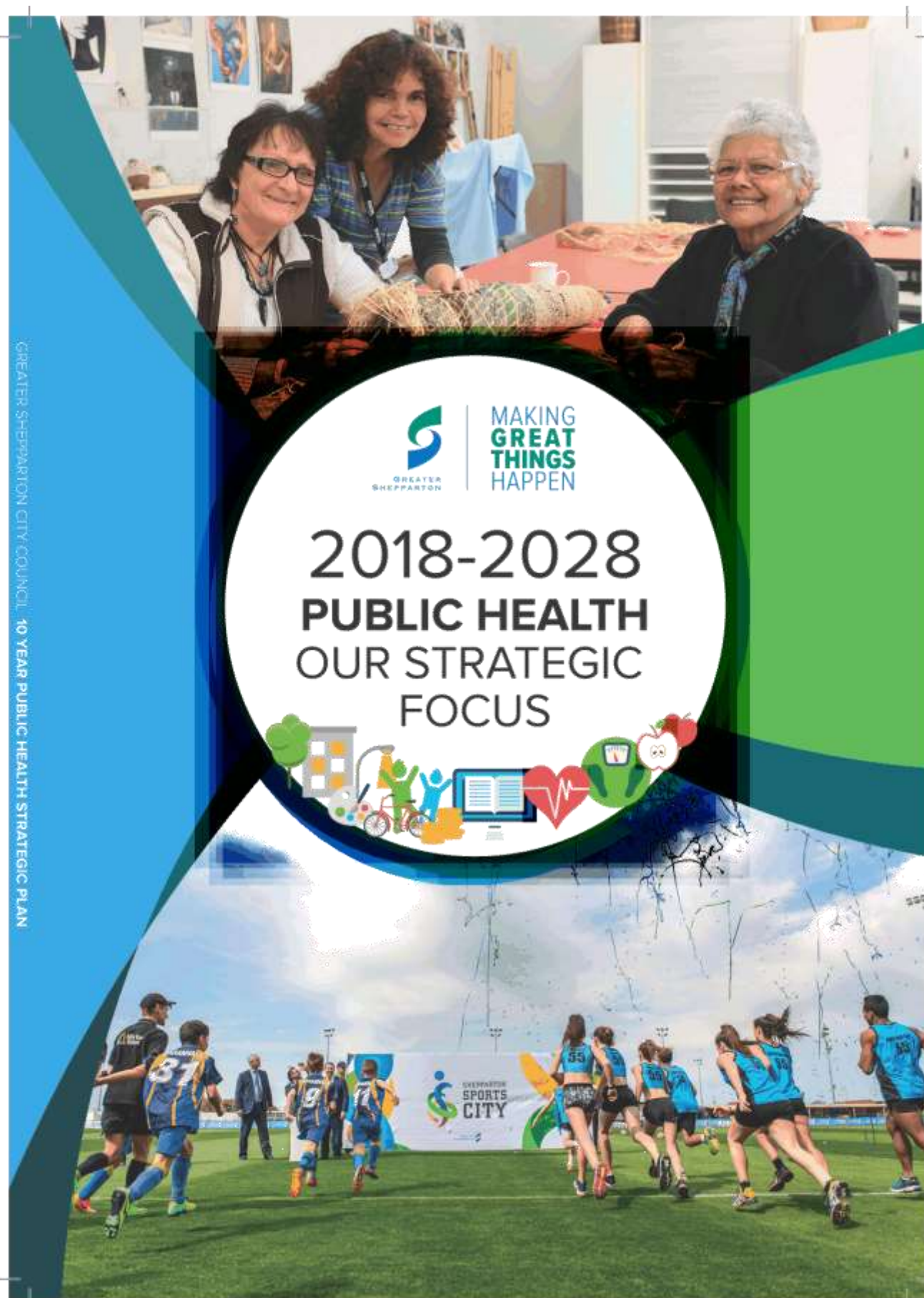


ATTACHMENT TO AGENDA ITEM

Ordinary Meeting

19 March 2019

Agenda Item 7.4	Greater Shepparton Public Health Strategic Plan 2018 - 2028	
Attachment 1	Greater Shepparton Public Health Strategic Plan 2018 - 2028	120



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Active Living Department**

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Join the conversation:    

Feedback is encouraged and clarification available.

The participation, contribution and assistance of the Greater Shepparton Public Health Advisory Committee to develop this Strategic Plan has been acknowledged and appreciated, including many local partner organisations and community member representatives.

DISCLAIMER

While all due care has been taken to collate information in this publication to ensure the most accurate and current data is provided at this point in time, there may be unintentional errors or omissions, or the information may be subject to variation. Sources are provided. No legal responsibility is accepted for the information and opinions given herein.

Greater Shepparton City Council
Released August 2017





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Message from the Mayor

It is with great pleasure that Council convenes the Greater Shepparton Public Health Advisory Committee and on behalf of the committee, presents the Greater Shepparton Public Health Strategic Plan.

As chair of the committee, creating an environment that enables people to lead a healthy lifestyle is important. As a community, we strive to make Greater Shepparton a municipality that facilitates increased physical activity, access to affordable healthy food, less reliance on private motor vehicles and thus improved air quality and reduced injury, giving attention to the provision of shade and sun protection, and consideration of how to reduce injury in the urban environment through appropriate design.

Local research and data indicates we need to collectively focus on a diverse range of health and wellbeing indicators, including but not limited to public transport and walkability, prevention of family violence and the prevalence of overweight and obesity.

While Council services were not traditionally considered to be 'health services', they are now acknowledged as delivering clear health benefits to the community. Services including maternal and child health, youth and children's services, aged services, sport, parks and recreation, art and performing arts, tourism and events, economic development, public health planning and services, environmental services as well as a range of community programs and initiatives all encourage our community to lead a healthy lifestyle.

The Greater Shepparton Public Health Advisory Committee, which has representation from primary and community health services, education, transport and business sectors as well as Council representation reflects the importance of health and wellbeing to the overall liveability of our municipality.

Working together across all sectors of our community will ensure a collaborative effort in ensuring we respond to local health issues that impact on our community.

I look forward to working with you all as we strive to create a healthier, welcoming and liveable Greater Shepparton.

Mayor Kim O'Keeffe

Greater Shepparton City Council
Chair Greater Shepparton Public Health
Advisory Committee



Executive Summary

Greater Shepparton's Public Health Strategic Plan (Health Plan) is the long term public health strategic planning tool that demonstrates compliance of key statutory requirements of the Public Health and Wellbeing Act 2008 and the Local Government Act 1989.

The Environments for Health Framework 2001 underpin the public health planning approach for local government and is based on a social model for health which recognises the impact of the **social, built, economic and natural environment**. The four environments are recognised in the Council Plan 2017-2021.

The Council Plan 2017-2021 incorporates health and wellbeing matters and is the key strategic document that drives Council action and delivery of services.

Greater Shepparton's Public Health Strategic Plan (Health Plan) is the long term public health strategic planning tool that demonstrates compliance of key statutory requirements of the Public Health and Wellbeing Act 2008 and the Local Government Act 1989.

The Health Plan 'tells the story' of our unique Municipality based on an analysis of local demographics, Census data, our Health Status, case studies and health and wellbeing indicators.

The Health Plan health goals help to address local health issues, risks, gaps in services and emerging health needs significant to the Greater Shepparton area to deliver health outcomes into the future.

The Health Plan recognises key public health guiding principles; frameworks and strategic plans, together with Municipal responsibilities, local factors and associated health and wellbeing influences.

Globally the significance of a liveability focus across the life span to improve health outcomes has been addressed in key public health planning tools.

Together with local knowledge evidence informs us that a more liveable environment makes it easier for individuals to make better choices and also results in better local economical returns.

A regional approach utilising the existing Regional Cities Victoria network formed from the top ten regional cities in Victoria delivered a 'Liveability Index' in 2017, resulting with a comparative data set of liveability indicators.

Locally a 'Neighbourhood Liveability Assessment of Shepparton' was completed by RMIT and funded by the Department of Health and Human Services in 2018. This report identified 17 themes of liveability with local measures captured using spatial mapping and provides the potential to compare commonalities on a smaller scale between Shepparton, small towns and local neighbourhoods into the future.

The Health Plan provides the catalyst for action to step forward, to change direction while considering emerging issues, chronic disease management and utilizing a liveability lens to consider health through the life stages. Using the eleven liveability domains specifically for Greater Shepparton a range of health goals are set to drive local action toward future desired outcomes, creating a more liveable region. These liveability domains will underpin the formation of working groups to work collaboratively on local issues.

The Health Plan will inform future public health planning priorities identified in the annual Public Health Implementation Plan that details local action and the development of health prevention models for the term of the Council Plan and into the future.

Consultation and community engagement is a key to public health planning.

Together with strong local and regional partnerships Council will lead and advocate for positive public health change delivering health outcomes for all to achieve optimum 'quality of life'.

An aerial photograph of a park. In the upper left, there is a playground with various structures and slides. A winding path cuts through the park, with a large grassy area on the right where a group of people is gathered. The overall scene is lush with greenery and trees.

VISION

Together we strive to create Greater Shepparton as the most liveable region.

PURPOSE

To provide leadership and direction of public health matters in collaboration, to enable services and prevention efforts that are responsive to local community members to achieve optimum 'quality of life'.



INTRODUCTION

The World Health Organisation defines health as 'a state of complete physical, social and mental wellbeing, and not merely the absence of disease or infirmity.'

The social determinants of health are the conditions in which people are born, grow, work, live and age, and the wider set of forces and systems shaping the conditions of daily life. These circumstances are shaped by the distribution of money, power and resources at global, national and local levels, which are themselves influenced by policy choices. The social determinants of health are mostly responsible for health inequities – the unfair and avoidable differences in health status.

The Health Plan provides the framework for local action to address public health matters. The Plan included and considers strategic objectives of the Victorian Public Health and Wellbeing Outcomes Framework, Victorian Public Health and Wellbeing Plan combined with a liveability approach to consider public health equality across the life stages for individuals to achieve optimum quality of life. Planning for public health and wellbeing across a municipality requires a strategic approach, while meeting specific Council responsibilities of the Local Government Act and Public Health and Wellbeing Act.

The 2017-2021 Greater Shepparton Council Plan is the key tool that drives the strategic direction of Council over the next four years and is a requirement under the Local Government Act (1989). The Council Plan incorporates the Municipal Health and Wellbeing Plan (MPHWP) and details objectives to be achieved and to guide decision making, priorities and the allocation of resources by Council to deliver outcomes and services to the community.

The Family violence and municipal public health and wellbeing planning – guidance for local government resulted from recommendation 94 of the Royal Commission into Family Violence. Local Governments are required to report their local action to reduce family violence and respond to the needs of victims in preparing their MPHWP. Preventing violence and injury is one of six priority areas in the Victorian public health and wellbeing plan 2015-2019, that councils are required to give regard to when preparing their municipal public health and wellbeing plan as required by the Victorian Public Health and Wellbeing Act 2008.

Liveability is complex and influenced by an array of factors, depending on an individual's access to the social determinants of health, expectations of an individual and many factors outside of Council's control. Recent work from both a regional and local liveability assessment has provided significant evidence of suitable measures for comparative purposes to inform benchmarks and help to identify local targets for action into the future to bring health equity across the life stages.

Through the development and implementation of a liveability framework, Council will take a lead in providing services, facilities and places of engagement that can positively affect health and wellbeing, for individuals and entire communities. Council will continue to work closely with stakeholders to advocate for funding, new services, programs in partnership, and to support communities to consider what impacts on individual's health and quality of life.

Greater Shepparton

Greater Shepparton is a vibrant, diverse community located approximately two hours north of Melbourne, in the heart of the Goulburn Valley.

The major urban centers of Shepparton and Mooroopna are located at the confluence of the Goulburn and Broken Rivers and at the intersections of the Goulburn Valley and Midland Highways.

The city's population is almost evenly split between the main urban centers of Shepparton and Mooroopna, and the surrounding rural areas, including the smaller townships of Tatura, Murchison, Dookie, Merrigum, Congupna, Toolamba, Undera, Katandra and Tallygaroopna. This split reflects the wide range of lifestyle choices available across the municipality, from small urban blocks close to high quality amenities, through to large working orchards and farms.

Greater Shepparton's diverse and multicultural composition is one of its key qualities, with approximately 15% of residents born overseas.

The city also has a significant aboriginal population, with approximately 3.4% of residents identified as Aboriginal and Torres Strait Islander (ABS 2016).

Dairying and fruit growing are the major primary industries, with the viticulture and tomato industries also showing significant growth. Food processing is a significant secondary industry, with over 30 major food processing related businesses located within two hours of the major urban centres. The large volume of fresh and processed food stuffs produced in the region generates an extremely high number of freight movements. The road transport industry which has grown up to

support this freight task is a substantial contributor to Greater Shepparton's economy in its own right and Shepparton is now provincial Victoria's largest truck sales and service centre.

Greater Shepparton has enjoyed strong industrial, business and residential growth over the past 10 years and Shepparton is one of the five fastest growing inland regional centres in Australia. Large food processing and retail developments have provided increased employment opportunities underpinned by this growth.

As a regional hub, Greater Shepparton provides a range of goods and services to a catchment of approximately 160,000 people. This regional role allows the city to support a strong and diverse retail sector and attract national retail outlets which in turn, increase the attractiveness of the city as a retail destination.

The city also enjoys high quality medical services and offers a range of tertiary education opportunities.

Greater Shepparton continues to reinforce its reputation as a key events destination within both the Victorian and national markets. The city has a strong history of attracting major events to the region to boost the local economy. Greater Shepparton City Council along with Federal, State and philanthropic commitment for a new Shepparton Art Museum to be completed by 2020 demonstrates a strong commitment to arts and culture within the region.



A SNAPSHOT OF OUR LIVEABILITY DOMAINS

Arts and Culture

Greater Shepparton residents can safely identify with their culture and identity



0.72 domestic daytrip and overnight tourists visiting for arts and recreational activities, per resident

Access to Food

Greater Shepparton residents have access to affordable healthy food



54% of people do not meet the dietary guidelines for either fruit or vegetable consumption

Residents living on the outer northern, southern and eastern areas of town have greater distances (generally above 3km) to access affordable fresh food

Community Participation

Greater Shepparton residents are socially engaged and live in inclusive communities



23.1% of people volunteer compared to the Victorian average of 20.8%

Crime and Safety

Greater Shepparton residents live in a community that is safe and secure



35.9% of female and **68%** of males feel safe when walking alone in local area at night

Health and Social Services

Greater Shepparton residents have good physical health



58.7% are overweight or obese compared to the Victorian average of 49.8%

38.7% of over 75s live alone. 73.9% are female and 26.1% are male

87% of children between 24 and 27 months are fully immunised

Housing

Greater Shepparton residents have suitable and stable housing



66% of lower income households are spending more than 30% of their total incomes on housing costs



OUR STRATEGIC FRAMEWORK

2030 Strategy

The City of Greater Shepparton and the Department of Sustainability and Environment have prepared Greater Shepparton 2030, a blueprint for building sustainable economic activity and maximising the quality of life in the municipality over the next 30 years.

This strategy updates the previous City of Greater Shepparton Strategy Plan 1996 which formed the basis for the current Municipal Strategic Statement (MSS). The MSS is the local strategy component of the Greater Shepparton Planning Scheme. The feedback from the community consultation assisted in the development of a vision and direction for following 25 to 30 years positively affecting most aspects of living and investing in our municipality through key themes:

1. Settlement and Housing
2. Community Life
3. Environment
4. Economic Development
5. Infrastructure

Council Plan 2017-2021

As specified in the Local Government Act 1989, Victorian local governments are required to prepare a Council Plan every four years. The Council plan sets the vision and high level strategic objectives for the Council term, guides activity undertaken and monitors the performance of the organisation in achieving its objectives. Section 125 of the Local Government Act 1989 requires the Council to prepare and approve a Council Plan.

The Public Health and Wellbeing Act 2008 reinforces the statutory role of councils to 'protect improve and promote public health and wellbeing within the municipal district' and requires Victorian municipalities to produce a Municipal Public Health and Wellbeing Plan (MPHWP). The MPHWP sets the broad mission, goals and priorities to enable people living in the municipality to achieve maximum health and wellbeing, particularly in the area of health prevention and promotion. Under the Public Health and Wellbeing Act 2008, MPHWP must address the following:

- Consideration of the directions and priorities of the Victorian Public Health and Wellbeing Plan 2015–2019.
- Consistency with Council's corporate plans and Council's land use plans as required by the Municipal Strategic Statement (MSS).



The Council Plan 2017–2021 is based on the key themes of the Environments for Health framework and incorporates the MPHWP. Greater Shepparton City Council obtained exemption from the Department of Health and Human Services to incorporate health and wellbeing matters into the Council Plan, as opposed to developing a separate MPHWP to the Council Plan. The Council Plan, and incorporated MPHWP, is reviewed annually and includes the following themes:

1. Leadership and Governance – provide strong civic leadership, advocacy and good governance in the operation of Greater Shepparton City Council
2. Social – develop resilient, inclusive, healthy communities that make Greater Shepparton a safe and harmonious place to live, work, learn and play.
3. Economic – build a thriving, resilient economy where Greater Shepparton is recognised as a competitive place to invest and grow business
4. Built – provide and support appealing relevant infrastructure that makes Greater Shepparton an attractive, liveable regional city
5. Environment – enhance and promote the clean, green environment that makes Greater Shepparton the unique place it is.

Public Health Strategic Plan

The Public Health Strategic Plan (Health Plan) sets the long term strategic approach to address health and wellbeing issues and achieve health outcomes for every individual to achieve optimum 'quality of life'.



Public Health Implementation Plan

The Public Health Implementation Plan (Implementation Plan) is developed annually and provides the annual strategic direction whereby Council will partner with DHHS and local stakeholders to implement positive health and wellbeing initiatives that address the Health Goals defined in the Public Health Strategic Plan.

Specific targets aim to address emerging population health trends, protect the community, prevent disease and address health dangers to achieve optimum health outcomes for all.

Annual Action Plan and Budget

Council's Annual Action Plan and Budget capture the annual action necessary to achieve the goals of the Council Plan and the resource capacity available.

Council is required to prepare and adopt an annual budget for each financial year in accordance with the Local Government Act 1989 and Local Government (Planning and Reporting) Regulation 2014.

The budget is required to include certain information about the rates and charges to be levied, capital works to be undertaken, the human resources required and other financial information Council requires to make informed decisions.

Department Business Plans

Department Business Plans provide the road map detailing how services and projects will be delivered with key performance indicators used to measure annual achievements.

Annual Report

The Annual Report provides a comprehensive account of Council's achievements, challenges and aspirations for the future. The report details performance against the commitments set in the Council Plan and provides an analysis of our financial performance.

Under the Victorian Local Government Act (1989) each Council is required to prepare an Annual Report.



GUIDING PRINCIPLES

International Influence

World Health Organisation

The World Health Organisation (WHO) was established in 1948 as a specialised agency of the United Nations serving as the directing and coordinating authority for international health matters and public health. WHO has provided clear scientific evidence to inform and support public health policies using the Social Determinants of Health (SDH) to consider key aspects of people's living and working conditions. The SDH address the core causes of ill health, health inequalities and identify the needs of those affected by poverty and social disadvantage.

Social Determinants of Health

To address key health and wellbeing inequalities public health planning needs to consider the social determinants of health (SDH) in which people are born, grow, work, live and age that shape daily life, are impacted by economic policies, social norms, social policies, political systems and the distribution of money, power and resources to improve liveability and health outcomes.

The SDH (Wilkinson & Marmot, 2003) are displayed below:

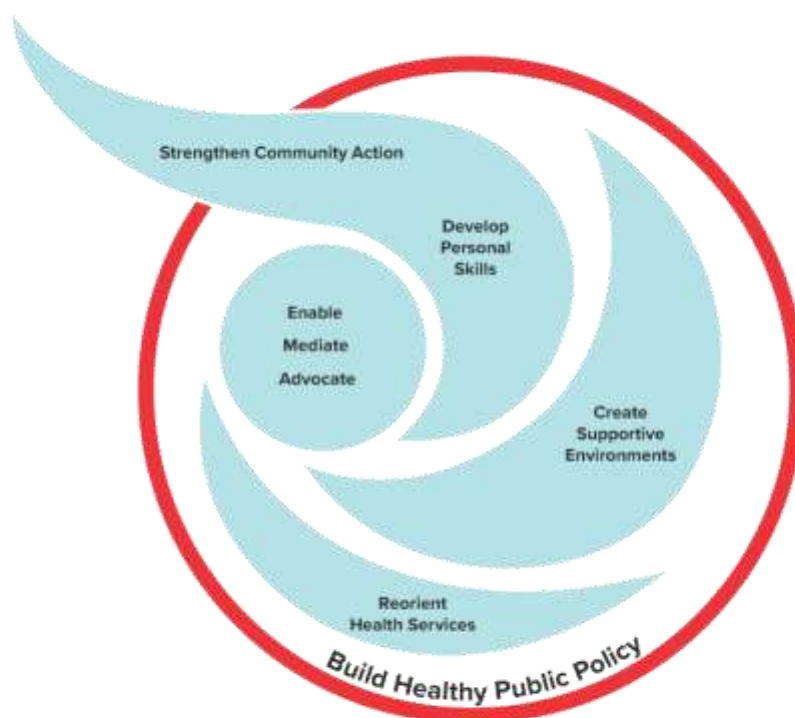
Social gradient Life expectancy is shorter and most diseases are more common further down the social ladder in each society	Unemployment Job security increases health, wellbeing and job satisfaction. Higher rates of unemployment, including insecure jobs and underemployment, cause more illnesses and premature death
Stress Stressful circumstances, making people feel worried, anxious and unable to cope, is damaging to health and may lead to premature death	Social support Friendship, good social relations and strong supportive networks improve health at home, at work and in the community
Early life A good start in life means supporting mothers and young children - the health impacts of early development and education last a lifetime	Drug dependence Individuals often turn to alcohol, drugs and tobacco as an escape from adversity to stress
Social exclusion Life is short where quality is poor. By causing hardship and resentment, poverty, social exclusion and discrimination cost lives	Food A good diet and adequate food supply including cost and access to fresh and healthy food, are central for promoting health and wellbeing
Work Stress in the workplace increases the risk of disease and people who have more control over their work have better health. It includes the type of work, management style and social relationships	Transport Healthy transport means less driving and more walking and cycling, backed up by better public transport

WHO Ottawa Charter for Health Promotion

First International Conference on Health Promotion, Ottawa, 21 November 1986.

Health promotion is the process of enabling people to increase control over, and to improve, their health. To reach a state of complete physical, mental and social well-being, an individual or group must be able to identify and to realize aspirations, to satisfy needs, and to change or cope with the environment.

Health is, therefore, seen as a resource for everyday life, not the objective of living. Health is a positive concept emphasizing social and personal resources, as well as physical capacities. Therefore, health promotion is not just the responsibility of the health sector, but goes beyond healthy life-styles to well-being.



Prerequisites for Health

The fundamental conditions and resources for health are:

- Peace
- Shelter
- Education
- Food
- Income
- A stable eco-system
- Sustainable resources
- Social justice and
- Equity

The Ottawa Charter states that health promotion action means:


- Building healthy public policy
- Creating supportive environments
- Strengthening community action
- Developing personal skills
- Reorienting health services
- Moving into the future

Health in all Policies

The Eighth Global Conference on Health Promotion was held in Helsinki, Finland from 10-14 June 2013, with the theme 'Health in All Policies' (HiAP). HiAP is an approach on health-related rights and obligations. It improves accountability of policymakers for health impacts at all levels of policy-making. It includes an emphasis on the consequences of public policies on health systems, determinants of health, and well-being. It also contributes to sustainable development. HiAP reflects the principles of:

- Legitimacy grounded in the rights and obligations conferred by national and international law
- Accountability of governments towards their people
- Transparency of policy-making and access to information
- Participation of wider society in the development and implementation of government policies and programmes
- Sustainability in order that policies aimed at meeting the needs of present generations do not compromise the needs of future generations
- Collaboration across sectors and levels of government in support of policies that promote health, equity, and sustainability





Jakarta Declaration on Leading health promotion into the twenty-first century

Emphasising the value of settings for implementing comprehensive strategies and providing an infrastructure for health promotion. Healthy cities are regarded as the best known and largest of the settings approaches.

A healthy city is 'one that is continually creating and improving those physical and social environments and expanding those community resources which enable people to mutually support each other in performing all the functions of life and developing to their maximum potential'. World Health Organisation 1998, The WHO Health Promotion Glossary, Geneva.

Councils can act as 'community builders' to achieve a strong and healthy community. However, they are not the only ones responsible for achieving this result. The WHO Healthy Cities program considers that a healthy city depends on 'a commitment to improve a city's environs and a willingness to forge the necessary connections in political, economic and social arenas' (WHO 'Types of Healthy Settings').

Other relevant frameworks:

Liveability Victoria International

UN Millennium Development Goals

The United Nations developed eight Millennium Development Goals (MDGs).

These goals are unprecedented efforts to meet the needs of the world's poorest and are considered in all facets of strategic health planning, as listed next.



National Influence

Local Government Act 1989

The Local Government Act 1989 clearly states the primary objective of each Council is to promote the social, economic and environmental viability and sustainability of the Municipality, to improve the overall quality of life of people in the local community. The Act states that each Council will provide:

- Services and facilities that are accessible and equitable
- An equitable imposition of rates and charges
- Transparency in decision making processes
- Other functions relating to maintaining the peace, order and good government of the municipal district

Public Health and Wellbeing Act 2008

The Public Health and Wellbeing Act 2008 requires Councils to prepare a Municipal Public Health and Wellbeing Plan within 12 months of each general election of the Council to:

- Protect the community
- Prevent disease, illness, injury or premature death
- Improve and promote public health and wellbeing prevention strategies
- Reduce inequalities
- Address environmental health dangers within their Municipal area

Creating Liveable Cities in Australia

Creating Liveable Cities in Australia is the first 'baseline' measure of liveability in Australia's state and territory capitals presented by RMIT. It represents the culmination of five years of research. Liveable communities are good for the economy, social inclusion and environmental sustainability, and promote the health and wellbeing of residents. Liveability encourages affordable housing linked by public transport, walking and cycling paths to workplaces, public open space and all the amenities required for daily living. This report suggests seven domains of urban liveability that can be utilised to promote the health and wellbeing of Australians:

- Walkability
- Public transport
- Public open space
- Housing affordability
- Employment
- Food and alcohol environments

In many cases government planning policies are failing to deliver liveability equitably across our cities, with no Australian capital city performs well across all the liveability indicators. Current policies and guidelines do not appear to be informed by the growing body of evidence about how to achieve healthy, liveable cities.

Other relevant frameworks:

Blueprint for an Active Australia

State-wide Influence

Victorian Health Priorities Framework 2012-2022

The Victorian Health Priorities Framework 2012-2022 reflects the government's commitment to delivering the best healthcare outcomes possible and ensuring people are as healthy as they can be. Both Victorian Priorities Framework 2012-2022; Metropolitan Health Plan and Rural and Regional Health Plan, have adopted the same seven key health priority areas:

- Developing a system that is responsive to people's needs
- Improving every Victorian's health status and health experience
- Expanding service, workforce and system capacity
- Increasing the system's financial sustainability and productivity
- Implementing continuous improvements and innovation
- Increasing accountability and transparency
- Utilising e-health and communications technology

Victorian Public Health and Wellbeing Plan 2015 – 2019

The Victorian Public Health and Wellbeing Plan 2015–2019 outlines the government's key priorities to improve the health and wellbeing of all Victorians. This plan articulates the government's vision for a Victoria free of the avoidable burden of disease and injury, so that all Victorians can enjoy the highest attainable standards of health, wellbeing, and participation at every age with six key priority areas:

- Healthier eating and active living
- Tobacco free living
- Reducing harm from alcohol and drug use
- Improving mental health
- Preventing violence and injury
- Improving sexual and reproductive health

Victorian Public Health and Wellbeing Outcomes Framework 2016

The Victorian government's release of the Victorian Public Health and Wellbeing Outcomes Framework in October 2016 has become the key document for setting Municipal Health and Wellbeing annual strategies and performance measures to monitor progress over a longer timeframe and recognises that it can take decades to see real improvement or change. The outcomes framework requires Council to report achievement in Year Three of the Council Plan term. The five key domains for action are:

- Victorians are healthy and well
- Victorians are safe and secure
- Victorians have the capabilities to participate
- Victorians are connected to culture and community
- Victoria is liveable

Victorian Gender Equality Strategy 2017

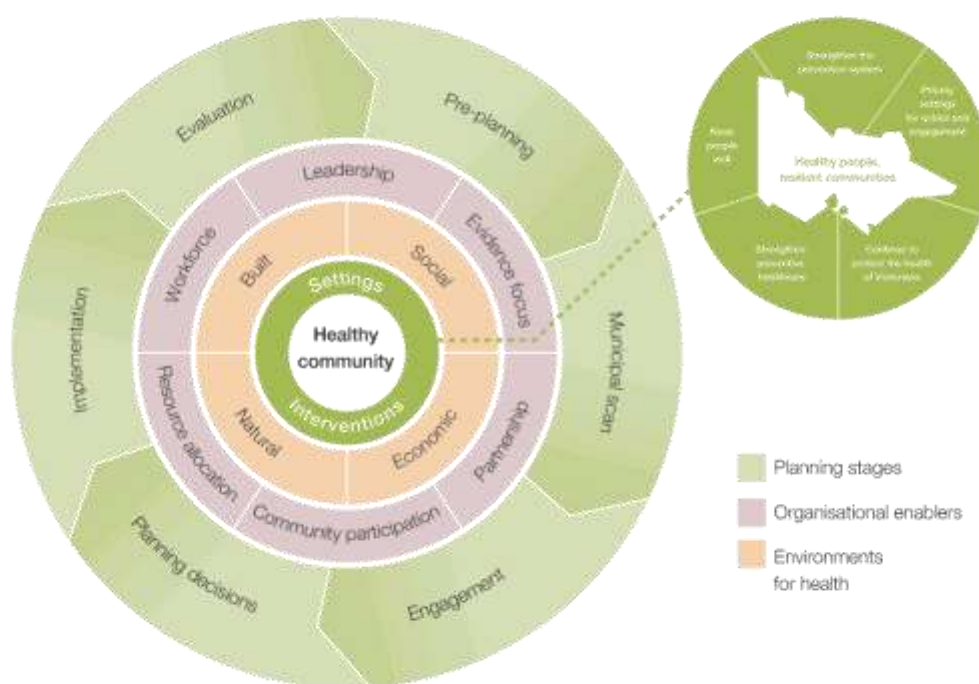
The Department of Health and Municipal Association of Victoria have recently instructed Councils to include family violence/gender equity in all future Public Health and Wellbeing Plans. The Victorian Gender Equality Strategy outlines key focus areas for change as a result of the Royal Commission into Family Violence. This Equality Strategy aims to build the attitudinal and behavioural change required to reduce violence against women and deliver gender equality.

Guide to Municipal Health and Wellbeing Planning 2013

The Department of Human Services have provided this Guide to recognise the experience of Councils in preparing public health plans and acknowledge their achievements over the last decades, noting the benefits of strong local collaborative partnerships. The guide provides councils and their partners with a set of strategic directions and broad priorities within which to develop municipal public health and wellbeing plans.

The emphasis is on local government being close to their community for a more effective local delivery system and is believed to underpin new approaches of how to work together to maximise the potential of preventative health interventions. The guide identifies that public health should focus on prevention, promotion and protection and consider the four environments for health; built, economic, natural and social.

This guide recognises six key stages for public health planning as details in the planning cycle below.



Environments for Health 2001

The Public Health Division of the Department of Human Services, in partnership with the Municipal Association of Victoria, Victorian Local Governance Association, local governments and other stakeholders, developed the Environments for Health (EH) in September 2001 as a Municipal Public Health Planning Framework to promote health and wellbeing through the four Environments for Health; Built, Economic, Natural and Social.

The EH is a planning resource to be used during the development, implementation and review of each Public Health Plan as legislated under the Health Act. The EH encourages strategic level planning, scanning health and wellbeing issues, researching, identifying action, considering impacts and setting priorities to achieve maximum health outcomes.

Environmental Dimensions	Components		Characteristics	Council Action Areas - Examples
Built / Physical	<ul style="list-style-type: none">• Transport• Roads• Urban planning outcomes; such as housing• Built form• Amenities: parks, street lighting, footpaths, shops• Permeable neighbourhoods• Recreation facilities: playgrounds, sports facilities		<ul style="list-style-type: none">• Liveable	<ul style="list-style-type: none">• Land use planning• Industrial development• Transportation• Traffic management• Housing• Recreation• MSS, EES, works approvals
Social	<ul style="list-style-type: none">• Demographics• Ethnicity• Sense of place and belonging• Sense of community• Social capital• Social support• Social inclusion or isolation• Lifelong learning	<ul style="list-style-type: none">• Gender• Language• Art and culture• Participatory democracy• Community facilities• Perceptions of safety• Globalisation	<ul style="list-style-type: none">• Equitable• Convivial	<ul style="list-style-type: none">• Community support services• Community safety• Art and cultural development• Library services• Adult education services• Neighbourhood houses• Recreation programs
Economic	<ul style="list-style-type: none">• Globalising economy• Economic policy	<ul style="list-style-type: none">• Industrial development• Employment• Resources	<ul style="list-style-type: none">• Sustainable	<ul style="list-style-type: none">• Employment• Income distribution• Community economic development• EES, works approvals• Access and equity
Natural	<ul style="list-style-type: none">• Climate• Geography• Air quality• Natural disasters• Global climate change	<ul style="list-style-type: none">• Ozone layer• Impact on food production• Farming practices• Water quality• Native vegetation	<ul style="list-style-type: none">• Viable	<ul style="list-style-type: none">• Water quality• Waste management• Energy consumption

Age Friendly Cities and Communities

In 2006 COTA, in partnership with the Municipal Association of Victoria, joined WHO as one of two Australian cities in the international project on Age-friendly Cities. An Age Friendly world enables people of all ages to actively participate in community activities and treats everyone with respect, regardless of their age. Supporting communities to become age friendly is one of the most effective strategies to promote active ageing. In Age Friendly communities older people live safely, enjoy good health and stay involved. Eight key domains were identified:

- Outdoor spaces and buildings
- Transportation
- Housing
- Social participation
- Respect and social inclusion
- Civic participation and employment
- Communication and information
- Community support and health services

Other relevant frameworks:

Health Planning Toolkit 2011
Leading the Way 2002
Victoria Local Government Women's Charter

Regional Influence

Deloitte Access Economics Liveability Index

In 2017 Deloitte Access Economics collated evidence to inform a comparative assessment of liveability indicators for Regional Cities Victoria (RCV), an alliance of the 10 largest regional Councils in Victoria. The primary objective of the Regional Partnerships is to give regions a stronger voice within State Government and to give them a direct pathway into State Government decision-making processes. Regional Partnerships will bring a whole of government lens to the complex issues facing regional communities and will give regional communities a voice straight into the heart of government.

The continued ability of regional cities to attract and retain residents can only happen if they are a desirable place to live in/near, or when they score highly on liveability. It is anticipated that an objective liveability index, spanning multiple relevant criteria, can be used by member councils to highlight their strengths to attract and retain residents to live, work and play, whilst understanding potential opportunities to improve existing liveability performances.

The 24 indicators developed are grouped into seven themes, encompassing the key aspects of liveability with a metric developed for each indicator. Each metric is underpinned by one (or more) publically available datasets across the 10 RCV Local Government Areas (LGAs), Greater Melbourne (or the LGAs that comprise it), and Victoria.

The performance of each LGA for each indicator is also ranked, and assessed relative to Greater Melbourne.

INDICATOR	MEASURE
Human Capital	Labour force; unemployment, income level, tertiary, secondary and primary education.
Physical Capital	Internet, rail, airport, bus, taxi, walkability, vehicle access
Social Capital	Volunteering, giving support, multiculturalism, philanthropy
Health and Safety	Primary and tertiary health, crimes recorded, crime perceptions, gambling, population forecasts, birth rates, gender equality, liquor outlets
Housing Affordability	Housing stress, prices and house price multiple
Visitor Attraction	Visitor attraction
Local Amenities	Retail, higher order retail, arts/recreation, arts/recreation appeal, leisure and culture, natural environment.

GVPCP Catchment Integrated Health Promotion Plan 2017-2021

This collaborative plan identifies the local health promotion priorities of all health and community organisations across Greater Shepparton, Moira and Strathbogie municipalities. The plan is supported by the Goulburn Valley Primary Care Partnership, local Government representatives and guided by the Department of Health and Human Services. Health promotion priority areas for the catchment are healthy eating and active living.

The Hume Strategy for Sustainable Communities 2010-2020

The Hume Strategy for Sustainable Communities 2010-2020 is a 10 year regional strategic framework for long term cooperation and investment through a regional plan and four sub regional plans. The Hume Strategy is set out under five themes; environment, communities, economy, transport and land use.



Local Influence

Council Strategic Plans

Greater Shepparton City Council has a number of strategic plans to be considered when developing this strategic framework and future strategies or plans. Please refer to Appendix One.

Goulburn Valley Health Strategic Plan

Goulburn Valley Health's (GVH) strategic plan provides a framework to guide the future development of health services. GVH's key strategic directions include;

- Empowering your health
- Strengthening services
- Developing staff
- Working with partners

Neighbourhood Liveability Assessment of Shepparton

The application of indicators as evidence to plan for a healthy and liveable regional city. Dr Melanie Davern, Rebecca Roberts and Carl Higgins, Healthy Liveable Cities Group, Centre for Urban Research, RMIT University.

The Healthy Liveable Cities Group at RMIT University completed a Neighbourhood Liveability Assessment of the township of Shepparton early 2018. The research was funded by the Department of Health and Human Services and devised in partnership with Greater Shepparton City Council.

The Healthy Liveable Cities Group provided an assessment of liveability for 114 neighbourhoods or SAIs across the towns of Shepparton (83 neighbourhoods), Mooroopna (19 neighbourhoods) and Tatura (12 neighbourhoods) using 17 themes of liveability.



24 | 2018 - 2028 Public Health Strategic Plan

Measures were developed for the 13 indicators selected that capture key areas for comparison.

INDICATOR	MEASURE
Walkability	Walkability for Transport Index School Walkability
Housing	Proportion of households with income in the bottom 40 percent of the income distribution spending more than 30 per cent of household income on housing costs Proportion of households renting as a per cent of total households
Housing diversity	Number of different housing types present
Public Transport	Proportion of residential dwellings within 400m of a public transport stop Proportion of residential dwellings within 400m of a public transport stop with a scheduled service at least every 60 minutes between 7:00am and 7:00pm on a normal weekday. Closest distance to a train station with connection to a capital city
Access to Food	Access to supermarkets (average distance to closest supermarket) Access to fast food outlets (average distance to closest fast food outlet)
Access to services of daily living	Average number of daily living types present; measured as a score of 0-3, with 1 point for each category of (convenience store/petrol station/newsagent, PT stop, supermarket) within 1600m network distance
Distance to nearest Public Open Space	Proportion of households within 400m of Public Open Space
Unemployment	People who are unemployed (per cent labour force)
Employment	Proportion of employed people (over 15 years) living and working in same area (SA2 in SA4)
Education	Completion of VCE or equivalent
Access to GPs	Average distance to GP clinic
Access to Services for Older People	Index of Access to Services for older people
SEIFA	Socio-economic Index for Areas – Relative Disadvantage (iRSD)

Other relevant frameworks:

2018 Fairley Foundation Philanthropic Summit Outcomes Document
City of Greater Shepparton Communities for Children Strategic Plan 2015-19
Greater Shepparton's Community Strategy for Children and Young People 2018-2023
GV Health Knowledge Exchange
The State of Greater Shepparton's Children Report 2014

DATA PROFILE

Evidence and analysis of key data sources is captured in three main sections; demographics, health and wellbeing priorities and liveability domains; to inform the current and emerging health status of the municipality.

The data is complemented with local reports which adds depth and 'tells the story' of key health and wellbeing measures.

Analysis of the data aims to provide examples of where our community is thriving, highlight areas of concern that can be addressed collectively, and identify potential data gaps.

The data informs the health goals we strive to achieve over the next 10 years, and will be reviewed annually to ensure the data sources remain current and reflective of changes in health status over time.

1. Demographics

The demographics sections of the report have been captured into the following groups; children and youth; adults and families; older adults; Aboriginal and Torres Strait Islander; Culturally and Linguistically Diverse (CALD); Lesbian, Gay, Bisexual, Trans and Intersex (LGBTI) Community and People with Disability.

Children and Youth

According to the 2016 Census, 19.9% of the population is aged between 0 and 15, with a larger percentage of persons aged 0 to 4 (6.6% compared to 5.8%). 6.8% of the population is aged 15 to 19 in comparison with 6.1% in Regional Victoria. Attendance rates of children attending maternal and child health checks is 65.4% compared to 64.4% in Victoria. The rate of substantial child abuse per 1,000 population is 10.9 compared to 6.7 in Victoria. The rate of children on child protection orders per 1,000 population is 8.5 compared to 5.2 in Victoria. The rate of children in out of home care per 1,000 population is 7.7 compared to 4.6 in Victoria.

Falling Through the Cracks

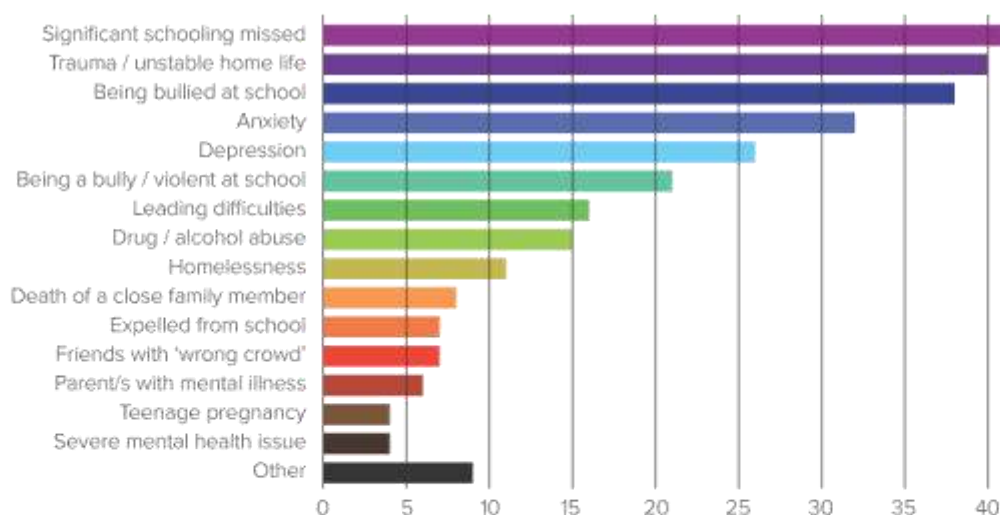
The Lighthouse Foundation consulted with 83 local youth to investigate the reasons why significant numbers of young people (aged 12-24) living in the Greater Shepparton area were not participating in mainstream education, employment or training (work or study). Greater Shepparton's population of 63,300 in 2011 reflected 13 per cent or 7,840 were aged between 15-24 years. Key findings include:

- **Study or Work:** Approximately 30 per cent of 15-24 year olds (or 2,300 young people living in Greater Shepparton) were not currently engaged in work or study (otherwise referred to as being disengaged). The reasons for disengagement for the majority of the young people interviewed were complex and were most commonly attributed to one or more, and often several, of the following factors; trauma in the home, the breakdown of the family unit, experiencing a combination of moderate to severe physical, verbal and online bullying, anxiety issues often linked to the experience of being bullied (at school), significant schooling missed most commonly due to being bullied (at school) over an extended period and/or anxiety issues, anger issues/violence at school leading to the expulsion of the young person, drug and/or alcohol abuse by the young person.
- **Bullying:** There was a particularly strong correlation between a young person experiencing ongoing bullying in school and also experiencing one or more of the following; trauma in the home and/or, an unstable home life and/or, the family unit was no longer intact. Of the 38 young people interviewed who said they had experienced ongoing bullying at school, 32 had experienced one or more of the abovementioned situations in their home life.
- **Feelings of Anger/Violence:** There was a particularly strong correlation between being a bully and/or being angry/violent at school and also experiencing one or more of the following; trauma in the home and/or, an unstable home life and/or, the family unit was no longer intact. Of the 21 young people interviewed who said they had anger/violence issues at school or

were the bully at school, 19 had experienced one of more of the abovementioned situations in their home life.

- **Feeling supported or not:** The majority (34 of the 38 or 89 per cent) of the young people who were bullied did approach the school for assistance to address the issue. The majority (29 of the 38 or 76 per cent) also reported that they felt unsupported by the school when they and/or their parents had reported their concerns and the situation had not been satisfactorily resolved.
- **Feelings of Anxiety:** Anxiety and depression also appear to be a very real barrier to learning and engagement. Many young people interviewed stated that their anxiety issues prevented them being able to stay in a mainstream school environment and that it led to them missing significant schooling, sometimes for weeks or months at a time. Anxiety was noted as a factor in disengaging for 33 (42 per cent) of the young people interviewed, while depression was mentioned by 26 (33 per cent) of the young people as contributing towards their disengagement.

- **School Absence:** The most common reason given overall for disengagement was because the young person had missed significant schooling, most commonly due to the factors of experiencing bullying, anxiety/depression, violence/being a bully. Young people also cited 'learning difficulties' and being unable to keep up with their school work, as a reason for missing significant schooling.
- **Home environment:** Strong themes emerged that youth experiencing a troubled home life predisposes young people to be bullied or bully others. These vulnerable youth find transition to secondary school difficult with large numbers diagnosed with depression or anxiety, unable to cope in mainstream school settings. Alternative settings have merged to cater for this vulnerable cohort, with many expressing keenness to continue to learn. The extent and range of trauma in the home, unable to cope in mainstream education settings, dealing with bullying experiences and regularly going hungry were common in these troubled lives.
- **Early Intervention:** Early intervention and prevention measures were recommended, rather than relying on clinical and crisis responses.



Falling Through the Cracks, Lighthouse Project November 2016

Adults and Families

Greater Shepparton has 50.3% of its population aged between 25 and 65 years.

Crossroads One Population Health Study

Crossroads One Study was conducted in 2001-3 which looked at rates of mental health, diabetes, cancer and other chronic health conditions, as well as emergency department, GP and hospital utilisation, across 9,260 adults and their children (approximately 6,000). Key findings from the original Crossroads One Study for the Goulburn Valley were:

- Diabetes was reported at 8.7 per cent of men and 7.5 per cent of women, which was higher than the Australian average
- Undiagnosed diabetes was high (26.3 per cent)
- Goulburn Valley residents recorded higher rates of people with false teeth than the Australian average
- Cardiovascular disease was reported by 13.2 per cent of men and 6.3 per cent of women
- Levels of obesity were higher in the Goulburn Valley (27.9 per cent) than the Australian average
- Residents of small towns were significantly less likely to have a regular GP (86.1 per cent) than residents of Shepparton/Mooroopna (90.9 per cent)
- Residents of small towns reported higher levels of physical exercise (46.0-48.4 per cent reported 150 minutes or more per week) than residents of Shepparton/Mooroopna (39.7 per cent), despite less access to physical activity amenities
- Residents of small towns travelled further for dental treatment, were less likely to have seen a dentist in the past year and were more likely to have false teeth than residents of Shepparton/Mooroopna

Crossroads Two Population Health Study

The Department of Rural Health, University of Melbourne conducted the Crossroads Two Population Health Study in 2016 across Greater Shepparton and Cobram. Crossroads Two will assess the prevalence of key factors contributing to metabolic disease, cancer and mental health conditions in the same population 15 years after the original Crossroads One Study. The changes in diagnosed and undiagnosed condition prevalence, health outcomes and health service access will also be assessed. A key objective of this study is for the data collected to be used to translate the findings into initiatives that may improve health outcomes for Goulburn Valley communities.

Older Adults

Census 2016 reports that as a nation, there are more of us, we're living longer, becoming more urbanised, more diverse, less religious, living closer together, earning more and forming the same type of family unit with early Census releases reporting that 85 is the new 65. Australia's once youthful population is ageing slowly. As our baby-boomer generation 'matures', we find that one in six of us are now over 65. More of us are surviving well into old age, thanks to improvements in diet, public health and medical technology. Our population of centenarians grew to 3,500 in 2016.

Generally, Women are living longer than men. Of those people aged 65 or older, 54 per cent are women and 46 per cent are men. Of those people aged 85 and older, 63 per cent are women and 37 per cent are men.

- Percentage of persons aged 75+ who live alone 38.7 per cent, of those 73.9 per cent are female and 26.1 per cent are male
- Aged care places (high care) per 1,000 eligible population 53.1 compared to 40.9 in Victoria
- Aged care places (low care) per 1,000 eligible population 56.5 compared to 44.4 in Victoria
- Age pension recipients per 1,000 eligible population 757.2 compared to 694.3 in Victoria

Aboriginal and Torres Strait Islander

Around 1.6 per cent of people in Greater Shepparton identified as Aboriginal and Torres Strait Islanders in the 2016 Australian Bureau of Statistics Census. However, anecdotal evidence shows that this is very under-represented, and Greater Shepparton's Aboriginal and Torres Strait Islanders population is actually nearly three times this, with a population of nearly 6,000.

Greater Shepparton comprises 2,186 Aboriginal and/or Torres Strait Islander persons (males 1,083 and females 1,103) living in Greater Shepparton with a median age of 22 compared to non-Indigenous residents with a median age of 40, with 1,812 living in a separate house, 168 in other private dwellings (includes semi-detached, flat, caravan, etc) and 52 in non-private dwellings.

The Greater Shepparton area holds significant Aboriginal cultural heritage, and is amongst the most culturally diverse municipalities in regional Victoria. Historically there were eight tribes that occupied Greater Shepparton, consisting of the Yorta Yorta, Bangerang, Kalitjeban, Wollitjiga, Moira, Ulupna, Kwat Kwat, Yalaba Yalaba and Nguaria-iliam-wurrung clans, all of which spoke the Yorta Yorta language.

Changing the Paradigm to 'Close the Gap'

Rumbalara Aboriginal Cooperative (RAC) produced an informative discussion paper identifying reasons behind the gap between the health and wellbeing of Aboriginal and Torres Strait Islanders (ATSI) and the general Australian community that may assist many to understand, consider and address their key health challenges into the future. Although Australia has one of the highest rates of life expectancy at 69.1 years for males and 73.7 years for females, the life expectancy for ATSI is about 10 years lower. The discussion paper identified the following seven key health determinants:

1. Cardiovascular Disease
2. Diabetes
3. Kidney Disease
4. Smoking
5. Obesity and Overweight
6. Asthma
7. Mental Health/Mental illness

Being unwell is the norm: RAC believes that the community we serve and provide services to, presents with a skewed understanding and experience of what wellness and wellbeing is. RAC believe that the community has become so used to living in sub-optimal conditions, that this has become the new norm, and that this encompasses physical, mental, cultural, spiritual, educational, and economic wellbeing. This is because of a historical environment of trauma and disadvantage that has been experienced by multiple generations who have normalised a state of being 'unwell'.



Culturally and Linguistically Diverse (CALD) Community

The Greater Shepparton region is multicultural and diverse made up of over 30 nationalities, who speak more than 50 languages.

- The 2016 Australian Bureau of Statistics Census (ABS 2016) shows that the population of Greater Shepparton is 65,593 with 14.8% 9,459 individuals of the population identifying as being born in a country other than Australia. Most of these (11.5% of the total population) were born in countries where English is not a first language
- Census 2016 data confirms that the five largest ancestries in the City of Greater Shepparton are Australian 35.1%, English 35%, Irish 11.6%, Scottish 9.5% and Italian 7.7%
- Overall, 76.8% of the Greater Shepparton population speak English only, with 15% speaking a non-english language. The dominant language was Italian 2.1% with others higher than the Victorian average being; Arabic 1.9%, Persian/Dari 1.7% and Punjabi 1.4%
- Data of emerging groups between Census 2011 to 2016 indicate those settling in Greater Shepparton were born overseas in India 397 persons, Afghanistan 198, Taiwan 170 and Phillipines 167.



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People With Disability

In 2016, 3,829 people or 6% of the population living in Greater Shepparton reported needing help in their day-to-day lives, which is comparable to Regional Victoria. There were 6,194 carers providing unpaid assistance to a person with a disability, long term illness or old age in 2016 (ABS 2016).

According to Australian Bureau Statistics data (2011) in any community at any one time, 20 per cent of the population has a permanent disability whilst another 6 per cent have a temporary disability. In relative terms this means that one in four people will have a disability. The percentage of people with disability increased as people age – for example 54 per cent of people over 65 years of age have a disability and this increase to 81 per cent for people over 84 years. It is important to recognise that the term 'disability' represents many different personal challenges of impairment. Greater Shepparton has a projected population of more than 62,000. Using the statistics above this indicates that there are currently 12,000 people in the municipality who have a permanent disability, and 3,600 residents who are living with a temporary disability.

The National Disability Insurance Scheme (NDIS) is a significant reform in disability services and is being rolled out nationally, to meet the needs of eligible people with significant and ongoing disabilities and who are under 65 years of age (under 50 for Indigenous). Greater Shepparton is scheduled to commence transition in January 2019 with the full transition to be completed by June 2019. To be eligible for the NDIS an individual must:

- Have a permanent disability that significantly affects their ability to take part in everyday activities
- Be aged less than 65 years
- Meet certain requirements for citizenship.

Current data indicates that of the 233 persons currently accessing Home and Community Care Program for Younger People (HACCPYP) support via council, approximately 70 will be eligible for the NDIS. The indicative funding table provided by the Department of Health and Human Services, indicates that 58 per cent of existing funding will transition leaving council with 42 per cent of current funding to service up to 70 per cent of clients not eligible for the NDIS by 2020 / 21.

LGBTI Community

Many lesbian, gay, bisexual, transgender and intersex (LGBTI) Victorians live healthy, connected, happy and positive lives, but the LGBTI population have poorer health and wellbeing outcomes than other Victorians in some areas. These areas include mental health, suicide, general health, alcohol and other drug use. Social determinants, such as discrimination on the basis of sexual orientation or gender identity and reduced access to appropriate health care, can affect these poorer health and wellbeing outcomes.



2. Health and Wellbeing Priorities

The Health and Wellbeing priorities are informed by the Victorian Public Health and Wellbeing Plan 2015-2019. Key local data identifies how we perform and helps to identify areas of concern. An explanation of why each priority is important for consideration is provided and helps to inform our health goals to improve health outcomes in Greater Shepparton.

Aged and Disability Services

Greater Shepparton City Council has provided assessment and support services under the Home and Community Care (HACC) program since its inception in 1985. The HACC program has supported frail older people, and people with disabilities, to remain living at home with dignity and to support their carers through the provision of a range of integrated, effective, flexible and responsive Home Care services.

- Council provided 20,246 meals on wheels delivered to frail, aged and those convalescing in 2017.
- Over 17,578 hours of domestic assistance were provided, 7,390 hours of personal care and 3,830 hours of respite care provided.

Assessment Services

The State continue to manage the Assessment function on behalf of the Commonwealth for people over the age of 65 years (over 50 for Indigenous) and an agreement exists between council and the State government to deliver this function within Greater Shepparton until June 2020.

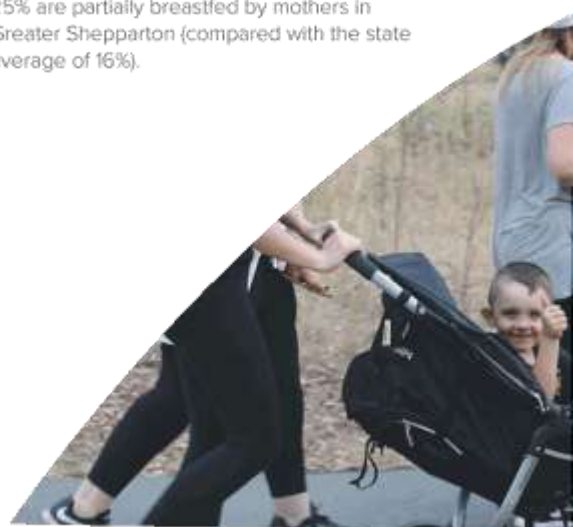
Effective from 1 October 2017, the assessment team is now also assessing every client for Community Home Support Program district nursing and allied health services.

Assessment continues to be a funded activity by the State government for persons under the age of 65 years (under 50 for Indigenous) to access the Home and Community Care Program for Younger People (HACCPYP).

Breastfeeding

Breastfeeding is the biological way of providing infants and young children with the nutrients required for optimum growth and development. Australian and international guidelines recommend that infants be exclusively breastfed until around six months of age, and that mothers continue breastfeeding with the addition of appropriate complementary foods for up to two years or beyond.

- Greater Shepparton is striving to be a Breastfeeding friendly city - where women can find the support they need to successfully breastfeed and find comfortable places to breastfeed, a place where professionals come to participate in high quality breastfeeding education, workplaces are encouraged to support breastfeeding, and community members and breastfeeding professionals work together to make Greater Shepparton a great place for breastfeeding
- More mothers in Greater Shepparton are fully breastfeeding their babies upon discharge from hospital compared to the average for Victorian mothers at discharge. However, the proportion of babies who are fully breastfed by their mothers in Greater Shepparton drops below state averages at 3 and 6 months
- At 3 months, 42.5% of infants are fully breastfed compared to 51.4% in Victoria
- At 6 months, 16% of babies are fully breastfed (compared with the state average 34%) and 25% are partially breastfed by mothers in Greater Shepparton (compared with the state average of 16%).



Chronic Disease Management

Chronic diseases affect the quality of life of many Victorians, and can lead to disability and premature death. They also account for a large share of Victoria's healthcare costs.

Chronic diseases can develop and progress differently among people affected, but they have similar characteristics; their cause can be complex, involving many risk factors; they may take a long time to develop; they result in a long illness, which often cannot be cured and they can lead to functional impairment or disability. Effective chronic disease management uses a model of shared care that engages people with a chronic disease as well as service providers. Integrated Chronic Disease Management (ICDM) is to slow the rate of disease progression while maximising health and wellbeing; improve access to quality, integrated multidisciplinary care; facilitate client and carer empowerment through self-management programs and approaches; actively engage general practitioners as part of a multidisciplinary coordinated approach; and reduce inappropriate demands on the acute health care system.

- People reporting asthma 13.7 per cent
- People reporting type 2 diabetes 4.9 per cent
- People reporting high blood pressure 25.4 per cent
- People reporting osteoporosis 4.6 per cent
- People reporting arthritis 19 per cent
- Avoidable deaths among people aged less than 75 years, all causes, per 100,000 population 130.3, Greater Shepparton is ranked 29 of the 79 LGA's
- Avoidable deaths among people aged less than 75 years, cancer, per 100,000 population 28.7, Greater Shepparton is ranked 16 of the 79 LGA's
- Avoidable deaths among people aged less than 75 years, cardiovascular disease, per 100,000 population 25.2, Greater Shepparton is ranked 46 of the 79 LGA's
- Avoidable deaths among people aged less than 75 years, respiratory disease, per 100,000 population 9.2, Greater Shepparton is ranked 40 of the 79 LGA's



Healthy Eating and Active Living

Healthy Eating

A healthy diet is vital for optimal growth, development and health throughout life and contributes to physical vitality, mental health and social wellbeing. The Australian Dietary Guidelines recommend eating a healthy diet with plenty of nutritious foods such as vegetables, fruit, lean protein, low-fat milk, cheese and yoghurt, nuts and seeds and wholegrains; and low in discretionary foods that are high in excess energy (kilojoules), such as salt, added sugar, saturated fat and trans fats which are found in sugar-sweetened beverages and fried foods. Excess intake contributes to an increased risk of obesity, cardiovascular disease, diabetes, some cancers and dental caries.

In Victoria, only one in 20 (6%) adults eat the recommended amount of five serves of vegetables per day, and approximately half (48%), eat the recommended amount of two serves of fruit per day.

Locally, 54% of people do not meet the dietary guidelines for either fruit or vegetable consumption. There is further evidence that people living in areas of high social disadvantage are more likely to be overweight or obese, and to drink greater amounts of sugar-sweetened beverages, in addition, are likely to spend approximately 30% of their weekly income on take away and fast food. The Goulburn DHS area, containing Greater Shepparton LGA, was ranked 7th highest out of 17 DHS areas in 2013 for the proportion of children eating the minimum recommended serves of fruit daily. All DHS areas reported rates of children eating the minimum recommended serves of vegetables daily less than 6%; most less than 4%. In Victoria, the direct healthcare costs attributed to overweight and obesity is estimated at \$14.4 billion, annually.

Physical Activity

Low levels of physical activity and high levels of sedentary behaviour (including prolonged sitting) are major risk factors for ill health and mortality. Individuals, who don't participate in regular physical activity, have greater risk of cardiovascular disease, colon and breast cancers, type 2 diabetes and osteoporosis. Being physically active improves mental and musculoskeletal health and reduces other risk factors such as overweight, high blood pressure, high blood cholesterol, reducing the risk of developing major chronic diseases, managing body weight and developing social connections. In addition to health benefits, there are also environmental, economic and social benefits. Active travel behaviours such as walking and cycling reduce greenhouse gas emissions, pollution and energy use, contributing to environmental benefits. Economic benefits include reducing costs associated with passenger transport, road infrastructure and traffic congestion. Social benefits include increased social connections, improved neighbourhood trust and safety, and reduced crime.

Victorian trends in participation of physical activity and sport demonstrate growth in non-organised participation (70.5%) compared to traditional club-based organised sport (28.7%). Walking continues to be the most popular form of physical activity in Victoria. The Australian Physical Activity and Sedentary Behaviour Guidelines recommend adults aged 18-64 years be active on most, preferably all, days of the week, aiming for 150 to 300 minutes (2 ½ to 5 hours) of moderate intensity physical activity.

Half (54%) of Greater Shepparton residents do not meet these recommended guidelines.

Obesity prevention

A Deakin University project Reflexive Evidence and Systems interventions to Prevent Obesity and Non-communicable Disease (RESPOND) led by the NHMRC Partnership Project Grant will trial a whole of community approach in Northern Victoria using systems science to guide planning and implementation and accelerate efforts to prevent childhood obesity.

The five-year project will target more than 30,000 children from birth to 12 years of age across 10 local government areas (LGAs), 14 health services and 116 schools in the Ovens Murray and Goulburn regions of Victoria, including those located in Greater Shepparton, Moira and Strathbogie Shires.

The project is the first stepped-wedge cluster randomised controlled trial of a whole of system childhood obesity prevention approach at scale in Northern Victoria.

Prior to the announcement of the RESPOND Grant, a collaborative obesity monitoring program initiated by Goulburn Valley Primary Care Partnership (GVPCP) and the Greater Shepparton Public Health Advisory Committee, with the support and guidance of Deakin University developed a local healthy weight range monitoring program in 2016. A significant part of the research methodology behind this initiative is based on a community led change approach, supported by gaining and using local data in real time, then utilising a systems thinking and collective impact approach to engage the community to lead investment and commitment to long-term change through greater awareness. Primary School students in years 2, 4 and 6 were surveyed and measured to capture their health status, physical activity, nutrition and wellbeing.

- From 62 schools invited across the Goulburn Valley area (GV) 39 participated, being 23 in Greater Shepparton from a possible 36
- A total of 1,616 students participated from the GV
- Of 1,493 students who had complete height and weight measurements recorded 36.3 per cent were classified as overweight or obese; Greater Shepparton (GS) 37.5 per cent, Moira 33 per cent and Strathbogie 29.6 per cent

Results for Greater Shepparton specifically indicated:

- Two serves of fruit per day were consumed by 72.3 per cent of students in GS
- Vegetable intake indicated 14.4 per cent consumed 4.5 serves of vegetables per day
- 12.6 per cent consumed take away two or more times per week
- 54.1 per cent consumed five or more glasses of water per day
- 23.1 per cent consumed one or more sugar sweetened beverages per day
- 16.9 per cent engage in moderate or vigorous physical activity
- 55.6 per cent engaged in two hours or less of screen time daily
- 23.9 per cent use active transport to or from school daily in GS compared to the National average for those aged 6-12 years of 37 per cent

Gambling

Problem gambling is the result of the complex interplay between many different factors. These factors include characteristics of the individual (knowledge, attitudes, beliefs, personality traits, personal experience); the influence of parents, peers and family; social and cultural norms; aspects of the gambling environment, including what gambling is offered, in what setting and how it is marketed, and the broader policy and legislative environment which governs access to and availability of the means to gamble. Gambling doesn't just affect a person's finances, it, can also affect their health. There is a strong link between gambling and mental health, as well as a connection between gamblers smoking or drinking alcohol.

- Venues are located in the most disadvantaged neighbourhoods based on SEIFA, with over \$16 million expended on electronic gaming machine (LA)
- Adult population 47,832, Total net expenditure 31,380,787.26, Population (18+) per venue 5,979, Net Electronic Gaming Machine Expenditure per adult 656.06, Electronic Gaming Machine per 1000 (18+) 7 (ABS)

Immunisation

Vaccination protects against infection, saves lives and protects those who are too young or too sick to be immunised. The risk of complications from childhood diseases like measles is much higher than the risks of vaccination. 'No Jab, No Play' is the name of legislation that requires all children to be fully vaccinated unless they have a medical exemption to be enrolled in childcare or kindergarten in Victoria. By law, a child must have an Immunisation History Statement from the Australian Immunisation Register to enrol in primary school.

- Children fully immunised between 24 and 27 months in Greater Shepparton is 87 per cent.
- Children fully immunised between 60 and 63 months is 96.22 per cent

Mental Health and Wellbeing

Mental health and wellbeing are fundamental to our collective and individual ability as humans to think, emote, interact with each other, earn a living and enjoy life. Mental wellbeing has been defined as a 'a state of wellbeing in which every individual realises his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community'.

Levels of mental wellbeing and prevalence of mental illness vary according to socio-demographic and socioeconomic factors, with disadvantaged and marginalised population groups having a higher risk of experiencing mental illness and poor mental wellbeing. While mental wellbeing and mental illness are considered to be distinct concepts, many factors that promote mental wellbeing are also factors that may protect against mental illness. These factors include resilience and social connection. Resilience, social capital and social connection are important for the development and maintenance of mental health and wellbeing. Resilience is a person's capacity to overcome significant challenges or negative life events and successfully return to their previous level of function, avoiding mental ill-health. High levels of resilience are associated with a lower risk of mental health problems and an improved sense of mental wellbeing. Social capital describes the benefits that arise as a consequence of social connections. Developing positive social connections and relationships is essential for optimal development, and provides a wide range of positive physical and mental health outcomes.

- Greater Shepparton has 19.4 registered mental health clients per 1,000 population.



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VicHealth Bright Futures Youth Study

VicHealth's Mental Wellbeing Strategy 2015-19 captured the factors set to influence the mental health and wellbeing of youth aged from 12-25 years, recognising that it is a critical period of social and emotional development where youth face serious challenges that may result with a lifelong impact. VicHealth identified the five key factors as a result of their survey findings in the metropolitan area:

- The rising bar
- Out of the shadows
- Global reach
- Overexposure online
- Life's richer tapestry

A survey was co-designed with local education, health and community organisation stakeholders to explore local factors causing poor mental health and wellbeing in Greater Shepparton. The five key health issues identified from survey findings by our local youth were:

- Perceptions of own health; self image, weight, mental health, physical activity
- Social isolation; feeling alone, not connected to community
- Future security; employment, education, housing
- Access to health services; ability to attend, transport, affordability
- Safety; Increased lighting, less drugs, more support services, higher police presence

In summary there were 487 survey respondents with key findings:

- Most (49.9 per cent) reside with both parents and although the majority of respondents were happy with what they were achieving in life, they were concerned of their mental wellbeing, weight and level of physical activity
- Respondents reflected high levels of stress and anxiety, inability to cope with negative feelings and there were significant numbers of respondents that indicated a fear of failure.
- More than half of the respondents (54.1 per cent) indicated that they got eight or more hours of sleep, however sleep was interrupted for a variety of reasons including; anxiety (25.3 per cent), distractions by phone/technology (20.2 per cent), homework or study (19.7 per cent), worrying about work or money, with the remaining respondents listing family, friends, nightmares and health as disturbances
- Most respondents indicated that they feel safe and included at home or school, but not in their local community. Less than half of the respondents (39.7 per cent) believe they will still be attending school in five years' time and are attending regularly (80.8 per cent) with only four (0.9 per cent) never attending
- Most respondents were happy with the help they received from others and indicated family, friends and neighbours as the preferred option, with some (17 per cent) indicating they felt uneasy or nervous about talking to support services or concerned of the cost and ability to access services
- Sport or physical recreation groups appear to be the most dominant reason of regular social interaction, however many respondents stated that they have no regular involvement with any organised groups

Headspace Centre Activity Overview Report

Headspace Shepparton provide reports to inform headspace centre staff and lead agencies of the centre's activity, based on client service activity data and local demographics allowing comparison to national averages for the 2015/16 period. Data findings include:

- There were 2,456 clients (young persons aged between 12 to 25 years) that received Occasions of Service at Headspace Shepparton; provision of face to face or over the phone full assessments compared to the National Centre Average of 3,024 in FY 2015
- There were 658 serviced young people in FY 2015
- There were 469 new young people attending in FY 2015; that have received services for the first time during the 12 month period (national Centre Average 466)
- 140 youth returned for services (national Centre Average 163) in FY 2015
- Average frequency of visits was 3.7 (national Centre Average 4.4) in FY 2015
- Visits were significantly higher during May and June
- Wait times to access services were similar for both local and national rates
- Significantly higher numbers of females access the services (172 or 67.5 per cent), males (80 or 31.4 per cent) and other (three or 1.2 per cent) (comparative to national rates)
- The highest volume of attendees were aged between 15-17 years
- Majority of attendees (180 or 92.3 per cent) reported having somewhere to live (nationally 89.5 per cent)
- Higher proportion of the attendees were Aboriginal and Torres Strait Islanders (25 or 9.9 per cent) accessed local services than national rates (2,127 or 7.8 per cent)
- Lower proportion of the attendees were Culturally or Linguistically Diverse (CALD) (eight or 3.2 per cent) accessed local services than national Centre Average rates (2,265 or 8.3 per cent)
- Mental health/behaviour is the dominant reason for attending (78.2 per cent), situational less (14 per cent), alcohol and other drugs (3.3 per cent) and vocational assistance, physical health and other being very low (comparative to national Centre Average rates)
- The majority of attendees heard of the service from somebody else
- Nearly half of all attendees (48 per cent) were referred by somebody they know, with many advising it was their idea to seek help (26.4 per cent).

Oral Health

Improving oral health requires access to fluoride (in water and toothpaste), good dental hygiene and regular access to preventative dental care. The major oral disease that cause poor oral health are tooth decay, gum disease and oral cancers. Dental decay is the second most costly diet-related disease in Australia, with an economic impact comparable with heart disease and diabetes. Oral disease is a key marker of disadvantage, with greater levels experienced by people on low income, dependant older people, Aboriginal people, people in rural areas, people with disability, and immigrant groups from culturally and linguistically diverse backgrounds.



Dental Health Services Victoria data for Greater Shepparton from 2014 – 2016 indicates the following:

- The proportion of children presenting with at least one decayed, missing or filled primary teeth (baby) or permanent (adult) tooth, attending public dental services for 0 – 5 years (46 per cent), 6 – 8 years (70 per cent), 9 – 12 years (67 per cent) and 13 – 17 years (74 per cent)
- The proportion of adults presenting with at least one decayed, missing or filled primary teeth (baby) or permanent (adult) tooth, attending public dental services for 18 – 24 years (88 per cent), 25 – 44 years (96 per cent), 45 – 64 years (100 per cent) and 65+ years (100 per cent)
- The average number of decayed, missing or filled primary (baby) and permanent teeth for children attending public dental services for 0 – 5 years (2.53), 6 – 8 years (3.38), 9 – 12 years (2.48), 13 – 17 years (2.87)
- The average number of decayed, missing or filled primary (baby) and permanent teeth for adults attending public dental services for 18 – 24 years (5.37), 25 – 44 years (12.42), 45 – 64 years (19.20), 65+ years (24.84)
- Potentially preventable hospitalisations due to dental conditions for children aged 0 – 4 years from 2013 – 2014 is 5.26 per 1,000 population
- 3.2 per cent of people report poor dental health with 0.2 dental service sites per 1,000 population.

Participation in Screening

Early diagnosis generally increases the chances for successful treatment by focusing on detecting symptomatic patients as early as possible. Early diagnosis improves outcomes by providing care at the earliest possible stage and is therefore an important public health strategy in all settings.

Pap screening data from 2014-2015 showed 58.9 per cent of eligible women in the Greater Shepparton (aged 20-69 years) had a Pap test. This is lower than the Hume region average of 64.0 per cent and the State average of 60.5 per cent for the same time period (Victorian Cervical Cytology Registry, 2014). The Pap test has been replaced with a 5-yearly human papillomavirus (HPV) test for women aged 25 to 74 (National Cervical Screening Program, 2017).

- Cancer Council Victoria, Victorian electorate cancer snapshot (2018) for Shepparton demonstrated 1456 people are living with cancer, 441 people are diagnosed with cancer each year and 153 people die from cancer each year
- The screening rate in Shepparton in comparison for Victoria is breast screening participation rate (2 yearly) is 57% in comparison to 54%, Bowel screening participation (2 yearly) is 43% in comparison to 41%, Cervical screening participation (5 yearly) is 81% in comparison to 83%
- Cancer Council Victoria have set targets to increase cervical screening participation to 88%, Bowel screening participation to 50% and Breast screening participation to 70%.



Preventing Violence and Injury

Preventing family violence is a major priority for the Victorian government. Violence and the fear of violence influence health and wellbeing. There is a strong relationship between the consumption of alcohol and violence. A family incident is defined as an incident attended by Victoria Police where a Victoria Police Risk Assessment and Risk Management Report was completed and recorded.

- Shepparton has the fourth highest number of incidences within the Region, ranked 10 of 79 Local Government Areas with over 900 recorded family violence incidents (LA)
- Family incidents rates are highest in Greater Shepparton with 2,218 per 100,000 that is higher than the Victoria rate of 1,249 per 100,000 population
- In 2017 97 females in Greater Shepparton reported a sexual offence. This was a rate of 15.2 women, per 10,000, which is similar to the Hume region (15.5) and State (13.7) average rates (Crime Statistics Agency Victoria, 2016).

Street and community violence by contrast impacts primarily on men. In 2012, Victorian men were around 90 per cent more likely than women to have experienced physical assault in the previous 12 months. In relation to injury, the leading causes of death in Victoria are falls, suicide, transport and poisoning, while the leading cause of morbidity is falls. About 60 per cent of premature deaths are potentially avoidable; of that about half are fully or partially preventable, including those due to falls and transport-related injury.

A total of six people were killed in road accidents in Greater Shepparton between April 2015 and April 2016. A total of 35 people were seriously injured.

LGBTI

The Royal Commission into Family Violence released 227 recommendations including experiences of lesbian, gay, bisexual, transgender and intersex people and the barriers they face in obtaining services are distinct from those of other victims of family violence. They also differ within these various communities. LGBTI people may also experience distinct forms of family violence, including threats to 'out' them. Although there has been little research into family violence in LGBTI relationships, the existing research suggests that intimate partner violence may be as prevalent in LGBTI communities as it is in the general population. The level of violence against transgender and intersex people, including from parents and other family members, appears to be particularly high. There are a variety of barriers to LGBTI people reporting and seeking help, including homophobia, transphobia and a fear of discrimination. The level of awareness of LGBTI experiences and needs is limited among police, in the courts, among service providers and in the community generally. As a result, LGBTI people can feel invisible in the family violence system.

The Commission recommends the development of LGBTI-specific resources, programs and targeted community education campaigns and identification of research priorities and effective prevention strategies. Measures to encourage service providers to adopt inclusive practices, through a review of the standards for family violence service providers are recommended. In the context of its commitment to review equal opportunity laws, the Victorian Government should also take into account concerns expressed about the potential for discrimination against LGBTI people seeking assistance in relation to family violence.

Injury Profile for Greater Shepparton

The Victorian Injury Surveillance Unit (VISU), located within the Monash University Accident Research Centre (MUARC) provides detailed reports on local hospital admissions and an injury profile for the Greater Shepparton Local Government Area (LGA) using the state-wide collection of data compiled by the Victorian Admitted Episodes Dataset (VAED). VISU aims to reduce the number and severity of injuries in the community through a program of ongoing injury surveillance: identifying hazards, disseminating data and information, supporting research and monitoring trends. VISU is funded by the Department of Health and Human Services (DHHS) Victoria.

Hospital Admissions - Results of analysis:

- Between July 2013 and June 2016 there were 3,261 admissions to hospitals for injury among residents of the Greater Shepparton region, 91 per cent of these admissions were for unintentional injury, 5 per cent were the result of intentional self-harm, 3 per cent were for injuries sustained through assault, maltreatment or neglect, and 1 per cent were for injuries of other or undetermined intent
- The age groups accounting for the most admissions were those aged 85 years or more (10 per cent) and 15-19 year olds (8 per cent)
- Males were over-represented, accounting for 57 per cent of admissions overall. Males were over-represented in most intent groups apart from the intentional self-harm group, which comprised 68 per cent females
- The specific body site most frequently injured was the head (16 per cent), followed by the knee & lower leg (14 per cent)
- The grouped body site most frequently injured was the upper extremity (30 per cent), followed by the lower extremity (27 per cent)
- Fractures were the most common type of main injury (41 per cent), followed by open wounds (10 per cent)
- Falls were the most common cause of injury, accounting for 39 per cent of admissions. The most common types of falls were slips, trips or

stumbles (10 per cent of all cases) and other falls on the same level (8 per cent). Next most common were transport injuries (16 per cent), most of which involved car occupants (7 per cent), motorcyclists (4 per cent) and pedal cyclists (2 per cent)

- Injuries most commonly occurred in the home (22 per cent) or on a road, street, or highway (11 per cent). Note that 45 per cent of cases did not specify a location
- The activity being undertaken when injured was most commonly described as sports (11 per cent). Working was also a common activity, either for income (5 per cent) or other types of unpaid work (4 per cent). Note that in 62 per cent of cases the activity was unspecified
- Of those injured and admitted to hospital 64 per cent stayed for less than two days and 28 per cent required a stay of between two and seven days, 7 per cent were admitted for between eight and thirty days, and only 1 per cent required a stay of 31 days or more
- Records indicate 80 per cent of those injured persons were discharged to private residence or accommodation, with 7 per cent transferred to another acute hospital or extended care.

Emergency Department Presentations - Results of analysis:

- Between July 2013 and June 2016 there were at least 18,002 presentations to emergency departments (EDs) for injury among residents of the Greater Shepparton region, with 91 per cent of these presentations for unintentional injury, 3 per cent were the result of intentional self-harm, 3 per cent were for injuries sustained through assault, maltreatment or neglect, and 3 per cent were for injuries of other or undetermined intent
- The age groups accounting for the most ED presentations were 15-19 year olds (11 per cent), followed by 10-14 year olds (10 per cent) and 20-24 year olds (10 per cent)
- Males were over-represented, accounting for 60 per cent of ED presentations overall. As was reported for the admissions data, there was a higher proportion of females (68 per cent) in

the intentional self-harm group presenting to emergency departments

- The specific body site most frequently injured was the wrist and hand (21 per cent), followed by the head (18 per cent)
- The grouped body site most frequently injured among those presenting to emergency departments was the upper extremity (33 per cent), followed by the lower extremity (23 per cent) and the head, face and neck (23 per cent)
- Dislocations, sprains and strains (23 per cent) were the most common type of main injury, followed by superficial injuries (23 per cent) and fractures (16 per cent)
- Falls were the most common cause of injury, accounting for 34 per cent of ED presentations. Next most common were hit/struck/crush injuries (17 per cent)
- Injuries most commonly occurred in the home (47 per cent) or in a sports and athletics area (9 per cent). Note that 11 per cent of cases did not specify a location
- The most frequent activity being undertaken when injured was 'leisure' (60 per cent), followed by sports (9 per cent) and working for income (8 per cent). Note: 9 per cent of cases the activity was unspecified
- Overall 16 per cent of those presenting to hospital emergency departments were admitted for further treatment

Reducing Harmful Alcohol and Drug Use

Alcohol and other drug dependency can be viewed and treated as a chronic illness, although many of the harms associated with alcohol are not about addiction but long-term regular drinking or single occasion risky (binge) drinking. Long-term and regular alcohol consumption, not only binge drinking, is linked to disease, including some cancers and even cardiac illness. Long-term and frequent alcohol use is also a risk factor for alcohol-related dementia and other acquired brain injuries. Some drugs can trigger the onset of a pre-existing mental illness. Alcohol and drug use is also closely associated with a range of mental health issues, and particularly anxiety and depression. Alcohol disorders are the second most commonly diagnosed disorder among those who die by suicide. A risk factor for problematic alcohol and drug use is the experience of trauma and in particular sexual violence. Excessive alcohol and drug use can contribute to the frequency and likelihood of being involved in violence. Recent research has attributed the excessive use of alcohol as a preventable risk factor in some family violence incidents.

- In Greater Shepparton 48.5 per cent of residents are at risky/high risk of short-term alcohol related harm (CP) with 2.8 per cent at risky/high risk long term alcohol related harm.
- The Goulburn DHS area, containing Greater Shepparton LGA, was ranked 7th lowest out of 17 DHS areas in 2013 for the proportion of children exposed to alcohol in utero (Lighthouse Data)

Sexual and Reproductive Health

Sexual health is an important element of health and wellbeing. Sexual health requires respect, safety and freedom from discrimination and violence. It is critically influenced by power dynamics, gender norms and expectations and is expressed through diverse sexualities. Sexual health encompasses emotional, physical, mental and social wellbeing in relation to sexuality, including the right to respectful, enjoyable and safe sexual relationships free of coercion, discrimination and violence. Reproductive health suggests people can enjoy a responsible, satisfying and safe sex life with decision-making control over their reproductive choices.

- In 2016 the number of live births in Greater Shepparton was 969. The total fertility rate per 1,000 women was 2.2 higher than Australia's total fertility rate of 1.8 babies per 1,000 women.
- Amongst women aged 15 – 19 in Greater Shepparton a rate of 21.3 babies per 1,000 women were born in 2015. This is considerably higher than the Hume region rate of 12.5 and Victorian average of 9.5.
- In the Hume Region, 5.3 per cent of 12 – 14 year old students reported they had sexual intercourse; 29.4 per cent of 15 – 17 year old students reported they had sexual intercourse; 58.9 per cent of these students practiced safe sex by using a condom and 94.6 per cent of sexually active adolescent females have used contraception to avoid pregnancy.
- In Greater Shepparton the Chlamydia rate per 10,000 persons was 22.17 for females and 12.9 for males. For women this is higher than the Hume Region, 15.5 and the Victorian average of 19.4.
- In Greater Shepparton the 2015 IUD insertion rate per 1,000 women aged 15-24 was 5.3 (based on Medicare claims). This rate increased in older cohorts, were 11.3 and 14.7 women per 1,000 aged 25-34 and 35-44 respectively had an IUD insertion. This rate decreased for women 45+, with 4.3 women having the IUD insertion (Women's Health Atlas, 2016). Again, based on Medicare claims, the Implanon insertion rate per 1,000 women aged 15-24 was 45.3. This rate decreased in older cohorts, where 26.2 women per 1,000 aged 25-34 and 13.2 women aged 35-44 had an Implanon insertion. This rate decreased for women 45+, with 3.3 women having the Implanon insertion. Privacy was found to be the most significant barrier to young people purchasing condoms in rural and regional areas.

Social Connection and Inclusion

Our social relationships or the social connections we form at an individual and community level impact on health and wellbeing. There is growing evidence that participation in groups is associated with less psychological distress and good mental health, while volunteering is associated with reduced mortality risk, good mental health, higher levels of self-reported personal wellbeing and neighbourhood wellbeing. Important aspects of social connection include supportive social networks; family, friends and community groups; participation in social activities such as those run by community groups or clubs; civic engagement through community groups, such as church or volunteer, service clubs, and professional or political associations.

According to the Australian Social Inclusion Board, 'a socially inclusive society' is one in which all Australians feel valued and have the opportunity to participate fully in the life of our society. Achieving this vision means that all Australians will have the resources, opportunities and capability to learn, work, engage in the community and have a voice' (Australian Social Inclusion Board 2009).

There is now strong evidence of the relationship between social isolation and health. Older people who are socially isolated or excluded are more likely to have poorer health, while adolescents who are isolated are more likely to experience depressive symptoms and have lower self-esteem.

Inequalities in the Social Determinants of Health

Inequalities in the social determinants of health and what it means for the health of Victorians – Findings from the 2014 Victorian Population Health Survey is a detailed report released in May 2017 that identifies key comparison areas between rural and metropolitan areas.

Results reflect that a much higher volunteer rate exist in rural areas (59 per cent) in comparison to metropolitan (22 per cent), more women volunteer, and volunteering is associated with better mental and physical health and it has been recognised that participation declines as household income declines.

Volunteering Victoria

Volunteering Victoria provided a detailed report about volunteering rates, barriers and identified benefits in 2015.

ABS 2011 captured data for the first time asking individuals how many hours were spent volunteering and results have been included.

- Number of individuals volunteering in Greater Shepparton 23.1 per cent (10,516 people) compared to Victoria 20.8 per cent (931,544) (ABS 2016)
- People who help as a volunteer in Greater Shepparton 22 per cent (CP, 2018)
- Higher rates of volunteering occurred between 35-64 years of age (Vol Vic)
- Highest rates of volunteering in Victoria occurred in the sport and recreation setting (38 per cent) (Vol Vic)
- Volunteer rates per gender male 21.4 per cent GS compared to Victoria 19.1 per cent, female 24.6 GS compared to Victoria 22.5 (ABS 2016)
- Median number of volunteer hours per year by gender in Victoria; Men 52, Women 62 (Vol Vic)
- Neighbourhood – people willing to help each other 81.1 per cent agree (VicHealth Explore your data)
- Neighbourhood – close-knit neighbourhood 70.1 per cent agree (VicHealth Explore your data)
- Neighbourhood – people can be trusted 72.9 per cent agree (VicHealth Explore your data)
- Average resilience rating 6.6 (VicHealth explore your data)
- Low gender equality score 35.7 per cent (VicHealth explore your data)



Sun Protection

Outdoor activity, both recreational and work-related, increases a person's risk of over-exposure to ultraviolet radiation (UVR). It is important to balance the risks of developing skin cancer with spending time outdoors and maintaining an active lifestyle. It is also important to balance the risks of skin cancer from too much sun exposure with maintaining adequate vitamin D levels, which is essential for bone and muscle health in all age groups. Most skin cancer can be prevented by using good sun protection including clothing, hat, sunscreen, shade and sunglasses.

- Cancer Council Victoria Cancer Statistics for Greater Shepparton from 2007 to 2011 demonstrate a total of 31 cases of melanoma diagnosed per year in Greater Shepparton equating to 1.39 per cent of Victorian cases.

Tobacco-Free Living

Tobacco smoking is the biggest risk factor for preventable cancer and is a major risk factor for cardiovascular disease with around one in eight cancer cases and one in five cancer deaths caused by smoking. There is evidence that socioeconomic disadvantage is associated with a higher smoking prevalence, with smoking rates higher among Aboriginal people, people who experience psychological distress, people with a lower level of education, people who live in rural areas and people on low incomes or who are unemployed. In Victoria, smoking costs approximately 4,000 lives and \$2.4 billion in direct healthcare costs and lost productivity annually.

- In Greater Shepparton, 13 per cent of people aged 18 years or over are current smokers and 26.9 per cent of women smoked during pregnancy.



3. LIVEABILITY INDICATORS

The Liveability indicators are reflective of those from the Neighbourhood Liveability Assessment of Shepparton developed by RMIT.

Definitions for each liveability indicator are sourced from Creating Liveable Cities in Australia: Mapping urban policy implementation and evidence-based national liveability indicators (October 2017) and Liveable, Healthy, Sustainable: What are the Key Indicators for Melbourne Neighbourhoods? (May 2013) to demonstrate how each indicator collectively contributes to developing a liveable community. Local data has been derived from the Neighbourhood Liveability Assessment of Shepparton, Regional Cities Victoria Liveability Index (November 2017) and VicHealth Indicators Report for Greater Shepparton (2015).

Access To Food

The local food environment helps determine the availability and accessibility of healthy food options, which in turn influences food choices and what people eat: unhealthy diets are a leading cause of chronic disease globally. Having nearby access to a source of healthy food, such as a supermarket, is associated with higher consumption of fruit and vegetables. Food purchasing may also be influenced by the ratio of healthy to unhealthy food outlets. Further, having shops nearby may encourage the use of active transport for shopping trips. Finally, the local alcohol environment has been found to affect health risk factors, particularly in areas of socio-economic disadvantage. For example, higher densities of alcohol outlets are associated with harmful consumption of alcohol and alcohol-related violence. There is evidence of more alcohol outlets and greater harm in more disadvantaged areas.

- RMIT's LA demonstrated poor access to supermarkets and associated fresh fruit and vegetables in the outer areas of town.
- The proportion of persons who had experienced food insecurity in the previous 12 months in Greater Shepparton was similar to the Victorian average.
- Access to fast food is concentrated across the centre of town and centred along the Goulburn Valley Highway. Residents living in central Shepparton and Mooroopna live within close proximity to fast food supermarkets while residents living on the outer boundaries of town must travel up to 15km to access these food outlets.
- Supermarkets are located in the central shopping and activity areas of Shepparton that provide good access (within 800m) to supermarkets for residents living within the centre of Shepparton. Residents living on the outer northern, southern and eastern areas of town have greater distances (generally above 3km) to access affordable fresh food.



Arts, Leisure and Culture

The arts provides a unique expression of what it means to be human, that is fundamental to our nature and affects us all, through all the possibilities of participation in roles as artists, arts workers, practitioners, teachers, students, critics, supporters, and consumers. There is now a well-established empirical evidence base supporting the view that the arts can make a vital contribution to our wellbeing. This can occur across a range of dimensions, from cultural to social and economic, at an individual, community and broader society level. The arts have the potential to bridge our worlds, harness the wisdom of our different views, engage our imagination to explore new ways of thinking, and create experiences that can be shared by all people in our community. Arts initiatives can transform public spaces that may once have been problematic or under-utilised into places that become meaningful and aesthetically pleasing to the communities that use them. The Victorian Neighbourhood and Community Renewal programs that have adopted arts-based engagement approaches have shown that it is possible to both re-engage communities that have been excluded from the political and social mainstream, and create inspirational public space outcomes.

Adopting art-based participation models can also be a powerful tool for engaging community debate on the use of public space. When a community becomes involved from the design to realisation phase of a project it can enhance their sense of belonging, encouraging them to become custodians of their local environment.

The greater the range and cultural appropriateness, and the more opportunities to participate in entertainment, leisure and recreation activities, the greater the liveability of an area. Participation builds social cohesion and connectedness, thereby reducing isolation. By building a collective identity, event and cultural facilities also build community strength. Community and cultural events provide a range of socially inclusive activities that contribute to overall community well-being. Both culture and leisure activities assist in developing national

identity and forming community networks and bonds crucial to social cohesion. Industries associated with culture and leisure are growth industries and are thus important to Australia's economic wellbeing.

The culture and leisure sector also contribute to economic development through facilitating creativity, innovation, and self-reflection. Most types of arts involvement have a social dimension that is an important basis for building social capital and community identity. The arts, through their communicative power, enhance individual engagement with the world in ways that have both personal and public benefits. These effects are instrumental in that they can open people to life and create the fabric of shared values and meanings that improves the public sphere. Collective artistic activity has the potential to provide a forum for voice, affect social change, or promote a community's unique cultural identity. Participation builds social cohesion and connectedness, thereby reducing isolation. Through building a collective identity, event and cultural facilities also build community strength. Community and cultural events provide a range of socially inclusive activities that contribute to overall community well-being.

- Deloitte – 0.5 per cent of Greater Shepparton residents workforce is employed within arts and recreational industries similarly to Wodonga, Mildura and Latrobe. Other regional areas scoring higher include Ballarat 1.1 per cent, Greater Bendigo 0.8 per cent, Greater Geelong 0.9 per cent, Horsham 0.9 per cent, Wangaratta 0.6 per cent, Warrnambool 0.9 per cent.
- Deloitte – Greater Shepparton averages 0.72 domestic daytrip and overnight tourists visiting for arts and recreational activities, per resident. This figure is lower than all other regional areas including Ballarat 5.80, Greater Bendigo 2.95, Greater Geelong 1.73, Horsham 1.16, Latrobe 1.33, Mildura 1.04, Wangaratta 2.50, Warrnambool 2.79 and Wodonga 1.37.



Community Participation

Community participation is the active involvement of people from communities preparing for, or reacting to, disasters. True participation means the involvement of the people concerned in analysis, decision-making, planning, and programme implementation, as well as in all the activities, from search and rescue to reconstruction, that people affected by disasters undertake spontaneously without the involvement of external agencies. While the opportunities for community participation may vary greatly from place to place and at different points in the disaster-management cycle, a participatory approach to disaster-related activities should be promoted to achieve sustainable development.

Crime and Safety

Neighbourhood safety and security are important determinants of people's health and wellbeing. When individuals feel safe within their communities, they are more likely to connect with friends, engage with other community members and experience greater levels of trust and social connection. Areas of socio-economic disadvantage are reported to have higher rates of social disorder, such as graffiti, drug use or dealing, theft, burglary and violent crime. When individuals perceive their neighbourhoods to be unsafe, they experience higher levels of anxiety and interactions between members of the community become more limited, placing them at risk of social isolation and mental illness. Neighbourhood safety also influences our physical health and wellbeing by altering how people use, and interact with, the built environment, local amenities, parks and community facilities.

- When walking alone in their area during the day, 99.9 per cent of Greater Shepparton residents felt safe or very safe.
- Only 53.5 per cent of Greater Shepparton residents felt safe or very safe walking alone at night, less than the Victorian average of 70.3 per cent.
- Greater Shepparton - 35.9 per cent of female and 68 per cent of males feel safe when walking alone in local area at night.
- Greater Shepparton had the highest rate of total crime (12,041.3 per 100,000) between January 2011–December 2015, higher than the Victorian rate at the same point in time (8,353.4 per 100,000).



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Education

Education is a key determinant of health and liveability, with lower levels of formal education contributing to poorer health outcomes across the life course.

- Greater Shepparton has a kindergarten participation rate of 94.5% compared to 98% for Victoria.
- Across all of the AECD indicators of health, social, emotional, language and communication, 27% of children in Greater Shepparton are vulnerable in one or more of these indicators compared with 22% of children nationally.
- 1 in 11 children in Shepparton enter school with emotional or behavioural problems compared with the Victorian average of 1 in 20.
- 18.5% of children at school entry present with speech or language problems compared to 13.8% in Victoria.
- Primary school students in the Greater Shepparton LGA consistently rank around the bottom 10% of LGAs in Victoria for the percent of students achieving national benchmarks in literacy (NAPLAN).
- Primary school students in Shepparton consistently record higher numbers of absence days per FTE student than the average for government primary school.
- 16.7% of young people in the Goulburn area showed high levels of depressive symptoms and psychological distress.
- Shepparton records a significantly higher number of absence days per FTE student in secondary school than other LGAs in Victoria.
- 26% of young people in Years 7-9 report being bullied in Greater Shepparton, compared with 18% in Victoria. When compared to LGAs across Victoria, reporting of bullying amongst young people in Years 7 – 9 in Greater Shepparton is very high.
- RMIT LA demonstrated low levels of Year 12 or VCE completion rates in young adults between 18 – 24 years with less than 50 per cent of young adults holding this level of education in a number of neighbourhoods.

- The proportion of students in Year 9 in Greater Shepparton who meet or exceed the benchmarks for literacy (87.4 per cent) and numeracy (90.9 per cent) is lower than the Victorian measure for literacy (93.5 per cent) and numeracy (95 per cent).
- Greater Shepparton has a lower proportion of the population, persons aged 15 years and over, (30.9 per cent male and 37.5 per cent females) that have completed Year 12 or equivalent than the Victorian average (50.3 per cent male, 53.1 per cent female).
- There were 337 residents that indicated that they completed year 12 or equivalent, with only 10 reporting they had not attended school.

The Shepparton Education Plan will transform student outcomes, by empowering all students to learn and achieve, experience high quality teaching practices and the best conditions for learning which equip them with the knowledge, skills and dispositions for lifelong learning and shaping the world around them. The first stage of the Shepparton Education Plan is to merge the four current high schools, McGuire College, Mooroopna Secondary College, Shepparton High School and Wanganui Park Secondary College onto the Shepparton High School site including new buildings, a wellbeing hub and more support for students with both high aspirations and more complex needs



Employment and Income

Employment and income is not only good for the economy but is a key determinant of health, and thus are important factors to consider when assessing the liveability of an area. Employment and income indicators are primarily concerned with income and employment levels, the number and type of jobs and job growth, as well as the location and accessibility of employment. RMIT Liveability Assessment (need to reference correctly) demonstrated high levels of local employment across the outer areas of town.

- In 2016, 26,978 people living in Greater Shepparton were employed, of which 60% worked full-time and 37% part-time.
- The most popular industry sectors were health care and social assistance (15.2%), retail trade (11.1%) and manufacturing (10%).
- The most popular occupations were professionals (17.1%), managers (14.5%) and labourers (13.9%).
- Greater Shepparton has an unemployment rate of 6.7%.
- Analysis of the individual income levels in the City of Greater Shepparton in 2016 compared to Victoria shows that there was a lower proportion earning a high income (those earning \$1,750 per week or more) as well as a lower proportion of low income persons (those earning less than \$500 per week). The median individual income is \$588 per week. Overall, 6.0% of the population earned a high income, and 39% earned a low income, compared with 6.9% and 40.2% respectively for Regional Victoria. The 'medium lowest' income quartile was the largest group in 2016, comprising 30% of people aged 15 and over.
- Analysis of household income levels shows there was a similar proportion of high income households (those earning \$2,500 per week or more) and a lower proportion of low income households (those earning less than \$650 per week). The median household income is \$1,163 per week (ABS 2016)

Health and Social Services

Health and social services encompasses access to general practitioners, access to services for older people and access to local amenities. This is essential social infrastructure required for communities. In addition to their importance to liveability, healthcare indicators are also relevant to health and wellbeing outcomes, as access to healthcare is a social determinant of health. (CI)

- Services of daily living are also concentrated across the centre of town. As housing development spreads into the outer northern, eastern, southern and western areas of Shepparton, access to daily living services become harder and more vehicle dependant creating greater pressure on car parking infrastructure with distances that are not conducive to walking or active transport. Similar situation in Mooroopna and Tatura.
- General Practitioners per 1,000 population – 1.4, Greater Shepparton is ranked 14 of the 79 LGA's.
- General practice clinics per 1,000 population – 0.3, Greater Shepparton is ranked 51 of the 79 LGA's.
- Allied health service sites per 1,000 population – 0.7, Greater Shepparton is ranked 58 of the 79 LGA's
- Dental service sites per 1,000 population – 0.2, Greater Shepparton is ranked 35 of the 79 LGA's
- Access to services (medical centres, community centres, hospitals, libraries, supermarkets, places of worship) are predominantly centrally located, with limited transport available (LA)



Housing Affordability and Diversity

Housing affordability, along with quality, location and density of housing, affects people's health, wellbeing and quality of life, making access to housing a health-equity issue. It has long been understood that poorer-quality housing is linked to poorer mental and physical health. However, housing affordability has become a pressing public policy issue in Australia, leading to construction of lower-cost, low-density housing on the urban fringe, which is poorly serviced by public transport and infrastructure. The car-dependence of these areas makes residents increasingly vulnerable to mortgage stress, in the face of rising oil prices and mortgage interest rates. Conversely, well-designed, well-located, higher-density housing with access to local employment, services and shops, and high-quality public transport, can promote good health by encouraging social connections and active forms of transport.

Housing indicators are concerned with the quality and affordability of housing, as well as population and housing density and the mixture of land uses. Indicators suggest that more liveable areas have a greater mix of land uses, and access to affordable housing relative to income, that is available and adaptable to those in need.

- RMIT's LA demonstrated a large proportion of lower income households (lowest 40 per cent of household incomes) experiencing housing stress and a need for greater housing diversity in the outer areas of town, with diversity only evident in the centre of town.
- A large proportion of neighbourhoods across Greater Shepparton are spending more than 30 per cent of their income on housing. Up to 66 per cent of lower income households (defined as households in the lowest 40 per cent of the income distribution) are spending more than 30 per cent of their gross incomes on housing costs.
- Rental Stress – Greater Shepparton had a higher proportion of households experiencing rental stress (27.9 per cent) than the Victorian average (25.1 per cent)

- Mortgage Stress – Greater Shepparton has 1,004 low income households experiencing mortgage stress is (13.3 per cent) higher than the Victorian figure of 11.4 per cent.
- Received Assistance from Centrelink – Greater Shepparton had the highest proportion of households receiving rent assistance from Centrelink (24.1 per cent), higher than the Victorian rate of 16.4 per cent
- Public Housing Waiting List – The total number of applicants on the public waiting list in Goulburn was 533 in March 2016.
- Social Housing – There were a total of 1,204 dwellings (19.4 per cent of all renting households) in Greater Shepparton that were rented from a State Government Housing Authority, a housing cooperative, or a community/church group. This is higher than the Victorian average of 12.3 per cent.



Sustainable Practices and Protection of our Natural Environment

The natural environment is an underlying determinant of healthy and liveable neighbourhoods. Natural environment indicators cover water quantity and conservation, air and water quality, climate, precipitation, biodiversity, energy consumption, and other environmental impacts of humans.

High quality freshwater is crucial to the health of terrestrial and aquatic ecosystems. The condition of river systems represents an integration of land use activities and is a major input into estuarine and marine environments. Stream health is therefore an effective indicator of wider catchment health and the sustainability of land uses. Safeguarding freshwater systems is essential to providing water for human uses, protecting biodiversity and providing intergenerational equity. Anthropogenic impacts on waterways include reduced flows from diversions, high sediment loads, pollution, removal of riparian vegetation and introduced pests and weed species - all of which exacerbate losses in biodiversity. In urban environments, the protection of waterways depends largely upon improved storm water management. Stormwater may be contaminated by car deposition (oils, fuel, tyre residue) and car washing detergents, grey water and septic tank seepage, illegal discharges, sediments from unsealed roads or road verges, agriculture and building site activities. Urban storm water run-off carry these pollutants into the urban drainage system, which discharge into waterways where it is ultimately carried to the sea. Clean air is cited as a fundamental element in Victoria's Sustainability Framework, "Our Environment, Our Future" (2005) and this indicator provides a measure of the state of the environment in terms of air quality. It is also an indirect measure of population exposure to suspended particles and noxious gases (United Nations, 2003). High population density and the concentration of industry, households, industry power stations and transportation (motor vehicles) exert great pressures on local environments (United Nations, 2003). However, due to prevailing weather

patterns and topography, the effects of air pollution may be felt off site, far from where they were generated. Energy use is a major limiting factor on the economy, as well as being an important factor for individual use and community well-being. However, the production and use of most types of energy has environmental impacts in biodiversity and ecological systems. (ABS, 1999).

Whilst society in general is afforded an increased standard of living with the utilization of energy resources, energy production and consumption are also a major source of human generated greenhouse gases, with fossil fuel production responsible for about three quarters of man-made carbon dioxide emissions. Sustainable energy use requires the adoption of energy conservation measures and emissions.

- Over 17,016 trees were planted in the 2017 calendar year by 2,771 participants across 44 planting sites
- Over 37% of all kerbside collection waste was diverted from landfill



Recreation Facilities and Public Open Space

Access to local public open space not only increases the urban liveability of communities by creating convivial, attractive environments, it is also important for the health and wellbeing of people of all ages. Green space helps cool the city and protect biodiversity. Access to public open space, particularly high-quality public open space, also promotes recreational physical activity. There is also evidence that access to high-quality public open space improves mental health. As cities densify, providing more public and semi-private open space is critical for population health and wellbeing, and to increasing biodiversity, particularly as the amount of private open space decline

The amount and type of open space is a key element of urban design and impacts on people's perceptions of 'neighbourliness' and safety. The type of open space also determines the range of recreation and leisure opportunities. Open space is often centred around areas of specific importance such as historic buildings, cultural centres, icons, parks and gardens. Open space acts to cement relationships within our communities and with the natural world. The amenity value of open space can be seen in the high price real estate commands in areas with views, ocean outlooks or surrounding parks and gardens.

Recreation facilities often use large areas of land, sometimes with significant infrastructure and buildings that are dedicated to a specific type or broad range of recreation and sporting activities. The planning of these facilities is especially important given the nature of their size and the number of users or spectators that are likely to use or attend the facility. Facilities that could be categorised as a regional recreation facility include sports stadium, equestrian centres, children's play facilities, aquatic centres and major playing fields incorporating a range of different organised sports such as athletics, tennis, hockey, football, soccer and netball.

- RMIT's LA demonstrated good access to public open space in many neighbourhoods of Shepparton.
- Deloitte's – Greater Shepparton has 1.6 per cent of land zoned for public use within urban areas (public parks and recreation zone) compared to Ballarat 8.4 per cent, Greater Bendigo 6.6 per cent, Greater Geelong 7.9 per cent, Horsham 5.2 per cent, Latrobe 8.4 per cent, Mildura 7.2 per cent, Wangaratta 3.8 per cent, Warrnambool 12.7 per cent and Wodonga 9.8 per cent



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Public Transport

Access to public transport is an underlying determinant of health. Public transport facilitates access to regional jobs and services, while shorter distances to public transport stops are associated with more transport-related walking, which decreases the risk of obesity. Conversely, there is evidence that for each additional hour spent driving a car, people's risk of obesity increases by around 6 per cent. Motor-vehicle traffic also increases the risk of traffic-related injuries, which are the eighth-leading cause of death and disability globally. Traffic also reduces air quality and is a major source of noise in cities, which is detrimental to mental health.

- RMIT Liveability Assessment (need to reference correctly) demonstrated Greater Shepparton has two train stations with access to capital cities in Mooroolpna and Shepparton, and good access to public transport stops within the centre of town. Limited access to public transport and services across the neighbourhoods of town, particularly in Grahamvale, Shepparton East and Orrvale.



Walkability

One significant way to improve people's health and wellbeing is through urban design and planning that create walkable, pedestrian-friendly neighbourhoods. Areas with high walkability have higher residential densities and street connectivity, mixed land-uses and high-quality pedestrian infrastructure. Walkable, pedestrian-friendly neighbourhoods encourage higher levels of walking for transport, by creating shorter and more convenient walking routes between homes and accessible destinations – including jobs, retail and essential infrastructure and services. Given the well-established benefits of a physically active lifestyle in preventing major chronic diseases, increasing walking is an international priority.

- RMIT's LA demonstrated that Shepparton has a walkable centre of town, and good school walkability but only for schools located in the northern end of town.



LIVEABILITY DOMAINS AND HEALTH GOALS

Greater Shepparton City Council has adopted the following definition of liveability.

'A liveable place is one that is safe, attractive, socially cohesive and inclusive, and environmentally sustainable; with affordable and diverse housing linked to employment, education, public open space, local shops, health and community services, and leisure and cultural opportunities; via convenient public transport, walking and cycling infrastructure'. (Lowe, 2013)

Liveability is an easily understood interpretation of the social determinants of health as depicted by Dahlgren and Whitehead's (1991) Rainbow Model of the Social Determinants of Health.

'Individuals are at the centre with a set of fixed genes. Surrounding them are influences on health that can be modified. The first layer is personal behaviour and ways of living that can promote or damage health; for example the choice to smoke or not-individuals are affected by friendship patterns and the norms of their community. The next layer is social and community influences, which provide mutual support for members of the community in unfavourable conditions. But they can also provide no support or have a negative effect. The third layer includes structural factors: housing, working conditions, access to services and provision of essential facilities.' Dahlgren and Whitehead (1991)



The Health Goals have been developed under each of the Environments for Health Framework 2011 and Liveability Domains to drive the key strategic focus of Greater Shepparton's Public Health effort.

Annually key strategies and action will be detailed in the Public Health Implementation Plan.

Health Goals have been informed by the Council Plan (CP), Local Government Area's Departmental Business Plans (LGA), Goulburn Valley Health and Wellbeing Community Profile 2016 (GVCP), Victorian Public Health and Wellbeing Outcomes Framework (OF) and the Neighbourhood Liveability Assessment for Shepparton (LA) produced by RMIT, 2018. Baseline targets of the OF are derived from the Victorian Public Health and Wellbeing Plan 2015-2019. Spatial map findings of the LA define benchmarking evidence.

Other data sources specific to a domain have been noted in full.

Greater Shepparton have chosen the following 11 Liveability Domains:

1. Access to Food
2. Arts and Culture
3. Community Participation
4. Crime and Safety
5. Education
6. Employment
7. Health and Social Services
8. Housing
9. Recreation Facilities and Public Open Space
10. Sustainable Practices
11. Transport



Liveability Indicator: **Arts and Culture**



Outcome: Greater Shepparton residents can safely identify with their culture and identity (OF)

Target:

1. Increase Greater Shepparton's annual visitor attraction rates from baseline 959,900 (Tourism Research Victoria)
2. Showcase local indigenous culture and heritage as a primary strength of Greater Shepparton including investment in indigenous public art, tours on the Goulburn River and providing further linkage to the new SAM precinct (LGA)
3. Promote and position Greater Shepparton as Regional Victoria's and Australia's sports events capital (LGA)
4. Promote community participation in arts and cultural activities (LGA)

Liveability Indicator: **Access To Food**



Outcome: Greater Shepparton residents have access to affordable healthy food

Target:

1. Increase access to fresh affordable healthy food within 1600m of residential areas (GVCP)
2. Decrease the prevalence of food insecurity from baseline 5.4 per cent (GVCP)

Liveability Indicator: **Community Participation**



Outcome: Greater Shepparton residents are socially engaged and live in inclusive communities (OF)

Target:

1. Increase the proportion of residents reporting community participation (volunteering, member of organised groups and/or local action groups, parental participation in schools, member of boards/committees, attendance at local events, participation in organised sport) (GVCP)
2. Increase the proportion of residents feeling part of the community and connecting with others through social and support networks (GVCP)
3. Advocate for reliable internet access. 26.6 per cent of private dwellings have no internet connection (GVCP)

Liveability Indicator: **Crime and Safety**



Outcome: Greater Shepparton residents live in a community that is safe and secure (OF)

Target:

1. Decrease the rate of incidence of family violence incidents recorded by police per 1,000 population from baseline of 22.6 (OF & GVCP)
2. Decrease the rate of discrimination occurrences on the basis of sexual orientation or gender identity (Royal Commission into Family Violence)
3. Decrease the rate of total offences per 1,000 population from baseline of 119.4 (OF & GVCP)
4. Decrease premature mortality from road traffic accidents per 100,000 from baseline 10.1 (OF & GVCP)
5. Increase the proportion of adults feeling safe walking in their street at night from baseline of 55 per cent (OF & GVCP)

Liveability Indicator: Health and Social Services



Outcome: Greater Shepparton residents have good physical health (OF)

Target:

1. Decrease the proportion of adults sitting for seven or more hours on an average weekday (OF)
2. Decrease the proportion of mothers who smoked tobacco in the first 20 weeks of pregnancy from baseline 26.9 per cent (OF & GVCP)
3. Decrease the proportion of babies born of low birth weight from baseline 7 per cent (OF & GVCP)
4. Decrease the proportion of children exposed to alcohol in utero from baseline 26.9 per cent (OF)
5. Decrease avoidable deaths due to cancer (28.7), cardiovascular diseases (25.2), respiratory disease (9.2) among people aged less than 75 years, per 100,000 from baseline (OF & GVCP)
6. Halt the rise in type 2 diabetes prevalence from baseline of 4.9 per cent (OF & GVCP)
7. Increase the proportion of residents with very good or excellent self-rated health from baseline 45.1 per cent (GVCP)
8. Decrease the proportion of people reporting poor dental health from baseline 3.2 per cent (GVCP)
9. Decrease the proportion of children and adults presenting with at least one decayed, missing or filled primary teeth (DHSV)
10. Reduce the rate of potentially preventable dental hospitalisations of children 0-9 years (OF)
11. Increase the proportion of adolescents who practice safe sex by using a condom (OF)
12. Reduce the birth rate for young women 15 – 19 years (OF)

Outcome: Greater Shepparton residents have good mental health (OF)

Target:

1. 20 per cent increase in resilience of adolescents from baseline (OF)
2. Decrease the prevalence of avoidable deaths from suicide and self-inflicted injuries per 100,000 from baseline 13.6 per cent (OF & GVCP)
3. Reduce the wait times to access mental health services from baseline 68.2 per cent waiting more than three days (Headspace Centre Activity Report 2016/17)

Outcome: Greater Shepparton residents act to protect and promote health (OF)

Target:

1. Increase the proportion of residents meeting the recommended serves of fruit and vegetables from baseline 54 per cent (OF & GVCP)
2. Increase the proportion of residents consuming water (11.3 per cent) over sugar sweetened beverages from baseline of 1.21 litres per day (OF & GVCP)
3. Increase the proportion of infants exclusively breastfed from 16% at 6 months of age 2016 (DE, MCH)
4. Increase the proportion of people meeting the recommended guidelines for physical activity from baseline 54 per cent (OF & GVCP)
5. Decrease the prevalence of overweight and obesity from baseline 58.7 per cent (OF & CP)
6. Decrease the prevalence of smoking in people aged over 18 years who are current smokers from baseline 13 per cent (OF & GVCP)

7. Decrease the prevalence of people at increased risk of alcohol-related harm on a single occasion of drinking from baseline 50 per cent (OF & GVCP)
8. Increase the proportion of children fully-immunised between 24 – 27 months from baseline 87 per cent (OF & GVCP)
9. Increase the proportion of residents applying sun protection behaviours from baseline 43.8 per cent (OF & GVCP)
10. Increase participation in breast screening (57 per cent), cervical screening (81 per cent) and bowel screening (43 per cent) from baseline (Cancer Council Victoria)
11. Improve access to services for older people (medical centres, community centres, hospitals, libraries, supermarkets, place on worship and public transport stops) within 1600m of residential land parcels (LA)
12. Increase the proportion of children attending key ages and stages visits (Source)
13. Increase access to General Practitioners per 1,000 people from baseline of 1.4 (LA & GVCP)
14. Increase access to General Practitioner clinics per 1,000 people from baseline of 0.3 (GVCP)
15. Increase access to allied health service sites per 1,000 people from baseline 0.7 (GVCP)
16. Increase access to dental service sites per 1,000 people from baseline 0.2 (GVCP)
17. Decrease the net Electronic Gaming Machine expenditure per adult from baseline \$656 (GVCP)
18. Decrease annual gambling expenditure in Greater Shepparton from \$16 million (LA)

Liveability Indicator: **Housing**



Outcome: Greater Shepparton residents have suitable and stable housing (OF)

Target:

1. Decrease homelessness from baseline 6.7 per cent (OF & LA)
2. Decrease the proportion of households with housing costs that represent 30 per cent or more of household gross income from baseline 66 per cent (OF)
3. Decrease the proportion of people living in households below the 50 per cent poverty line (OF)

Liveability Indicator: Transport



Outcome: Greater Shepparton residents have access to safe walking and cycling routes and reliable public transport options (VH)

Target:

1. Primary School Walkability – work toward creating an 800m neighbourhood road network buffer to increase residents active transport to school (LA)
2. Secondary School Walkability – work toward creating a 2km neighbourhood road network buffer to increase active transport to school (LA)
3. Walkability for transport – work toward creating townships that provide land use mix and services of daily living (something to walk to), road connectivity (a way to get there), and housing density (more housing and population density to supply services and different land uses) (LA)
4. Increase reliable public transport options for residents (LA)
5. Increase access to public transport stops within 400m of residential dwellings resulting in more than 54.7 per cent of residents living near public transport (LA & GVCP)

Liveability Indicator: Recreation Facilities and Public Open Space



Outcome: Greater Shepparton residents have access to quality recreation facilities and public open space

Target:

1. Provide inclusive physical activity and active participation opportunity for all ages and abilities (LGA)
2. Provide universal access to public amenities, outdoor public seating, drinking fountains and shade (LGA)
3. Greater Shepparton residents can access public open space within 400m of their residential location (LA)

Liveability Indicator: **Education**



Outcome: Greater Shepparton residents participate in learning and education (OF)

Target:

1. Decrease the proportion of children at school entry who are developmentally vulnerable on one or more domains of the Australian Early Development Census (OF)
2. 25 per cent more Year 9 students will reach the highest levels of achievement in reading (87.4 per cent) and maths (90.9 per cent) from baseline (OF & GVCP)
3. 25 per cent more young people aged 18 – 24 years achieve Year 12 or higher from baseline of 77.9 per cent (LA & GVCP)

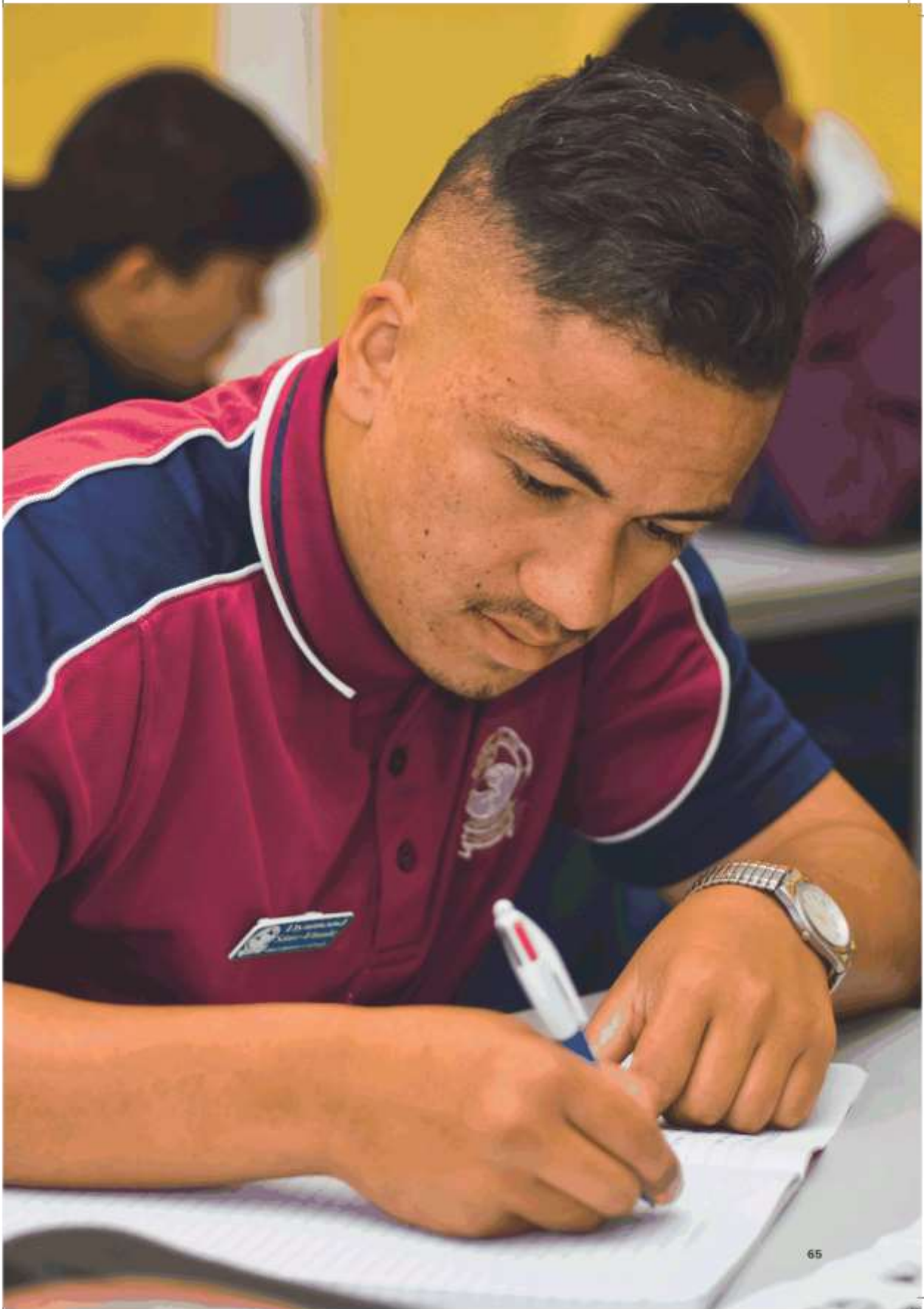
Liveability Indicator: **Employment and Income**



Outcome: Greater Shepparton residents participate in and contribute to the economy (OF)

Target:

1. Decrease Greater Shepparton's unemployment rate lower than the baseline of 6.7 per cent (OF & GVCP)
2. Increase the proportion of young people 17-24 years who are engaged in full time education and/or work (OF & ABS)



Liveability Indicator: Sustainable Practices



Outcome: Greater Shepparton residents have access to sustainable natural environments

Target:

1. Increase environmental sustainability and quality, and work towards meeting the Victorian target of 25 per cent of the State's electricity from build renewable generation by 2020, 40 per cent by 2025 from 2013-14 baseline (OF)
2. Waste is managed in a sustainable way that is environmentally friendly, reliable and sustainable for future generations (CP)
3. Reduce excess death during extreme heat and heatwaves (OF)
4. Increase resilient energy practices to adapt to the impact of climate change (OF & Victoria's Climate Change Adaption Plan 2017-2020)
5. Increase the number of designated smoke free spaces to enhance air quality and reduce the prevalence of exposure to second-hand smoke (LGA)
6. Make Greater Shepparton greener by committing to the global One Tree Per Child Project and annual National Tree Day (CP)
7. Increase percentage of tree canopy cover for Greater Shepparton (GSCC Urban Forest Strategy 2017-2037)
8. Increase percentage of Native Vegetation Cover (NVC) (CP)
9. Preserve existing NVC by continually improving land management practices (LGA)
10. Implement sustainable practices to recognise water recycling and water efficiency opportunities (LGA)
11. Reduce Council Greenhouse Gas Emissions by implementing energy reduction and renewable energy costs (LGA)



CONSULTATION

A key component of public health planning is the inclusion of the community in the development and review of each Municipal Public Health Plan.

Together the Local Government Act, Public Health and Wellbeing Act 1989 and the influencing policies and frameworks listed within this health plan confirm our local approach and statutory obligations to consult, communicate and engage with our local community utilising existing networks and interested community members. A service mapping exercise captured community input to various levels of decision-making processes through strong local and regional networks.

Council's Community Engagement Strategy 2009 and Community Development Framework 2010 outline a consultative approach to engage with community and utilise existing networks in planning and decision-making processes.

Greater Shepparton Public Health Advisory Committee

The Greater Shepparton Public Health Advisory Committee (PHAC) consists of key stakeholders from local health organisations, support agencies and community to capture a diverse range of opinion and experience. The PHAC have provided guidance in the formation of this Plan and are our key consultation group.

Small Town or Neighbourhood Planning Groups

Opportunities to get involved or become an active member of a small town planning group or neighbourhood development plan will provide individuals with an opportunity to help to shape the future of where they live, work and play. There are currently more than 17 existing and active networks.

Each small town and more recently smaller pockets of our regional city, Shepparton, are given the opportunity to get involved in their local Community Planning Group to develop a Community Plan. Each Community Plan captures the current situation in the particular community, their vision for the future and the identified short, medium and long-term priorities. (Refer to Appendix Two, Three and Four for a list of network opportunities listed above)

Local Committees and Networks

A service mapping exercise was conducted in 2016 to capture all existing engagement and consultation opportunities, work groups, advisory committees and existing networks. This exercise captured 165 active network opportunities including:

- 36 advisory committees
- 65 local networks
- 26 regional networks
- 19 section 86 committees and
- 17 established small town planning groups engaging with Councillors or Council staff.

Community and Individual Input

There are opportunities for both individual and community organisations to be involved in our liveability approach to all aspects of public health and local health prevention models by making contact via Council's website or in person directly to Council.

GOVERNANCE AND PARTNERSHIPS

The Constitution Act 1975 and the Local Government Act 1989 empower councils to make decisions and take actions that contribute to the governance of their local areas. The Act provides for two main types of committees, special committees and advisory committees.

Greater Shepparton City Council has established the Public Health Advisory Committee to provide advice to council on public health and wellbeing matters. The operation and responsibilities of an advisory committee are determined by Council and inform the Terms of Reference, or purpose of the advisory committee.

The Greater Shepparton Public Health Advisory Committee is governed by the adopted Terms of Reference and is chaired by a Greater Shepparton Councillor. Members of the Committee are endorsed by Greater Shepparton City Council following an Expression of Interest process, and elected to the committee for a two-year term.

The purpose of the Greater Shepparton Public Health Advisory Committee is to drive positive change for public health and provide a platform for strong collaborative working relationships across all sectors of our community to contribute to health outcomes.

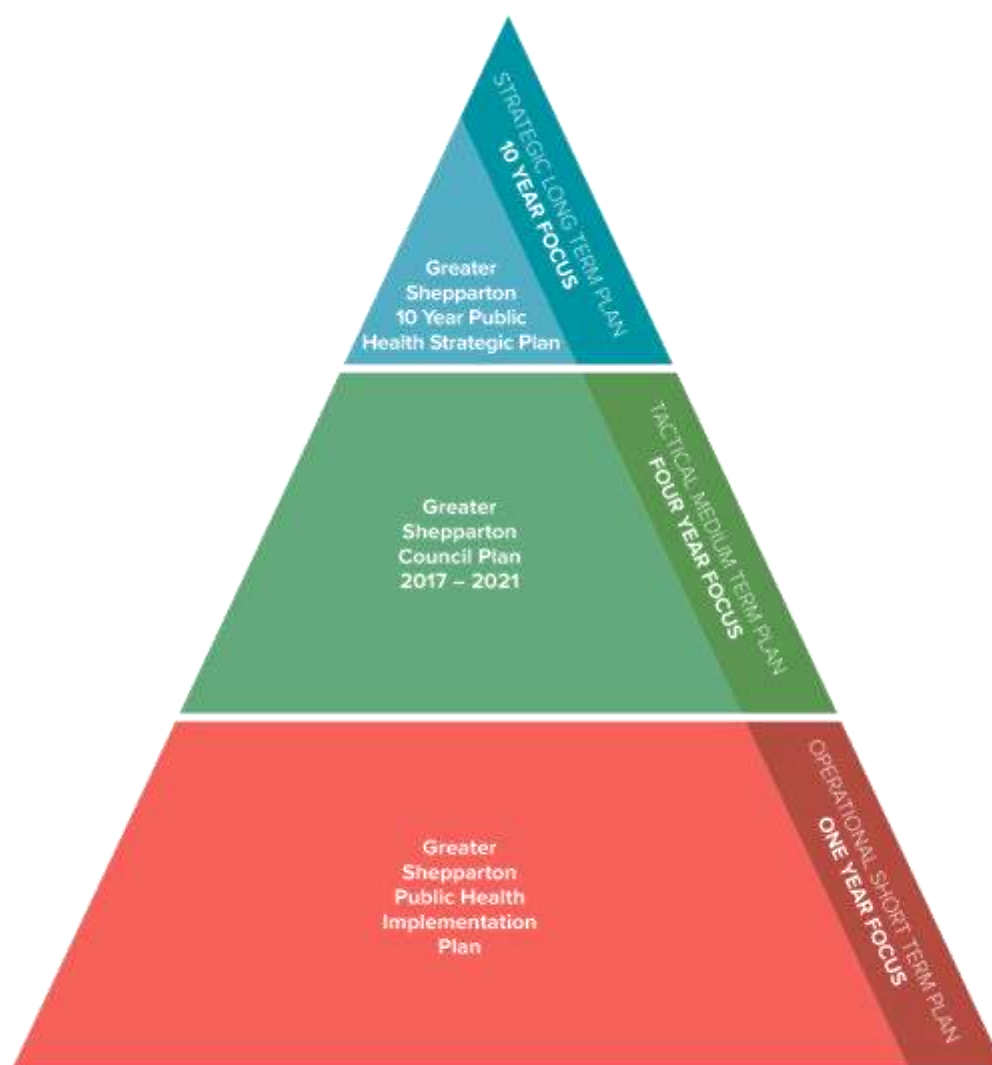
The Greater Shepparton Public Health Advisory Committee is responsible for the development, implementation and annual review of the Greater Shepparton Public Health Strategic Plan, public health matters integrated into the Greater Shepparton City Council Plan and Public Health Implementation Plan; in consultation with key stakeholders, Greater Shepparton City Council and the community.

Local organisations and networks, regional networks, advisory committees, section 86 committees, small town planning groups and community members form the foundation of the governance structure. These groups work together on actions detailed in the Public Health Implementation Plan to drive effort toward achieving the medium to long term health goals under each liveability domain, as specified in the Public Health Strategic Plan.

The proposed Governance structure reflects a community wide approach to making and implementing decisions regarding public health.

Governance Structure

Greater Shepparton's Three Tier Public Health Planning Approach



FINANCIAL INVESTMENT

The Financial Investment summary details financial investment in the health sector and others. Extra effort has captured investment in the liveability domains selected for Greater Shepparton to create an awareness of the level of investment in our region and how that translates into statistics and opportunity for local collaborative action for change or improvement.

Most councils recognise that although they cannot directly deliver business outcomes, they can facilitate and promote economic development within the context of their wider community and environmental objectives. As such, Council's role is to influence and advocate for appropriate investment and business development in line with Council Plan strategic goals and facilitate business through creating an environment conducive to economic activity and investment. To achieve this, Council provides a clear vision for the future of the municipality, delivering major events, marketing investment opportunities, improving the amenity of open spaces and infrastructure,

encouraging investment and employment opportunities to provide an environment that encourages population and business growth.

The Gross Regional Product (GRP) of an area is the equivalent of Gross Domestic Product, but for a smaller area. It is the amount of the nation's wealth which is generated by businesses, organisations and individuals working in the area. This dataset is derived from the National Economics microsimulation model, and is a broad indicator of the growth or decline of the local economy over time. Data reflects a continual overall growth from 2002 to 2017, no change in 2009 and 2014, followed by low level decline recorded in 2012 and 2013 and a considerable increase then occurred from 2016 to 2017. The GRP was \$3,481m at 30 June 2017.

Greater Shepparton Employment and Economic Output 2015

Figures below indicate the employment and economic output by industry.

INDUSTRY	JOBS	OUTPUT (\$ MILLION)
Health Care & Social Assistance	4,022	\$413
Retail Trade	3,280	\$355
Manufacturing	3,150	\$2,180
Education & Training	2,161	\$248
Agriculture, Forestry & Fishing	1,866	\$426
Construction	1,629	\$691
Accommodation & Food Services	1,160	\$140
Public Administration & Safety	1,150	\$224
Professional, Scientific & Technical Services	1,024	\$251
Other Services	1,010	\$129
Transport, Postal & Warehousing	976	\$241
Wholesale Trade	916	\$310
Electricity, Gas, Water & Waste Services	704	\$420
Administrative & Support Services	546	\$121
Financial & Insurance Services	490	\$267
Information Media & Telecommunications	305	\$144
Rental, Hiring & Real Estate Services	224	\$614
Arts & Recreation Services	154	\$26
Mining	29	\$16
Total	24,796	\$7,215

Source: Remplan Economic Profile 2015

Regional Financial Contributions

The dairy and fruit industries have predominantly been the economic drivers across our irrigated district for many years, with significant environmental changes, drought, transport costs and changes in local manufacturing resulting in reductions. However, dairy and fruit remains the highest concentration of food processing in rural Australia.

Dairy processing remains the largest food processing industry in Greater Shepparton, estimated to produce \$1.3 billion in economic output and employ 1,841 people.

Transport and distribution is a large employing sector and remains critical to the local agricultural supply chain also.

The retail and health services sectors remain the largest two sectors offering employment opportunities in our local area.

The Education and Healthcare sectors provide over 6,204 jobs, equivalent to 25 per cent of employment in Greater Shepparton providing a significant regional service centre for healthcare and education, with schools and hospitals being the major employers in the municipality.

Investment across Liveability Domains

A snapshot of investment across the selected liveability domains for Greater Shepparton is provided:

Arts and Culture

Tourism and Hospitality

Tourism and hospitality are key industries and major contributors to Australia's economy, with \$189.6m sales recorded in Greater Shepparton in 2015/16. (Source NIEIR)

Greater Shepparton recorded an annual increase of 959,900 visitor numbers (Tourism Research Australia 2016) with a length of stay per visitor of 2.3 nights.

Over 46,000 attended Riverlinks and 32,000 visited Shepparton Art Museum in 2016.



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Access to Food

Significant numbers of local food businesses are recognised in Greater Shepparton:

FOOD PREMISES - LISTING BY TYPE OF PREMISES	
Accommodation Getaway (breakfast only)	16
Aged Care Facilities	14
Bakery Retailer	23
Bar/Pub	4
Cafe/Restaurant	128
Canteen/Camps	35
Catering	17
Child Care	16
Club	38
Coffee & Dessert Outlet	11
Community Events	2
Convenience Stores (milk bars, service stations, low risk food packaging/handling)	25
Delicatessen	3
Delivery Meal Organisation	1
Green Grocer	23
Home Based Retailer	15
Hospital	4
Juice Bar	1
Low Risk Packaged Food Retailer (Pre-packaged food at Chemists, Newsagents, Department stores)	79
Manufacturer - Low Risk Foods	16
Manufacturer - Potentially Hazardous Foods	9
Mobile Food Premises	41
Nuts/Herbs/Spices Retail	2
Reception Centre	2
Residential Care	1
Supermarket	19
Take Away Foods/Fast Food Outlet/Kiosk	93
Temporary Food Premises	10
Vending Machine	2
Warehouse/Distributors/Wholesalers & Importers	12
TOTAL	662

Food premises inspections provide an ongoing maintenance of food preparation and storage.

Community Participation

Volunteerism brings both social value and significant economic value to the local economy. (Vic Vol)

The projected gross opportunity cost wage rates for volunteers (based on Australian Bureau of Statistics Unpaid Work and the Australian Economy 2000) are estimated at \$34.89 per hour in 2016, indicating a contribution of over \$366,903 based on 10,516 volunteer hours (ABS 2016)

Crime and Safety

Locally strong networks exist working together across crime and safety issues, with Council officers supporting Police in local camera monitoring throughout the CBD area. Organisations include Victoria Police, Department of Justice, CFA and Vic Roads Neighbourhood Watch and others.

A local Nightlife Radio network operates with all late night venues, police and volunteer operators of the street rider bus network in the CBD area, as part of the monitoring.

There are 20 security cameras located in Shepparton across the CBD area, with six delivered in partnership with Lascorp.

The Community Safety Strategy targets future expansion and upgrade of the safer city camera network and will continue to investigate future opportunities and potential focus sites or identified blackspots.

Council provides in kind collaborative effort and participation in the family violence prevention network and the north east regional community of practice.

Education

Greater Shepparton offers an abundance of child care centres (25), kindergartens (36) primary schools (36), private secondary schools (two) and public secondary schools (six).

In addition, Greater Shepparton is the location of tertiary education campuses (three); La Trobe University, the University of Melbourne (Dookie Campus and Rural Health Centre), and Goulburn Ovens Institute of TAFE (GOTAFE) offering a limited range of courses, with small numbers of adult and disabled learning facilities available.

The largest changes in the number of persons attending between 2001 and 2016 reflect a reduction 431 at government secondary schools, increased 282 primary school attendees, increased 275 at university and increased 196 at catholic secondary.

The Education Plan is the most recent project working with local secondary schools to develop a new approach aimed at increasing the number of youth completing year 12 or equivalent.

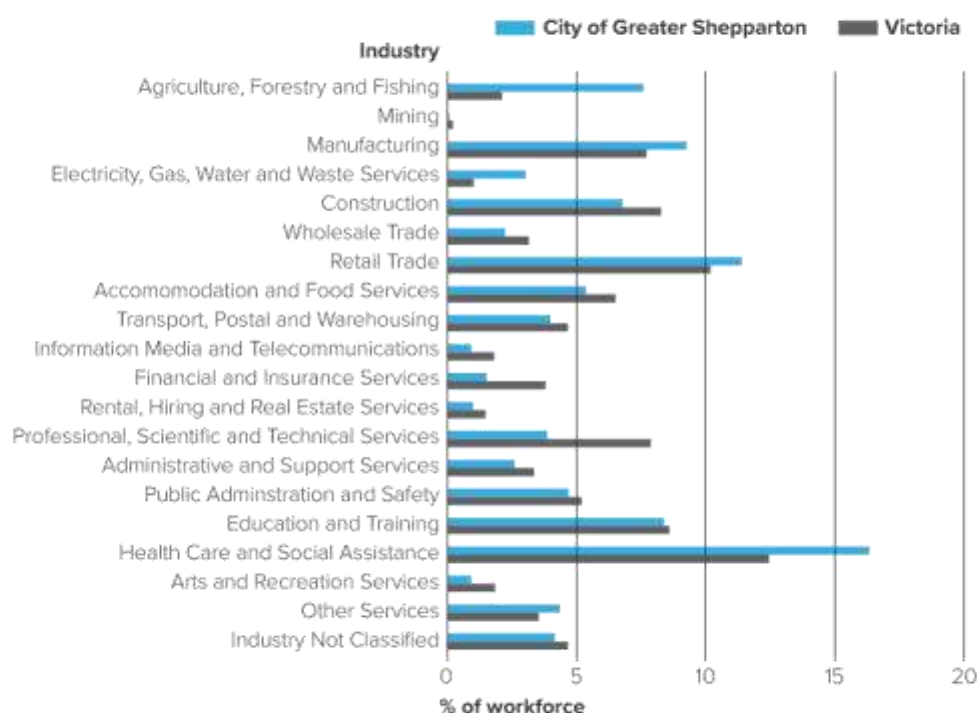
Employment and Income

A count of local jobs is one of the most fundamental economic indicators of the size of the local economy, and increasing numbers jobs generally represent a growing economy.

Data reflects a steady increase in job opportunities, with declines evident in 2009 and 2014. There were 31,676 jobs located in Greater Shepparton ending June 2017. (Source NEIR)

The jobs to residents ratio indicated 1.04 in 2016/17 meaning there were more jobs than resident workers, with the industry sector Electricity, Gas, Water and Waste services recording the highest ratio at 1.25 and mining the lowest at 0.72.

Employment (Census) by industry sector, 2016



Source: ABS, Census 2016: id the Population experts.

Health and Social Services

Health Services

There is significant investment within the health services sector in Shepparton, with Goulburn Valley Health's (GVH) budget of approximately \$185 million per year providing extensive services and accommodating over 340 beds for acute and extended care in Shepparton, including smaller distribution at sites in Tatura and Waranga/Rushworth. There are also over 55 operational residential aged care beds and 20 mental health beds, sub-acute of 48 and 20 for PARC and SRRP. GVH treat over 21,000 acute inpatients, over 28,000 emergency department presentations, over 87,900 outpatient occasions of service, approximately 1,000 births annually and over 700 mental health patients. GVH is our largest employer with over 1,500 employees.

Shepparton Private Hospital contributes to extensive inpatient and day patient services equipped with 69 beds and three operating theatres.

Both hospitals are planning major investment in the coming years to meet increasing demands.

There are many other 'health' agencies and providers providing health services; such as Primary Care Connect, Rumbalara Health Services, Murray Primary Health Network and Headspace which receive funds from federal, state and other sources too difficult to quantify. It is noted that some of the funding whilst going to a Shepparton based agency provides services to other neighbouring areas and LGAs.

Immunisation

Immunisation services provided 93 per cent coverage to 12-15 month old children, 92 per cent for 24-27 month old and 94 per cent for 60-63 month old at various locations throughout the municipality.

Aged and Disability Services

The community based aged care sector is now facing a period of rapid and extensive change to both the policy and funding environment, particularly as this relates to some of the traditional HACC roles Local Government has played in Victoria.

The Commonwealth aged care reform agenda covers the broad spectrum of aged care in Australia, including both residential care and community based aged care. This has seen, and will continue to see, a number of new providers emerge in the region potentially providing an economic boost. Essentially the reforms include:

- All aged care programs to be coordinated and directly funded by the Commonwealth instead of the States
- Changes to community aged care service models including the integration of multiple programs under the new Commonwealth Home Support Program (CHSP)
- Implementation of the National Disability Insurance Scheme (NDIS) which will alter some of the service functionality from the traditional HACC program that relates to the support of younger people with disabilities.

The Rollout of the NDIS across the Goulburn Region (Greater Shepparton, Strathbogie, Moira, Mitchell and Murrindindi Shires) is expected to see a market value increase of 90m or 113 per cent with workforce projections expected to double from the current workforce of 700 to 1,400.

Council's funded Regional Assessment Service receives approximately 80 referrals per month from people over the age of 65 years who are requiring assessment to access support services to remain living at home.

Council is the funded provider of Commonwealth Home Support Program (CHSP) in Greater Shepparton providing much needed support to approximately 1,000 residents with tasks of daily living including domestic assistance, personal care, respite care, social support, meals and home maintenance and modifications. As part of the transition agreement between the State and Commonwealth governments, existing funding in excess of \$923,415 for Assessment services, CHSP and HACCYP will be maintained through to June 2019, with possible extension through to June 2020.

Community Health Services

Community Health Services, such as Primary Care Connect, Family Care, GV Hospice Care provide valuable support for vulnerable population groups.

Disability Services

Disability Services such as GV Connect, Shepparton Access and Work trainers contribute to the most vulnerable providing essential support services.

Community Care Services

Community Care Services such as; Community Interlink, Calvary Silver Circle, Southern Cross Care, Villa Maria and others provide aged and community care

Home Care Services

Home Care and Support Services provide affordable housing options for frail and aged at various levels of independence. This includes; Shepparton Villages, Mercy Place, Villa Maria, Shepparton Gardens, Lifestyle Shepparton, Kensington Gardens, Tarcoola, Kialla Gardens and others.

Health Promotion

The total funded investment in health promotion via the integrated health promotion program for Greater Shepparton is approximately \$379,607 which according to agency reports equates to 2.9 EFT and four persons employed.

There are also other significant local contributors to health promotion activities via a range of other agencies; Vic Health, Valley Sport, Heart Foundation.

Additional organisations that conduct regular health promotion programs such as ASHE, Goulburn Valley Water, education providers and community service agencies, such as Wellways, with funding from other sources to benefit locals.

Housing

Significant annual investment in housing occurs in Greater Shepparton. In 2016/17 there were 258 building permits issued, with increased 324 issued during 2017/18 as at 31 May 2018.

Building improvements cost Council over 2.2m in 2017 and land improvements over 5.9m.



Recreation Facilities and Open Space

Recreational, leisure and community facilities are maintained annually with costs over 5.5m recorded in 2017 and visitation rates at key public facilities were recorded in 2017:

- KidsFest attracted 15,965 visitors over two days in September 2017
- KidsTown had 150,536 visitors
- More than 700,000 people visited Aquamoves
- 393 free and low cost activities delivered in parks and reserves throughout Greater Shepparton attended by 14,532 people
- 534 Sporting Chance grants were distributed to encourage participation in sport

Parks, open spaces and streetscapes were maintained and refurbished costing Council over \$530,000 in 2017.

Overall, Council maintains 97 parks including walking tracks, 82 playgrounds and 4 skate parks, 110 open native sites including wetlands and lakes, 27 sporting facilities with 45 turf ovals and 2 synthetic fields.

Sustainable Practices

Energy efficiencies

- Annual budget contribution of \$224,000 for solar panel installation 2017/18
- Annual project contribution of \$144,000 including Planet footprint, Energy monitoring unit and Goulburn Broken Greenhouse Alliance street lighting project

Natural environment

- Annual budget contribution of \$152,000 including revegetation and weed control

Waterways

- Annual budget contribution \$200,000 including Flood Portal study, RiverConnect and Regional Water Management Partnership

Waste management services cost in excess of 11.2m in 2017.

Over 37 per cent of all kerbside collection waste was diverted from landfill.

Annual drainage costs for 2017 were over \$619,000.

Annual tree planting of 17,016 trees in 2017 calendar year by 2,771 participants.

Transport

Council invests significantly to local and regional transport services in Greater Shepparton.

Road repairs and maintenance costs exceeded \$11.9m in 2017.

Bridge replacement and refurbishment occurred over \$53,000.

Footpaths and cycle ways cost over \$433,000 annually.

The maintenance of the Shepparton aerodrome accounted for \$26,248 in 2017.



DELIVERY APPROACH

The following delivery approaches will be used to achieve the health goals and to encourage work with community on targets outlined in the Public Health Strategic Plan.

As a general rule, sustainable improvements in health and wellbeing are achieved when change is guided and owned by affected communities, interventions are tailored to particular needs and local circumstances, and people are empowered to make the changes needed. Many of these actions need to occur in the communities and settings where people live, learn, work and play.

Healthy and Sustainable Environments

Healthy environments are essential to the health and wellbeing of current and future generations.

Protecting health through robust, evidence-based standards that support clean air, soil quality, clean water, a safe food supply and management of physical, chemical, biological and radiological hazards are fundamental for a safe and healthy society. Capacity to effectively take action when emergencies occur, remain equally important as investment in building resilient communities and supporting disaster recovery.

Climate change adaption presents environmental, economic and health challenges impacting on both the built and natural environment. Investment in adaptation strategies will contribute to build resilient communities that are less affected by major climatic events such as storms, floods and heat related events.

Person Centred Approach

A person centred approach to health means supporting and empowering individuals to better manage their own health.

Person centred approaches focus on treatment and care provided by health services, how an individual navigates through the health system and what their experience has been, including the health of a person's carer. This approach focuses on treating individuals as they want to be treated, with dignity and respect.

Place Based Approach

A place based approach to health targets an entire community and aims to address issues that exist at the neighbourhood level, such as poor housing, social isolation, poor or fragmented service provision that leads to gaps or duplication of effort, and limited economic opportunities.

Place based approaches aim to address complex problems.

Small town planning and neighbourhood approaches practiced in Greater Shepparton demonstrates the benefits of this approach, to utilise the skills and abilities of those living in the area to maximise outcomes, commonly referred to as an Asset Based Community Development Approach.

Systems Thinking 'Big Picture Thinking'

Systems Thinking is a perspective or a way of seeing elements that inter-relate with each other that make up the big picture. "A system is a group of interacting, interrelated and interdependent components that form a complex and unified whole".

Systems Thinking approach to prevention has the following key elements:

1. Being systematic about prevention
2. Working across different systems to improve health
3. Recognising that the settings in which prevention action takes place (e.g. schools, workplaces and communities) are ecological systems
4. Explicit use of systems and tools and system theories to analyse and improve prevention practice

Collective Impact Approach

Collective Impact is a framework to tackle deeply entrenched and complex social problems. It is an innovative and structured approach to making collaborating work across government, business, philanthropy, non-profit organisations and citizens to achieve significant and lasting social change.

The Collective Impact approach is premised on the belief that no single policy or program can tackle or solve the increasingly complex social problems we face as a society. The approach calls for multiple organisations or entities from different sectors to abandon their own agenda in favour of a common agenda, shared measurement and alignment of effort.

The Stanford Social Innovation Review in 2011 identified five key elements as pictured in the diagram below.



Applying a Health Equity Lens

The 'Fair Foundations: The VicHealth framework for health equity' is a planning tool based on a conceptual and action oriented framework developed by the World Health Organisation Commission on the Social Determinants of Health designed to assist with health promotion planning. 'Equity in health is not about eliminating all health differences so that everyone has the same level of health, but rather to reduce or eliminate those which result from factors which are considered to be both avoidable and unfair'. Each layer of influence is an entry point for action.

Health equity practice calls for a mix of strategies including:

1. Universal approaches, those open to the whole population or to a defined population without recognising differences in social position.
2. Targeted approaches, important in reducing gaps in health status between groups.
3. Life-course approaches, as the effects of social disadvantage accumulate and interact throughout a person's life, from birth to old age. Therefore a mix of strategies targeting different life stages, with a particular focus on early years is important.
4. Settings approaches, making the everyday settings of people's lives – where they live, learn, play and work, more supportive of healthy outcomes.
5. Whole-of-systems approach, looking at the 'big picture' of issues across a range of different stakeholders

MEASURING ACHIEVEMENT

Greater Shepparton Public Health Strategic Plan 2018 – 2028

The Public Health Strategic Plan is the long-term public health approach to guide the direction of public health effort.

The Strategic Plan will be reviewed annually by Greater Shepparton's Public Health Advisory Committee, resulting in updates where necessary and fulfill requirements of the Public Health and Wellbeing Act 2008.

Council Plan 2017 – 2021

The Council Plan is the medium term plan developed every four years, including the incorporation of health and wellbeing matters.

Councils are required to complete annual monitoring of achievement of strategic objectives, as specified under the Local Government Act.

Greater Shepparton Public Health Implementation Plan

The Public Health Implementation Plan is the short-term public health plan detailing annual targets to progress effort toward medium and long term health goals. This plan is the working document that provides more detail at an operational level, guiding local effort that contributes to achieving each health goal and working toward positive health outcomes.

Greater Shepparton Public Health Implementation Plan Template

Outcome	What do we want to achieve?						
No.	Action/ Strategies	Delivery Approach			Performance Measure	Lead Agency	Source and Timeframe
		Person Centred Approach	Place Based Approach	Policy Level			
Target	Our desired result planned within a specified time and may refer to a long term improvement or desired health outcome						

The Public Health Implementation Plan refers to VicHealth's Local Government Action Guides and Fair Foundations: The VicHealth framework for health equity to inform strategies and actions.

An annual review of the Implementation Plan will capture progress, monitor achievement and report completed tasks. Reporting of the annual review to Council and the Department of Health and Human Services is required to meet statutory requirements of the Public Health and Wellbeing Act 2008 and the Local Government Act.

The Victorian Public Health and Wellbeing Outcomes Framework

The Outcomes Framework requires Council to report achievement in Year Three of the Council Plan term. Reporting will include assessment of progress towards identified targets. Where targets for measures are not identified, the direction of change will be monitored.

CONCLUSION AND RECOMMENDATIONS

Conclusion

In Greater Shepparton we will work in collaboration to explore and understand a liveability approach to public health to achieve our long term Health Goals.

We have identified key delivery approaches to trial health prevention models, ranging from an individual focused approach to a systems thinking whole community approach that can help to drive positive behaviour change and health outcomes.

We recognise significant local and regional investment, opportunity and growth.

We will challenge and build resilient healthy communities for future generations using our current health status as a benchmark for change.

Recommendations

1. Examine the associations between the liveability index and health and wellbeing outcomes for Greater Shepparton to assess and measure change
2. Establish a platform of evidence for regional Victoria
3. Develop a liveability index for Greater Shepparton
4. Advocate for improved health and wellbeing outcomes for Greater Shepparton residents
5. Influence land use planning through future policy development to create a liveable Greater Shepparton
6. Take a collective impact and systems thinking approach to address health and wellbeing issues across the municipality

GLOSSARY OF TERMS

Equitable

Equitable approaches are those aimed at closing the gap in outcomes for different population groups. This may mean providing additional support for people experiencing disadvantage in order to achieve equal outcomes (Vic Health)

Gender Equality

Workplace gender equality is achieved when people are able to access and enjoy the same rewards, resources and opportunities regardless of gender. The aim of gender equality in the workplace is to achieve broadly equal outcomes for women and men, not necessarily outcomes that are exactly the same for all (Workplace Gender Equality Agency)

Gender Equity

Involves fairness and justice in the distribution of resources and responsibilities between men and women; sometimes referred to as substantive equality. It often requires women-specific programs and policies to end existing inequalities (WHO)

Health

A state of complete physical, social and mental wellbeing, and not merely the absence of disease or infirmity (WHO)

Health Impact

A health impact can be positive or negative. A positive health impact is an effect which contributes to good health or to improving health. A negative health impact has the opposite effect, causing or contributing to ill health (WHO)

Health Indicator

A health indicator is a characteristic of an individual, population, or environment which is subject to measurement (directly or indirectly) and can be used to describe one or more aspects of the health of an individual or population (quality, quantity and time) (WHO) Often shortened to indicator.

Health Inequality

Health Inequalities are the differences in health status between population groups (WHO)

Health Inequity

Health Inequities are differences in health status between population groups that are socially produced, systematic in their unequal distribution across the population, avoidable and unfair (WHO)

Health Outcomes

A health outcome is a change in the health status of an individual, group or population which is attributable to a planned intervention or series of interventions, regardless of whether such an intervention was intended to change health status.

Such a definition emphasizes the outcome of planned interventions (as opposed, for example, to incidental exposure to risk) and that outcomes may be for individuals, groups or whole populations. Interventions may include government policies and consequent programs, laws and regulations, or health services and programs, including health promotion programs. It may also include the intended or unintended health outcomes of government policies in sectors other than health. Health outcomes will normally be assessed using health indicators. (WHO)

Health Promotion

Health promotion is the process of enabling people to increase control over, and to improve, their health. To reach a state of complete physical, mental and social well-being, an individual or group must be able to identify and to realize aspirations, to satisfy needs, and to change or cope with the environment. Health is, therefore, seen as a resource for everyday life, not the objective of living. Health is a positive concept emphasizing social and personal resources, as well as physical capacities. Therefore, health promotion is not just the responsibility of the health sector, but goes beyond healthy life-styles to well-being (WHO).

Health Status

The health status is a generic term referring to the health of a person, group or population in a particular area, especially when compared to other areas or with national data.

Health status is determined by more than the presence or absence of any disease. It is often summarised by life expectancy or self-assessed health status and more broadly includes measures of functioning, physical illness, sexual health and mental wellbeing. Measuring the overall health of the local population involves analysis of the following indicators of health status:

- Wellbeing, including measures of physical, mental and social wellbeing
- Health conditions; including measures of disease prevalence, disorder, injury or trauma or other health-related state
- Human function; including indicators that measure alterations to body, structure or function (impairment), activity limitations and restrictions in participation
- Deaths; including indicators
- measuring mortality rates and life expectancy

(WHO)

APPENDICIES

Appendix One: Council's Strategic Plans

Algabonyah Agreement
 Aquamoves Master Plan
 Asset Management Policy and Strategy Review
 Best Value Strategy
 City of Greater Shepparton Industrial Land Review 2011
 City of Greater Shepparton Strategic Review of Tatura Industrial Land 2011
 Commercial Activities Centres Strategy
 Community Access and Inclusion Plan
 Community Engagement Strategy
 Community Plans; Arcadia, , Congupna, Dhurringile, Dookie & District, Katandra West, Merrigum,
 Community Safety Strategy 2014-2017
 Congupna Urban Drainage Strategy
 Council Plan 2017-22
 Cultural Diversity and Inclusion Strategy and Action Plan 2015-2018
 Customer Service Charter
 Disability Action Plan
 District and Undera
 Domestic Animal Management Plan (2013-17)
 Domestic Wastewater Management Plan (DWMP)
 Food Safety Strategy
 Greater Shepparton 2030 Strategy
 Greater Shepparton City Council Community Safety Strategy 2014-2017
 Greater Shepparton City Council Seasonal Pools Review and Strategy
 Greater Shepparton Cycling Strategy 2013-2017
 Greater Shepparton Environmental Sustainability Strategy 2014-2030
 Greater Shepparton Football Strategy

Greater Shepparton Freight and Land Use Study 2013
 Greater Shepparton Heritage Study 2013
 Greater Shepparton Housing Strategy 2011
 Greater Shepparton Industrial Development Guidelines
 Greater Shepparton Movement and Place Strategy – Draft Challenges and Opportunities Paper
 Greater Shepparton Planning Scheme
 Greater Shepparton Resource Recovery Precinct Feasibility and Site Study 2016
 Greater Shepparton Urban Forest Strategy 2013-2023
 Greater Shepparton Volunteer Strategy and Action Plan 2014-2018
 Greater Shepparton Women's Charter
 Greater Shepparton Youth Strategy and Actions Plan 2012-2015
 Greening Greater Shepparton
 ICT Strategy
 Infrastructure Design Manual
 Investigation Area 1 – Goulburn Valley Harness & Greyhound Racing Precinct Feasibility Study & Investigation Area 3 – Adams Road Area, Kialla
 KidsTown Future Directions Plan: Food Hub Concept
 Liveability Framework and Indicators Plan
 Local Floodplain Development Plans/Precincts Masterplan
 Mooroopna West Growth Corrido 2009
 Mooroopna, Murchison & District, Shepparton East, St George's Road, Tallygaroopna, Tatura, Toolamba &
 Mosquito Management Plan
 Municipal Health and Wellbeing Plan
 Neighbourhood Plans - Boulevard and Golf Estates, Kialla Lakes and Seven Creeks.

Northern Victoria Regional Transport Strategy
 Open Space and Recreation Strategy
 People and Development Strategy (2014-2017)
 Playground Provision Strategy
 Rating Strategy 2017 – 2021
 Recreation Plan
 Regional Land Use Strategy 2008
 RiverConnect Strategy
 Roadside Management Strategy
 SAM Fundraising Strategy
 Seasonal Pools Review and Strategy
 Shepparton North South Growth Corridor 2003
 Small Towns Youth Recreation Spaces Strategy
 South Shepparton Community Infrastructure
 Needs Assessment 2011
 Southern Gateway Landscape Strategy
 Storm Water Management Plan
 Strategy for Tertiary Education in Shepparton
 2005
 Streetscape Plan
 Sustainable Community Strategy – Final Report
 Urban Design Framework – Shepparton North
 and South Business Areas 2006
 Urban Design Manual
 Urban Development Program – Residential and
 Industrial Land Supply Assessments 2016
 Volunteer Strategy and Action Plan 2014-2018
 Waste Management Strategy 2013-2023
 Workforce Health and Safety Plan
 Youth Strategy

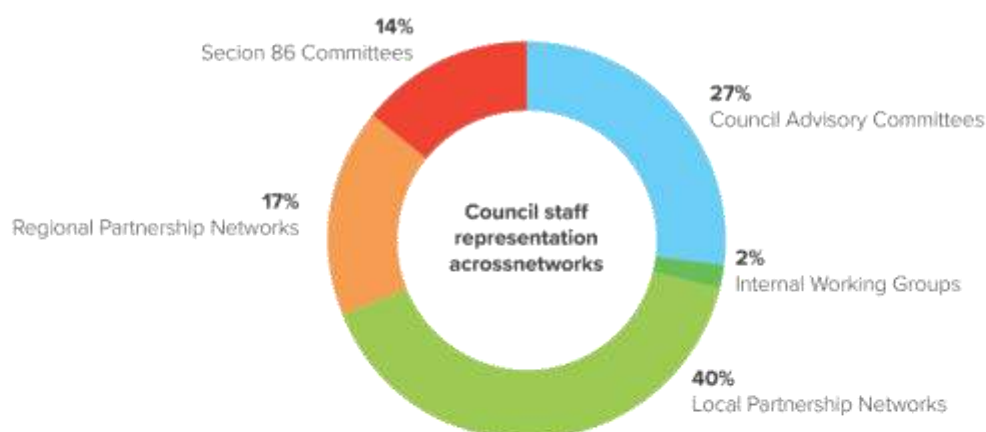
Council Strategies planned for development or review:

Aquamoves Master Plan
 Domestic Animal Management Plan (2017-21)
 Economic Development Tourism and Major Events
 Strategy 2017 – 2021
 Greater Shepparton 2050 Strategy
 Greater Shepparton Heritage Strategy 2017-202
 Greater Shepparton International Engagement
 Strategy

Appendix Two: Service Mapping

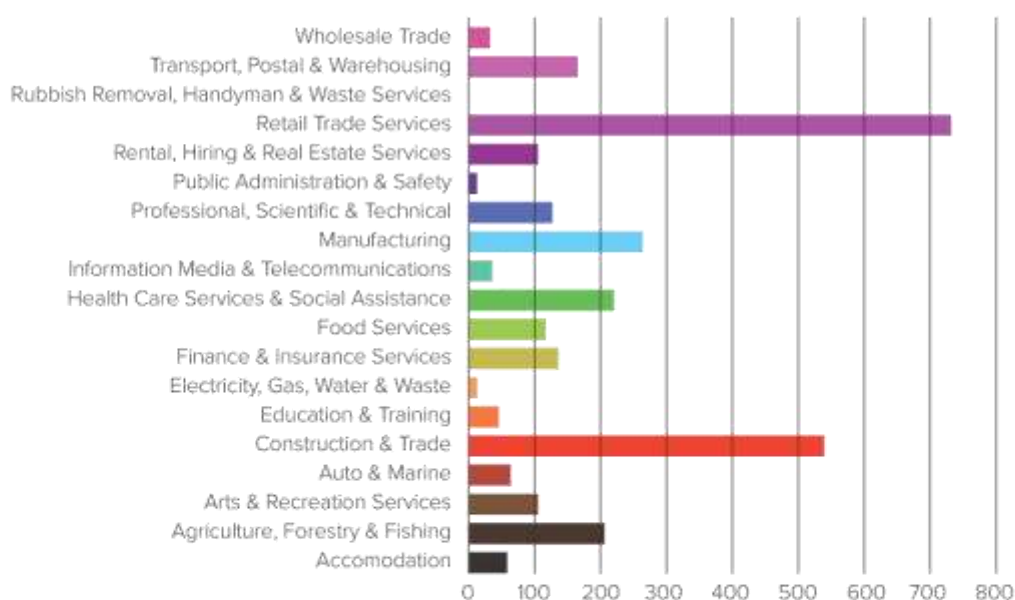
An extensive service mapping exercise identified current networks supported by Council.

Council staff representation across networks



Local Businesses reflect predominantly large retail, construction and trade businesses.

Local Business by Industry Sector



Appendix Three: Advisory Committees

Australian Botanic Gardens Shepparton Special Committee

Best Start Municipal Early Years Partnership Committee

Deakin Reserve Advisory Committee

Development Hearings Panel

Disability Advisory Committee

Festive Decorations Advisory Committee

Goulburn Broken Greenhouse Alliance

Goulburn Valley Highway Bypass Action Group

Goulburn Valley Regional Library Corporation Board

Greater Shepparton Aerodrome Advisory Committee

Greater Shepparton Audit and Risk Management Committee

Greater Shepparton Public Health and Wellbeing Plan Advisory Committee

Greater Shepparton Safe Communities Advisory Committee

Greater Shepparton Women's Charter Alliance Advisory Committee

Heritage Advisory Committee

Melbourne University Rural Clinical School Advisory Board and Department of Rural Health Management Advisory Committee

Municipal Association of Victoria

Municipal Emergency Management Planning Committee (MEMPC)

Murray Darling Association

North Eastern Australian Local Government Women's Association (NEALGWA)

Positive Ageing Advisory Committee

Rail Freight Alliance Committee

Regional Aboriginal Justice Advisory Committee

RiverConnect Community Advisory Committee

Rumbalara Aboriginal Cooperative Working Party

Shepparton Art Museum Advisory Committee

Shepparton Liquor Licensing Accord

Shepparton Regional Saleyards Advisory Committee

Shepparton Show Me Committee

Shepparton Showgrounds Advisory Committee

Sir Murray Bouchier Memorial Advisory Committee

Sports Hall of Fame Advisory Committee

Tatura Park Advisory Board

Victorian Local Governance Association

Appendix Four: Community Planning Groups

Arcadia Community Planning Group

Boulevard and Golf Estate Community Planning Group

Congupna Community Planning Group

Dhurringile Community Planning Group

Dookie Community Planning Group

Katandra West Community Planning Group

Kialla Lakes Community Planning Group

Merrigum Community Planning Group

Mooroopna Community Planning Group

Murchison Community Planning Group

Seven Creeks Community Planning Group

Shepparton East Community Planning Group

St George's Road Community Planning Group

Tallygaroopna Community Planning Group

Tatura Community Planning Group

Toolamba Community Planning Group

Undera Community Planning Group

**Greater Shepparton City Council
Active Living Department**

90 Weisford Street, Shepparton, Victoria, 3630

Phone: (03) 5832 9700

Email: council@shepparton.vic.gov.au

Web: www.greatershepparton.com.au

Join the conversation:



ATTACHMENT TO AGENDA ITEM

Ordinary Meeting

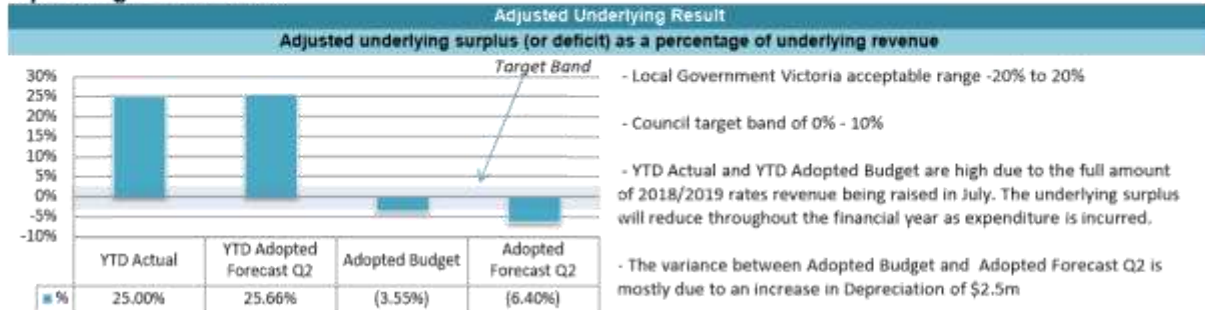
19 March 2019

Agenda Item 8.3 February 2019 Monthly Financial Report

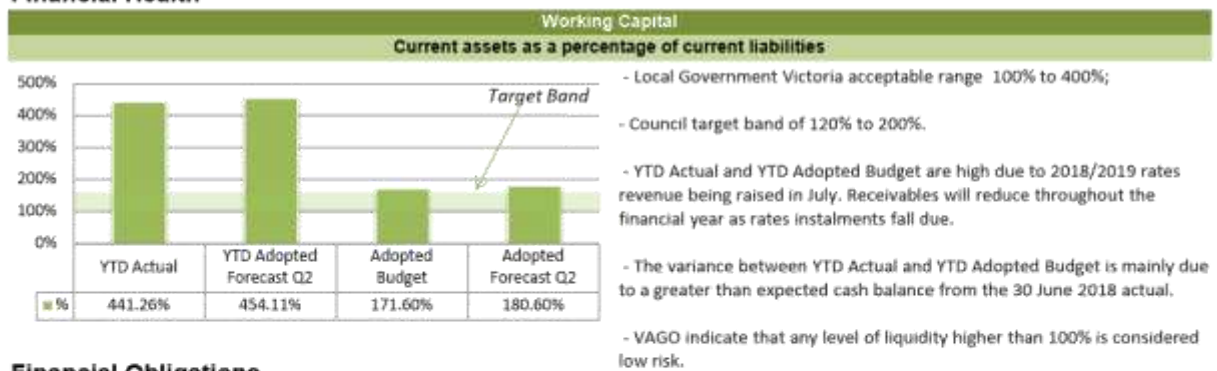
Attachment 1 February 2019 - Monthly Financial Statements 213

MONTHLY FINANCIAL REPORT FEBRUARY 2019

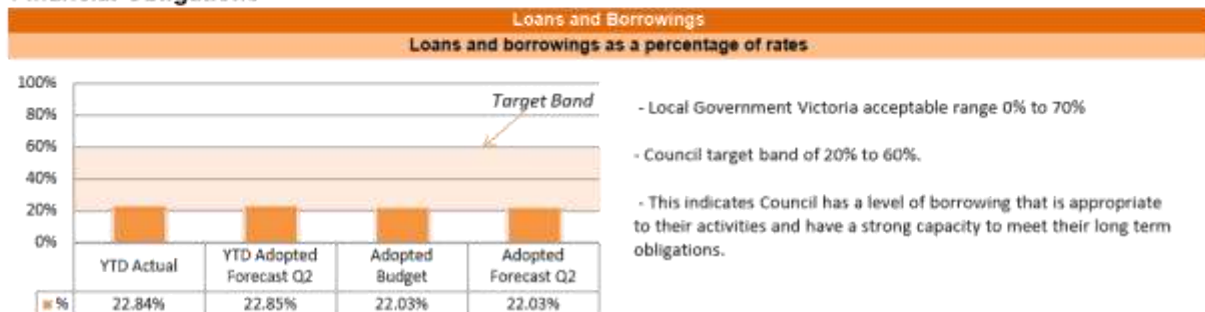
Operating Performance



Financial Health

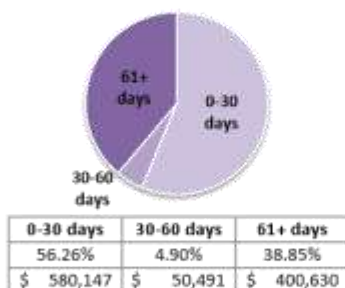


Financial Obligations



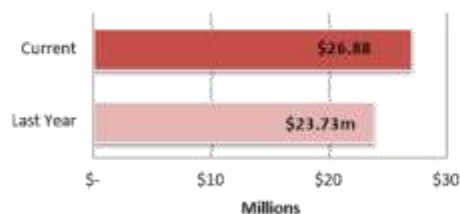
Other Financial Performance

Sundry Debtors



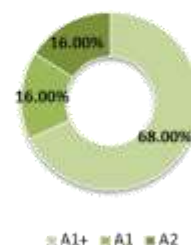
Rates Debtors

Third instalment due 28 February 2019



Investments

\$50m with average 2.49%
\$828k interest income to date



Operating Performance
FEBRUARY 2019

	YTD Adopted Forecast Q2 vs YTD Actual (Fav)/Unfav		Projected Full Year vs Adopted Forecast Q2 (Fav)/Unfav	
Income				
Rates and Charges	Steady	(\$0.04m)	Steady	(\$0.01m)
Statutory Fees	Steady	\$0m	Unfavourable	\$0.34m
User Charges	Steady	(\$0.13m)	Steady	(\$0.04m)
Grants	Favourable	(\$0.16m)	Steady	(\$0.06m)
Contributions	Steady	(\$0.03m)	Steady	\$0m
Other Revenue	Steady	(\$0.1m)	Steady	(\$0.03m)
Total Income	Steady	(\$0.46m)	Steady	\$0.22m
Expense				
Employee Costs	Steady	\$0.35m	Steady	\$0.09m
Materials and Consumables	Steady	\$0.69m	Favourable	(\$2.31m)
Bad and Doubtful Debts	Steady	\$0m	Steady	(\$0m)
Depreciation and Amortisation	Steady	(\$0m)	Steady	\$0m
Borrowing Costs	Steady	(\$0m)	Steady	\$0m
Other Expenses	Steady	\$0m	Steady	\$0.08m
Total Expense	Steady	\$1.04m	Steady	(\$2.14m)

Notes:

1) Statutory Fees Projected Full Year \$340k less than Adopted Forecast Q2. This unfavourable variance is mostly due to a lower number of Parking Infringements, Planning Permits and DPCD Statutory Fees. Please see income statement for more detail.

2) Operating Grants are \$159k greater than YTD Adopted Forecast Q2. This favourable variance is mostly due to additional State Government funding for the transition to centralised annual valuations, as well as additional funding for the affordable housing policy \$40k and aged home maintenance. Please see income statement for more detail.

3) Materials and Services is \$2.31m less than Adopted Forecast Q2. This favourable variance is mostly due to various savings found across the organisation. Please see income statement for more detail.

Capital Works Performance FEBRUARY 2019

ADOPTED BUDGET	ADOPTED FORECAST Q2	PROJECTED FULL YEAR	YTD ACTUAL
\$46.36m	\$52.6m	\$49.59m	\$15.51m

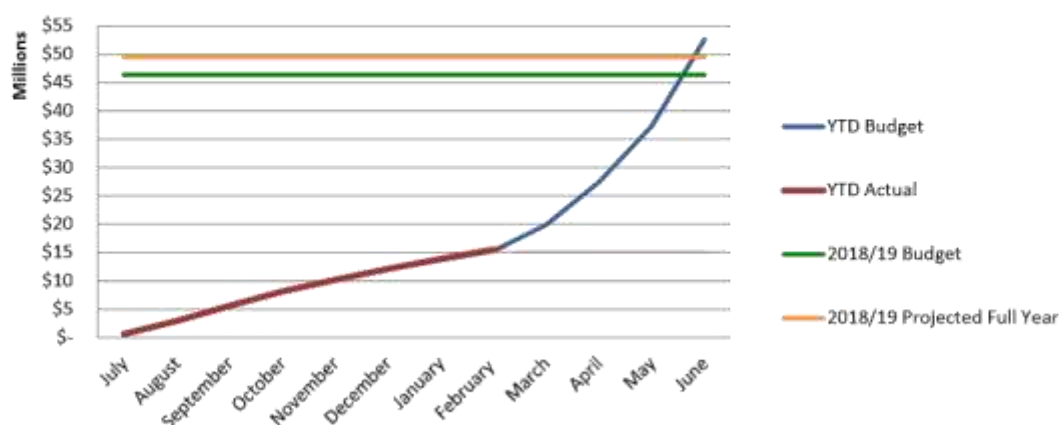
PROGRESS

*33.45% of Adopted Budget spent

*31.27% of current full year projection spent

* Same time last year: \$17.68m (46.17%) of the 2017/2018 Adopted Budget had been spent

CAPITAL WORKS BUDGET VS. ACTUAL

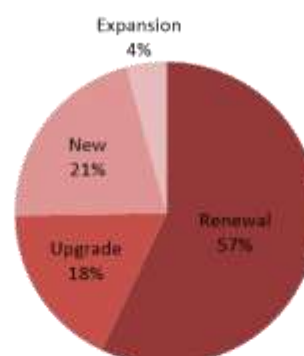


RENEWAL

Asset Renewal	
Asset renewal as a percentage of depreciation	
ADOPTED BUDGET	PROJECTED FULL YEAR
96.80%	106.19%

- Expected range of 40% to 130%; Target band of 90% to 110%.
- Indicator of assets being renewed as planned. High or increasing percentages indicate improvement in capacity to meet long term obligations.
- The variance between Adopted Budget and Projected Full Year is mostly due to the timing of renewal works at Cosgrove Landfill

% Split of Projected Full Year by Capital Works Type



Greater Shepparton City Council
Income Statement
for period ended February 2019

	YEAR TO DATE					FULL YEAR					Notes
	2018/2019 YTD Adopted Budget	2018/2019 YTD Adopted Forecast Q2	2018/2019 YTD Actual	YTD Adopted Budget Variance (Fav)/Unfav	YTD Adopted Forecast Q2 Variance (Fav)/Unfav	2018/2019 Adopted Budget	2018/2019 Adopted Forecast Q2	2018/2019 Projected Full Year	Adopted Budget Variance (Fav)/Unfav	Adopted Forecast Q2 Variance (Fav)/Unfav	
	\$	\$	\$	%	%	\$	\$	\$	%	%	
Revenues from Operating Activities											
Rates and Charges	77,220,570	77,302,436	77,344,221	(0.2%)	(0.1%)	77,426,385	77,463,622	77,468,622	(0.1%)	(0.0%)	
Statutory Fees	2,129,308	1,516,324	1,513,845	28.9%	0.2%	3,394,929	3,249,785	2,909,447	14.3%	10.5%	1
User Charges	12,576,365	12,167,968	12,294,103	2.2%	(1.0%)	18,748,202	18,962,914	18,999,138	(1.3%)	(0.2%)	
Operating Grants	12,442,826	12,796,742	12,956,120	(4.1%)	(1.2%)	17,602,271	18,452,093	18,509,620	(5.2%)	(0.3%)	2
Operating Contributions	833,647	1,264,252	1,291,697	(54.9%)	(2.2%)	1,357,669	1,723,089	1,719,379	(26.6%)	0.2%	3
Other	1,427,089	1,527,823	1,632,326	(14.4%)	(6.8%)	1,992,131	2,412,461	2,440,028	(22.5%)	(1.1%)	4
Total Operating Revenue	106,629,805	106,575,545	107,032,312	(0.4%)	(0.4%)	120,521,587	122,263,964	122,046,234	(1.3%)	0.2%	
Expenses from Operating Activities											
Employee Costs	32,600,132	32,543,468	32,897,055	0.9%	1.1%	49,543,187	49,579,194	49,668,169	0.3%	0.2%	
Materials and Consumables	33,126,980	28,611,769	29,297,380	(11.6%)	2.4%	49,745,854	52,602,917	50,292,482	1.1%	(4.4%)	5
Bad & Doubtful Debts	39,078	12,924	13,335	(65.9%)	3.2%	173,740	178,852	178,307	2.6%	(0.3%)	
Depreciation and Amortisation	17,084,709	17,129,759	17,129,688	0.3%	(0.0%)	23,602,979	26,101,548	26,101,548	10.6%	0.0%	6
Borrowing Costs	500,000	503,389	503,389	0.7%	(0.0%)	1,002,000	1,002,000	1,002,000	0.0%	0.0%	
Other Expenses	388,022	469,651	472,419	21.8%	0.6%	587,091	619,091	698,906	19.0%	12.9%	
Total Operating Expenses	83,738,921	79,270,960	80,313,266	(4.1%)	1.3%	124,654,851	130,083,602	127,941,412	2.6%	(1.6%)	
UNDERLYING OPERATING RESULT	22,890,884	27,304,585	26,719,046	(16.7%)	2.1%	(4,133,264)	(7,819,638)	(5,895,178)	(42.6%)	24.6%	
Non-operating Income and Expenditure											
Capital Grants	2,370,000	1,204,215	1,321,708	44.2%	(9.8%)	8,700,370	8,264,930	8,291,568	4.7%	(0.3%)	
Capital Contributions	412,000	1,702,326	1,702,327	(313.2%)	(0.0%)	911,000	2,447,743	2,466,932	(170.8%)	(0.8%)	7
Contributed Assets	8,498,872	6,101,719	6,101,719	28.2%	0.0%	13,842,129	13,842,129	13,030,970	5.9%	5.9%	
Proceeds from Sale of Assets	110,000	142,608	142,608	(29.6%)	(0.0%)	390,000	390,000	390,000	0.0%	0.0%	
Written Down Value of Asset Disposals	(359,544)	(199,394)	(199,394)	44.5%	(0.0%)	(539,535)	(539,535)	(539,535)	0.0%	0.0%	
Other Revenue	0	133,030	133,030	(100.0%)	0.0%	0	133,030	133,030	(100.0%)	0.0%	
Total Non Operating Items	11,031,328	9,084,504	9,201,998	16.6%	(1.3%)	23,303,964	24,538,297	23,772,965	(2.0%)	3.1%	
ACCOUNTING SURPLUS/(DEFICIT)	33,922,212	36,389,089	35,921,044	(5.9%)	1.3%	19,170,700	16,718,659	17,877,787	6.7%	(6.9%)	

Notes to the Income Statement for period ended February 2019

- 1) Statutory Fees Projected Full Year \$340k less than Adopted Forecast Q2. This unfavourable variance is mostly due to a lower number of Parking Infringements \$204k, Planning Permits \$50k and DPCD Statutory Fees \$48k.
- 2) Operating Grants are \$159k greater than YTD Adopted Forecast Q2. This favourable variance is mostly due to additional State Government funding for the transition to centralised annual valuations \$46k, as well as additional funding for the affordable housing policy \$40k and aged home maintenance \$39k.
- 3) Operating contributions Projected Full Year is \$362k more than 2018/2019 Adopted Budget. This favourable variance is mostly due to additional Natural Disaster financial assistance from the Department of Treasury and Finance \$133k, additional developer contributions for civil works and trees in new estates \$124k, and additional contributions towards building insurance from Council's leasees \$46k and Recreational Land Fund \$40k.
- 4) Other Revenue Projected Full Year is \$448k more than 2018/2019 Adopted Budget. This favourable variance is mostly due to additional interest income from high levels of investment \$650k, additional fuel rebates \$384k, additional royalties for Cosgrove Landfill \$90k.
- 5) Materials and Services is \$2.31m less than Adopted Forecast Q2. This favourable variance is mostly due to various savings found across the organisation including Works and Waste \$1.01m, Environmental operations \$255k, Projects department \$252k and early childhood education \$225k.
- 6) Depreciation Projected Full Year is \$2.49k more than 2018/2019 Adopted Budget. This unfavourable variance is due to asset revaluations which resulted in an increase in asset values.
- 7) Capital Contributions Projected Full Year is \$1.55m more than 2018/2019 Adopted Budget. This favourable variance is mostly due to additional funding from Vic Roads as part of the Fixing Country Roads program for bridge renewals \$930k. Also impacted by additional developer contributions \$290k for Northside Estate, Seven Creeks Estate, Kialla Green Estate and Windsor Park.

Greater Shepparton City Council

Balance Sheet

as at February 2019

	Total Actual June 2018 \$	Adopted Budget June 2019 \$	Adopted Forecast Q2 June 2019 \$	YTD Adopted Budget 2019 \$	YTD Adopted Forecast Q2 2019 \$	YTD Actual 2019 \$	Total Actual June 2018 Variance (Fav)/Unfav %	Adopted Forecast Q2 Variance (Fav)/Unfav %	Notes
Current Assets									
Cash and Cash Equivalent	23,809,567	18,057,669	17,262,525	21,339,902	36,527,410	20,004,297	16.0%	(15.9%)	
Receivables	7,943,794	6,692,000	8,975,559	27,090,151	14,594,951	30,904,718	(289.0%)	(244.3%)	
Other Financial Assets	31,500,000	13,600,000	13,600,000	45,000,000	43,000,000	43,000,000	(36.5%)	(216.2%)	
Inventories	120,198	74,000	120,198	158,941	288,530	288,530	(140.0%)	(140.0%)	
Assets Held for Resale	248,085	-	248,085	-	248,085	248,085	0.0%	0.0%	
Other Assets	1,375,355	1,050,000	1,375,354	236,380	269,647	355,367	74.2%	74.2%	
Total Current Assets	64,996,998	39,473,669	41,581,721	93,825,374	94,928,623	94,800,996	(45.9%)	(134.8%)	
Non Current Assets									
Investment in Associates	1,457,302	1,511,499	1,457,302	1,511,499	1,457,302	1,457,302	0.0%	0.0%	
Infrastructure	1,036,461,256	1,118,546,000	1,076,259,742	1,044,687,436	1,040,426,148	1,040,665,379	(0.4%)	3.3%	
Intangible Assets	-	848,000	-	-	-	-	0.0%	0.0%	1
Total Non Current Assets	1,037,918,558	1,120,905,499	1,077,717,044	1,046,198,935	1,041,883,450	1,042,122,681	(0.4%)	3.3%	
Total Assets	1,102,915,556	1,160,379,168	1,119,298,765	1,140,024,309	1,136,812,073	1,136,923,677	(3.1%)	(1.6%)	
Current Liabilities									
Trade & Other Payables	9,997,114	8,720,000	11,041,320	11,632,850	5,779,614	6,362,613	(36.4%)	(42.4%)	
Trust Funds	2,836,213	2,717,000	2,836,213	5,894,981	5,414,464	5,414,464	90.9%	90.9%	
Provisions	9,220,504	10,119,000	9,220,506	8,785,574	9,120,471	9,117,122	(1.1%)	(1.1%)	
Interest Bearing Liabilities	1,362,130	1,447,000	1,362,130	825,242	589,750	589,750	(56.7%)	(56.7%)	
Total Current Liabilities	23,415,961	23,003,000	24,460,169	27,138,647	20,904,299	21,483,948	(8.3%)	(12.2%)	
Non Current Liabilities									
Provisions	7,107,824	7,094,000	7,107,824	7,118,151	7,107,824	7,107,824	0.0%	(0.0%)	
Interest Bearing Liabilities	17,073,415	15,610,000	15,706,200	16,837,286	17,073,415	17,073,415	0.0%	8.7%	
Total Non Current Liabilities	24,181,238	22,704,000	22,814,024	23,955,437	24,181,239	24,181,238	0.0%	6.0%	
Total Liabilities	47,597,199	45,707,000	47,274,193	51,094,084	45,085,538	45,665,186	(4.1%)	(3.4%)	
Net Assets	1,055,318,357	1,114,672,168	1,072,024,572	1,088,930,225	1,091,726,535	1,091,258,491	96.5%	(1.8%)	
Represented By									
Accumulated Surplus	392,432,069	555,416,922	409,138,284	426,043,937	428,840,247	428,372,203	(9.2%)	(4.7%)	
Reserves	662,886,288	559,255,246	662,886,288	662,886,288	662,886,288	662,886,288	0.0%	0.0%	
Total Equity	1,055,318,357	1,114,672,168	1,072,024,572	1,088,930,225	1,091,726,535	1,091,258,491	96.5%	(1.8%)	

Notes to the Balance Sheet as at February 2019

1) Intangible assets is \$848k less than 2018/2019 Adopted Budget. Land controlled by Places Victoria, creating an intangible assets for the right to receive income, was gifted back to Council resulting in a write off of intangible assets as part of the 2017/2018 end of financial year reports. The budget for this was adjusted as part of the 2018/2019 Q1 Forecast Review.

Greater Shepparton City Council

Cash Flow Statement

as at February 2019

	2018/2019 Adopted Budget \$	2018/2019 Adopted Forecast Q2 \$	2018/2019 YTD Adopted Budget \$	2018/2019 YTD Adopted Forecast Q2 \$	2018/2019 YTD Actual \$	Adopted Budget Variance (Fav)/Unfav \$	Adopted Forecast Q2 Variance (Fav)/Unfav \$
Cash flows from operating activities							
Receipts from customers	101,251,809	100,991,812	77,178,732	88,152,433	72,026,843	6.68%	18.29%
Payments to suppliers	(97,376,000)	(102,980,054)	(64,548,897)	(65,307,122)	(65,769,849)	1.89%	0.71%
Net cash inflow(outflow) from customers(suppliers)	3,875,809	(1,988,242)	12,629,835	22,845,311	6,256,994	(50.46%)	(72.61%)
Interest received	582,000	1,230,000	355,830	657,794	657,841	(84.88%)	(0.01%)
Government receipts	26,371,000	26,717,023	14,812,826	14,000,957	14,277,828	3.61%	(1.98%)
Contributions	2,269,000	4,170,832	1,318,336	3,039,267	3,066,714	(132.62%)	(0.90%)
Net cash inflow(outflow) from operating activities	33,097,809	30,129,613	29,116,827	40,543,329	24,259,376	(16.68%)	(40.16%)
Cash flows from investing activities							
Net movement in other financial assets	3,400,000	17,900,000	(13,500,000)	(11,500,000)	(11,500,000)	14.81%	164.25%
Infrastructure, property, plant & equipment - proceeds	390,000	390,000	110,000	142,608	142,608	(29.64%)	(0.00%)
Infrastructure, property, plant & equipment - payments	(46,356,000)	(52,597,440)	(16,923,476)	(15,192,326)	(15,431,486)	(8.82%)	1.57%
Net cash inflow(outflow) from investing activities	(42,566,000)	(34,307,440)	(30,313,476)	(26,549,718)	(26,788,878)	11.63%	(0.90%)
Cash flows from financing activities							
Finance Cost	(1,002,000)	(1,002,000)	(500,000)	(503,389)	(503,389)	0.68%	(0.00%)
Repayment of interest-bearing loans and borrowings	(1,377,000)	(1,367,215)	(773,016)	(772,379)	(772,380)	(0.08%)	0.00%
Net cash inflow(outflow) from financing activities	(2,379,000)	(2,369,215)	(1,273,016)	(1,275,768)	(1,275,769)	0.22%	0.00%
Net increase(decrease) in cash and equivalents	(11,847,191)	(6,547,042)	(2,469,665)	12,717,843	(3,805,270)	54.08%	(129.92%)
Cash and equivalents at the beginning of the year	29,904,860	23,809,567	23,809,567	23,809,567	23,809,567	(0.00%)	(0.00%)
Cash and equivalents at the end of the year	18,057,669	17,262,525	21,339,902	36,527,410	20,004,297	6.26%	45.23%

Greater Shepparton City Council
Capital Works Statement
 period ended February 2019

Capital Works Area	2018/2019 YTD Adopted Budget	2018/2019 YTD Adopted Forecast Q2	2018/2019 YTD Actual	YTD Adopted Budget Variance (Fav)/Unfav %	YTD Adopted Forecast Q2 Variance (Fav)/Unfav %	2018/2019 Adopted Budget	2018/2019 YTD Adopted Forecast Q2	2018/2019 Projected Full Year	Adopted Budget Variance (Fav)/Unfav %	Adopted Forecast Q2 Variance (Fav)/Unfav %	Note
	\$	\$	\$			\$	\$	\$			
Aerodrome	399,000	12,500	12,500	(97%)	0%	399,000	411,500	411,500	3%	0%	
Bridges	450,000	11,398	11,398	(97%)	0%	450,000	1,360,000	1,360,000	202%	0%	1
Buildings	2,677,904	1,945,198	1,950,245	(27%)	0%	9,929,300	10,100,002	8,100,002	(18%)	(20%)	2
Computer & Telecommunications	1,235,000	126,773	129,368	(90%)	2%	1,405,000	1,640,241	1,252,241	(11%)	(24%)	3
Drainage	670,000	110,908	110,908	(83%)	0%	1,076,000	1,197,000	1,237,528	15%	3%	
Fixture Fittings and Furniture	285,000	246,961	251,708	(12%)	2%	349,000	361,763	363,387	4%	0%	
Footpaths & Cycleways	446,880	229,755	229,821	(49%)	0%	1,641,380	1,656,355	1,171,421	(29%)	(29%)	4
Land	44,000	0	4,009	(91%)	100%	649,000	605,000	550,000	(15%)	(9%)	
Land Improvements	1,135,980	690,902	719,910	(37%)	4%	1,205,980	878,980	975,938	(19%)	11%	5
Off Street Car Parks	0	14,145	14,145	100%	0%	65,000	65,000	65,000	0%	0%	
Parks, Open Space & Streetscape	965,700	264,564	264,563	(73%)	(0%)	1,646,000	1,602,498	1,601,842	(3%)	(0%)	
Plant Machinery & Equipment	2,065,000	1,212,057	1,216,320	(41%)	0%	2,795,000	2,945,993	2,945,993	5%	0%	
Recreational Leisure and Community Facilities	1,415,530	762,419	772,259	(45%)	1%	1,624,439	2,373,223	2,400,596	48%	1%	6
Roads	10,788,769	7,328,887	7,387,029	(32%)	1%	16,219,194	16,489,601	16,134,373	(1%)	(2%)	7
Waste Management	1,900,000	1,536,419	1,596,914	(16%)	4%	5,510,000	9,518,284	9,625,265	75%	1%	8
Other Infrastructure	392,000	156,853	217,801	(44%)	39%	392,000	392,000	392,000	0%	0%	
Project Management Office	659,264	619,181	619,182	(6%)	0%	1,000,000	1,000,000	1,000,000	0%	0%	
Total Capital Works	25,530,027	15,268,920	15,508,079	(39%)	2%	46,356,293	52,597,440	49,587,086	7%	(6%)	

Capital Works Area	2018/2019 YTD Adopted Budget	2018/2019 YTD Adopted Forecast Q2	2018/2019 YTD Actual	YTD Adopted Budget Variance (Fav)/Unfav %	YTD Adopted Forecast Q2 Variance (Fav)/Unfav %	2018/2019 Adopted Budget	2018/2019 YTD Adopted Forecast Q2	2018/2019 Projected Full Year	Adopted Budget Variance (Fav)/Unfav %	Adopted Forecast Q2 Variance (Fav)/Unfav %	Note
	\$	\$	\$			\$	\$	\$			
Renewal	16,086,740	11,862,671	11,972,088	(26%)	1%	22,846,980	28,079,819	27,716,129	21%	(1%)	
Upgrade	3,454,950	504,611	505,265	(85%)	0%	8,294,744	8,614,557	8,600,766	4%	(0%)	
New	4,163,873	2,125,614	2,250,775	(46%)	6%	11,679,569	12,295,064	10,187,191	(13%)	(17%)	
Expansion	1,165,200	156,843	160,769	(86%)	3%	2,535,000	2,608,000	2,083,000	(18%)	(20%)	
Project Management Office	659,264	619,181	619,182	(6%)	0%	1,000,000	1,000,000	1,000,000	0%	0%	
Total Capital Works	25,530,027	15,268,920	15,508,079	(39%)	2%	46,356,293	52,597,440	49,587,086	7%	(6%)	

Notes to the Capital Works Statement for period ended February 2019

- 1) Bridges Projects Full Year is \$910k more than 2018/2019 Adopted Budget. This unfavourable variance is due to additional planning and design expenditure for Toolamba, Watt Road and Burkes Road bridges. This additional expense is offset by additional monetary contributions from Vic Roads as part of the Fixing Country Roads program.
- 2) Buildings Projected Full Year is \$2m less than Adopted Forecast Q2 and \$1.83m less than 2018/2019 Adopted Budget. These favourable variances are due to the rebudget of works for the New SAM building into future financial years.
- 3) Computer and Telecommunications Projected Full Year is \$463k less than Adopted Forecast Q2 and \$485k less than 2018/2019 Adopted Budget. These favourable variances are due to works on the Primary Compute & Storage Refresh \$250k and Public Wifi Projects \$150k being rebudgeted into future financial years.
- 4) Footpaths and Cycleways Projected Full Year is \$485k less than Adopted Forecast Q2. This favourable variance is mostly due to the rebudget of the Dookie Rail Trail Stage 2 \$515k into future financial years.
- 5) Land Improvements Project Full Year is \$230k greater than 2018/2019 Adopted Budget. This favourable variance is mostly due a reduction in the scope of the trade waste treatment project at the Saleyards due to revised Goulburn Valley Water requirements \$290k. The favourable variance is also due to the deferral of Children Services garden renewals until future financial years to allow for the development of a renewal program \$50k.
- 6) Recreational Leisure and Community Facilities Projected Full Year is \$776k more than 2018/2019 Adopted Budget. This unfavourable variance is mostly due to new capital works including Central Park netball court upgrade \$315k which is offset by additional grant funding. Also impacted by additional works associated with Federal funding at the Greater Shepparton Regional Sports Precinct \$308k and additional playground works at Kinchanga Park \$75k.
- 7) Roads Projected Full Year is \$355k less than Adopted Forecast Q2. This favourable variance is mostly due to lower than expected costs on Nixon Street Bus Interchange \$146k, McEwen Road \$86k and Mooroopna West Growth Corridor North South Road Work \$80k.
- 8) Waste Management Project Full Year is \$107k greater than Adopted Forecast Q2. This unfavourable variance is due to progress payment claims on Cosgrove 3 Cell 1 Construction \$156k.

ATTACHMENT TO AGENDA ITEM

Ordinary Meeting

19 March 2019

Agenda Item 9.1 Rename - Flanagan Place, Tatura

Attachment 1 Renaming of Flanagan Place, Tatura 226

16 January 2018

Tatura Senior Citizens
Flanagan Place (PO Box 107)
TATURA 3616

Greater Shepparton City Council	
File No	
Record No	
19 JAN 2018	
Referred To	
Copies To	

Janine Saxon
Support Officer - Building/Planning
Greater Shepparton City Council
Locked Bag 1000
SHEPPARTON 3631

Dear Janine

The Tatura Senior Citizens wrote to Council on 28 August 2016 regarding their concern re the duplication of street names in Tatura in particular Flanagan Place and Flanagan Drive. The duplication is known to cause confusion for visitors and emergency services.

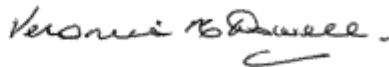
The Tatura Senior Citizens have raised this with the Tatura Community Plan Committee who supports the request to change the name to ensure emergency services arrive at the correct address.

The Club has had conversations with Flanagan family members who have no issue with Flanagan Place being renamed considering there is the Drive and a Park also acknowledging the name in the town.

The Tatura Community Plan Committee has representation from the RSL who have proposed that Flanagan Place be renamed Memorial Place in keeping with the Robert Mactier Statue and memorial features in the park.

We would appreciate if you could consider our request. If you require more information I can be contacted on 5824 1815.

Yours sincerely



Veronica Dowell
President
Tatura Senior Citizens

ATTACHMENT TO AGENDA ITEM

Ordinary Meeting

19 March 2019

Agenda Item 9.2	Adoption of the Shepparton Mooroopna Flood Mapping and Flood Intelligence Project March 2019 and the Greater Shepparton City Council Municipal Flood Emergency Plan August 2018	
Attachment 1	Shepparton Mooroopna Flood Mapping and Flood Intelligence Final Report - March 2019	228
Attachment 2	Greater Shepparton City Council Municipal Flood Emergency Plan - August 2018	341
Attachment 3	Draft Shepparton Mooroopna Flood Mapping and Flood Investigation Project 2018 and Draft Greater Shepparton City Council Municipal Flood Emergency Plan - September 2018 Ordinary Council Meeting Report	562





Document Status

Version	Doc type	Reviewed by	Approved by	Date issued
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V02	Final Draft	Ben Tate	Ben Tate	01/08/2018
V03	Final Draft	Ben Tate	Ben Tate	16/08/2018
V04	Final Draft	Ben Tate	Ben Tate	10/09/2018
V05	Final Draft	Ben Tate	Ben Tate	31/01/2019
V06	Final	Ben Tate	Ben Tate	01/03/2019

Project Details

Project Name	Shepparton Mooroopna Flood Mapping and Flood Intelligence Study
Client	Greater Shepparton City Council
Client Project Manager	Greg McKenzie
Water Technology Project Manager	Ben Tate
Water Technology Project Director	Warwick Bishop
Authors	Richard Connell, Lachlan Inglis, Ben Tate, Michael Cawood
Document Number	2360-01_R03v05_Shepparton_FloodMapping&FloodIntelligence.docx

Project Partners:



Funding Bodies:



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EXECUTIVE SUMMARY

The Shepparton-Mooroopna Flood Mapping and Flood Intelligence Study provides a technical review and update to the previous flood study (SKM, 2002). This work is considered an improvement on the previous flood study for the following reasons:

- Technological advancements in topographic data capture (LiDAR) better representing the floodplain, including roads, levees, channel banks, new development, etc, improving the flood mapping.
- Flood modelling software has advanced significantly since the previous study, again improving the flood mapping outputs.
- An improved understanding of the timing of tributary flows and how breakouts from the Goulburn River, Broken River and Seven Creeks interact around the Goulburn Main Channel.
- The advancements in the modelling of this study is demonstrated through the excellent calibration achieved over the range of flood events modelled, (1974, 1993 and 2010). The calibration was informed by a large amount of observed historical flood data including aerial flood photography, surveyed flood levels, and recorded streamflow gauges.
- The hydrology and hydraulic model calibration were reviewed by an independent technical review panel appointed by the Department of Environment, Land, Water and Planning, providing confidence that the methods adopted were appropriate.

The study has produced an improved set of flood maps for a range of Goulburn River at Shepparton gauge height increments between 9.5 m and 12.5 m. The flood level at Shepparton is influenced by flood flows from the Goulburn River, Broken River and Seven Creeks, with flood mapping outputs produced for a Goulburn River dominant, Broken River / Seven Creeks dominant, and neutral flood scenarios. A gauge height level of 12.2 m at the Goulburn River at Shepparton gauge was determined to be equivalent to a 1% AEP flood event, and for design flood mapping purposes, all three tributary dominance scenarios were combined, taking the maximum of the three scenarios. When compared to the previous 1% AEP flood mapping, the new 1% AEP flood mapping shows a very similar extent across the floodplain, with the area of inundation reduced through Kialla West and Mooroopna due to the inclusion of more detailed representation of channel banks and roads which impact on the flood behaviour in those areas. The new 1% AEP flood mapping has therefore reduced the area of flood prone land in the Shepparton, Mooroopna and surrounding area.

The flood mapping has been formatted into Victoria Flood Database format and uploaded to Flood Zoom so the data is available for emergency services to use during a flood event. The flood mapping has been carefully examined to provide improved flood intelligence on areas inundated and flood impacts during the range of flood scenarios modelled. This information has been used to update the *Greater Shepparton City Council Flood Emergency Plan: A Sub-Plan of the Municipal Emergency Management Plan*. This Plan is used by emergency services personal and Council staff to guide emergency response actions. The Total Flood Warning System was reviewed, and several clear recommendations were made to further strengthen the system.

To ensure that the outcomes from this study directly benefited the communities of Shepparton, Mooroopna and surrounding areas, the flood mapping data was made available through an online flood mapping portal which can be accessed via www.floodreport.com.au. This portal allows individuals to visualise the flood mapping online for a range of flood events, and to click on any property within the study area and download a property specific flood report. The flood report provides flood information specific to that property along with a flood preparedness table which links the Goulburn River at Shepparton gauge height to a flood level and depth above or below floor level at that property. This allows residents to better understand their personal flood risk. The service replaces an outdated and no longer supported system that was previously hosted by Council.



WATER TECHNOLOGY
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The study has made several recommendations for Greater Shepparton City Council, Goulburn Broken CMA and Victoria State Emergency Services to consider. These recommendations are generally actions designed to make the most of the new flood mapping and flood intelligence generated by this study, and to further strengthen the existing Total Flood Warning System.

Water Technology would like to thank our project partners, HydroLogic and Michael Cawood and Associates for their role in delivering this study. Water Technology would like to specifically acknowledge the contributions of Guy Tierney of Goulburn Broken CMA and Greg McKenzie of Greater Shepparton City Council in the completion of this study, and their ongoing commitment to reducing flood risk in the Shepparton, Mooroopna and surrounding areas.



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1 INTRODUCTION

Water Technology was commissioned by the Greater Shepparton City Council to undertake the Shepparton Mooroopna Flood Mapping and Intelligence Project. This study was a review and technical update to the previous flood study (SKM, 2002). This study involved detailed hydrological and hydraulic modelling of the Goulburn River, Seven Creeks and the Broken River, flood mapping and collation of flood intelligence information. The main outcome of the study was to produce improved flood mapping information for use in sharing flood intelligence for the Shepparton Mooroopna area with multiple stakeholders and the community. The study has produced an online flood mapping portal to allow community members easy access to flood information, see www.floodreport.com.au.

As part of the initial scoping work, the data required for modelling and mapping was collated and reviewed. The hydrology approach adopted for this study utilised the extensive streamflow gauge network, using flood frequency analysis, past studies and past flood events to derive hydrographs for input into the hydraulic model. A hydraulic model was developed using TUFLOW software and was calibrated to the large flood event of October 1993 and the smaller September 2010 flood event, with validation to the May 1974 flood event.



2 STUDY AREA

Shepparton and Mooroopna are situated on the Goulburn River at the confluence with the Broken River and Seven Creeks. The study area in the tender documentation extended upstream of Shepparton to Toolamba and downstream of Shepparton to Loch Garry on the Goulburn River, upstream of Shepparton to Kialla East on the Broken River and upstream of Shepparton to Kialla West on Seven Creeks.

To model the Goulburn River, Broken River and Seven Creeks system, coarse hydraulic models were extended upstream to suitable boundary locations, Murchison on the Goulburn River, Gowangardie on the Broken River and upstream of Kialla West on the Seven Creeks. These coarse models allowed flows to be developed at these gauging stations and routed downstream to the detailed hydraulic model area surrounding the urban area of Shepparton and Mooroopna, see Figure 2-1. The larger model area was separated into three separate hydraulic models. The upstream coarse models study the routing between the upstream gauges and Shepparton, and on the Broken River allow a better understanding of breakout flows leaving the river between Gowangardie and Shepparton. A higher resolution model of the flood mapping area extended from about 2.5 km upstream of East Goulburn Main Channel on the Broken River, 2 km upstream of the East Goulburn Main Channel on Honeysuckle/Irish Creeks, upstream of Union Road on Seven Creeks, and upstream of Bridge Road on the Goulburn River down to Loch Garry on the Goulburn River.

The hydrology of the system was considered across an even wider area, with many gauges outside the extended study area analysed.



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FIGURE 2-1 STUDY AREA EXTENT, REVISED MODEL AREA AND GAUGE LOCATIONS



3 DATA REVIEW AND ASSESSMENT

3.1 Overview

A large amount of information was available within the study area and broader catchment to assist in this study. A significant amount of hydrological data was collated and analysed along with many different topographical datasets. Shepparton and Mooroopna have a long history of flooding so many historical accounts of flooding and observed data was collated. Information from Goulburn Broken Catchment Management Authority (GBCMA), Greater Shepparton City Council (GSCC), the Department of Environment Land Water and Planning (DELWP), hydrographers (Ventia), Goulburn Murray Water (GMW) and VicRoads was collated. The Shepparton Mooroopna Floodplain Management Study by Sinclair Knight & Merz (SKM, 2002) was a major study that considered the issues of flooding in the study area, and as such was reviewed in detail.

3.2 Hydrological Data

3.2.1 Streamflow Data

Streamflow data is required for the hydrological analysis. The details of the streamflow gauging stations used in this analysis are listed in Table 3-1. These streamflow gauging details include the period of continuous streamflow record for each gauge. The continuous period of record is the period of systematic recording of streamflow via a daily read staff gauge or a continuous recorder. For some streamflow gauges, records are available during flood events only. Streamflow data records have been sourced from the DELWP water data portal.

Rating tables for the various stream gauges within the catchment were provided by Goulburn Broken CMA, DELWP and Ventia. During the calibration stage of the project it was found that recent changes to rating tables applied back over the entire record of data at some gauge sites has significantly changed the peak flow record for some historic flood events. This has a significantly large impact on the results of any flood frequency analysis and resultant design flows for this study. As such this is discussed in detail in Section 4.2.

TABLE 3-1 STREAMFLOW GAUGE DETAILS

Station Name	Station No.	Area (km ²)	Period of record	Additional data since 2002 study
<i>Broken River at Benalla</i>	404203	1,461	1886 – 1961 (partial)* Oct 1977 to current	2002-now
<i>Broken River at Casey's Weir (Goorambat) Headwater Gauge</i>	404216	1,924	February 1888 to June 1916. July 1979 to current	2002 - now
<i>Broken River at Casey's Weir (Goorambat) Tailwater Gauge</i>	404200	1,924	July 1916 to June 1979	N/A
<i>Broken River at Gowangardie</i>	404224	2,396	January 1978 to July 1985 August 1991 to current	Not used in SKM study
<i>Broken River at Orrvale</i>	404222	2,508	June 1977 to current	2002 - now
<i>Goulburn River at Goulburn Weir</i>	405253	10,627	March 1967 to October 1985	N/A



Station Name	Station No.	Area (km ²)	Period of record	Additional data since 2002 study
Goulburn River at Murchison	405200	10,772	June 1881 to March 1967 November 1984 to current	2002 - now
Goulburn River at Kialla West	405270	12,038	June 1977 to August 1985	N/A
Goulburn River at Shepparton	405204	16,125	June 1921 to current	2002 - now
Goulburn River at Loch Garry	405276	16,490	Feb-1978 to current	2002 - now
Seven Creeks at Euroa Township	405237	332	May 1963 to current	2002 - now
Seven Creeks at Kialla West	405269	1,505	June 1977 to current	2002 - now
Pranji Creek at Moorilim	405226	787	December 1957 to current	Not used in SKM study
Castle Creek at Arcadia	405246	164	June 1970 to current	Not used in SKM study

* note that the rating curve for Benalla pre-1970 is no longer valid due to construction of the lake

3.2.2 Peak Design Flow Estimates

The SKM (2002) study undertook a detailed flood frequency analysis for many gauges on the Goulburn and Broken Rivers. This analysis is provided below in Table 3-2. Note that for some sites the adopted design flows were from a combination of methods and unless otherwise indicated, estimates were from flood frequency analysis over the gauge period.

TABLE 3-2 SKM (2002) ADOPTED DESIGN PEAK FLOW ESTIMATES (ML/D)

	Goulburn River at Murchison	Broken River at Casey's Weir	Broken River at Benalla	Seven Creeks at Euroa	Goulburn River at Shepparton
Period for FFA	1956-1999, 1916 ⁽¹⁾	1889-1999	1955-1999, 1916, 1921	1956-1999, 1916, 1921	1921-1999, 1916
20%	51,900	23,300	30,900	11,800	73,400
10%	68,400	31,400	45,500	16,200	102,000
5%	87,000	40,500	61,600	20,200	137,000
2%	114,000	54,500	85,600 ⁽²⁾	25,800 ⁽³⁾	180,000
1%	134,000	66,900	106,000 ⁽²⁾	34,000 ⁽³⁾	219,000
0.5%	158,000	81,200	128,000	42,900 ⁽³⁾	261,000
0.2%	192,000	103,000	161,000	56,300 ⁽³⁾	336,000

(1) 1956-1999 chosen for FFA as it is period after construction of Big Eildon dam.

(2) Estimate adopted from calibrated rainfall-runoff modelling by Willing and Partners (1998) study instead of FFA.

(3) Estimate adopted from calibrated rainfall-runoff modelling by SKM (1997) study instead of FFA.

The SKM (2002) study used several regression equations to transpose the peak design flows from the above-mentioned gauges to the boundaries of their study area. As volume is just as important as peak flow in large flat floodplains, the frequency analysis and transposition was repeated for five day volumes.



3.2.3 Design Flow Hydrographs

To determine a design hydrograph, the SKM (2002) study scaled historic hydrographs to represent the design peak flow and 5 day volume. The 1974 hydrograph was adopted for the Goulburn River and the 1993 hydrographs for the Broken River and Seven Creeks.

The timing of the three major contributing catchments has a large impact on the resulting flood at Shepparton. The SKM (2002) study found that the peak flow of Seven Creeks at Kialla West generally occurs between 6-24 hours earlier than the Broken River at Orrvale, the study adopted the median 15 hour time offset for the peak flow for design purposes. The relative timing of the Goulburn and Broken River flood peaks was also investigated, however a lack of data hindered this assessment. A lag time of 33 hours was assumed between Goulburn Weir and Kialla West and 30 hours between Murchison and Kialla West. It was estimated that the peak flow in the Goulburn at Kialla West occurred approximately 15 hours after the peak flow on the Broken River at Orrvale for the 1974 event, with a 60 hour lag in the 1993 event. This longer lag in 1993 was attributed to the impact of Eildon attenuating the flood in the upper catchment, with the lower catchment having a smaller contribution to the Goulburn flows. For design purposes the 15 hour time lag from the 1974 event was adopted. Several design flood scenarios were developed using various combinations of Goulburn River, Broken River and Seven Creeks flows for a given design event at the Shepparton gauge. A similar approach in adopting appropriate timing for design events for the current investigation is discussed in more detail in Section 4.4.2 with timing tested in the hydraulic model to assess the sensitivity on flood levels shown in Section 6.1.

3.3 Topographic and Physical Survey

Several sources of topographic/survey data were obtained to prepare the hydraulic model. Most of the data was provided by GBCMA and GSCC. These include:

- Light detection and ranging (LiDAR) data
- Pipe Drainage Networks
- Survey Cross sections
- Photogrammetry
- Feature survey of Shepparton Mooroopna Causeway
- Feature survey of strategic levees downstream of Shepparton

3.3.1 LiDAR Data

LiDAR data for the region was made available by Goulburn Broken CMA and DELWP. A summary of available digital elevation model (DEM) data sets is summarised below in Table 3-3.

TABLE 3-3 AVAILABLE DIGITAL ELEVATION MODEL DATA SETS

DEM Data Set	Resolution	Year Flown	Vertical Accuracy
Fugro Spatial Systems (FSS)	1 m & 5 m DEM	2007	± 0.10 m
Index of Stream Condition (ISC)	1 m DEM	2011	± 0.15 m
Floodplain Set I	1 m DEM	2011	± 0.10 m
Think Spatial UAV	1m DEM	2013	± 0.15 m
VicMap Elevation	20 m DEM		
Geoscience Australia	1 Second DEM		



Figure 3-2 shows the extent of available DEMs used in the hydraulic modelling.

The 5 m/1 m Fugro Spatial Systems (FSS) data contained many gaps and 'holes' within the DEM. These were removed (using 12d terrain software) by creating a Triangulated Irregular Network (TIN) across the surrounding data points and exporting as a new DEM.

A comparison of the Floodplain (FP) and FSS datasets was undertaken in ARCGIS for a location where there was overlap. Both datasets had the same 1 m grid resolution. Very little elevation difference was observed where the two datasets overlapped, with the differences mostly present in channels and water bodies as well as variations in crop development. An example of the comparison in DEMs is shown in Figure 3-3. Areas of river channel, dense vegetation and crops showed elevated surface levels in the FP LiDAR compared to the FSS LiDAR, which indicated that the FSS LiDAR may be closer to the true ground level in these locations. Therefore, the FSS LiDAR was used in preference to the FP LiDAR where there was overlap.

The Index of Stream Condition (ISC) data follows the alignment of major waterways but doesn't extend far onto the floodplain. This data set was found to be the most consistent with the feature survey of the causeway, whereas the FSS LiDAR data set was found to be lower than the feature survey. This is demonstrated by the analysis of the feature survey along the Shepparton Mooroopna Causeway shown in Figure 3-1 and summarised in Table 3-4.

The ISC LiDAR is on average 0.2 cm lower than the feature survey and the FSS LiDAR is on average 7.8 cm lower. For this reason, the ISC LiDAR data set was chosen as the basis for the final model topography and the other data sets were adjusted to match. Several checks were carried out along the interface of the different datasets and following this analysis it was decided to raise the FSS and FP LiDAR datasets by 10 cm to ensure a smooth transition between the different data sets. The final composition of the LiDAR used in the topography is shown in Figure 3-4.

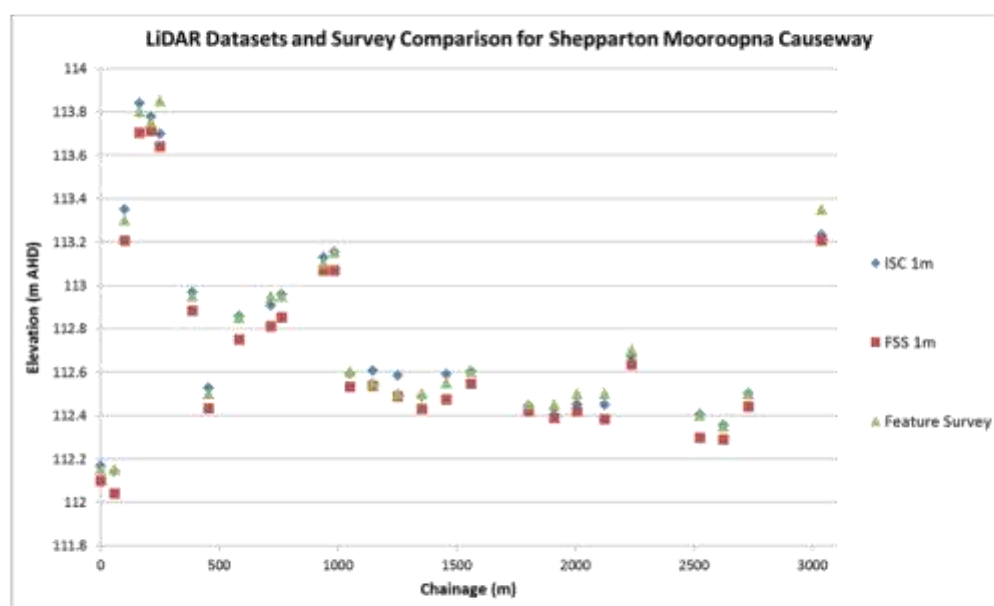


FIGURE 3-1 SURVEY AND LIDAR ELEVATION COMPARISON ALONG SHEPPARTON-MOOROOPNA CAUSEWAY



TABLE 3-4 SURVEY AND LIDAR ELEVATION DIFFERENCES FOR SHEPPARTON MOOROOPNA CAUSEWAY

Chainage (m)	ISC 1 m Difference (cm)	FSS 1 m Difference (cm)	Chainage (m)	ISC 1 m Difference (cm)	FSS 1 m Difference (cm)
0	1.7	-5.2	1146	5.8	-1.1
59	-0.7	-11.0	1253	8.6	-1.1
101	4.9	-9.3	1354	-1.3	-7.0
166	3.8	-9.7	1457	3.9	-7.5
212	2.9	-3.7	1560	0.5	-5.4
252	-15.1	-21.1	1805	-0.6	-3.1
387	1.9	-6.6	1913	-2.1	-6.2
456	2.7	-6.8	2009	-4.8	-8.2
584	0.8	-10.0	2125	-5.0	-11.7
718	-4.3	-14.0	2238	-2.6	-6.5
764	0.7	-9.6	2526	0.5	-10.2
940	2.8	-3.1	2623	0.4	-6.0
987	0.3	-8.2	2731	0.1	-5.9
1051	-0.8	-6.9	3039	-11.8	-14.5
			Mean	-0.2	-7.8



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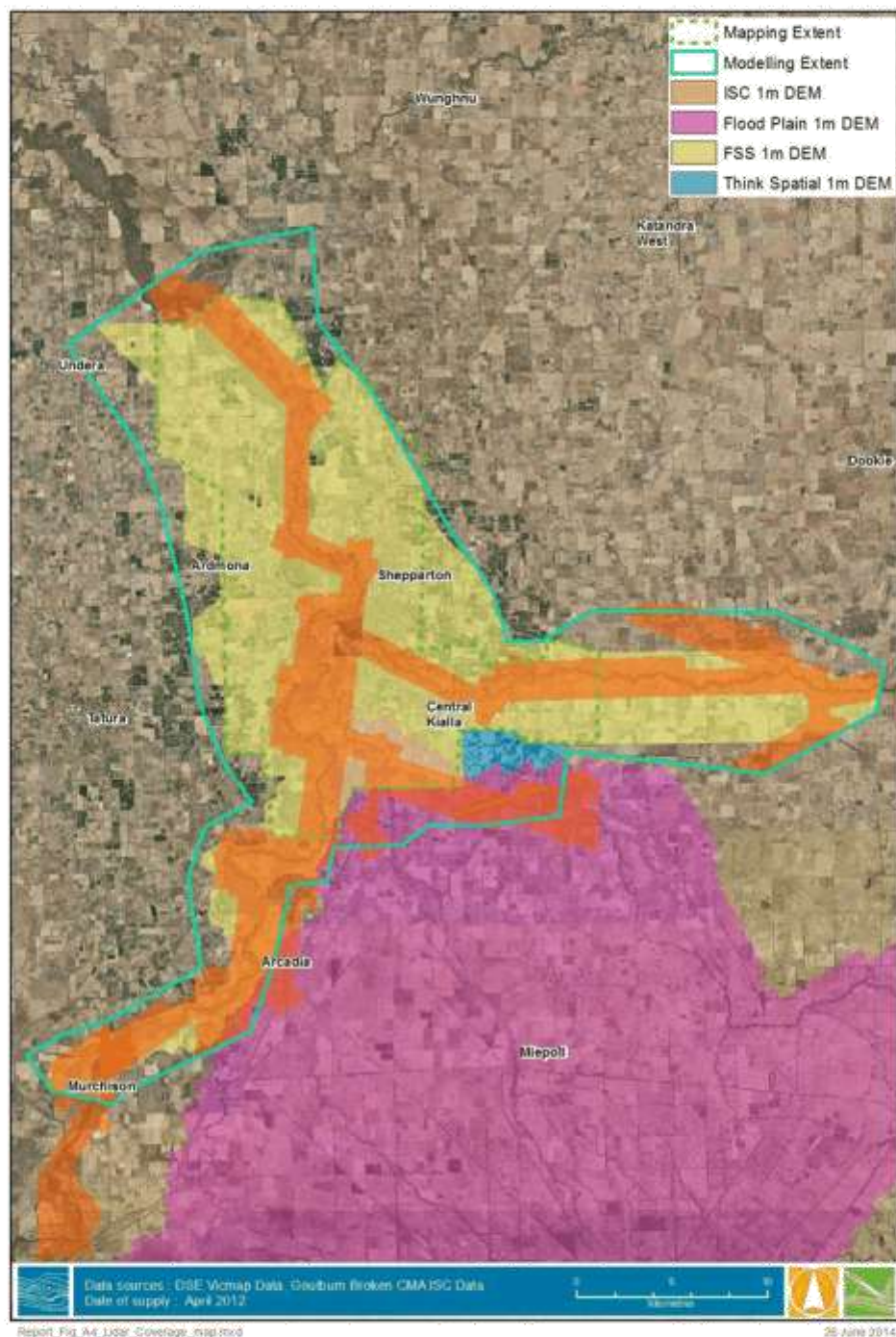


FIGURE 3-2 EXTENT OF AVAILABLE DEM'S



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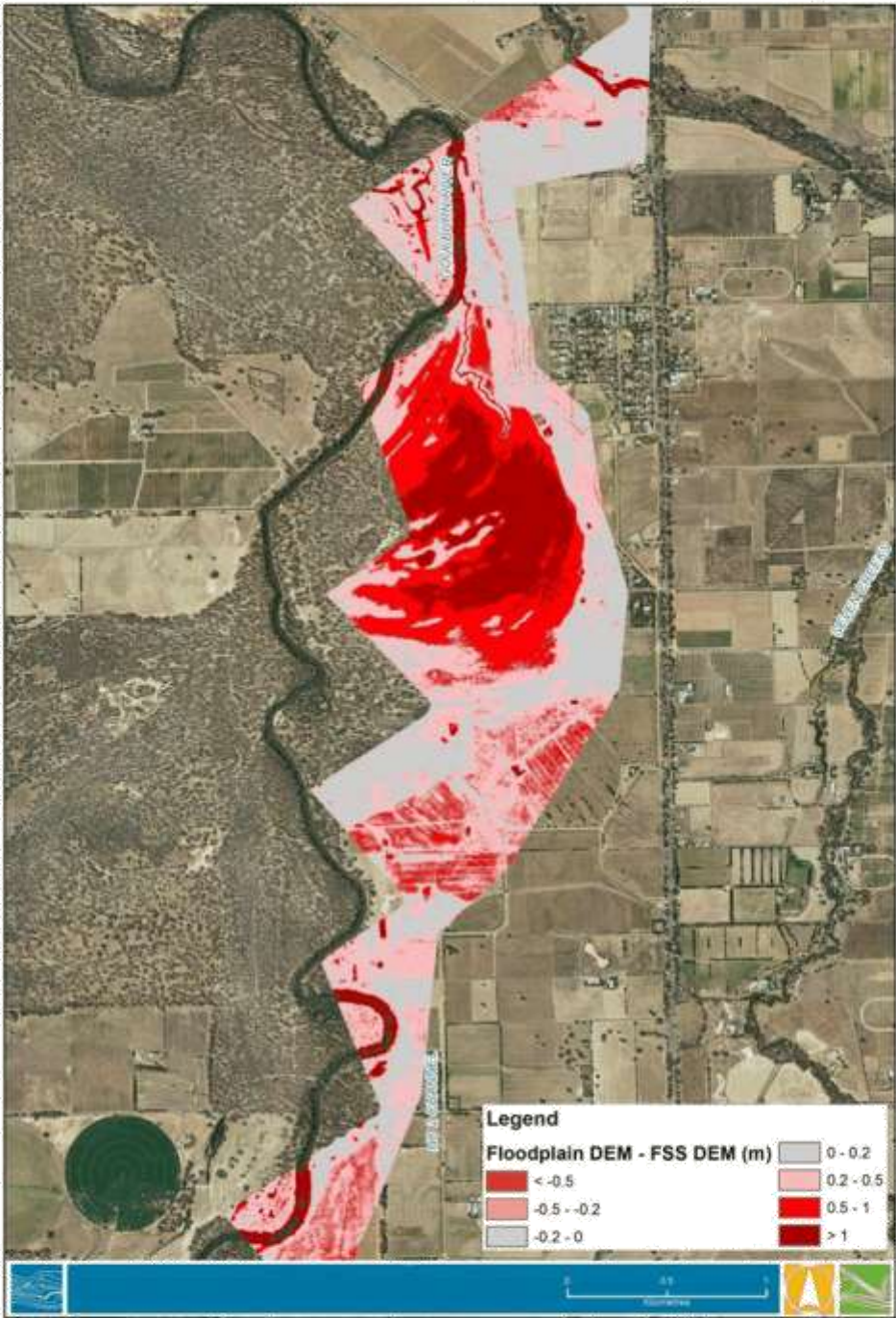


FIGURE 3-3 VERTICAL COMPARISON OF FLOODPLAIN DEM AND FSS DEM



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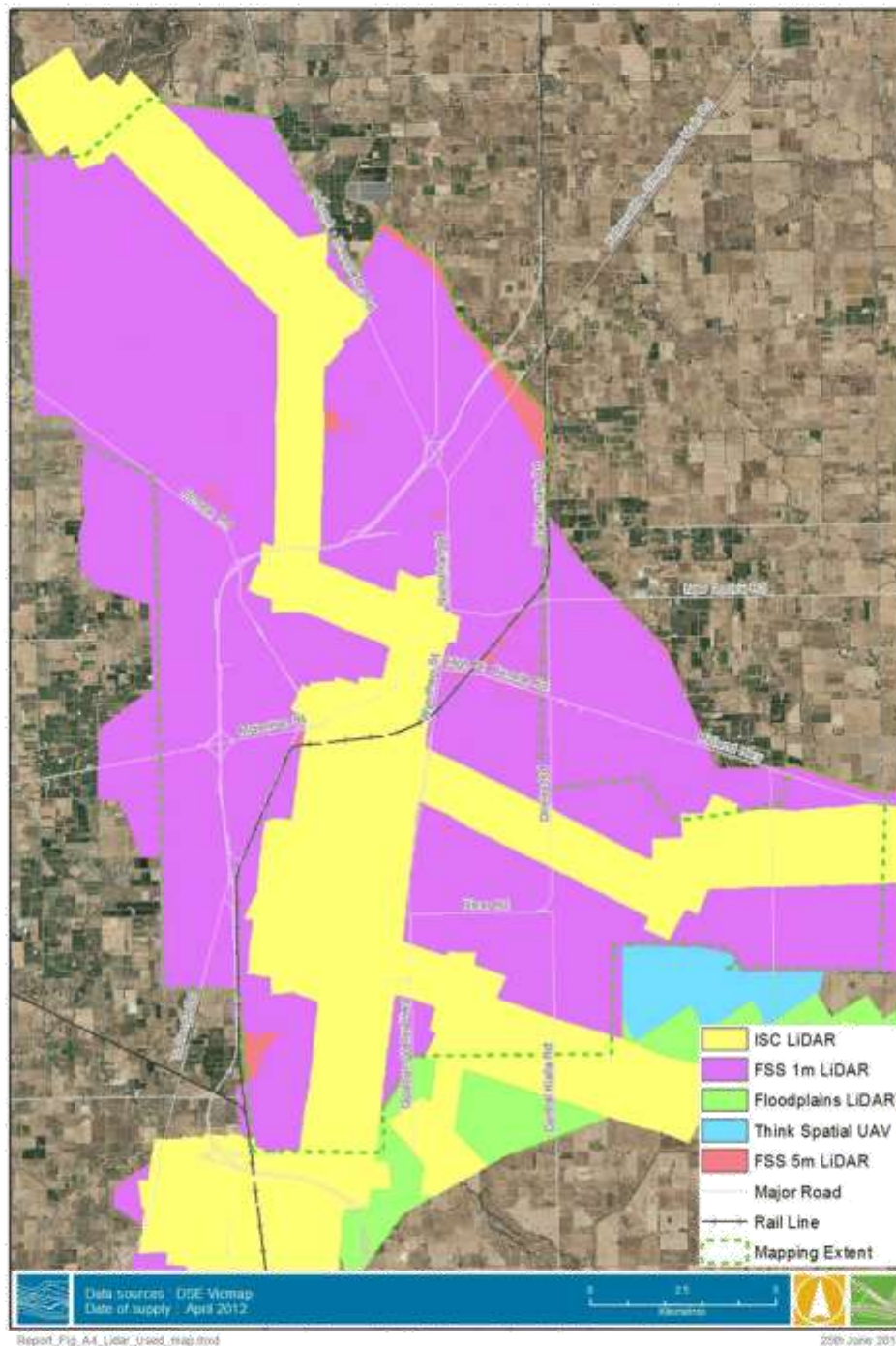


FIGURE 3-4 DEMS USED IN HYDRAULIC MODEL TOPOGRAPHY



3.3.2 Stormwater Drainage

Details of the underground drainage network are important for the establishment of the hydraulic model and identification of flood related drainage issues. It should be noted however that this study was not intended to consider the entire stormwater system. The study focussed on larger riverine flood events and included pipes greater than 600 mm in diameter, as identified within the GSCC GIS database. Other smaller pipes were included in areas where it was thought that they may be important in conveying floodwaters from the river to low lying areas that would be otherwise disconnected. Council was consulted on the pipes and pits that were to be included in the hydraulic modelling and approved the selection.

Greater Shepparton City Council supplied their drainage network layout for Shepparton and Mooroopna. The network was received in an ESRI shapefile format of the pipes and pits.

The shapefiles indicated conduit/pit locations and conduit sizes for constructed pipes. The shapefile drainage network consisted of 8,091 conduits of which 8,078 had recorded diameters and 3,055 had recorded inverts. The drainage network is shown in Figure 3-6.

In addition to the underground pipe network, several major culverts, siphons and bridges were incorporated into the hydraulic model, Figure 3-7. Existing survey of the Shepparton-Mooroopna Causeway was available from earlier studies, with several hardcopy plans also made available from VicRoads, VicTrack and GMW.

3.3.3 Feature Survey

Two sets of feature survey were made available for this study, the survey of the Shepparton Mooroopna Causeway and the survey of the strategic levees downstream of Shepparton on the Goulburn River. The survey of the causeway was used to verify the LiDAR data as mentioned in Section 3.3.1. The survey of the levees was stamped onto the hydraulic model topography as thin break lines in the TUFLOW model topography. The location of the feature survey is shown in Figure 3-8.

Although the feature survey defined crest elevation for the causeway, the waterway openings were not defined. The Goulburn Broken CMA took photos and sketched up dimensions of all the waterway openings so that they could be well defined within the hydraulic model. The sketch provided for Daintons Bridge over the Goulburn River is shown in Figure 3-5. This is the main bridge crossing the Goulburn River, which was modelled as a 1D structure within the 1D Goulburn River Channel network. The remaining waterway openings were modelled as 2D structures, applying form losses, blockage from piers and the bridge deck and rails.

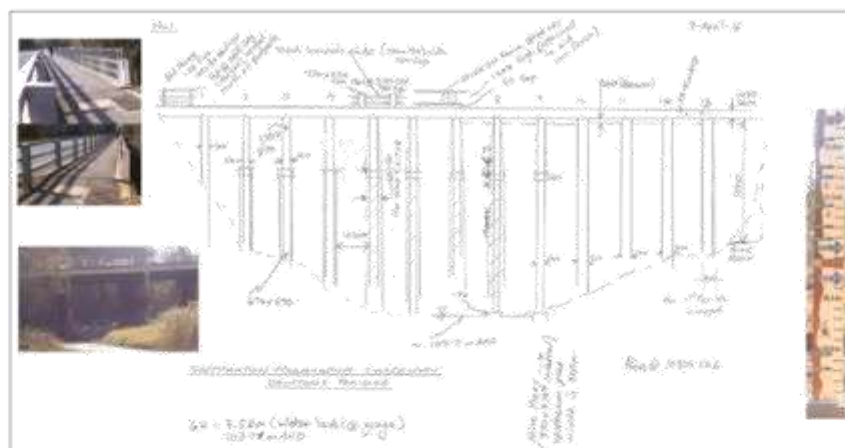


FIGURE 3-5 DAINTONS BRIDGE SKETCH PROVIDED BY GOULBURN BROKEN CMA



3.3.4 Irrigation Channels

The Goulburn Broken CMA provided ESRI shapefiles of the irrigation network. The data showed the location of channels and is shown in Figure 3-8. The irrigation channel banks form hydraulic barriers across the floodplain and were stamped onto the topography as thin break lines in the TUFLOW hydraulic model. The irrigation channel banks were digitised using the irrigation channel network shapefiles, refined using the 1 m LiDAR datasets.

Very limited information other than the alignment of these irrigation and drain features was available other than that extracted from LiDAR information. Some feature survey was available for small sections of channel bank and was included.

3.3.5 Aerial Photos and Observed Flood Extents

Aerial photos of the 1974 and 1993 flood events were received from Goulburn Broken CMA as well as digitised flood extents generated from the photos. Aerial photos for the 2010 flood event were sourced from NearMap and flood extents were digitised from this photography. The flood extents and photos were used to validate the hydraulic model for the calibration events. It should be noted that these images do not necessarily represent the peak of the flood event, with the 1993 image taken 2 days after the flood peak.

A recent aerial photo from 14th December 2013 was used for mapping purposes as a background image. This image was supplied by the Goulburn Broken CMA.

3.3.6 Observed Flood Levels and Floor Levels

The Goulburn Broken CMA provided flood levels from the Victorian Flood Database (VFD) which contain levels for a range of events including the 1974, 1993 and 2010 events. These levels were used to calibrate the hydraulic model. Figure 3-9 shows the available observed levels for the three calibration events.

3.3.7 Waterway survey

State Rivers and Water Supply Commission (SRWC) survey was used to define the channel invert within the waterway. This survey was undertaken for the 1982 Shepparton Mooroopna Flood Study undertaken by Sinclair Knight and Partners (SKP).



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FIGURE 3-6 SHEPPARTON-MOOROOPNA STORMWATER PIPE SYSTEM



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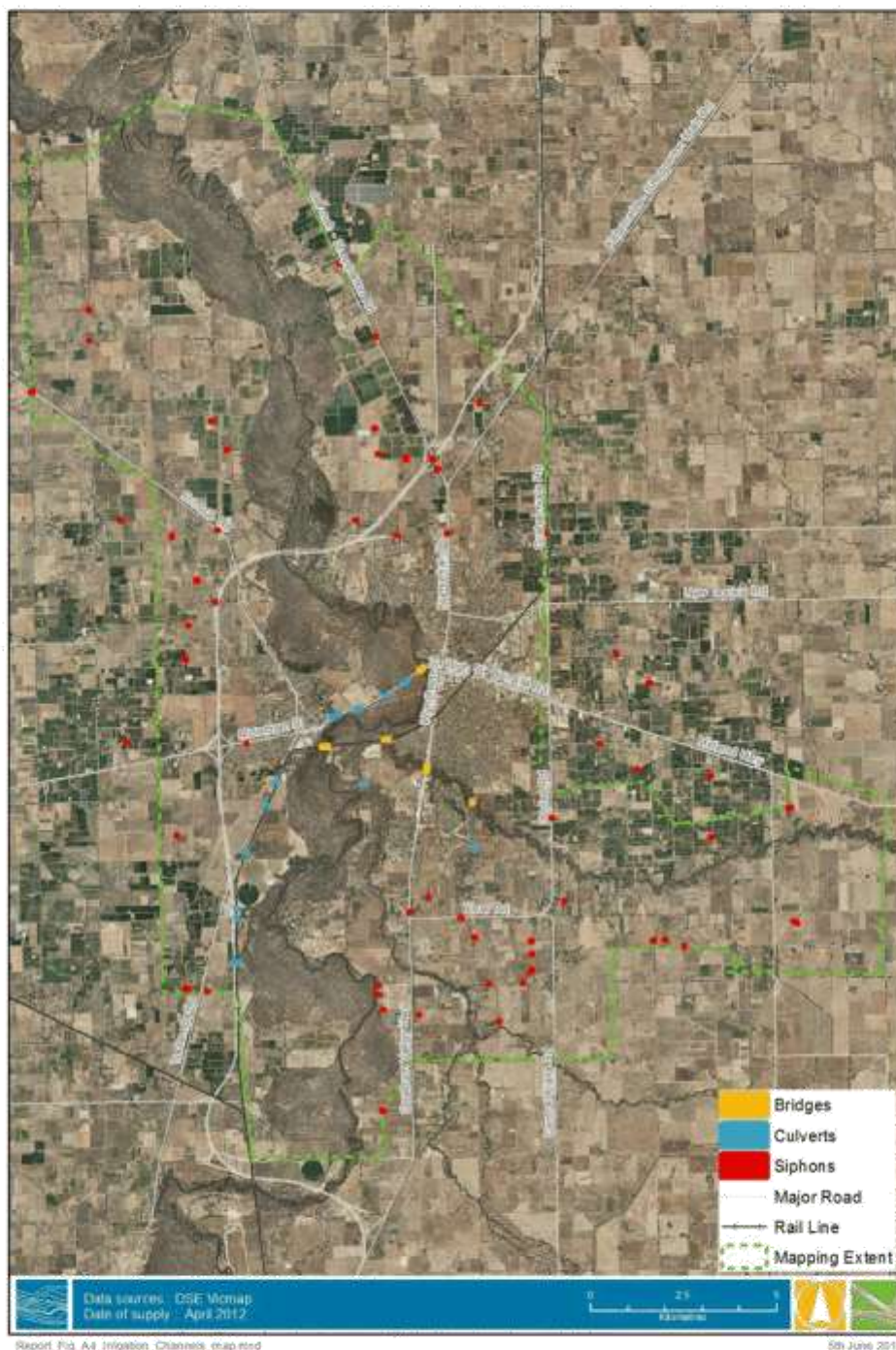


FIGURE 3-7 SHEPPARTON-MOOROPNA CULVERTS, SIPHONS AND BRIDGES



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FIGURE 3-8 SHEPPARTON-MOOROOPNA IRRIGATION CHANNELS AND FEATURE SURVEY



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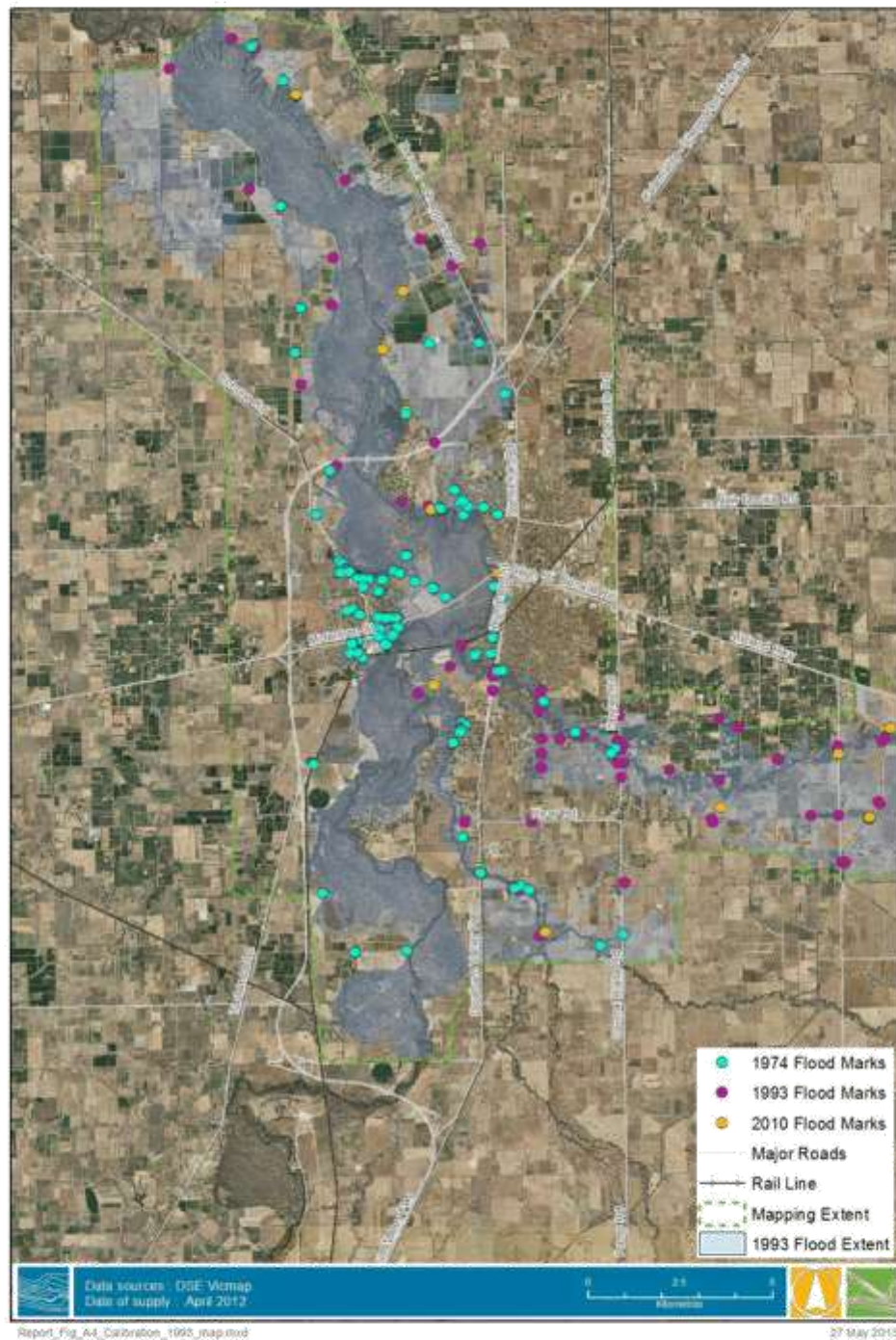


FIGURE 3-9 SHEPPARTON-MOOROOPNA OBSERVED FLOOD LEVELS



4 HYDROLOGY

4.1 Overview

Shepparton and Mooroopna are located on the floodplain of the Goulburn River, Broken River and Seven Creeks. The total catchment area of the Goulburn River at Shepparton is approximately 16,000 km² (2,525 km² in the Broken River catchment, 1,510 km² in the Seven Creeks/Honeysuckle Creek catchment, 800 km² in the Pranjip Creek catchment and 280 km² on the Castle Creek catchment). Given the size of the combined catchment of the Goulburn River upstream of Shepparton and the significance of Lake Eildon in the upper catchment, it was considered impractical to develop a single hydrological model of the area. Any model of the whole area would require numerous assumptions about design considerations and may not make the best use of available streamflow information. Furthermore, breakout flows are likely to occur in the Broken River and Seven Creeks catchments because of the extremely flat floodplain, making calibration of a hydrological model impractical. This was demonstrated in earlier hydrological studies of the Seven Creeks catchment. Given the uncertainties regarding an appropriate spatial and temporal distribution of design rainfall over such a large and varying catchment, not to mention drawdown considerations of Lake Eildon, it is considered more practical and a more efficient approach to update the methodology adopted in the SKM (2002) study, which used Flood Frequency Analysis of the long period of gauge records.

The hydrology approach adopted by SKM (2002) was robust but was improved and updated to take advantage of:

- Additional data from rainfall and streamflow events between 2002 and present day;
- New techniques and research undertaken as part of the revision of Australian Rainfall and Runoff; and,
- Inclusion of outputs from studies completed since 2002.

More specifically the hydrology approach outlined in the study was similar to SKM (2002) with the following updates and enhancements:

- The historical flow series used in flood frequency analysis was updated to include events up to 2012, including the large event in September 2010;
- Flood frequency analysis used updated procedures as outlined in the revised edition of Australian Rainfall and Runoff for fitting design distributions.
- Streamflow gauge ratings were reviewed, with the most appropriate streamflow data utilised;
- Additional routing was carried out within hydraulic models from established gauge locations to the township model boundary to aid in adopting time lags between upstream gauges and model inflow boundaries;
- Specific modelling of major breakouts from the Broken River to the Broken Creek catchment was completed for a range of events; and,
- Recent flood events and available hydrodynamic modelling of the Goulburn was utilised to inform timing of coincident flows for design purposes.

The following sections summarise the hydrological analysis that was undertaken as part of this project, building on the review of previous work undertaken in the SKM (2002) study.

Based on the availability of flood data (aerial imagery, survey and anecdotal evidence), the October 1993, September 2010 and May 1974 events have been used to calibrate the hydraulic model. There is an emphasis on these events in the following discussion around hydrology.



4.2 Rating Curve Review

4.2.1 Overview

Streamflow data was collated for all relevant gauges in the catchment from the Water Information Management System (<http://data.water.vic.gov.au/monitoring.htm>), and directly from DELWP. The data was compared, and it was found that the two datasets had significant discrepancies in the instantaneous peak flows and average daily computed flow. Upon further analysis, a similar trend was observed across most gauges assessed. It was identified that this discrepancy was due to recent rating curve revisions, some of which had been applied back over the entire gauge period. To illustrate this, the 1916 peak flow was revised for the Goulburn River at Murchison gauge from 195,000 ML/d to 311,000 ML/d, close to a 60% increase in the peak flow. If this flow increase was adopted it would mean that the revised 1% AEP flow would be larger than the previous 0.2% AEP flow, dramatically changing design flood levels and influencing planning decisions. As the Goulburn River at Murchison gauge was used to produce the upstream model inflows on the Goulburn River, it was decided to undertake a thorough review of the rating curve using a detailed hydraulic model of Murchison.

4.2.2 Recent Changes to the Rating Curves

DELWP supplied rating curves along with instantaneous and daily mean streamflow records for all relevant gauges requested. Figure 4-1 below compares rating curves at different time periods (1974, 1993, 2010 and current) for all relevant gauges.

All the rating curves have experienced significant change over the past 40 years. Of interest was the Goulburn River at Murchison rating curve. Although the rating curve has not experienced much change in the high flow section of the rating curve since 1974, when comparing previously accepted estimates of the largest historic flood events to flows estimated using the recent rating curves, major discrepancies were identified.

4.2.3 Goulburn River at Murchison

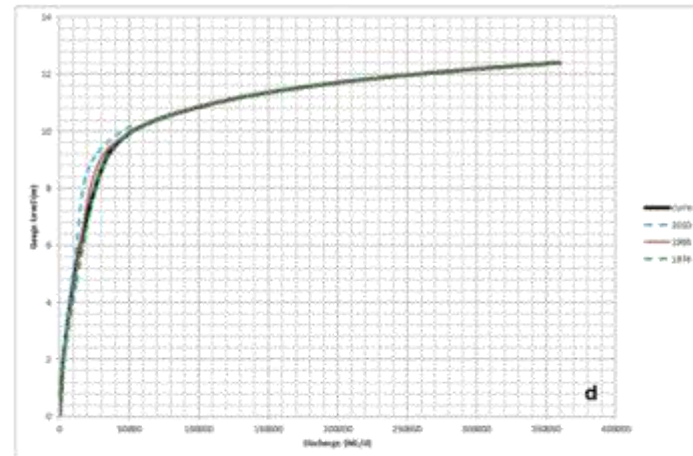
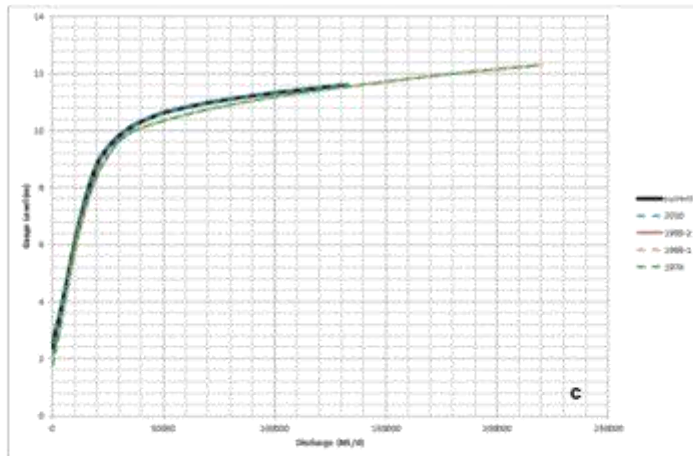
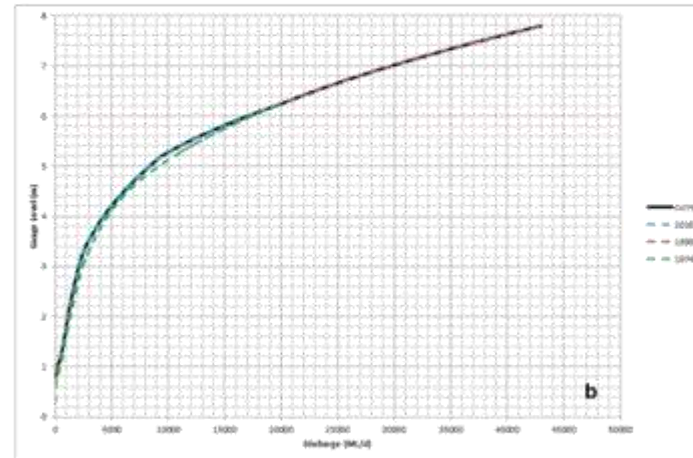
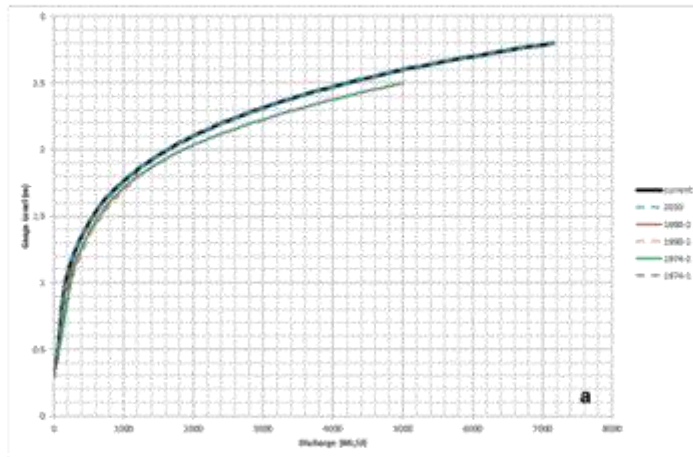
The rating curve review and update of the Goulburn River at Murchison gauge is fully detailed in the Murchison Flood Mapping Study Report (Water Technology, 2014) and is summarised below.

The Murchison gauge has operated since 1887 and has a significant number of gaugings (610) that have made up the current rating curve (rating table number 73.00). The current rating curve is considered reliable up to a relative gauge height of 11.6 m or 184,000 ML/d. The highest gauging used to construct the rating curve was taken in 1974 at a relative gauge height of 10.915 m and approximately 100,000 ML/d, so even within the 'reliable' section of the curve there has been some extrapolation. The rating curve has been extrapolated out to a gauge height of 12.4 m or 360,000 ML/d.

The need to complete a full rating curve review became apparent when comparing the previously accepted flow estimates of the largest of the historic flood events with flows estimated using the extrapolated section of the current rating curve. The previously accepted flow estimate for the 1916 flood was 195,000 ML/d at Murchison. Using the current rating curve, the 1916 flow is estimated at 311,000 ML/d. This increase in the flow of the 1916 event and other large events would have a significant impact on flood frequency analysis and design flood flows if adopted. This revised flow for 1916 did not correspond with other regional flow estimates on the Goulburn River, i.e. it was significantly larger than upstream and downstream gauge readings, warranting further investigation.

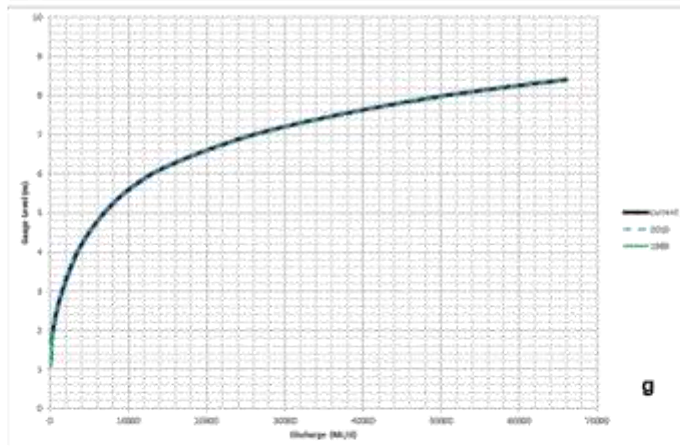
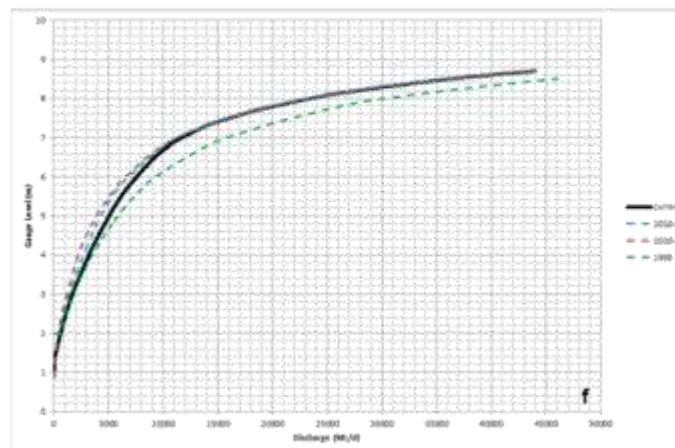
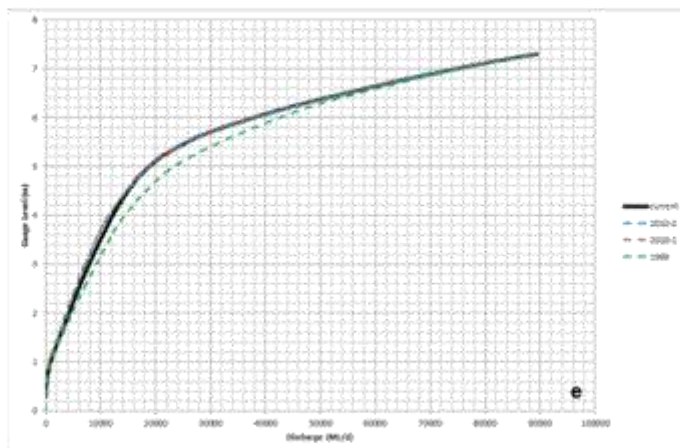


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- a. 405246 Castle Creek @ Arcadia
- b. 405226 Pranjip Creek @ Moorilim
- c. 405204 Goulburn River @ Shepparton
- d. 405200 Goulburn River @ Murchison
- e. 405224 Broken River @ Gowangardie
- f. 405222 Broken River at Orvale
- g. 405269 Seven Creeks @ Kialla West

FIGURE 4-1 RECENT RATING CURVE REVISIONS

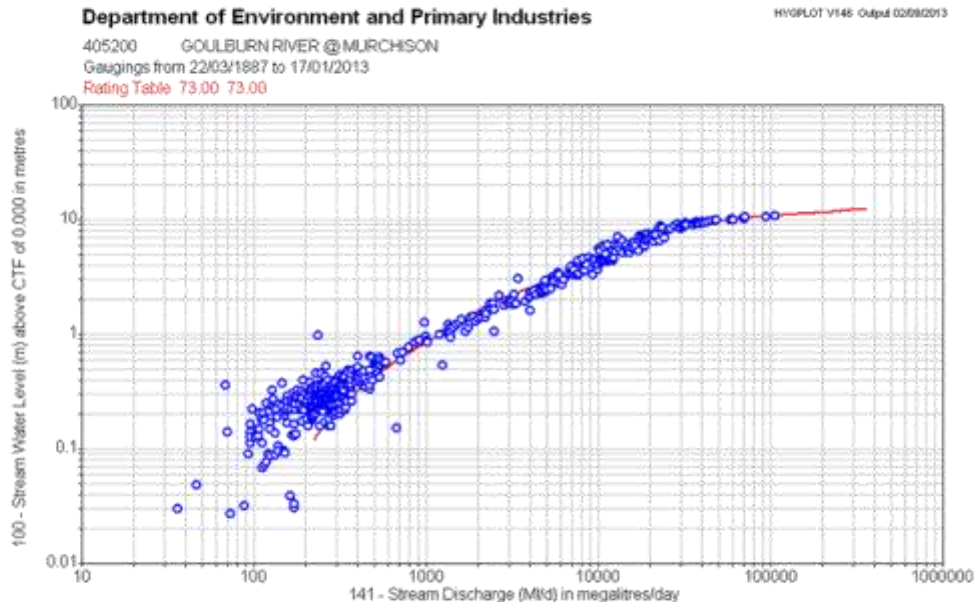


FIGURE 4-2 MURCHISON CURRENT RATING CURVE AND GAUGINGS (SOURCE: DELWP)

4.2.3.1 Murchison Hydraulic Modelling

A 1D-2D TUFLOW model with a grid resolution of 5 m was developed for the Murchison area, extending 4 km upstream and over 11 km downstream of the gauge site. The model was calibrated at the gauge site using the water levels and flows available for the 1974, 1993 and 2010 events. Another three steady state flows were run through the model to provide further verification points along the rating curve at the gauge site. The downstream boundary was set as a constant water level, 1.68 m below the level expected at the Murchison gauge site, based on analysis of the water surface profile captured by the ISC LiDAR. Although this is a simplistic assumption, it was tested through sensitivity and was shown to not unduly impact on model results due to its distance downstream.

The water levels predicted by the model at the gauge site for each flow are shown in Table 4-1 and Figure 4-3. The level for the 20,000 ML/d flow was 0.16 m lower than the current rating curve, however it was well within the envelope formed by the historic gaugings. It is understood that there exists a very large hysteresis loop in the rating curve at the site, with flows measured on the rising limb of a flood being very different to the flows measured on the falling limb of the flood. The levels were within 0.1 m of the current rating curve for flows from 50,000 to 100,000 ML/d. Given that gaugings only extend up to 100,000 ML/d this is a good calibration result, with the rating curve well-matched within this flow range. Above this flow, the modelled levels started to diverge from the rating curve significantly, and the modelled level for a flow of 184,000 ML/d was 0.62 m higher than the rating curve. This indicates that the extrapolation of the current rating curve above this flow is most likely to overestimate flows for a given level.

This result is supported by a comparison of upstream and downstream gauges and previously adopted lower flow rates for the larger historic events.



TABLE 4-1 MURCHISON CALIBRATION RESULTS

Flow (ML/d)	Level (current rating curve)		Year	Tailwater level (m AHD)	Modelled Level		Deviation from Rating Curve (m)	Deviation from historic levels (m)
	(m)*	(m AHD)			(m)	(m AHD)		
20,000	7.04	115.72		114.04	6.88	115.56	-0.16	-
50,200	9.93	118.61**	2010	116.93	9.87	118.55	-0.06	-0.27 (2010)
63,500	10.27	118.95	1993	117.27	10.22	118.90	-0.05	-0.05 (1993)
100,000	10.84	119.52		117.84	10.93	119.61	+0.09	-
142,000	11.29	119.97	1974	118.29	11.64	120.32	+0.35	+0.35
184,000	11.60	120.28		118.60	12.22	120.90	+0.62	-

* Gauge zero 108.679 m AHD

** A level of 118.82 was measured in 2010 with a flow of 50,200 ML/d for this event; the current rating curve differs slightly.

Two sensitivity analyses were performed by reducing the tailwater level by 1 m and increasing roughness by 25%. Figure 4-3 shows the results of the sensitivity analysis. This showed that the model is moderately sensitive to the adopted roughness values with water levels raised by between 0.18 and 0.35 m at the gauge location. It showed that the model is sensitive to the tailwater condition at low flows but less sensitive at high flows. Even with variation in the possible modelled rating curve, the current rating curve over predicts flow at high stages.

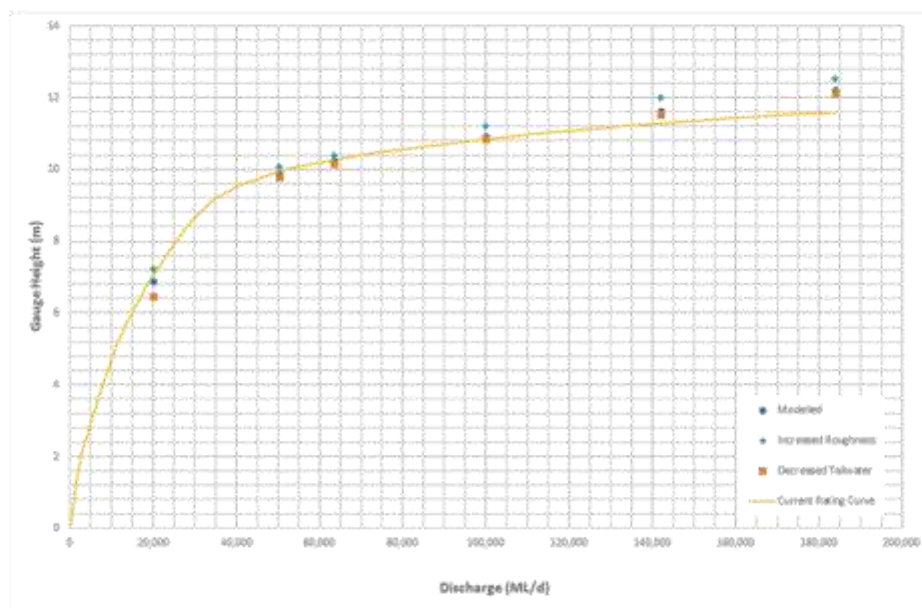


FIGURE 4-3 MURCHISON CALIBRATION AND SENSITIVITY RESULTS

Given the good calibration to the high reliability section of the rating curve between 20,000 and 100,000 ML/d, and the relative insensitivity to tailwater conditions and roughness, the calibration was adequate for simulation of flood levels at the Murchison gauge. It was concluded that the current rating curve significantly overestimates the flow for a given stage at high flows. A revised rating curve was developed using the existing



rating curve up to a relative gauge level of 10.5 m or 76,000 ML/d, with the rest of the curve interpolated between the modelled points from 10.5 m to 12.22 m.

The revised rating curve resulted in the 1916 flood level of 12.22 m having a peak flow of 178,000 ML/d which is much closer to the previously accepted estimate of 195,000 ML/d as compared to the current rating curves estimate of 311,000 ML/d. This flow estimate for 1916 is in line with estimates for other upstream and downstream gauges, so provides further confidence that the revised rating curve is an improvement on the current rating curve for the Goulburn River at Murchison.

At the time of writing this report, Ventia was in the process of updating the rating curve in the extrapolated region using the modelled rating curve as suggested. This will be back dated to 2010 and will be used as part of the official rating curve at this site into the future. Ventia have created a new quality code to indicate the flow is based on a modelled extrapolated rating curve.

It should be noted that the recorded peak flow for 1975 at this gauge was found to be inconsistent with upstream and downstream gauges. The method adopted for estimating the actual 1975 peak flow is discussed below, in Section 4.3.4.

4.3 Design Flow Estimates

Flood frequency analysis was previously undertaken for the Shepparton Mooroopna Floodplain Management Study (SKM, 2002), which included flow data up till 1999. The flood frequency analysis was updated for this study utilising additional data from 2000 to 2012. There were also some issues identified with the flow gauging data which resulted in changes to the peak flow magnitudes included in the annual series.

4.3.1 Method

The following streamflow gauges were subject to a flood frequency analysis and revised estimates of design flood peaks were calculated:

- Broken River @ Benalla (404203)
- Broken River @ Orrvale (404222)
- Goulburn River @ Goulburn Weir (405253)
- Goulburn River @ Murchison (405200)
- Goulburn River @ Shepparton (405204)
- Seven Creeks @ Kialla West (405269)
- Pranjip Creek @ Moorilim (405226)
- Castle Creek @ Arcadia (405246)

Design peak flow estimates were derived directly from flood frequency analysis for most of the gauges. Estimates for the Broken River @ Benalla were adopted directly from SKM (2002), as there was no new flow data available. Estimates for Seven Creeks at Kialla West were derived from a regression with upstream gauges, due to a lack of long-term gauge data at Kialla West. This was possible because there was a good gauge record at Euroa and a strong relationship between peak flows at the two gauges. For gauges at the hydraulic model boundaries, flood frequency analysis on volume was also carried out to enable design volumes to be estimated along with the design peak flows.



4.3.2 Data Review

A summary of the available gauge data for relevant gauges on the Goulburn River, Broken River and Seven Creeks is provided in Table 4-2 below. There were some discrepancies between the period of data available, and the recorded flow magnitudes, in the SKM (2002) report and the currently available dataset, this is described further below. A summary of the data used by SKM (2002) is provided in Table 4-3 below.

TABLE 4-2 AVAILABLE GAUGE DATA

Gauge Number	Gauge Name	DELWP Water Monitoring Portal	RWC Blue Book (RWC, 1990)	Historic Peaks
404203	Broken River @ Benalla	1978-1981, 1983-1984, 1993, 1995-1996, 1998	1956, 1958, 1964 (Inst Flow) 1955-1964 (MDF)	
404200	Broken River @ Goorambat (Casey Weir T. Gauge)	1916-1973 (MDF) 1973-1979		
404216	Broken River @ Goorambat (Casey Weir H. Gauge)	1888-1916 (MDF) 1972-2013	1888-1916 (MDF) 1979-1986	
404222	Broken River @ Orrvale	1977-2013		1993
404224	Broken River @ Gowangardie	1991-2013		1993
405253	Goulburn River @ Goulburn Weir	1974-1980 1967-1980 (MDF)	1967-1984 (MDF)	1916, 1934, 1956
405200	Goulburn River @ Murchison	1881-2013		1916
405204	Goulburn River @ Shepparton	1974-2013 1921-2013 (MDF)	1921-1984	1916
405237	Seven Creeks @ Euroa	1973-2013 1963-1973 (MDF)		
405269	Seven Creeks @ Kialla West	2003-2013		1974*, 1993*
405226	Pranji Creek @ Moorilim	1974-2013	1958-1986	
405246	Castle Creek @ Arcadia	1974-2013	1970-1986	

*Based on SKM Hydraulic Modelling (SKM, 2002)



TABLE 4-3 DATA USED BY SKM (2002) FOR FLOOD FREQUENCY ANALYSIS

Gauge Number	Gauge Name	Annual Series	Historic Peaks	1% AEP Flow (ML/d)
404203	Broken River @ Benalla	1955-1999	1916, 1921	103,000
404200	Broken River @ Casey's Weir	1889-1999		66,900
404222	Broken River @ Orrvale*	1955-1999	1916, 1921	43,500
405253	Goulburn River @ Goulburn Weir			N/A
405200	Goulburn River @ Murchison	1956-1999	1916	134,000
405204	Goulburn River @ Shepparton	1921-1999	1916	219,000
405269	Seven Creeks @ Kialla West**	1963-1995	1916	69,900

* Regression with Broken River @ Benalla using 1977-1993 data

** Regression with Seven Creeks @ Euroa using 1977-1996 data

4.3.2.1 Broken River @ Benalla (404203)

Some discrepancies between DELWP and RWC data, and the flows reported in SKM (2002) were found.

- DELWP has only recorded 20 years of instantaneous flow data between 1978 and 1998, of which almost 10 years is classified as missing data.
- 10 years of mean daily flow data are recorded in the RWC Blue Book from 1955 to 1964 (RWC, 1990). No information was available on historic floods.
- The SKM analysis used a full annual series of peak flows from 1955 to 1998 plus historic peaks in 1916 and 1921.
- The peak flow for 1993 provided by DELWP was confirmed to be the same as the flow reported in SKM (2002).
- Most of the flow data used by SKM (2002) could not be located.

4.3.2.2 Goulburn River @ Murchison (405200)

Some discrepancies between DELWP and RWC data, and the flows reported in SKM (2002) were found.

- There are no records in the Blue Book from 1967 to 1984.
- The Victorian Water Resources Data Warehouse station level and instantaneous flow data set is missing from January 1970 to June 1977 and January 1981 to November 1984.
- The DELWP Instantaneous flow dataset is complete from 1881 to 2013.
- The 1916 flow in the DELWP dataset was 311,000 ML/d, compared to 195,000 ML/d (average daily flow) in the Blue Book.
- The 1974 flow in the DELWP dataset was 142,000 ML/d, compared with 111,000 in SKM (2002).
- The 1975 flow in the DELWP dataset was 411,000 ML/d, significantly larger than 1975 flows at upstream and downstream gauges, and larger than the 1916 largest event on record.

A revised rating curve was developed for the high flow region of this gauge through 1D/2D hydraulic modelling for the Murchison Flood Mapping (Water Technology, 2014), see Section 4.2. With the revised rating curve applied to the DELWP dataset, the 1916 flow is estimated at 178,180 ML/d and the 1974 flow is estimated at 117,860 ML/d, which are more consistent with the data in SKM (2002). The flood frequency analysis for this



gauge was undertaken with both the raw DELWP dataset and the revised rating curve dataset for comparison. Additional information from the Granite Creeks regional flood mapping study was used to provide an input for Pranjip and Castle Creek, tributaries of the Goulburn River between Murchison and the Seven Creeks outfall.

4.3.3 Broken River Flows

The Broken River inflow boundary to the detailed Shepparton-Mooroopna hydraulic model was located approximately 1.5 km upstream of the East Goulburn Main Channel. To determine design hydrology for this location, a coarse Broken River model was developed from Gowangardie to downstream of the East Goulburn Main Channel. This model determined the magnitude of flow splits leaving the Broken River and was used to determine the ratio of flows between the downstream Broken River at Orrvale gauge and the inflow boundary to the detailed Shepparton-Mooroopna flood model. A flood frequency analysis on the Orrvale gauge was completed and flows at the inflow boundary upstream of the East Goulburn Main Channel were scaled up using the ratio determined from the coarse Broken River modelling. The inflow boundary was scaled up as it was demonstrated that breakouts occur away from the river and the East Goulburn Main Channel redirects some of the flow, reducing the flow passing the Orrvale gauge. This is discussed further in Section 5.4.1

4.3.3.1 Broken River @ Benalla (404203)

Given that there is no additional recent flow data available, and less historic data is now available compared to what was used in SKM (2002), the SKM peak flow estimates were adopted (Table 4-4). The approximate AEP for a selection of recorded floods are provided in Table 4-5.

TABLE 4-4 DESIGN PEAK FLOWS FOR BROKEN RIVER @ BENALLA (404203)

AEP	ARI (1 in X years)	Peak Flow (ML/d) Adopted from SKM (2002)
20%	5	30,900
10%	10	45,500
5%	20	61,600
2%	50	83,400
1%	100	103,000
0.5%	200	128,000
0.2%	500	161,000

TABLE 4-5 HIGHEST RECORDED FLOWS AND CORRESPONDING AEP FOR BROKEN RIVER @ BENALLA (404203)

Year	Peak Flow (ML/d)	Approx. AEP
1993	112,000	1-0.5%
1981	41,400	20-10%
1956	37,700	20-10%
1996	33,400	20-10%



4.3.3.2 Broken River @ Casey Weir (404200/404216)

The Casey Weir gauge was reviewed, and an initial flood frequency analysis was performed. It was found that the design flows were significantly different to that obtained in the previous SKM (2002) study and were significantly different to the downstream Orrvale gauge. On inspection of the rating curve it was found that the maximum gauged level at 1.9 m or 17,000 ML/d was sufficiently low, that 44 years within the annual series exceeded the maximum gauging. The reliability of the rating curve was questionable, and further analysis was not completed as it added no value to the project.

4.3.3.3 Broken River @ Gowangardie (404224)

The Gowangardie gauge has a very short period of record, not enough to allow a flood frequency analysis to be performed with any degree of certainty. No further analysis was completed for this gauge.

4.3.3.4 Broken River @ Orrvale (404222)

Peak flows from 1978-2012 (35 years) were used for the annual series.

Log Pearson III and GEV distributions were fitted. 11 low flows less than 4,000 ML/d were omitted from the fitting of the distribution, as they appeared to follow a different distribution to the higher flows. The GEV distribution was judged to have the best fit (Figure 4-4). The resulting peak flow estimates are provided in Table 4-6. The resulting 1% AEP flow was broadly consistent with (but slightly higher than) the SKM (2002) estimate, which was derived from a regression relationship with Broken River at Benalla.

Under this distribution the 1993 flood has an AEP of between 2% and 1%, and the 1981, 2010 and 1996 floods have an AEP between 10% and 5% (Table 4-7).

TABLE 4-6 DESIGN PEAK FLOWS FOR BROKEN RIVER @ ORRVALE (404222)

AEP	ARI (1 in X years)	GEV Peak Flow (ML/d) 11 low flows censored
20%	5	17,900
10%	10	24,800
5%	20	31,600
2%	50	40,800
1%	100	48,000
0.5%	200	55,400
0.2%	500	65,600

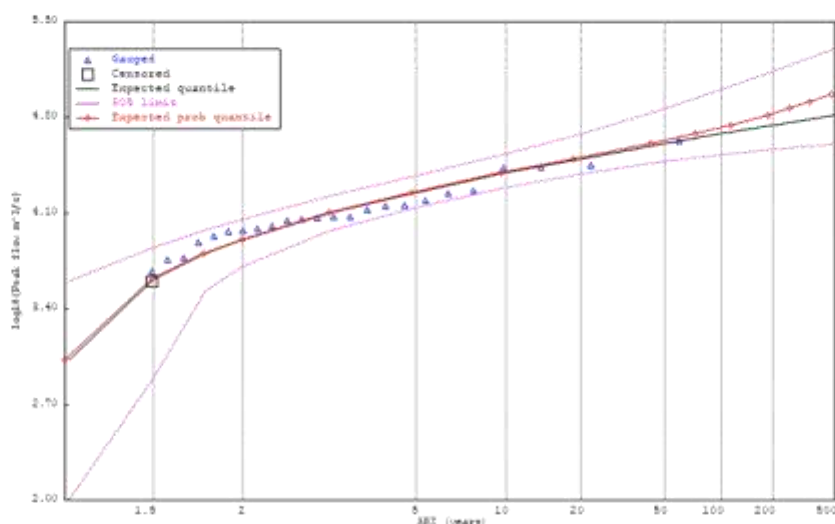


FIGURE 4-4 GEV DISTRIBUTION FITTED TO ANNUAL SERIES FOR BROKEN RIVER @ ORRVALE (404222)

TABLE 4-7 HIGHEST RECORDED FLOWS AND CORRESPONDING AEP FOR BROKEN RIVER @ ORRVALE (404222)

Year	Peak Flow (ML/d)	Approx. AEP
1993	42,900	2-1%
1981	28,300	10-5%
2010	27,300	10-5%
1996	27,100	10-5%

4.3.4 Goulburn River Flows

The Goulburn River at Murchison gauge was the focus for defining the historic and design flows for the Goulburn River. The detailed Shepparton-Mooroopna flood model boundary on the Goulburn River was in Toolamba between the railway bridge crossing and Bridge Road at the location of the Castle Creek confluence. Historic hydrographs from Murchison were routed through the coarse Goulburn River model to the detailed Shepparton-Mooroopna flood model inflow boundary to provide an estimate of model routing time. These routing times were also applied to the design hydrographs from Murchison to the model inflow boundary. The tributary inflows from Castle Creek and Pranjip Creek were also assessed, but after an analysis of both gauges it was found the gauge rating curve for both sites had a high degree of uncertainty associated with flood flows. Given their contributions are relatively small, a simplified approach of adding a small flow contribution from the two gauges to the design event was adopted. This is discussed further in Section 5.4.1

4.3.4.1 Goulburn River @ Goulburn Weir (405253)

Instantaneous flow data was available for 1968-1969 and 1975-1979. Mean daily flow was available from 1967-1984. A regression analysis was undertaken on the coincident instantaneous flows and mean daily flows, and the relationship $INSTANTANEOUS = 1.0862 \times AVERAGE\ DAILY$ was derived ($r^2 = 0.99$). This was applied to the mean daily flow data to fill in the missing years in the instantaneous flow annual maximum series. The



resulting annual series had 18 years of data from 1967-1984. This limited flow record may result in high uncertainty of peak flow estimates, particularly for large events.

The 1974 flood was the highest recorded flow at Goulburn Weir. The 1975 peak at Goulburn Weir was a much lower event (72,000 ML/d), compared to the recorded flow at Murchison in the DELWP Water Information Monitoring System database (411,000 ML/d). This indicates a possible error in one or both measurements as the flow between Goulburn Weir and Murchison is not likely to be very different. The peak at Goulburn Weir is coded as "Unedited data". This provides further weight to the earlier discussion regarding the overestimation of flows using the current rating curve at Murchison. The revised 1975 peak flow at Murchison correcting for the revised rating curve was 223,000 ML/d, which is still significantly higher than the Goulburn Weir recorded flow, it is likely that the Goulburn Weir flow may be underestimated for this event.

The 1974 flow was exceeded at Murchison three times in the period 1881-1966, and never in the period 1985-2012. The three floods in 1916, 1934 and 1956 were included as peaks over the threshold of 121,000 ML/d (the 1974 flow at Goulburn Weir), as there is good evidence of a strong correlation between flows at Murchison and Goulburn Weir.

Log Pearson III and GEV distributions were fitted. The GEV distribution was judged to have the best fit (Figure 4-5). The resulting peak flow estimates are provided in Table 4-8. Approximate AEPs for recorded floods are provided in Table 4-9.

TABLE 4-8 DESIGN PEAK FLOWS FOR GOULBURN RIVER @ GOULBURN WEIR (405253)

AEP	ARI (1 in X years)	GEV Peak Flow (ML/d) 3 peaks over threshold and 111 peaks under threshold of 121,000 ML/d
20%	5	59,500
10%	10	80,000
5%	20	101,600
2%	50	132,600
1%	100	158,400
0.5%	200	186,500
0.2%	500	227,700

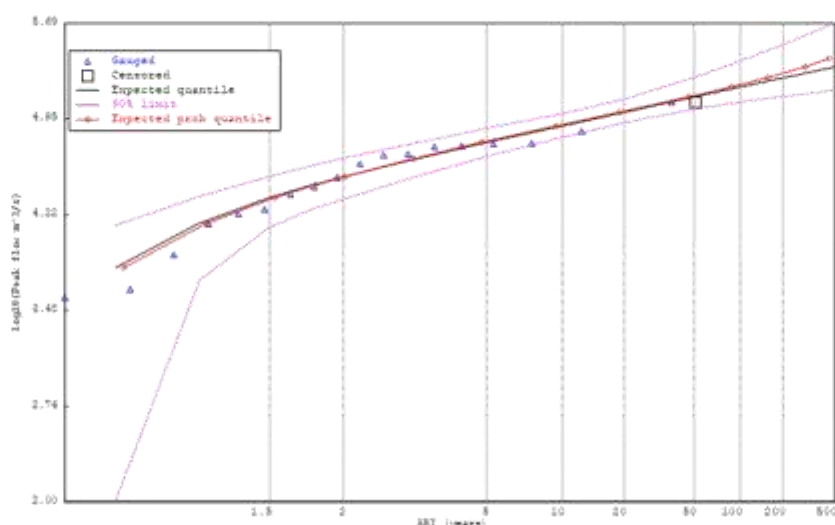


FIGURE 4-5 GEV DISTRIBUTION FITTED TO ANNUAL SERIES FOR GOULBURN RIVER @ GOULBURN WEIR (405253)

TABLE 4-9 HIGHEST RECORDED FLOWS AND CORRESPONDING AEP FOR GOULBURN RIVER @ GOULBURN WEIR (405253)

Year	Peak Flow (ML/d)	Approx. AEP
1974	120,600	5-2%
1981	59,000	20%

4.3.4.2 Goulburn River @ Murchison (405200)

SKM (2002) adopted data from 1956-1999 plus 1916 peak. There is evidence in the record that moderate flood flows were smaller after 1956 (after construction of Big Eildon dam) than before. The 1916 event was included for the following reason (SKM 2002, p. 22):

The rainfall spatial pattern for the 1916 event (SKP 1982) indicates significant rainfall fell downstream of Eildon. The 1916 event occurred in September, a time of year where the storage level in Lake Eildon is usually high. Given the size, the spatial rainfall pattern and time of year the event occurred, it is considered reasonable to assume the presence of Big Eildon, if constructed, may have had little impact on the peak flow at Murchison for the 1916 event. As a result, the peak flow for the 1916 event is included in the frequency analysis without modification.

As discussed previously in Section 4.2.3, a review of the Murchison rating curve was conducted, and it was found that the rating curve required revision for high levels in the extrapolated area of the curve. Flood



frequency analysis was performed on the Murchison gauge data using both the raw data from the DELWP Water Information Monitoring System and with the gauge record adjusted using the recommended revised rating curve. The flood frequency analysis for both sets of analysis are provided below, but it is recommended that the revised rating curve flows be adopted for this study.

4.3.4.2.1 EXISTING RATING CURVE PEAK FLOW ANALYSIS

The annual series was constructed using the same period of record used by SKM (2002), post-Big Eildon Dam from 1956, plus 1916, and extended through to 2012. The analysis was also run on the entire record from 1881 to 2012 for comparison.

The 1984 maximum was missing from the gauge record and the 1975 peak flow was inconsistent with upstream and downstream gauges. The 1984 peak was excluded from the annual series. The 1975 peak was estimated from the upstream gauge at Goulburn Weir (405253). Monthly maximum flows at Murchison have a strong correlation with Goulburn Weir, following the relationship $MURCHISON = 0.8585 * GOULBURN WEIR$ ($R^2 = 0.98$). A 1975 peak flow of 62,200 ML/d was adopted using this relationship.

The GEV distribution was adopted following initial trials of GEV and Log Pearson III. Low flows below 6,000 ML/d were considered "non-flood" years and excluded from the distribution fitting. There were 8 of these non-flood years over the 1956-2012 period and a further two over the pre-1956 period.

The adopted distribution is shown in Figure 4-6 and Figure 4-7, with the resulting peak flow estimates provided in Table 4-10.

Approximate AEPs for recorded floods are given in Table 4-11. Upon review of the results it was noted that the full record period produced peak flow estimates that were higher for events between 20% and 5% AEP, and lower for the larger events as compared to the post-Big Eildon record FFA. This may be explained by the lower range of peak annual flows being slightly higher pre-1956 due to the reduced storage of Eildon and the lack of any large floods above 100,000 ML/d in the 35 year period between 1881 to 1915. The two time periods have been combined, adopting the post-dam period for events up to the 1% AEP, and for the rare 0.5% and 0.2% AEP events, the full period of record was adopted. The rationale behind this decision is that in the rare events the impact of the dam would be minimal, and the full record can be used in the annual series.

TABLE 4-10 DESIGN PEAK FLOWS FOR GOULBURN RIVER @ MURCHISON (405200), EXISTING RATING CURVE

AEP	ARI (1 in X years)	GEV Peak Flow (ML/d) Post-Big Eildon Record 1956-2012 plus 1916 8 low flows censored, 74 flows below 1916 threshold censored	GEV Peak Flow (ML/d) Entire Record 1881-2012 10 low flows censored	Adopted Peak Flow (ML/d)
20%	5	49,900	59,800	49,900
10%	10	74,700	82,800	74,700
5%	20	105,500	108,500	105,500
2%	50	158,400	147,800	158,400
1%	100	210,800	182,700	210,800
0.5%	200	277,100	222,900	222,900
0.2%	500	392,800	285,400	285,400



TABLE 4-11 HIGHEST RECORDED FLOWS AND CORRESPONDING AEP FOR GOULBURN RIVER @ MURCHISON (405200), EXISTING RATING CURVE

Year	Peak Flow (ML/d)	Approx. AEP
1916	311,000	<0.2%
1956	154,000	5-2%
1974	142,000	5-2%
1993	80,200	10-5%

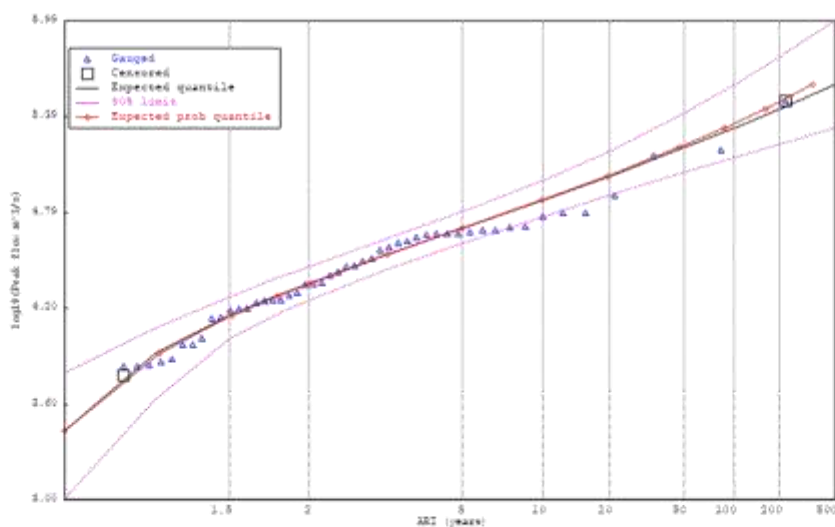


FIGURE 4-6 GEV DISTRIBUTION FITTED TO ANNUAL SERIES FOR GOULBURN RIVER @ MURCHISON (405200), DELWP RATING CURVE, POST-BIG EILDON RECORD PLUS 1916

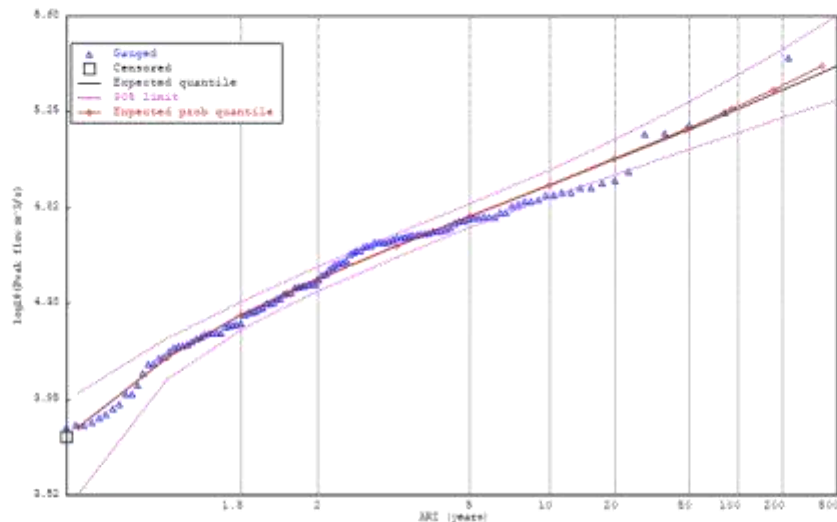


FIGURE 4-7 GEV DISTRIBUTION FITTED TO ANNUAL SERIES FOR GOULBURN RIVER @ MURCHISON (405200), DELWP RATING CURVE, ENTIRE RECORD

4.3.4.2.2 REVISED RATING CURVE PEAK FLOW ANALYSIS

The annual maximum flow series was constructed utilising the revised rating curve discussed in Section 4.2.3 for levels in the extrapolated region of the rating curve. The time periods, peaks over threshold and low flow censoring treatment was the same as the FFA for the existing rating curve analysis described above.

The adopted distribution is shown in Figure 4-8 and Figure 4-9, with the resulting peak flow estimates provided in Table 4-12. Approximate AEPs for recorded floods are provided in Table 4-13.

Similarly, to the existing rating curve FFA, the full record period produced peak flow estimates that were lower than or equal to the post-Big Eildon record FFA for 2% AEP flows and above. The two time periods were again combined, adopting the post-dam period for events up to the 1% AEP and the full period for the rarer 0.5% and 0.2% AEP events.

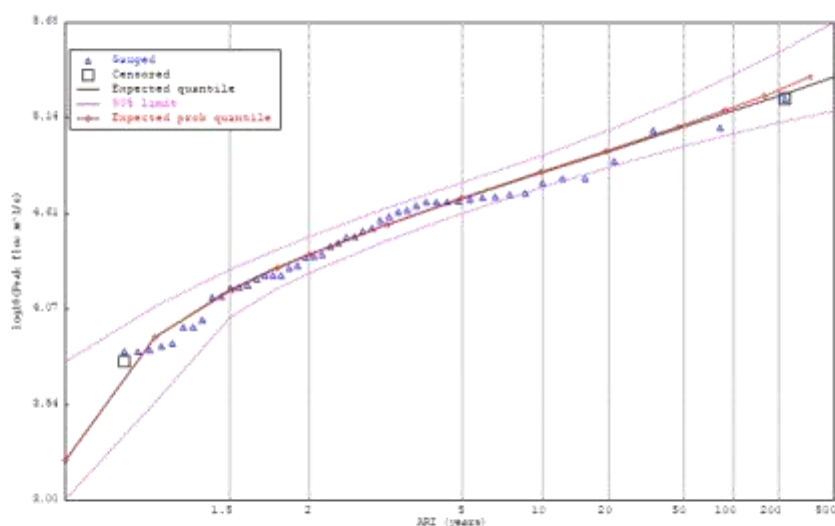
As seen in Table 4-10 and Table 4-12, using the revised rating curve to construct the annual series significantly reduces the design flows at Murchison for events greater in magnitude than a 10% AEP. It has been demonstrated that the revised rating curve is a better representation of the stage-flow relationship for larger events than the current rating curve, fitting with the regional hydrology upstream and downstream, and the understanding of historic flood flows in the Goulburn River. At the time of finalising this report it is understood that Ventia will be updating the rating curve for this location using the modelled rating curve in the extrapolated region of the curve. Table 4-12 was adopted for design flows at Murchison for the purposes of this study.


TABLE 4-12 DESIGN PEAK FLOWS FOR GOULBURN RIVER @ MURCHISON (405200), REVISED RATING CURVE DATA

AEP	ARI (1 in X years)	GEV Peak Flow (ML/d) Post-Big Eildon Record 1956-2012 plus 1916 8 low flows censored, 74 flows below 1916 threshold censored	GEV Peak Flow (ML/d) Entire Record 1881- 2012 10 low flows censored	Adopted Peak Flow (ML/d)
20%	5	49,100	59,700	49,100
10%	10	69,000	78,600	69,000
5%	20	90,900	97,700	90,900
2%	50	123,900	123,900	123,900
1%	100	152,600	144,700	152,600
0.5%	200	185,200	166,500	166,500
0.2%	500	235,200	196,900	196,900

TABLE 4-13 HIGHEST RECORDED FLOWS AND CORRESPONDING AEP FOR GOULBURN RIVER @ MURCHISON (405200), REVISED RATING CURVE DATA

Year	Peak Flow (ML/d)	Approx. AEP
1916	178,200	0.5-0.2%
1956	123,200	2%
1974	117,900	5-2%
1993	80,000	10-5%


FIGURE 4-8 GEV DISTRIBUTION FITTED TO ANNUAL SERIES FOR GOULBURN RIVER @ MURCHISON (405200), REVISED RATING CURVE DATA, POST-BIG EILDON RECORD PLUS 1916

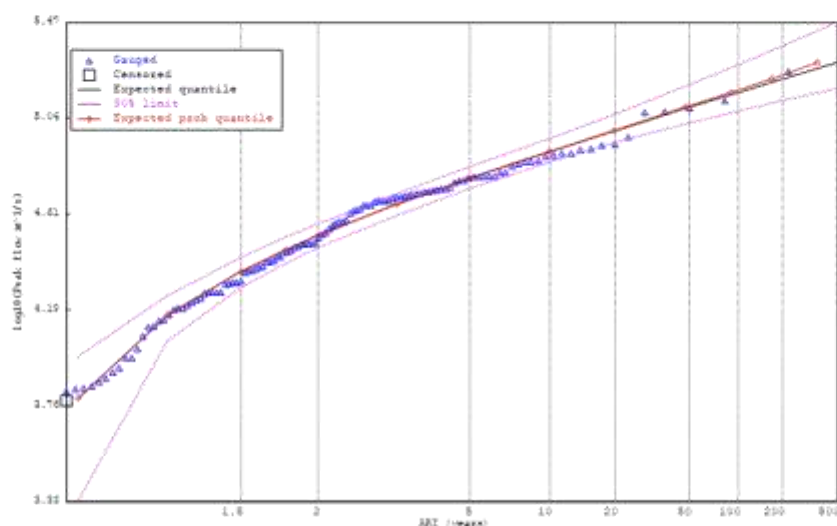


FIGURE 4-9 GEV DISTRIBUTION FITTED TO ANNUAL SERIES FOR GOULBURN RIVER @ MURCHISON (405200), REVISED RATING CURVE DATA, ENTIRE RECORD

4.3.4.2.3 VOLUME ANALYSIS

A flood frequency analysis on 5 day volume was undertaken using the revised rating curve. The Log Pearson III distribution was found to provide a much better fit than the GEV distribution, the Log Pearson III distribution was adopted. Similar to the flood frequency on peak flow, the 1975 and 1984 events were excluded from the analysis due to missing data. Unlike the flood frequency analysis on peak flow, the analysis was performed on the entire period of record. Inconsistencies in the volumes arrived if the entire record analysis was combined with the post Big Eildon analysis. The analysis on the entire record had much tighter confidence intervals and is thought to provide reasonable results (Figure 4-10). The resulting five day volume estimates are provided in Table 4-14.

TABLE 4-14 GOULBURN RIVER @ MURCHISON 5 DAY VOLUME

AEP	ARI (1 in X years)	LP III 5 day volume (ML)
20%	5	244,500
10%	10	312,100
5%	20	375,000
2%	50	452,600
1%	100	507,500
0.5%	200	559,600
0.2%	500	624,400

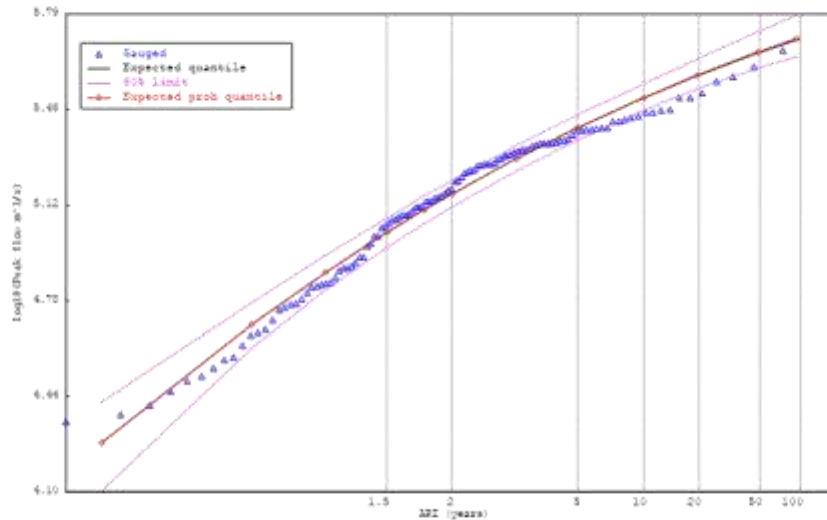


FIGURE 4-10 LPIII DISTRIBUTION FITTED TO ANNUAL SERIES OF 5 DAY VOLUMES FOR GOULBURN RIVER @ MURCHISON 405200 (SOURCE: DELWP)

4.3.4.3 Goulburn River @ Shepparton (405204)

Instantaneous flow data was available for 1941-1968 and 1974-2012. Mean daily flow was available from 1921-2012. A regression analysis was undertaken on the coincident instantaneous flows and mean daily flows, and the relationship $INSTANTANEOUS = 1.071 \times AVERAGE\ DAILY$ was derived ($r^2 = 0.99$). This was applied to the mean daily flow data to fill in the missing years in the instantaneous flow annual maximum series. The resulting annual series had 92 years of data from 1921-2012.

The 1974 peak flow was revised down in the latest DELWP data to 191,000 ML/d (from 214,000 ML/d in the SKM study in 2002) and the 1993 peak flow to 150,000 ML/d in the latest DELWP data (from 160,500 ML/d in the SKM study in 2002). It is presumed this revision in flow is due to changes in the rating curves applied back to the historic record.

An estimate of the 1916 peak of 233,300 ML/d from SKM (2002) was used as a historic peak. This is lower than the previous estimate of the 1916 flood of 267,000 ML/d in the Shepparton Flood Study by Sinclair Knight and Partners (SKP 1982). Again, it is presumed that this reduction in the historic peak flow is due to a change in the upper end of the rating curve applied back to the historic flow series.

Log Pearson III and GEV distributions were fitted. 15 low flows less than 10,000 ML/d were omitted from the fitting of the distribution, as they appeared to follow a different distribution to the higher flows. The GEV distribution was judged to have the best fit (Figure 4-11). The resulting peak flow estimates are provided in Table 4-15. Approximate AEPs for recorded floods are provided in Table 4-16.

TABLE 4-15 DESIGN PEAK FLOWS FOR GOULBURN RIVER @ SHEPPARTON (405204)

AEP	ARI (1 in X years)	GEV Peak Flow (ML/d) 15 low flows censored, 39 flows below 1916 threshold censored
20%	5	70,000
10%	10	97,800



AEP	ARI (1 in X years)	GEV Peak Flow (ML/d) 15 low flows censored, 39 flows below 1916 threshold censored
5%	20	128,200
2%	50	173,800
1%	100	213,200
0.5%	200	257,800
0.2%	500	325,700

TABLE 4-16 HIGHEST RECORDED FLOWS AND CORRESPONDING AEP FOR GOULBURN RIVER @ SHEPPARTON (405204)

Year	Peak Flow (ML/d)	Approx. AEP
1916	233,300	1-0.5%
1974	191,000	2-1%
1939	161,000	5-2%
1993	150,000	5-2%
1956	121,000	10-5%

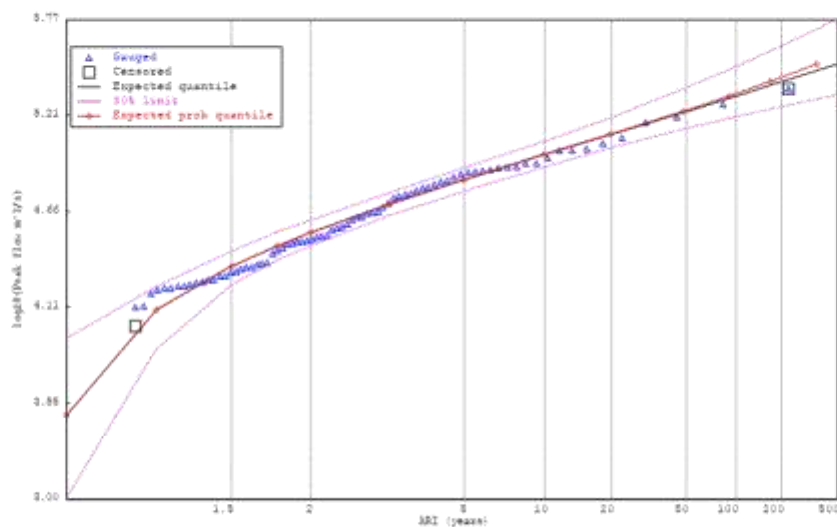


FIGURE 4-11 GEV DISTRIBUTION FITTED TO ANNUAL SERIES FOR GOULBURN RIVER @ SHEPPARTON (405204)



4.3.4.4 Pranjip Creek @ Moorilim (405226)

4.3.4.4.1 PEAK FLOW ANALYSIS

Instantaneous flow data was available for 1974-2013. Monthly maximum instantaneous flow was available in the RWC Blue Book for 1965-1986 and monthly maximum mean daily flow was available for 1958-1986 (RWC, 1990). A regression analysis was undertaken on the coincident maximum annual instantaneous flows and mean daily flows, and the relationship $INSTANTANEOUS = 1.125 \times AVERAGE \text{ DAILY}$ was derived. This was applied to the mean daily flow data to fill in the missing years in the instantaneous flow annual maximum series. The resulting annual series had 56 years of data from 1958-2013.

Log Pearson III and GEV distributions were fitted. Nine low flow outliers were detected using the multiple Grubbs Beck test and were censored. The LPIII distribution was judged to have the best fit (Figure 4-12). The resulting peak flow estimates are provided in Table 4-17. The AEP of the highest recorded flood events is provided in Table 4-18.

TABLE 4-17 DESIGN PEAK FLOWS FOR PRANJIP CREEK @ MOORILIM (405226)

AEP	ARI	LPIII Peak Flow (ML/d)
20%	5	6,200
10%	10	6,400
5%	20	12,800
2%	50	17,200
1%	100	20,400
0.5%	200	23,500
0.2%	500	27,400

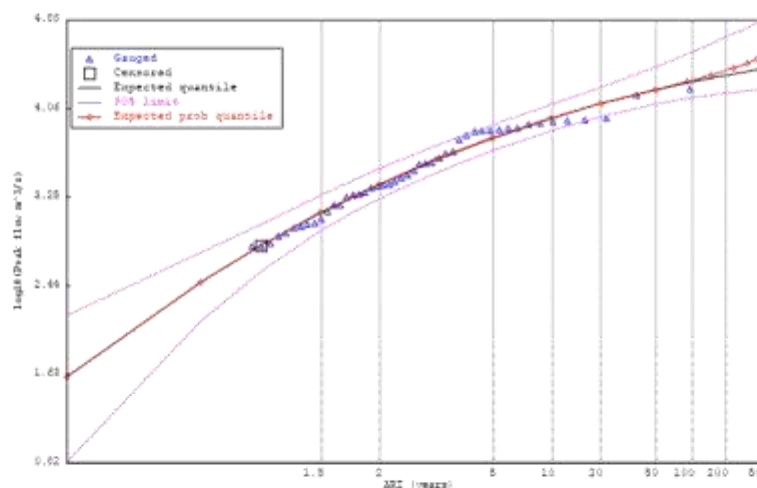


FIGURE 4-12 LOG PEARSON III DISTRIBUTION FITTED TO ANNUAL SERIES FOR PRANJIP CREEK @ MOORILIM (405226)


TABLE 4-18 HIGHEST RECORDED FLOWS AND CORRESPONDING AEP FOR PRANJIP CREEK @ MOORILIM (405226)

Year	Peak Flow (ML/d)	Approx. AEP
1974	17,444	2%
1993	15,209	5-2%
1973	9,410	10-5%

The Pranjip Creek @ Moorilim gauge rating curve is coded as extrapolated for flows above 7,400 ML/d, this equates to an event slightly larger than a 10% AEP event. The gauge is located at a siphon on the East Goulburn Main Channel, where the channel runs under Pranjip Creek. Immediately downstream the creek is crossed by the Goulburn Valley Highway. It is likely that at high flows, these structures have an impact on the hydraulics of the floodplain, and that without high flow gauging there is likely to be significant uncertainty in the recorded flows and thus the flood frequency analysis on peak flow. The Granite Creeks Regional Flood Mapping Study (Water Technology, ongoing at time of writing this report), has shown that the East Goulburn Main Channel does impact on flood flows, at Pranjip Creek.

4.3.4.4.2 VOLUME ANALYSIS

A flood frequency analysis of three day volumes was undertaken for the period from 1958-2013, using mean daily flows for 1958-1973 and instantaneous flows for 1974-2013.

Log Pearson III and GEV distributions were fitted. 22 low outliers were detected using the multiple Grubbs Beck test and were censored. The GEV distribution was judged to have the best fit (Figure 4-13). The resulting three day volume estimates are provided in Table 4-19.

TABLE 4-19 DESIGN 3 DAY VOLUMES FOR PRANJIP CREEK @ MOORILIM (405226)

AEP	ARI (1 in X years)	GEV 3 Day Volume (ML)
20%	5	14,700
10%	10	20,100
5%	20	25,200
2%	50	31,600
1%	100	36,200
0.5%	200	40,600
0.2%	500	46,200

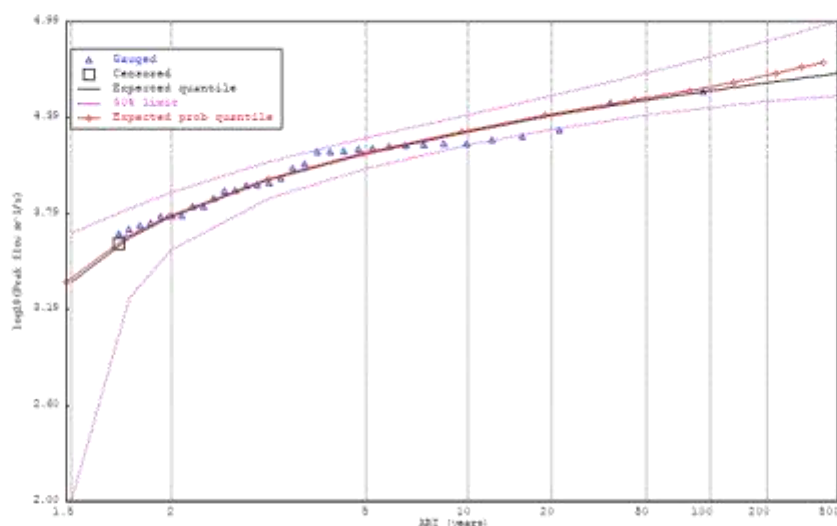


FIGURE 4-13 GEV DISTRIBUTION FITTED TO ANNUAL SERIES OF 3 DAY VOLUMES FOR PRANJIP CREEK @ MOORILIM (405226)

4.3.4.5 Castle Creek @ Arcadia (405246)

4.3.4.5.1 PEAK FLOW ANALYSIS

Instantaneous flow data was available for 1974-2013. Monthly maximum instantaneous flow was available in the RWC Blue Book for 1970-1986 (RWC, 1990). The resulting annual series had 42 years of data from 1970-2013, with two years of data missing in 1989 and 1990. These two years were excluded completely from the series (i.e. the series length was shortened by two years).

Log Pearson III and GEV distributions were fitted. 21 low outliers were detected using the multiple Grubbs Beck test. This was not thought to be reasonable as it left a very small sample size in the annual series. The number of flows censored was reduced to 12 after inspection of the annual series. The GEV distribution was judged to have the best fit (Figure 4-14). The resulting peak flow estimates are provided in Table 4-20.

TABLE 4-20 DESIGN PEAK FLOWS FOR CASTLE CREEK @ ARCADIA (405246)

AEP	ARI (1 in X years)	GEV Peak Flow (ML/d)
20%	5	2,400
10%	10	3,200
5%	20	4,000
2%	50	5,000
1%	100	5,700
0.5%	200	6,400
0.2%	500	7,300

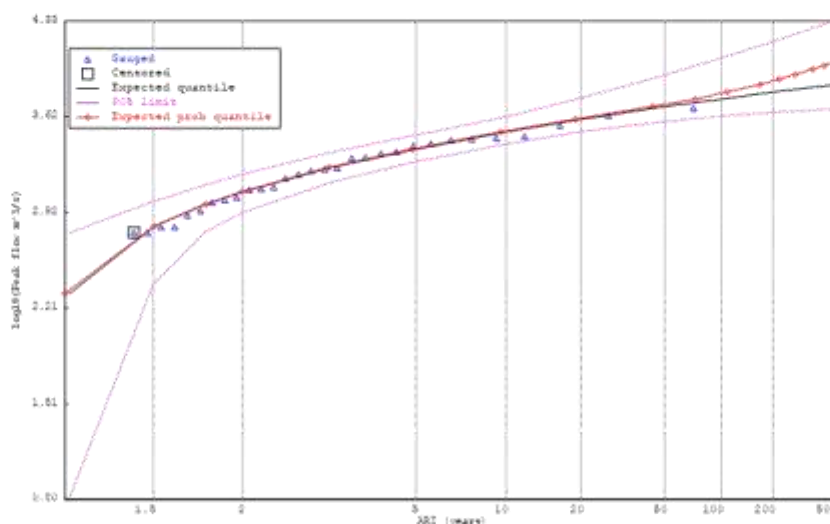


FIGURE 4-14 GEV DISTRIBUTION FITTED TO ANNUAL SERIES FOR CASTLE CREEK @ ARCADIA (405246)

TABLE 4-21 HIGHEST RECORDED FLOWS AND CORRESPONDING AEP FOR CASTLE CREEK @ ARCADIA (405246)

Year	Peak Flow (ML/d)	Approx. AEP
1993	4,835	2%
1974	4,264	5%
2012	3,606	10-5%
2010*	3,034	10%

* note that the peak flow recorded in 2010 occurred in December. This report uses the September 2010 flood event as a calibration event.

The Castle Creek @ Arcadia gauge rating curve is coded as extrapolated for flows above 2,410 ML/d, this equates to a 20% AEP event. The gauge is located at a siphon on the East Goulburn Main Channel, where the channel runs under Castle Creek. It is likely that at high flows, the channel has an impact on the hydraulics of the floodplain, and that without high flow gauging there is likely to be significant uncertainty in the recorded flows and thus the flood frequency analysis on peak flow. The Granite Creeks Regional Flood Mapping Study (Water Technology, ongoing at time of writing this report), has shown that the East Goulburn Main Channel does impact on flood flows, at Castle Creek and Pranjip Creek.

4.3.4.5.2 VOLUME ANALYSIS

A flood frequency analysis of three day volumes was undertaken for the period from 1970-2013, using mean daily flows for 1970-1973 and instantaneous flows for 1974-2013. The resulting annual series had two years of missing data in 1989 and 1990; these years were excluded completely from the series.

Log Pearson III and GEV distributions were fitted. 19 low outliers were detected using the multiple Grubbs Beck test. This was not thought to be reasonable due to the small sample size remaining, and the number of flows censored was reduced to 11, after inspection of the annual series. The Log Pearson III distribution was judged to have the best fit (Figure 4-15). The resulting three-day volume estimates are provided in Table 4-22.



TABLE 4-22 DESIGN 3 DAY VOLUMES FOR CASTLE CREEK @ ARCADIA (405246)

AEP	ARI (1 in X years)	LPIII 3 Day Volume (ML)
20%	5	4,100
10%	10	5,700
5%	20	7,200
2%	50	8,900
1%	100	10,000
0.5%	200	11,000
0.2%	500	12,100

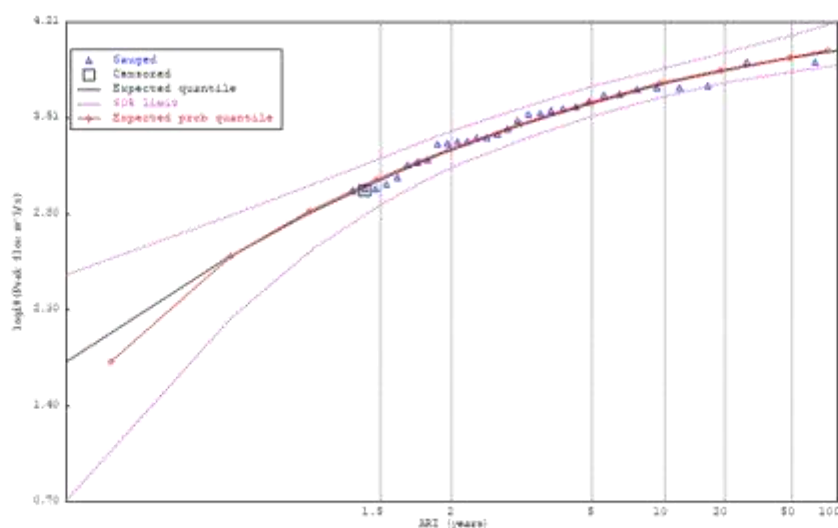


FIGURE 4-15 LPIII DISTRIBUTION FITTED TO ANNUAL SERIES OF 3 DAY VOLUMES FOR CASTLE CREEK @ ARCADIA (405246)

4.3.5 Seven Creeks Flows

The Seven Creeks system has a large catchment area with Seven Creeks and Honeysuckle Creek combining 1.8 km upstream of the Seven Creeks @ Kialla West gauge. The inflow boundaries to the detailed Shepparton-Mooroopna hydraulic model are further upstream on both these tributaries. The Honeysuckle Creek inflow boundary is located upstream of the Shepparton-Euroa Road, and the Seven Creeks inflow boundaries are split on the two anabranches of the creek upstream of Union Road.

To develop historic and design flows for Seven Creeks and Honeysuckle Creek, the Seven Creeks at Kialla West gauge was used as a combined flow, which was then split evenly between the two tributaries. The even split was based on the catchment areas which were roughly the same. This split was later verified through hydraulic model calibration.



To develop the combined flow a regression analysis was used with upstream gauges in both catchments to extend the estimated streamflow record for the Seven Creeks at Kialla West streamflow gauge. Without this regression analysis the period of record was too short to complete a flood frequency analysis. This catchment has significant cross-catchment flows making hydrological catchment modelling difficult, necessitating the flood frequency approach.

4.3.5.1 Seven Creeks @ Kialla West (405269)

The quality of the DELWP data is questionable up to 2003, as peak flows appear to be missing. There is only 10 years of data available between 2003-2012, this does not constitute sufficient record for undertaking a flood frequency analysis. Regressions with two upstream gauges (Seven Creeks @ Euroa and Stony Creek @ Tamleugh) were developed to infill the years between 1977-2003 to extend the Seven Creeks @ Kialla West annual series. The gauge Stony Creek @ Tamleugh is named incorrectly, it is on Honeysuckle Creek downstream of the confluence with Stony Creek. This was raised with the Regional Water Monitoring Partnership during the Granite Creeks Regional Flood Mapping Study, and it is recommended that the name be changed to avoid confusion in the future.

The regression was undertaken between monthly maximum flows at each gauge from 1977-2013. As the data from the three gauges had significant periods of missing data there was a very limited period where all three gauges overlapped. This meant that a multiple regression relationship could not be established, instead a linear relationship was established between Seven Creeks @ Kialla West and each of the two upstream gauges. The maximum of the two regression equations was then used to infill the annual series for the Seven Creeks @ Kialla West gauge. The following relationships were produced: $KIALLA\ WEST = 2.20 * EUROA$ ($r^2 = 0.83$) and $KIALLA\ WEST = 2.613 * TAMLEUGH$ ($r^2 = 0.88$).

A flood frequency analysis on the extended gauge record was then undertaken and fitted using Log Pearson III and GEV distributions. The Log Pearson III distribution was judged to have the best fit and is shown in Figure 4-16. The resulting peak flow estimates are provided in Table 4-23. Approximate AEPs for the three flood events that are to be calibrated are provided in Table 4-24.

The resultant design flows in this analysis are slightly higher than those estimated in the SKM (2002) study. They are still relatively similar and are thought to provide reasonable design estimates. The flow values calculated from the flood frequency analysis are to be placed several kilometres upstream of the Seven Creeks @ Kialla West (405269) streamflow gauge on the Seven Creeks and Honeysuckle System. It is likely that some attenuation may occur between the inflow locations and the streamflow gauge.

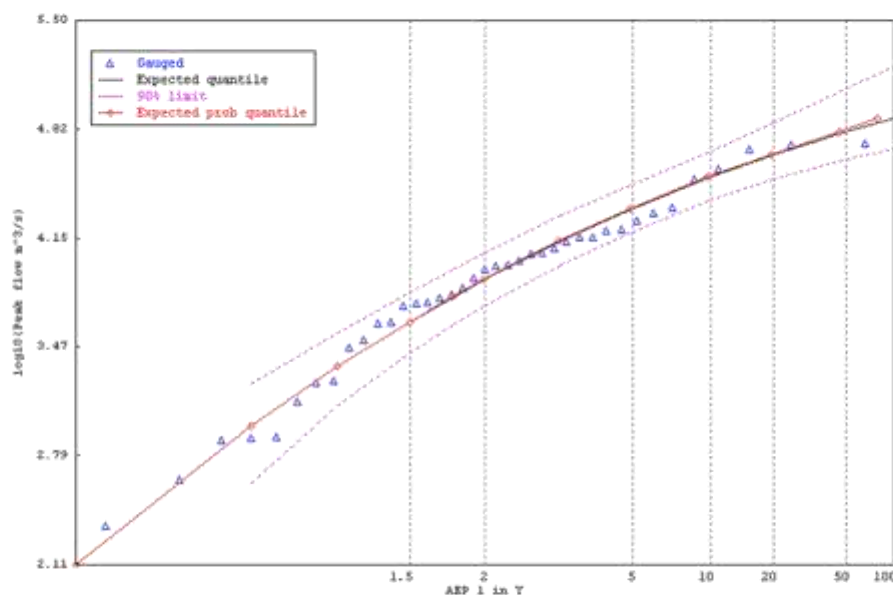


FIGURE 4-16 LOG PEARSON III DISTRIBUTION FITTED TO ANNUAL SERIES FOR SEVEN CREEKS @ KIALLA WEST (405269)

TABLE 4-23 DESIGN PEAK FLOWS FOR SEVEN CREEKS @ KIALLA WEST (405269)

AEP	ARI (1 in X years)	SKM (2002) Method Peak Flow (ML/d)	Updated Method Peak Flow (ML/d)
20%	5	17,000	21,400
10%	10	27,100	33,400
5%	20	38,700	46,300
2%	50	56,600	64,100
1%	100	72,300	77,700
0.5%	200	89,600	91,200
0.2%	500	115,000	108,703

TABLE 4-24 HIGHEST RECORDED FLOWS AND CORRESPONDING AEP FOR SEVEN CREEKS @ KIALLA WEST (405269)

Year	Peak Flow (ML/d)	Approx. AEP
1993	62,000*	2%
1974	50,000**	5-2%
2010	20,500	20%

*Estimated based on Shepparton-Mooroopna Flood Study (SKM, 2002)

**Estimated based on Regression Equation with Seven Creeks at Euroa streamflow gauge



4.3.6 Comparison with SKM (2002)

Comparisons between the current 1% AEP peak flow estimates at streamflow gauges throughout the catchment with the SKM (2002) estimates are provided in Table 4-25. Most of the estimates were broadly consistent. The estimates for Goulburn River @ Murchison diverge, but using the updated rating curve at Murchison, the results are more consistent with the SKM (2002) estimate.

TABLE 4-25 COMPARISON OF UPDATED DESIGN PEAK FLOWS WITH SKM (2002) ESTIMATES

Gauge	1% AEP Flow (Updated FFA)	1% AEP Flow (SKM 2002)
Broken River @ Casey's Weir	^a	66,900
Broken River @ Orrvale*	48,000	43,500
Goulburn River @ Goulburn Weir	158,400	-
Goulburn River @ Murchison*	152,600	134,000
Goulburn River @ Shepparton	213,200	219,000
Seven Creeks @ Kialla West	77,700	69,900

^a Updated FFA estimate using revised rating curve from hydraulic modelling

* 1% Flow at Casey's Weir not reliable due to poor rating curve

4.4 Design Flow Hydrographs

To determine a design hydrograph the SKM (2002) study scaled historic hydrographs to represent the design peak flow and 5 day volume. The 1974 hydrograph was adopted for the Goulburn River and the 1993 hydrographs for the Broken River and Seven Creeks. The design hydrographs were scaled and lagged from the upstream gauges to the model boundary.

The major difference between the hydraulic model inflow hydrographs of this study and that of the SKM (2002) study is that in this study coarse hydraulic models were developed to route flows from the upstream gauges to the model boundaries of the detailed Shepparton-Mooroopna flood model. This allowed a more accurate lag time to be applied to the historic and design hydrographs developed at gauges and transferred to the model boundaries. It also allowed for an improved understanding of breakout flows and the impact of structures such as the East Goulburn Main Channel. Another difference was when considering the volume on the Goulburn River, a 5 day volume was considered but on the Broken River and on the smaller tributaries, a 3 day volume was considered as the large historic hydrographs all showed a duration closer to 3 days than 5 days.

4.4.1 Previous Approach

The timing of the three major contributing catchments has a large impact on the resulting flood at Shepparton. The SKM (2002) study found that the peak flow of Seven Creeks at Kialla West generally occurs between 6-24 hours earlier than the Broken River at Orrvale, the study adopted the median 15 hour time offset for the peak flow for design purposes. The relative timing of the Goulburn and Broken Rivers was also investigated; however, a lack of data did hinder this assessment. A lag time of 33 hours was assumed between Goulburn Weir and Kialla West, and 30 hours between Murchison and Kialla West. It was estimated that the peak flow in the Goulburn at Kialla West occurred approximately 15 hours after the peak flow on the Broken River at Orrvale for the 1974 event, with a 60 hour lag in the 1993 event. This longer lag in 1993 was attributed to the impact of Eildon attenuating the flood in the upper catchment, with the lower catchment having a smaller contribution to the Goulburn flows. For design purposes the 15 hour time lag from the 1974 event was adopted.



Several design flood scenarios were developed using various combinations of Goulburn River, Broken River and Seven Creeks flows for a given AEP event at the Shepparton gauge.

4.4.2 Current Approach

Coarse hydraulic models were developed for the Goulburn River from Murchison to downstream of Toolamba, and on the Broken River from upstream of Gowangardie streamflow gauge to downstream of the East Goulburn Main Channel. The detailed Shepparton-Mooroopna model had hydraulic model boundaries located at Toolamba on the Goulburn River at the confluence with Castle Creek, upstream of the East Goulburn Main Channel on the Broken River, a Broken River breakout flow boundary 2.5 km south of the Broken River, upstream of Shepparton-Euroa Road on Honeysuckle Creek, and upstream of Union Road on the two Seven Creeks anabranches.

Using results from the coarse hydraulic modelling for a range of flows, the hydrographs developed for Seven Creeks at Kialla West, Broken River at Orrvale and Goulburn River at Murchison were scaled and lagged to allow for the floodplain characteristics between the gauge locations and the inflow boundary locations. For design purposes, typical relative hydrograph timing was applied to represent a likely design event scenario. It must be noted that every flood is different, and the subtleties in tributary timing may result in differences in the resulting flood levels at Shepparton. This has been tested through this study during sensitivity analysis and is discussed further in Section 6.1

It is accepted that various combinations of hydrograph peak flows, volume, shape and timing with tributaries will lead to significant differences in flood level throughout the study area. The hydrology documented above has estimated various design peak flows and volumes for all modelled tributaries. The combination of these inputs will be discussed further below in Section 6, with the timing of hydrographs summarised below.

Similar to the earlier SKM (2002) study, for design events the 1974 hydrograph shape was scaled for the Goulburn River, and the 1993 hydrographs scaled for Broken River and Seven Creeks.

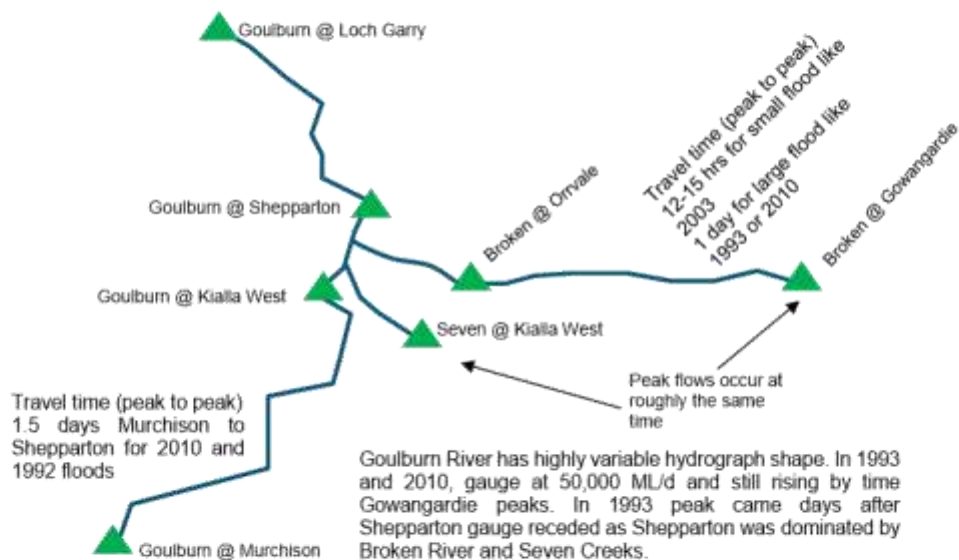


FIGURE 4-17 ANALYSIS OF HISTORIC FLOODS FOR TRIBUTARY TIMING



The final design modelling adopted tributary timing as follows.

- Seven Creeks model inflow peaks first.
- Broken River model inflow peaks 26 hours after Seven Creeks model inflow.
- Goulburn River model inflow peaks 10 hours after Broken River model inflow.
- Broken River breakout model inflow peaks 24 hours after the Broken River model inflow.

The above timings are based on an analysis of historic events routed through the coarse upper floodplain models from Murchison on the Goulburn River and Gowangardie on the Broken River. The timings of the peaks are different to that of the previous SKM study because of the new information from the coarse floodplain models and the change in inflow boundary locations. Consensus was reached on this approach with Greater Shepparton City Council and Goulburn Broken CMA.

Many design hydrograph combinations were modelled in the hydraulic model. The aim was to provide increments at thirteen different water level heights at the Goulburn River at Shepparton gauge. The approximate water level heights are 9.5 (minor flood level), 10.1, 10.5, 10.7 (moderate flood level), 10.9, 11.0 (major flood level), 11.1, 11.3, 11.5, 11.7, 11.9, 12.1, 12.2, 12.3 and 12.5 m. These incremental water level heights at the Goulburn River at Shepparton gauge were produced using three different scenarios, assuming either the Goulburn River was dominant, the Broken River/Seven Creeks was dominant, and a neutral scenario with no dominance. For each modelled scenario, maximum depth, velocity, water surface and flood hazard mapping were produced. An additional Probable Maximum Flood (PMF) scenario was also modelled. Section 6 includes further information regarding the design scenarios modelled.

4.4.3 Summary of Adopted Design Inflows at Hydraulic Model Boundaries

The design flows determined at the gauge locations were scaled slightly to appropriately account for the attenuation experienced across the floodplain. For instance, the design flows developed for the Broken River at Orrvale gauge were scaled up for the upstream inflow boundary location to account for the attenuation experienced because of the East Goulburn Main Channel. A summary of the adopted design inflows is provided in Table 4-26. The Seven Creeks inflow in Table 4-26 includes both the Seven Creeks and Honeysuckle Creek inflows.

TABLE 4-26 ADOPTED DESIGN EVENT INFLOW SUMMARY

Design Event	Goulburn River (ML/d)	Broken River (ML/d)	Seven Creeks (ML/d)
20 % AEP	49,100	17,900	22,500
10 % AEP	69,000	29,600	35,100
5 % AEP	90,900	42,700	48,600
2 % AEP	123,900	53,800	67,300
1 % AEP	162,600	63,430	82,100
0.5 % AEP	176,500	72,680	95,760



5 HYDRAULIC MODELLING

5.1 Approach

A detailed combined 1D-2D hydraulic model of the township and surrounding floodplain was developed for the determination of flood levels and extents over a range of flood events primarily to inform flood intelligence for the study area. The calibrated hydraulic model simulates flood flow behaviour of the Goulburn River, Broken River and Seven Creeks as well as the overbank flow throughout the floodplain. The hydraulic modelling approach consisted of the following components:

- One dimensional (1D) hydraulic model of key hydraulic structures, pipes and river channels;
- Two dimensional (2D) hydraulic model of remaining waterways and the broader floodplain; and
- Links between the 1D and 2D hydraulic models to integrate the 1D hydraulic components with the broader floodplain flow.

The hydraulic modelling software TUFLOW developed by BMT-WBM was used for this study. TUFLOW is a state-of-the-art tool for floodplain modelling that combines the dynamic coupling of the 1D ESTRY river model and 2D TUFLOW model systems. Through coupling of these two systems it is possible to accurately represent river, pipe and floodplain processes.

The model was initially calibrated to the October 1993 and September 2010 flood events, and verified to the May 1974 flood event, with the model calibrated to reproduce the observed flood heights and extents.

5.2 Information Used

The key information used to develop and run the hydraulic model is discussed below.

5.2.1 LiDAR data

LiDAR data for the region was made available from three different data sets, referred to as floodplain (FP), Fugro Spatial Systems (FSS) and Index of Stream Condition (ISC). A comparison of these datasets was undertaken as described in Section 3.3.1. The 1m ISC DEM was approximately 100 mm above the FSS and FP DEMs. The available LiDAR grids are shown in Figure 3-2.

After careful analysis it was decided to use the ISC DEM as the base data set as it correlated the best with the feature survey and compliment the ISC with the FSS and FP DEMs respectively. The FSS data was raised 100 mm to ensure there was no banding where the two datasets met.

5.2.2 Field Survey

Key survey data collated for the study included:

- Culvert crossings and bridge structure survey;
- Floor level survey of affected properties;
- Feature survey of the Shepparton Mooroopna causeway;
- Photos and sketches of the Shepparton Mooroopna causeway waterways;
- Feature survey of strategic levees downstream of Shepparton;
- Survey of key local drainage assets;



- Flood marks for the May 1974, October 1993 and September 2010 events; and
- SR&WSC Waterway cross sections used as part of SKP 1982

5.2.3 Hydrological Data

As part of the current study a detailed hydrologic analysis of the study area was undertaken and is detailed in Section 4.

The hydrology data was used as the input boundaries to the hydraulic model for the Goulburn River at Murchison, the Broken River at Gowangardie, Castle Creek at Arcadia, Pranjip Creek at Moorilim, and Seven Creeks at Kialla West. The hydrology of these boundaries was derived for a range of design events and the available gauge data was used directly for the May 1974, October 1993 and September 2010 calibration events. The rating curve for the Goulburn River at Loch Garry was used as the downstream model boundary, and the Goulburn River at Shepparton and the Broken River at Orrvale were used for calibration. Details of these gauges and the relevant available calibration data is shown in Table 5-1 and the locations of the gauges are shown in Figure 5-1.

TABLE 5-1 AVAILABLE GAUGE DATA AND PEAK FLOW DATA FOR CALIBRATION EVENTS

Site Number	Site Name	Catchment Area (Km ²)	Peak Flow 2010 (ML/d)	Peak Flow 1993 (ML/d)	Peak Flow 1974 (ML/d)
405246	CASTLE CREEK @ ARCADIA	164	2,870*	4,840	4,260
405226	PRANJIP CREEK @ MOORILIM	787	7,310	15,200	17,400
405269	SEVEN CREEKS @ KIALLA WEST	1,505	20,500	N/A	N/A
404224	BROKEN RIVER @ GOWANGARDIE	2,396	51,100	59,600	N/A
404222	BROKEN RIVER @ ORRVALE	2,508	27,300	42,900	N/A
405200	GOULBURN RIVER @ MURCHISON	10,772	50,200	63,500	117,900
405204	GOULBURN RIVER @ SHEPPARTON	16,125	78,600	150,000	191,000
405276	GOULBURN RIVER @ LOCH GARRY	16,490	57,100	97,400	N/A

*note that a higher flow was recorded in December 2010, however this investigation utilises the September 2010 event for calibration

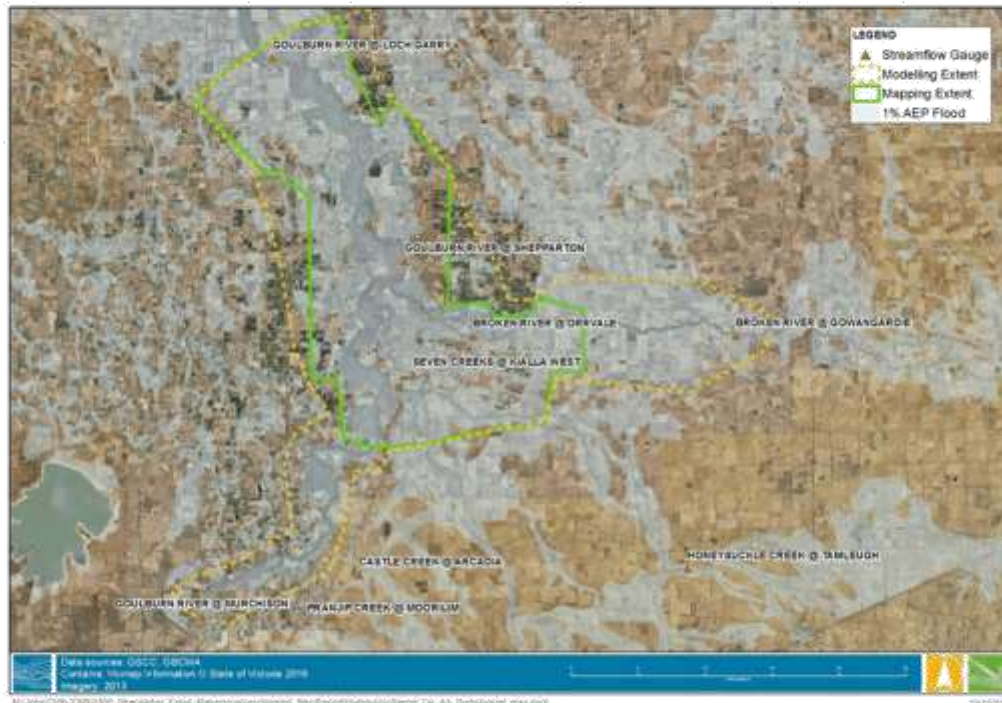


FIGURE 5-1 LOCATION OF AVAILABLE STREAM GAUGES AND MAPPING EXTENT

5.3 Hydraulic Model Development

5.3.1 Overview

Due to the complex nature of the floodplain within the study area, several hydraulic modelling options were tested. Through this process, several grid sizes and model extents were trialled. A single model extending from Murchison to Loch Garry on the Goulburn River and Gowangardie to Shepparton on the Broken River was initially trialled, but due to long run times this was split into three separate models. The approach then adopted two coarse resolution models on the upstream extents of the rivers, routing flows to the detailed Shepparton model area. The detailed Shepparton model initially represented the Goulburn River in 2D but was converted to a 1D-2D model to improve run times. The 2D grid resolution was tested also to optimise the balance between run time and resolution. This section describes the final hydraulic model development.

5.3.2 Topography

The model covers a large area surrounding Shepparton, extending approximately 30 km up the Goulburn River to Murchison, approximately 26 km up the Broken River to Gowangardie Weir, and approximately 18 km downstream of Shepparton to Loch Garry. Shepparton is located at the confluence of the Goulburn and Broken Rivers, with heights ranging across the area from 116 m AHD near Murchison to around 105 m AHD within Loch Garry. Across the floodplain there are several small ephemeral watercourses, structures, irrigation channels, levees, railways and roadways which all influence flood behaviour, as well as the pipe drainage network within Shepparton itself.



To best represent the region, while allowing for reasonable run times, the model topography was split into three separate hydraulic models. To extend the model to the Murchison and Gowangardie gauges upstream of Shepparton, two smaller models were constructed using a 20 m grid resolution to route the flows from the gauges to the flood mapping extent along the Goulburn and Broken Rivers respectively. In both models the river channel was represented by a 1D channel and allowed to surcharge onto the 2D floodplain.

The larger Shepparton model covers the flood mapping extent with both the Goulburn and Broken Rivers and Seven Creeks again represented in 1D. The grid resolution for this model was split into two sections so that the Shepparton Township and surrounds could be modelled at the higher 10 m resolution and the routing downstream to Loch Garry is modelled at the lower 20 m grid resolution. The change in grid resolution occurs approximately 250 m north of Wanganui Road. The schematisation of the hydraulic model is shown in Figure 5-2 below.

Cross sectional survey was used to 'stamp' in the geometry of the main waterway channels on the LiDAR, so that the conveyance was accurately represented.

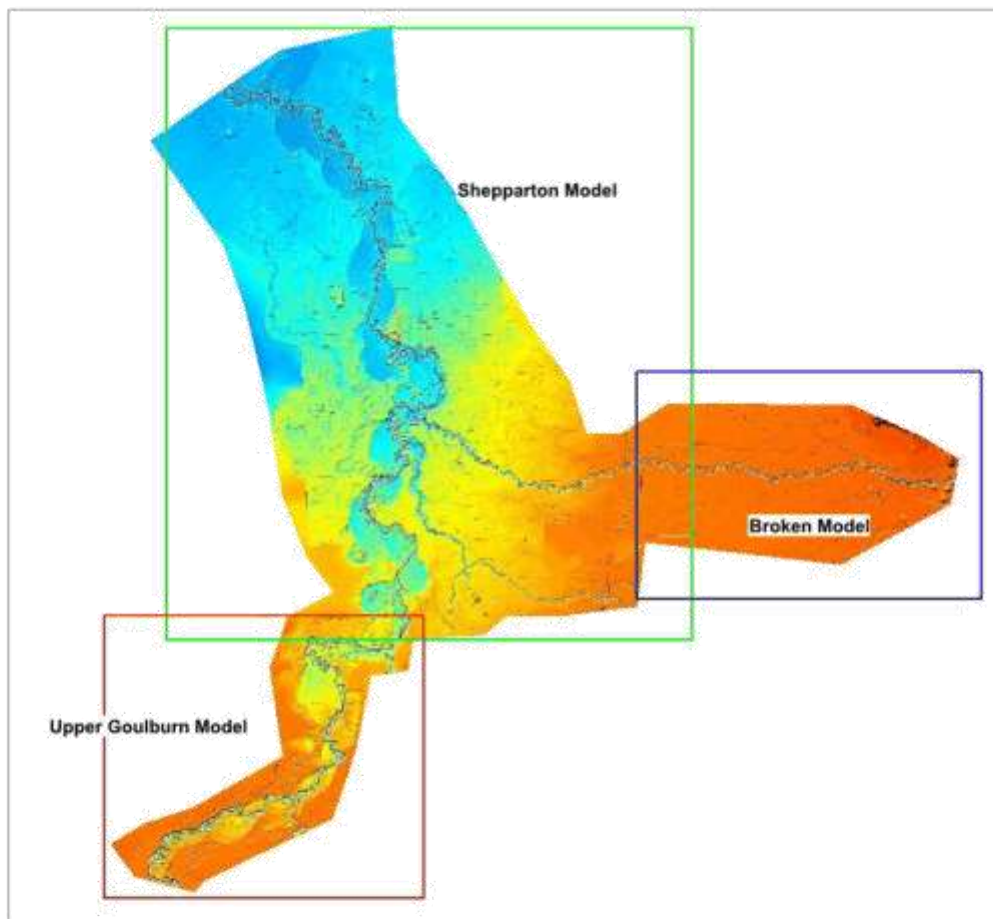


FIGURE 5-2 SHEPPARTON HYDRAULIC MODEL SCHEMATISATION



5.3.3 Key Structures

Information about the key hydraulic structures within the floodplain including dimensions and inverts were required for input into the hydraulic model. The main structures within the study area were:

- East Goulburn Main Channel and the associated syphons;
- The railway bridge over the Goulburn and Broken Rivers;
- The causeway between Shepparton and Mooroopna across the Goulburn River floodplain;
- The levees adjacent to the Goulburn River;
- The Shepparton and Mooroopna drainage pipe network;
- The channels associated with the irrigation network;
- The Goulburn Valley Highway bridge over the Broken River; and
- Numerous drainage structures at various locations in the floodplain, such as culverts associated with the railway, roads and the irrigation channels.

Cross section details, dimensions and/or obverts of several hydraulic structures were not known and required estimation. LiDAR data was used to estimate invert levels and cross sections, and various imagery was used to estimate structure dimensions. It is expected that this method of estimating the structure inverts and dimensions will be accurate to +/-150 mm and as such will not have a significant impact on the model accuracy.

The main opening in the causeway (Daintons Bridge) is modelled as a (BW) Bridge Weir Structure in the 1D domain. The remaining openings in the Midland Highway have been modelled using an increased roughness.

Several other bridges within the model extent were modelled as openings as identified in the LiDAR.

5.3.4 Hydraulic Roughness

The variation in hydraulic roughness within the study area was schematised as two separate roughness layers, one representing all the roads and the other representing the other various hydraulic roughness values (e.g. floodplain, channels, vegetation etc.). Areas with different roughness types were identified using aerial photographs and VicMap data layers. The values adopted for the two-dimensional hydraulic model are summarised in Table 5-2 and shown in Figure 5-3 below. These values were based on standard industry roughness values and were modified during the calibration process. The values adopted are reasonable estimates of hydraulic roughness given the floodplain condition.



TABLE 5-2 HYDRAULIC ROUGHNESS PARAMETERS

Land Type	Roughness (Manning's "n")
Roads	0.015
Crops	0.05
Medium Density Vegetation	0.07
High Density Vegetation	0.10
Stagnant Water Bodies	0.03
Residential	0.06
Industrial	0.06
Cleared Land/Open Space	0.04
Goulburn River Channel	0.065
Seven Creeks Channel	0.06
Broken River	0.10
Pipes/Culverts	0.012



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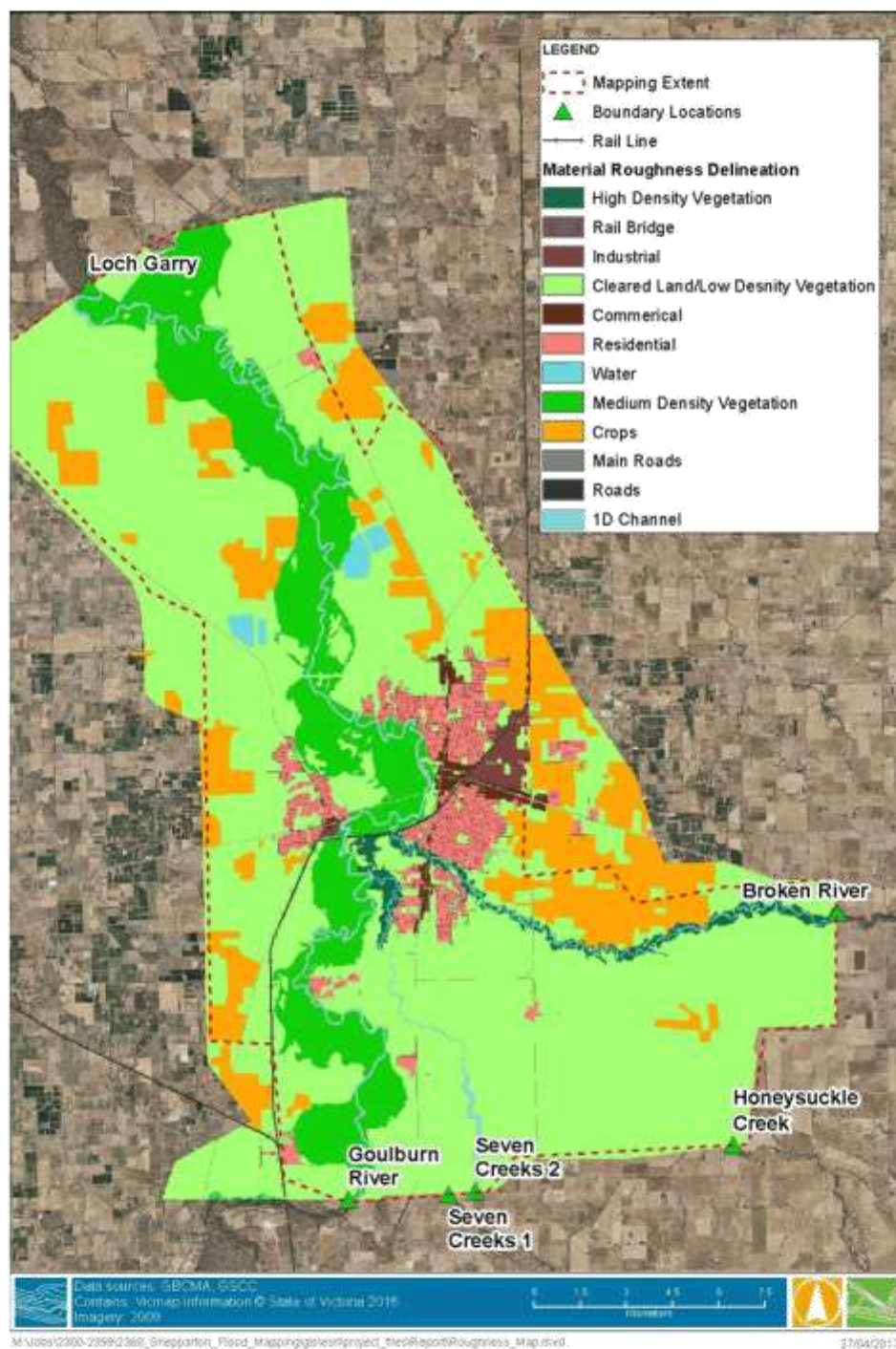


FIGURE 5-3 2D MATERIAL ROUGHNESS MAP



5.3.5 Boundary Conditions

5.3.5.1 Broken Model

The Broken model was developed with a single inflow boundary for the Broken River at Gowangardie Weir, located 26 km upstream of the confluence with the Goulburn River. This location was specifically chosen so that recorded flows from the gauge at Gowangardie could be input directly into the model for historical events, and flood frequency analysis at the gauge can be used for the design events.

The downstream boundaries were placed just downstream of the East Goulburn Main Channel, defined using the automatically generated Q-H relationships. Hydrographs for the Shepparton model were extracted for the Broken River and a breakout flow to the south upstream of the East Goulburn Main Channel. This structure acts as a major hydraulic control on the floodplain and greatly influences flow paths during overbank flow events. This barrier makes an ideal location to separate the hydraulic models.

Flow from the Broken River can also overtop the Midland Highway just to the north of the river and enter the Pine Lodge Creek system. Another Q-H boundary has been placed on Pine Lodge Creek to the north to take this flow out of the model, and a flow extraction line (TUFLOW PO line) has been placed there to quantify this breakout.

5.3.5.2 Upper Goulburn Model

Like the Broken model, the Upper Goulburn model has an inflow point on the Goulburn River at Murchison. There are also two tributaries that enter downstream of Murchison, being Pranjip Creek at Moorilim and Castle Creek at Arcadia. All three of these flows are taken directly from the gauged data for the historical events and from the flood frequency analysis for the design events.

The downstream Q-H boundary of the Upper Goulburn model has been placed just upstream of the flood mapping extent, downstream of Bridge Road near Toolamba. The flow extraction line for the Shepparton model has been placed just upstream of Bridge Road.

5.3.5.3 Shepparton Model

The Shepparton model has numerous inflow boundaries not only from the Upper Goulburn and Broken models, but for Seven Creeks as well. The Shepparton model overlaps the Upper Goulburn and Broken models and uses the flows extracted from those models as the upstream boundaries for the Goulburn River, the Broken River and the breakout south of the Broken River upstream of the East Goulburn Main Channel.

As the gauge for Seven Creeks at Kialla West is within the flood mapping extent, the inflow boundary was split into three boundaries upstream of the confluence of Seven Creeks and Honeysuckle Creek. The catchment areas for Honeysuckle Creek and Seven Creeks at this point are approximately the same, so the inflows have been split evenly between Honeysuckle Creek and Seven Creeks, with the Seven Creeks inflow split evenly again between the two branches. The inflows at these boundaries had to be scaled up slightly to ensure that the flow at the gauge was accurately reproduced (to account for floodplain storage between the boundary inflows and the streamflow gauge). A similar approach was adopted for the Broken River inflows, with the main Broken River inflow placed upstream of the East Goulburn Main Channel and a secondary Broken River inflow placed south of the Broken River. With both inflows upstream of the Broken River at Orrvale streamflow gauge, flows were scaled up to simulate the design flow estimates from the flood frequency analysis at the streamflow gauge.

The downstream extent of the model incorporates Loch Garry and the gauge on the Goulburn River approximately 18 km downstream of Shepparton. The rating curve from the gauge has been used for the Q-H relationship on the Goulburn River downstream boundary. There is also an automatically generated Q-H boundary on the floodplain adjacent to the Goulburn River outside of the levee to the south west, and another



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Q-H boundary on the floodplain north of the Loch Garry levee. An automatically generated Q-H boundary has also been used for the structure within Loch Garry to estimate the operation of the weir during flood events. All model boundary locations are shown in Figure 5-4.



FIGURE 5-4 SHEPPARTON MOOROOPNA HYDRAULIC MODEL BOUNDARY LOCATIONS



5.3.6 1D Pipe Network

There are areas of Shepparton and Mooroopna that are inundated due to the backflow of pipes and council has requested that these be included in the hydraulic model. The entire stormwater network was provided by Council and after discussions with Council and the Goulburn Broken CMA it was decided to include those pipes greater than 600 mm in diameter. Figure 5-5 shows the selected pipes from the stormwater water pipe system for Shepparton and Mooroopna that have been included in the TUFLOW hydraulic model.





FIGURE 5-5 SELECTED SHEPPARTON AND MOORoopNA STORMWATER PIPES

5.4 Hydraulic Model Calibration

5.4.1 Overview

The following Section discusses the fine-tuning of the hydraulic model parameters through calibration against observed flood data. The model was calibrated to the large flood event of October 1993 and smaller September 2010 flood event in tandem, with validation to the May 1974 flood event. Surveyed flood marks (provided by the Goulburn Broken CMA), gauged river heights and aerial photographs of the floods were the basis for comparison to the modelled results.

Several sensitivity runs were undertaken with minor changes to the model parameters to get a better match to gauged river levels, surveyed flood levels and flood extents, namely:

- Adjusting the Broken River channel cross section near the East Goulburn Main Channel to allow more flow to pass through the gap in the high channel banks. The East Goulburn Main Channel creates a major hydraulic barrier, so time was spent ensuring the afflux across the structure was modelled correctly.
- Adding the culverts under the railway line near Toolamba Road.
- Increased the Goulburn River and Seven Creeks roughness from 0.045 to 0.06 and the Broken River roughness from 0.06 to 0.10 (reasonable given the dense vegetation and woody debris along the channel). This helped raise flood levels to better match the observed flood levels for the 1993 and 2010 calibration events.
- Incorporating crest levels from the Goulburn River levee survey downstream of Shepparton from the Goulburn River Levee Audit project completed on behalf of the Goulburn Broken CMA. This provided a more accurate representation of the levee, which was otherwise not adequately defined in 2D at the model resolution.
- Layered flow constrictions and form losses were applied along the Shepparton-Mooroopna Causeway waterway opening after receiving the detailed gauging record from the 1974 flood event and structure details from the Goulburn Broken CMA. This additional information helped refine the flow through the causeway structures.

The final roughness parameters determined from the calibration process are shown in Table 5-2.

It should be noted that while flood mark survey is available for the calibration events there is inherent inaccuracies in the collection of those levels. The levels are primarily based on flood debris marks which may be significantly higher or lower than the true peak due to several reasons such as debris piling up on the upstream side of an obstruction or debris collecting on the recession of a flood, and obstructions causing a bow wave effect (with higher levels on the upstream face and lower on the downstream face).

A certain degree of engineering judgement is required in the collection of this data and inaccuracies in the data at some locations are likely.

5.4.2 September 2010 Calibration

15 flood marks within the flood mapping extent from the September 2010 flood event were collected by the Goulburn Broken CMA. These flood marks were complimented with aerial photography of the flood extent and river gauge data to check the modelled flood extent.

The 15 survey flood marks located within the study area were compared to the modelled flood levels:



- 12 points were within +/- 200 mm;
- 2 points had modelled water levels with a difference greater than 200 mm;
- On average the model levels were 49 mm higher than the observed flood marks.

The overall trend showed that the modelled flood levels were slightly higher than the surveyed flood levels. All modelled flood levels were well within the error threshold for the hydraulic model calibration for the September 2010 flood event.

Figure 5-6 below shows a plot of the water level for the gauge on the Goulburn River at Shepparton comparing the model results to the gauged data. The graphs show that the rising limb of the modelled hydrograph arrives slightly earlier than the gauged data; nevertheless, the peak elevation is well represented in the model. A calibration plot for the September 2010 flood event is shown in Figure 5-9. The aerial imagery obtained after the flood peak from Nearmap (Figure 5-10) shows the flood extent matches well around the Kialla West area along the Broken River.

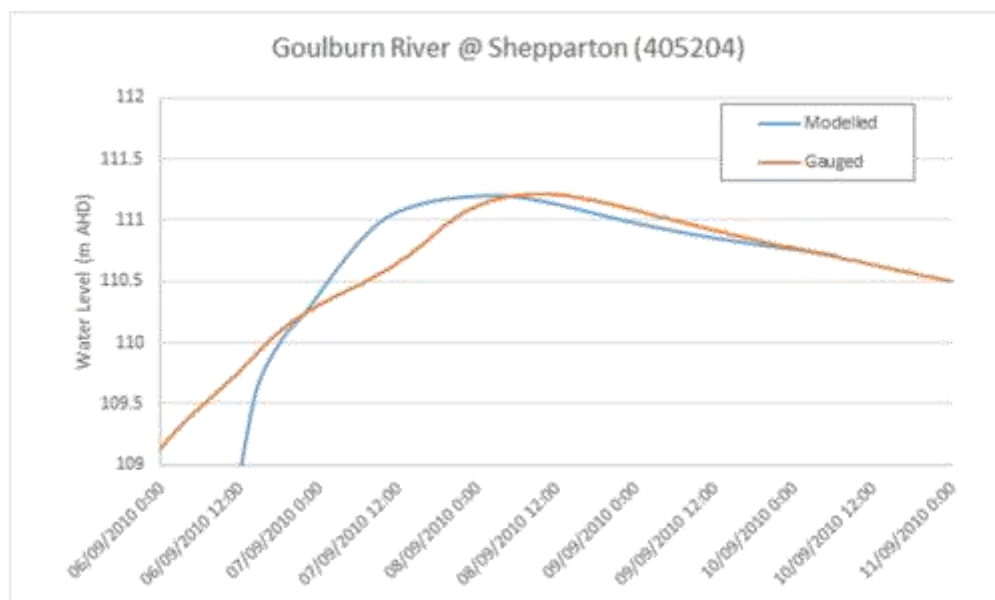


FIGURE 5-6 COMPARISON BETWEEN MODELLED AND GAUGED WATER LEVELS FOR THE GOULBURN RIVER AT SHEPPARTON DURING THE SEPTEMBER 2010 EVENT

Figure 5-7 below shows a plot of the water level for the gauge on the Broken River at Orrvale comparing the model results to the gauged data. The graphs show that the rising limb of the modelled hydrograph compares well with the gauged data, the peak elevation is well represented in the model, and only the falling limb does not compare well, receding quicker than the gauged data. Figure 5-8 shows the comparison of the modelled and gauged water levels at the Seven Creeks at Kialla streamflow gauge. This shows the modelled peak flood level being slightly lower (110 mm) compared to the gauged flood level. The rising limb is not shown in this plot as the final calibration run utilised a hot start initial condition at 6:00am on the 6th September 2010.

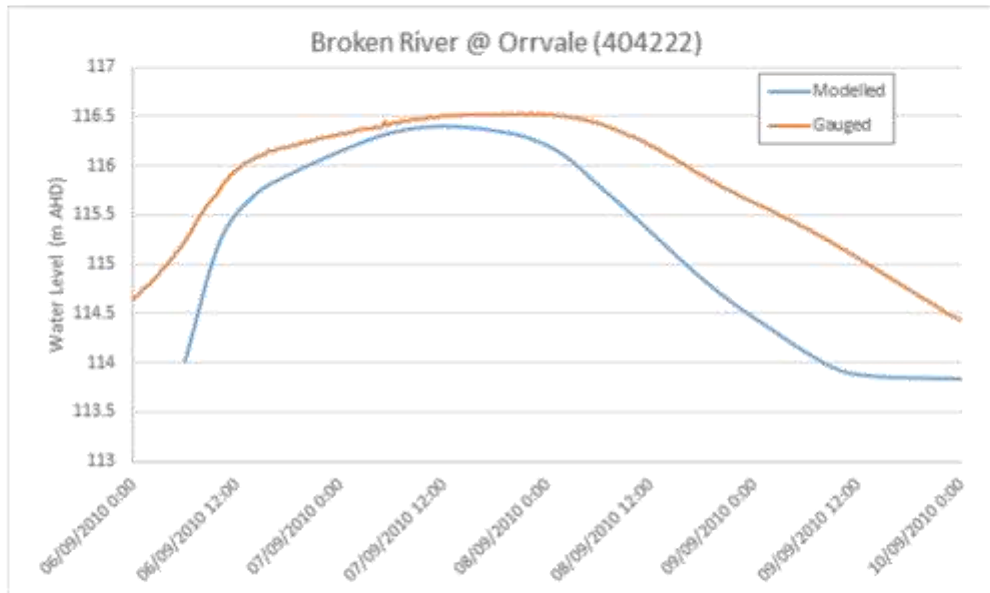


FIGURE 5-7 COMPARISON BETWEEN MODELLED AND GAUGED WATER LEVELS FOR THE BROKEN RIVER AT ORRVALE DURING THE SEPTEMBER 2010 EVENT

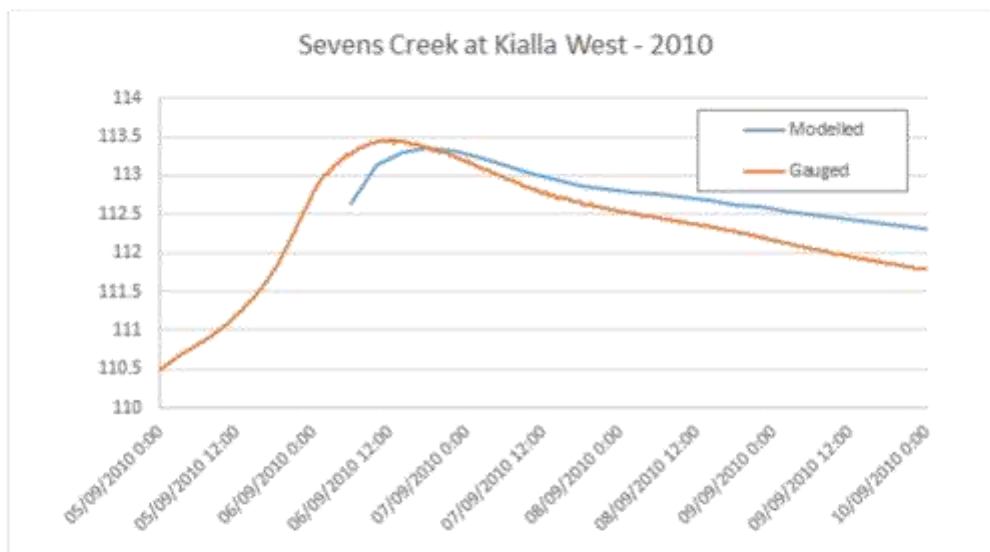


FIGURE 5-8 COMPARISON BETWEEN MODELLED AND GAUGED WATER LEVELS FOR THE SEVEN CREEKS AT KIALLA WEST DURING THE SEPTEMBER 2010 EVENT

The modelled flood extent matched very well with observations, gauged river heights and aerial photographs, and was deemed an acceptable calibration result. Figure 5-11 shows the water surface profiles along the three main waterways. These are plotted with the chainage distance of the waterway along the x – axis and the running distances (provided by the GBCMA) have also been included at key features along the waterways.



5.4.2.1 Flood Behaviour

Heavy rainfall occurred in the north east of Victoria on Saturday 4th and Sunday 5th September 2010, particularly in the alpine areas including the upper Goulburn and Broken catchments. On Monday 6th September, the Seven Creeks at Kialla West peaked just above the major flood level of 6.6 m, and shortly after the Broken River at Orrvale peaked overnight at 8.19 m, again above the major flood level of 7.9 m. On Wednesday 8th September, the Goulburn River at Shepparton also peaked just above the major flood level of 11 m. Minor tributaries into the Goulburn, Castle Creek and Pranjip Creek, also flooded.

The September 2010 event was mostly contained within the lower floodplain area on the Goulburn River, however low-lying areas near the Broken River were inundated. The SES advised that 13 houses and 31 structures were damaged by the floods. Approximately 30 local roads were closed due to flooding, however all major roads surrounding Shepparton remained open for the duration of the event. Figure 5-9 below shows the modelled peak flood extent which was consistent with the observed flood extent. This shows that low lying areas between Archer Road and the East Goulburn Main Channel along the Broken River were inundated during the event, whilst areas outside of the Goulburn River lower floodplain were not affected.



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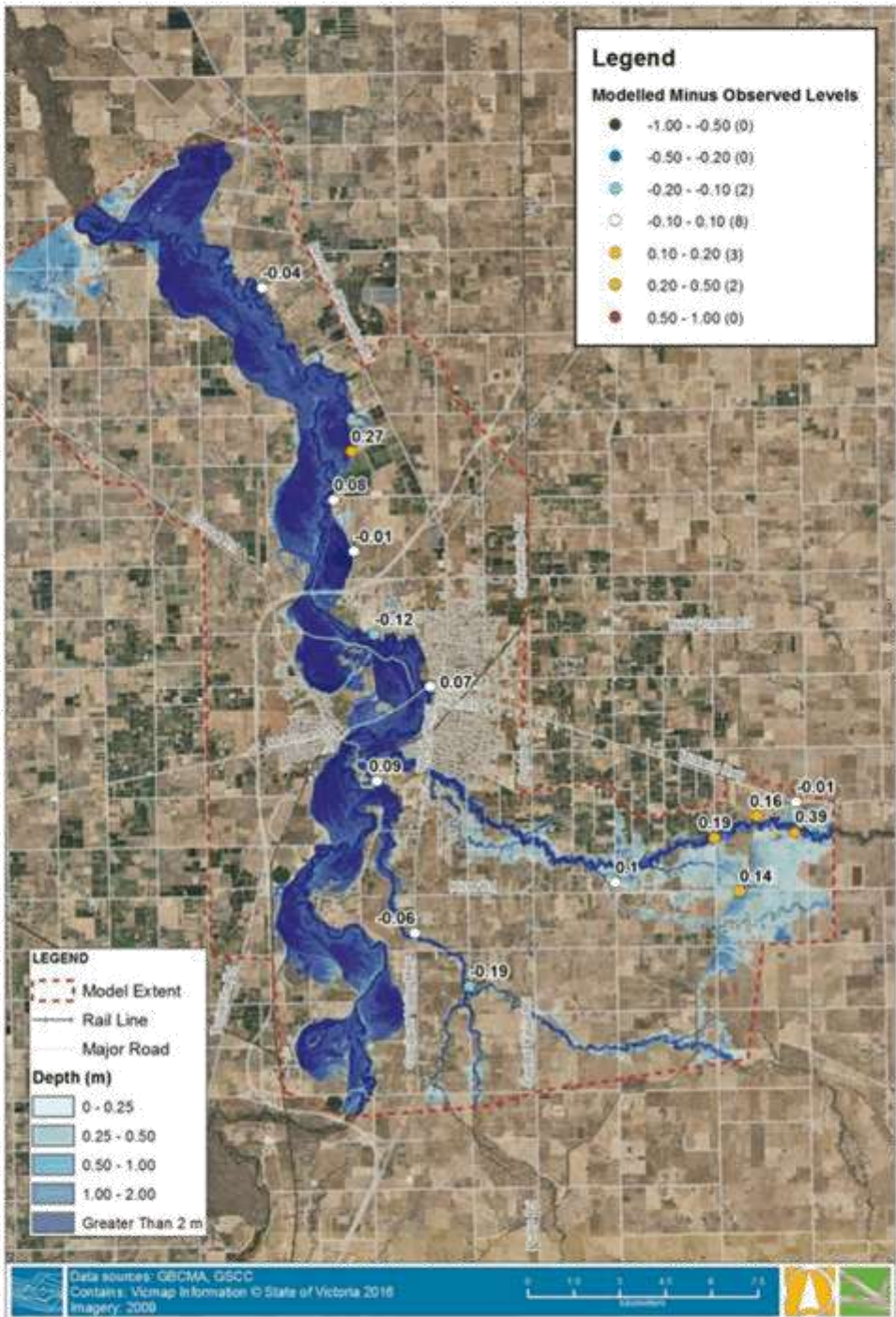


FIGURE 5-9 HYDRAULIC MODEL CALIBRATION PLOT – SEPTEMBER 2010



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FIGURE 5-10 SEPTEMBER 2010 MODELLED FLOOD EXTENT AERIAL IMAGERY VALIDATION (SOURCE: NEARMAP)

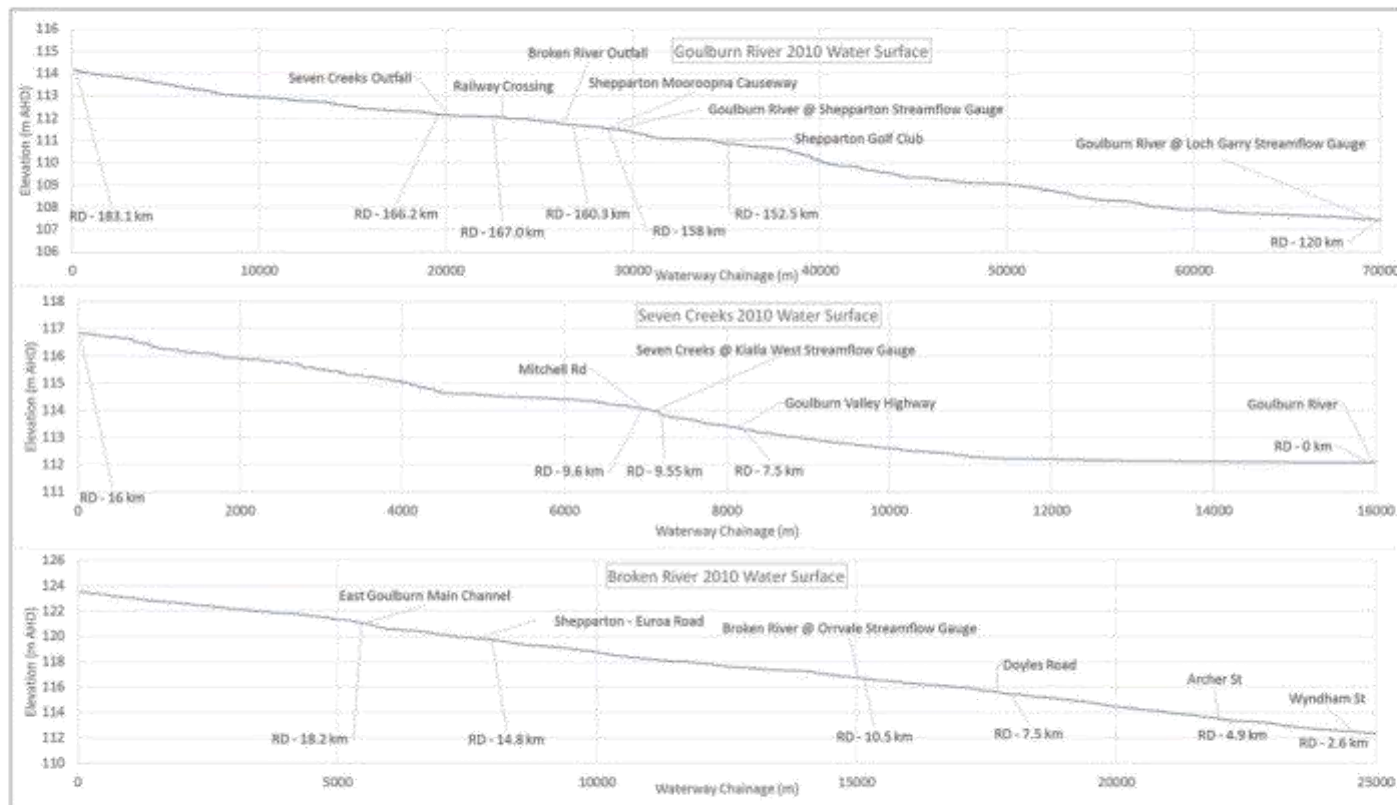


FIGURE 5-11 SEPTEMBER 2010 – WATER SURFACE PROFILES



5.4.3 October 1993 Calibration

Many survey flood marks were collected for the October 1993 flood event. In total, there were 66 survey points to which the model results were calibrated, giving confidence in the reliability of the reproduced flood behaviour. Calibration plots of the October 1993 flood event are shown in Figure 5-14. Of the 66 survey flood marks located within the study area:

- 32 (48%) points were within +/- 100 mm;
- 19 (29%) points were within +/- 100 - 200 mm;
- 8 (12%) points were within +/- 200 - 300 mm;
- 4 (6%) points were below 300mm and were mainly near the Broken River just upstream of the confluence with the Goulburn River;
- 3 (5%) points were above 300mm; and
- On average the 66 observed flood levels that sit within the modelled flood extent showed no overall difference above or below the surveyed flood marks, with a standard deviation of 219 mm.

The overall trend showed that the modelled flood levels had no bias higher or lower than the surveyed flood levels and were predominately well within the satisfactory error interval expected for flood modelling scenarios.

Figure 5-12 below shows a plot of the water level for the gauge on the Goulburn River at Shepparton comparing the model results to the gauged data. The graphs show that the rising and falling limbs of the modelled hydrograph are well represented within the model, and the peak elevation is approximately 110 mm higher than the gauged data.

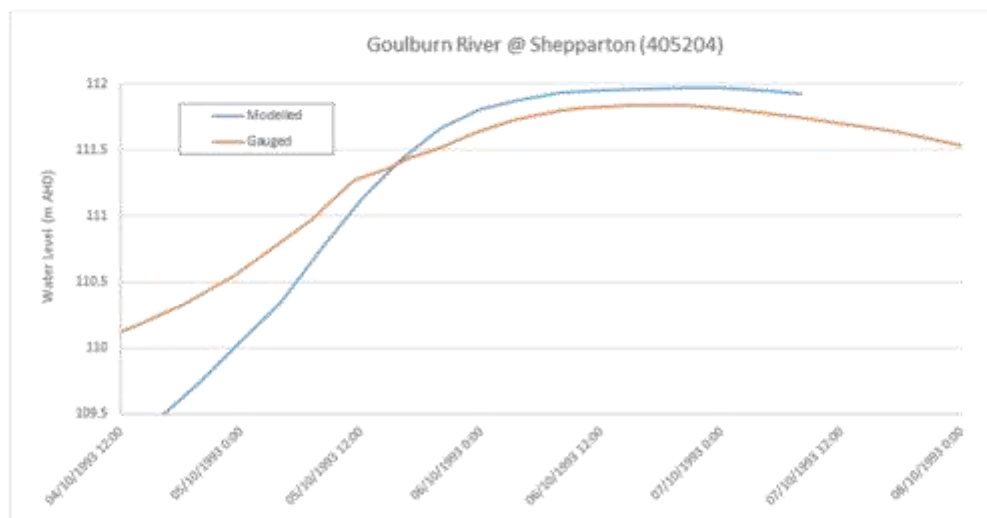


FIGURE 5-12 COMPARISON BETWEEN MODELLED AND GAUGED WATER LEVELS FOR THE GOULBURN RIVER AT SHEPPARTON DURING THE OCTOBER 1993 EVENT

Figure 5-13 below shows a plot of the water level for the gauge on the Broken River at Orrvale comparing the model results to the gauged data. The graphs show that the rising limb of the modelled hydrograph arrives slightly later than the gauged data, and the peak elevation is well represented in the model, despite overestimating the peak by 150 mm.

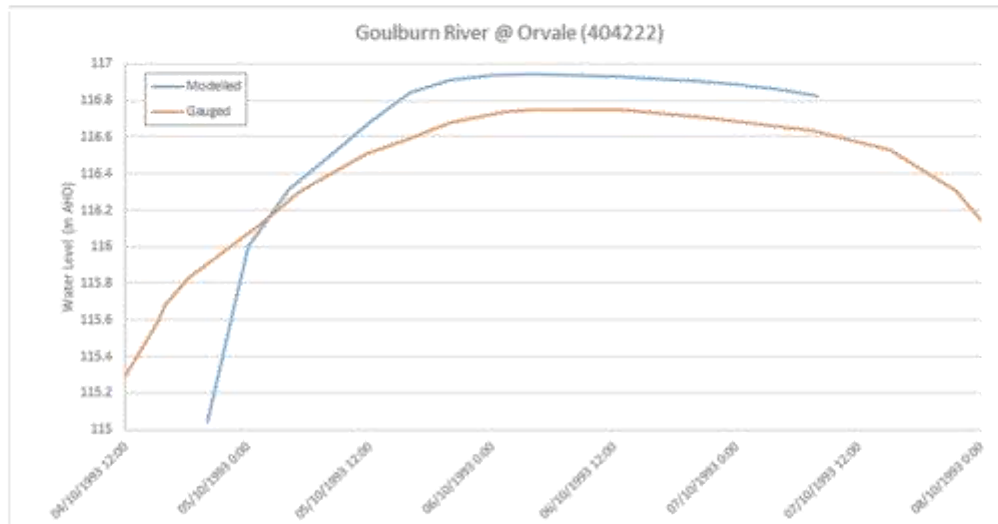


FIGURE 5-13 COMPARISON BETWEEN MODELLED AND GAUGED WATER LEVELS FOR THE BROKEN RIVER AT ORVALE DURING THE OCTOBER 1993 EVENT

There is limited streamflow data for Seven Creeks at Kialla West for the 1993 flood event.

The modelled flood extent matched very well with observations, gauged river heights and aerial photographs, and was deemed an acceptable calibration result. Figure 5-15 shows the water surface profiles along the three main waterways. These are plotted with the chainage distance of the waterway along the x – axis and the running distances (provided by the GBCMA) have also been included at key features along the waterways.

5.4.3.1 Flood Behaviour

In the lead up to the October 1993 flood, the Goulburn River had sustained high water levels for the majority of September. The Broken River and Seven Creeks during this time were relatively low until they both received a big inflow that started around 3rd October and lasted until early on the 9th October. The Goulburn River peaked again at the same time and stayed high until around the 16th October when it finally receded. Even though the peak in the Goulburn River wasn't as high upstream of Shepparton as it was in September, the combination of the three systems caused a peak water level of approximately 11.7 m at the gauge in Shepparton on Wednesday 6th October.

Upstream of Shepparton on the Goulburn River most of the flow was contained within the lower floodplain. The flows in the Goulburn River, Broken River and Seven Creeks were all larger than 2010, particularly in Seven Creeks where significant overbank flood flow occurred in surrounding low lying areas. Parts of the town of Shepparton were inundated during the event and significant areas downstream of Shepparton were also inundated, particularly around the water treatment plant. The 1993 flood event is referred to as a 'Broken River and Seven Creeks dominant event'. This refers to the two systems mentioned being the dominant flooding mechanism and the flows recorded on these systems being of higher magnitude compared to the Goulburn River during the flood event.





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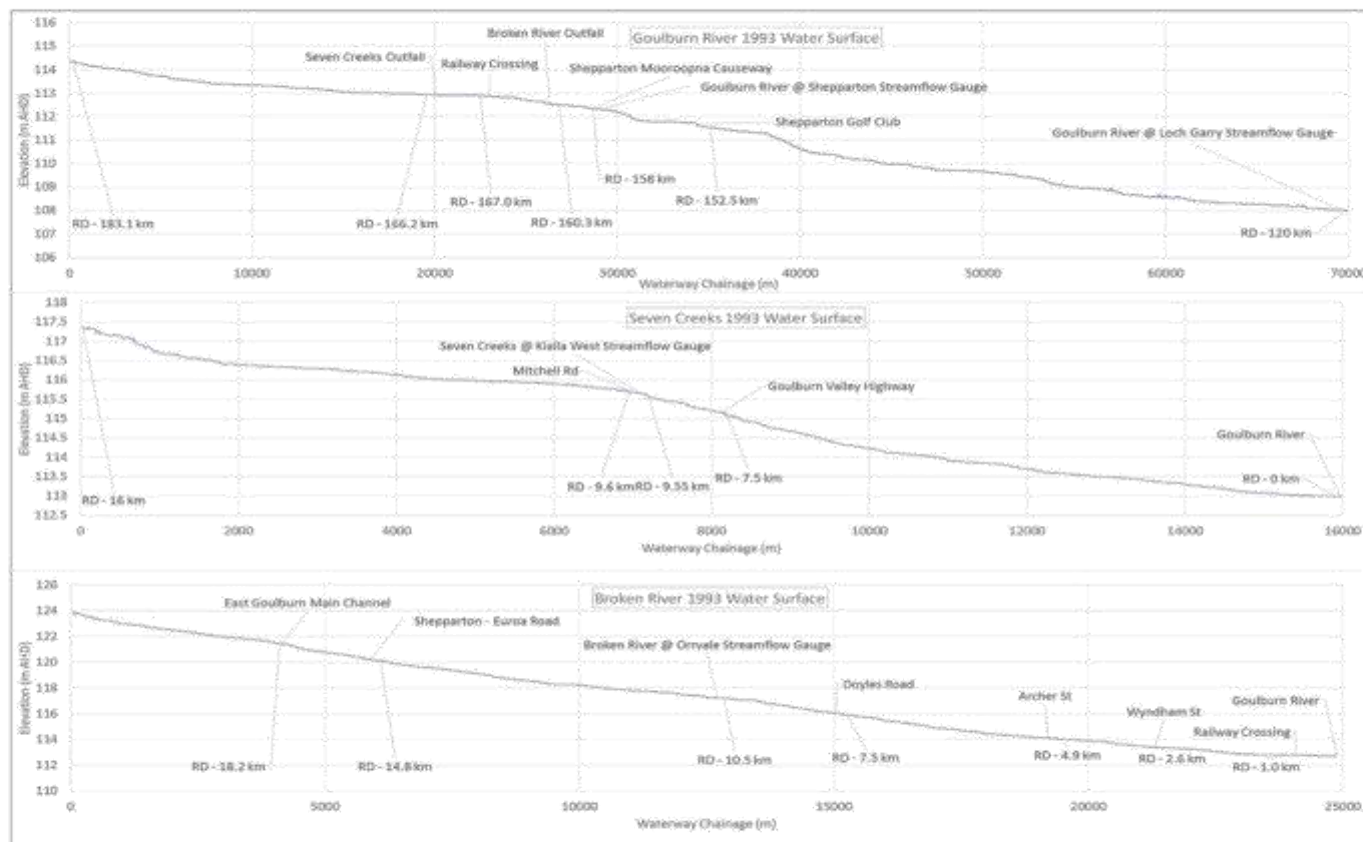


FIGURE 5-15 OCTOBER 1993 - WATER SURFACE PROFILES



5.4.4 May 1974 Validation

Many survey flood marks were collected for the May 1974 flood event. In total there were 377 survey points available in the VFD, 114 of these points were classified with a reliability of 'Good' or 'High'. Only the surveyed points with these levels of reliability were used to validate the hydraulic model, giving confidence in the reliability of the reproduced flood behaviour. Validation plots of the May 1974 flood event are shown in Figure 5-17 and Figure 5-18. Of the 114 survey flood marks located within the study area:

- 40 (35%) points were within +/- 100 mm;
- 28 (25%) points were within +/- 100 - 200 mm;
- Approximately 60% of the modelled validation points were within 200 mm;
- 19 (17%) points were within +/- 200 - 300 mm;
- 3 (3%) points were below 300mm;
- 20 (18%) points were above 300mm.
- 4 (4%) points were not in the modelled flood extent; and
- On average the modelled water levels were 124 mm above the surveyed flood marks, with a standard deviation of 201 mm.

The overall trend showed that the modelled flood levels were slightly higher than the surveyed flood levels but the majority within the satisfactory error interval expected for flood modelling scenarios. Most of the modelled flood levels which were higher than observed levels were centred around the Mooroopna area. A comparison of aerial imagery from 1974 and present day shows extensive development to the north of the Midland Highway in Mooroopna. It would be expected that development through this area would have likely required earthworks to infill the floodplain which may have resulted in an increase in flood levels.

Figure 5-16 below shows a plot of the water level for the gauge on the Goulburn River at Shepparton comparing the model results to the gauged data. The graphs show that the rising limb of the modelled hydrograph arrives slightly later than the gauged data, the peak elevation is approximately 100 mm lower than the gauged data, and the falling limb receding slightly later than the gauged data as well.

Figure 5-19 shows the water surface profiles along the three main waterways. These are plotted with the chainage distance of the waterway along the x – axis and the running distances (provided by the GBCMA) have also been included at key features along the waterways.

Figure 5-20 provides a summary of the longitudinal section for the peak flood level for each waterway during the three historical events modelled. This helps to provide context for the magnitude of the events on each of the waterways.



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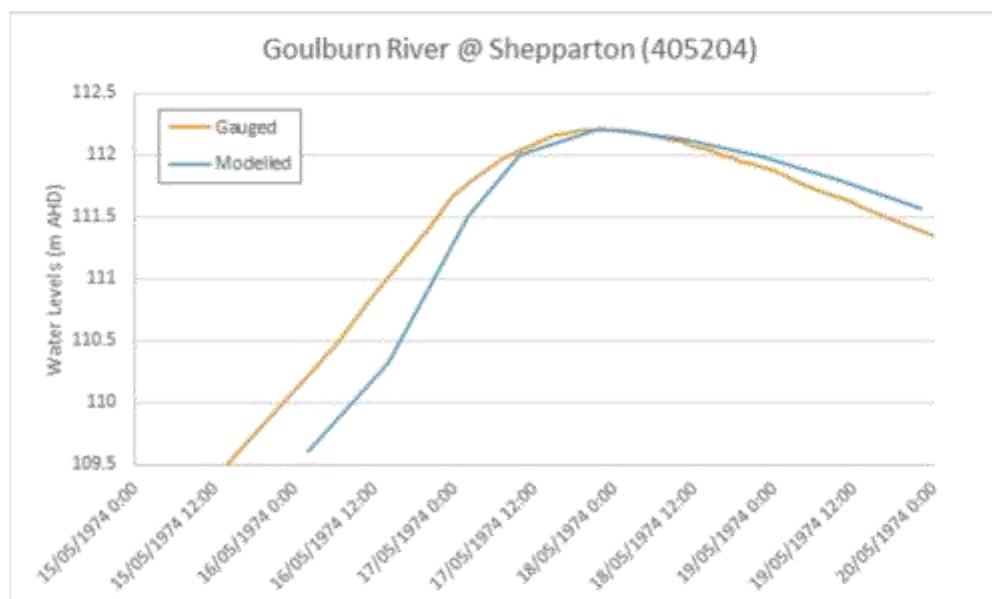


FIGURE 5-16 COMPARISON BETWEEN MODELLED AND GAUGED WATER LEVELS FOR THE GOULBURN RIVER AT SHEPPARTON DURING THE MAY 1974 EVENT

No streamflow data for the Broken River at Orrvale or the Seven Creeks at Kialla West gauge exists for the 1974 flood event. Both gauges were installed in 1977.

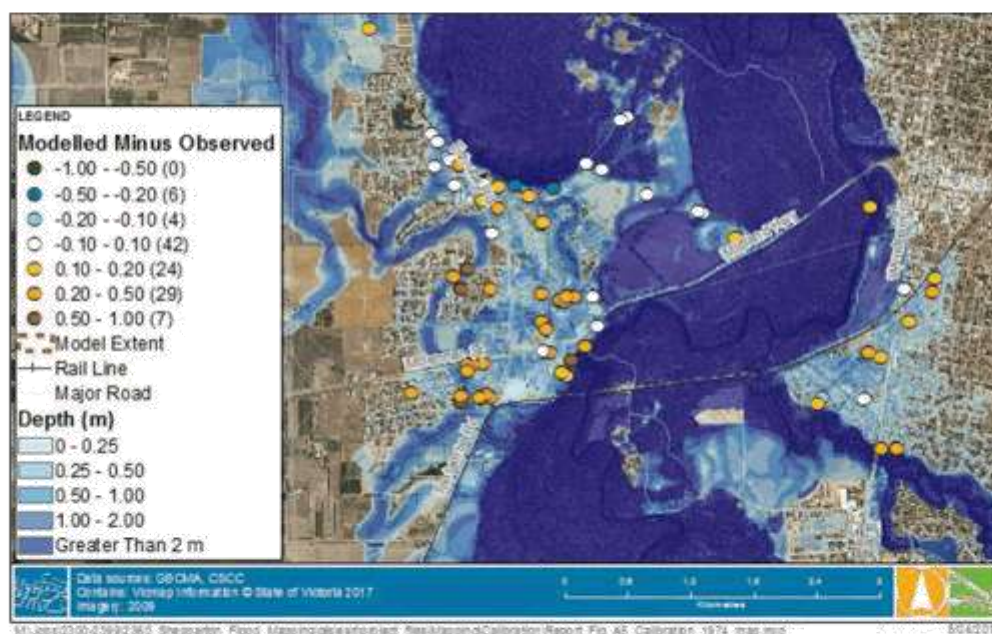


FIGURE 5-17 HYDRAULIC MODEL VALIDATION PLOT – MAY 1974 EVENT (TOWNSHIP)



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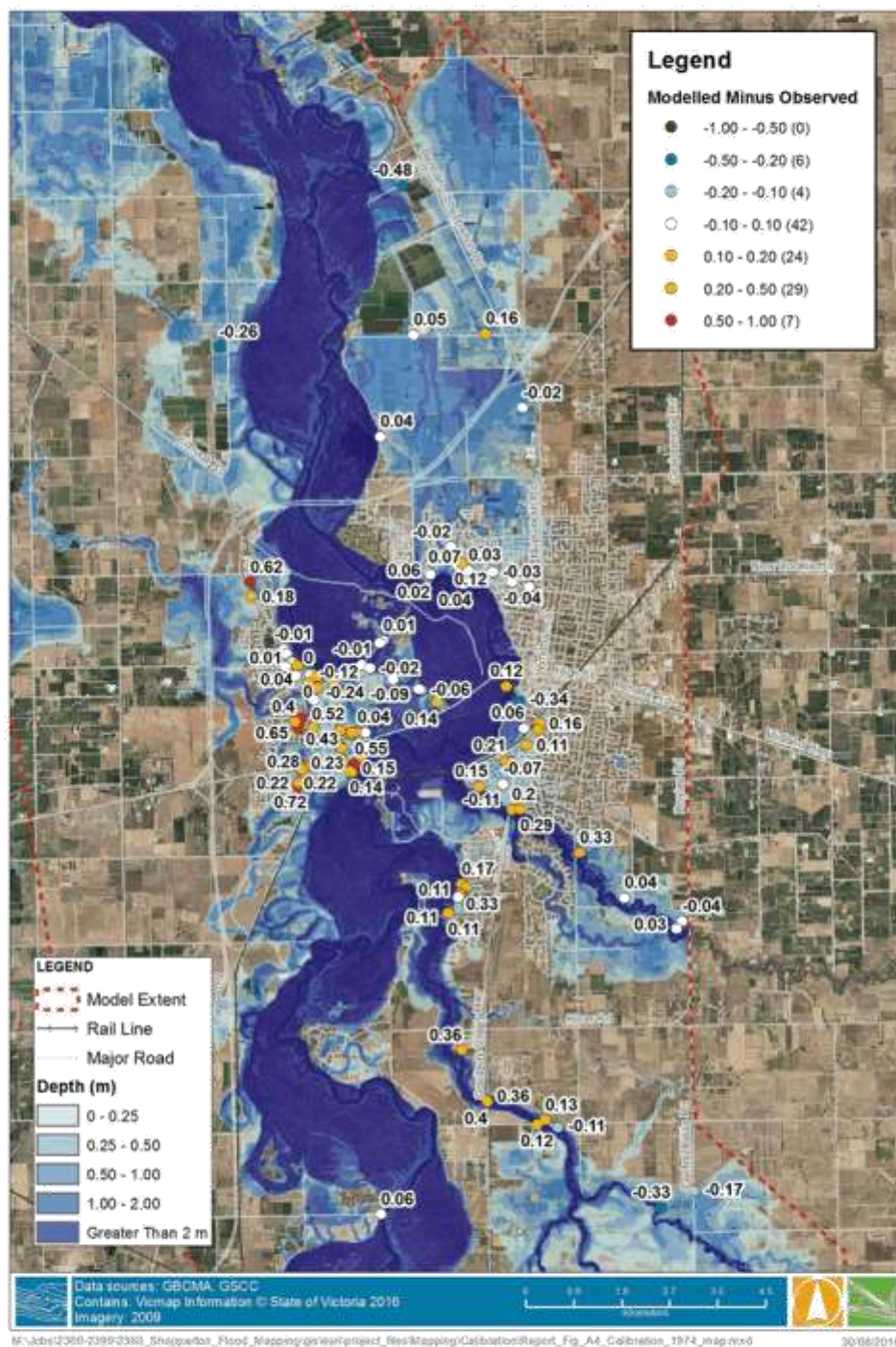


FIGURE 5-18 HYDRAULIC MODEL VALIDATION PLOT – MAY 1974 EVENT



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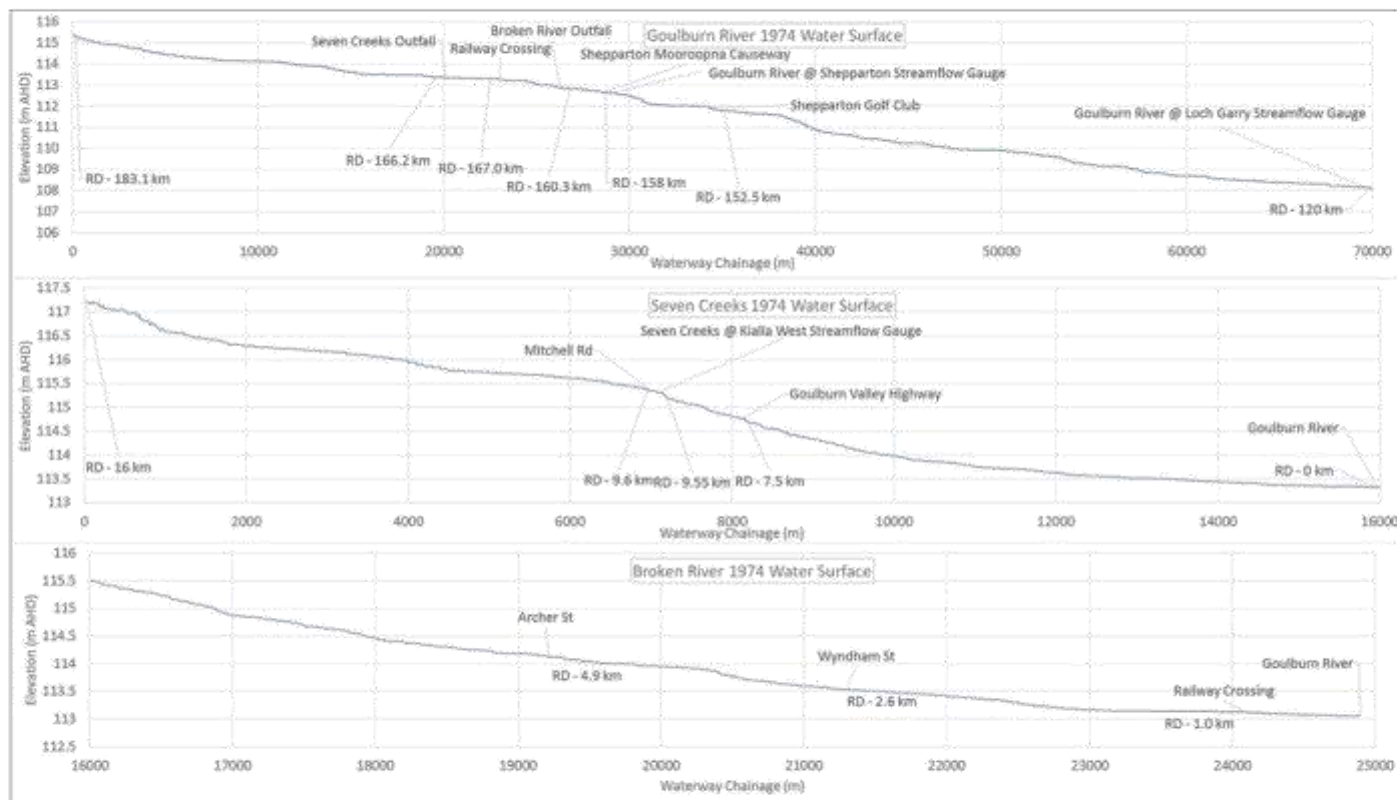


FIGURE 5-19 MAY 1974 - WATER SURFACE PROFILES



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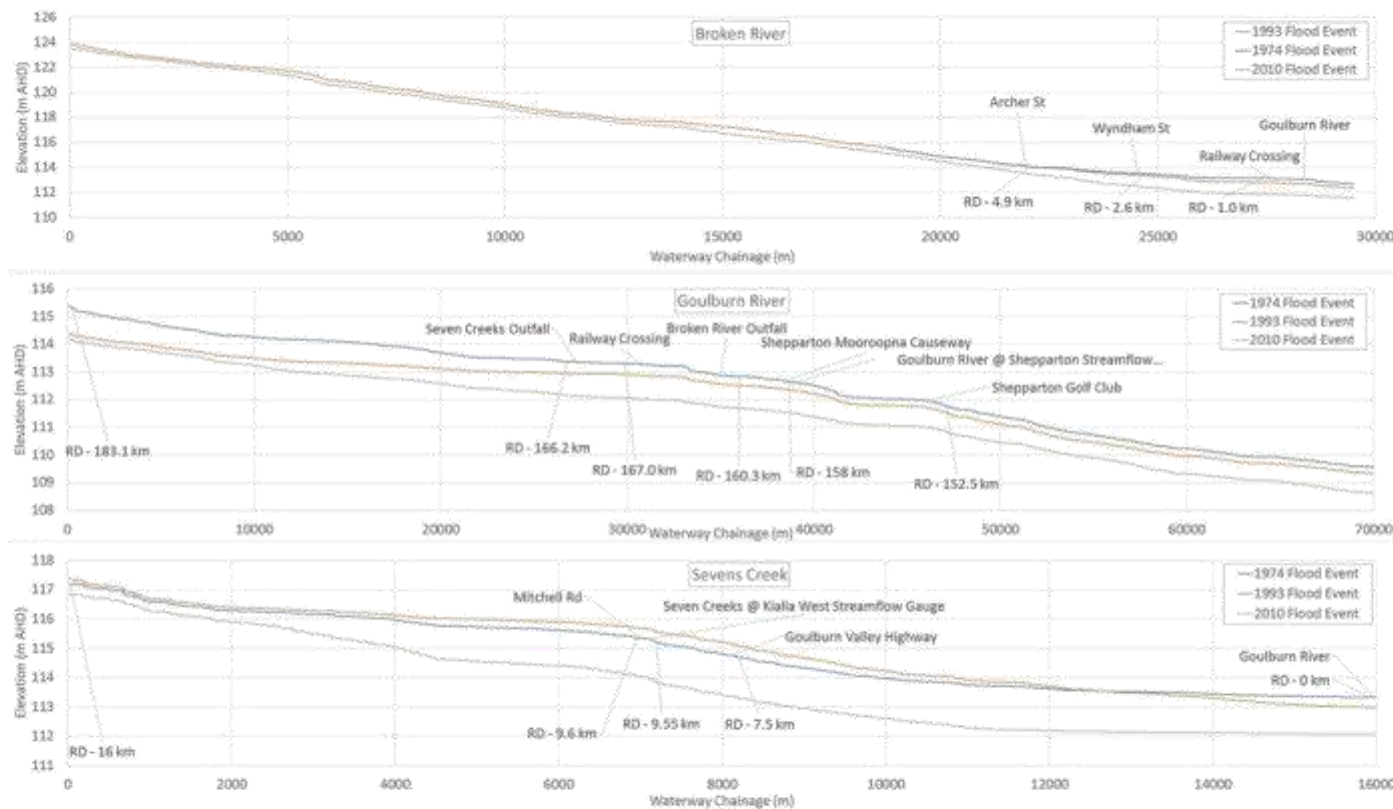


FIGURE 5-20 CALIBRATION EVENT SUMMARY - WATER SURFACE PROFILES



5.4.5 Hydraulic Model Calibration Summary

The hydraulic model calibration and validation results demonstrated the ability of the model to represent the flood behaviour for Shepparton and surrounding areas for the May 1974, October 1993 and September 2010 flood events. The modelling demonstrates that the events were quite different in nature with May 1974 being a Goulburn River dominated event whilst October 1993 and September 2010 were Broken River and Seven Creeks dominant events.

The October 1993 event and May 1974 event inundated approximately 30 and 600 residential and commercial buildings above floor respectively because of large breakouts from the Goulburn River, Broken River and Seven Creeks (SES, 2013). The September 2010 event resulted in damage to 13 houses and 31 structures. It is noted that increased development along the Broken River near Shepparton means that a flood of the magnitude of October 1993 would result in many more properties being affected if it were to occur again.

The model results for the May 1974, October 1993 and September 2010 floods replicated the observed flood behaviour through Shepparton and surrounding areas quite accurately; this was confirmed by a comparison to observed flood marks, aerial images as well as gauged data. A summary of the peak flood levels at the Shepparton gauge is shown in Table 5-3.

TABLE 5-3 COMPARISON OF PEAK FLOOD LEVELS AT SHEPPARTON GAUGE

Flood Level	1974	1993	2010
Observed	112.21 m AHD	111.84 m AHD	111.21 m AHD
Modelled	112.19 m AHD	111.95 m AHD	111.19 m AHD
Comparison	-0.02 m	+0.11 m	-0.02 m

Throughout the course of the lengthy calibration process, the sharing of information with Greater Shepparton City Council and the Goulburn Broken CMA has allowed for independent checking of results. This careful interrogation has led to a successful calibration which is considered fit for purpose for design event modelling.



6 DESIGN FLOOD MODELLING

The design hydrographs were generated for 15 flood events ranging from a gauge height of 9.5 m up to 12.5 m at the Shepparton gauge, Table 6-1.

Each of these gauge increments was replicated across three scenarios;

- A Goulburn dominant event – where the Goulburn River was the dominant flooding mechanism at the Shepparton gauge, like the 1974 flood event.
- A Broken/Seven dominant event – where the Broken River and Seven Creeks are the dominant flooding mechanism within Shepparton, like the 1993 flood event.
- A neutral flood event – where the flood magnitude of all events is approximately the same.

The peak flow and approximate AEP of the 45 combinations as well as the PMF design flows are shown in Table 6-2. Several iterations of design model scenarios were run to achieve the target flood levels at Shepparton, with tributary flows slightly changed. Sensitivity modelling as outlined in Section 6.1 was also conducted.

TABLE 6-1 GOULBURN RIVER AT SHEPPARTON DESIGN LEVELS TO BE MODELLED

Event	Goulburn River @ Shepparton Gauge Height (m AHD)	Goulburn River @ Shepparton Gauge Level (m)
Minor Flood	109.627	9.5
20-10%	110.227	10.1
Moderate Flood	110.827	10.7
10%	111.027	10.9
Major Flood 2010	111.127	11.0
10-5%	111.227	11.1
5%	111.427	11.3
5-2%	111.627	11.5
1993	111.827	11.7
2%	112.027	11.9
1974	112.227	12.1
1%	112.327	12.2
0.5%	112.427	12.3
0.2%	112.627	12.5



TABLE 6-2 FLOOD MAPPING TRIBUTARY FLOW COMBINATION MATRIX

Event	Goulburn River at Shepparton Gauge (m)	Goulburn Dominant			Broken/Seven Dominant			Neutral		
		Goulburn River Flow	Broken River Flow	Seven Creeks Flow	Goulburn River Flow	Broken River Flow	Seven Creeks Flow	Goulburn River Flow	Broken River Flow	Seven Creeks Flow
Minor Flood	9.5	19,100 ML/d	6,000 ML/d	4,300 ML/d	13,000 ML/d	8,700 ML/d	6,000 ML/d	15,000 ML/d	7,800 ML/d	5,200 ML/d
		1EY	2EY	1EY	1EY	50% AEP	1EY	1EY	50% AEP	1EY
	10.1	34,900 ML/d	12,500 ML/d	11,000 ML/d	24,300 ML/d	21,600 ML/d	11,200 ML/d	32,000 ML/d	13,800 ML/d	11,300 ML/d
		50% AEP	50% AEP	50% AEP	1EY	20% AEP	50% AEP	50% AEP	50% AEP	50% AEP
	10.5	43,200 ML/d	13,000 ML/d	11,000 ML/d	34,900 ML/d	18,000 ML/d	18,800 ML/d	39,700 ML/d	15,600 ML/d	18,300 ML/d
		50-20% AEP	50% AEP	50% AEP	50% AEP	20% AEP	50-20% AEP	50-20% AEP	20% AEP	50-20% AEP
Moderate Flood	10.7	52,300 ML/d	18,100 ML/d	11,300 ML/d	34,900 ML/d	32,700 ML/d	29,400 ML/d	45,800 ML/d	17,300 ML/d	22,500 ML/d
		20% AEP	20% AEP	50% AEP	50% AEP	5% AEP	20-10% AEP	20% AEP	20% AEP	20% AEP
	10.9	56,200 ML/d	28,100 ML/d	11,300 ML/d	36,700 ML/d	34,700 ML/d	35,400 ML/d	54,400 ML/d	20,700 ML/d	28,500 ML/d
		20-10% AEP	10-5% AEP	50% AEP	50% AEP	5% AEP	10% AEP	20% AEP	10% AEP	20-10% AEP
Major Flood (2010)	11	62,600 ML/d	10%	13,800 ML/d	40,300 ML/d	37,400 ML/d	38,900 ML/d	69,100 ML/d	24,200 ML/d	32,000 ML/d
		20-10% AEP	20% AEP	50% AEP	50% AEP	5-2% AEP	10-5% AEP	10% AEP	10% AEP	10% AEP
	11.1	69,100 ML/d	24,200 ML/d	32,000 ML/d	43,200 ML/d	42,300 ML/d	42,300 ML/d	62,000 ML/d	25,900 ML/d	32,800 ML/d
		10% AEP	10% AEP	10% AEP	50-20% AEP	2% AEP	5% AEP	10% AEP	10% AEP	10% AEP
	11.3	82,000 ML/d	27,600 ML/d	18,100 ML/d	51,800 ML/d	46,700 ML/d	49,200 ML/d	73,400 ML/d	30,200 ML/d	33,700 ML/d
		10-5% AEP	10-5% AEP	20% AEP	20% AEP	2-1% AEP	5% AEP	10% AEP	5% AEP	10% AEP
	11.5	92,900 ML/d	30,200 ML/d	22,500 ML/d	60,500 ML/d	50,100 ML/d	56,200 ML/d	86,400 ML/d	34,600 ML/d	36,800 ML/d
		5% AEP	5% AEP	20% AEP	20-10% AEP	1% AEP	5-2% AEP	10-5% AEP	5% AEP	10% AEP
1993	11.7	108,800 ML/d	34,600 ML/d	26,400 ML/d	77,800 ML/d	53,600 ML/d	62,200 ML/d	96,800 ML/d	37,800 ML/d	40,600 ML/d
		5-2% AEP	5% AEP	20-10% AEP	10% AEP	1% AEP	2% AEP	5% AEP	5-2% AEP	10-5% AEP
		138,200 ML/d	43,200 ML/d	34,600 ML/d	111,400 ML/d	57,500 ML/d	68,600 ML/d	121,00 ML/d	44,000 ML/d	49,700 ML/d



Event	Goulburn River at Shepparton Gauge (m)	Goulburn Dominant			Broken/Seven Dominant			Neutral		
		Goulburn River Flow	Broken River Flow	Seven Creeks Flow	Goulburn River Flow	Broken River Flow	Seven Creeks Flow	Goulburn River Flow	Broken River Flow	Seven Creeks Flow
	11.9	2-1% AEP	2% AEP	10% AEP	5-2% AEP	1% AEP	2-1% AEP	2% AEP	2-1% AEP	5% AEP
1974	12.1	151,200 ML/d	47,500 ML/d	35,900 ML/d	116,600 ML/d	58,800 ML/d	69,100 ML/d	137,400 ML/d	60,500 ML/d	58,800 ML/d
		1% AEP	5-2% AEP	10% AEP	5-2% AEP	1% AEP	2-1% AEP	2-1% AEP	0.5-0.2% AEP	5-2% AEP
	12.2	162,500 ML/d	53,100 ML/d	36,700 ML/d	125,300 ML/d	71,300 ML/d	79,500 ML/d	164,200 ML/d	71,700 ML/d	79,500 ML/d
		1% AEP	1% AEP	10-5% AEP	2% AEP	0.2% AEP	1% AEP	0.50% AEP	0.20% AEP	1% AEP
	12.3	216,000 ML/d	69,100 ML/d	69,100 ML/d	155,500 ML/d	86,400 ML/d	88,100 ML/d	186,600 ML/d	75,600 ML/d	82,100 ML/d
		0.50% AEP	0.2% AEP	2% AEP	1% AEP	0.2-0.1% AEP	0.50% AEP	0.5-0.2% AEP	0.2% AEP	1-0.5% AEP
	12.5	259,200 ML/d	82,100 ML/d	82,100 ML/d	190,100 ML/d	151,200 ML/d	151,200 ML/d	216,000 ML/d	121,000 ML/d	121,000 ML/d
		0.2-0.1% AEP	0.2-0.1% AEP	1% AEP	0.2% AEP	0.10% AEP	0.2-0.1% AEP	0.2-0.1% AEP	0.2-0.1% AEP	0.20% AEP
	PMF	1,330,000 (ML/D)	388,000 (ML/D)	622,000 (ML/D)	Note that Broken/Seven dominant events may show high Goulburn River flows to achieve some of the higher gauge levels at Shepparton.					



6.1 Timing Sensitivity Analysis

Two preliminary design events were modelled using the timing methodology mentioned in Section 4.4.2. A further sensitivity analysis of the timing of the three peak inflows entering the model was undertaken to assess the water level differences experienced downstream of the confluences of the Goulburn River with the Seven Creeks and Broken River. While it is unlikely that a flood occurring in Shepparton would have the peak flow from the three river systems combining at the same time, it is important to assess the impact that a combination of this nature can have.

A comparison of the Goulburn River dominant and Broken River/ Seven Creeks dominant flood events with the adopted design hydrograph timing compared to the adopted design hydrographs phased so the peaks at the inflow locations align is shown in Figure 6-1. The impact at the Shepparton gauge for the aligned tributary peak scenario is shown in Table 6-3. Note that the tributary inflows could be phased so that the peaks at Shepparton aligned more closely and the impacts on level at the Shepparton gauge may be more pronounced than the scenario presented.

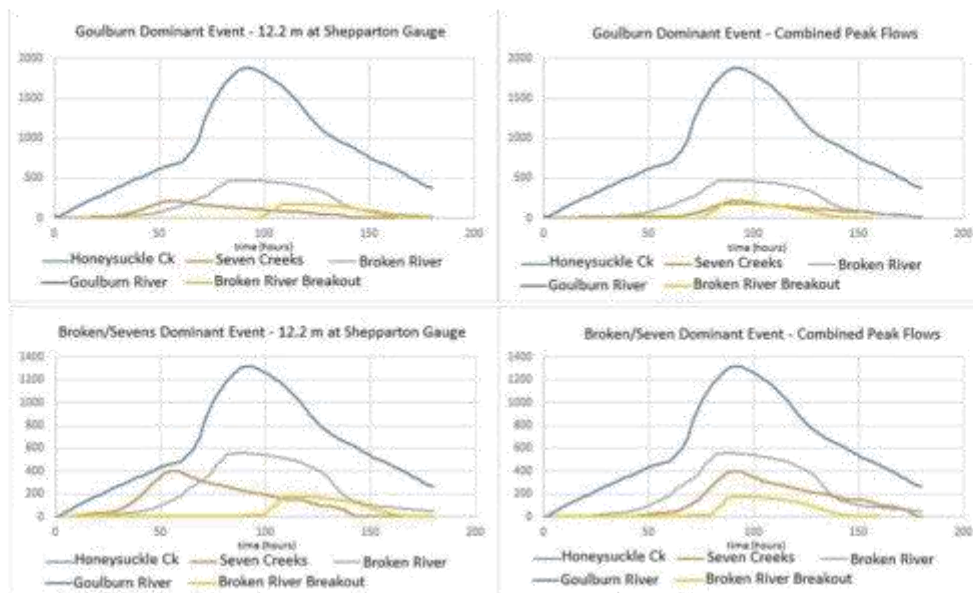


FIGURE 6-1 INFLOW HYDROGRAPHS FOR SENSITIVITY ANALYSIS OF TRIBUTARY TIMING

TABLE 6-3 IMPACTS OF TRIBUTARY TIMING AT THE SHEPPARTON GAUGE

Flow Event	Flood Level at Shepparton Gauge (m AHD)	Flow at Shepparton Gauge (ML/d)
Goulburn Dominant Design Event	112.28	222,100
Goulburn Dominant Combined Peak	112.38	241,800
Broken/Seven Dominant Design Event	112.21	205,718
Broken/Seven Dominant Combined Peak	112.36	237,600



As expected, more closely aligning the peaks of the inflows resulted in an increase in flood levels at Shepparton. It showed not only an increase downstream of the confluences but also back up the three tributary systems. The Broken/Seven dominant event showed a larger increase in flood levels (generally 100-200 mm) compared to the Goulburn dominant event (50-100 mm increase). The peak flows through the causeway increase significantly with the peaks aligned. Given the various catchment sizes of the contributing tributaries it is unlikely that they will align perfectly, and the design assumption is based on observations from historic events.

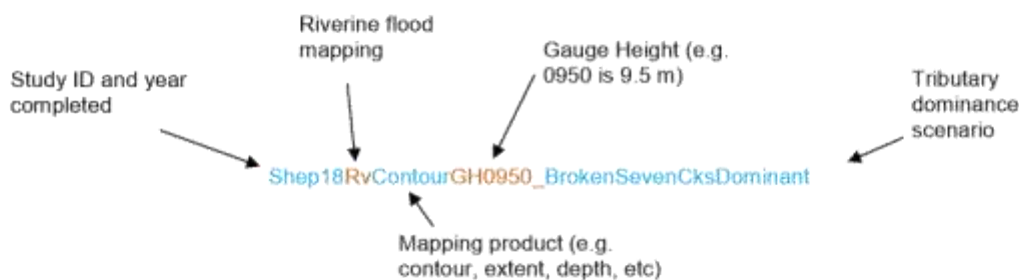
6.2 Design Flood Mapping

Flood mapping was produced for each of the gauge height increments for all three tributary dominance scenarios. For final design mapping of each gauge height increment, the three tributary dominance scenarios were combined, taking the maximum of the dominance scenarios.

Each scenario modelled was processed to produce mapping following the Victoria Flood Database (VFD) version 2 specifications. The VFD outputs included the following:

- Flood surface elevation contours at 200 mm intervals;
- Flood surface elevation grids (10 m grid resolution);
- Flood depth grids (10 m grid resolution);
- Flood velocity grids (10 m grid resolution);
- Flood hazard grids (velocity x depth at 10 m grid resolution);
- Flood extent polygons;
- Floor level survey points (9,355 floors); and
- Various VFD tables describing the study.

The VFD data was supplied as a geodatabase (Shep18Rv_VFD2_V9_Rev_07.gdb) to the Goulburn Broken CMA. The naming of the flood mapping products followed the naming convention below:



6.3 Online Flood Portal

To ensure that not only government agencies had access to the flood mapping developed during this study, but that community had access to the flood mapping, a cloud-based flood mapping portal was developed. At the time of writing this report the portal was online and accessible via www.floodreport.com.au but it is likely that the website will change in the near future to accommodate more townships to be displayed. This will see the addition of a landing page with easy links to the individual township flood mapping portals and possibly links to other sites of interest and general flood information.



The flood portal allows users to view flood depth maps across the range of events considered in this study, see Figure 6-2. Users can also click on a property parcel or search for an address and generate a property specific flood report, see Figure 6-3. This PDF report will generate a summary table of the water level, depth and velocity across the property, a 1% AEP flood map of the property of interest and a flood preparedness table which shows the water level at the property for all the modelled Goulburn River at Shepparton scenarios. If the property has a surveyed floor level, it will also show the depth of flooding above or below floor for that property. Note that not all properties within Shepparton have a recorded floor level. Floor levels were surveyed as part of the previous flood study (SKM, 2002), and since that time new developments should have been built with floor levels a minimum of 300 mm above the 1% AEP flood level. There is also the possibility that some buildings have been altered with raised floors, or have been demolished and built new, so floor levels may differ from that surveyed during the 2002 study.

The flood portal was developed by HydroLogic, the developers of the HydroNET platform. Water Technology is the Australian distributor of HydroNET.

A standalone user guide was developed to help users with the flood portal, the user guide can be accessed by clicking on the 'User Guide' link above the map.

Given the flood mapping is accessible via the flood portal, and the number of flood mapping scenarios mapped was so large, this report does not include any further flood mapping figures and the reader is encouraged to view the maps via www.floodreport.com.au.

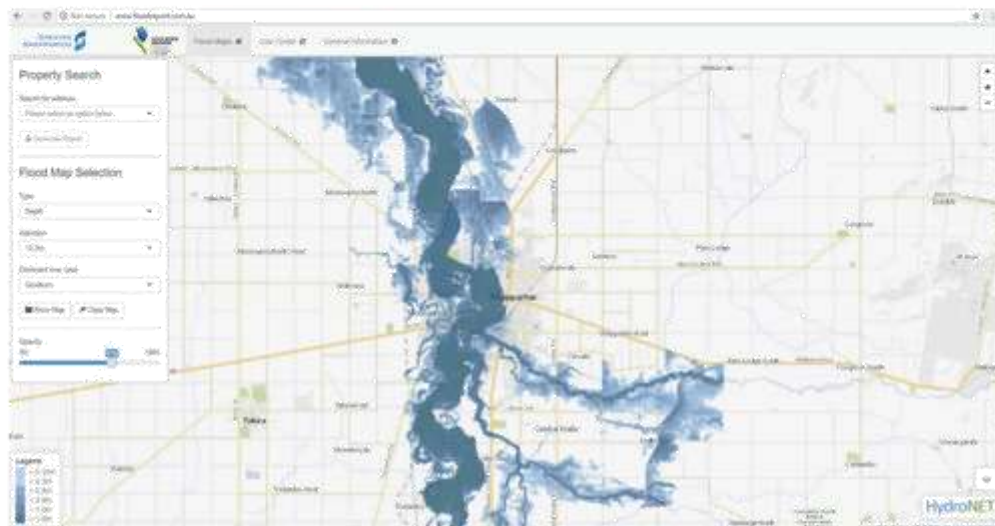


FIGURE 6-2 FLOOD REPORT PORTAL

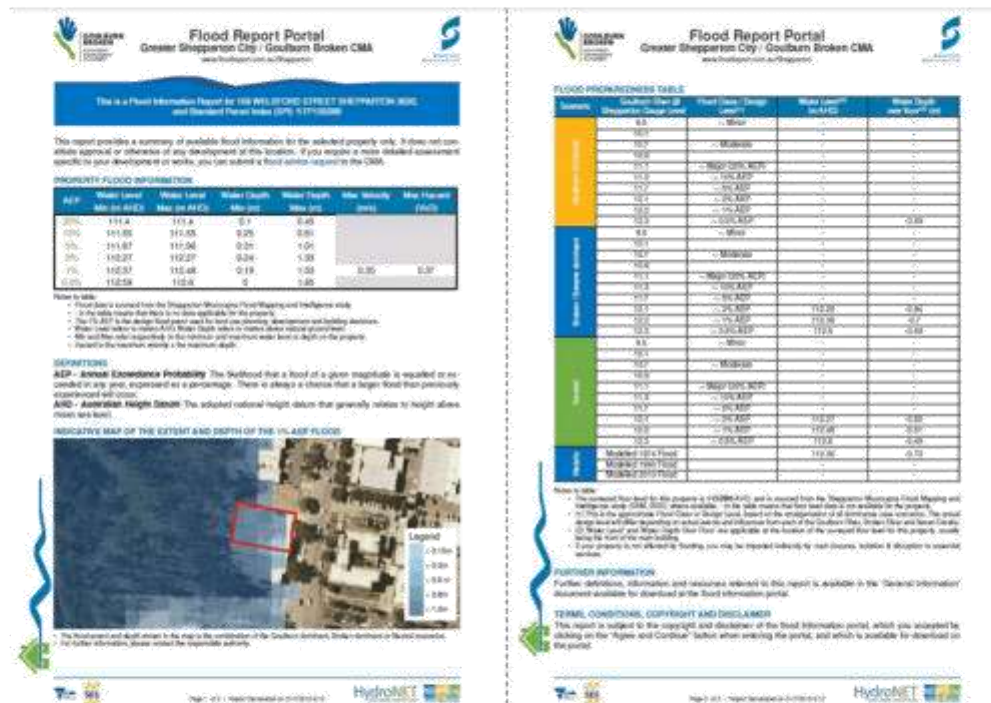


FIGURE 6-3 PROPERTY SPECIFIC FLOOD REPORT

6.4 Comparison to Previous Design Flood Mapping

The flood mapping produced in this study has improved on the previous flood mapping through advancements in topography survey (LIDAR), significantly improved modelling approaches and computer software/hardware, better representation of levees, roads and channel embankments through the floodplain. All these improvements led to a very good calibration of three historic flood events (1974, 1993 and 2010), providing confidence in the model's ability to accurately describe flood behaviour throughout the study area. A greater understanding of tributary timing and breakouts from the Goulburn River, Broken River and Seven Creeks, and their interaction with the East Goulburn Main Channel has also improved model results.

When compared to the previous 1% AEP flood mapping, the new 1% AEP flood mapping shows a very similar extent across the floodplain, with the area of inundation reduced through Kialla West and Mooroopna due to the inclusion of more detailed representation of channel banks and roads which impact on the flood behaviour in those areas. The new 1% AEP flood mapping has therefore reduced the area of flood prone land in the Shepparton, Mooroopna and surrounding area.

The 1% AEP flood height at the Goulburn River at Shepparton gauge has not changed, it remains at 12.2 m. The flood level contours across the study area are similar to the previous flood mapping but vary slightly due to the improved representation of key features throughout the floodplain.



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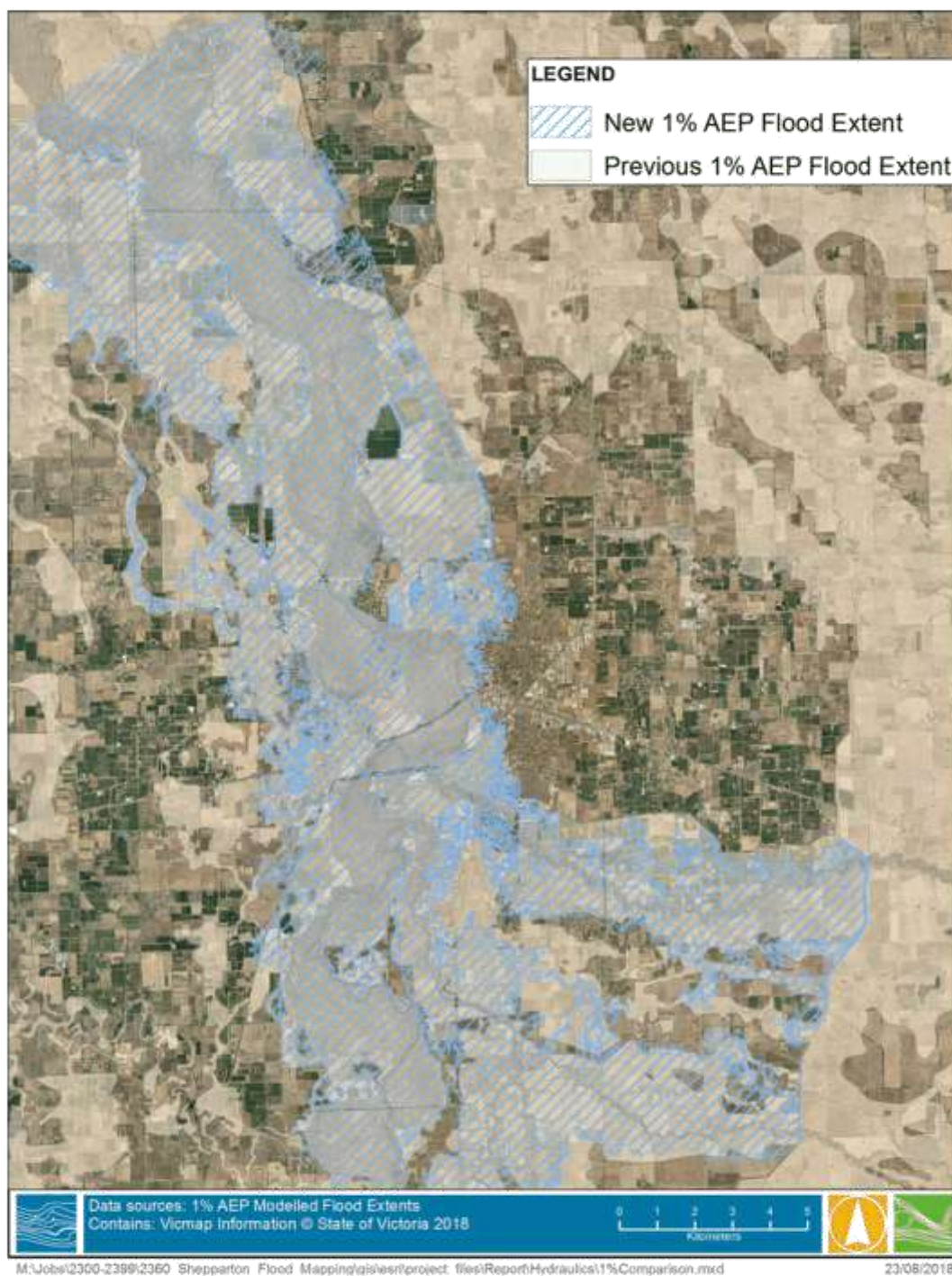


FIGURE 6-4 COMPARISON BETWEEN NEW AND PREVIOUS 1% AEP FLOOD MAPPING



7 FLOOD INTELLIGENCE

Water Technology partnered with Michael Cawood & Associates to develop flood intelligence information for the Shepparton-Mooroopna Flood Mapping and Flood Intelligence Study. The major flood intelligence deliverable was an update to the **Greater Shepparton City Council Flood Emergency Plan: A Sub-Plan of the Municipal Emergency Management Plan**. The flood intelligence is summarised in this section, but readers are referred to the Flood Emergency Plan for more detail.

7.1 Flood Warning System and Flood Class Level Review

In 2006, Water Technology published a report as part of the Shepparton-Mooroopna Flood Warning and Emergency Management Project that reviewed the then flood warning arrangements and flood class levels for the study area and presented a draft Flood Forecast and Warning Service Charter (Water Technology, 2006). The Charter was founded on the Total Flood Warning System (TFWS) concept (EMA, 2009), but confined itself to the prediction, interpretation, message construction and review aspects of the TFWS for Shepparton and Mooroopna.

A TFWS (EMA, 2009), typically includes the following elements:

- **Data Collection and Collation** – rain and river gauges, data management and display systems.
- **Prediction** – estimating the flood magnitude and time of onset of particular levels of flooding.
- **Interpretation** – identifying the impacts of the predicted flood levels on the community at risk.
- **Flood Warning Message Construction** – defining the content of the message, describing what is happening, the expected impact and what action should be taken.
- **Message Communication** – disseminating warning information in a timely fashion to people and organisations likely to be affected by a flood.
- **Response** – generating appropriate and timely actions from the community and from the agencies involved.
- **Flood Awareness** – material aimed at raising awareness of flood risk and what to do in the lead up to and during a flood.
- **Review** – examining the various aspects of the system with a view to improving performance.

The Service Charter summarised the prediction requirement as follows:

To enable the maximum use of available flood intelligence and streamflow and rainfall data in the effective response to a flood event, flood predictions are required at the following gauges:

- Goulburn River at Murchison;
- Goulburn River at Arcadia Downs;
- Goulburn River at Shepparton;
- Seven Creeks at Kialla West; and
- Broken River at Orrvale.



The Service Charter went on to clarify agency roles and responsibilities in relation to flood predictions and, following a description of the flood inundation mapping available, outlined a process for selecting the most appropriate map set to inform emergency flood response. This was an important element of the Service Charter as Goulburn-Murray Water (G-MW) were keen to relinquish the lead role they had occupied for some considerable time in providing flood forecasts for Shepparton and the surrounding area.

Messaging requirements were outlined in the Service Charter and agency roles and responsibilities clarified. Of particular note is the requirement that:

"all warning information for the project area shall be contained in a set of single flood warning messages applicable to the entire project area. Rather than warning information.....being contained in separate.....messages for the Goulburn River, Broken River and Seven Creeks respectively."

Requirements relating to message content, warning lead times and update times were also documented. An operational review and update process for the Service Charter was also detailed.

7.1.1 Current Status of TFWS Elements

7.1.1.1 Data Collection and Collation

The current network of telemetered rain and river gauges upstream of Shepparton provide suitable information to support the TFWS for Shepparton and Mooroopna.

Rainfall data is available at 3-hourly intervals during smaller floods and more frequently during large floods. Weather radar also covers the area. River level data is available more frequently. Rain and river data, including the latest radar and satellite imagery, is available from the Bureau of Meteorology (BoM) website and through FloodZoom.

The City of Greater Shepparton is a contributing member of the Regional Surface Water Monitoring Partnership which ensures that all data is quality assured and stored in an accessible database, and that the gauge sites and equipment are covered by comprehensive routine and fault fix maintenance arrangements.

7.1.1.2 Prediction

BoM provide quantitative flood forecasts (BoM, 2015) for the following sites near Shepparton:

- Goulburn River at Murchison;
- Goulburn River at Shepparton;
- Seven Creeks at Kialla West; and
- Broken River at Orrvale.

A forecast is not provided for the Goulburn River at Arcadia Downs (also known as Goulburn River at Kialla West) site (AWRC 405270: BoMSN 581022), despite the requirement being documented and discussed in the Service Charter (Water Technology, 2006). Sometime after December 2011, but before the release of the first version of the Service Level Specification for Flood Forecasting and Warning Services for Victoria in 2013, the BoM dropped the flood class levels for this site, relegated it to data location status and began referring to it as Goulburn River at Kialla West rather than Goulburn River at Arcadia Downs. Before the site was relegated to data location status, BoM updated the flood class levels to reflect the levels specified in the Service Charter (Water Technology, 2006) and adopted those levels for operational use.



The requirement for a quantitative flood forecast for this site has increased following this study. The mapping requires a (forecast) level at the upstream forecast locations, including at the Goulburn River at Arcadia Downs (Kialla West) gauge, to enable determination of dominance and the most appropriate flood mapping set. This drives flood response, e.g. which roads will be affected first, which properties will be flooded, what community assets will be inundated, where sandbags will be required to minimise damage and disruption, etc.

It appears, based on experience during flood events over the past few years, that BoM have adopted a cautious approach to the issuing of flood forecasts for Murchison, Orrvale, Seven Creeks at Kialla West and Shepparton. To enable informed planning for evacuation etc. during an event (flooding causes substantial disruption within Shepparton's communities, there are more than 9,000 properties at risk of flooding, and upstream peak levels are key to determining flood dominance and therefore which inundation map set is most appropriate), an early "heads up" forecast is required. This is often left to a flood specialist in the Incident Control Centre (ICC) to develop, as the official BoM flood forecast is often issued much later, closer to the peak of the flood.

The flood class level review documented in the Service Charter was revisited as part of this review. While the updated modelling in this project has resulted in some changes to the water surface profiles through the study area, the flood class levels for all locations are still relevant. The triggering consequences in the definition for each class of flooding are occurring at about the same levels as identified previously even though the situation is complicated by which of the Goulburn, Broken-Seven or neutral dominance scenarios should be used for flood intelligence. It is evident that the flood class levels for each of the forecast locations do not need to change. The levels previously used for the Goulburn River gauge at Arcadia Downs (Kialla West) should be reinstated (i.e. 9 m, 10.4 m & 10.7 m). The naming of this gauge should also revert to Goulburn River at Arcadia Downs, so as not to confuse the gauge site with Seven Creeks at Kialla West.

A summary of the current flood class levels is provided in Table 7-1.

TABLE 7-1 FLOOD CLASS LEVELS

Flood Class Level	Goulburn River at Shepparton	Goulburn River at Arcadia Downs	Broken River at Orrvale	Seven Creeks at Kialla West
Minor	9.5 m	9.0 m	6.8 m	4.5 m
Moderate	10.7 m	10.4 m	7.2 m	5.0 m
Major	11.0 m	10.7 m	7.9 m	6.0 m

7.1.1.3 Interpretation

The Shepparton Municipal Flood Emergency Plan (MFEP) has been substantially updated to include flood intelligence from all recent flood and related studies. The work has included development of flood intelligence cards that include consequences across a range of flood levels, for key locations.

A companion spreadsheet of properties likely to be flooded over-ground and over-floor, with expected depths for various increments on the Shepparton gauge, has also been prepared.

The flood maps produced during this study are key to interpreting flood risk and consequences and when used in conjunction with the summary information contained in the MFEP, can inform the development of a targeted emergency response to flooding.

The part of the MFEP that deals with Shepparton, Mooroopna, Kialla and Kialla West includes a set of simple to apply flood forecast tools. These tools can be used to develop a heads-up flood forecast for Shepparton (and the upstream locations) before Benalla, Euroa or Goulburn Weir have peaked. This enables flood



dominance to be determined and an appropriate flood map set to be selected at an early stage. This facilitates early planning for and implementation of flood response activities. It also informs community messaging.

To facilitate use of the latest MFEP within an ICC, it should be loaded to FloodZoom along with the spreadsheet of properties likely to be flooded and all flood mapping layers supplied to Goulburn Broken CMA as discussed in Section 6.2.

7.1.1.4 Flood Warning Message Construction

While BoM provide a standardised product, the matters raised through the Service Charter (Water Technology, 2006) have been mostly addressed. A gap does however exist in the value adding that could occur within an ICC to aid a community's understanding of what the BoM forecast flood height means in terms of local consequences. One way of closing this gap would be to develop, during non-flood periods, a suite of pre-scripted warning messages that include the value-added material for a range of gauge heights. The intelligence required to populate such messages is available in the MFEP and supported by the updated flood mapping. Keys and Cawood (2009) provides additional commentary on this subject.

7.1.1.5 Message Communication

BoM continues to use the wider media to disseminate flood warnings as does VicSES.

The demise of Xpedite, the message delivery system subscribed to by Greater Shepparton City Council in the mid-2000's to disseminate flood warnings to those at risk within Shepparton and Mooroopna, appeared initially to present a few problems. However, with Emergency Management Victoria (EMV) establishing the VicEmergency website and App, that service has been replaced. All warnings issued by BoM and VicSES are available on the website and are "pushed" to users of the App. Shepparton residents would be well advised to access the App and/or the website when flood threatens.

7.1.1.6 Response

With the adoption of AIIMS 4 and the inclusion of technical expertise in the ICC coupled with access to current flood intelligence through MFEP's and flood mapping available through FloodZoom, flood response has improved markedly over the past few years. Many of the issues raised by Comrie (2011) relating to this aspect of the TFWs have been addressed.

7.1.1.7 Flood Awareness

As part of this study, Water Technology has developed a web-based flood and property information portal for community use, www.floodreport.com.au. The portal enables flood maps to be visualised for the various dominance scenarios (e.g. neutral, Goulburn River dominant, Broken-Seven dominant) for a range of Goulburn River at Shepparton gauge heights, as well as allowing the download of a property specific flood report linking gauge heights to flood depths and floor levels.

The maps display the modelled inundation for 14 different river heights between 9.5 and 12.3 m on the Goulburn River at Shepparton (Dainton's Bridge) gauge. The flood information for a user-specified property is presented as a report that includes all available flood information for that property. See Section 0 for further information.

The maps and reports provide a means for community members to inform themselves of the likelihood of their property being inundated and the likely depths of inundation for a range of levels at the Shepparton gauge. The portal therefore replaces the property charts produced and disseminated in the early 2000's as well as the now out-dated on-line flood map viewing system hosted by Council since the mid-2000's.



Local Flood Guides (LFGs) have been developed and are available from VicSES for Shepparton and Mooroopna and for Murchison. LFGs need to be developed for all other locations for which flood studies have been completed (e.g. Kialla and Kialla West, East Shepparton, Tatura, Merrigum and the rural area upstream of Kialla West) as a step in raising awareness of flood risk in these areas. It is suggested that the Shepparton and Mooroopna LFGs could be updated with a link to the flood and property information portal once it is made public, to assist in raising community flood awareness.

7.1.1.8 Review

The review process that forms part of the Service Charter (Water Technology, 2006) has not been activated to date. It is apparent that there would be significant value in doing so as it would again draw stakeholder attention to matters that are crucial to improving the TFWS for Shepparton and Mooroopna.

TFWS performance during recent events (most recently in early December 2017) indicate that the TFWS is reasonably well developed. Operational processes seem to be working well with close cooperation between key agencies who openly share data and other information. There are however several actions that are considered key to further performance improvements:

- BoM to consider elevating the Goulburn River at Arcadia Downs (Kialla West) site from data location to forecast location. This is critical to improved flood response within Shepparton and Mooroopna.
- BoM to consider changing the name of the Goulburn River at Kialla West back to Goulburn River at Arcadia Downs (as it was previously known), to avoid confusion with Seven Creeks at Kialla West.
- BoM to consider providing earlier heads-up type forecasts for Shepparton and the immediate upstream locations so that flood response planning and community messaging can proceed with some lead time.
- Upload new flood intelligence information and flood mapping to FloodZoom so that it is available to inform future operations and messaging/warnings.
- Sharing of the updated flood mapping with the Shepparton community via the community web-based flood portal to raise flood awareness.
- Promotion of the VicEmergency website and App.
- Review exiting LFG's for accuracy and consistency with the MFEP, update to include information regarding the community web-based flood portal and produce additional LFG's for locations where studies have been completed.
- Develop a suite of pre-written value-added flood warning messages.

7.1.2 Suggested Actions Arising from this Review

The below section includes a series of suggested actions grouped by the responsible agency.

1. To maximise the value inherent in work done to date, it is suggested that the Greater Shepparton City Council, ideally in association with VicSES and with the support of DELWP, formally request that BoM consider the following:
 - Rename the Goulburn River at Kialla West to Goulburn River at Arcadia Downs, as it was previously known.
 - Add Goulburn River at Arcadia Downs (Kialla West) to the list of quantitative forecast locations;
 - Reinstate the previously adopted flood class levels for the Goulburn River at Arcadia Downs (Kialla West) gauge;
 - Provide initial flood predictions based on rainfall and observed / forecast river levels at upstream locations, aimed at maximising lead time without undue concern for forecast precision, for the following sites:



- Murchison – based on forecast outflows from Goulburn Weir;
 - Goulburn River at Arcadia Downs (Kialla West) – based on the forecast level for Murchison;
 - Seven Creeks at Kialla West – based on the forecast level for Euroa;
 - Orrvale – based on the forecast level for Benalla;
 - Shepparton – based on the above forecasts.
2. It is further suggested that Greater Shepparton City Council:
- Arrange for the Shepparton MFEP to be loaded to FloodZoom together with the spreadsheet of properties likely to be flooded along with all flood mapping layers and associated reports.
 - In conjunction with VicSES, actively promote the VicEmergency website and App to the Shepparton, Mooroopna, Kialla and Kialla West communities as part of a flood preparedness and awareness program.
 - Promote the web-based flood portal, www.floodreport.com.au within the Shepparton and Mooroopna communities.
 - Prompt a review of the Shepparton flood forecast and warning service charter (Water Technology, 2006).
3. It is suggested that VicSES:
- Review and update the LFGs for Shepparton, Mooroopna and Murchison so that there is consistency between the LFG's and the MFEP.
 - Produce and promote LFG's for other locations within the Municipality.
 - Promote the use of the flood portal for Shepparton and Mooroopna.
 - In conjunction with Greater Shepparton City Council, develop a suite of pre-written value-added flood warning messages.

7.2 Municipal Flood Emergency Plan (MFEP) Summary Information

The major flood intelligence deliverable was an update to the **Greater Shepparton City Council Flood Emergency Plan: A Sub-Plan of the Municipal Emergency Management Plan**. The section below summarises some of the key flood intelligence findings included within the MFEP. For more details, the reader is referred to the MFEP.

7.2.1 Historic Flooding

The MFEP includes a good summary of historic flood events including gauge levels, flows and impacts within the Shepparton and Mooroopna communities, Table 7-2.

Many residents can relate to the October 1993 and September 2010 flood events, because they are recent events. A smaller number of longer term residents will remember the 1974 event. The March 2012 localised rainfall event, which caused small rural creeks to flood in the north-east region of the municipality (and a record flood along Broken Creek), has served to advise that any area may be subject to flooding. The heavy rain event of 27th and 28th February 2013 which resulted in severe flooding through East Shepparton reinforced that message.



TABLE 7-2 MAJOR FLOODS AT GOULBURN RIVER AT SHEPPARTON GAUGE

Flood / Year	Gauge Height (m)	Peak Discharge (ML/d)	Rank
September 1916	12.25	233,300	1
May 1974	12.08	214,000 #	2
1939		161,000	3
October 1993	11.72	160,500 ^	4
1956	11.42	121,000	5
1934		118,400	6
1975	11.24	105,000	7
1924		103,300	8
1958	11.21	103,000	9
1921		97,500	10
September 2010	11.09	81,328 *	11

The Goulburn River at Shepparton gauge has changed locations three times. It was located upstream of Dainton's Bridge from 1968 to 1986. It was moved to the current downstream location in 1986. There is about 100mm head loss through the bridge.

Historic streamflow record, this study has revised the peak flow to 191,000 ML/d.

^ Historic streamflow record, this study has revised the peak flow to 150,000 ML/d.

* Historic streamflow record, this study has revised the peak flow to 78,600 ML/d.

7.2.2 Flood Travel Times

In the case of riverine flooding, the time of travel of a flood peak will be influenced by antecedent conditions. A flood on a 'dry' watercourse will generally travel more slowly than a flood on a 'wet' watercourse (e.g. the first flood after a dry period will travel more slowly than the second flood in a series of floods), and big floods tend to travel faster than small floods. Hence, the size of the flood, recent flood history, soil moisture and forecast weather conditions all need to be considered when using the following information to direct flood response activities.

The characteristics of the first flood after a dry period can be significantly altered by floodwater filling floodplain storage. This phenomenon is particularly important for the floodplain upstream of Shepparton and thus flood volume and dominance (i.e. whether the Broken – Seven Creeks system or Goulburn River or neither will dominate) is a key consideration in determining both travel times and flood attenuation.

Dominance and the timing of flows in the three key contributing catchments (i.e. Goulburn, Broken and Seven) is key to determining peak levels and thus impacts within Shepparton and Mooroopna. The Broken – Seven Creeks system appears to dominate most often with the Goulburn dominating least often.

The Goulburn River, Broken River and Seven Creeks waterways present a significant flood risk to the Shepparton/Mooroopna urban area and the immediate surrounds because their confluences are located within or adjacent to the urban area. A further significant flood risk arises from locally intense storms over urban and peri-urban areas, such as East Shepparton. The generally flat nature and poor drainage characteristics of the East Shepparton area make it particularly vulnerable to intense and heavy continuous rain.



TABLE 7-3 RIVERINE FLOOD TIMING

Location From	Location To	Typical Travel Time	Comments
Riverine Flooding – Goulburn River			
Floods are characterised by steady rises, peaks that extend for a number of hours and recessions that are around one-half to one-third the rate of rise (i.e. takes around 2.5 to 3 times longer). The further down the catchment the longer the peak and the slower the recession. Flood volume determines rise and recession characteristics.			
Eildon	Seymour	48 hours	
Seymour	Goulburn Weir	30 to 40 hours	
Seymour	Murchison	40 to 60 hours	
Goulburn Weir	Murchison	9 to 18 hours	Generally, around 10 hours or a little less. Can be as short as 3 hours
Murchison	Kialla West (Goulburn River)	15 to 25 hours	In 1974, peak on Goulburn at Kialla West occurred 15 hours after the Broken at Orrvale peaked while in 1993 the difference was 60 hours.
Murchison	Shepparton	18 to 30 hours	20 hours or less if Goulburn dominant. 24 to 36 hours if Broken – Sevens dominant. In 1992 & 2010, travel time for peak from Murchison to Shepparton was ~1.5 days.
Kialla West (Goulburn)	Shepparton	Up to 12 hours	When Broken – Sevens dominant, peak at Shepparton can be at the same time or a little before peak at Goulburn at Kialla West.
Shepparton	McCoys Bridge	46 hours	
Shepparton	Echuca	7 days	
Riverine Flooding – Seven Creeks			
The recession at Kialla West is around one-third to one-quarter the rate of rise (i.e. takes around 3 to 4 times longer).			
Euroa	Kialla West (Mitchell Road)	26 to 50 hours	26 to 30 hours for floods ~6m and over at Kialla West. 35 to 48 hours if between 4.5m and 6m but 30 to 36 hours if 2nd flood in past 3 weeks or rain across lower catchment similar to upper catchment.
Kialla West (Seven Cks)	Shepparton	18 to ~60 hours	18 to 21 hours if Broken and Seven Creeks dominant. Time increases towards 30+ hours under neutral conditions but can be as high 60 hours.
Peak at Kialla West (the gauge is located immediately downstream from the Mitchell Road Bridge) occurs around 6 – 24 hours earlier than at the Broken River at Orrvale. Median time is around 15 hours but the usual range is 12-18 hours. In general terms, peak occurs at about the same time as at (or within a few hours of) the Broken River at Gowangardie. Travel time from Kialla West to Shepparton increases as Goulburn dominance builds.			
Riverine Flooding – Broken River			
After a slow peak, the recession at Orrvale is around one-third the rate of rise (i.e. takes around 2.5 to 3 times longer).			
Benalla	Casey's Weir	6 to 12 hours	Tends to cluster around 7 to 9 hours.
Benalla	Gowangardie Weir	18 to 37 hours	Think in terms of 26 to 30 hours but faster if good rain downstream from Benalla or 2 nd flood.
Benalla	Orrvale	31 to 54 hours	Tends to cluster around 36 to 42 hours.
Casey's Weir	Gowangardie Weir	12 to 30 hours	Tends to cluster around 20 – 26 hours.



Location From	Location To	Typical Travel Time	Comments
Gowangardie Weir	Orrvale	10 to 18 hours	Usually in the 13-15 hour range (as per 2003) but ~24 hours in 1993 & 2010.
Orrvale	Shepparton	4 to 40+ hours	Generally, 8 to 14 hours with Broken River dominant. 20 to 28 hours as Goulburn flows increase (Murchison around 7.5m to 8.5m – neutral). 30+ hours with Goulburn dominant and Murchison above flood level.
In general terms, for a Broken – Seven Creeks dominant flood, the peak occurs at Gowangardie a few hours after the peak occurs at Kialla West on Seven Creeks. The difference between peak timings is longer (of order 12+ hours) for a neutral flood. Travel time from Orrvale to Shepparton increases as Goulburn dominance builds.			

To summarise, Shepparton and surrounds will have between 3 and 5 days' notice of the approach of major flooding within the river system. Flash flooding (e.g. East Shepparton) occurs within a few hours.

7.2.3 Flood Consequences

The MFEP contains tables with detailed flood consequence information for Shepparton, Mooroopna and surrounding communities. Those tables are not reproduced in this report. A summary of flood consequences is provided below. Detailed information is available in the MFEP. Emergency response agency staff are encouraged to use a combination of the flood mapping products available through FloodZoom, the MFEP, the excel spreadsheet of properties impacted, and this report, to fully understand likely flood impacts to implement appropriate emergency response actions. Shepparton and Mooroopna community members are encouraged to stay informed via their local emergency broadcaster and via the VicEmergency [website](#) and App. Community members are also encouraged to use the www.floodreport.com.au flood mapping portal to identify the likely impacts at their property of any flood levels forecast for the Goulburn River at Shepparton gauge.

7.2.3.1 Road Access

The main highways to Shepparton will begin to be inundated from around the start of major flooding (i.e. greater than 11.0 m at the Shepparton gauge). Details are provided in the Shepparton flood intelligence card of the MFEP.

- The Midland Highway will be impassable near the eastern boundary of the municipality when the Broken River breaks its banks at Gowangardie.
- The Midland Highway will be wetted in Mooroopna from around 11.66 m and may need to be closed.
- The Midland Highway in Shepparton begins to get wet between Mitchell and Florence Streets from around 12.05 m and may need to be closed.
- The Barnah – Shepparton Road will be wetted to the north of its intersection with the Goulburn Valley Highway from around 11.7 m and may need to be closed.
- The Goulburn Valley Highway will be inundated opposite Victoria Park Lake (north of the railway line) from around 11.4 m as well as north and south of the town.
- The Goulburn Valley Highway will be wetted at the Brauman Street – Pine Road intersection in North Shepparton from around 11.8 m.
- In December 2017, Castle Creek was against the underside of the lower Goulburn Valley Highway Bridge with the Castle Creek at Arcadia gauge showing 2.39 m.
- Some other roads will be closed at creek and river crossings – see the MFEP for details.



7.2.3.2 Evacuation Issues

The majority of properties have satisfactory egress in the event of rising floodwaters. However, there are three (3) locations that may present evacuation issues, if the residents are not notified early. These are:

- Kialla Settlement, Riverview Drive;
- Arcadia Downs Estate; and
- Kidstown Tourist facility.

Evacuation of areas close to the Goulburn River, Broken River and Seven Creeks waterways may be required once the Shepparton gauge is expected to exceed 11.1 m.

7.2.3.3 Caravan Parks

Caravan parks are also susceptible to flooding. The main sites in Shepparton and Mooroopna are:

- Victoria Lake Holiday Park, 536 Wyndham Street or Fitzjohn Road, Shepparton. The grounds begin to flood at around 11.18 m at Shepparton while the first floors begin to flood from about 11.4 m.
- Shepparton Riverside Cabin Park, 8049 Goulburn Valley Highway, Shepparton South. The grounds begin to flood at around 12.0 m at Shepparton.
- Big4 Shepparton Park Lane Holiday Park, 7835 Goulburn Valley Highway, Kialla. The grounds begin to flood at around 12.4 m at Shepparton
- Aspen Lodge Caravan Park, 1 Lawson Street, Mooroopna. The grounds begin to flood at around 11.4m at Shepparton while the first floors begin to flood from about 11.6 m.

7.2.3.4 Property Inundation

The property data on which the following count is based was collected as part of the SKM (2002) study and targeted all land parcels and buildings then determined to lie within the 1% AEP flood extent. It is assumed that all buildings constructed since 2002 have their floors at the 1% AEP flood level plus a minimum of 300 mm freeboard, therefore no further floor levels were collected as part of this study. There are likely to be other properties not included in the count of buildings inundated. Those buildings are likely to be above flood level but inundation on or surrounding the property may be observed. In addition, there may be some buildings which have been redeveloped since 2002 and no longer have the same floor level.

A summary of the number of properties and floors inundated at various levels at Shepparton is provided in Table 7-4.

A full list of all properties affected by flooding (including over-floor) was supplied as a separate Excel spreadsheet and was not added into the MFEP due to the large number of properties. The spreadsheet should be added to FloodZoom to be accessible by emergency flood response agencies. A summary of the properties first impacted by flooding is provided in the MFEP.



TABLE 7-4 PROPERTIES IMPACTED BY FLOODING IN STUDY AREA

Event	Shepparton gauge level (m)	Properties				Floors			
		Flooded and almost flooded	Flooded	Almost flooded	Number of properties not "flood affected"	Flooded and almost flooded	Flooded	Almost flooded	Number of floors not "flood affected"
	10.5	2	2	0	9353	0	0	0	9355
Moderate	10.7	13	10	3	9342	4	4	0	9351
10% AEP	10.9	31	23	8	9324	5	5	0	9350
Major	11	64	36	28	9291	11	9	2	9344
	11.1	164	98	66	9191	18	18	0	9337
5% AEP	11.3	308	193	115	9047	31	28	3	9324
~1993	11.5	498	322	176	8857	64	45	19	9291
	11.7	1337	878	459	8018	142	109	33	9213
2% AEP	11.9	4200	3565	635	5155	800	552	248	8555
~1974	12.1	5742	5065	677	3613	1429	1022	407	7926
1% AEP	12.2	7206	6684	522	2149	2301	1734	567	7054
0.5% AEP	12.3	8134	7777	357	1221	3862	3010	852	5493
0.2% AEP	12.5	8624	8404	220	731	5555	4567	988	3800

Note: The count of floors flooded in the above table, uses data from the previous flood study (SKM, 2002). It does not include properties built in the floodplain since 2002 (but those buildings should have floor levels set at least 300 mm above the 1% AEP flood level. There may also be some buildings which have been redeveloped since 2002 and the floor levels may have changed.

7.2.3.5 Essential Services

During a flood event, ground level electrical substations are at extreme risk and will need to be protected with sandbags. Failure to protect the substations may result in shut down localised outages.

The water treatment plant is well protected but if the levees are breached, water supply will be affected; the town has only a single week's supply of treated water available if the plant were to become inoperable.

The sewerage system will become overloaded if floodwater can flow back into the system through private gully traps and such; all inlets must be closed.

Goulburn Valley Water, the responsible agency for water supply and sewerage management in the City of Greater Shepparton municipal area, has its own detailed response plan which includes details of tasks to be conducted when river levels rise. Their works commence when the level reaches 8.5 m at the Shepparton gauge. Their water treatment plant and sewerage pumps will be adversely affected at a river height of 11.9 m.

If the Shepparton gauge is forecast to reach levels above 12.0 m, the Municipal offices at 90 Welsford Street are impacted and the Municipal Emergency Coordination Centre should be relocated to 315 Doyles Road, Orrvale.



7.2.4 Flood Mitigation

Shepparton, Murchison, Kialla and Undera regions have levees at strategic locations. However, these only provide protection up to just over the Shepparton major flood level of 11.0 m and have been overtopped twice in the past 40 years.

Penstocks are in place on most inlet pipes to the rivers, preventing backflow of floodwaters. The closing and opening of these penstocks is correlated closely to the levels recorded at the 3 major automated flood level gauges on the Broken, Sevens and Goulburn waterways.

There are large volume pumps at some locations to lift and discharge waters when penstocks are closed.

All new subdivisions are being developed with sufficient retardation basin capacity, to slow up the inflow of water into the town stormwater drainage systems.

7.2.5 Flood Forecasting

This study has reviewed and updated an early heads up forecasting procedure for Shepparton and Mooroopna based on upstream gauge levels or flows. The approach requires some knowledge of the catchment and is best used by an experienced flood analyst who knows the catchment. This procedure has not been developed to replace detailed flood forecasts provided by the Bureau of Meteorology. It is designed purely for an early heads up to begin planning for an oncoming flood event.

The approach is outlined in the MFEP and is not reproduced in this report.



8 CONSULTATION PROCESS

The Shepparton-Mooroopna Flood Mapping and Flood Intelligence Study was commissioned in 2012. The purpose of the study was to provide a technical review and update of the previous flood study (SKM, 2002), and to develop updated flood mapping and flood intelligence information for emergency managers and the broader community.

The project was completed in close consultation with Greater Shepparton City Council engineers, planners and emergency managers, Goulburn Broken CMA floodplain managers and the Victoria State Emergency Service.

Initially there were some major data gaps in topography that led to delays in the project. A major issue with the Goulburn River at Murchison streamflow gauge required additional work to improve the flow gauging. This led to the completion of a flood mapping and intelligence study for Murchison, which has provided additional benefit to understanding flood risk in the region. An extensive review and update to the regional hydrology of the Goulburn, Broken and Seven Creeks catchments also led to an improved understanding of design flood flows for the region, resolving some discrepancies which previously existed in prior knowledge. The flood portal was added to the project toward the end of the flood modelling component. Extensive consultation occurred with key stakeholders to ensure the product met their needs and would be flexible enough to allow other Councils to make use of the same service in the future.

Through the many deviations that this project has taken, Water Technology has kept close consultation with Greater Shepparton Council, Goulburn Broken CMA and Victoria State Emergency Service to ensure that the project delivered a high-quality product for the region.

Consultation included a series of technical project meetings either held in Shepparton or Melbourne. At these meetings study progress was reviewed, key data gaps were discussed along with deficiencies and required solutions. The meetings were also important for reaching agreement and sign-off at key decision points and discussing future timelines for delivery. At various stages these meetings included Council planners to ensure they were kept up to date on the study and were aware of the best available flood data for use in land use planning decisions.

During the flood modelling, Water Technology worked very closely with Goulburn Broken CMA to ensure the best possible calibration could be achieved. This involved many hours of sitting with knowledgeable CMA individuals to review and improve the flood mapping, both through calibration and design phases.

The hydrology and hydraulic flood modelling calibration was reviewed by an independent technical review panel process arranged by the Department of Environmental, Land, Water and Planning. This technical review provided increased confidence in the appropriateness of the study method.



9 CONCLUSION AND RECOMMENDATIONS

The Shepparton-Mooroopna Flood Mapping and Flood Intelligence Study provides an improved understanding of flood behaviour through the study area. This will ensure future flood-related planning decisions are based on the best available flood risk information. The study has included:

- Collection and review of data relevant to flooding within the study area.
- A rigorous hydrologic analysis to develop robust design flood estimates for the study area including consideration for the timing and potential combinations of Goulburn River, Broken River and Seven Creeks riverine flooding.
- Development and calibration of a detailed hydraulic model that can predict flood impacts across the complex floodplain.
- Flood mapping of many potential design flood scenarios.
- Development of an online flood mapping portal, www.floodreport.com.au.
- Quantification of flood risk at a property specific level.
- Review of flood warning and emergency response, and an update to the Municipal Flood Emergency Plan.

The key findings and outcomes of the study are summarised below:

- Update to previous design hydrology of the Goulburn River basin, which has resulted in an improved understanding of design flooding throughout the system, including resolution of an earlier discrepancy in relation to the Murchison design flows. The Goulburn River at Murchison gauge rating curve has been updated, and this has officially been incorporated into the gauge rating for large flood flows.
- The hydraulic modelling in the Shepparton, Mooroopna and surrounding areas has been completed at a higher resolution using better topography data compared to the earlier SKM (2002) study. This has resulted in improved flood mapping for the area.
- The flood mapping data has been formatted into the Victoria Flood Database format and has been provided to Goulburn Broken CMA. The flood mapping portal, www.floodreport.com.au, has made the flood mapping accessible to anyone with internet access, and provided a means to obtain property specific flood information to assist in raising community flood awareness.
- A comprehensive review of the flood warning system was completed along with a major update to the Municipal Flood Emergency Plan for Shepparton, East Shepparton, Mooroopna, Kialla, Murchison, Tallygaroopna, Congupna, Katandra West, Tatura and Merrigum.

Following the investigations undertaken for this study it is recommended that:

- **Goulburn Broken CMA**
 - Endorse the flood study and use the flood mapping data to inform floodplain risk management decisions.
 - Upload the Victoria Flood Database mapping data to FloodZoom
 - Work with Greater Shepparton City Council to define the specific criteria for defining flood planning layers using the flood modelling produced in this study. This may include investigation of higher resolution modelling and mapping of the Shepparton, Mooroopna and surrounding area.

**■ Greater Shepparton City Council**

- Endorse the flood study before putting it out for public comment with aim of adopting the flood study and implementing a planning scheme amendment to update the flood related planning overlays.
- Arrange to load the updated MFEP and the excel spreadsheet of property inundation to FloodZoom (Goulburn Broken CMA may be able to assist).
- Review the Shepparton flood forecast and warning service charter (Water Technology, 2006).
- Request that the Bureau of Meteorology consider the following:
 - Rename Goulburn River at Kialla West to Goulburn River at Arcadia Downs, as it was previously known.
 - Add Goulburn River at Arcadia Downs (Kialla West) to the list of quantitative forecast locations.
 - Reinstate the previously adopted flood class levels for the Goulburn River at Arcadia Downs (Kialla West) gauge.
 - Provide initial flood predictions based on rainfall and observed / forecast river levels at upstream locations, aimed at maximising lead time for Goulburn River at Murchison, Arcadia Downs (Kialla West) and Shepparton, Seven Creeks at Kialla West, and Broken River at Orrvale.
- Actively promote the use of the VicEmergency website and App and the flood portal www.floodreport.com.au to the community to improve flood preparedness and awareness.

■ Victoria State Emergency Service with assistance from Goulburn Broken CMA and Greater Shepparton City Council:

- Continue to engage the community through regular flood awareness programs such as the VICSES FloodSafe program.
- Update the Local Flood Guides of Shepparton and Mooroopna and Murchison to reflect the new flood study data and to provide consistency across all documents.
- Develop Local Flood Guides for other locations within the municipality using the updated information contained in this report and the MFEP.
- Develop a suite of pre-written value-added flood warning messages.



10 ACKNOWLEDGEMENTS

Water Technology would like to acknowledge the contributions of Guy Tierney of Goulburn Broken CMA and Greg McKenzie of Greater Shepparton City Council in the completion of this study, and their ongoing commitment to reducing flood risk in the Shepparton, Mooroopna and surrounding areas. We would also like to acknowledge the contributions from our project partners, HydroLogic and Michael Cawood and Associates.



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Greater Shepparton City Council

Flood Emergency Plan

A Sub-Plan of the Municipal Emergency Management Plan

For Greater Shepparton City Council,
VICSES North East Region,
VICSES Unit Tatura and Murchison
and
Shepparton Search & Rescue Squad

Version 2.4 Draft August 2018



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Distribution List

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5		MRM	
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20		Power supplier (Powercor)	
21		Goulburn Murray Water	
22		Goulburn Valley Water	
23		Shepparton Search & Rescue Squad (SS&RS)	
24			
25			

Document Transmittal Form / Amendment Certificate

This Municipal Flood Emergency Plan (MFEP) will be amended, maintained and distributed as required by VICSES in consultation with Greater Shepparton City Council.

Suggestions for amendments to this Plan should be forwarded to VICSES Regional Office North East (Hume) Benalla.

Amendments listed below have been included in this Plan and promulgated to all registered copyholders.

Amendment Number	Date of Amendment	Amendment Entered By	Summary of Amendment
V2.0	March 2018	M Cawood	Update of flood intelligence (Appendices A, B, C, etc) drawing on recent events and flood studies – Shepparton-Mooroopna, East Shepparton, Murchison, Merrigum & Tatura. Checked and adjusted EMMV & VFMS references. Updated agency names as well as Section 4.3 re Animal Welfare. Added references. Selected Appendices reviewed by Ben Tate of Water Technology.
V2.1	June 2018	Ben Tate	As discussed with GSCC, GBCMA, VICSES, MCA – May 2018
V2.2	June 2018	M Cawood	Further edits based on discussion and feedback from GSCC, GBCMA, VICSES. Other minor edits.
V2.3	July 2018	M Cawood	Added flood intel and history for Congupna, Dainton's, Pine Lodge, O'Keefe & Gulfus creeks from the 27Feb2014 report from Greg Sidebottom to GSCC.
V2.4	August 2018	Ben Tate	Changed Flood Class Level table on page 48, had incorrect levels for the Goulburn River at Arcadia Downs site. The updated levels have come directly from Section 5.2.2 from the Flood Warning Service Charter.

This Plan will be maintained on the www.ses.vic.gov.au and www.greatershepparton.com.au websites.

List of Abbreviations & Acronyms

The following abbreviations and acronyms are used in the Plan:

AEP	Annual Exceedance Probability
AHD	Australian Height Datum (the height of a location above mean sea level in metres)
AIIMS	Australasian Inter-service Incident Management System
AoCC	Area of Operations Control Centre / Command Centre
ARI	Average Recurrence Interval
ARMCANZ	Agricultural & Resource Management Council of Australia & New Zealand
AV	Ambulance Victoria
BoM	Bureau of Meteorology
CEO	Chief Executive Officer
CERM	Community Emergency Risk Management
CFA	Country Fire Authority
CMA	Catchment Management Authority
DEDJTR	Department of Economic Development, Jobs, Transport and Resources
DELWP	Department of Environment, Land, Water and Planning (successor body to DSE, DPI and DEPI)
DHHS	Department of Health and Human Services
DoI	Department of Infrastructure
EMMV	Emergency Management Manual Victoria
EMT	Emergency Management Team
EO	Executive Officer
FO	Floodway Overlay
FWS	Flood Warning System
UFZ	Urban Floodway Zone
IC	Incident Controller
ICC	Incident Control Centre
IMT	Incident Management Team
IMS	Incident Management System
EMLO	Emergency Management Liaison Officer
H&HS SEMC	The Health & Human Services State Emergency Management Centre
LSIO	Land Subject to Inundation Overlay
MECC	Municipal Emergency Coordination Centre
MEMP	Municipal Emergency Management Plan
MEMPC	Municipal Emergency Management Planning Committee
MERC	Municipal Emergency Response Coordinator
MERO	Municipal Emergency Resource Officer
MFB	Metropolitan Fire and Emergency Services Board
MRM	Municipal Recovery Manager
PMF	Probable Maximum Flood

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RCC	Regional Control Centre
RDO	Regional Duty Officer
REOC	Regional Emergency Operations Centre
RERC	Regional Emergency Response Coordinator
RERCC	Regional Emergency Response Coordination Centre
SBO	Special Building Overlay
SCC	State Control Centre
SEWS	Standard Emergency Warning System
SS&RS	Shepparton Search and Rescue Squad
SHERP	State Health Emergency Response Plan
SOP	Standard Operating Procedure
VicPol	Victoria Police
VICSES	Victoria State Emergency Service

Part 1. INTRODUCTION

1.1 Municipal Endorsement

This Municipal Flood Emergency Plan (MFEP) has been prepared by the Shepparton MEMPC Flood Sub Committee and with the authority of the Greater Shepparton City Council MEMPC pursuant to Section 20 of the Emergency Management Act 1986 and Emergency Management Act 2013 (as amended)¹.

Greater Shepparton City Council has undertaken consultations with the Shepparton, Mooroopna, Murchison, Toolamba, Tatura, Tallygaroopna, Congupna and Katandra communities about the arrangements contained within this plan.

This MFEP is a sub plan to the Greater Shepparton City Council Municipal Emergency Management Plan (MEMP). It is consistent with the Emergency Management Manual Victoria (EMMV) and the Victorian Floodplain Management Strategy (DELWP, 2016), and takes into account the outcomes of the Community Emergency Risk Assessment (CERA) process undertaken by the Municipal Emergency Management Planning Committee (MEMPC).

The Municipal Flood Emergency Plan is consistent with the Regional Flood Emergency Plan and the State Flood Emergency Plan.

This Municipal Flood Emergency Plan is a result of the cooperative efforts of the Greater Shepparton City Council Flood Planning Committee (MFPC) and its member agencies.

This Plan is endorsed by the Greater Shepparton City Council MEMPC as a sub-plan to the MEMP.

Endorsement

Keith O'Brien
VICSES Regional Manager

Date 29 August 2014

Kaye E. Thomson
Municipal Emergency Manager
Director Community.

Date 29 August 2014

¹ The 2013 Act operates concurrently with the *Emergency Management Act 1986* with the intention that the 1986 Act will ultimately be repealed.

1.2 The Municipality

An outline of the City of Greater Shepparton in terms of its location, demography and other general matters is provided in the MEMP. An outline of the flood threat is provided in Appendix A of this Plan.

1.3 Purpose and Scope of this Flood Emergency Plan

The purpose of this MFEP is to detail arrangements agreed for the planning, preparedness/prevention, response and recovery from flood incidents within the City of Greater Shepparton municipal area.

As such, the scope of the Plan is to:

- Identify the Flood Risk within the City of Greater Shepparton municipal area;
- Support the implementation of measures to minimise the causes and impacts of flood incidents within the City of Greater Shepparton municipal area;
- Detail Response and Recovery arrangements including preparedness, Incident Management, Command and Control;
- Identify linkages with Local, Regional and State emergency and wider planning arrangements with specific emphasis on those relevant to flood.

This Flood Emergency Plan document is complemented by two other guides which provide the public with additional information specific to their area:

- a) Local Flood Guide (Appendix F)
- b) Community Information Guide (Appendix G)

1.4 Municipal Flood Planning Committee (MFPC)

Membership of the Greater Shepparton City Council Flood Planning Committee (MFPC) will comprise of the following representatives from the following agencies and organisations:

- VICSES (i.e. Unit Controller & Regional Officer – Emergency Management) **(Chair)**,
- Greater Shepparton City Council,
- Victoria Police (i.e. Municipal Emergency Response Co-ordinator) (MERC),
- Goulburn Broken Catchment Management Authority,
- Department of Health and Human Services (DHHS) as required,
- Department of Environment Land Water and Planning (DELWP) as required,
- Goulburn Murray Water
- Goulburn Valley Water
- Shepparton Search & Rescue
- Other agencies as required

1.5 Responsibility for Planning, Review & Maintenance of this Plan

This Municipal Flood Emergency Plan must be maintained in order to remain effective.

VICSES through the Flood Planning Committee has responsibility for preparing, reviewing, maintaining and distributing this plan.

The MFPC will meet at least once per year.

The plans should be reviewed:

- Following any new flood study;
- Change in non-structural and/or structural flood mitigation measures;
- After the occurrence of a significant flood event within the Municipality to review and where necessary amend arrangements and information contained in this Plan.

1.6 Endorsement of the Plan

The MFEP will be circulated to the Greater Shepparton City Council Emergency Management Planning Committee to seek acceptance of the draft plan.

Upon acceptance, the plan is forwarded to the MEMPC for endorsement with the recommendation to include the MFEP as a sub-plan of the MEMP.

Additional supporting documents which focus on specific towns and areas are:

- a) Local Flood Guide
- b) Community Information Guide

Part 2. PREVENTION / PREPAREDNESS ARRANGEMENTS

2.1 Community Awareness for all Types of Flooding

Details of this MFEP will be released to the community through local media, the FloodSafe program, websites (www.ses.vic.gov.au and www.greatershepparton.com.au) upon formal adoption by the Greater Shepparton City Council.

VICSES with the support of Greater Shepparton City Council and Goulburn Broken Catchment Management Authority will coordinate community education programs for flooding within the council area. E.g., FloodSafe / StormSafe.

2.2 Structural Flood Mitigation Measures

The following summary of structural flood mitigation measures exist within the Council area:

- Levees in Murchison, Kialla, Mooroopna and Shepparton. These are on private and Crown land and maintenance responsibility is to be determined.
- Flood pumps are positioned at strategic locations to protect urban areas
- Penstocks are located along waterways to prevent backflow
- There are more than 70 retardation basins (47 in East Shepparton) across the municipality, owned and maintained by Council.

Refer to Appendix C for detailed information of structural flood mitigation measures.

2.3 Non-structural Flood Mitigation Measures

2.3.1 Exercising the Plan

Arrangements for exercising this Plan will be at the discretion of the MEMPC. This Plan should be regularly exercised, preferably on an annual basis.

2.3.2 Flood Warning

Arrangements for flood warnings are contained within the State Flood Emergency Plan, the EMMV (Part 7) and on the BoM website (see <http://www.bom.gov.au>).

Specific details of local flood warning systems and arrangements are provided in Appendix E.

2.3.3 Flood Observers

Community Observers provide local knowledge to VICSES and the Incident Control Centre regarding local insights and the potential impacts and consequences of an incident and may assist with the dissemination of information to community members.

Specific details of arrangements to capture local knowledge are provided in Appendix G.

Part 3. RESPONSE ARRANGEMENTS

3.1 Introduction

3.1.1 Activation of Response

Flood response arrangements may be activated by the Regional Duty Officer (RDO) VICSES North East (Hume) Region or Incident Controller.

The Incident Controller/RDO VICSES will activate agencies as required and documented in the State Flood Emergency Plan.

3.1.2 Responsibilities

There are a number of agencies with specific roles that will act in support of VICSES and provide support to the community in the event of a serious flood within the City of Greater Shepparton. These agencies will be engaged through the EMT.

The general roles and responsibilities of supporting agencies are as agreed within the Greater Shepparton City Council MEMP, EMMV (Part 7 'Emergency Management Agency Roles'), State Flood Emergency Plan and Regional Flood Emergency Plan.

3.1.3 Municipal Emergency Coordination Centre (MECC)

If established, liaison with the emergency coordination centre will be through the established Division/Sector Command and through Municipal involvement in the Incident EMT, in particular the Municipal Emergency Response Coordinator (MERC). The VICSES RDO / ICC will liaise with the MECC directly if no Division/Sector Command is established.

The function, location, establishment and operation of the MECC will be as detailed in the Greater Shepparton City Council MEMP.

3.1.4 Escalation

Most flood incidents are of local concern and an appropriate response can usually be coordinated using local resources. However, when these resources are exhausted, the State's arrangements provide for further resources to be made available, firstly from neighbouring Municipalities (on a regional basis) and then on a State-wide basis.

Resourcing and event escalation arrangements are described in the EMMV ('State Emergency Response Plan' – Part 3).

3.2 Strategic Control Priorities

To provide guidance to the Incident Management Team (IMT), the following strategic control priorities shall form the basis of incident action planning processes:

1. Protection and preservation of life is paramount - this includes:
 - Safety of emergency services personnel; and,
 - Safety of community members including vulnerable community members and visitors/tourists located within the incident area.

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2. Issuing of community information and community warnings detailing incident information that is timely, relevant and tailored to assist community members make informed decisions about their safety.
3. Protection of critical infrastructure and community assets that supports community resilience;
4. Protection of residential property as a place of primary residence;
5. Protection of assets supporting individual livelihoods and economic production that supports individual and community financial sustainability; and
6. Protection of environmental and conservation values that considers the cultural, biodiversity, and social values.

Circumstances may arise where the Incident Controller is required to vary these priorities, with the exception being that the protection of life should remain the highest. This shall be done in consultation with the State Controller and relevant stakeholders based on sound incident predictions and risk assessments.

3.3 Command, Control & Coordination

The Command, Control and Coordination arrangements in this Municipal Flood Emergency Plan must be consistent with those detailed in State and Regional Flood Emergency Plans. For further information, refer to the State Emergency Response Plan, Part 3 of the EMMV.

The specific details of the Command, Control and Coordination arrangements for this plan are to be provided in Appendix C.

3.3.1 Control

Functions 5(a), 5(b) and 5(c) at Part 2 of the *Victoria State Emergency Service Act 2005* detail the authority for VICSES to plan for and respond to flood.

Part 7.1 of the EMMV prepared under the *Emergency Management Act 1986* and *Emergency Management Act 2013 (as amended)*, identifies VICSES as the Control Agency for flood. It identifies DELWP as the Control Agency responsible for "*dam safety, water and sewerage asset related incidents*" and other emergencies. A more detailed explanation of roles and responsibilities is provided in later sections of Part 7 of the EMMV.

All flood response activities within the City of Greater Shepparton municipal area including those arising from a dam failure or retardation basin / levee bank failure incident will therefore be under the control of the appointed Incident Controller, or their delegated representative.

3.3.2 Incident Controller (IC)

An Incident Controller (IC) will be appointed by the VICSES (as the Control Agency) to command and control available resources in response to a flood event on the advice of the Bureau of Meteorology (or other reliable source) that a flood event will occur or is occurring. The Incident Controller responsibilities are as defined in Part 3 of the EMMV

3.3.3 Incident Control Centre (ICC)

As required, the Incident Controller will establish an Incident Control Centre (ICC) from which to initiate incident response command and control functions. The decision as to if and when the ICC should be activated, rests with the Control Agency (i.e. VICSES).

Pre-determined Incident Control Centre locations are

- CFA Hume Region District 22 Office 195 – 205 Numurkah Road Shepparton.
 - VICSES North East (Hume) Region 64 Sydney Road Benalla
- And / Or are listed in the North East (Hume) Regional Flood Emergency Plan.

3.3.4 Divisions and Sectors

To ensure that effective Command and Control are in place, the Incident Controller may establish Divisions and Sectors depending upon the complexity of the event and resource capacities.

The following Divisions and Sectors may be established to assist with the management of flooding within the Municipality:

Division	Sector
Tatura	Tatura, Murchison, Nagambie and Mooroopna
Shepparton	Shepparton, Kialla

Pre-determined Division Command locations are:

- Tatura Division Command location Corner Russell and Martin Street Tatura
- Shepparton S&R Division Command location 15 Dudley St Shepparton

Pre-determined Sector Command locations are:

- Tatura Sector Command location is Corner Russel and Martin Streets Tatura
- Shepparton S&R Sector Command location is 15 Dudley Street Shepparton
- Murchison Sector Command location is 10a Watson Street, Murchison
- Nagambie Sector Command location is Vine Street, Nagambie
- Kialla Sector Command location is Central Kialla Road, Kialla

3.3.5 Incident Management Team (IMT)

The Incident Controller will form an Incident Management Team (IMT).

Refer to the EMMV for guidance on IMTs and Incident Management Systems (IMSS).

3.3.6 Emergency Management Team (EMT)

The Incident Controller will establish a multi-agency Emergency Management Team (EMT) to assist the flood response. The EMT will consist of key personnel (with appropriate authority) from stakeholder agencies and relevant organisations who need to be informed of strategic issues related to incident control and who are able

to provide high level strategic guidance and policy advice to the Incident Controller for consideration in developing incident management strategies.

Organisations, including Greater Shepparton City Council, required within the EMT will provide an Emergency Management Liaison Officer (EMLO) to the ICC if and as required as well as other staff and / or resources identified as being necessary, within the capacity of the organisation.

Refer to the EMMV for guidance on EMTs.

3.3.7 On Receipt of a Flood Watch / Severe Weather Warning

Incident Controller or VICSES RDO (until an incident controller is appointed) will undertake actions as defined within the flood intelligence cards (Appendix C). General considerations by the Incident Controller/VICSES RDO will be as follows:

- Review flood intelligence to assess likely flood consequences
- Monitor weather and flood information – www.bom.gov.au
- Assess Command and Control requirements.
- Review local resources and consider needs for further resources regarding personnel, property protection, flood rescue and air support
- Notify and brief appropriate officers. This includes Regional Control Centre (RCC) (if established), State Control Centre (SCC) (if established), Council, other emergency services through the EMT.
- Assess ICC readiness (including staffing of IMT and EMT) and open if required
- Ensure flood bulletins and community information are prepared and issued to the community
- Monitor watercourses and undertake reconnaissance of low-lying areas
- Develop media and community information management strategy
- Ensure flood mitigation works are being checked by owners
- Develop and issue incident action plan, if required
- Develop and issue situation report, if required

3.3.8 On Receipt of the First and Subsequent Flood Warnings

Incident Controller/VICSES RDO (until an incident controller is appointed) will undertake actions as defined within the flood intelligence cards (Appendix C). General considerations by the Incident Controller/VICSES RDO will be as follows:

- Develop an appreciation of current flood levels and predicted levels. Are floodwaters, rising, peaking or falling?
- Review flood intelligence to assess likely flood consequences. Consider:
 - What areas may be at risk of inundation
 - What areas may be at risk of isolation
 - What areas may be at risk of indirect affects as a consequence of power, gas, water, telephone, sewerage, health, transport or emergency service infrastructure interruption
 - The characteristics of the populations at risk

- Determine what the at-risk community need to know and do, as the flood develops.
- Warn the at-risk community including ensuring that an appropriate warning and community information strategy is implemented including details of:
 - The current flood situation
 - Flood predictions
 - What the consequences of predicted levels may be
 - Public safety advice
 - Who to contact for further information
 - Who to contact for emergency assistance
- Liaise with relevant asset owners as appropriate (i.e. water and power utilities)
- Implement response strategies as required based upon flood consequence assessment.
- Continue to monitor the flood situation – www.bom.gov.au/vic/flood/
- Continue to conduct reconnaissance of low-lying areas

3.4 Community Information and Warnings

Guidelines for the distribution of community information and warnings are contained in the State Flood Emergency Plan.

Community information and warnings communication methods available include:

- Emergency Alert;
- VicEmergency
- Phone messages (including SMS);
- Radio and Television;
- Two-way radio;
- Mobile and fixed public address systems;
- Sirens;
- Verbal Messages (i.e. Door knocking);
- Agency Websites;
- VICSES Flood Storm Information Line;
- Variable Message Signs (i.e. road signs);
- Community meetings;
- Newspapers;
- Email;
- Telephone trees;
- Community Flood Observers;
- Fax Stream;
- Newsletters;
- Letter drops;

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- Social media and/or social networking sites (i.e. Twitter and/or Facebook).

Refer to Appendix E for the specific details of how community information and warnings are to be provided.

The release of flood bulletins and information with regard to response activities at the time of a flood event is the responsibility of VICSES, as the Control Agency.

Council has the responsibility to assist VICSES to warn individuals within the community including activation of flood warning systems, where they exist. Responsibility for public information, including media briefings, rest with VICSES as the Control Agency.

Other agencies such as CFA, DELWP and VicPol may be requested to assist VICSES with the communication of community flood warnings.

In cases where severe flash flooding is predicted, dam failure is likely or flooding necessitating evacuation of communities is predicted, the Incident Controller may consider the use of the Emergency Alert System and Standard Emergency Warning System (SEWS).

DHHS will coordinate information regarding public health and safety precautions.

3.5 Media Communication

The Incident Controller through the Information Unit established at the ICC will manage media communication. If the ICC is not established the RDO will manage all media communication.

3.6 Impact assessment

Impact assessments can be conducted in accordance with Part 3 section 5.2.5 of the EMMV to assess and record the extent and nature of damage caused by flooding. This information may then be used to provide the basis for further needs assessment and recovery planning by DHHS and recovery agencies.

3.7 Preliminary Deployments

When flooding is expected to be severe enough to cut access to towns, suburbs and/or communities the Incident Controller will consult with relevant agencies to ensure that resources are in place if required to provide emergency response. These resources might include emergency service personnel, food items and non-food items such as medical supplies, shelter, assembly areas, relief centres etc.

3.8 Response to Flash Flooding

Emergency management response to flash flooding should be consistent with the guideline for the emergency management of flash flooding contained within the State Flood Emergency Plan.

When conducting pre-event planning for flash floods the following steps should be followed, and in the order as given:

1. Determine if there are barriers to evacuation by considering warning time, safe routes, resources available and etc.;

2. If evacuation is possible, then evacuation should be the adopted strategy and it must be supported by a public information capability and a rescue contingency plan;
3. Where it is likely people will become trapped by floodwaters due to limited evacuation options safety advice needs to be provided to people at risk advising them not to attempt to flee by entering floodwater if they become trapped, and that it may be safer to seek the highest point within the building and to telephone 000 if they require rescue. This advice needs to be provided even when evacuation may be possible, due to the likelihood that not all community members will evacuate.
4. For buildings known to be structurally unsuitable an earlier evacuation trigger will need to be established (return to step 1 of this cycle).
5. If an earlier evacuation is not possible then specific preparations must be made to rescue occupants trapped in structurally unsuitable buildings either pre-emptively or as those people call for help.

During a flash flood it will often be difficult, due the rapid development of flooding, to establish evacuation (relief) centres ahead of actually triggering the evacuation as is normal practice but this is insufficient justification for not adopting evacuation.

3.9 Evacuation

The decision to recommend or warn people to prepare to evacuate or to evacuate immediately rests with the Incident Controller.

Once the decision is made VicPol are responsible for the management of the evacuation process where possible. VICSES and other agencies will assist where practical. VICSES is responsible for the development and communication of evacuation warnings.

VicPol and/or Australian Red Cross may take on the responsibility of registering people affected by a flood emergency including those who have been evacuated.

Refer to Part 3, Part 6 and Part 8 (Appendix 9) of the EMMV for further guidance on evacuations for flood emergencies. Agency roles and responsibilities are detailed in Part 7.

Refer to Appendix D of this Plan for detailed evacuation arrangements applying within the City of Greater Shepparton.

3.10 Flood Rescue

Victoria Police is the control agency for rescue of persons from water. VICSES may conduct flood rescues as directed by a Police rescue coordinator, during a large-scale flood event.

Appropriately trained and equipped VICSES units or other agencies that have appropriate training, equipment and support may carry out rescues.

Rescue operations may be undertaken where voluntary evacuation is not possible, has failed or is considered too dangerous for an at-risk person or community. An assessment of available flood rescue resources (if not already done prior to the event) should be undertaken prior to the commencement of Rescue operations.

Rescue is considered a high-risk strategy to both rescuers and persons requiring rescue and should not be regarded as a preferred emergency management strategy. Rescuers should always undertake a dynamic risk assessment before attempting to undertake a flood rescue.

Resources available for use for rescues to be carried out within the City of Greater Shepparton can be/are detailed in Appendix D.

3.11 Aircraft Management

Aircraft can be used for a variety of purposes during flood operations including evacuation, resupply, reconnaissance, intelligence gathering and emergency travel.

Air support operations will be conducted under the control of the Incident Controller.

The Incident Controller may request aircraft support through the State Air Desk located at the State Control Centre will establish priorities.

Suitable airbase facilities are located at:

- The Shepparton Aerodrome is located on Melbourne Road, Kialla; 5.5 kilometres south from the Shepparton CBD. It is at latitude S 36° 25'7", longitude E 145°a 23'6" and altitude 374 feet.

The following facilities at the Shepparton Aerodrome may be at risk of flooding during a 1 in 100 flood event:	
Facility Name Potential water level over land	Water Level
Terminal Building 7810 Goulburn Valley Highway KIALLA 3631	0.25 to 0.5m
Hangar 15 7810 Goulburn Valley Highway KIALLA 3631	0.25 to 0.5m
Emergency Equipment Shed 7810 Goulburn Valley Highway KIALLA 3631	0.25 to 0.5m

3.12 Resupply

Communities, neighbourhoods or households can become isolated during floods as a consequence of road closures or damage to roads, bridges and causeways. Under such circumstances, the need may arise to resupply isolated communities/properties with essential items.

When predictions/intelligence indicates that communities, neighbourhoods and/or households may become isolated, VICSES will advise businesses and/or households that they should stock up on essential items.

After the impact, VICSES can support isolated communities through assisting with the transport of essential items to isolated communities and assisting with logistics functions.

Resupply operations are to be included as part of the emergency relief arrangements with VICSES working with the relief agencies to service communities that are isolated.

3.13 Essential Community Infrastructure and Property Protection

Essential community infrastructure and property (e.g. residences, businesses, roads, power supply etc.) may be affected in the event of a flood.

The Greater Shepparton City Council maintains a small stock of sandbags at the Doyles Road Complex, 315 Doyles Road, Orrvale and back-up supplies are available through the VICSES Regional Headquarters. The Incident Controller will determine the

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priorities related to the use of sandbags which will be consistent with the strategic priorities.

If VICSES sandbags are becoming limited in supply, then priority will be given to protection of essential community infrastructure. Other high priorities may include for example the protection of historical buildings.

Property may be protected by:

- Sandbagging to minimise entry of water into buildings
- Encouraging businesses and households to lift or move contents
- Construction of temporary levees will be in consultation with the VICSES, Goulburn Broken CMA, LGA and VICPOL and within appropriate approval frameworks.

The Incident Controller will ensure that owners of essential community infrastructure are kept advised of the flood situation. Essential community infrastructure providers must keep the Incident Controller informed of their status and ongoing ability to provide services.

Refer to Appendix D for further specific details of essential infrastructure requiring protection and location of sandbag collection point(s).

3.14 Disruption to Services

Disruption to services other than essential community infrastructure and property can occur in flood events. Refer to Appendix C & D for specific details of likely disruption to services and proposed arrangements to respond to service disruptions in the City of Greater Shepparton.

3.15 Road Closures

The Greater Shepparton City Council and VicRoads will carry out their formal functions of road closures including observation and placement of warning signs, road blocks etc. to its designated local and regional roads, bridges, walking and bike trails. Greater Shepparton City Council staff may also liaise with and advise VicRoads as to the need or advisability of erecting warning signs and / or of closing roads and bridges under its jurisdiction. VicRoads are responsible for designated main roads and highways and Council is responsible for the designated local and regional road network.

VicRoads and the Greater Shepparton City Council will communicate community information regarding road closures.

3.16 Dam Failure

DELWP is the Control Agency for dam safety incidents (e.g. breach, failure or potential breach / failure of a dam), however VICSES is the Control Agency for any flooding that may result from such an incident.

Major dams and weirs with potential to cause structural and community damage within the Municipality are contained in Appendix A.

3.17 Waste Water related Public Health Issues and Critical Sewerage Assets

Inundation of critical sewerage assets including septic tanks and sewerage pump stations may result in water quality problems within the Municipality. Where this is

likely to occur or has occurred the responsible agency for the critical sewerage asset (Goulburn Valley Water) should undertake the following:

- Advise VICSES of the security of critical sewerage assets to assist preparedness and response activities in the event of flood;
- Maintain or improve the security of critical sewerage assets;
- Check and correct where possible the operation of critical sewerage assets in times of flood;
- Advise the ICC in the event of inundation of critical sewerage assets.
- Advise the EMT, DHHS and the Health Commander within the ICC

It is the responsibility of the Greater Shepparton City Council's Environmental Health Team to inspect and report to the MERO and the ICC on any water quality issues relating to flooding.

3.18 After Action Review

VICSES will coordinate the after action review arrangements of flood operations as soon as practical following an event.

All agencies involved in the flood incident should be represented at the after action review.

Part 4. EMERGENCY RELIEF AND RECOVERY ARRANGEMENTS

4.1 General

Arrangements for recovery from a flood incident within the City of Greater Shepparton are detailed in the Greater Shepparton City Council MEMP and/or the Recovery Sub-plan.

4.2 Emergency Relief

Incident Controllers (appointed by the control agency for the incident - refer to State Emergency Relief and Recovery Plan (Part 4 of the EMMV)) are responsible for considering the current and potential impacts and consequences of an emergency, and advising the relevant emergency relief and recovery agencies as soon as possible.

The Emergency Management Team (which is established when an emergency requires a response by more than one agency - refer to the EMMV) includes provisions for a functional commander for recovery - a Recovery Commander. This position is competency-based and can be held by anyone who has the appropriate experience and training.

The Recovery Commander will be appointed at the discretion of the Regional Recovery Coordinator (Department of Health and Human Services).

Regardless of the appointee's normal role, they will represent all emergency relief and recovery agencies at the incident control level. This position will not be required for all emergencies but is most likely to be beneficial for emergencies with Tier 2 or 3 impacts as per the tiered approach to emergency relief and recovery coordination outlined below.

	Tier 0	Tier 1	Tier 2	Tier 3	Tier 3+
Likely Incidence	Frequent	Occasional	Rare	Very Rare	Extremely Rare
Complexity	Low-Medium	Medium	Medium-High	High	Extreme
Consequence	Low-Medium	Medium	Medium-High	High	Extreme
Population Effects	No Significant Disruptions	Minor Localised Disruptions	Moderate Short-Term Disruptions	Major Medium-Term Disruptions	Most or all usual activity Disruption
Activation	Normal Business Procedures	MEMPlans	Regional Plans	State Plans	State Plans (Possible Commonwealth Involvement)
Coordination Level	Local	Local	Regional	State	State
Coordination Point	None	MECC	REOC	H&HS SEMC	H&HS SEMC
Illustrative Examples	House fire or Car Accident	Gas leak in a block of flats	Widespread Hail Storm	Prolonged Flood Situation	Terrorist attack Or Significant Earthquake

The range and type of emergency relief services to be provided in response to a flood event will be dependent upon the size, impact, and scale of the flood. Refer to Part 4 of the EMMV for further information including on details of the range of emergency relief services that may be provided.

Details of the relief arrangements are available in the MEMP.

4.3 Animal Welfare

Refer to the Municipal Emergency Animal Welfare Plan if implemented.

Matters relating to the welfare of livestock, companion animals and wildlife (including feeding and rescue) are to be referred to DEDJTR. This includes requests for emergency supply and / or delivery of fodder to stranded livestock or for livestock rescue.

Matters relating to the welfare of wildlife are to be referred to DELWP.

Refer to Appendix D for animal shelter compound locations.

4.4 Transition from Response to Recovery

VICSES as the Control Agency is responsible for ensuring effective transition from response to recovery. Transition is detailed in the MEMP and is consistent with Part 4 of the EMMV.

APPENDIX A - FLOOD THREATS FOR THE CITY OF GREATER SHEPPARTON MUNICIPALITY

General - Goulburn and Broken Rivers and Seven Creeks

Shepparton and Mooroopna are situated on the Goulburn River downstream from the Seven Creeks² – Goulburn River confluence and a little downstream from where the Broken River³ joins the Goulburn. Two other tributaries enter the Goulburn River between Murchison and Shepparton; Pranjip Creek at Moorilim and Castle Creek at Arcadia.

The Goulburn Broken catchment comprises the Goulburn and Broken River catchments and part of the Murray Valley and covers 2.4 million hectares, or 10.5% of Victoria⁴. It provides 11% of the Murray Darling Basin's stream flow although it occupies just 2% of the basin. It stretches from near the outskirts of Melbourne to the Murray River and includes the municipalities of Moira Shire Council, Benalla Rural City, Mansfield Shire Council, Mitchell Shire Council, Murrindindi Shire Council, Strathbogie Shire Council and the Greater Shepparton City Council. The Goulburn River stretches from the headwaters near Woods Point, and flows to the west through Lake Eildon, Alexandra and Yea. At Seymour it turns to the north and continues through Nagambie / Goulburn Weir, Murchison, and Shepparton to its confluence with the Murray River upstream of Echuca. The total length of the Goulburn River is 570 km. It has a mean annual discharge of 3,040 GL. This volume of water is approximately 14% of the total water discharge from Victoria (Goulburn Broken CMA, 2005).

The Goulburn Broken catchment produces approximately 11% of the Murray Darling Basin's water and is a key food producing area. Production from irrigation supports a large food processing industry, contributing to 25% of Victoria's export earnings, approximately 70% of the land has been cleared and public land makes up 28% of the catchment.

Major Floods

Major floods in the Shepparton-Mooroopna area generally occur after moderate to heavy widespread rainfall across the catchment. This can be the result of prolonged periods of regular rainfall or one or more significant storms. Due to the relatively large catchment area above Shepparton and the number of major tributary streams the timing and distribution of rainfall across the catchment can significantly influence the nature of flooding in and around Shepparton-Mooroopna. Apart from the base flow in the Goulburn River and tributaries prior to a major flood producing storm, the other factors such as Lake Eildon storage conditions and possible diversion operations at Goulburn Weir could affect the magnitude of flooding at the Shepparton gauge. These will be discussed further in the following sections.

² Seven Creeks and Honeysuckle Creek join 1.8 km upstream of the Seven Creeks @ Kialla West gauge.

³ During large events (i.e. more than about 18,000 ML/d or around 3.0 m at Benalla), the Broken River spills to the north into the Broken Creek catchment with a corresponding reduction in flow increases at Orrvale.

⁴ The total catchment area of the Goulburn River at Shepparton is approximately 16,000 km². 2,525 km² in the Broken River catchment, 1,510 km² in the Seven Creeks/Honeysuckle Creek catchment, 800 km² in the Pranjip Creek catchment and 280 km² in the Castle Creek catchment (Water Technology, 2017).

There are several small ephemeral watercourses, structures, irrigation channels, levees, railways and roadways across the floodplain which all influence flood behaviour. The pipe drainage networks within Shepparton and Mooroopna also influence flood behaviour: some of the urban area is inundated due to backflow within these pipes.

Effect of Lake Eildon

Goulburn Murray Water (G-MW) operates Lake Eildon to ensure the safety of the structure while, as far as is possible within the operating rules of the structure, minimising peak flood outflows. Flood mitigation potential is greatest when there is storage capacity (i.e. air-space with the level below FSL) prior to a flood event.

The peak inflow to Lake Eildon during the October 1993 flood was estimated at 170,000 ML/d (Hydro Technology, 1995) with the peak outflow now estimated at 46,630 ML/d. The dam was operated to achieve a significant reduction in the peak outflow and thereby avoid more serious flooding at Seymour and downstream. This was achieved by surcharging the storage but is unlikely to occur in the future due to current G-MW policy.

The potential for Eildon to deliver indirect flood mitigation benefits to the Goulburn River immediately and further downstream of the dam is significant as demonstrated in October 1993. However, due to changes to G-MW operations policies this degree of attenuation is unlikely to be experienced again if conditions that occurred in 1993 were to be repeated.

Effect of Goulburn Weir & Waranga Basin Diversions

Low flood flows in the Goulburn River at Shepparton can be significantly influenced by the operation of Goulburn Weir and diversions to Waranga Basin via the Stuart Murray Canal (SMC) or Cattanach Canal (CC) where the combined diversion flow capacity is 7,290 ML/d.

For example, at the start of the June 1996 rain event the Goulburn Weir pool was well below full supply level (FSL) with close to maximum diversions via the SMC and CC to Waranga Basin occurring during the subsequent flood event. Whether diversions are occurring or not will depend on the status of Waranga Basin. If Waranga Basin is full or close to full then the diversion flow will be nil or very low. Even if diversions are occurring at the start of the flood they may cease during the flood event once Waranga Basin is full or reaches the interim FSL.

If heavy rain occurs following releases from Lake Eildon for irrigation purposes, there is a rapid and substantial reduction in the need for the water for irrigation. As a result, G-MW may need to rapidly increase discharge downstream of Goulburn Weir. This results in what G-MW call a "rain rejection event". While the resulting flush is often well below minor flood level, there may be recreational users within the river bank who could be caught unawares and impacted by a rapid rise in river level. This is a problem more likely to occur during the summer months than at other times of the year.

G-MW has an arrangement with VICSES at Benalla to alert VICSES when a release of greater than 3,000 ML/d is expected from Goulburn Weir. While it is possible for these releases to have some impact on the Goulburn River in Shepparton-Mooroopna the full impact is more likely to occur upstream from Murchison. DELWP and Parks Victoria also are stakeholders in this issue.

Effect of Irrigation Channels

There are a number of irrigation channel banks within the Goulburn and Broken floodplains, all of which form hydraulic barriers across the floodplain of various size and effectiveness. In producing the flood mapping for the Shepparton Mooroopna Flood

Mapping and Flood Intelligence project (2017), Water Technology stamped the irrigation network onto the topography as thin break lines in the TUFLOW hydraulic model. Thus flood mapping produced by that study and available through FloodZoom and other means, reflects the influence on conveyance of the existing irrigation channel network.

Irrigation channel banks are designed to convey irrigation water, not act as flood levees. Channel banks may fail (or be deliberately breached) during a flood and inundation may differ during an event.

Historic Floods

The Shepparton-Mooroopna area has a long history of major flooding on the Goulburn River dating back to 1870. The largest flood in the recent past occurred in September 1916. It is difficult to rank the 1916 flood in terms of current conditions due to the Big Eildon Dam not being constructed at that time and because of major changes within the floodplain as well as to bridges and the causeway between Shepparton and Mooroopna.

Since the completion of the Eildon dam in 1955 there have been seven floods exceeding the Major Flood Level of 11.0 metres on the Shepparton gauge. These occurred in 1956, 1958, 1974, 1975, 1981, 1993 and 2010 resulting in a major flood on average every 7-8 years prior to the onset of major drought in late 1996.

Flooding at Shepparton is caused by a combination of Goulburn River, Broken River and Seven Creeks flows. Due to the rainfall patterns of any given event, each waterway is likely to respond differently. The May 1974 flood was a Goulburn River dominated event while the October 1993 and September 2010 floods were Broken River and Seven Creeks dominant events.

Specific flood information for the key flood gauges in the Shepparton-Mooroopna area is contained in the various Appendix C's to this document.

September 1916 Flood

The September 1916 flood on the Goulburn River at Shepparton is the highest flood on record with an estimated peak flow of 233,000 ML/d (SKM 2002) and a peak level at Shepparton of 12.25 m (SKP 1982). The rainfall ranged from 130 mm in the Broken River catchment, to 178 mm in the Goulburn above Seymour, with Seven Creeks catchment receiving around 170 mm. Rainfall accumulations were recorded over a six day period (SKP 1982, *Shepparton-Mooroopna Flood Study* Appendices, p B10).

May 1974 Flood

The flood in May 1974 reached 12.08 metres on the Shepparton gauge with a peak flow of 214,000 ML/d⁵ (SKM, 2002). At Shepparton, it was the largest flood since 1955 when Eildon was completed (important as Eildon changed flow frequencies) and also the largest flood since 1916.

Around 600 residential and commercial buildings were inundated above floor due to large breakouts from the Goulburn River, Broken River and Seven Creeks (VICSES, 2013). If a flood of similar magnitude occurred now, it is estimated that around 7,000 residential, commercial and industrial properties are likely to be affected.

⁵ The peak flow estimate for the 1974 event has changed a number of times since it was first published with revisions to the rating curve, the most recent estimate on the DELWP WIMS system is 191,000 ML/d (Water Technology, 2017).

This was a "Goulburn River dominated flood" in that flows in the Goulburn were larger than those in the Broken River and Seven Creeks system.

October 1993

The major flood of October 1993 reached 11.72 metres on the Shepparton gauge with a peak flow estimated at 150,000 ML/d. Around 30 residential and commercial buildings were inundated above floor (VICSES, 2013). If a flood of similar type and magnitude was to occur now, it is expected that around 2,700 residential, commercial and industrial properties would be affected.

The Goulburn River had sustained high water levels for the majority of September 1993. The Broken River and Seven Creeks were relatively low until they both received a big inflow that started around 3rd October and lasted until early on the 9th October. The Goulburn River peaked at Shepparton on the 6th October and stayed high until around the 16th when it finally receded. Even though the peak in the Goulburn River upstream of Shepparton wasn't as high as in September (as most of the flow was contained within the lower floodplain), the combination of flows from the three systems caused a peak water level of 11.72 m at the Shepparton gauge on Wednesday 6th October.

Parts of Shepparton were inundated during the event and significant areas downstream of Shepparton were also inundated, particularly around the water treatment plant.

This event was a "Broken River and Seven Creeks dominated flood" in that flows in these watercourses were larger than in the Goulburn River, particularly in Seven Creeks where significant overbank flood flow occurred in surrounding low lying areas.

September 2010 Flood

The September 2010 flood reached 11.09 metres on the Shepparton gauge with a peak flow of 93,500 ML/d⁶. During this flood, 13 houses and 31 structures were damaged, 620 houses were isolated and more than 60 people attended the relief and recovery centre. While approx. 30 local roads were closed due to flooding, all major roads surrounding Shepparton remained open for the duration of the event.

Heavy rain fell across the north east of Victoria on Saturday 4th and Sunday 5th September 2010, particularly in the alpine areas including the upper Goulburn and Broken catchments. On Monday 6th September, the Seven Creeks at Kialla West peaked just above the major flood level of 6.6 m while the Broken River at Orrvale peaked overnight at 8.19 m, above the major flood level of 7.9 m. On Wednesday 8th September, the Goulburn River at Shepparton peaked just above the major flood level (11 m) at 11.09 m. Both Castle Creek and Pranjip Creek also flooded.

Low lying areas between Archer Road and the East Goulburn Main Channel along the Broken River were inundated as were parts of the lower Goulburn River floodplain. Areas outside the lower Goulburn River floodplain were not affected.

This event was a "Broken River dominated event" with significant contributing flows from the Broken River.

A report on this event and the subsequent floods in December 2010 and January 2011, has been drafted by the Goulburn-Broken Catchment Management Authority (GBCMA, 2012). Key data is documented along with assessment of "flood dominance".

⁶ Water Technology (2017) quote a revised peak flow of 78,600 ML/d.

History of Flood Levels & Discharges

At Shepparton, the largest floods this century have occurred in 1916, 1939, 1974 and 1993⁷. These were ranked 1, 3, 2 and 4, respectively by HydroTechnology (1995) - see Table 1-1. However, Big Eildon Dam was not constructed prior to the 1916 and 1939 events, and it is estimated that it would have had some effect in reducing the peaks of those floods. Given that the estimated peak discharges in 1939 and 1993 were very similar, allowance for the effect of Eildon would likely elevate the 1993 flood to the third largest this century.

The effect of Eildon Reservoir in reducing flood peaks has been studied previously (SRWSC, 1981). It was estimated that at Shepparton the impact on flood peaks during large floods is approximately 7%. Nathan (1992) estimated a reduction of 27% in large floods in the Goulburn River at Murchison. The impact is larger in more frequent floods of smaller magnitude, and the impact is also greater further upstream near Eildon. The effect diminishes downstream because of the effect of unregulated tributary inflows and floodplain storage.

There is also fairly clear indirect evidence that a flood larger than any this century occurred in 1870. Although there were no gauges operating on the Goulburn at that time, the Murray River at Echuca peaked much higher in 1870 (and in 1867) than in 1916. It should be noted that the effect on flooding at Echuca from the Murray River downstream of Barmah is restricted by the effect of the Bama Sandhills, so that little more than the "choke" capacity of approximately 35,000 ML/d can pass along the Murray without forcing additional flow north along the Edward River into NSW. Therefore, the magnitude of flood peaks at Echuca above this capacity is very dependent on the magnitude of flows received from the Goulburn and Campaspe Rivers, and to a much lesser extent the Broken Creek.

A comparison of the highest ranked floods last century is presented in the following table for the Goulburn River at Shepparton. A continuous recorder has operated at this location since 1939. A staff gauge was observed daily from 1921 to 1939.

Magnitudes and Ranking of Major Floods at Shepparton

Flood / Year	Gauge Height (m)	Peak Discharge (ML/d)	Rank
September 1916	12:25	233,300	1
May 1974	12:08	214,000 ⁸	2
1939		161,000	3
October 1993	11:72	160,500 ⁹	4
1956	11:42	121,000	5
1934		118,400	6

⁷ The Shepparton gauge was moved from upstream of Dainton's Bridge (built in the late 1960s) to the current downstream location in 1986. There is about 100mm head loss through the bridge.

⁸ Water Technology (2017) quote a revised peak flow of 191,000 ML/d.

⁹ Water Technology (2017) quote a revised peak flow of 150,000 ML/d.

Flood / Year	Gauge Height (m)	Peak Discharge (ML/d)	Rank
1975	11.24	105,000	7
1924		103,300	8
1958	11.21	103,000	9
1921		97,500	10
September 2010	11.09	81,328 ¹⁰	11
The Goulburn River at Shepparton gauge has changed locations three times. It was located upstream of Dainton's Bridge from 1968 to 1986. It was moved to the current downstream location in 1986. There is about 100mm head loss through the bridge.			

At Shepparton, the October 1993 (11.72 m) and September 2010 (11.09 m) are the two floods that many residents can relate to because they were recent floods on the main rivers. However, the March 2012 localised rainfall event, which caused small rural creeks to flood in the north-east region of the municipality (and a record flood along Broken Creek), has served to advise that any area may be subject to flooding. The heavy rain event of 27th / 28th February 2013 which resulted in severe flooding through East Shepparton reinforced that message.

Magnitudes and Ranking of Major Floods at Murchison

Flood / Year	Gauge Height (m)	Peak Discharge (ML/d)	Rank
1916	12.22	178,180	1
1934	11.55	132,750	2
1956	11.38	123,200	3
1974	11.29	117,860	4
1917	11.28	117,030	5
1939	10.79	91,490	6
1923	10.67	84,870	7
1912	10.64	83,700	8
1993	10.57	80,010	9
1920	10.52	76,620	10

The table below provides a summary of most floods in the Goulburn since 1955 (i.e. since Big Eildon Dam was constructed). Peak flow data (ML/d) and peak level data has been extracted from available sources for the key gauging stations upstream of

¹⁰ Water Technology (2017) quote a revised peak flow of 78,600 ML/d.

Shepparton. Note that a number of flow estimates have changed over time, with revisions to gauge rating curves. The 'WT quote...' comments in the table relate to.

Gauging Station, Site Number, Peak Flow, Peak Level						
M12/59542						
Date	Goulburn River Murchison 405200	Goulburn River Arcadia Downs 405270	Seven Creeks Kialla West 405269	Broken River Orrvale 404222	Goulburn River Shepparton 405204	Flood Category / Dominance
Aug-55	45,170 9.69				68,900 10.72	Moderate
Jul-56	123,200 11.38				121,000 11.42	Major
Aug-58	60,330 10.17				103,000 11.21	Major
Sep-60	512,750 9.97				77,600 10.86	Moderate
Oct-64	47,430 9.80				67,800 10.70	Moderate
Jun-68	41,460 9.53				55,900 10.47	Minor
Sep-73	42,490 9.57				54,400 10.47	Minor
May-74	111,000 WT quote 117,900 11.29	135,000 12.10	50,200 7.85	40,000 8.33	191,166 WT quote 191,000 12.08	Major / Goulburn
Sep-75	72,500 ~10.46				105,000 11.24	Major / Neutral
Aug-78	30,200 ~9.02	28,959 9.79			31,626 9.74	Minor / Goulburn
Oct-79	39,000 9.40	37,375 10.28	10,979 5.53	18,257 7.24	43,900 10.20	Minor / Neutral
Jul-81	49,690 9.87	59,352 10.70	40,230 7.48	30,061 7.99	87,300 11.00	Major / Broken-Seven
Sep-83	50,200 9.88	51,954 10.62	10,128 5.42	7,961 5.74	60,800 10.57	Minor / Goulburn
Oct-92	63,380 10.24	11.05	8,086 5.13	13,369 6.76	81,800 10.93	Moderate / Goulburn
Sep-93	80,010 10.57	11.33	19,097 6.32	15,936 7.01	95,667 11.12	Major / Goulburn
Oct-93	60,903 WT quote 63,500 10.26	11.08	68,000 8.23	43,852 WT quote 43,900 8.44	150,000 11.72	Major / Broken-Seven
Aug-96	47,220 9.80	10.74	15,348 6.02	12,140 6.56	60,183 10.56	Minor / Goulburn
Oct-96	44,010 9.69	10.66	15,384 6.02	27,155 7.86	58,156 10.52	Minor / Goulburn
Sep-10	58,237 WT quote 50,200 10.15	NA	19,653 WT quote 20,900 6.69	8.14 WT quote 27,300	81,328 WT quote 78,600 11.09	Major / Broken
Mar-12	18,619 7.13	NA	11,718 6.03	7.00	38,549 9.97	Major / NE creeks

Note: In the above table "WT quote" refers to Water Technology (2017)

revised flows quoted in the Water Technology (2017) report, which have come from the latest DELWP WIMS streamflow data website.

Description of Major Waterways and Drains around Shepparton

Waterway	Description
Goulburn River	Emanates from the Great Dividing Range near Jamieson and is mitigated by Eildon and Goulburn weirs
Broken River	Rises in the Tolmie Highlands of the Great Dividing Range
Seven Creeks	Rises in the Strathbogie Ranges east of Euroa
Honeysuckle Creek	Emanates from the Strathbogie Ranges east of Violet Town
Castle Creek	Emanates from runoff upstream of Euroa
Congupna Creek	Emanates from farmland run-off near Cosgrove and is fed by Broken River, when it floods
Pine Lodge Creek	Emanates from farmland run-off near Pine Lodge and is fed by Broken River, when it floods
Dainton's Creek	Emanates from farmland run-off near Cosgrove and is fed by Broken River, when it floods
O'Keefe Creek	Emanates from farmland run-off near Pine Lodge and is fed by Broken River, when it floods

The Goulburn River around Shepparton-Mooroopna experiences localised flooding initially along Watts Road, the main alternative route and short cut from Mooroopna south to the Goulburn Valley Highway, once the Shepparton gauge exceeds 8.75 m. A series of levees are located on the east side of the Goulburn River from Knight Street in Shepparton to Furphy Avenue in Kialla and prevent flooding up to 10.98 m on the Shepparton gauge, just below the major flood level of 11.0 m.

Mitchell Road at Kialla West is the first area to be affected by flooding from Seven Creeks with the low-level bridge overtopped at about 4.5 m on the Kialla West gauge. Raftery Road becomes impassable after the Kialla West gauge exceeds 5.0 m with Seven Creeks breaking its bank at the floodway west of the bridge. The first residential properties to be flooded are located on Central Kialla Road in Kialla. These properties can be affected by either backwater flooding up Seven Creeks from the Goulburn River once the Shepparton gauge reaches 10.5 m, or by flooding directly from Seven Creeks after the Kialla West gauge has exceeded around 6.5 m.

Minor flooding of rural properties along Broken River upstream of Doyles Road commences once the Orrvale gauge reaches 6.8 m. The flooding of Gordon Drive (located in the Broken River anabranch) follows soon after and the major arterial road of Archer Street is overtopped by floodwater backing up across the floodway on the north side of the Broken River bridge.

The first house in Mooroopna to be flooded above floor level is on the Midland Highway when the Shepparton gauge approaches 11.1 m. Properties in The Boulevard area of North Shepparton can expect flooding above floor level to commence once the Shepparton gauge has reached 11.6 m.

The Midland Highway Causeway between Shepparton and Mooroopna also begins to be affected by floodwater around 12.0 m with higher flows progressively disrupting traffic along this vital road link. However, at the Mooroopna side of the Causeway (Chinaman's Gardens), the road is overtopped at a lower flood level (from about 11.6 m on the Shepparton gauge).

The first properties flooded by location:

Location	Street	Level on the Shepparton gauge at which inundation starts (m)
Kialla West	Archer Road	Between 10.5 & 10.7
Kialla	Central Kialla Road	As level approaches 10.5
Shepparton	Doyles Road	Between 10.5 & 10.7
Shepparton North	Daldy Road	Between 11.1 & 11.3
Bunbartha	Barmah-Shepparton Road & McClelland Road	Between 11.5 & 11.7
Mooroopna	Midland Highway	Between 10.7 & 10.9
Mooroopna North	Koenig Road	Between 11.5 & 11.7
Coomboona	Koenig Road	Between 11.5 & 11.7
Ardmona	Excelsior Avenue	Between 11.7 & 11.9

The first buildings flooded above floor by location:

Location	Street	Level on the Shepparton gauge at which inundation starts (m)
Bunbartha	Barmah-Shepparton Road	Between 11.7 & 11.9
Kialla West	Archer Road	Between 10.5 & 10.7
Kialla	Central Kialla Road	Between 10.5 & 10.7
Shepparton	The Boulevard, Wanganui Road and the Caravan Park on Fitzjohn Road	Between 11.3 & 11.5
Shepparton North	Daldy Road	Between 11.3 & 11.5
Mooroopna	Midland Highway	Between 11.0 & 11.1
Mooroopna North	Echuca Road	Between 11.7 & 11.9
Ardmona	Excelsior Avenue	Between 12.1 & 12.2

Dam Failure

Flooding resulting from failure of the following dams is likely to cause significant structural and community damage within the municipality.

Location	Owner	Dam Height	Dam Capacity (ML)	Comments
Eildon Dam	G-MW	84.25m	3,334,158	ANCOLD & AIIMS compliant Dam Safety Emergency Plan in place.
Lake Waranga Reservoir	G-MW	12.2m (ave)	432,260	ANCOLD & AIIMS compliant Dam Safety Emergency Plan in place.
Goulburn Weir	G-MW	13.7m (ave)	25,000	ANCOLD & AIIMS compliant Dam Safety Emergency Plan in place.
Lake Nillahcootie Reservoir	G-MW	35m (ave)	40,400	ANCOLD & AIIMS compliant Dam Safety Emergency Plan in place.
Caseys Weir	G-MW	3m	<150	
Gowangardie Weir	Committee of Management	3m	140	Stock & Domestic Committee from local farmers manage the flow from the weir. Greater Shepparton City Council assists with maintenance of the channels.

APPENDIX B - TYPICAL FLOOD PEAK TRAVEL TIMES

Definitive information on the time it takes flash flooding (i.e. resulting from heavy rainfall associated with severe weather or thunderstorm activity) to develop (i.e. to arrive at a location) following the start of heavy rain and the time it takes for the maximum water depth / extent to be reached is not available.

In the case of riverine flooding, the time of travel of a flood peak will be influenced by antecedent conditions. A flood on a 'dry' watercourse will generally travel more slowly than a flood on a 'wet' watercourse (e.g. the first flood after a dry period will travel more slowly than the second flood in a series of floods) and big floods tend to travel faster than small floods. Hence, the size of the flood, recent flood history, soil moisture and forecast weather conditions all need to be considered when using the following information to direct flood response activities. This first flood can be significantly altered by floodwater filling the floodplain storage. *This phenomena is particularly important for the floodplain upstream of Shepparton and thus flood volume and dominance (i.e. whether the Broken – Seven Creeks system or Goulburn River or neither will dominate – the Broken and Seven Creeks appear to dominate most often with a neutral situation observed a little less often) is a key consideration in determining both travel times and flood attenuation.* In very simplistic terms, due to the wide floodplain and opportunity for significant loss as well as friction, a flood on a wet floodplain will behave very differently from one on a dry floodplain.

Dominance and the timing of flows in the three key contributing catchments (i.e. Goulburn, Broken and Seven) is key to determining peak levels and thus impacts within Shepparton and Mooroopna. The Broken – Seven Creeks system appears to dominate most often with the Goulburn dominating least often.

The Goulburn, Broken and Sevens waterways present a significant flood risk to the Shepparton / Mooroopna urban area and the immediate surrounds because their confluences are located within or adjacent to the urban area. A further significant flood risk arises from locally intense storms over urban and peri-urban areas, such as East Shepparton. The generally flat nature and poor drainage characteristics of the East Shepparton area make it particularly vulnerable to intense and heavy continuous rain.

Location From	Location To	Typical Travel Time	Comments
RIVERINE FLOODING – Goulburn River – see diagram below			
Floods are characterised by steady rises, peaks that extend for a number of hours and recessions that are around one-half to one-third the rate of rise (i.e. takes around 2.5 to 3 times longer). The further down the catchment the longer the peak and the slower the recession. Flood volume determines rise and recession characteristics.			
Eildon	Seymour	48 hours	
Seymour	Goulburn Weir	30 to 40 hours	
Seymour	Murchison	40 to 60 hours	
Goulburn Weir	Murchison	9 to 18 hours	Generally around 10 hours or a little less. Can be as short as 3 hours
Murchison	Kialla West (Goulburn River)	15 to 25 hours	In 1974, peak on Goulburn at Kialla West occurred 15 hours after the Broken at Orrvale peaked while in 1993 the difference was 60 hours.

Location From	Location To	Typical Travel Time	Comments
Murchison	Shepparton	18 to 30 hours	20 hours or less if Goulburn dominant. 24 to 36 hours if Broken – Sevens dominant. In 1992 & 2010, travel time for peak from Murchison to Shepparton was ~1.5 days.
Kialla West (Goulburn)	Shepparton	Up to 12 hours	When Broken – Sevens dominant, peak at Shepparton can be at the same time or a little before peak at Goulburn at Kialla West.
Shepparton	McCoys Bridge	46 hours	
Shepparton	Echuca	7 days	
RIVERINE FLOODING – Seven Creeks – see diagram below			
The recession at Kialla West is around one-third to one-quarter the rate of rise (i.e. takes around 3 to 4 times longer).			
Euroa	Kialla West (Mitchell Road Bridge over Seven Creeks)	26 to 50 hours	26 to 30 hours for floods –6m and over at Kialla West. 35 to 48 hours if between 4.5m and 6m but 30 to 36 hours if 2nd flood in past 3 weeks or rain across lower catchment similar to upper catchment.
Kialla West (Seven Cks)	Shepparton	18 to ~60 hours	18 to 21 hours if Broken and Seven Creeks dominant. Time increases towards 30+ hours under neutral conditions but can be as high 60 hours.
Peak at Kialla West (the gauge is located immediately downstream from the Mitchell Road Bridge) occurs around 6 – 24 hours earlier than at the Broken River at Orrvale. Median time is around 15 hours but the usual range is 12-18 hours. In general terms, peak occurs at about the same time as at (or within a few hours of) the Broken River at Gowangardie. Travel time from Kialla West to Shepparton increases as Goulburn dominance builds.			
RIVERINE FLOODING – Broken River – see diagram below			
After a slow peak, the recession at Orrvale is around one-third the rate of rise (i.e. takes around 2.5 to 3 times longer).			
Benalla	Casey's Weir	6 to 12 hours	Tends to cluster around 7 to 9 hours.
Benalla	Gowangardie Weir	18 to 37 hours	Think in terms of 26 to 30 hours but faster if good rain downstream from Benalla or 2 nd flood.
Benalla	Orrvale	31 to 54 hours	Tends to cluster around 36 to 42 hours.

Location From	Location To	Typical Travel Time	Comments
Casey's Weir	Gowangardie Weir	12 to 30 hours	Tends to cluster around 20 – 26 hours.
Gowangardie Weir	Orrvale	10 to 18 hours	Usually in the 13-15 hour range (as per 2003) but ~24 hours in 1993 & 2010.
Orrvale	Shepparton	4 to 40+ hours	Generally 8 to 14 hours with Broken River dominant. 20 to 28 hours as Goulburn flows increase (Murchison around 7.5m to 8.5m – neutral). 30+ hours with Goulburn dominant and Murchison above flood level.
In general terms, for a Broken – Seven Creeks dominant flood, the peak occurs at Gowangardie a few hours after the peak occurs at Kialla West on Seven Creeks. The difference between peak timings is longer (of order 12+ hours) for a neutral flood. Travel time from Orrvale to Shepparton increases as Goulburn dominance builds.			
RIVERINE FLOODING – Congupna Creek			
Gowangardie Weir	Congupna	52 hours	Flooding in these creeks results from local runoff and from breakouts from the Broken River during major floods.
RIVERINE FLOODING – Pine Lodge Creek			
Gowangardie Weir	Tallygaroopna	3.5 days	Breakouts from near Casey's Weir occur when flow in the Broken River reaches approximately 18,000ML/d or around 3.0m at Benalla. At Casey's Weir the trigger flow is around 17,250ML/d (~200m ³ /s) or at a water surface elevation of 158.73mAHD (around 1.81m at the gauge). Further details are provided in the Moira Shire MFEP.
RIVERINE FLOODING – Guilfus Creek			
Gowangardie Weir	Katandra West (rural areas to the west)	52 hours	Further details are provided in the Moira Shire MFEP.

APPENDIX C1 – MURCHISON FLOOD EMERGENCY PLAN

Overview of Flooding Consequences

Murchison is a small rural town located on the Goulburn River 40 km from Shepparton and is within the Great Shepparton City Council. It is surrounded by countryside which contains orchards, vineyards and dairy farms. HM Prison Dhurringile is just down the road.

Murchison town centre has been developed on a land locked depression which could flood during a Goulburn River flood or a major rain event (flash flooding).

Around Murchison, the major flood risk is from the Goulburn River which can result in flooding which lasts from one (24hrs) to three days (72 hrs). When floods affect areas around Murchison, road access in and out of the area can be compromised, resulting in isolation for some areas.

River levels can rise within several hours of heavy rain, and during floods, floodwater can travel from Goulburn Weir to Murchison in 12 – 15 hours and from Seymour to Murchison in 40 to 60 hours (sometimes a little longer). Be aware that floods can affect properties before the peak arrives and no two floods are the same.

Areas likely to be affected:

- During “**Minor**” flooding the low lying rural properties upstream and downstream of Murchison are likely to be flooded. This may necessitate the removal of stock and equipment to higher ground and the closing of some local roads. Camping and fishing spots north of the Bridge will also need to be evacuated.
- During “**Moderate**” flooding, such as occurred in 2010 (10.15 m) people were moved to Murchison Relief centre in Watson Street and caravans were moved to higher ground.
- When “**Major**” flooding occurs (10.7 m and above), the area around High Road and River Haven Caravan Park will be impassable.
- At 11.92 m (the 1% AEP flood level) low lying areas are flooded including Willoughby Street, Phillip Lane, Hutchison Street, Gillam Streets and the cemetery

Caravan Parks likely to be affected

- **River Haven Caravan Park**, 88 High Road (or Low Road), Phone 03-5826 2403
 - Sites – 36 powered, 6 unpowered and cabins.
 - Low areas affected in Moderate flood event (10.2 m), and evacuation required in Major flood events (10.7 m).
- **River Road Caravan Park**, 101 River Road, Phone 03-5826 2546
 - Sites – 8 powered, 10 unpowered and 8 on-site cabins.
 - Not impacted by Goulburn River flooding up to 1916 flood event – levee protects.
- **Murchison Caravan Park**, 4925 Goulburn Valley Hwy, Phone 03-5826 2229
 - Sites – 20 powered, 48 unpowered and cabins.
 - Not impacted by Goulburn River flooding up to 1916 flood event.
- Campers regularly camp along the banks of the Goulburn Rivers at Murchison; they will need to be notified when high or flood waters are approaching.

How many properties.

During a Major Goulburn River flood:

- East of Willoughby Street and East on the Old Weir Road up to 6 properties may be affected by flooding.

- South along the old railway line up to 2 km may see flooding affects.
- River Haven Caravan Park on High Road will be affected during a major flood.

How much warning time

- The Goulburn River in flood will generally take somewhere between 40 and 60 hours to travel from Seymour to Murchison and half a day (12 to 15 hours) to travel from Goulburn Weir to Murchison. Murchison to Arcadia Downs (now referred to as Kialla West) will take approximately 1 day (15 to 25 hours).

Isolation risks

- Flooding in and around Murchison can last 1 to 3 days (24 to 72 hours). This depends on the amount of rain that has fallen around the area.

Major road closures

- Willoughby Street would be closed south of the town and Old Weir Road should be monitored for closure.
- The Causeway does not overtop until the river reaches 11.9 m.
- River Road appears to remain dry, even in very large floods, with modelling showing it dry up to and including at 12.22 m.

Locations where evacuation difficulties may occur (e.g. low flood islands)

- Evacuation of the River Haven Caravan Park could be difficult if the Goulburn River rises quicker than expected.
- Campers on the banks of the Goulburn River could be caught if there is a lot of rain which will prevent them from leaving their camp site.

Flood Mitigation

There are a number of rain and river gauges in the general vicinity and upstream of Murchison that can provide flood information for the town. For example:

- One at Murchison Bridge.
- Goulburn Weir.
- Seymour.
- Trawool.
- Ghin Ghin.
- Lake Eildon dam (downstream of the wall).
- Hughes Creek at Tarcombe Road and a rain gauge at Temagong which can provide early indications of rainfall intensity east of Seymour.
- Data from additional sites are available from the BoM website. FloodZoom also provides access to this and other data relevant to flooding at Murchison.

The following levees exist in Murchison:

- There is a 200 m long earthen levee, approximately 600 mm in height, along the bank of the Goulburn River north from High Street (Bendigo / Murchison Road) to the back of the playground. This levee protects from backwater flooding along the depression that runs past Stevenson Street back towards Watson Street. This levee has a minimum crest elevation of 121.04 m AHD, which provides a freeboard of 610 mm during a 1% AEP flood event (i.e. water level is 120.43 m AHD at this location) and a freeboard of 310 mm during a repeat of the 1916 flood.
- The River Road Caravan Park on River Road is protected by a levee that is not overtopped in a repeat of the 1916 flood (i.e. 12.22 m).

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Details of any levee closure points such as railway crossing etc, which may need to be sandbagged.

- During an extreme flood event (i.e. from above 12.1 m or so and similar to what occurred in 1916) and as a consequence of a breakout from the Goulburn River upstream of Murchison establishing a flow path through the western side of the town, there is a possibility of flooding of the depression that runs through the town. Given the long lead times, sandbagging could prevent this flooding at the location shown on the figure below. The location is suggested as it is at a natural constriction and is where flows are the shallowest. However, as this location appears to be on private land, an arrangement with the landholder would need to be agreed. The matter is discussed further in Water Technology (2014).

Flood Mapping

A set of flood inundation maps for Murchison has been produced for emergency management and response purposes (Water Technology, 2014). Maps were produced for 12 incremental gauge heights from 9.0 to 12.2 m, including the 1% AEP gauge height (11.92 m)

Flood mapping is available of the Goulburn River from where the Stuart Murray Canal crosses under Old Weir Road downstream to Follett Rd. Flood mapping is available through FloodZoom. The study report (Water Technology, 2014) is also available through FloodZoom.

Flood Frequency

AEP	ARI (1 in X years)	Adopted Peak Flow (ML/d)	Gauge Height (m)
20%	5	49,100	9.9
10%	10	69,000	10.4
5%	20	90,900	10.8
2%	50	123,900	11.4
1%	100	152,600	11.9
0.5%	200	166,500	12.1
0.2%	500	196,900	12.4

Past Flood Experience – History

The highest flood recorded at Murchison was in 1916 when up to a meter of water flowed down the main street. Other floods above the major flood level (10.7 m on the Murchison Gauge) have occurred in the region in 1917, 1934, 1939 and 1974.

- Eildon Weir, built in 1956, and water diversions at Goulburn Weir now control most water flows including irrigation into the lower Goulburn River. Although Eildon Weir and Goulburn Weir were not specifically designed for flood mitigation, these weirs have reduced how often minor and moderate floods affect Murchison and the damage this causes. However, in a major flood these two weirs may not be able to reduce the impact of severe flooding on Murchison.
- Extreme heavy local rainfall between Eildon Weir and Murchison can also result in floods, such as in 1974, the highest floods since Eildon Weir and Lake Eildon were created.

Community or agency flood awareness material

SES in conjunction with the Greater Shepparton City Council has produced a "Local Flood Guide" for Murchison (see Appendix F). The Guide has been distributed to all residents in

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areas likely to be impacted by flood.

Community and agency knowledge

- To be identified:

Known or possible community infrastructure impacts including:

- Impacts on essential community infrastructure – **still to be considered**
- There are no known / identified groundwater wells likely to be inundated;
- Water treatment plants and water storage areas along with pumps and other service equipment etc likely to be inundated.

GV Water	Murchison WTP	Water Treatment Plant	52 Stevenson St, Murchison
GV Water	Murchison WWTP	Waste water treatment plant	Murchison
GV Water	Murchison SPS 1	Sewer pump station	Watson Ave, Murchison
GV Water	Murchison SPS 2	Sewer pump station	McKenzie St, Murchison
GV Water	Murchison SPS 3	Sewer pump station	Station St, Murchison
GV Water	Murchison SPS 4	Sewer pump station	Meteorite St, Murchison
GV Water	Murchison SPS 5	Sewer pump station	Murray Lane, Murchison
GV Water	Murchison water tower	Water Tower	71 Stevenson St, Murchison
GV Water	Murchison WTP	Water Treatment Plant / Water Tower	Stevenson St (opposite water tower), Murchison

Command, Control and Coordination

VICSES will assume overall control of the response to flood incidents. Other agencies will be requested to support operations as detailed in this Plan. Control and coordination of a flood incident shall be carried out at the lowest effective level and in accordance with the State Emergency Response Plan (EMMV Part 3). During significant events, VICSES will conduct incident management using multi-agency resources.

Divisional Command will be located at the Hume Region Divisional Command Centre Shepparton and Tatura to manage the Murchison community.



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Gauge Location: Goulburn River at Murchison Gauge

Note to convert gauge level to m AHD, add 108.679 (i.e. gauge zero is 108.679 m AHD)

River Height (m) and / or River Flow (ML/d)	Annual Exceedance Probability	Consequence / Impact	Action Actions may include (but not limited to) Evacuation, closure of road, sandbagging, issue warning and who is responsible
5.62	Dec 2017 flood	<ul style="list-style-type: none"> Was a Seven Creeks – Broken River dominant flood 	•
7.12	March 2012 flood	<ul style="list-style-type: none"> Was a Seven Creeks – Broken River dominant flood 	•
Minor flood level 9.0 m 34,900	50% AEP (<2 year ARI)	<ul style="list-style-type: none"> Low lying rural properties upstream and downstream of Murchison are likely to be flooded. Floodwater approaching the downstream side of High Road and Hutchison Road. 	<ul style="list-style-type: none"> Move stock and equipment to higher ground. Close local roads adjacent to river. Evacuate camping and fishing spots north of the bridge. Note flood impacts for later update of this table.
9.40	Oct 1979 flood		•
9.57	Sept 1973 flood		•
9.43	Nov 2011 flood	<ul style="list-style-type: none"> No significant impacts in Murchison. 	•
9.791	Dec 2010 flood	<ul style="list-style-type: none"> No significant impacts in Murchison. 	•
9.80	Aug 1996 flood		•
9.87	July 1981 flood		•
9.88	Sept 1983 flood		•
9.93	Jan 2011 flood	<ul style="list-style-type: none"> No significant impacts in Murchison. 	•
10.15	Sept 2010 flood	<ul style="list-style-type: none"> People were moved to Murchison Relief Centre in Watson Street and caravans were moved to higher ground. 	•
Moderate flood level 10.2 62,600	12% AEP (8 year ARI)	<ul style="list-style-type: none"> Overland flooding south of High Road covering western side of River Haven Caravan Park. Extensive inundation of floodplain and shallow water over Willoughby Street south of Station Street. High Road and Hutchison Road wet. 	<ul style="list-style-type: none"> Move caravans in River Haven Caravan Park to higher ground. Willoughby Street – consider for closure. High Road – consider for closure.
10.24	Oct 1992 flood	•	•
10.26	Oct 1993 flood	•	•
10.57	Sept 1993 flood	•	•

River Height (m) and / or River Flow (ML/d)	Annual Exceedance Probability	Consequence / Impact	Action Actions may include (but not limited to) Evacuation, closure of road, sandbagging, issue warning and who is responsible
Major flood level 10.7 86,400	6% AEP (18 year ARI)	<ul style="list-style-type: none"> Shallow inundation of Hutchinson Road, Old Weir Road and more extensive inundation of Willoughby Street south of Station Street. Water up against River Road downstream of town Cemetery beginning to flood. 	<ul style="list-style-type: none"> Evacuate residents on Hutchinson Road Evacuate River Haven Caravan Park Close Willoughby Street south of Station Street Old Weir Road – Consider for Closure
10.79	1939 flood	•	•
10.8 92,200	5% AEP (20 year ARI)	<ul style="list-style-type: none"> Inundation of properties on east side of Willoughby Street, including cemetery, south of Station Street. Water encroaching onto the foreshore opposite the CBD in Stevenson Street. 	<ul style="list-style-type: none"> Consider opening evacuation centre Warn residents along Willoughby Street
11.0 103,500	3.3% AEP (30 year ARI)	<ul style="list-style-type: none"> Inundation of several properties on east end of Willoughby Street near Watson Street. (i.e. properties east of McKenzie Street) Phillip Lane wet. 	<ul style="list-style-type: none"> Consider closing Willoughby Street.
11.2 114,000	2.5 % AEP (40 year ARI)	<ul style="list-style-type: none"> Inundation of Willoughby Street between Watson Street and Stevenson Street and adjacent properties. Water up to 1m deep. Inundation of Watson Street east of Willoughby Street. 	<ul style="list-style-type: none"> Close Willoughby Street between Station Street and Stevenson Street Close Watson Street near Willoughby Street
11.25	1934 flood		•
11.28	1917 flood		•
11.29	May 1974 flood		•
11.38	July 1956 flood		•
11.4 123,600	2% AEP (50 year ARI)	<ul style="list-style-type: none"> Further inundation of properties east of Willoughby Street between Watson Street and Station Street. Flow across Donegans Road north of Hutchinson Road – has broken out of the immediate floodplain downstream of town. 	<ul style="list-style-type: none"> Close Donegans Road
11.55	Dec 1934 flood		
11.6 134,700	1.4% AEP (70 year ARI)	<ul style="list-style-type: none"> Flow across Watson Street west of Willoughby Street. 	
11.8 147,700	1.1% AEP (90 year ARI)	<ul style="list-style-type: none"> Inundation of additional property west of Willoughby Street between Watson Street and Stevenson Street. Extensive flow across Donegans Road. 	<ul style="list-style-type: none"> Warn residents along McKenzie Street and Watson Street.

River Height (m) and / or River Flow (ML/d)	Annual Exceedance Probability	Consequence / Impact	Action Actions may include (but not limited to) Evacuation, closure of road, sandbagging, issue warning and who is responsible
11.92 152,600	1% AEP (100 year ARI)	<ul style="list-style-type: none"> Flow will begin to overtop Murchison-Bendigo Road causeway. 	<ul style="list-style-type: none"> Monitor Murchison-Bendigo Road Causeway – consider closing
12.0 160,200	0.7% AEP (150 year ARI)	<ul style="list-style-type: none"> Breakout flow across Gillam Road towards Hutchinson Road across several properties. Intersection of Stevenson and McKenzie streets now wet. Breakout immediately to the south of town will soon activate and the overland flow path begin flowing. Substantial property flooding and over-floor likely. 	<ul style="list-style-type: none"> Close Murchison-Bendigo Road Causeway. Close Gillam Road. Sandbag low area south of Station Street between Willoughby Street and Robinson Street – across the flow path of the breakout in order to prevent flooding through town. Consider relocating VICSES and VicPol operations. Warn residents in the overland flow path of possible / likely flooding.
12.22 175,300	Sept 1916 flood 0.3% AEP (300 year ARI)	<ul style="list-style-type: none"> Breakout from river south of Station Street and the rail trail with flow path through town. Crosses Robinson Street south of Station Street, then across Station Street, Watson Street and Stevenson Street between Impey Street and Robinson Street. Substantial number of properties, including in the CBD, wet. Above floor flooding likely in properties along High, Station, Willoughby, Hutchison and Gillam streets, Phillip Lane and River Road. Intersection of Stevenson Street and High Road wet. Extensive flooding of River Haven Caravan Park. Significant number of rural properties isolated. VICSES depot surrounded by water. Police station surrounded by water. 	<ul style="list-style-type: none"> If not already done, sandbag low area south of Station Street between Willoughby Street and Robinson Street in order to prevent breakout and flooding through town.

APPENDIX C2– SHEPPARTON / MOOROOPNA and KIALLA FLOOD EMERGENCY PLAN

Overview of the Catchment and Flooding Consequences

Shepparton-Mooroopna lies at the confluence of three main river systems, the Goulburn River, the Broken River and Seven Creeks. Large floods can originate from any one of the three systems or from a combination of the three systems.

The total catchment area to Shepparton is 16,125 km².

The Goulburn River catchment at its confluence with Seven Creeks has an approximate catchment area of 12,000 km². The river rises in the Great Dividing Range above Jamieson. The upper catchment flows into Lake Eildon which has a storage capacity of 3,390,000 ML and provides irrigation supplies to a large part of northern and central Victoria. During floods, the storage may reduce flow peaks from the upper catchment. From Lake Eildon to Seymour, several tributaries including the Rubicon, Acheron and Murrindindi Rivers join the Goulburn as it flows to the west. From Seymour, the Goulburn River turns to flow in a northern direction to the Goulburn Weir near Nagambie. Downstream of Goulburn Weir, the river continues to flow in a northerly direction to Shepparton. Just upstream of Shepparton, the Goulburn River is joined by Seven Creeks and the Broken River. Downstream of Shepparton at Bunbartha, the Goulburn flows in a north westerly direction to join the River Murray upstream of Echuca.

The Broken River rises in the Tolmie highlands and flows to the west before flowing to the north into Lake Nillahcootie. Lake Nillahcootie has a storage capacity of 39,800 ML and is not large enough to have a significant effect on major floods (HydroTechnology 1995a). Nevertheless Cardno (2008) found that without Lake Nillahcootie, flood levels at Benalla would be up to 0.23m higher (a situation that could occur if Nillahcootie was at FSL at the start of a major flood event). Holland Creek joins the Broken River just upstream of Benalla. The river continues flowing north until downstream of Benalla where the river turns and flows west to join the Goulburn River. The catchment area of the Broken River at the Goulburn River confluence is 2,510 km². During large floods, the flow in the Broken River break out to the north in the vicinity of Casey's Weir and joins the Broken Creek system (see footnote ¹¹ below, additional details are provided in the Moira Shire MFEP). Further breakouts to the north and south occur during large floods along the Broken River between Casey's Weir and Shepparton. About 10 km upstream of the Broken River's confluence with the Goulburn River, the East Goulburn Main Channel passes under the Broken River via a siphon. The channel causes a constriction in the floodplain and during major floods this constriction results in a ponding of water upstream of the channel. Flood flow may break out upstream of the channel and flow to the south to join Honeysuckle Creek, a tributary of Seven Creeks or to the north to the Broken Creek via a number of tributaries including Pine Lodge, Congupna and Dainton's creeks³. The breakouts and the floodplain storage result in a reduction of the peak flow for the Broken River from Benalla to its confluence with the Goulburn River.

Seven Creeks flows to the north-west from the Strathbogie Ranges through Euroa and to its confluence with the Goulburn River. The catchment area of Seven Creeks at the confluence

¹¹ During major floods, flows spill into the Broken Creek catchment from the Broken River near Casey's Weir and downstream from Gowangardie Weir through minor watercourses such as Guilfus, Congupna, Dainton's, Pine Lodge and O'Keefe creeks and moves north across a broad area west of Gowangardie Weir. Extensive inundation of the surrounding land results. These creeks discharge into Nine Mile Creek downstream from Wunghnu and then into the Broken Creek between Numurkah and Walsh's Bridge

Breakouts from near Casey's Weir occur when flow in the Broken River reaches approximately 18,000 ML/d or around 3.0 m at Benalla. At Casey's Weir the trigger flow is around 17,250 ML/d (~200 m³/s) or at a water surface elevation of 158.73 m AHD (or around 1.81 m at the gauge).

is about 1,550 km². Honeysuckle Creek is a tributary of Seven Creeks and joins just upstream of Kialla West. During major flood events in the Broken River, the flow may break out of the Broken River and flow to the south joining Honeysuckle Creek. Some exchange of flow from Seven Creeks to the Broken River may occur during major floods. This exchange occurs downstream of Kialla West, spilling across Riverview Drive toward Kalinga Park (Lincoln Drive).

Two other tributaries enter the Goulburn downstream from Murchison: Pranjip Creek at Moorilim and Castle Creek at Arcadia.

The Goulburn and Broken Rivers in particular have a number of tributary and effluent flow paths. These facilitate flow transfers during large floods which further complicates flood behaviours.

The City of Greater Shepparton is built on a floodplain and can expect flooding across the majority of the municipality from time to time. Historical records indicate that the areas directly adjacent to the major waterways are obviously most at risk from major floods; however, because of the flat terrain, most areas will experience localised 'flash flooding' from intense storms. See for example Appendix C3 for East Shepparton.

Generally Shepparton and surrounds will have between 3 and 5 days' notice of the approach of major flooding within the river system. Flash flooding (e.g. East Shepparton) occurs within a few hours.

The main highways to Shepparton will begin to be inundated from around the start of major flooding (i.e. greater than 11.0 m). Details are provided in the Shepparton flood intelligence card.

- The Midland Highway will be impassable near the eastern boundary of the municipality when the Broken River breaks its banks at Gowangardie.
- The Midland Highway will be wetted in Mooroopna from around 11.66 m and may need to be closed.
- The Midland Highway in Shepparton begins to get wet between Mitchell and Florence Streets from around 12.05 m and may need to be closed.
- The Barmah – Shepparton Road will be wetted to the north of its intersection with the Goulburn Valley Highway from around 11.7 m and may need to be closed.
- The Goulburn Valley Highway will be inundated opposite Victoria Park Lake (north of the railway line) from around 11.4 m as well as north and south of the town.
- The Goulburn Valley Highway will be wetted at the Brauman Street – Pine Road intersection in North Shepparton from around 11.8 m.
- Some other roads will be closed at creek and river crossings – see the table below giving the depth of water over the pavement and where "pink" indicates within 100 mm of over-topping.

In December 2017, Castle Creek was against the underside of the lower Goulburn Valley Highway Bridge with the Castle Creek at Arcadia gauge showing 2.39 m.

Evacuation issues

The majority of properties have satisfactory egress in the event of rising floodwaters. However, there are three (3) locations that may present evacuation issues, if the residents are not notified early. These are:

- Kialla Settlement, Riverview Drive
- Arcadia Downs Estate
- Kidstown Tourist facility

Depth of flooding at key creek and river crossings

Bridge or Causeway name	Depth of flooding over bridge deck or causeway for various levels at Shepparton gauge										
	9.5m	10.1m	10.7m	10.9m	11.1m	11.3m	11.7m	12.1m	12.2m	12.3m	12.5m
Watt Rd - Goulburn River	-	-	-	-	-	-	-	-	0.08	0.16	-
Shep - Euroa Rd - Broken River	-	-	-	-	-	-	-	-	-	-	-
Mitchell Rd - Seven Cks	0.36	1.30	2.62	2.89	3.18	3.46	3.84	4.09	4.09	4.17	4.44
GV Highway - Seven Cks	-	-	-	-	-	-	-	0.08	0.10	0.17	0.44
GV Highway River Rd	-	-	-	-	-	-	-	0.17	0.17	0.18	0.68
Doyles Rd - Broken River	-	-	-	-	-	-	-	-	-	-	-
Archer Rd - Broken River	-	-	-	-	-	-	-	0.08	0.19	0.45	-
GV Highway - Broken River	-	-	-	-	-	-	-	-	0.04	0.25	-
Railway - Goulburn River	-	-	-	-	-	-	-	-	-	-	-
Railway - Broken River	-	-	-	-	-	-	-	-	-	-	-
Chinamans Gardens Culvert	-	-	-	-	-	-	-	-	-	-	-
Causeway Br1	-	-	-	-	-	-	-	-	-	-	-
Causeway Br 2	-	-	-	-	-	-	-	-	-	-	-
Causeway Br 3	-	-	-	-	-	-	-	-	-	0.09	-
Causeway Br 4	-	-	-	-	-	-	-	-	-	-	-
Dainton's Br	-	-	-	-	-	-	-	-	-	-	-
Midland Hwy Culvert Mooroopna	-	-	-	-	-	-	-	0.47	0.73	0.80	1.14
Trevaskis Rd - Honeysuckle Ck	-	0.55	1.21	1.29	1.37	1.42	1.49	1.54	1.55	1.56	1.65
Central Kialla Rd - Honeysuckle Ck	-	-	-	-	-	-	-	-	-	-	-

Note – refer to the map on the following page for bridge and causeway locations.

Caravan parks are also susceptible to flooding. The main sites in Shepparton and Mooroopna are:

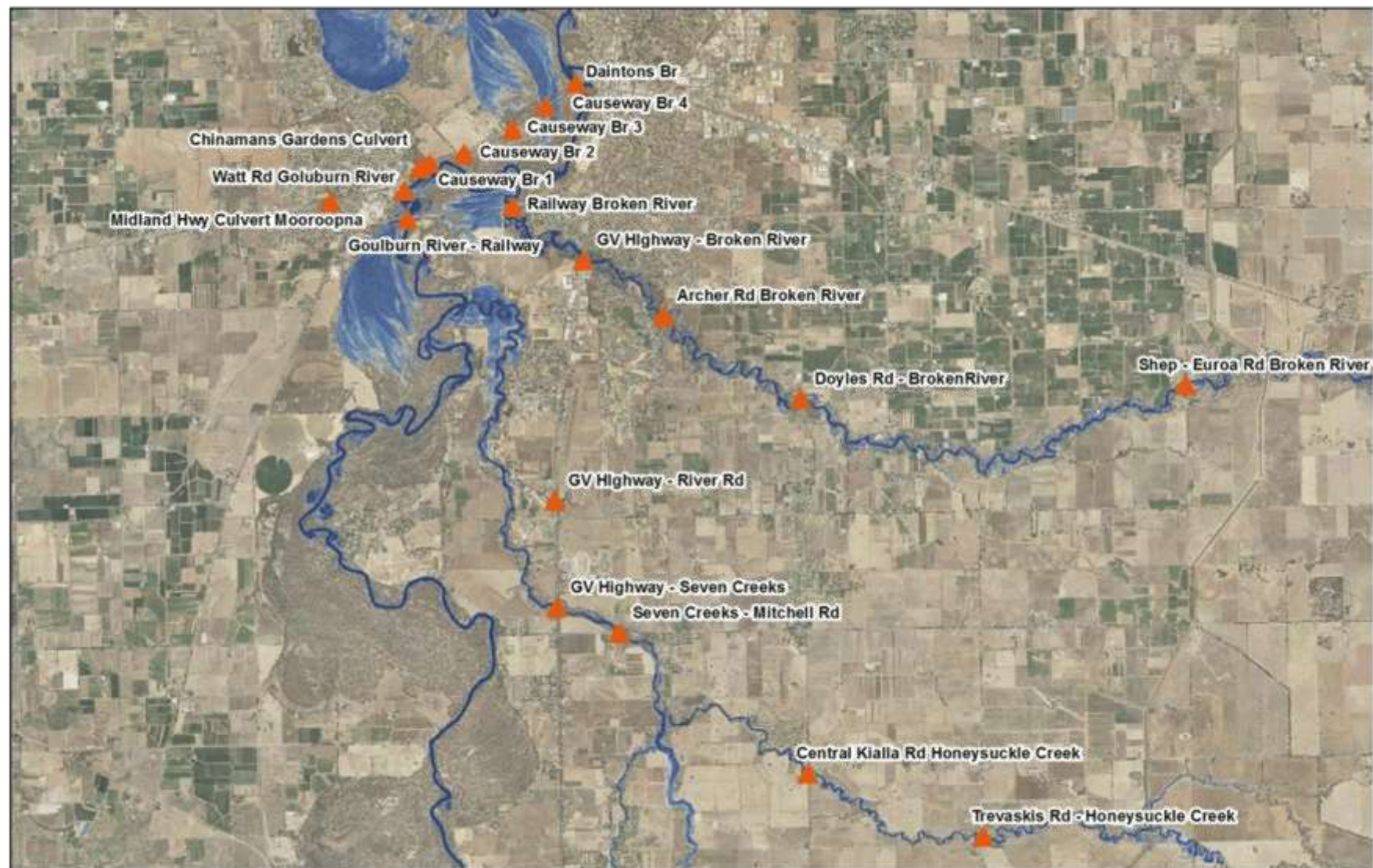
- **Victoria Lake Holiday Park**
536 Wyndham Street or Fitzjohn Road, Shepparton Tel 03 5821 5431
The grounds begin to flood at around 11.18m at Shepparton while the first floors begin to flood from about 11.4m.
- **Shepparton Riverside Cabin Park**
8049 Goulburn Valley Highway, Shepparton South Tel 03 5823 1561
The grounds begin to flood at around 12.0m at Shepparton.
- **Big4 Shepparton Park Lane Holiday Park**
7835 Goulburn Valley Highway, Kialla Tel 03 5823 1576
The grounds begin to flood at around 12.4m at Shepparton
- **Aspen Lodge Caravan Park**
1 Lawson Street, Mooroopna Tel 03 5825 2245
The grounds begin to flood at around 11.4m at Shepparton while the first floors begin to flood from about 11.6m.

Property Flooding

There are in excess of 9,000 properties within the current 1% AEP flood extent.

Property Data Summary

The property data on which the following count is based was collected as part of the 2002 study and targeted all land parcels and buildings then determined to lie within the 100 year ARI flood extent. It is assumed that all buildings constructed since 2002 have their floors at the 100-year ARI flood level plus a minimum of 300 mm freeboard, therefore no further floor levels have been collected as part of this study. So there are likely to be other properties not included in this list where buildings will be above flood level but inundation on or surrounding the property is observed. In addition to the above note, the property use may have changed.



Greater Shepparton City Council Flood Emergency Plan – A Sub-Plan of the MEMP

For example, the building at 195-205 Numurkah Road is now occupied by the CFA and hosts the Shepparton ICC, and both the Mooroopna Police Station and Mooroopna Hospital are no longer located in McLennan Street).

The number of properties and buildings assessed as being subject to inundation has also changed due to updated flood extent and depth modelling. This is mostly due to the higher resolution of the recent study, incorporating the impacts of channel embankments in the modelling, reducing areas of inundation in some locations.

A summary of the number of properties and floors inundated at various levels at Shepparton is provided in the following table (Water Technology, 2017).

Number of properties and floors flooded at various levels

Event	Shepparton gauge level (m)	Properties				Floors			
		Flooded and almost flooded	Flooded	Almost flooded	Number of properties not "flood affected"	Flooded and almost flooded	Flooded	Almost flooded	Number of floors not "flood affected"
	10.5	2	2	0	9353	0	0	0	9355
Moderate	10.7	13	10	3	9342	4	4	0	9351
10% AEP	10.9	31	23	8	9324	5	5	0	9350
Major	11	64	36	28	9291	11	9	2	9344
	11.1	164	98	66	9191	18	18	0	9337
5% AEP	11.3	308	193	115	9047	31	28	3	9324
~1993	11.5	498	322	176	8857	64	45	19	9291
	11.7	1337	878	459	8018	142	109	33	9213
2% AEP	11.9	4200	3565	635	5155	800	552	248	8555
~1974	12.1	5742	5065	677	3613	1429	1022	407	7926
1% AEP	12.2	7206	6684	522	2149	2301	1734	567	7054
0.5% AEP	12.3	8134	7777	357	1221	3862	3010	852	5493
0.2% AEP	12.5	8624	8404	220	731	5555	4567	988	3800

Properties likely to be first affected by flooding

The following list has been compiled from a combination of local knowledge and the property listings produced by the 2017 study. Levels at which key public buildings and services are impacted along with a more detailed listing of flood consequences is included in the Flood Intelligence Card included in this Appendix.

A listing of properties affected by flooding (including over-floor) is not included in this document but is available as a separate Excel spreadsheet from which will be added to FloodZoom along with this MFEP document.

685 DOYLES ROAD, KIALLA

The property begins to be affected from 6.3 m at Orrvale. The house is a fair bit higher (approx. 1 m) with levels known by the owner. Does not need to be sandbagged until Orrvale likely to approach 7.3 m.

68 DOYLES ROAD, KIALLA

When the Broken River reaches 7.8 m at Orrvale there will be water lapping at the house

SHEPPARTON VILLAGES

Ensure that the chief project officer and management of Tarcoola Village and Waranga Drive Village are advised of predicted flood levels so that they can activate their flood response plan for both sites.

470 MADILL ROAD, UNDERA

Levee banks in the area of his farm will over-top when we have a flood in excess of approximately 11.2 m on the Shepparton gauge.

95 JAMIESON ROAD, ORRVALE

The Broken River will flood up around the house at around 7.8 m at Orrvale; they need a Road Closed sign at Channel Road to stop people driving down there.

25 FURPHY AVENUE, KIALLA

Will always ring to find out what is going on because she lives in the deepest part of Furphy Avenue. Property starts to flood around 11.2 m at Shepparton with over-floor flooding likely to start from approx. 11.4 m

3 & 5 McLENNAN STREET, MOOROOPNA

Right beside the river in the service road. Both properties start to flood around 11.0 m at Shepparton. No 3 will be flooded over-floor to a depth of around 10mm at 11.1 m at Shepparton while the lower level of No 5 will begin to flood as the river exceeds 11.1 m.

489 ARCHER ROAD, KIALLA

Owns the house and land at the floodway south of Kialla Lakes Drive, on the east side of Archer Road. Knows it is his responsibility to keep the floodway, watercourse clear and has assisted us with his tractor to rescue stranded motorists when Archer Road flooded.

60 HOOPER ROAD, KIALLA

The property will start to be flooded if the Broken River reaches 7.7 m at Orrvale as the anabranch will flow out from the Broken across to the Archer Road culverts.

56, 60 & 100 HOOPER ROAD, KIALLA

All properties begin to flood from about 10.8 m at Shepparton with over-floor flooding at No 60 likely if Shepparton exceeds 11.5 m.

360 & 370 CENTRAL KIALLA ROAD, KIALLA

These are the first properties flooded in Kialla from around 10.4 m at Shepparton.

966, 970 & 980 ARCHER ROAD, KIALLA WEST

These are the first properties flooded in Kialla West from around 10.6 m at Shepparton. Nos 966 & 980 are also likely to begin experiencing over-floor flooding around this level.

650 DOYLES ROAD, SHEPPARTON

The first property flooded in Shepparton from around 10.6 m.

118 MCPHEES ROAD & 89 MALCOLM CRESCENT, SHEPPARTON

These two properties are likely to be the first to suffer over-floor flooding in Shepparton, beginning from around 11.8 m.

7275 MIDLAND HIGHWAY, MOOROOPNA

The first property flooded in Mooroopna from around 10.8 m at Shepparton.

3 McLENNAN STREET, MOOROOPNA

This is the first property likely to suffer over-floor flooding in Mooroopna, beginning from around 11.0 m at Shepparton.

Essential Services

Essential services such as electricity supply (Powercor) will be impacted by floodwaters. Ground level electrical substations are at extreme risk and will need to be protected with sandbags; otherwise they will have to be shut down; causing localised outages.

The water treatment plant is well protected but if the levees are breached, water supply will be affected; the town has only a single week's supply of treated water available, if the plant were to become inoperable due to floodwater damage. The sewerage system will become overloaded if floodwater is allowed to flow back into the system through private gully traps and such; all inlets must be closed. Goulburn Valley Water who is the responsible agency for water supply and sewerage management in the City of Greater Shepparton municipal area, has its own detailed response plan which includes details of tasks to be conducted when river levels rise. Their works commence when the level reaches 8.5 m at the Shepparton gauge. Their water treatment plant and sewerage pumps will be adversely affected at a river height of 11.9 m.

Flood Mitigation

- Shepparton, Murchison, Kialla and Undera regions have levees at strategic locations; however, these only provide protection up to just over the Shepparton major flood level of 11.0 m and have been overtopped twice in the past 40 years.
- Penstocks are in place on most inlet pipes to the rivers, preventing backflow of floodwaters. The closing and opening of these penstocks is correlated closely to the levels recorded at the 3 major automated flood level gauges on the Broken, Sevens and Goulburn waterways.
- There are large volume pumps at some locations to lift and discharge waters when penstocks are closed.
- All new subdivisions are being developed with sufficient retardation basin capacity, to slow up the inflow of water into the town stormwater drainage systems.
- Greater Shepparton City Council manages and maintains floodwater infrastructure.

Flood Impacts and Required Actions

Totems for the Goulburn and Broken Rivers and Seven Creeks waterways display the impacts and actions required when the waterways reach certain levels. They were developed in 1994 using historical data and reviewed after each flood event for the past 18 years to refine and improve Council's preparedness.

Flood reaction 'totems' have recently been prepared for local communities at Tallygaroopna, Congupna and Katandra; these will need to be checked for practical function during future events.

Note – In Flash Flood areas without gauges, it will only be possible to provide a general description of likely flood impacts.

Flood Mapping

A comprehensive set of riverine flood inundation maps for Shepparton-Mooroopna has been produced for emergency management and response purposes (Water Technology, 2017) for Goulburn dominant, Broken – Seven Creeks dominant and neutral flood scenarios. Maps were produced for the design event combinations shown in the table below from the minor flood level (9.5 m at Shepparton) up to the 0.2% AEP (500-year ARI) event (12.5 m at Shepparton). Each map set comprises:

- Flood extent;
- Flood depth in metres;
- Flood level in m AHD;
- Velocity;
- Hazard;
- Flood affected properties and those flooded over-floor (these are the properties listed in the separate Excel spreadsheet referred to on the previous page).

Mapping is available through FloodZoom. The study reports (Water Technology, 2017) are also available through FloodZoom.

A matrix has been developed for each of the modelled and mapped flood (or dominance) scenarios. The matrix comprises flood levels at each of the Broken River at Orrvale, Seven Creeks at Kialla West and Goulburn River at Kialla West gauges, that in combination produce the listed key levels at the Goulburn River at Shepparton gauge for each of the mapped scenarios. The matrix is provided at the end of this Appendix.

Shepparton gauge heights for flood inundation map sets

Event	Goulburn River @ Shepparton Gauge Height (m AHD)	Goulburn River @ Shepparton Gauge Level (m)
Minor Flood	109.627	9.5
20-10%	110.227	10.1
Moderate Flood	110.827	10.7
10%	111.027	10.9
Major Flood 2010	111.127	11.0
10-5%	111.227	11.1
5%	111.427	11.3
5-2%	111.627	11.5
1993	111.827	11.7
2%	112.027	11.9
1974	112.227	12.1
1%	112.327	12.2
0.5%	112.427	12.3
0.2%	112.627	12.5
PMF		

Flood Class Levels

Flood Class Level	Goulburn River at Shepparton	Goulburn River at Arcadia Downs	Broken River at Orrvale	Seven Creeks at Kialla West
Minor	9.5 m	9.0 m	5.8 m	4.5 m
Moderate	10.7 m	10.4 m	7.2 m	5.0 m
Major	11.0 m	10.7 m	7.5 m	6.6 m

Using the flood inundation map sets

The first step in using the flood mapping data sets is to determine which dominance scenario applies (i.e. Broken–Seven Creeks, neutral or Goulburn). This will dictate which map set is appropriate to determine flood extents and consequences in the vicinity of each of Orrvale, Seven Creeks at Kialla West, Goulburn River at Kialla West and Shepparton. The appropriate map and summary of likely consequences (read from the flood intelligence card for each gauge) at a location will be the one that matches the expected level at that location.

As the event progresses and peak level forecasts are refined, the appropriateness of map sets being used and thus likely consequences should be reviewed and adjustments made as necessary.

While a conservative approach would be to use the maximum extent map sets, on-ground flood impacts will in general be less than expected in some locations. See for example, the 1% AEP flood extent maps below for each of the dominance scenarios.

Getting a heads-up of likely flood severity and impacts

Tools and instructions for their use are provided at the end of this Appendix to enable a user to quickly determine an indication of likely flood severity and consequences through the lower reaches of the Broken - Seven Creeks - Goulburn system.

The earliest an initial heads-up of the expected peak level at Shepparton can be determined is after a forecast peak level is available for Benalla and Euroa and a peak outflow forecast (or estimate) is available for Goulburn Weir (i.e. a peak level for the Goulburn Weir tail gauge). The use of actual flood peaks will generally result in more accurate estimates.

The tools provide an estimate of the likely flood peak. They are not infallible and are unlikely to be as precise as BoM flood forecasts.

Use of FloodZoom and other tools is encouraged in order to better inform the early heads-up estimate and assist response activity planning and implementation.

Past flood experience

The City of Greater Shepparton has a history of flooding including major floods (i.e. above 11 m) in 1870, 1916, 1939, 1974, 1981, 1993 and more recently in 2010, recent moderate floods in 1981 and 1983 and minor floods in 1996 and 2016.

- 1974 was a Goulburn River dominant flood.
- 1993 was a Broken River dominant flood.
- 2010 was a flood which saw gauges on the Goulburn, Broken and Seven Creeks peak at major level. During this flood, 13 houses and 31 buildings were flooded in Shepparton, 620 houses were isolated and approx. 40 houses inundated in Kialla and more than 60 people attended the relief and recovery centre.

Flooding from the rivers and creeks in this area usually lasts about four to seven days depending on the rainfall. Roads and properties can also flood due to water backing up in the stormwater drain system.

Flash flooding caused by heavy rainfall can also occur in low-lying areas, especially in the industrial and business areas of Mooroopna and Shepparton East and around the Doyle's Road-Midland Highway roundabout. These flash floods only last a few hours but can be dangerous and cause extensive damage.

Community Education

An important deliverable from the Shepparton-Mooroopna Flood Mapping and Intelligence Study (Water Technology, 2017) was a web-based flood and property information portal for community use. The portal enables flood maps for the various dominance scenarios (e.g. neutral, Goulburn River dominant, Broken-Sevens dominant) to be displayed as well as flood related information for a user-specified property.

The maps display the projected inundation for a variety of river heights: from 9.5, 10.1, 10.7, 10.9, 11.0, 11.1, 11.3, 11.5, 11.7, 11.9, 12.1, 12.2 and 12.3 m; as measured on the

Goulburn River at Shepparton (Dainton's Bridge) gauge.

The flood information for a user-specified property is presented as a report that includes all available flood information for that property.

The maps and reports provide a means for community members to inform themselves of the likelihood of their property being inundated and the likely depths of inundation for a range of levels at the Shepparton gauge.

A typical map is included in Appendix G.

The web-based flood and property information portal can be accessed <http://www.floodreport.com.au/>

The full range of flood inundation maps for the Shepparton area are kept electronically on Greater Shepparton City Council's Crisisworks and the VICSES G drive: G:\Data\AAA North East Operations\Flood Management\Flood Intelligence and Planning\Shepparton-Mooroopna Flood maps will also be available via FloodZoom.

Local Flood Guides are available for all residents within the City of Greater Shepparton to assist them in preparing for future flood events. Refer to Appendix F for a sample. These Local Flood Guides need to be kept current, and should consider the latest flood information and the web-based flood and property information portal.

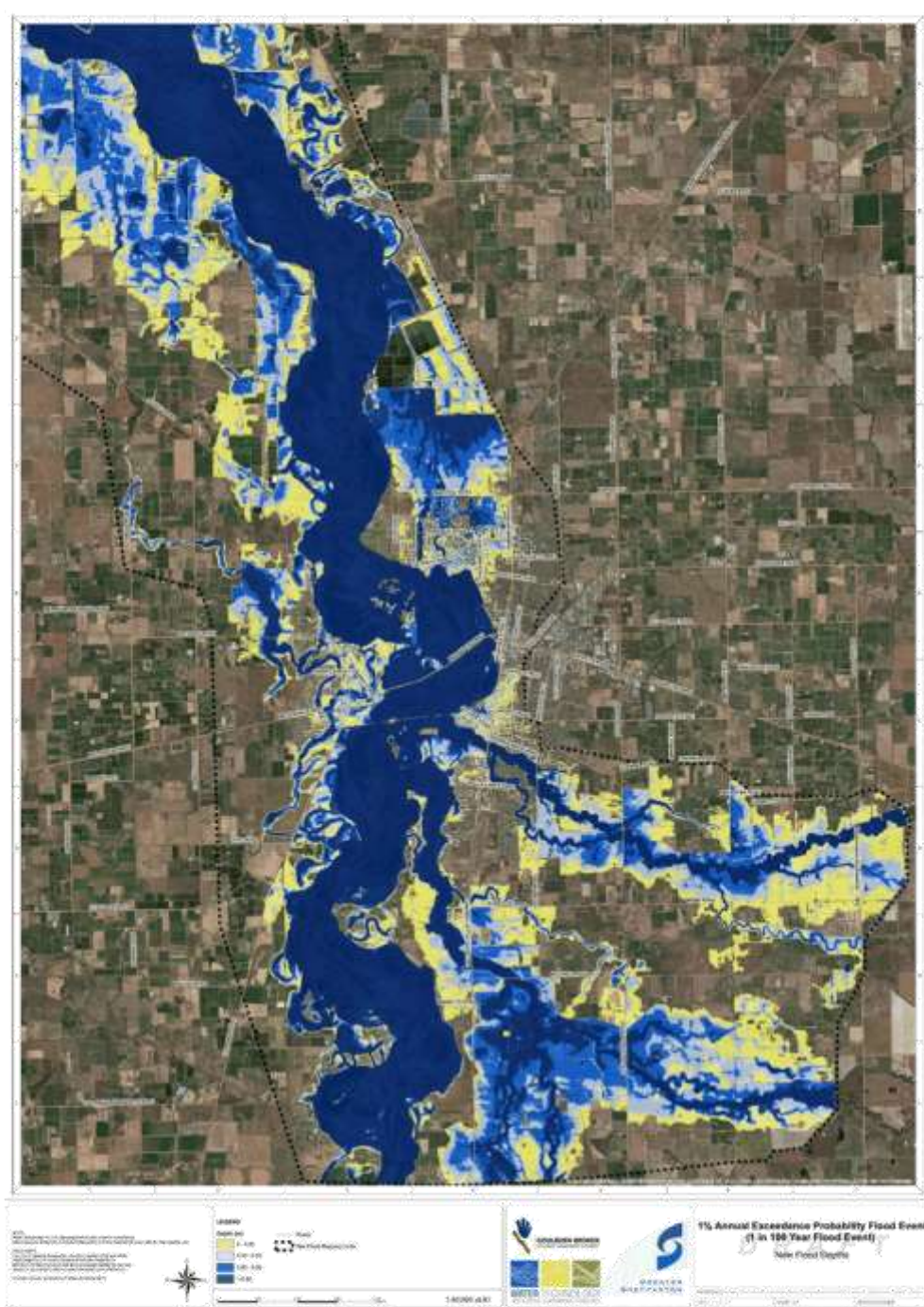
Command, Control and Coordination

The responsible agency for the Command, Control and Coordination of floods is the Victorian State Emergency Service (VICSES).

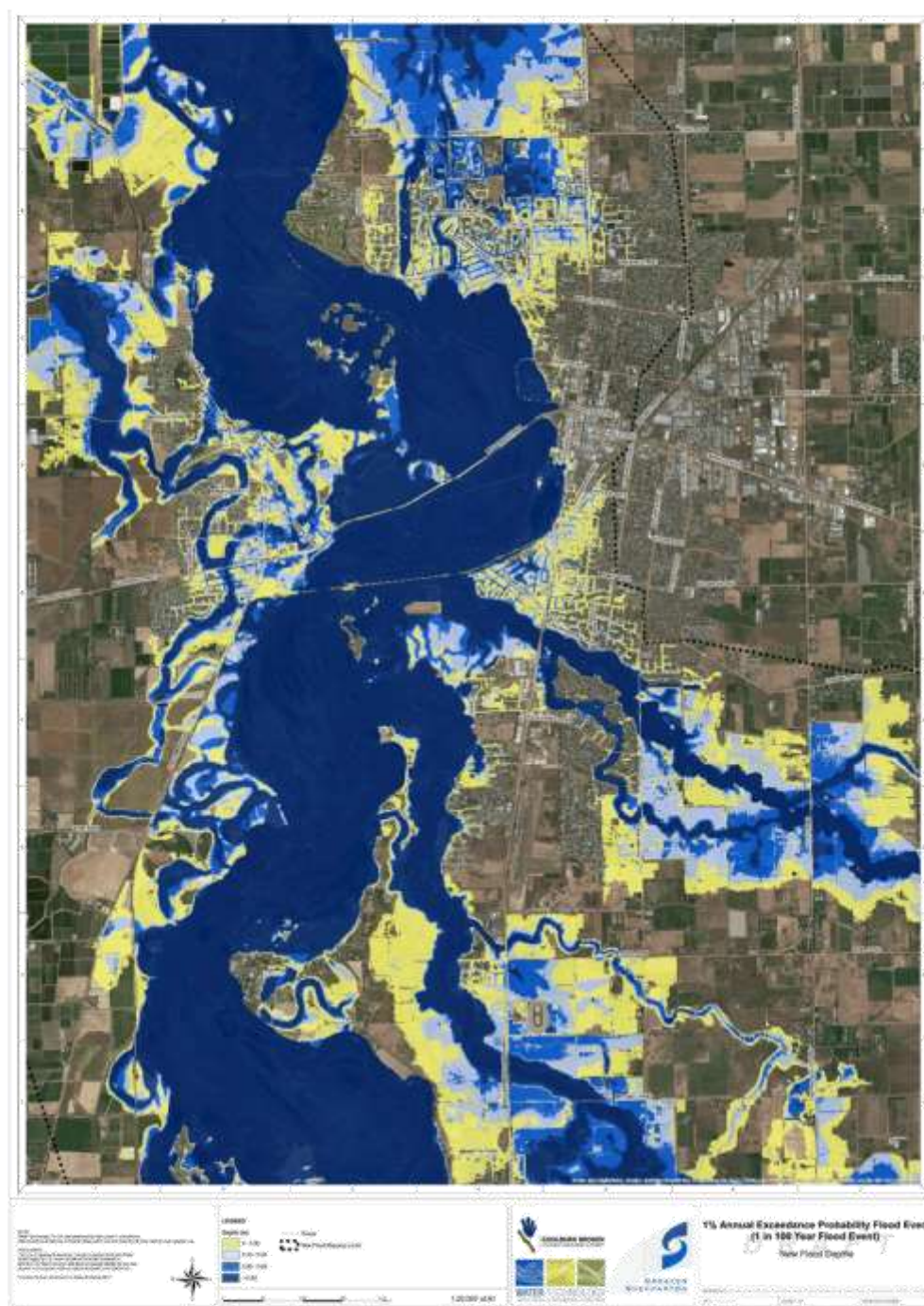
VICSES will assume overall control of the response to flood incidents. Other agencies will be requested to support operations as detailed in this Plan. Control and coordination of a flood incident shall be carried out at the lowest effective level and in accordance with the State Emergency Response Plan (EMMV Part 3). During significant events, VICSES will conduct incident management using multi-agency resources.

Divisional Command will be located at the Hume Region Divisional Command Centre Shepparton and Tatura to manage the Shepparton community.

The Incident Control Centre (ICC) for management of floods is located at the CFA Headquarters, 195 Numurkah Road, North Shepparton or at the VICSES North East Regional Headquarters, 64 Sydney Road, Benalla.



1% AEP flood depths (maximum of Goulburn dominant, Broken/Seven dominant, neutral events)



1% AEP flood depths zoomed in (maximum of Goulburn dominant, Broken/Seven dominant, neutral events)

GOULBURN RIVER

Gauge Location: Goulburn River at Shepparton

River Height (m) and / or River Flow (ML/d)	Annual Exceedance Probability	Consequence / Impact	Action Actions may include (but not limited to) evacuation, closure of road, sandbagging, issue warning and who is responsible
Refer to the spreadsheet of addresses of flooded properties and buildings – covers Kialla, Kialla West, Kialla Lakes, Shepparton, Mooroopna and nearby areas			
7.93m		<ul style="list-style-type: none"> Princess Park north end beside bike path, near end of Knight Street 	<ul style="list-style-type: none"> First Penstocks to be closed Note flood impacts for later update of this table.
8.54m		<ul style="list-style-type: none"> Macguire Reserve north end near Jetty; Penstock is in the middle of the bike path 	<ul style="list-style-type: none"> Close penstock
8.70m			<ul style="list-style-type: none"> Greater Shepparton City Council Internal Flood Management Group Briefing
8.75m		<ul style="list-style-type: none"> Watt Road (back road or alternative route to Mooroopna) flooded. The trigger for this is when the Goulburn River @ Kialla West reaches 9.0m. Rafferty Road at the bridge through to Edgewater Road flooded. 	<ul style="list-style-type: none"> Close Watt Road Close Rafferty Road at the bridge through to Edgewater Road. Monitor conditions for variation of flood flow down each river/creek. Monitor Toolamba Bridge Road for need to close.
8.92m	Dec 2017 event	<ul style="list-style-type: none"> 	<ul style="list-style-type: none">
9.15m		<ul style="list-style-type: none"> Welsford St behind Lawn Tennis Court 	<ul style="list-style-type: none"> Check that pump is operating
9.45m		<ul style="list-style-type: none"> Hassett Street near Lincoln Drive Princess Park south end near BOCCE Club 	Check all OK
9.50m	Minor flood level <50% AEP (<2yr ARI)		<ul style="list-style-type: none"> Greater Shepparton City Council Internal Flood Management Group Briefing. VICSES may coordinate an EMT meeting / teleconference and briefing regarding flood predictions and or actions. If an ICC has not been established or an EMT has not been conducted, contact with the VICSES RDO should be considered (1800 899 927 requesting the NEDO be paged with your name and contact details).
9.80m			<ul style="list-style-type: none"> McFarlane Road – consider for closure Lenne Street Penstock to be closed If rain continues in Mooroopna will need to monitor pump on Toolamba Road pipe (it is a manual pump)
9.97m	March 2012 flood		
10.1m	20% - 10% AEP (5yr – 10yr ARI)		

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River Height (m) and / or River Flow (ML/d)	Annual Exceedance Probability	Consequence / Impact	Action Actions may include (but not limited to) evacuation, closure of road, sandbagging, issue warning and who is responsible
Refer to the spreadsheet of addresses of flooded properties and buildings – covers Kialla, Kialla West, Kialla Lakes, Shepparton, Mooroopna and nearby areas			
10.20m			<ul style="list-style-type: none"> Creek Street (Kialla Park) - Check the gate is closed
10.21m			<ul style="list-style-type: none"> Newton Street Pump Station (Turn on pump and pump out well) 58 The Boulevard - pit behind house
10.30m		<ul style="list-style-type: none"> The Boulevard at Kitties Road 	<ul style="list-style-type: none"> Close Tom Collins Drive to traffic at Fitzjohn Road and at Aquamoves entrance
10.36m		<ul style="list-style-type: none"> Loch Gary Regulator Operates - G-MW will commence removing bars and they are responsible for advising the farms downstream of Loch Garry 	<ul style="list-style-type: none"> All bars are removed at 36ft / 10.96m
10.37m			<ul style="list-style-type: none"> Provide flexi-pump to Manager of Victoria Lake Caravan Park. Tom Collins Drive on drain into Caravan Park. There are 2 penstocks along this levee.
10.40m		<ul style="list-style-type: none"> First properties flooded at Kialla – 360 & 370 Centre Kialla Road, Kialla 	<ul style="list-style-type: none">
10.50m		<ul style="list-style-type: none"> In North Shepparton, Goulburn is about to break-out into the overland flow path that travels north from near the corner of The Boulevard and Hovell Court. 	<ul style="list-style-type: none"> Penstock – Carr Crescent in Mooroopna Penstock – Lenne Street, Mooroopna, check operation of pump If rain continues in Mooroopna will need to close Penstock on the Gange Estate. Check River Road Toolamba, Operate Echuca Road pump near Ann Street Check levels at Gemmill's Swamp and consider closing Gange Estate Penstock.
10.52m			<ul style="list-style-type: none"> Balaclava Road / The Boulevard roundabout on Parkside drain
10.60m		<ul style="list-style-type: none"> First property flooded in Shepparton – 650 Doyles Road. First properties flooded at Kialla West – 966, 970 & 980 Archer Road. Nos 966 & 980 close to over-floor flooding. Properties in Adams Road, Watt Road and Watt Road, Kialla wetted. 	<ul style="list-style-type: none">
10.70m	Moderate flood level	<ul style="list-style-type: none"> Flooding of Watt Road and along Victoria Park more extensive. 	<ul style="list-style-type: none"> Consider opening Evacuation Centres Check Echuca Road north of Mooroopna in anticipation of closure Briefing MERC, MERO, MRM & Support Agencies listed
10.80m		<ul style="list-style-type: none"> Balmoral Street Estate flooding will occur East end McLennan Street, Mooroopna both sides of Highway Properties at 56, 60 & 100 Hooper Road, Kialla begin to flood First property flooded in Mooroopna – 7275 Midland Highway Properties in Doyles Road & Hoopers Road in Kialla wetted Goulburn Valley Highway properties at Kialla & Kialla West wetted 	<ul style="list-style-type: none"> Turn on Creek Street pump, if it is still raining. Car park opposite old Mooroopna hospital – McLennan Street south side block pit inside levee. Main drain outlet or Main drain near Fairway Drive Block culverts under railway line from Mooroopna Station to Pyke Road.

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River Height (m) and / or River Flow (ML/d)	Annual Exceedance Probability	Consequence / Impact	Action Actions may include (but not limited to) evacuation, closure of road, sandbagging, issue warning and who is responsible
Refer to the spreadsheet of addresses of flooded properties and buildings – covers Kialla, Kialla West, Kialla Lakes, Shepparton, Mooroopna and nearby areas			
10.82m			<ul style="list-style-type: none"> Set up pump and pump out drain in Vaughan Street west of Weisford Street. Use 8" diameter centrifugal pump.
10.81m	2010 flood		
10.90m	10% AEP (10yr ARI)	<ul style="list-style-type: none"> Grounds of swimming pool on Tom Collins Drive about to be wetted. Will need to remove electric motors if flood likely to be ~250mm higher. 	<ul style="list-style-type: none"> Activate Flood Operations Centre
10.98m		<ul style="list-style-type: none"> Macguire Reserve Levee overtopped near Dainton's Bridge Fitzjohn Road at Tom Collins Drive Break-out from the Goulburn into Mooroopna near the intersection of Toolamba Road and Lenne Street about to commence. 	<ul style="list-style-type: none"> Warn property owners in Weisford Street, adjacent to Macguire Reserve of levee breach. Rear yards and their car parking area only should be affected. Set up pump and pump out Wilmot Road drain
11.00m	Major flood level July 1981 flood	<ul style="list-style-type: none"> Flooding of properties at 3 & 5 McLennan Street, Mooroopna about to start with 3 McLennan Street and 7275 Midland Highway about to be flooded over-floor. Properties in Cameron Avenue, McPhees Road & Newton Street in Shepparton about to be flooded Properties in Riverview Drive, Kialla about to be flooded Main Highways into Shepparton begin to be inundated. First affected is the Midland Highway near the Municipality's eastern boundary when the Broken River breaks out at Gowangardie. 	<ul style="list-style-type: none"> Open Flood Information Centre at Weisford Street Offices Assess need to place levee across Alternate Route at Channel No. E.G. 16/10 in Doyles Road to stop water from flowing west from here and inundating residential areas of South Shepparton. Penstock – Archer Street Penstock – Ardmona Cannery – Railway Yard Ardmona Cannery Office Penstock (Cannery usually control) Mooroopna Waterworks Trust Office (Trust usually control) Consider need to close the Midland Highway to the east of Shepparton
11.06m		<ul style="list-style-type: none"> Premises at 3 McLennan Street, Mooroopna about to be flooded over-floor 	
11.09	Sept 2010 flood		

River Height (m) and / or River Flow (ML/d)	Annual Exceedance Probability	Consequence / Impact	Action Actions may include (but not limited to) evacuation, closure of road, sandbagging, issue warning and who is responsible
Refer to the spreadsheet of addresses of flooded properties and buildings – covers Kialla, Kialla West, Kialla Lakes, Shepparton, Mooroopna and nearby areas			
11.10m	10%-5% AEP (10yr – 20yr ARI)	<ul style="list-style-type: none"> Furphy Ave overtopped. Balmoral Estate levee is overtopped. Lower level of 5 McLennan Street, Mooroopna about to be flooded over-floor In North Shepparton, a second break-out is about to activate from the Goulburn into the overland flow path near Walters Reserve at intersection of The Boulevard and Kittles Road. First property on The Boulevard is about to be flooded 	<ul style="list-style-type: none"> Gemmill Crescent outlet – block at Gemmill Crescent Centennial Drive outlet – block on high ground Outlet on Echuca Road south of Paisley Crescent – block in Paisley Crescent Paisley Crescent & Wishaw Court outlet – block in street by sandbagging perimeter of pits Operate Lenne Street pump and manipulate rural inflow from the south to keep Lenne Street area dry. May need to bank to restrict rural flow entering Lenne Street area Penstock – Lenne Street penstock. Lift pit lid on river side of railway line so as to release pressure on pipeline. Monitor drain culvert under railway line at Ferguson Road, close as necessary Warn G.V. Estate area. McFarlane Road, Mooroopna drain near Rodney Park Assess need to sandbag Echuca – Mooroopna Road in low section near Gange Estate and houses in Carr Crescent. Sand to be stockpiled at Recreation Reserve Baker Crescent Mooroopna outfall; block at outlet Consider / commence evacuation of Balmoral Estate Warn The Boulevard, Wanganui Estate and Tassicker Estate properties and DECA of break-out.
11.13m			<ul style="list-style-type: none"> Close Penstocks at:
11.18m		<ul style="list-style-type: none"> Victoria Park Lake Levee overtopped Victoria Lake Holiday Park (536 Wyndham Street / Fitzjohn Road) begins to flood. 	<ul style="list-style-type: none"> Warn Tennis Club Close Fitzjohn Road at Wyndham Street Remove electric motors from pool pumps and lake pumps Turn off sewerage pumps and plug sewer at Caravan Park and Aquamoves. Evacuate Victoria Lake Caravan Park and remove all equipment Close Weisford Street at Sobroan Street Consider need to evacuate Victoria Lake Holiday Park

River Height (m) and / or River Flow (ML/d)	Annual Exceedance Probability	Consequence / Impact	Action Actions may include (but not limited to) evacuation, closure of road, sandbagging, issue warning and who is responsible
Refer to the spreadsheet of addresses of flooded properties and buildings – covers Kialla, Kialla West, Kialla Lakes, Shepparton, Mooroopna and nearby areas			
11.20m		<ul style="list-style-type: none"> Lincoln Drive at Varcoe Street Lincoln Drive at Gourlay Street Lincoln Drive at Abernethy Street Lincoln Drive at Coppin Crescent Levees at the farm at 470 Madill Road, Undera about to be overtopped. Water onto property at 25 Furphy Avenue, Kialla (at lowest part of the road) River breaks its banks near Watters Reserve at intersection of The Boulevard and Kitties Road and floods north 	<ul style="list-style-type: none"> Check sewers and plug or shut down pumps affected as required. Evacuate houses in lower lying areas as necessary.
11.30m	5% AEP (20yr ARI)	<ul style="list-style-type: none"> Broken River breaks its banks near Railway Bridge 	<ul style="list-style-type: none"> Warn Taylors Estate (western end), Halls Estate and Longstaff Street area. Evacuate houses in western end of Halls Estate not built to current 1% AEP flood level. Consider / commence evacuating The Boulevard and Wanganui Estate. GVW will check sewers and plug or shut off as required.
	Summary of flood characteristics for the 20yr ARI event: <ul style="list-style-type: none"> Large amount of inundation along the Broken River upstream of the East Goulburn Main Channel and a transfer of flow to Honeysuckle Creek. Shallow flow overtops the channel with constriction at Beckham Road and Central Avenue directing flow up to the north. Flows through Kialla Lakes. Flow along Seven Creeks confined to the adjacent floodplain downstream of Mitchell Road. Immediately upstream, flows extend from the No 6 Main Channel to the Goulburn Valley Highway. Further upstream, flows again confined generally to the immediate floodplain. Goulburn River adjacent to Arcadia Downs generally confined to the floodplain. Floodplain flow constricted at the railway and Midland Highway. Flow breaking out into Mooroopna through some private properties. Further downstream, flow breaking out to the Echuca - Mooroopna Road north of Homewood Drive, some private property inundated. Flow heading through the floodway to the north. In North Shepparton, flow breaking out over The Boulevard to the north inundating some private property. Overland flow constricted by Wanganui Rd and Channel No. 7. Flows extend to alongside the Barmah – Shepparton Road. 		
11.38m		<ul style="list-style-type: none"> Broken River breaks its banks at Gourlay Street and Wyndham Street (GVH) bridge 	<ul style="list-style-type: none"> Warn area east of Wyndham Street between Broken River and railway line, Riverpark Estate and Housing Commission area. Consider evacuation - check area for necessity to evacuate particular houses – refer to spreadsheet of addresses of flooded properties and buildings. GVW will check sewers and pump stations.

River Height (m) and / or River Flow (ML/d)	Annual Exceedance Probability	Consequence / Impact	Action Actions may include (but not limited to) evacuation, closure of road, sandbagging, issue warning and who is responsible
Refer to the spreadsheet of addresses of flooded properties and buildings – covers Kialla, Kialla West, Kialla Lakes, Shepparton, Mooroopna and nearby areas			
11.40m		<ul style="list-style-type: none"> Water about to flood over-floor at 25 Furphy Avenue, Kialla (at lowest part of the road) The first house flooded over-floor on The Boulevard Goulburn Valley Highway in Shepparton north of the railway line / opposite Victoria Park Lake about to get wet. Highway also wet north & south of town The lowest floors at Victoria Lake Holiday Park (536 Wyndham Street / Fitzjohn Road) begin to flood. Grounds of Aspen Lodge Caravan Park (1 Lawson Street, Mooroopna) begin to flood 	<ul style="list-style-type: none"> Consider need to close Goulburn Valley Highway in Shepparton north of the railway line / opposite Victoria Park Lake. Consider need to evacuate Aspen Lodge Caravan Park.
11.50m	5% - 2% AEP (20yr -50yr ARI)	<ul style="list-style-type: none"> Premises at 60 Hooper Road, Kialla about to flood over-floor. Flooding around GVW asset at 35 McLennan Street, Mooroopna 	<ul style="list-style-type: none"> Check Riverside Cabin Park Grant Street drain at Fairway Drive – may need to sand bag perimeter of pits in Ann Street, Harding Street etc.
11.53m		<ul style="list-style-type: none"> Further break-out from the Goulburn at the Boulevard / Balacava Road roundabout 	<ul style="list-style-type: none"> Warn all residents north of Balacava Road and west of Numurkah Road. Evacuate Tarcoola Retirement Home Check sewers and pump stations.
11.60m		<ul style="list-style-type: none"> The lowest floors at Aspen Lodge Caravan Park (1 Lawson Street, Mooroopna) begin to be wetted 	
11.66m		<ul style="list-style-type: none"> Princess Park Levee overtopped Midland Highway in Mooroopna beginning to get wet The grounds of Wanganui Park Primary School are about to be wetted: 	<ul style="list-style-type: none"> Warn Shepparton Swans Football Club and Shepparton United Cricket Club and property owners adjoining Princess Park Consider evacuating the Princess Park Sports Complex Remove sewerage ejector pump. Consider need to close Midland Highway in Mooroopna Close the school?
11.70m		<ul style="list-style-type: none"> Grounds of swimming pool at 24 Morrell Street, Mooroopna will be wetted if water rises further. Will need to remove electric motors if flood likely to reach 11.9m. Grounds of (old) Mooroopna Police Station at 119 McLennan Street flooded Grounds of the old Hospital at 2-8 McLennan Street, Mooroopna flooded. Access may be an issue. Flooding outside and over-floor at Goulburn Medical Centre at 113 – 115 McLennan Street, Mooroopna Grounds of the Wastewater Treatment Plant on McCracken Road in North Shepparton begin to flood Grounds of the Wastewater Treatment Plant at 5440 Barmah-Shepparton Road, Bunbartha begin to flood Adams Road, Kialla is impassable The Barmah – Shepparton Road will be wetted to the north of its intersection with the Goulburn Valley Highway. 	<ul style="list-style-type: none"> Make sure Adams Road, Kialla is closed Consider closing the Barmah – Shepparton Road

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River Height (m) and / or River Flow (ML/d)	Annual Exceedance Probability	Consequence / Impact	Action Actions may include (but not limited to) evacuation, closure of road, sandbagging, issue warning and who is responsible
Refer to the spreadsheet of addresses of flooded properties and buildings – covers Kialla, Kialla West, Kialla Lakes, Shepparton, Mooroopna and nearby areas			
11.71m	October 1993 flood		
11.80m		<ul style="list-style-type: none"> First premises about to be flooded over-floor in Shepparton – 118 McPhees Road & 89 Malcolm Crescent Water outside the Mooroopna Fire Station in Ann Street, Mooroopna Abernethy Street is impassable The grounds of these schools are about to be wetted: <ul style="list-style-type: none"> Gowrie Street Primary School Guthrie Street Primary School Mooroopna Primary School The Goulburn Valley Highway will be wetted at the intersection of Brauman Street & Pine Road in North Shepparton. 	<ul style="list-style-type: none"> Make sure Abernethy Street is closed Close schools? Consider closing the Goulburn Valley Highway through North Shepparton.
11.81m	August 1939 flood		
11.9m	2% AEP (50yr ARI)	<ul style="list-style-type: none"> Welsford Street - Water Treatment plant and sewerage pumps affected Floors of Swimming pool at 24 Morrell Street, Mooroopna just being wetted. Grounds of Shepparton Police Station at 195 Welsford Street flooded Grounds of Valley Residential Aged Care Facility, 195-205 McLennan Street, Mooroopna flooded Floor of the Mooroopna Fire Station in Ann Street beginning to flood Over-floor flooding at the Wastewater Treatment Plant at 5440 Barmah-Shepparton Road, Bunbartha Over-floor flooding of GVW asset at 35 McLennan Street, Mooroopna Flooding around GVW asset at 242 Riverview Drive, Kialla Flooding around GVW pump station at 104 Numurkah Road, Shepparton <p>Summary of flood characteristics for the 50yr ARI event:</p> <ul style="list-style-type: none"> Large amount of inundation along the Broken River upstream of the East Goulburn Main Channel. Break-outs to the north well established. Inundation occurs in South Shepparton (Lincoln & Broken River Drives) Increased Goulburn River flow through Arcadia Downs but still predominantly contained within the general floodplain. A large amount of flow heading through Mooroopna inundating the majority of the private properties in the eastern parts. In North Shepparton, increased flow breaking out over The Boulevard inundating many properties to the north. Overland flow constricted by Channel No. 7. Increased flood extent to the east and around Coomboona. Flooding extends across the Barmah - Shepparton Road. Flood depths and extent increase as move downstream. 	<ul style="list-style-type: none"> GVW plans implement to address WTP and sewerage pump issues. Remove electric motors from pool pumps.
12.00m		<ul style="list-style-type: none"> A large part of North Shepparton north from around Mason Street & Balaclava Road is flooded Grounds of Shepparton Riverside Cabin Park (8049 Goulburn Valley Highway) begin to flood The Midland Highway and the P.R Edwards Causeway flooded – loss of connection between Shepparton and Mooroopna (east & west) 	<ul style="list-style-type: none"> Close the Midland Highway at the Causeway

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River Height (m) and / or River Flow (ML/d)	Annual Exceedance Probability	Consequence / Impact	Action Actions may include (but not limited to) evacuation, closure of road, sandbagging, issue warning and who is responsible
Refer to the spreadsheet of addresses of flooded properties and buildings – covers Kialla, Kialla West, Kialla Lakes, Shepparton, Mooroopna and nearby areas			
12.05m		<ul style="list-style-type: none"> Midland Highway in Shepparton between Mitchell & Florence Streets about to get wet 	<ul style="list-style-type: none"> Consider need to close Midland Highway in Shepparton
12.09m	May 1974 flood		
12.10m		<ul style="list-style-type: none"> Access to the CFA (and ICC) facility at 195-205 Numurkah Road, Shepparton is about to be compromised as surrounding access roads get flooded 	<ul style="list-style-type: none"> Relocate the ICC
12.20m	1% AEP (100yr ARI) 1916 flood event	<ul style="list-style-type: none"> Old Mooroopna Police Station at 119 McLennan Street inundated (below floor). Police Station rebuilt since floor level survey was captured. Old Mooroopna Hospital at 2-8 McLennan Street, Mooroopna flooded over-floor. The Valley Residential Aged Care Facility, 195-205 McLennan Street, Mooroopna flooded over-floor The car park of the Hospital off Graham Street, Shepparton beginning to get wet. Surrounding roads get wetter as levels increase. Access increasingly becoming an issue. Over-floor flooding of GWW asset at 242 Riverview Drive, Kialla Over-floor flooding of GWW pump station at 104 Numurkah Road, Shepparton 	
12.3m	0.5% AEP (200yr ARI)	<ul style="list-style-type: none"> Shepparton Police Station at 195 Welsford Street flooded over-floor The CFA (and ICC) facility at 195-205 Numurkah Road, Shepparton is flooded over-floor 	
12.40m		<ul style="list-style-type: none"> Grounds of the Big4 Shepparton Park Lane Holiday Park (7835 Goulburn Valley Highway, Kialla) begin to flood 	
12.5m	0.2% AEP (500yr ARI)	<ul style="list-style-type: none"> Council offices in Welsford Street surrounded by mostly shallow water 	
x.xxm	Probable Maximum Flood (PMF)		

Note: Flood intelligence records are approximations. This is because no two floods at a location, even if they peak at the same height, will have identical impacts. Flood intelligence cards detail the relationship between flood magnitude and flood consequences. More details about flood intelligence and its use can be found in the Australian Emergency Management Manuals flood series.

BROKEN RIVER

Gauge Location: Broken River at Orrvale Gauge

River Height (m) and / or River Flow (ML/d)	Annual Exceedance Probability	Consequence / Impact	Action Actions may include (but not limited to) Evacuation, closure of road, sandbagging, issue warning and who is responsible
		<ul style="list-style-type: none"> The Midland Highway near the Municipality's eastern boundary is flooded when the Broken River breaks out at Gowangardie. 	<ul style="list-style-type: none"> Close Midland Highway to the east of Shepparton Note flood impacts for later update of this table.
4.90m	Dec 2017 flood	<ul style="list-style-type: none"> 	
6.30m		<ul style="list-style-type: none"> 685 Doyles Road begins to be wetted but house is about 1m higher with levels known by owner. Sandbagging not required until ~7.3m. 	Place "water over road" signs and monitor for closures.
6.80m	Minor flood level	<ul style="list-style-type: none"> Rural properties upstream of Doyles Road flooded. 	
7.00m	March 2012 flood	<ul style="list-style-type: none"> 	
7.15m		<ul style="list-style-type: none"> Gordon Drive (Broken River anabranch) will be over-topped at western end by waters flowing out of Lake Kialla. Affects Gordon Drive. 	
7.20m	Moderate flood level	<ul style="list-style-type: none"> Lake Amaroo will over top and flow under the new Kialla Lakes Drive bridge. Kialla Lakes Drive likely to be wetted. Traffic disruption in and around Kialla Lakes residential area. 	<ul style="list-style-type: none"> Monitor for road closures.
7.30m		<ul style="list-style-type: none"> Archer Street at Oxbow Court. Floodway on Archer Street about to be over-topped by the Broken River. Kialla Lakes Drive likely to be impassable. 	<ul style="list-style-type: none"> Close boom gate at Oxbow Court and open the gate into Kensington Gardens; their Manager has a key. Consider closing Archer Street. Close Kialla Lakes Drive.
7.50m		<ul style="list-style-type: none"> First properties flooded at Kialla West – 966, 970 & 980 Archer Road. Nos 966 & 980 close to over-floor flooding. Gordon Drive likely to be impassable. 	<ul style="list-style-type: none"> Close Gordon Drive.
7.61m	October 2016 flood	<ul style="list-style-type: none"> 	<ul style="list-style-type: none">
7.70m		<ul style="list-style-type: none"> Inundation of land beginning at 56, 60 & 100 Hooper Road, Kialla Water over northern causeway on Archer Street around 500mm deep. 	<ul style="list-style-type: none"> Inundation at 60 Hooper road premises starts to occur. No access over causeway.
7.80m		<ul style="list-style-type: none"> 68 Doyles Road – starting to flood over-floor 95 Jamieson Road – starting to flood over-floor 	<ul style="list-style-type: none"> Sandbag houses at 68 Doyles Road and 95 Jamieson Road and / or assist residents. Close Jamieson Road at Channel Road
7.85m		<ul style="list-style-type: none"> Archer Road, south of Kialla Lakes Drive, about to be over-topped by overflow from Broken River anabranch. 	<ul style="list-style-type: none"> Consider closing Archer Road as over-topped by anabranch flow 4WD access only at this stage

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River Height (m) and / or River Flow (ML/d)	Annual Exceedance Probability	Consequence / Impact	Action Actions may include (but not limited to) Evacuation, closure of road, sandbagging, issue warning and who is responsible
7.86m 27,155ML/d	October 1996 flood		
7.90m	Major flood level 10% AEP (10 year ARI)	<ul style="list-style-type: none"> Likely that residents north and east of Lake Kialla and east of Lake Amaroo are isolated. 	
7.99m	July 1981 flood	<ul style="list-style-type: none"> 	
8.10m 33,032ML/d	20% AEP (5 year ARI)	<ul style="list-style-type: none"> First homes in Guthrie, Nicholls and Abernathy begin flooding 	
8.14m		<ul style="list-style-type: none"> Kialla Lakes Drive 	<ul style="list-style-type: none"> Engineers estimate that the new bridge will start to over-top at this water level. To be confirmed at next event
8.19m	Sept 2010 flood	<ul style="list-style-type: none"> 	
8.33m 40,000ML/d	2% AEP (50 year ARI) May 1974 flood	<ul style="list-style-type: none"> 	
8.41m	October 1993 flood	<ul style="list-style-type: none"> Water over southern causeway on Archer Road approaching 500mm deep. 	<ul style="list-style-type: none"> No access over causeway.
8.44m 43,852ML/d	1% AEP (100 year ARI)	<ul style="list-style-type: none"> 	
8.50m 48,300ML/d	0.5% AEP (200 year ARI)	<ul style="list-style-type: none"> Over-floor flooding at 60 Hooper Road, Kialla. 	

SEVEN CREEKS

Gauge Location: Seven Creeks at Kialla West

River Height (m) and / or River Flow (ML/d)	Annual Exceedance Probability	Consequence / Impact	Action Actions may include (but not limited to) Evacuation, closure of road, sandbagging, issue warning and who is responsible
4.50m	Minor flood level	<ul style="list-style-type: none"> Floodwater will overtop Mitchell Road Bridge and road floods between the Goulburn Valley Highway and Archer Road 	<ul style="list-style-type: none"> Consider closing road Note flood impacts for later update of this table.
5.00m	Moderate flood level	<ul style="list-style-type: none"> Rafferty Road will be over-topped between the bridge and Edgewater Road. Also occurs when the Goulburn River @ Kialla West gauge reaches 10.4m. 	<ul style="list-style-type: none"> Detour traffic
5.46m	October 2016 flood	•	•
6.02m	October 1996 flood March 2012 flood	•	•
6.03m	June 1995 flood	•	•
6.33m	July 1981 flood Dec 2017 flood	•	•
6.5m		<ul style="list-style-type: none"> First properties flooded in Kialla – 360 & 370 Centre Kialla Road. 	•
6.60	Major flood level 1% AEP (5 year ARI)	<ul style="list-style-type: none"> First residential floor flooded in Balmoral Estate Over-floor flooding at 360 & 370 Central Kialla Road, Kialla Also occurs when Goulburn River @ Kialla West reaches 10.7m 	<ul style="list-style-type: none"> Consider evacuation of Balmoral Estate.
6.70m	Sept 2010 flood	•	•
6.90m	1% AEP (10 year ARI)	<ul style="list-style-type: none"> Houses flood in Archer Road South 	<ul style="list-style-type: none"> Advise residents Close Archer Road South at Mitchell Road
7.25m		<ul style="list-style-type: none"> First residential floors flooded in Kialla West – 966 & 980 Archer Road 	•
7.40m		<ul style="list-style-type: none"> Water onto property at 25 Furphy Avenue, Kialla (at lowest part of the road) 	•
7.50m		<ul style="list-style-type: none"> Water about to flood over-floor at 25 Furphy Avenue, Kialla (at lowest part of the road) 	•
7.66m		<ul style="list-style-type: none"> Properties in Riverview Drive, Kialla about to be flooded 	•
7.85m	1% AEP (35 year ARI) May 1974 flood	•	•
8.23m	1% AEP (100 year ARI) October 1993 flood	•	•

Flood Forecast Tools and How to Use Them

The purpose of the following flood forecast tools is to enable an early heads-up of likely flood severity and consequences through the lower reaches of the Broken - Seven Creeks - Goulburn system.

It is important to be fully aware that the tools provide an estimate of the likely flood peak. They are not infallible and are unlikely to be as precise as BoM flood forecasts. While they should not be used to generate competition with BoM, they may provide a basis for informed discussion with BoM about the flood forecasts for Seven Creeks at Kialla West, Broken River at Orrvale and Goulburn River at Shepparton.

Use of FloodZoom and other tools is encouraged in order to better inform the early heads-up and assist response activity planning and implementation.

The earliest an initial heads-up of the expected peak level at Shepparton can be determined is after a forecast peak level is available for Benalla and Euroa and a peak outflow forecast (or estimate) is available for Goulburn Weir (i.e. a peak level for the Goulburn Weir tail gauge). The use of actual flood peaks will generally result in more accurate estimates.

To repeat the above as a word of caution. The following flood forecast tools provide estimates of the likely flood peaks and timings at Orrvale, Seven Creeks at Kialla, and the Goulburn River at both Kialla West and Shepparton. Those estimates and the associated timings are unlikely to be exact but will be sufficiently accurate to indicate, when used in conjunction with the flood intelligence tables and flood mapping, likely consequences and to guide and inform early response planning and related activity.

1. Determine the expected peak level for Seven Creeks at Kialla West using the Euroa peak level. The relationship implicitly includes an allowance for Stony and Honeysuckle Creek flows. If these are exceptionally high (look at data from Tamleugh and U/S Violet Town) and noting the comment on the tool about upper and lower catchment rainfall, increase the level suggested by the tool up by 100 mm or so (i.e. bias to the upper side of the curve).
2. Determine the expected peak level for Orrvale using either the Benalla peak level and / or the Gowangardie Weir peak level. The relationship implicitly accommodates the flow transfers to the Broken Creek system that occur from a level at Casey's Weir of around 1.81 m.
3. Determine the expected peak level for the Goulburn at Kialla West using either Goulburn Weir tail gauge peak level and / or the Murchison peak level.
4. Using information at Appendix B, determine likely timings for all locations, including Shepparton. If and as appropriate and in order to increase confidence in estimated timings, use FloodZoom to look at relative timings in similar past events (i.e. similar in terms of rainfall distributions and / or levels at key gauges).
5. Determine dominance: Broken – Seven Creeks, neutral or Goulburn. This will dictate which map is appropriate to determine flood extents and consequences in the vicinity of each of Orrvale, Seven Creeks at Kialla West, Goulburn River at Kialla West and Shepparton. The appropriate map and summary of likely consequences (read from the flood intelligence card) at a location will be the one that matches the expected level at that location.

As the event progresses and peak level forecasts are refined, the appropriateness of map sets being used and thus likely consequences should be reviewed and

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adjustments made as necessary.

While a conservative approach would be to use the maximum extent maps, the resulting expected peak level for Shepparton is likely to be incorrect.

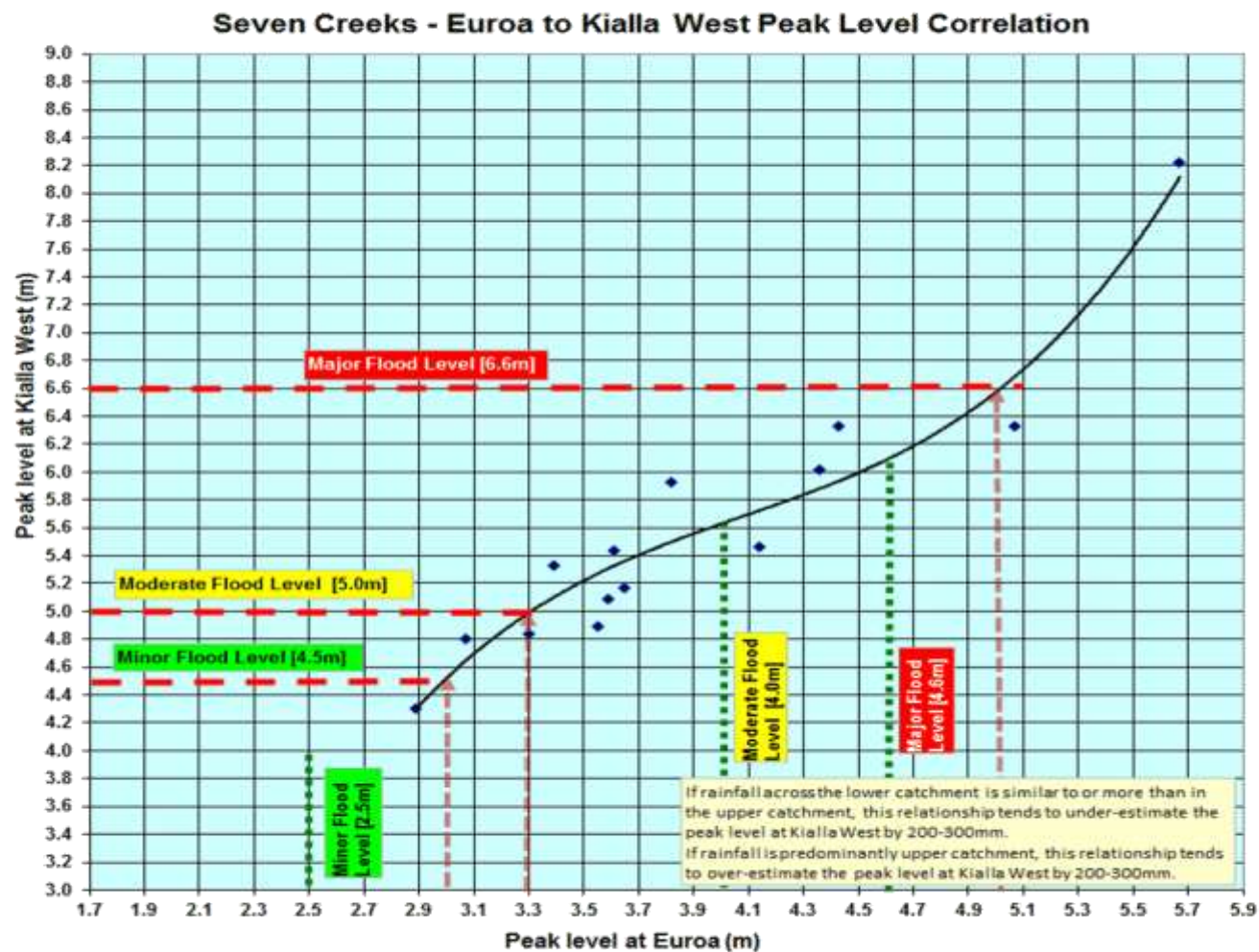
6. Determine the expected peak level for Shepparton. Two approaches are suggested.
 - a. **APPROACH 1:** Using the dominance scenario matrix (see below) and the following rules. This involves extracting the Shepparton value associated with the expected peak at each of Orrvale, Seven Creeks at Kialla West and Goulburn River at Kialla West for the selected dominance scenario. This will always give you 3 values.

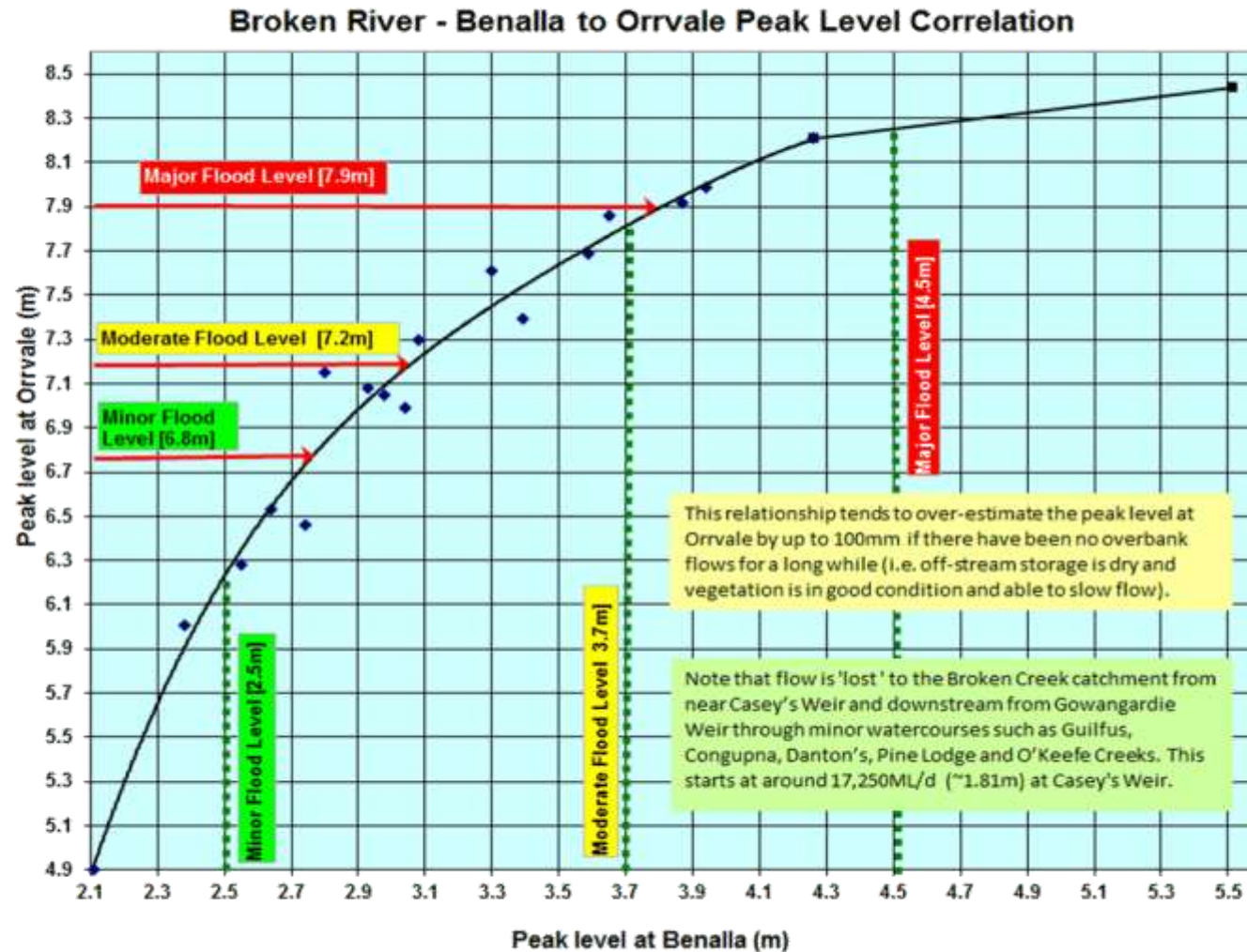
IMPORTANT NOTE: If the results of the following give at least 2 Shepparton values that are less than 9.5 m, the peak at Shepparton will be below the minor flood level (i.e. less than 9.5 m) unless Murchison is above minor flood level (i.e. 9.0 m) in which case Shepparton will almost certainly exceed minor flood level (i.e. 9.5 m). If only 1 of the values is less than 9.5 m, that value should be changed to 9.5 m.

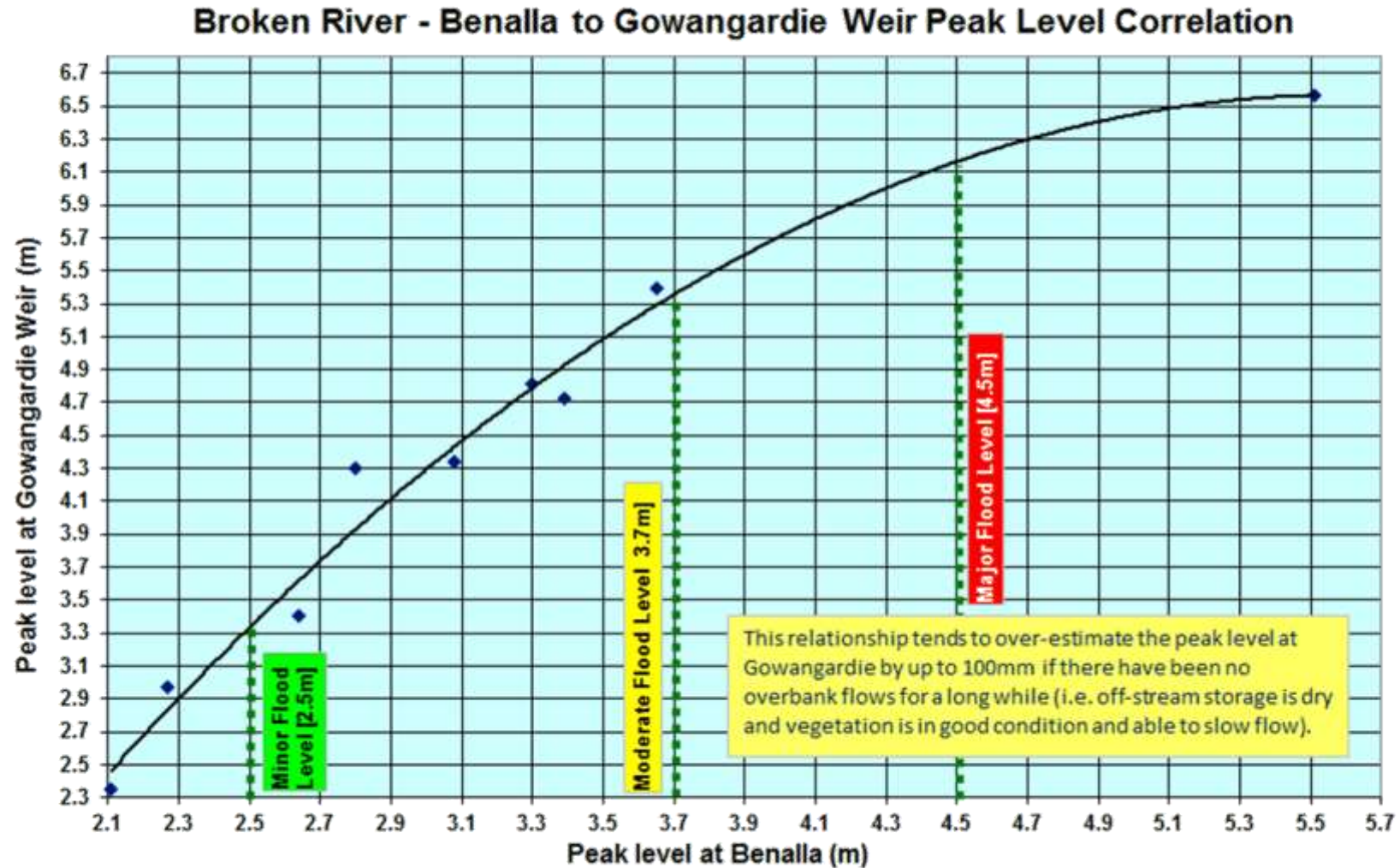
 - i. If the expected peak at **Seven Creeks at Kialla West** is **GREATER THAN 6 m**, use the **NEUTRAL matrix** to determine the 3 Shepparton values. Add these 3 values together and divide by 3. The result is the expected peak at Shepparton. It can generally be expected to be within +/- ~100 mm of the actual peak.
 - ii. If the expected peak at **Seven Creeks at Kialla West** is **LESS THAN 6 m** and the expected peak at **Murchison** is **GREATER THAN 8 m**, use the **GOULBURN dominant matrix**. Add the Shepparton values associated with the expected peaks at Orrvale and Seven Creeks at Kialla West and divide by 2. If the expected peak at **Orrvale** is **GREATER THAN 7 m**, add 100 mm to the above result otherwise add 50 mm. This is the expected peak at Shepparton. It can generally be expected to be within +/- ~100 mm of the actual peak.
 - iii. At all other times (unless the Goulburn is clearly dominant) use the Broken – Seven Creeks dominant matrix. Add the Shepparton values associated with the expected peaks at Orrvale and Seven Creeks at Kialla West and divide by 2. This is the expected peak at Shepparton.
 - b. **APPROACH 2:** Using current rating tables for each of Orrvale, Seven Creeks at Kialla West, Goulburn River at Kialla West and Shepparton.
 - i. Determine the expected peak flows at Orrvale, Seven Creeks at Kialla West and Goulburn River at Kialla West.
 - ii. Add these flows and reduce by between 10% and 20%.

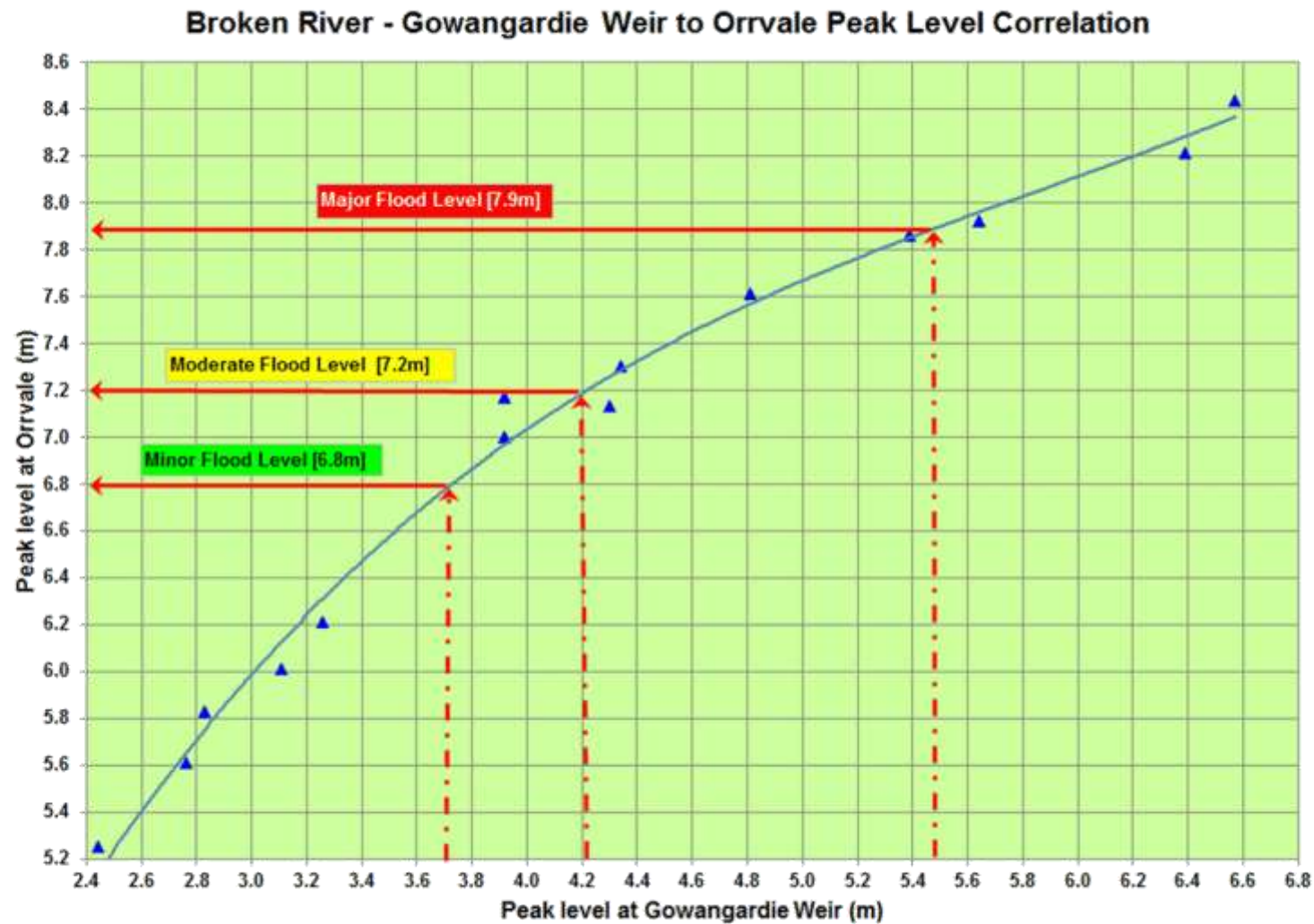
Use 20% when the floodplain and off-stream storage are dry and waterways are running at normal levels (i.e. not elevated).

Reduce by 10% if the area is wet and / or this is a follow-on flood with off-stream floodplain storage wetted and elevated levels in waterways.



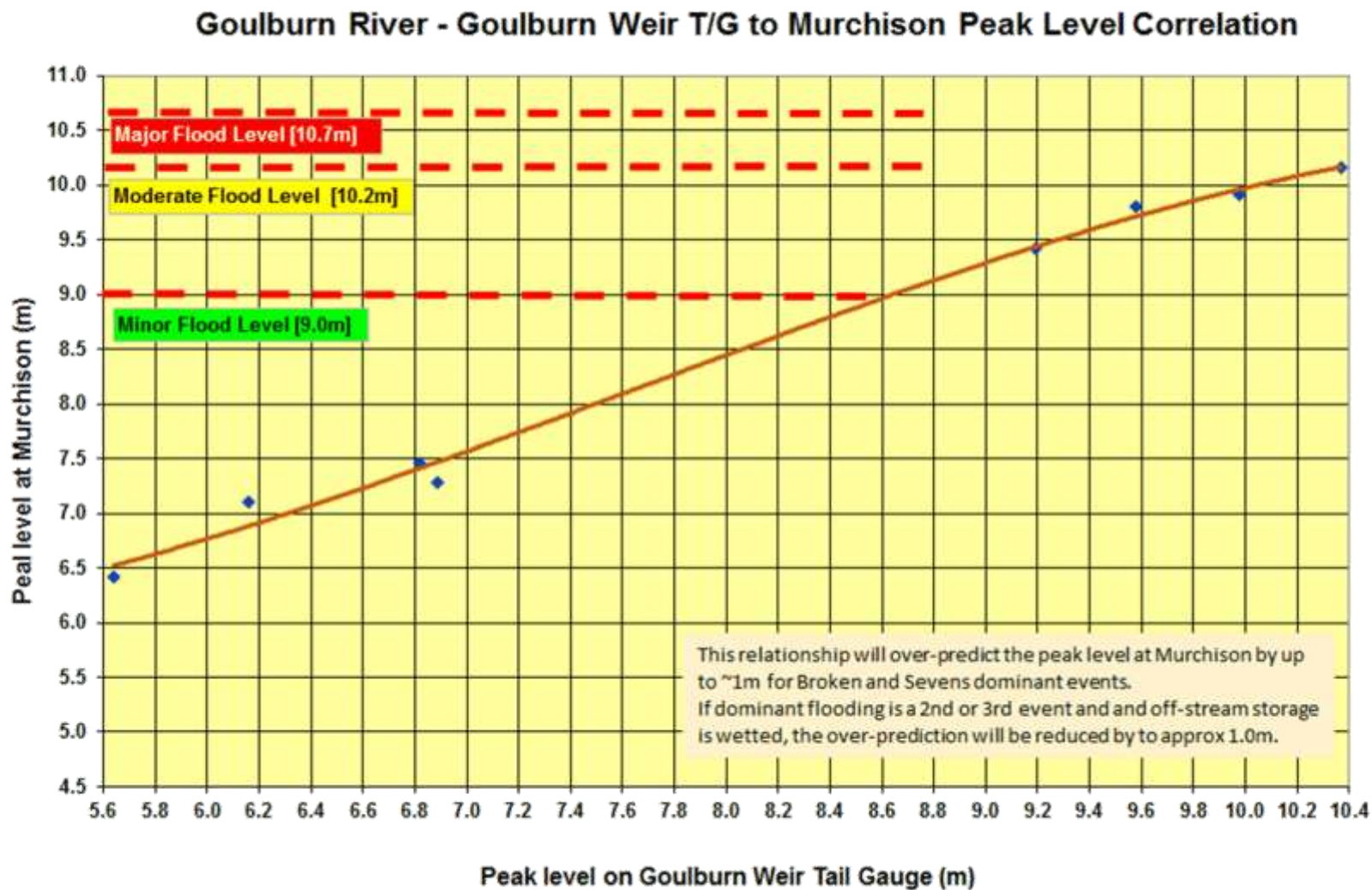


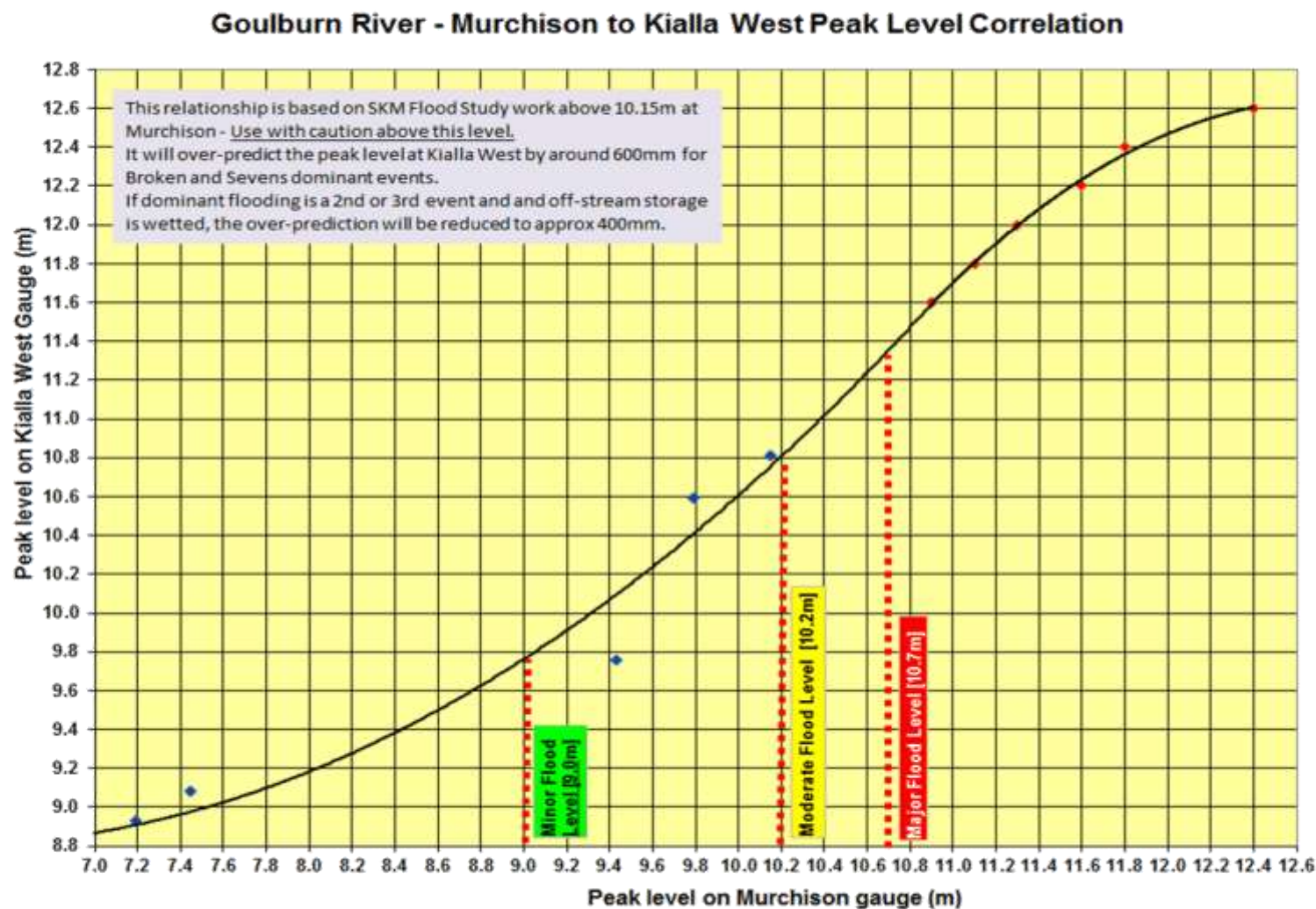




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Dominance scenario matrix – PART 1							
Broken - Sevens dominant				Goulburns dominant			
Gauge levels in metres				Gauge levels in metres			
Goulburn River @ Shepparton	Broken River @ Orrvale	Seven Creeks @ Kialla West	Goulburn River @ Kialla West	Goulburn River @ Shepparton	Broken River @ Orrvale	Seven Creeks @ Kialla West	Goulburn River @ Kialla West
9.5 (minor)	6.15	4.98	9.73	9.5 (minor)	5.55	4.58	10.20
9.7				9.7			
9.9				9.9			
10.1	7.53	5.92	10.58	10.1	6.77	5.93	10.90
10.5				10.5			
10.7 (moderate)	7.97	7.25	11.09	10.7 (moderate)	7.32	5.95	11.46
10.9 (10% AEP)	8.16	7.52	11.18	10.9 (10% AEP)	7.35	5.95	11.53
11 (major)				11 (major)			
11.1	8.37	7.81	11.40	11.1	7.75	6.36	11.76
11.3 (5% AEP)	8.45	8.09	11.62	11.3 (5% AEP)	7.94	6.60	11.93
11.5	8.52	8.32	11.81	11.5	8.06	6.86	12.09
11.7	8.57	8.46	12.08	11.7	8.23	7.12	12.30
11.9 (2% AEP)				11.9 (2% AEP)			
12.1	8.67	8.61	12.47	12.1	8.44	7.17	12.75
12.2 (1% AEP)	8.71	8.61	12.74	12.2 (1% AEP)	8.55	7.64	12.84
12.3 (0.5% AEP)	8.80	8.80	12.87	12.3 (0.5% AEP)	8.56	8.17	12.92
12.5 (0.2% AEP)				12.5 (0.2% AEP)			

Dominance scenario matrix – PART 2							
Neutral scenario				Maximum envelope			
Gauge levels in metres				Gauge levels in metres			
Goulburn River @ Shepparton	Broken River @ Orrvale	Seven Creeks @ Kialla West	Goulburn River @ Kialla West	Goulburn River @ Shepparton	Broken River @ Orrvale	Seven Creeks @ Kialla West	Goulburn River @ Kialla West
9.5 (minor)	5.97	4.82	9.91	9.5 (minor)	6.15	4.98	10.20
9.7				9.7	6.45	5.11	10.44
9.9				9.9	6.77	5.11	10.48
10.1	6.90	5.92	10.76	10.1	7.53	5.93	10.90
10.5				10.5	7.33	6.60	11.20
10.7 (moderate)	7.32	5.95	11.46	10.7 (moderate)	7.97	7.25	11.46
10.9 (10% AEP)	7.38	7.15	11.48	10.9 (10% AEP)	8.16	7.52	11.53
11 (major)				11 (major)	8.25	7.66	11.65
11.1	7.79	7.44	11.77	11.1	8.37	7.81	11.77
11.3 (5% AEP)	7.91	7.44	11.82	11.3 (5% AEP)	8.45	8.09	11.93
11.5	8.14	7.58	12.05	11.5	8.52	8.32	12.09
11.7	8.26	7.76	12.20	11.7	8.57	8.46	12.30
11.9 (2% AEP)				11.9 (2% AEP)	8.62	8.59	12.63
12.1	8.57	8.57	12.60	12.1	8.67	8.72	12.75
12.2 (1% AEP)	8.70	8.72	12.90	12.2 (1% AEP)	8.71	8.72	12.90
12.3 (0.5% AEP)	8.76	8.79	13.05	12.3 (0.5% AEP)	8.80	8.80	13.05
				12.5 (0.2% AEP)	9.02	9.06	13.31

APPENDIX C3 – EAST SHEPPARTON FLOOD EMERGENCY PLAN

Overview of Flooding Consequences

Land use through East Shepparton is mainly residential and agricultural (e.g. orchards) with some industrial and commercial.

The area drains through an extensive network of man-made open drains rather than a natural drainage system – see figure on following page. The area is generally flat with raised irrigation channels forming barriers to overland flows. Drainage is relatively poor. Large portions of the area take considerable time to drain after a flood with many requiring the water to be pumped away.

East Shepparton is susceptible to widespread and generally shallow slow moving flooding following heavy rain. While flooding is extensive across the area, it is generally confined to the road reserves, particularly within the urban portion. Flood depths within the road reserves are typically between 250mm and 400mm with isolated areas up to 1.0m. Depths greater than 1.0m only occur within the 47 retarding basins within the area (see list below).

Where flooding occurs within residential or commercial properties, the depth of inundation is typically shallow (i.e. less than 250mm) and slow moving.

The Goulburn Valley Highway acts as a hydraulic control as it holds back some of the overland flow in North Shepparton. Water levels are therefore elevated on the upstream side.

In the rural and farm areas of East Shepparton, flooding is widespread at even the 20% AEP (5 year ARI) event with floodwater filling local depressions and backing up behind roadways or other ridges through the catchment. Flood depths are typically shallow and rarely exceed 500mm, even in the 1% AEP (100 year ARI) event.

As the area is generally quite flat with widespread shallow flooding, flood velocities are typically slow, rarely exceeding 0.25m/s. They are a bit higher but mostly less than 0.5m/s in the road reserves within urban areas. Across residential and commercial properties they are typically less than 0.1m/s.

With the exception of the 47 retarding basins throughout the area, at a small number of roadways and within a small number of road reserves in the urban areas, the flood risk (as per ARR 2016) is low for adults, children and vehicles.

The Drainage Network (see figure on following page)

Goulburn-Murray Water Main Drain No 2 flows west from the East Goulburn Main Channel and drains agricultural land between the Midland Highway and the Broken River as well as some urban areas. It is 12.5km long. It discharges into the Broken River between Archer Street and McPhees Road.

Goulburn-Murray Water Main Drain No 3 flows for 20km north-west from the East Goulburn Main Channel, crossing Central Avenue, Doyles Road and the Goulburn Valley Highway before discharging into the Goulburn River at Reedy Swamp.

Open drains from agricultural properties combine with Main Drain No 2 and Main Drain No 3 to form a dense drainage network.

In addition to the Main Drain catchments, there are a number of small urban catchments that drain directly to the Broken and Goulburn rivers through the urban drainage system.

The Midland Highway forms a significant ridge which largely prevents cross-flows between the areas contributing flow to Main Drain No 2 and Main Drain No 3.

There are 47 retarding basins spread through East Shepparton. 5 are privately owned with the remaining 42 owned by Greater Shepparton City Council. Due to the general lack of grade across the area, all but 3 of these basins are pumped (or balanced) and as such operate as depression storages rather than the more typical gravity outlet controlled retarding basin. See table below. Further details are provided in WBM (2017).

There are no flow or water level gauges in any of the channels in East Shepparton.

Basin Name	Ownership	Outfall from Basin
Big 4 Shepparton	Private	
The Boulevard	GSCC	Pumped
Channel Road Estate (Support Basin)	GSCC	Balance pipe
Connolly Park Estate	GSCC	Pumped
Connolly Park (Support Basin)	GSCC	Balance pipe
Crestwood Estate	GSCC	Pumped
Ducat Reserve (Relief Basin)	GSCC	Gravity
Enterprise Drive	GSCC	Pumped
Grammar Park Estate	GSCC	Pumped
Ivanhoe	GSCC	Pumped
Kensington Gardens	Private	Pumped
Kialla Greens	GSCC	Gravity
Kialla Lakes (Lake Kialla)	GSCC	
Kialla Lakes (Lake Amaroo)	GSCC	Balance pipe
Kialla Lakes (Lowanna Waters)	GSCC	Balance pipe
Lifestyle Communities	GSCC	Pumped
Lifestyle Communities (Support Basin)	GSCC	Balance pipe
Market Place	Private	Pumped
Mercury Drive	GSCC	Pumped
Orchard Circuit	GSCC	Pumped
Parkside Gardens Estate (Wetland Basin)	GSCC	Pumped
Parkside Gardens Estate (Support Basin 1)	GSCC	Balance pipe
Parkside Gardens Estate (Support Basin 2)	GSCC	Balance pipe
Parkside Gardens Estate (Support Basin 3)	GSCC	Balance pipe
Parkside Gardens Estate (Support Basin 4)	GSCC	Balance pipe
Perrivale	GSCC	Pumped
Perrivale (Support Basin)	GSCC	Balance pipe
Pine Park Estate	GSCC	Pumped
River Rise Estate	GSCC	
Riverview Estate	GSCC	Pumped
Ross Alan Drive	GSCC	Pumped
Seven Creeks Estate	GSCC	
Shepparton East Drainage Scheme	GSCC	Pumped
Sherbourne Estate	GSCC	Pumped
Sherbourne Estate (Support Basin)	GSCC	Balance pipe
Smythe Street	GSCC	Gravity
Sofra Drive	GSCC	Pumped

Basin Name	Ownership	Outfall from Basin
Southdown Estate	GSCC	Pumped
Southdown Estate (Support Basin)	GSCC	Balance pipe
Telford Drive	GSCC	Pumped
Telford Drive (Support Basin)	GSCC	Balance pipe
Vision Australia	Private	
Windsor Park Estate	GSCC	Pumped
Windsor Park Estate (Support Basin 1)	GSCC	Balance pipe
Yakka Estate	GSCC	Pumped
Zurcas Lane	GSCC	Pumped
405 Goulburn Valley Highway	Private	Pumped

Properties at Risk of Flooding

An estimate of the number of properties at risk from flooding was produced by WBM (2017) using a simplified schema. A number of assumptions underpin the approach as surveyed floor levels were not available to the study team.

Due to the flat nature of the area (and absence of floor level data), the majority of properties have been categorised at the highest risk category (category 5). This is because the assessment is based on property boundaries and as such if any water, no matter how shallow or expansive, is on more than 5% of the property it is deemed at risk.

Schema:

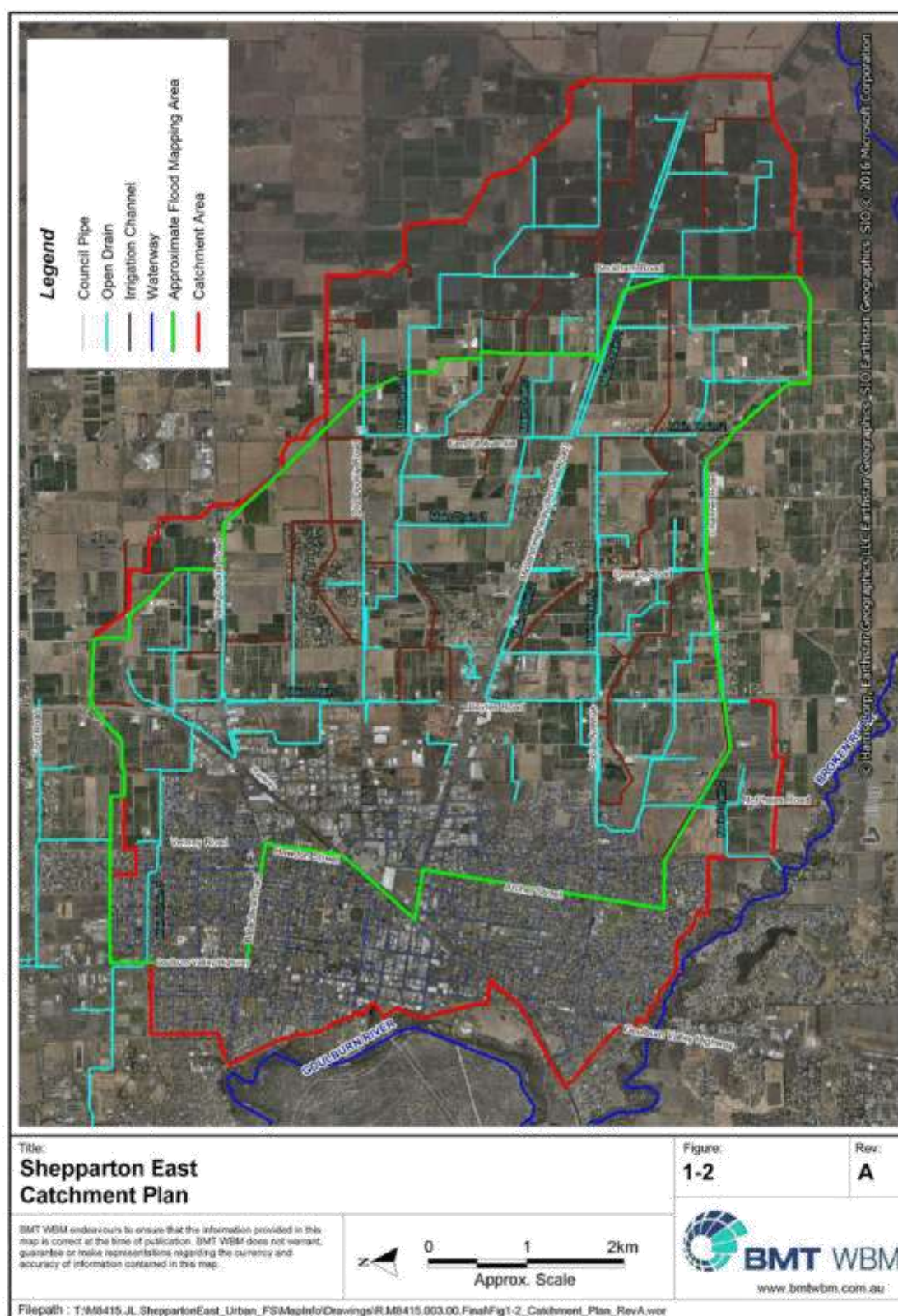
- Category 1 – the property is above the 2% AEP but below the 1% AEP flood level
- Category 2 – the property is above the 5% AEP but below the 2% AEP flood level
- Category 3 – the property is above the 10% AEP but below the 5% AEP flood level
- Category 4 – the property is above the 20% AEP but below the 10% AEP flood level
- Category 5 – the property is below the 20% AEP

Existing conditions	Category 1	Category 2	Category 3	Category 4	Category 5
No of properties within category	321	564	408	279	1,585
Flood size	Up to 1% AEP	Up to 2% AEP	Up to 5% AEP	Up to 10% AEP	Up to 20%AEP
No of properties at risk of flooding	3,157	2,836	2,272	1,864	1,585

Past Floods

A significant rain and flood event occurred on 27th & 28th February 2013. The flood was estimated by WBM (2017) as between a 0.5% and 0.2% AEP (200 to 500 year ARI) event. Peak discharges at key locations and the approximate AEPs are listed in the table below.

- ABC Shepparton reported that *"Flash flooding has inundated homes, closed roads and caused the evacuation of residents from an aged-care facility in the Goulburn Valley. Official rainfall gauges (the BoM AWS at Shepparton airport) say 50 to 65 millimetres of rain has fallen in Shepparton since yesterday afternoon however some residents have reported over 100 millimetres of rainfall."*

**East Shepparton drainage network**

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- One resident reported that the rain started at 5 o'clock. By 7 o'clock there was 98mm in the gauge and by morning it had a further 42mm in it (a total of 140mm).
- Further local rainfall recordings are provided in the table below.
- SES reported 4 houses inundated with water above the floor boards.
- The following roads were closed in Shepparton:
 - Drummond Road
 - King Richard Drive
 - Ross Allen drive
 - Kakadu Drive
 - Matilda Drive
 - Mehmet Drive
 - Orchard Circuit
 - Grace Road between Barmah Road and Shepparton Zeerust Road
 - Pine Road
 - Merino Drive
 - Byass Street

LOCAL RAINFALL DATA – COLLECTED AFTER THE EVENT						
Collected by:	Easting	Northing	Reading 1	Reading 2	Reading 3	Total
Trevor Birch 47 Archer St, Solar City Market	357700	5972680	to 5:15pm 45mm	to ~7pm 65mm	to 10:45pm 25mm	135mm
Megan McFarlane 1300 Midland Hwy East Shepparton	368800	5968080	to 7pm 102mm	to 7am (28.02.2013) 50mm		152mm
Don Colbert 1 Bregan Court, Grahamvale)	360410	5973210	to 8:30pm 170mm	Said it stopped raining for ~15mins at ~6.30 to 7pm	Neighbour's gauge overtopped at 150mm	170mm
Lorraine and Gordon Threlfull 14 Dobson Road Grahamvale 0427214627	360570	5973710	4pm to 7:15pm 114mm	7:15pm to 8am (28.02.2013) 48mm		162mm
Owen Power 27 Hicken Cres. 58214195	356090	5974950	4pm to 8am 125mm			125mm
Helen Williams 65 Ebbott Road 58292522	364800	5969260	4pm to 7am 140mm			140mm
Helen Williams 535 Old Dookie Rd 58292522	363290	5973300	4:10pm to 7:15pm 75mm	7:15pm to 9pm 50mm	9pm to 7am (28.02.2013) 10mm	135mm
Dimits Orchard 223 DoYLES Road	359420	5972210	to 6pm 96mm	6pm to 9pm 44mm	9pm to 7am (28.02.2013) 16mm	156mm
Sue Wallington 6 Holstein Court	357780	5976220	4pm to 9am (28.02.2013) 136.9mm			136.9mm

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LOCAL RAINFALL DATA – COLLECTED AFTER THE EVENT						
Collected by:	Easting	Northing	Reading 1	Reading 2	Reading 3	Total
Graeme Jackson Unit 100 / 80 Channel Road, Kensington Gardens 5831 5877	358070	5969480	5pm to 7:30am (28.02.2013) 66mm			66mm
Dennis Collins 590 Old Dookie Road	363780	5972970	Total to the following day 140mm (same rainfall depth recorded by his neighbours at 710 Old Dookie Road and at 285 Boundary Road)			140mm
Brett Laws 365 Hosie Road 0419144351	366480	5970840	4:30pm to 6:30pm 100mm (same rainfall depth recorded by his brother at 339 Hosie Road)	6:30pm to 7am (28.02.2013) 72mm		172mm
Ron Davies 405 Midland Hwy 58292323	360330	5971600	4:30pm to 6:30pm 100mm	6:30pm to 7am (28.02.2013) 60mm		160mm
Ross Reddrop 540 New Dookie Road, Lemnos 0412606341	363140	5974380	Has an AWS			128mm
Peter Moller Rubicon Water 8 Grammar Court 5820 8851						130mm
Charles DuBourg Kialla 0428210477	360643.1	5966723.7	Guy Tierney at GBCMA has Excel spreadsheet of weather station data			59mm
IK Caldwell Grahamvale 0426210477	360098.7	5974651.5				150mm

Estimated flow and AEP of the flood at key locations							
Location	Beckham Road	Central Avenue	Doyles Road	Main Drain No 2 Outlet	314 Old Dookie Road	Railway	Main Drain No 3 Outlet
Peak flow (m ³ /s)	17.8	16.2	20.9	20.1	25.9	36.4	35.6
AEP	>0.2%	0.5% - 0.2%	~0.5%	~1%	~0.5%	0.5% - 0.2%	0.5% - 0.2%

Rain to Flood and Peak – Typical Response Times

Under heavy continuing rain conditions, floods develop and rise quickly across East Shepparton, more so when the area is wet. Warning times are short with flooding likely to develop within an hour or so of heavy rain starting.

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MAIN DRAIN No 2				
Location	Time from start of heavy rain			
	To start of rise	To inundation	To peak	To reduced flows
Beckham Road	45 - 60 minutes	60 - 75 minutes	65 - 90 minutes	~6 hours
Central Avenue	~1 hour	~90 minutes	~ 2 hours	~10 hours
Doyles Road	~1 hour	~90 minutes	3.5 - 4 hours	10 - 15 hours
Outlet	~2 hours	2.5 - 3 hours	4 - 6 hours	18+ hours

MAIN DRAIN No 3				
Location	Time from start of heavy rain			
	To start of rise	To inundation	To peak	To reduced flows
314 Old Dookie Rd	~60 minutes	75 minutes	2 - 4 hours	~8 hours
Railway	~2 hours	3 - 4 hours	8 - 10 hours	~15 hours
Outlet	1 - 2 hours	2 to 3 hours	~10 hours	15 - 20 hours

Flood Mapping

A comprehensive set of flood inundation maps has been produced for East Shepparton (WBM, 2017) – see Appendix F. Maps were produced for the 20%, 10%, 5%, 2%, 1%, 5% and 0.2% AEP flood events under existing conditions. While future conditions including climate change scenarios were modelled and mapped, those results are not presented or discussed herein. Each map set comprises:

- Flood extent;
- Flood depth in metres;
- Flood level in m AHD;
- Velocity; and
- Hazard.

Mapping is available from [?where? and how accessed from ICC?](#) and through FloodZoom. The study reports (WBM, 2017) are also available through FloodZoom.

Command, Control and Coordination

The responsible agency for the Command, Control and Coordination of floods is the Victoria State Emergency Service (VICSES).

VICSES will assume overall control of the response to flood incidents. Other agencies will be requested to support operations as detailed in this Plan. Control and coordination of a flood incident shall be carried out at the lowest effective level and in accordance with the State Emergency Response Plan (EMMV Part 3). During significant events, VICSES will conduct incident management using multi-agency resources.

Divisional Command will be located at the Hume Region Divisional Command Centre Shepparton and Tatura to manage the Shepparton community.

The Incident Control Centre (ICC) for management of floods is located at the CFA Headquarters, 195 Numurkah Road, North Shepparton or at the VICSES North East Regional Headquarters, 64 Sydney Road, Benalla.

Indicative Flood / No Flood Guidance Tool for East Shepparton

As the BoM does not currently provide flash flood forecasts other than in very general terms, all actions must be driven by rain and / or observations of elevated flows in drain and the start of overland flows.

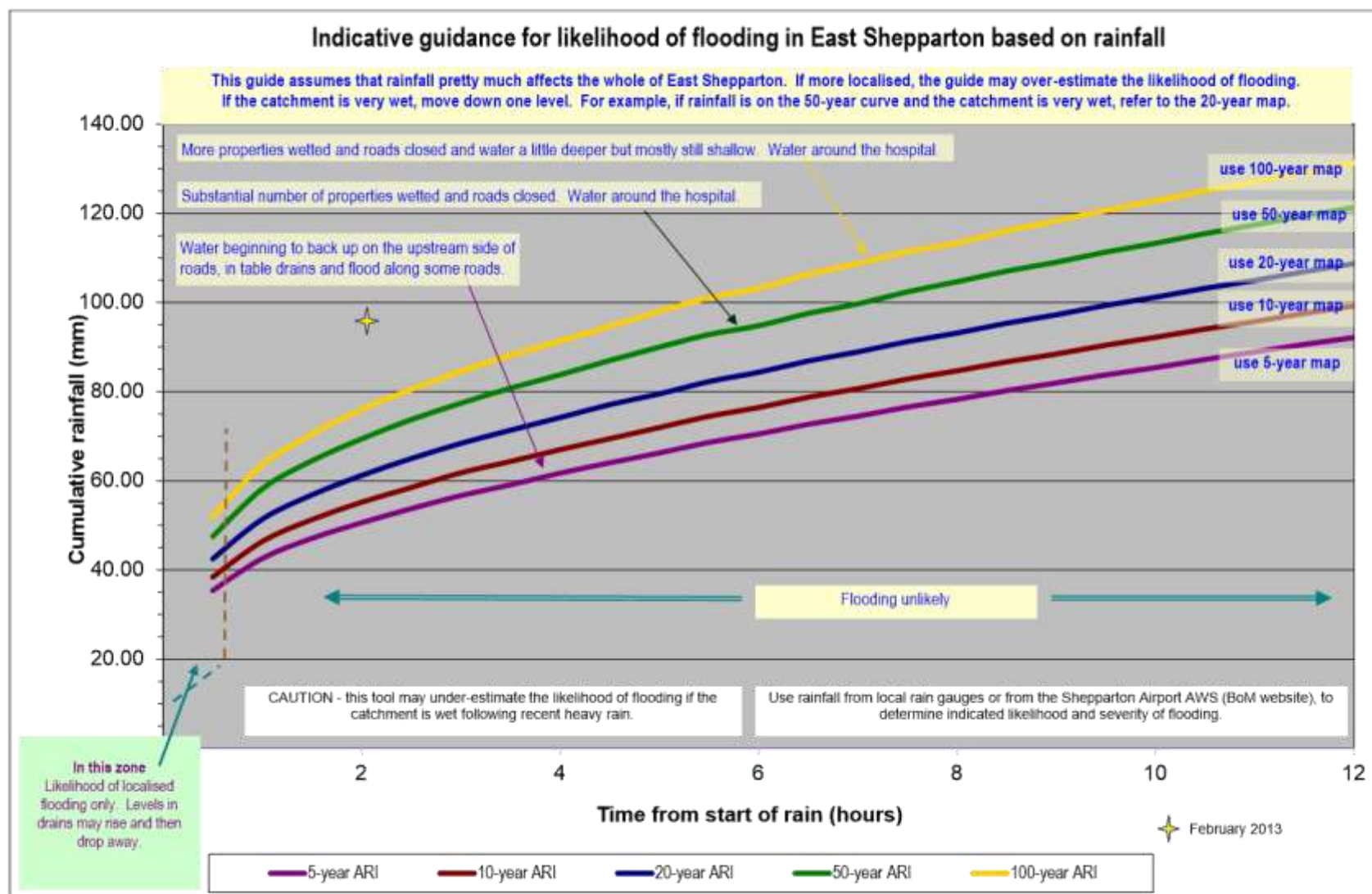
It is suggested that the **indicative quick look 'flood / no-flood' tool** developed for East Shepparton (see below) will provide an initial heads-up of the likelihood and scale of possible flooding. **Local rainfall data** determined from local reports or from an **interpretation of BoM weather radar images** can be used to determine an appropriate rainfall depth for use in the tool. Rainfall reported from the **Shepparton Airport AWS** (available from the BoM website at 30 minute intervals and occasionally more frequently) will provide near real-time data as well as a basis for calibration of radar imagery.

It should be noted that the tool provides indicative guidance only that can then be related to the flood inundation maps (and GIS datasets) produced by WBM (2017), a sub-set of which is provided in Appendix F. The flood extent mapping and report are also available through FloodZoom.

The rainfall that produces each new flood event should be added to the indicative tool as a dot along with the date. It is also suggested that information about the area over which the rainfall occurred and the consequences should be added to the past floods and flooding consequences sections of this Appendix C.

Local Data

Source local knowledge (e.g. collect private rain gauge data).



APPENDIX C4 - TALLYGAROPNA FLOOD EMERGENCY PLAN

Overview of Flooding Consequences

The township of Tallygaroopna is located 15 km north of Shepparton. The 2007 census recorded a population of 270 people while the 2016 census recorded 579 people in the Tallygaroopna Census area. The town itself encompasses a total land area of approximately one square kilometre and is defined by the railway line and Goulburn Valley Highway to the west and general farmland to the east.

Three distinct waterways flow around the town itself:

- The Pine Lodge Creek flows approximately 3 kilometres to the south,
- Dainton's and Congupna Creek flow north-westerly past the town to the east.

Essentially rural in character, the town has a Primary School and a significant recreation reserve which services a number of different sports.

Greater Shepparton City Council has a pump and retarding basin on the northern side of the town near the silos.

Flood history.

- The Tallygaroopna area has a history of flooding with big floods recorded in 1919, 1939, 1956, 1974, 1993 and 2012. The highest recorded flood in Tallygaroopna occurred in 1993.
- The Tallygaroopna area has a flat landscape with grades of approximately a slope of 1 metre per kilometre.
- Tallygaroopna has experienced flash flooding caused by heavy rain over a short period of time (generally greater than 75mm in a 24 hour period).
- March 2012 – substantial flooding occurred due to very intense rainfall (up to 300mm occurring to the east of Tallygaroopna over three days).
- October 1993 - there was a slow onset flood caused primarily by the Broken River spilling over its banks at Gowangardie; which resulted in significant overland flows reaching Tallygaroopna and the surrounding districts.
- Tallygaroopna has experienced some inconvenience caused by overflowing of the Pine Lodge, Dainton's and Congupna Creek systems. These systems are sometimes filled by waters flowing out of the Broken River when it is in flood, which then take up to 3 days to peak in Tallygaroopna.
- There are no regulated water storages (e.g. dams) or large wetlands in this area.
- Large pockets of water can collect in low-lying areas before slowly draining away/drying out.
- Road closures are likely to include Victoria Road, Goulburn Valley Highway (north and south bound), Bowey Road and Tallygaroopna West / Bunbartha Road.



Aerial view of flooding at Tallygaroopna in March 2012
(source: Tallygaroopna Local Flood Guide, December 2016)

Slow onset flooding

The township has experienced slow moving flooding in the past primarily from the overflow of the Broken River via its creek system, which may last for one or more weeks, or even months on some occasions.

There are three water level gauges located on the Broken River at different points including:

- Broken River at Benalla
- Broken River at Casey's Weir
- Broken River at Orrvale near Shepparton (does not affect Tallygaroopna)

Flood warnings from the Broken River Gauges at Benalla and Casey's Weir will give an indication of the possibility and potential size of a flood based on historical records.

Flash flooding

Severe storm warnings will usually give an indication of what rainfall to expect during the storm event. The BoM may also issue warnings that include mention of flash flooding for particular areas depending on the estimated intensity of the expected rainfall.

HISTORIC FLOOD LEVELS AND FLOW ASSUMPTIONS

Note that no two floods are ever the same. Water flows and impacts of weather can be highly variable, especially after changes to the floodplain (road works, laser levelling).

The following levels and information are provided as a guide only and should be considered flexible and changeable according to the conditions at the time of an event.

The emergency service providers will be in charge of determining what actions to take according to information and data provided to them at the time by BoM and the Goulburn Broken CMA. The following information can assist in their decision making, however it should be noted that this may not be appropriate for the circumstances at the time of the event.

The following assumptions about flooding in the Tallygaroopna area are based on historic observations and the past behaviour of our river and creek systems as they peak at varying times. Historic records indicate that flooding usually occurs when;

- Generally there has not been any significant rain recorded in previous days,
- The catchments are saturated,
- The rainfall intensity has been evenly spread over a 24 hour period.

When the Broken River floods, it can spill over its banks in many places. If it spills over near Gowangardie Weir (from about 1km east of Gowangardie Weir through to Pine Lodge at the East Goulburn Main Channel), the water usually flows in a generally north easterly direction into five waterways:

- Congupna Creek
- Dainton's Creek
- Pine Lodge Creek
- Guilfus Creek
- O'Keefe Creek.

All five creeks flow toward the Tallygaroopna area as per the map.

A number of staff gauges have been installed along these creeks. See map of gauge locations, photos of gauges, key data and local contacts at Appendix I. A summary of data collected for these gauges is provided below.

	Centreline of road	Gauge reading			
		1993	2010	2012	
Benalla		5.50	4.43	N/A	
Caseys Weir		4.18	3.6	N/A	
O'Keefe Creek (refer to Appendix I)					
New Dookie Road 1.7km west of Pine Lodge North Road	2.078	2.34	1.71	1.82	
Pine Lodge Creek (refer to Appendix I)					
New Dookie Road 0.6km east of Pine Lodge North Road Road first covered 20m west of bridge	1.623	2.578	1.838	1.948	
Lemnos North Road 0.2km north of Congupna East Road	2.283	2.358	1.965	2.208	
Katamatite-Shepparton Road 1.9km north of Congupna East Road Road first covered 30m south of bridge	2.328	2.448	2.050	2.300	
Dainton's Creek (refer to Appendix I)					
New Dookie Road 0.3km east of Sidebottom Road	1.850	1.855	1.326	1.436	
Congupna East Road 0.3km west of Hudson Road	1.995	2.500	2.109	2.218	
Congupna Creek (refer to Appendix I)					
New Dookie Road 0.3km west of Kellows Road Road first covered 15m west of bridge	1.900	2.065	1.536	1.646	
Tungamah-Boundary Road 0.2km east of Sidebottom Road	2.074	2.938	2.409	2.519	
Katamatite-Shepparton Road 0.3km south of Thompsons Road Road first covered 20m north of bridge	2.125	2.585	2.176	2.235	
Guilfus Creek (refer to Appendix I)					
Katandra Main Road 0.8km east of Boundary Road Road first covered 20m west of bridge	2.050	2.025	1.495	1.795	
		Indicates road is wet across the centreline			

River Level (metres)	Gauge	Significant flood event	Impact on Tallygaroopna township
Not applicable	Benalla Gauge Gowangardie Weir Gauge	March 2012	Flash Flood: This flood was caused by localised intense rainfall of 300mm over a period of 3 days; not from the Broken River.
4.26m 6.39m	Benalla Gauge Gowangardie Weir Gauge	September 2010	Tallygaroopna township was not flooded.

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River Level (metres)	Gauge	Significant flood event	Impact on Tallygaroopna township
3.87m 5.64m	Benalla Gauge Gowangardie Weir Gauge	December 2010	Tallygaroopna township was not flooded.
5.51 6.57	Benalla Gauge Gowangardie Weir Gauge	October 1993	Slow Onset flood – overland from creek system. Township flooded.

Possible Rainfall impacts based on local knowledge

The following rainfall measurements are based on readings from local resident rainfall gauges.

Bureau of Meteorology warnings are not in place on these systems.

- The first 50mm or so of localised rainfall should not cause any significant flooding; for example, 28 mm of rainfall was accumulated at the Numurkah gauge (15.3 km from Tallygaroopna) in the 24 hours to 09:00 on 4 September 2010 and no flooding was recorded.
- 75mm+ over a wide area may cause minor flooding; for example, 73 mm of rainfall was accumulated at the Numurkah gauge in the 48 hours prior to 09:00 on 9 December 2010.
- 125mm+ of localised rainfall event may cause widespread minor to moderate flooding
- 150mm+ of localised rainfall event may cause moderate flooding and some major
- 200mm+ of localised rainfall event will most likely result in major flooding; for example, 300mm of rainfall accumulated over a period of 3 days lead to flash flooding at Tallygaroopna.

**If the above rainfall amounts happen over a shorter time frame;
it is likely localised flash flooding will occur**

ESTIMATED FLOOD TRAVEL TIMES

The flood travel times are estimates based on local resident knowledge and observations at previous events. These times were not provided from a formal source or Authority.

BENALLA TO GOWANGARDIE WEIR	Varies but 29 hours is a reasonable estimate – see Appendix B
GOWANGARDIE WEIR TO NEW DOOKIE ROAD	12 HOURS
NEW DOOKIE ROAD TO CONGUPNA EAST ROAD	1 DAY
CONGUPNA EAST ROAD TO KATAMATITE ROAD	1 DAY
KATAMATITE ROAD TO TALLYGAROPNA	1 DAY
Between staff gauges at bridges over the Creeks – see Appendix I	

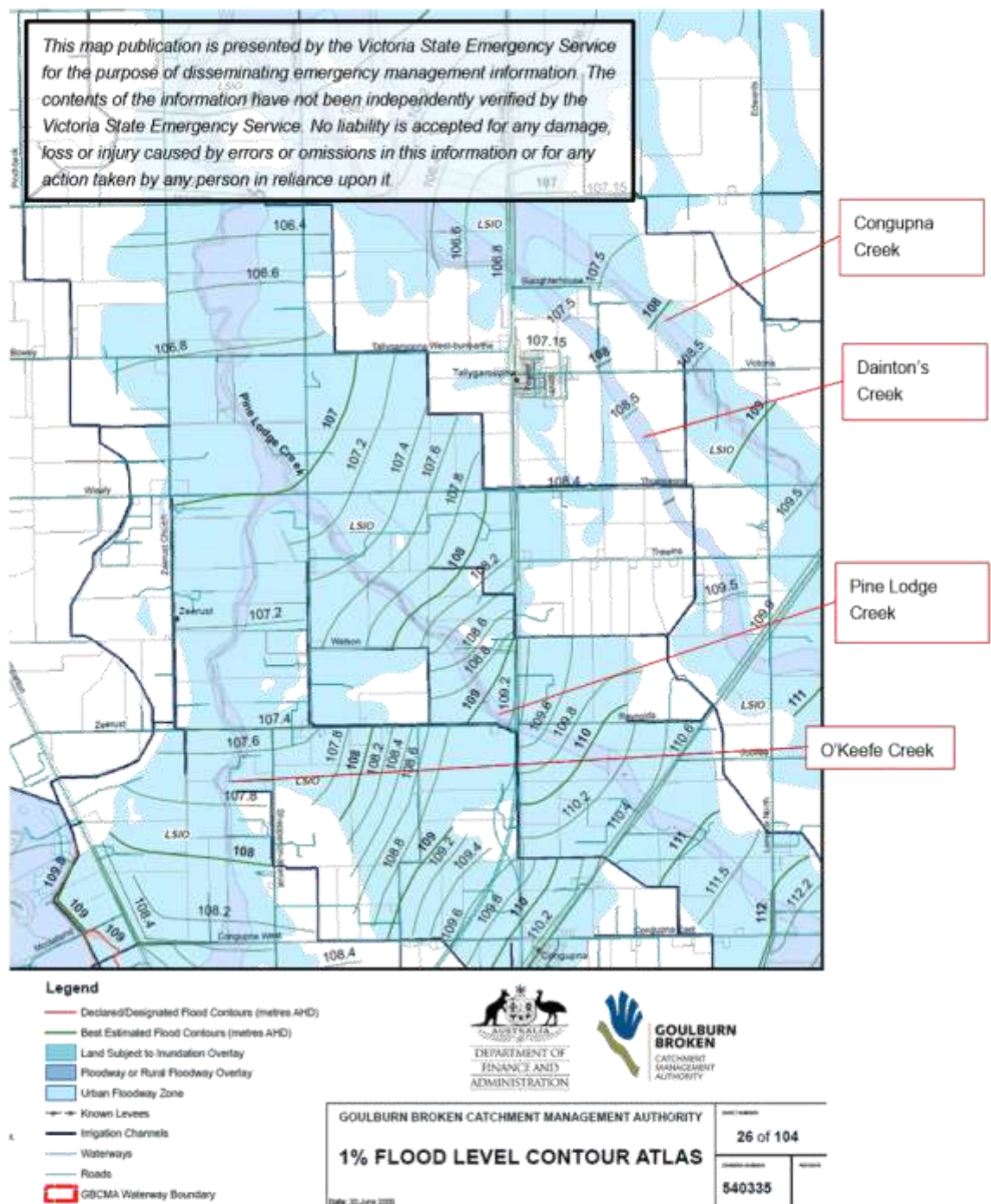
For the 1993 flood the passage of the flood peak from Gowangardie to Tallygaroopna took approximately 2.5 days.

Note: These flow times are based on observations from previous floods and may vary considerably depending on the weather and other conditions at the time of the event.

AUTOMATIC GAUGE READINGS

Tallygaroopna has no automatically monitored flood gauges.

The Broken River Gauge at Benalla can help to provide a guide as to the potential for floodwater that may come this way. Refer to Bureau of Meteorology website for River Heights http://www.bom.gov.au/cgi-bin/wrap_fwo.pl?IDV60150.html



River level / rainfall gauge prompts and actions

River Level (metres)	Gauge location	General Information	General Action	Drain/Penstock/ Other Action	Roads
NA	Localised Heavy rainfall or Thunderstorms may cause widespread minor to moderate flash flooding	Flash flooding can occur at any time with short notice. Can only be guided for likelihood of flooding by BoM heavy rainfall /storm warnings.	Monitor BoM weather sites for rainfall indicators and flash flooding warnings. Source local knowledge (e.g. collect private rain gauge data). Creek level markers have been installed which may assist authorities in assessing the risk of flood. Refer to Appendix I.		
5.51 6.57	Benalla Gauge Gowangardie Weir Gauge (Oct 1993 event level)	Water overflow from Broken River at Gowangardie Weir will affect New Dookie Road at the Congupna, Dainton's, Pine Lodge and O'Keefe Creeks. Based on past events, the estimated flow time is 3 days to Tallygaroopna.	Consider delivery of 120m ³ sand and 3000 sandbags to car park beside Tallygaroopna CFA building	Communicate with G-MW to consider the possibility of directing flood flow into the East Goulburn Main Channel where there is capacity	Midland Highway possibly closed by VicRoads New Dookie Road possibly closed the next day
		First farm vulnerable properties to be affected are in Edwards, Trewins and Thompsons Roads.	Ensure VICSES is aware of vulnerable properties. Ensure residents/ landholders are advised of situation.		
		First township vulnerable properties to be affected are in North, Fowler, Church and Victoria Streets	Ensure VICSES is aware of vulnerable properties. Ensure residents/ landholders are advised of situation.		
			Inspect retardation basin pump and the outfall to ensure pump is operating.	Table drain pipes in Tallygaroopna West Road are clear to be checked to ensure clean and clear.	Council to provide road closure signs at appropriate locations by advised.

River Level (metres)	Gauge location	General Information	General Action	Drain/Penstock/ Other Action	Roads
		4 x 150mm pumps were deployed in 2012	Consider installing flood pumps at this railway bridge site as necessary. Contact VicTrack, V-Line and VicRoads to ensure they are aware of the emergency situation and imminent installation of flood pumps on Congupna Creek.	Check the outlet pipe and penstock into Congupna Creek at the railway bridge to ensure positive flow. Close this penstock once Congupna Creek exceeds the inflow level and positive flow is no longer possible.	
		1 x 150mm pump was deployed in 2012	Consider installing additional flood pump at retardation basin if town streets are not clearing quickly enough.		
				Request G-MW to review inlet gates into Congupna Creek at the end of Slaughterhouse Lane and others to ensure positive flow; otherwise these gates are to be closed	
				Consult with G-MW to consider opening channel gates along Thompson's Rd until positive flow no longer possible, then close.	Consider closing Thompsons & Trewins Roads to deter sightseeing traffic.
				Consult with G-MW to consider opening channel gates at Trewins and Reynolds Roads until positive flow is no longer possible then close.	

River Level (metres)	Gauge location	General Information	General Action	Drain/Penstock/ Other Action	Roads
			Monitor channel bank on Congupna Creek on Edwards Road adjacent to Bagley property.	Consider installing slides either side of Edwards Rd when Congupna Creek is full; 100mm Pump to be located on Congupna Creek Bank to discharge water from table drains into creek.	
			Consult with G-MW monitoring the gates at back of Maddison property in Edwards Road on Channel 17, 400m north of Trewins Road; Request G-MW to consider installing 150mm Pumps x2 to allow discharge of Dainton's Creek water into Channel 17.	Consult with G-MW to consider opening channel gates into this channel until positive flow is not possible, and then close. Ask G-MW to consider the possibility of lowering the level of the channel to accept this water.	
			Channel bank 5/17 east of Tallygaroopna to be monitored for integrity.		
			Consider sandbagging across Victoria Road itself on the 5/17 channel, 400m east of Slaughterhouse Lane.		Consider closing Victoria Road if required.
			Consider sandbagging across Victoria Road at Slaughterhouse Lane to direct water down the Lane.		
			Check that Congupna Creek (Drain 2/11) flows within its banks and does not surcharge back toward the township.		
			Consider sandbagging at Trewins/Edwards Road corner.		

This map publication is presented by the Victoria State Emergency Service for the purpose of disseminating emergency management information. The contents of the information have not been independently verified by the 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.

APPENDIX C5 – CONGUPNA FLOOD EMERGENCY PLAN

Overview of Flooding Consequences



The township of Congupna is located 8 km north of Shepparton and has a population of 230 people (605 for Congupna Census area, 2016).

The town itself only encompasses a total land area of approximately one square kilometre and is situated at the crossroads of Goulburn Valley Highway and Katamatite-Shepparton Road and is surrounded by farmland on all sides

There are no distinct waterways that flow through the town itself, with over land run-off being the major source of floodwater. However, the Pine Lodge Creek will flood and threaten farming properties approximately 2 kilometres to the north and east of the town; with O'Keefe Creek also contributing to these flows.

Essentially rural in character, the town has a Primary School and a significant recreation reserve which services a number of different sports.

The map on the next page outlines the areas and river and creek systems, relative to the Shepparton urban development.



Flood level maps are available on the Goulburn Broken CMA website:

http://www.gbcma.vic.gov.au/default.asp?ID=floodplain_and_drainage

Are you at risk of flood?

- Congupna Township has had a significant history of flash flooding. Heavy rain over a short period of time (generally greater than 75mm in a 24 hour period) will result in the urban drainage network being overwhelmed, causing streets to flood for many hours.
- There are approximately six homes in the town itself which will be inundated during extreme events.
- In times of flood, five homes adjacent to Pine Lodge Creek will also experience some inconvenience through inundation. This creek system is often charged by waters flowing out of the Broken River when it is in flood, which then take up to two days to peak in the Congupna area.
- Road closures are likely to include Wallace Street and Katamatite-Shepparton Main Road.
- Congupna has a flat landscape with grades of approximately a slope of one metre per kilometre across the region.
- There are no regulated water storages (e.g. dams) or large wetlands in this area.
- Large pockets of water can collect in low-lying areas before slowly draining away/drying out.

Slow onset flooding

The township has experienced slow moving flooding in the past from the overflow of the Broken River via its creek system, which may last for one or more weeks, or even months on some occasions.

There are three water level gauges located on the Broken River at different points including:

- Broken River at Benalla
- Broken River at Casey's Weir
- Broken River at Orrvale near Shepparton (does not affect Congupna)

Flood warnings from the Broken River Gauges at Benalla and Casey's Weir will give an indication of the possibility and potential size of an overland slow onset flood based on historical records.

Flash flooding

Severe storm warnings will usually give an indication of what rainfall to expect during a storm event. The BoM may also issue warnings that include mention of flash flooding for particular areas depending on the estimated intensity of the expected rainfall.

HISTORIC FLOOD LEVELS AND FLOW ASSUMPTIONS

Note that no two floods are ever the same. Water flows and impacts of weather can be highly variable, especially after changes to the floodplain (road works, laser levelling).

The following levels and information are provided as a guide only and should be considered flexible and changeable according to the conditions at the time of an event.

The emergency service providers will be in charge of determining what actions to take according to information and data provided to them at the time by BoM and the Goulburn Broken CMA. The following information can assist in their decision making, however it should be noted that this may not be appropriate for the circumstances at the time of the event.

The Congupna area has a history of flooding with big floods recorded in 1919, 1939, 1956, 1974, 1993 and 2012.



Aerial view of flooding at Congupna in March 2012
(source: Congupna Local Flood Guide, December 2016)

The following assumptions about flooding in the Congupna area are based on historic observations and the past behaviour of our river and creek systems as they peak at varying times. Historic records indicate that flooding usually occurs when;

- Generally there has not been any significant rain recorded in previous days,
- The catchments are saturated,
- The rainfall intensity has been evenly spread over a 24 hour period.

When the Broken River floods, it can spill over its banks in many places. If it spills over near

Gowangardie Weir (from about 1km east of Gowangardie Weir through to Pine Lodge at the East Goulburn Main Channel), the water usually flows in a generally north easterly direction into five waterways:

- Congupna Creek
- Dainton's Creek
- Pine Lodge Creek
- Guilfus Creek
- O'Keefe Creek.

NB. Only Pine Lodge and O'Keefe Creeks flow toward Congupna area (see previous map).

A number of staff gauges have been installed along these creeks. See map of gauge locations, photos of gauges, key data and local contacts at Appendix I. A summary of data collected for these gauges is provided below.

	Gauge reading				
	Centreline of road	1993	2010	2012	
Benalla		5.50	4.43	N/A	
Caseys Weir		4.18	3.6	N/A	
O'Keefe Creek (refer to Appendix I)					
New Dookie Road 1.7km west of Pine Lodge North Road	2.078	2.34	1.71	1.82	
Pine Lodge Creek (refer to Appendix I)					
New Dookie Road 0.6km east of Pine Lodge North Road Road first covered 20m west of bridge	1.623	2.578	1.838	1.948	
Lemnos North Road 0.2km north of Congupna East Road	2.283	2.358	1.965	2.208	
Katamatite-Shepparton Road 1.9km north of Congupna East Road Road first covered 30m south of bridge	2.328	2.448	2.050	2.300	
Dainton's Creek (refer to Appendix I)					
New Dookie Road 0.3km east of Sidebottom Road	1.850	1.855	1.326	1.436	
Congupna East Road 0.3km west of Hudson Road	1.995	2.500	2.109	2.218	
Congupna Creek (refer to Appendix I)					
New Dookie Road 0.3km west of Kellows Road Road first covered 15m west of bridge	1.900	2.065	1.536	1.646	
Tungamah-Boundary Road 0.2km east of Sidebottom Road	2.074	2.938	2.409	2.519	

	Gauge reading			
	Centreline of road	1993	2010	2012
Katamatite-Shepparton Road 0.3km south of Thompsons Road Road first covered 20m north of bridge	2.125	2.585	2.176	2.235
Gullfus Creek (refer to Appendix I)				
Katandra Main Road 0.8km east of Boundary Road Road first covered 20m west of bridge	2.050	2.025	1.495	1.795
		Indicates road is wet across the centreline		

River Level (metres)	Gauge	Significant Flood event	Impact on Congupna township
Not applicable	Benalla Gauge Gowangardie Weir Gauge	March 2012	Flash Flood: This flood was caused by localised intense rainfall of 300mm over a period of 3 days; not from the Broken River.
4.26m 6.39m	Benalla Gauge Gowangardie Weir Gauge	September 2010	Congupna township was not flooded.
3.87m 5.64m	Benalla Gauge Gowangardie Weir Gauge	December 2010	Congupna township was not flooded.
5.51 6.57	Benalla Gauge Gowangardie Weir Gauge	October 1993	Slow onset flood – overland from creek system. Township flooded.

Possible Rainfall impacts based on local knowledge

The following rainfall measurements are based on readings from local resident rain gauges. Bureau of Meteorology warnings are not in place on these systems. In general the following totals over around 12 hours:

- 50mm or so of localised rainfall should not cause any significant flooding
- 75mm+ over a wide area may cause minor flooding
- 125mm+ of localised rainfall may cause widespread minor to moderate flooding
- 150mm+ of localised rainfall may cause moderate flooding and some major
- 200mm+ of localised rainfall will most likely result in major flooding

**If the above rainfall amounts happen over a shorter time frame;
it is likely localised flash flooding will occur**

ESTIMATED FLOOD TRAVEL TIMES

The flood travel times are estimates based on local resident knowledge and observations at previous events. These times were not provided from a formal source or Authority.

BROKEN RIVER BENALLA TO GOWANGARDIE WEIR	Varies from 18 to 37 hours but 29 hours is a reasonable first estimate – see Appendix B
BROKEN RIVER BREAKOUT GOWANGARDIE WEIR TO NEW DOOKIE ROAD	~12 HOURS
BROKEN RIVER BREAKOUT NEW DOOKIE ROAD TO CONGUPNA EAST ROAD	~1 DAY
BROKEN RIVER BREAKOUT CONGUPNA EAST ROAD TO KATAMATITE ROAD	~1 DAY
BROKEN RIVER BREAKOUT KATAMATITE ROAD TO TALLYGAROPNA	~1 DAY
Between staff gauges at bridges over the Creeks – see Appendix I	

For the 1993 flood the passage of the flood peak from Gowangardie to Tallygaroopna took approximately 2.5 days so would be less for Congupna.

Note: These flow times are based on observations from previous floods and may vary considerably depending on the weather and other conditions at the time of the event.

AUTOMATIC GAUGE READINGS

Congupna has no automatically monitored flood gauges.

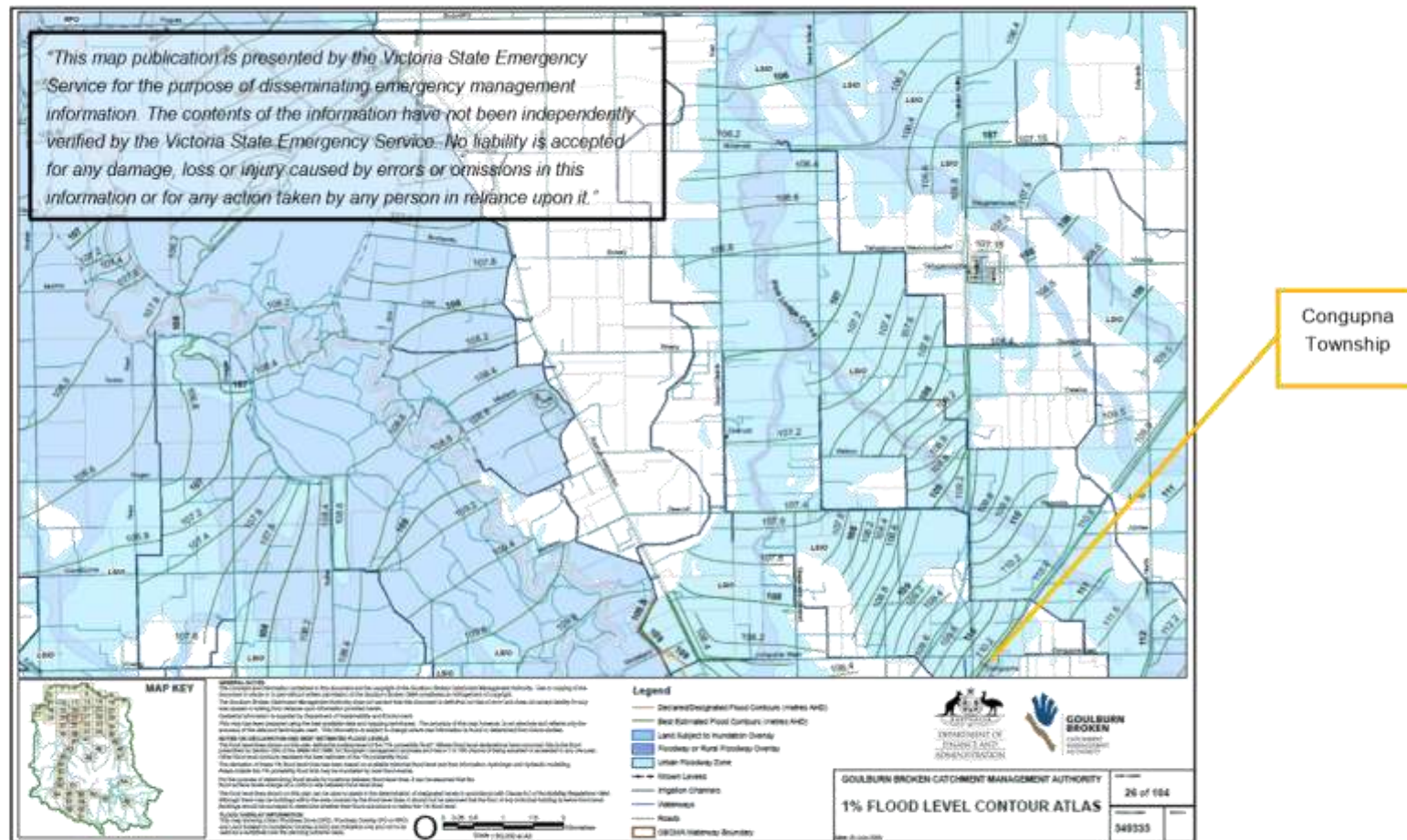
The Broken River Gauge at Benalla can help to provide a guide as to the potential for floodwater that may come this way. Refer to Bureau of Meteorology website for River Heights
http://www.bom.gov.au/cgi-bin/wrap_fwo.pl?IDV60150.html

River level / Creek marker prompts and actions

River Level	Location	General Information / Impact	General Action	Drain/Penstock Other Action	Roads
	Localised Heavy rainfall or Thunderstorms may cause widespread minor to moderate flash flooding	Flash flooding can occur at any time with short notice. Can only be guided for likelihood of flooding by BoM heavy rainfall warnings.	Monitor BoM weather sites. Source local knowledge (e.g. collect private rain gauge data). Creek level markers have been installed which may assist authorities in assessing the risk of flood. Refer to Appendix I.		
5.51 6.57	Benalla Gauge Gowangardie Weir Gauge (Oct 1993 event level)	New Dookie Road is likely to over-top at Pine Lodge and O'Keefe Creeks which gives approximately 28 hours' notice to Congupna & 22 hours to Lemnos North	Ensure VICSES is aware of vulnerable properties in Congupna and Lemnos North. Ensure residents/landholders are aware of the situation.	Communicate with G-MW to inspect outfall pipe into G-MW drain, 600m north of the township to ensure it is clear and positive flow occurring. This pipe/penstock should be closed when negative flow occurs and install a high flow pump.	VicRoads will have closed Midland Highway and then New Dookie Road the next day.
			Consider delivery of 60m ³ sand and 1000 sandbags to Congupna recreation reserve; behind the goals at eastern end of oval.		Consider closing Old Dookie and Lemnos-Cosgrove Roads
			Consider sandbagging across Lemnos North Road at the flood flap pipes as necessary.	Consult with G-MW to consider opening the gates into G-MW channels to the East of township until positive flow ceases and then close these gates.	Consider closing Lemnos North Road

River Level	Location	General Information / Impact	General Action	Drain/Penstock Other Action	Roads
				In consultation with G-MW, inspect outfall pipe into G-MW drain, 600m north of the Congupna township to <u>ensure it is clear and positive flow occurring (this is an on-going maintenance issue)</u> . This flood flap will close when negative flow occurs and there is a need to consider installing a high flow pump.	
			Consider installing pumps at each end of Wallace Street to remove further rainfall; if necessary.	Check Penstocks in Wallace Street and keep open until positive flow ceases; then close.	
			Consider blocking 12 inch pipe/drain at South side of Congupna East Road. 400-500 metres from the corner of Lemnos North Road. That may help impede a small flow west to the Congupna Township.	Consult with G-MW to consider to opening gates into G-MW channels to the East of town until positive flow ceases and then close these gates.	Monitor Lemnos North and Congupna East Roads and prepare for closure.
			Consider sandbagging across Old Grahamvale Road where the pipe goes under the railway line.		Consider closing Old Grahamvale Road.
			It was noted that Drains need to be maintained and kept clear of weeds and debris to lessen the impact of floods.		





"Floods can go higher than the 100-year flood level. In Australia, the flood planning level is usually defined by the 100-year flood. This is not a flood which happens once every 100 hundred years but one which has a 1 in 100 or 1% chance of occurring in each and every year. In a 70 year lifetime there is a 50/50 chance of a 1 in 100 flood being exceeded at any location." Text sourced from Flood Victoria Website: http://www.floodvictoria.vic.gov.au/centre/fq/common_misconceptions_about_flooding.jsp

Greater Shepparton City Council Flood Emergency Plan – A Sub-Plan of the MEMP

APPENDIX C6 – KATANDRA WEST FLOOD EMERGENCY PLAN

Overview of Flooding Consequences



The township of Katandra West is located 20km north east of Shepparton and has a population of 230 people (476 in Katandra West Census area, 2016).

The town itself only encompasses a total land area of approximately one square kilometre and is situated at the crossroads of Hickey and Sidebottom's Roads and is surrounded by farmland on all sides.

There are no distinct waterways that flow close to the town itself; with farmland run-off being the major source of floodwater. The Guilfus Creek will flood and threaten farming properties approximately 2 kilometres to the west of the town.

It is important to recognise that Guilfus Creek impacts the rural areas west of the Katandra West township, and not the township itself. The township of Katandra West is primarily impacted by direct rainfall. It is not impacted directly by riverine flooding at all.

Essentially rural in character, the town has a Primary School and a significant recreation reserve which services a number of different sports.

Greater Shepparton City Council has:

- A pump and basin in the grounds of the Katandra Football ground, Hickey Road.; and
- A pump in Black Street Katandra West (pumps into a nearby drain).

The map below outlines the areas and river and creek systems, relative to Katandra West and the Shepparton urban development.

Flood History

- The Katandra West district experienced flooding in 1919, 1939, 1956, 1974, 1993 and in March 2012.
- During significant events, the nearby Congupna and Guilfus creeks will flood the surrounding area and threaten farming properties to the west of town.
- Congupna and Guilfus creeks also flood if heavy rain falls in the Dookie Hills, as occurred in March 2012.
- The 2012 event overwhelmed the town's drainage network causing Black Street, Coleman Street, Burgman Street, Hickey Road, Donohue Street and King Street to flood for several days. Flooding in the Labuan Road area lasted longer than in the town.
- Katandra West township has not had a significant history of flash flooding; however, heavy rain over a short period of time (generally greater than 75mm in a 24 hour period) will result in the urban drainage network being overwhelmed, causing streets to flood for a few hours.
- Generally no homes in the town should be inundated; however, the water will flow to the west and has flooded two houses on Labuan Road in the past.
- In times of flood, homes adjacent to Guilfus Creek may experience some inconvenience. This creek system is often charged by waters flowing out of the Broken River when it is in flood, which then take up to 2 days to peak in the Katandra West area.
- Katandra West has a flat landscape with an approximate slope of 1 metre per kilometre across the region.
- The township of Katandra West is only at risk of overland flooding from local storm events.
- There are no regulated water storages (e.g. dams) or large wetlands in this area, meaning that large pockets of water can collect in low-lying areas before slowly draining away / drying out.

Significant Flood Events

March 2012 – substantial flash flooding occurred due to very intense rainfall (300mm occurring to the east of Katandra West over three days).

October 1993 - was a flood caused primarily by the Broken River breaking its banks at Gowangardie; which resulted in significant overland flows reaching the rural areas west of the Katandra West township.



Aerial view of flooding at Katandra West in March 2012
(source: Katandra West Local Flood Guide, December 2016)

Slow onset flooding

The township has experienced slow moving flooding in the past primarily from the overflow of the Broken River via its creek system, which may last for one or more weeks, or even months on some occasions.

There are three water level gauges located on the Broken River at different points including:

- Broken River at Benalla
- Broken River at Casey's Weir
- Broken River at Orrvale near Shepparton (does not affect Katandra West)

Flood warnings from the Broken River Gauges at Benalla and Casey's Weir will give an indication of the possibility and potential size of a flood based on historical records.

Flash flooding warnings

Severe storm warnings will usually give an indication of what rainfall to expect during the storm event. The BoM may also issue warnings that include mention of flash flooding for

particular areas depending on the estimated intensity of the expected rainfall.

HISTORIC FLOOD LEVELS AND FLOW ASSUMPTIONS

Note that no two floods are ever the same. Water flows and impacts of weather can be highly variable, especially after changes to the floodplain (road works, laser levelling).

The following levels and information are provided as a guide only and should be considered flexible and changeable according to the conditions at the time of an event.

The emergency service providers will be in charge of determining what actions to take according to information and data provided to them at the time by BoM and the Goulburn Broken CMA. The following information can assist in their decision making, however it should be noted that this may not be appropriate for the circumstances at the time of the event.

The following assumptions about flooding in the Katandra West area are based on historic observations and the past behaviour of our river and creek systems as they peak at varying times. Historic records indicate that flooding usually occurs when;

- Generally there has not been any significant rain recorded in previous days,
- The catchments are saturated,
- The rainfall intensity has been evenly spread over a 24 hour period.

When the Broken River floods, it can spill over its banks in many places. If it spills over near Gowangardie Weir (from about 1km east of Gowangardie Weir through to Pine Lodge at the East Goulburn Main Channel), the water usually flows in a generally north easterly direction into five waterways:

- Congupna Creek
- Dainton's Creek
- Pine Lodge Creek
- Guilfus Creek
- O'Keefe Creek.

Nb. Only the Congupna and Guilfus Creeks flow toward the Katandra West area.

A number of staff gauges have been installed along these creeks. See map of gauge locations, photos of gauges, key data and local contacts at Appendix I. A summary of data collected for these gauges is provided below.

	Centreline of road	Gauge reading			
		1993	2010	2012	
Benalla		5.50	4.43	N/A	
Caseys Weir		4.18	3.6	N/A	
O'Keefe Creek (refer to Appendix I)					
New Dookie Road 1.7km west of Pine Lodge North Road	2.078	2.34	1.71	1.82	
Pine Lodge Creek (refer to Appendix I)					
New Dookie Road 0.6km east of Pine Lodge North Road Road first covered 20m west of bridge	1.623	2.578	1.838	1.948	
Lemnos North Road 0.2km north of Congupna East Road	2.283	2.358	1.965	2.208	
Katamatite-Shepparton Road 1.9km north of Congupna East Road Road first covered 30m south of bridge	2.328	2.448	2.050	2.300	
Dainton's Creek (refer to Appendix I)					
New Dookie Road 0.3km east of Sidebottom Road	1.850	1.855	1.326	1.436	
Congupna East Road 0.3km west of Hudson Road	1.995	2.500	2.109	2.218	
Congupna Creek (refer to Appendix I)					
New Dookie Road 0.3km west of Kellows Road Road first covered 15m west of bridge	1.900	2.065	1.536	1.646	
Tungamah-Boundary Road 0.2km east of Sidebottom Road	2.074	2.938	2.409	2.519	
Katamatite-Shepparton Road 0.3km south of Thompsons Road Road first covered 20m north of bridge	2.125	2.585	2.176	2.235	
Guilfus Creek (refer to Appendix I)					
Katandra Main Road 0.8km east of Boundary Road Road first covered 20m west of bridge	2.050	2.025	1.495	1.795	
		Indicates road is wet across the centreline			

River Level (metres)	Gauge	Significant Flood event	Impact on Katandra West township
Not applicable	Benalla Gauge Gowangardie Weir Gauge	March 2012	Flash Flood: This flood was caused by localised intense rainfall of 300mm over a period of 3 days; not from the Broken River.
4.26m 6.39m	Benalla Gauge Gowangardie Weir Gauge	September 2010	Katandra West township was not flooded.
3.87m 5.64m	Benalla Gauge Gowangardie Weir Gauge	December 2010	Katandra West township was not flooded.
5.51 6.57	Benalla Gauge Gowangardie Weir Gauge	October 1993	The rural areas west of the Katandra West township were flooded from breakouts from the Broken River

Possible Rainfall impacts based on local knowledge

The following rainfall measurements are based on readings from local resident rain gauges. Bureau of Meteorology warnings are not in place on these systems. In general the following totals over around 12 hours:

- 50mm or so of localised rainfall should not cause any significant flooding
- 75mm+ over a wide area may cause minor flooding
- 125mm+ of localised rainfall may cause widespread minor to moderate flooding
- 150mm+ of localised rainfall may cause moderate flooding and some major
- 200mm+ of localised rainfall will most likely result in major flooding

**If the above rainfall amounts happen over a shorter time frame;
it is likely localised flash flooding will occur**

ESTIMATED FLOOD TRAVEL TIMES

The flood travel times are estimates based on local resident knowledge and observations at previous events. These times were not provided from a formal source or Authority.

BROKEN RIVER BENALLA TO GOWANGARDIE WEIR	Varies from 18 to 37 hours but 29 hours is a reasonable first estimate – see Appendix B
BROKEN RIVER BREAKOUT GOWANGARDIE WEIR TO NEW DOOKIE ROAD	~12 HOURS
BROKEN RIVER BREAKOUT NEW DOOKIE ROAD TO CONGUPNA EAST ROAD	~1 DAY
BROKEN RIVER BREAKOUT CONGUPNA EAST ROAD TO KATAMATITE ROAD	~1 DAY
BROKEN RIVER BREAKOUT KATAMATITE ROAD TO TALLYGAROPNA	~1 DAY
Between staff gauges at bridges over the Creeks – see Appendix I	

For the 1993 flood the passage of the flood peak from Gowangardie to Tallygaroopna took approximately 2.5 days.

Note: These flow times are based on observations from previous floods and may vary considerably depending on the weather and other conditions at the time of the event.

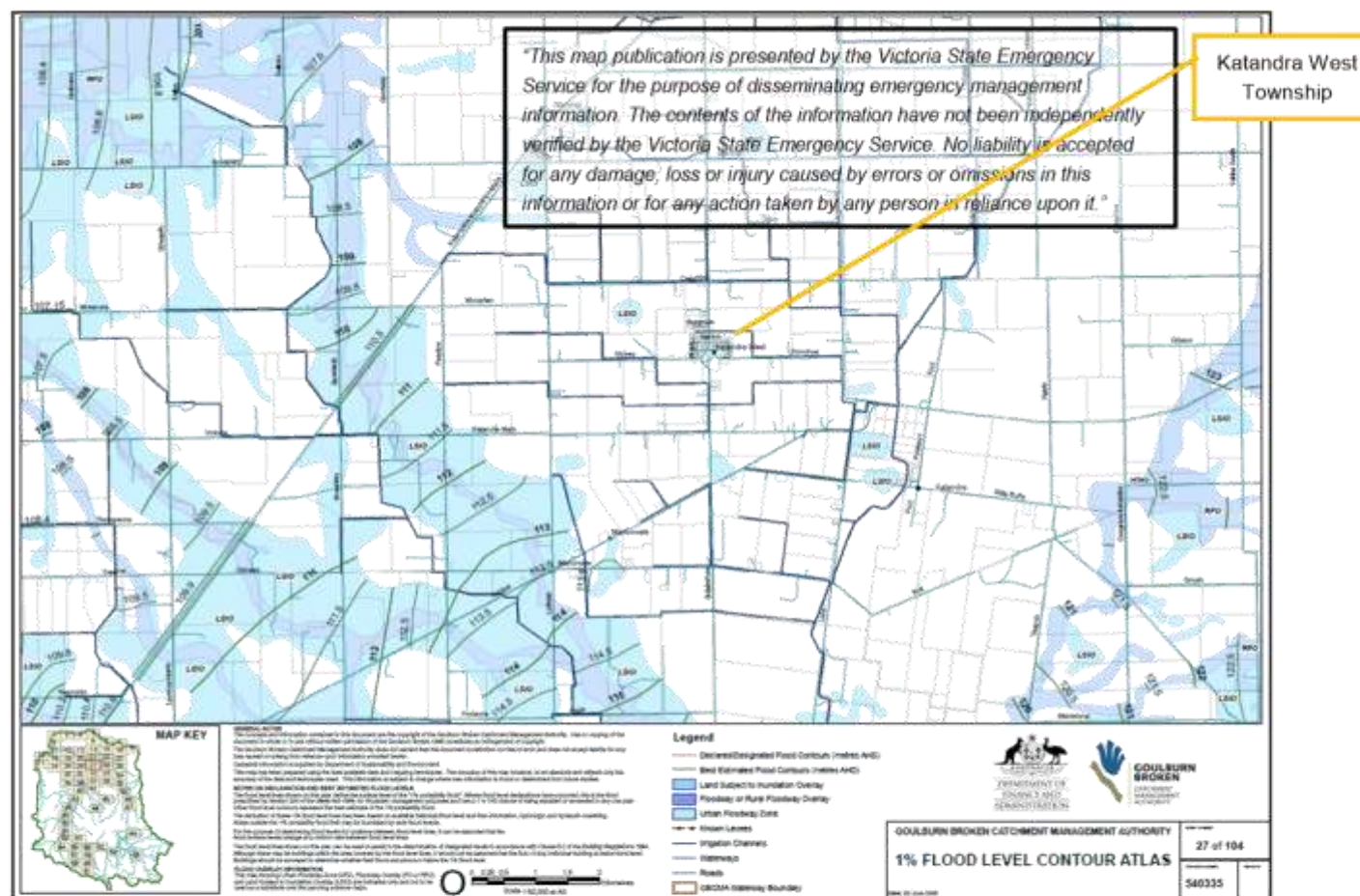
AUTOMATIC GAUGE READINGS

Katandra West has no automatically monitored flood gauges.

The Broken River Gauge at Benalla can help to provide a guide as to the potential for floodwater that may come this way. Refer to Bureau of Meteorology website for River Heights
http://www.bom.gov.au/cgi-bin/wrap_fwo.pl?IDV60150.html

River level / Creek marker prompts and actions

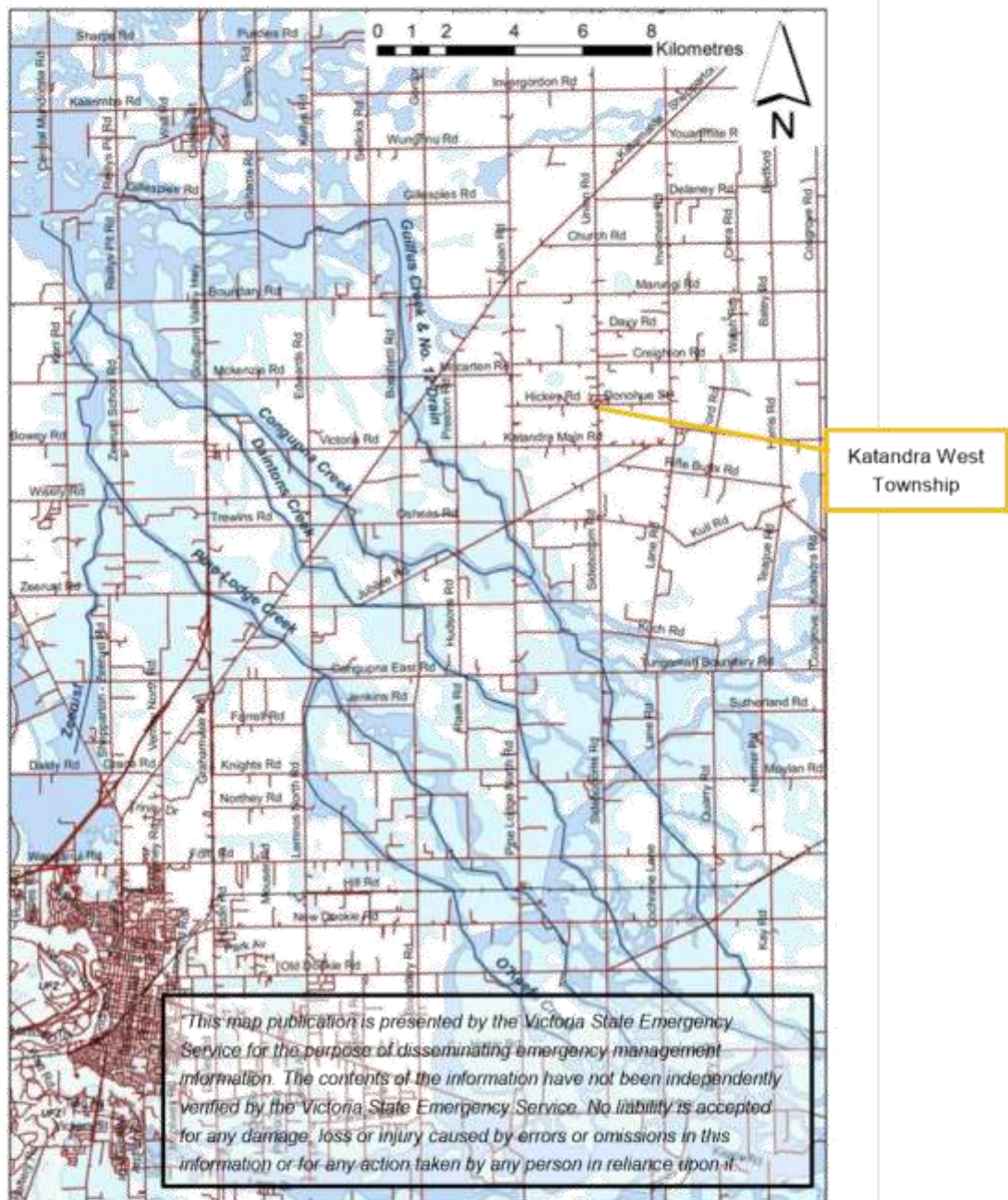
River Level	Gauge	General Information	General Action	Drain/Penstock/Other Action	Roads
	Localised Heavy rainfall or Thunderstorms may cause widespread minor to moderate flash flooding	Flash flooding can occur at any time with short notice. Can only be guided for likelihood of flooding by BoM heavy rainfall warnings.	Monitor BoM weather sites for rainfall indicators and flash flooding warnings. Source local knowledge (e.g. collect private rain gauge data). Creek level markers have been installed which may assist authorities in assessing the risk of flood. Refer to Appendix I.		
5.51 6.57	Benalla Gauge Gowangardie Weir Gauge (Oct 1993 event level)	New Dookie Road will over-top at Congupna, Dainton's, Pine Lodge and O'Keefe Creeks which gives just over 2 days' notice to Katandra West.		Communicate with G-MW to consider the possibility of directing flood flow into the East Goulburn Main Channel where positive flow is possible	VicRoads will most likely close Midland Highway and then New Dookie Road the next day
			Alert vulnerable properties in Sidebottom, Hickey, Labuan Roads and township	Check the drain from the retardation basin discharge point, to the west is clear	Consider placing "Road Closed" signs at these sites in preparation for closing
			Consider delivery of 80m3 sand and 2000 sandbags to the car park in front of the Recreation Reserve pavilion	Check pump is running in Bankin Street retardation basin. Check the outlet to the north is also clear.	
			Ensure appropriate channel banks are secure in Hickey Street	Check the pump is running in Hickey Street retardation basin	
As above				Flood flap on pipe in Union Road, north of the town to be closed to avoid any negative flow back south toward the township	



Flood level maps are available on the Goulburn Broken CMA website: http://www.gbcma.vic.gov.au/default.asp?ID=floodplain_and_drainage

"Floods can go higher than the 100-year flood level. In Australia, the flood planning level is usually defined by the 100-year flood. This is not a flood which happens once every 100 hundred years but one which has a 1 in 100 or 1% chance of occurring in each and every year. In a 70 year lifetime there is a 50/50 chance of a 1 in 100 flood being exceeded at any location." Text sourced from Flood Victoria Website: http://www.floodvictoria.vic.gov.au/centric/faq/common_misconceptions_about_flooding.jsp

Locality Creek System Map



APPENDIX C7 - TATURA FLOOD EMERGENCY PLAN

Overview of the Catchment

Tatura lies 17km south-west of Shepparton and 20km directly north of Murchison within the Mosquito Depression East Arm floodplain. In turn, the Depression is within the Deakin Basin. The eastern boundary of the Basin parallels the east side of the Depression's route.

The Mosquito Depression East Arm is a sub-catchment of the Mosquito Depression which originates south of Tatura in the general vicinity and to the west of Murchison. It drains into the Deakin Main Drain about 15km upstream from where the Drain outfalls into the Murray River, east (i.e. upstream) of Echuca.

The Mosquito Depression East Arm drains a highly modified 6.15km² catchment of rural pasture and orchards to Tatura. It comprises a network of shallow and wide interconnecting drainage paths on a low grade. Important features of the upstream catchment include agricultural storages / farm dams, irrigation channels, flood protection levees, road and rail embankments and culverts, and shallow interconnecting floodways. These features substantially attenuate flows.

Upstream of Tatura, the Mosquito Depression East Arm exists as two distinct branches, one from the south, the other from the east. The two branches are of similar length and have comparable catchment areas. However, agricultural storages and levees in the Eastern Branch impede the arrival of flood peaks at the town boundary by days.

The branches converge at Tatura to form a series of meandering and interlinked shallow depressions. Floodwaters enter the town via four flow paths from the south and east and drain through the town to the northwest before joining the main branch of Mosquito Depression.

Downstream from Tatura and on its way past Merrigum, the Depression winds through the catchment as a series of defined ephemeral flow paths although drainage is generally via the Mosquito Depression Drain, an open trapezoidal earth lined channel.

An extensive underground pipe network drains runoff from the developed areas of Tatura to the Southern and Eastern Branches of the Mosquito Depression East Arm. While drainage reserves have been designated along the Eastern Branch, significant development has occurred within the flood prone Southern Branch.

Tatura is cut diagonally by the Toolamba - Echuca railway embankment, which acts as a constriction to flows along the Southern Branch. Flows are conveyed via an underpass (~3.2m wide and 1.8m high). The majority of the town's flood prone properties are located along the Southern Branch in the area upstream of the embankment.

Flood History

Tatura's first experience with suburban flooding occurred in March 1950, when floodwaters rose rapidly in the area that is now Lake Bartlett and broke across Martin Street flooding shops and businesses in the Depression's natural course. Flooding occurred again in 1955, 1956, May 1974 and October 1993.

The 1955 flood is considered to be the largest on record. The May 1974 flood was not as severe and was contained by locals using portable and tractor-mounted pumps to pump flows down Service Street and into the Eastern Branch.

Large amounts of fill became available as the town's sewerage system was constructed and many low lying allotments within the floodplain were raised. Concern about development in the floodplain led to planning controls being put in place and construction

by Council of banks of culverts within the Eastern Branch. A flood management plan was also implemented. The Plan utilised penstocks at Lake Bartlett to hold back flows in the Southern Branch while flows within town receded. Once sufficient capacity had returned within the town's drainage network, the penstocks were to be opened to allow Southern Branch flows to drain away via the natural depression. Local flood management has also involved cutting through roads and the deployment of pumps once the capacity of penstocks has been exceeded.

There is no rainfall or stream gauge data available for any flood producing storms within the catchment in the vicinity of Tatura.

Flood Behaviour

Flooding at Tatura has two sources: high intensity short duration storms that lead to localised rapid onset stormwater flooding within the township and long duration (36 hours or so) rainfall events that cause elevated flows within Mosquito Depression.

Overland flows through Tatura follow multiple flow paths with interconnections controlled by a range of constructed and natural features. For example, topography is flat, sinuosity is high, and there are numerous culverts, crossings and both natural and man-made levees. Further, the underground (trunk) stormwater drainage system can potentially convey a considerable portion of flow during some events as there are no restrictions on the exchange of water between the underground drainage network and overland flow paths. As a result, individual flow paths (and their relationship with others) are not always easily defined or predictable.

Localised stormwater flooding within town due to capacity constraints within the minor drainage network occurs, in general, much earlier, and is much smaller in magnitude, than resulting from flows in the Mosquito Depression East Arm.

Five electric pumps remain on standby at the Margaret Street Pumping Station to lift flows over an embankment into the Cussen Park Wetland once stormwater enters the Margaret Street pump well. The combined capacity of the pumps is approx. 3.4m³/s (294ML/d).

The depth of flooding along drainage lines and in flood storage areas can be substantial. However, grades are flat and flows sluggish within the Depression. Floods travel slowly along the Depression and through Tatura with the result that the rise and recession are also slow. It can take several days for a flood to reach a peak and many more for it to drain. In the lower reaches, flooding can persist for anywhere from 14 days to 2 months.

Flood risk (based on depths and velocities as per ARR 2016) outside the drainage lines and storage areas is considered to be low for adults, children and vehicles

Blockages at drainage infrastructure, particularly in the vicinity of the railway bypass, will increase flood levels and extents.

A remote pocket of flooding will begin to develop in the vicinity of Hunter Street and between Unilever Foods and William Street as flood levels approach the 10% AEP (10yr ARI) event. This is backwater flooding caused by elevated water levels at the railway underpass pushing water back up the minor stormwater drainage network. It could be prevented by placing sandbags at drain outlets north and south of the railway embankment (i.e. those that drain the area affected) after any local runoff has escaped via the drainage network and before the peak of the flood passes through town.

Flood Impacts

Overview

Flood impacts in and around Tatura can be significant: multiple road closures, loss of access for residents, disruption to schools, child care centres and the hospital, property isolation, over-floor flooding, risks to emergency personnel during sand bagging and

evacuation operations, and damage to buildings constructed below flood level. During major floods, there are also likely to be substantial rural and infrastructure flood damages.

Properties at Risk of Flooding

The number of properties at risk of flooding along with the number of buildings (those that are habitable: does not include garages or carports) at risk of over-floor flooding was calculated by WBM (2006). A summary of that analysis is provided in the table below.

ARI (years)	AEP	Number of properties at risk	
		Flooded above ground level	Flooded above floor level
10	10%	163	32
20	5%	220	46
50	2%	312	92
100	1%	399	132
500	0.2%	483	201

Caravan Parks

The Tatura Caravan Park is inundated from around the 10-year ARI (10% AEP) event.

Known or possible community infrastructure impacts including:

- Telstra exchange
- CFA Fire Station / Incident Command Centre
- Hospital and Aged Care Facility
- Schools and Child Care Centres
- Ovals and sporting facilities including the bowls club, tennis courts and swimming pool

Road closures

These are listed in the Flood Intelligence Card below and can also be determined from the flood mapping delivered by WBM (2006). See also FloodZoom.

Flood Mapping

A set of flood inundation maps for Tatura (depth and water surface elevation) has been produced for emergency management and response purposes (WBM, 2006). Maps were produced for 5 design events (i.e. 10, 20, 50, 100 & 500 year ARI).

Mapping is available from [?where? and how accessed from ICC?](#) and through FloodZoom. The study report (WBM, 2006) is also available through FloodZoom.

Command, Control and Coordination

VICSES will assume overall control of the response to flood incidents. Other agencies will be requested to support operations as detailed in this Plan. Control and coordination of a flood incident shall be carried out at the lowest effective level and in accordance with the State Emergency Response Plan (EMMV Part 3). During significant events, VICSES will conduct incident management using multi-agency resources.

Divisional Command will be located at the Hume Region Divisional Command Centre Shepparton and Tatura to manage the local community.

Flood Intelligence and Action Table for Tatura

Introduction

Flood impacts described in the following tables relate primarily to flooding from the Mosquito Depression. It should be noted that local impacts, or impacts in excess of those indicated, may occur, especially in the event of locally heavy rain in and around Tatura, especially if that rain coincides with high flows within the Depression. Similarly, local increases in flood levels and impacts may result from local factors such as blockages at culverts and from obstructions within overland flow paths.

Notes:

1. While flood intelligence cards provide guidance on the relationship between flood magnitude and flood consequences, flood intelligence records are approximations. This is because no two floods at a location, even if they peak at the same height, will have identical impacts. Further, the hydrologic and hydraulic modelling that underpins much of the intell detailed below is informed by a number of assumptions and approximations that are unlikely to be replicated exactly during a flood event. Actual impacts under similar rainfall conditions are therefore expected to be similar but may not be exactly the same: there are likely to be some differences. Additional details about flood intelligence and its use can be found in the Australian Emergency Management Manuals flood series at <http://www.ema.gov.au> and in particular in Manual 20 "Flood Preparedness".
2. All levels, impacts and actions listed in the following flood intelligence card may need to be adjusted to better reflect experience.

Flood Intelligence Card

Observed Rainfall	~AEP of flood	Consequence / Impact at Tatura Refer to FloodZoom and to maps at Appendix F	Action Actions may include (but not limited to) evacuation, closure of roads, sandbagging, issue of warnings and who is responsible
<ul style="list-style-type: none"> It is important that sand and sandbags are delivered to Tatura and made available to residents as soon as possible after it becomes apparent that flooding is likely. Sandbags are only likely to be efficient for masonry or brick buildings on a concrete slab. All others should concentrate on lifting furniture and other valuables. Consider how best to assist nursing staff attend the Tatura Public Hospital and Parkville Aged Care Facility in Hunter Street if flooding more severe than 10 year ARI is considered likely. 			
USING THIS INTELLIGENCE CARD The observed rainfall range and duration is provided as a guide only. Greater depths of rainfall over a shorter period may also lead to rises and possible flooding along the Mosquito Depression and through Tatura. While heavy short duration rainfall may lead to localised flash stormwater flooding within Tatura, the consequences of that are not detailed in this intelligence card. Rainfall reported from the Tatura AWS (available from the BoM website at 30 minute intervals and occasionally more frequently and also from FloodZoom) or from local gauges (or perhaps from the Castle Creek at Arcadia gauge - available from the BoM website and FloodZoom)) will provide near real-time data for use herein in order to determine the approximate flood severity. Consider the appropriate flood inundation map remembering that water will rise slowly and travel slowly. Review all consequences and actions in this table, from the first row down to the approximate expected severity of flooding. Initiate all actions in a logical sequence. Some actions may need to be initiated in an order that is different from their relative placement in this table.			
~50 to 70mm in 24hrs ~55 to 80mm in 36hrs	<10% AEP (<10yr ARI)	<ul style="list-style-type: none"> Flow in Mosquito Depression through Tatura. Heavy local rain resulting in stormwater flooding and / or high flows within the stormwater drainage network. 	<ul style="list-style-type: none"> Manage the penstocks at Lake Bartlett as per the Flood Management Plan. Periodically check that the 5 electric pumps at the Margaret Street Pumping Station are operating as required and lifting water over the embankment into the Cussen Park Wetland. Check drainage infrastructure, particularly in vicinity of the railway bypass for blockages and clean out as necessary. This could include removing any build-up of soil in the culverts at Gowie St and Hogan St.

Observed Rainfall	~AEP of flood	Consequence / Impact at Tatura Refer to FloodZoom and to maps at Appendix F	Action Actions may include (but not limited to) evacuation, closure of roads, sandbagging, issue of warnings and who is responsible
~55mm in 12hrs ~70mm in 24hrs ~80mm in 36hrs	10% AEP (10yr ARI)	<p>The 12 hour rainfall is likely to cause some increase in flows but no real flooding issues in Tatura.</p> <ul style="list-style-type: none"> Flooding into the racecourse and into Cussen Park Wetland. Frank Howley Oval and adjacent oval flooded. Tatura Caravan Park flooded by up to 300mm deep. Both Hastie St and Galloway St are also flooded to a similar depth. Hunter St flooded in front of the Tatura Public Hospital and Parkville Aged Care Facility to around 300mm depth. VICSES Tatura unit HQ is dry but there water is close to Martin St either side. Flooding of a number of roads, mostly less than 300mm depth but up to 500mm: Albert St, Alexander Av, Bartlett St, Brown St, Casey St, Cussen St, Dhurringile Rd, Edgar St, Francis St, Fraser St, Gowie Park Rd, Johnstone Rd, Kerford St, Galloway St, Hampton Rd, Hastie St, Hogan St, Hunter St, Langdon Rd, Martin St, Murlon Rd, O'Reilly Rd, Park St, Pyke St, Ross St, Serra Ct, Service St, Taylor Rd. 163 properties flooded along these roads and 32 buildings flooded over-floor. Most of the over-floor flooding is in the properties immediately downstream from Lake Bartlett: 55-59 Albert St, 28-35 Francis St, 11-17 Fraser St, 47 Hastie St, 16 Hunter St, 22-30 Kerford St, 103-142 Martin St, 100 O'Reilly Rd, 22-34 Service St. Water banked up on the upstream side of Pyke Road north of town. Water through George Reilly Park and Lions Park Playground. <p>This flood will pass through Merrigum. Is there anything that can be done now to assist response? For example, advice re likely flood size? See Appendix C8 of this MFEP.</p>	<ul style="list-style-type: none"> Consider delivering sand and sandbags (60m³ and 1,000 respectively?) into Tatura to the nominated collection point (where is it?) sufficient for the expected severity of flooding. Note that the Shire Depot on Cussen St remains mainly dry but that access is about to be compromised / it becomes isolated. Evacuate Tatura Caravan Park. Review road flooding, place "Water over road" signs and consider closing roads as necessary. Place sandbags at drain outlets north and south of the railway embankment (i.e. those that drain Hunter Street and the area between Unilever Foods and William Street) after any local runoff has escaped via the drainage network and before the peak of the flood passes through town in order to prevent backwater flooding into this pocket. Sandbag or otherwise assist household likely to flood over-floor. Refer to the 10% AEP flood map for Tatura at Appendix F of this MFEP. Monitor water levels. Check drainage infrastructure, particularly in vicinity of the railway bypass for blockages and clean out as necessary. This could include removing any build-up of soil in the culverts at Gowie St and Hogan St. Review evacuation plan and prepare for implementation noting that there are very few shrinking islands but that the likelihood of isolation does increase as flood severity increases. A number of properties do become isolated – see flood depth maps available through FoodZoom. With the ICC and Goulburn Broken CMA, raise the possibility of installing one or more PALS in Mosquito Depression upstream of, at, and downstream from Tatura. The intention is to collect height data to enable development of more robust flood guidance tools. Record flood levels and impacts for later update of this table. This information could assist the development of a flood warning / prediction system for Merrigum.
~64mm in 12hrs ~81mm in 24hrs ~92mm in 36hrs	5% AEP (20yr ARI)	<p>The 12 hour rainfall is likely to cause some increase in flows but no real flooding issues in Tatura.</p> <ul style="list-style-type: none"> Flooding into the Bowls Club and alongside the Netball courts in Hastie St. Shallow water on Casey St in front of the CFA fire station (also local incident command centre). Tatura telephone exchange in Casey St surrounded by water. Tatura Public Hospital and Parkville Aged Care Facility may be isolated. Mostly shallow flooding though the majority of the CBD in Casey St. All flow paths are running deeper and a bit wider with a few more roads now 	<ul style="list-style-type: none"> Review road flooding, place "Water over road" signs and consider closing roads as necessary. Sandbag or otherwise assist household likely to flood over-floor. Refer to the 10% AEP flood map for Tatura at Appendix F of this MFEP. Consider how to assist nursing staff maintain access to the hospital and aged care facility in Hunter St. Monitor water levels. Check drainage infrastructure, particularly in vicinity of the railway bypass for blockages and clean out as necessary. This could include removing any build-up

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Observed Rainfall	~AEP of flood	Consequence / Impact at Tatura Refer to FloodZoom and to maps at Appendix F	Action Actions may include (but not limited to) evacuation, closure of roads, sandbagging, issue of warnings and who is responsible
		flooded (e.g. Elizabeth St, Erica Av, Davey St, Hughes St, Margaret St, Peter Av, Thomson St, Toro Ct, William St). Velocities still slow. <ul style="list-style-type: none"> 220 properties flooded and 46 buildings flooded over-floor. 	of soil in the culverts at Gowrie St and Hogan St.
~76mm in 12hrs ~99mm in 24hrs ~112mm in 36hrs	2% AEP (50yr ARI)	<i>The 12 hour rainfall is likely to cause some increase in flows but no real flooding issues in Tatura.</i> <ul style="list-style-type: none"> All flow paths are running a bit deeper and a bit wider. Velocities still slow. 312 properties flooded and 92 buildings flooded over-floor. Tatura Public Hospital and Parkville Aged Care Facility isolated. Water just beginning to overtop Pyke Rd downstream / north of town. 	<ul style="list-style-type: none"> Review road flooding, place "Water over road" signs and consider closing roads as necessary. Sandbag or otherwise assist household likely to flood over-floor. Refer to the 10% AEP flood map for Tatura at Appendix F of this MFEP. Monitor water levels. Check drainage infrastructure, particularly in vicinity of the railway bypass for blockages and clean out as necessary.
~85mm in 12hrs ~111mm in 24hrs ~128mm in 36hrs	1% AEP (100yr ARI)	<i>The 12 hour rainfall is likely to cause some increase in flows but no real flooding issues in Tatura.</i> <ul style="list-style-type: none"> All flow paths are running deeper and a bit wider with a few more roads now flooded. Velocities still slow. Flood depths on roads now between 300mm and 800mm. Buildings in the Tatura Caravan Park are flooded over-floor. Water up against the Tatura library building in Casey St. Water surrounds the CFA Fire Station in Casey St. 399 properties flooded and 132 buildings flooded over-floor. Over-floor flooding is concentrated in: <ul style="list-style-type: none"> > The block surrounded by O'Reilly Rd, Hastie St, Albert St & Davey St. > The area immediately downstream from Lake Bartlett through to the railway embankment. > Hunter St and Park St either side of the railway embankment. 	<ul style="list-style-type: none"> Sandbag or otherwise assist household likely to flood over-floor. Refer to the 1% AEP flood map for Tatura at Appendix F of this MFEP. Review road flooding, place "Water over road" signs and consider closing roads as necessary. Sandbag or otherwise assist household likely to flood over-floor. Refer to the 10% AEP flood map for Tatura at Appendix F of this MFEP. Monitor water levels. Check drainage infrastructure, particularly in vicinity of the railway bypass for blockages and clean out as necessary.
	0.2% AEP (500yr ARI)	<ul style="list-style-type: none"> All flow paths are running deeper and a bit wider. Velocities still slow. 483 properties flooded and 201 buildings flooded over-floor. The hospital grounds are partially flooded. VICSES unit HQ is dry but there is water across Martin St either side. 	<ul style="list-style-type: none"> Review road flooding, place "Water over road" signs and consider closing roads as necessary. Monitor water levels. Check drainage infrastructure, particularly in vicinity of the railway bypass for blockages and clean out as necessary.

APPENDIX C8 - MERRIGUM FLOOD EMERGENCY PLAN

Overview of the Catchment

Merrigum lies approx. 25km west of Shepparton and 12km north-west of Tatura within the Mosquito Depression floodplain. In turn, the Depression is within the Deakin Basin. The eastern boundary of the Basin parallels the east side of the Depression's route.

The Mosquito Depression originates south of Tatura. It drains into the Deakin Main Drain about 15km upstream from where the Drain outfalls into the Murray River, east (i.e. upstream) of Echuca.

The catchment upstream of Merrigum consists of a mix of around 228km² of irrigated and non-irrigated crops, orchards and pastoral land. The Depression winds through the catchment as a series of defined ephemeral flow paths although drainage is generally via the Mosquito Depression Drain, an open trapezoidal earth lined channel. The Drain was originally cut in the mid-1890's and extended in the early 1990's. Further minor extensions occurred during the 2000's.

The Drain has a design capacity of 150ML/d (1.8m³/s), the flow estimated to result from a 2-year ARI (50% AEP) design storm of 50mm over a period of 24 hours. In comparison, the 10-year ARI (10% AEP) design storm delivers around 75mm in 24 hours.

Embankments were added to the floodway between Waverley Avenue and the railway embankment (through the urban area of Merrigum) in 1994 with crest levels set at 500mm above the 1993 flood levels.

Upstream of Tatura there are many obstructions in the Depression, all of which impact on flow conveyance (see Appendix C7). Between Tatura and Merrigum, there are substantially fewer obstructions (only 15 or so).

The local relatively small upper Byrneside – Merrigum catchment contributes to flows in the Depression at Merrigum upstream of the railway line. These flows arrive in the Depression well ahead of flows from further upstream.

There is significant storage within the catchment upstream of Merrigum, including wetlands upstream of Tatura, Cussen Park Wetland and Lake Bartlett at Tatura, a number of other named storages in other parts of the catchment, and swampy areas between Tatura and Merrigum.

Approximately 5km downstream from Tatura, there is a diversion out of the Depression to the north into the Rodney Main Drain system. Capacity is around 240ML/d (2.8m³/s).

An underground pipe network drains stormwater runoff from the developed areas of Merrigum to the Mosquito Depression Drain.

Flood History

Flooding is known to have occurred at Merrigum in May 1974 and October 1993. Community feedback (WBM, 2005) also identified flooding in 1950, 1954, 1955, 1956 and 1982.

The '74 and '93 events resulted in inundation of roads and properties within the town (see photos below). Both events are thought to be around the 10-year ARI (10% AEP) level.

There is no rainfall or stream gauge data available for any flood producing storms within the catchment in the vicinity of Merrigum.



Flooding in Waverley Avenue, October 1993 (source: WBM, 2005)



Flooding at corner of Judd and Waverley Avenues, October 1993 (source: WBM, 2005)

Flood Behaviour

Flooding at Merrigum has two sources: high intensity short duration storms that lead to localised rapid onset stormwater flooding within the township and long duration (36 hours or so) rainfall events that cause elevated flows within Mosquito Depression.

The nature of flooding in Merrigum is influenced by the very flat grade and meandering

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nature of the Depression, the railway embankment and associated bridges and culverts, and the Waverly Avenue culverts. Irrigation channels contained by levees affect flood flows outside the town.

Grades are flat and flows sluggish within the Depression. Floods travel slowly with the result that the rise and recession are also slow. It can take several days for a flood to reach a peak and many more for it to drain. In the lower reaches, flooding can persist for anywhere from 14 days to 2 months.

At Merrigum, an initial rise is likely at around 24 to 36 hours after the start of rain. Peak flow could be expected around 4 days later with a return to "non-flood" conditions in a further 5 to 7 days.

Velocities are up to 0.2m/s on the floodplain, 0.2 to 0.5m/s in the natural depression, and up to 1.0m/s in the confined and straightened sections of the Drain.

The depth of flooding along drainage lines and in flood storage areas is generally in the range 1.5m to 2m. Depth on the floodplain varies but is generally less than 500mm.

Flood risk (based on depths and velocities as per ARR 2016) outside the drainage lines and storage areas is considered to be low for adults, children and vehicles

Localised stormwater flooding within town due to capacity constraints within the minor drainage network occurs, in general, much earlier, and is much smaller in magnitude, than resulting from flows in the Mosquito Depression. Similarly, local catchments contribute flows to the Depression ahead of upstream flows. These give the initial rises.

Blockages at drainage infrastructure will increase flood levels and extents.

Flood Impacts

Overview

Flood impacts in and around Merrigum can be significant: multiple road closures, loss of access for residents, disruption to school and child care centre, property isolation, over-floor flooding, risks to emergency personnel during sand bagging and evacuation operations, and damage to buildings constructed below flood level. During major floods, there are also likely to be substantial rural and infrastructure flood damages.

Properties at Risk of Flooding

The majority of the buildings in Merrigum are residential with a small number of commercial and industrial. WBM (2005) noted 218 buildings in Merrigum and a population of around 470.

The number of habitable buildings at risk of being flooded over-floor flooding was calculated by WBM (2005). A summary of that analysis is provided in the table below.

Depth of over-floor flooding (m)	Number of buildings flooded over-floor				
	10% AEP (10yr ARI)	5% AEP (20yr ARI)	2% AEP (50yr ARI)	1% AEP (100yr ARI)	0.2% AEP (500yr ARI)
0 – 0.10	4	8	12	17	
0.10 – 0.60	3	9	22	32	
0.60 – 1.50	0	0	1	1	
>1.5	0	0	0	0	

TOTAL	7	17	35	50	73
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Caravan Parks

The northern half of the Merrigum Caravan Park begins to be inundated from somewhere between the 100 and 500-year ARI (1% to 0.2% AEP) event.

Known or possible community infrastructure impacts including:

- Telstra exchange
- CFA Fire Station
- Primary school and kindergarten
- Judd Memorial Park including the tennis courts, swimming pool and oval
- Merrigum Golf Course
- Public Hall

Road closures

These are listed in the Flood Intelligence Card below and can also be determined from the flood mapping delivered by WBM (2005). See also FloodZoom.

Flood Mapping

A set of flood inundation maps for Merrigum (depth and water surface elevation) has been produced for emergency management and response purposes (WBM, 2005). Maps were produced for 5 design events (i.e. 10, 20, 50, 100 & 500 year ARI).

Mapping is available from **?where where and how accessed from ICC?** and through FloodZoom. The study report (WBM, 2005) is also available through FloodZoom.

Command, Control and Coordination

VICSES will assume overall control of the response to flood incidents. Other agencies will be requested to support operations as detailed in this Plan. Control and coordination of a flood incident shall be carried out at the lowest effective level and in accordance with the State Emergency Response Plan (EMMV Part 3). During significant events, VICSES will conduct incident management using multi-agency resources.

Divisional Command will be located at the Hume Region Divisional Command Centre Shepparton and Tatura to manage the local community.

Flood Intelligence and Action Table for Merrigum

Introduction

Flood impacts described in the following tables relate primarily to flooding from the Mosquito Depression. It should be noted that local impacts, or impacts in excess of those indicated, may occur, especially in the event of locally heavy rain in and around Tatura, especially if that rain coincides with high flows with the Depression. Similarly, local increases in flood levels and impacts may result from local factors such as blockages at culverts and from obstructions within overland flow paths.

Notes:

- While flood intelligence cards provide guidance on the relationship between flood magnitude and flood consequences, flood intelligence records are approximations. This is because no two floods at a location, even if they peak at the same height, will have identical impacts. Further, the hydrologic and hydraulic modelling that underpins much of the intell detailed below is informed by a number of assumptions and approximations that are unlikely to be replicated exactly during a flood event. Actual impacts under similar rainfall conditions are therefore expected to be similar but may not be exactly the same: there are likely to be some differences. Additional details about flood intelligence and its use can be found in the Australian Emergency Management Manuals flood series at <http://www.ema.gov.au> and in particular in Manual 20 "Flood Preparedness".
- All levels, impacts and actions listed in the following flood intelligence card may need to be adjusted to better reflect experience.

Flood Intelligence Card

Observed Rainfall	~AEP of flood	Consequence / Impact at Tatura Refer to FloodZoom and to maps at Appendix F	Action Actions may include (but not limited to) evacuation, closure of roads, sandbagging, issue of warnings and who is responsible
USING THIS INTELLIGENCE CARD The observed rainfall range and duration is provided as a guide only. Greater depths of rainfall over a shorter period may also lead to rises and possible flooding along the Mosquito Depression and through Merrigum. While heavy short duration rainfall may lead to localised flash stormwater flooding within Merrigum, the consequences of that are not detailed in this intelligence card. Rainfall reported from the Tatura AWS (available from the BoM website at 30 minute intervals and occasionally more frequently and also from FloodZoom) or from local gauges (or perhaps from the Castle Creek at Arcadia gauge - available from the BoM website and FloodZoom)) will provide near real-time data for use herein in order to determine the approximate flood severity. Consider the appropriate flood inundation map remembering that water will rise slowly and travel slowly. Review all consequences and actions in this table, from the first row down to the approximate expected severity of flooding. Initiate all actions in a logical sequence. Some actions may need to be initiated in an order that is different from their relative placement in this table.			
~50 to 70mm in 24hrs ~55 to 80mm in 36hrs	<10% AEP (<10yr ARI)	<ul style="list-style-type: none"> Flow in Mosquito Depression. Heavy local rain resulting in stormwater flooding and / or high flows within the stormwater drainage network. 	<ul style="list-style-type: none"> Check drainage infrastructure for blockages and clean out as necessary. Check for flooding over the Merrigum – Ardmona Road town side of Ryan Road and close as necessary. Check for flooding over Waverly Av north of Judd Av and close as necessary.
~55mm in 12hrs ~70mm in 24hrs ~80mm in 36hrs	10% AEP (10yr ARI)	<i>The 12 hour rainfall is likely to cause some increase in flows but no real flooding issues in Merrigum.</i> <ul style="list-style-type: none"> Merrigum Golf Course is flooded and access compromised. Flooding of all road in town and immediately upstream (i.e. to the east), mostly less than 300mm depth with the exception of the Merrigum – Ardmona Rd which is up to 600mm deep along the edges and Waverly Rd which is up to 500mm deep: Judd Av, Merrigum - Ardmona Rd, Palmer Ct, Ryan Rd, Waverley Av. 	<ul style="list-style-type: none"> Close the Merrigum – Ardmona Road and Morrissey Av if not already done. Review road flooding and adjust signage and closures as necessary. Sandbag or otherwise assist household likely to flood over-floor. Refer to the 10% AEP flood map for Merrigum at Appendix F of this MFEP. Monitor water levels. Check drainage infrastructure for blockages and clean out as necessary.

Observed Rainfall	~AEP of flood	Consequence / Impact at Tatura Refer to FloodZoom and to maps at Appendix F	Action Actions may include (but not limited to) evacuation, closure of roads, sandbagging, issue of warnings and who is responsible
		<p>Wilson Av.</p> <ul style="list-style-type: none"> A number of buildings flooded over-floor along Waverley Rd. 2 buildings flooded over-floor in Judd Av. Water is encroaching on the Merrigum CFA site at the corner of Morrissey St and Waverley Av with 2 buildings wetted over-floor. The site will soon be fully wet. Merrigum telephone exchange surrounded by water. Kindergarten surrounded by water. 7 buildings flooded over-floor, 3 up to a depth of 600mm. 	<ul style="list-style-type: none"> Review evacuation plan and prepare for implementation noting that water will soon cover the entire town if it continues rising to the 5% AEP flood level. With the ICC and Goulburn Broken CMA, raise the possibility of installing one or more PALS in Mosquito Depression upstream of, at, and downstream from Merrigum. The intention is to collect height data to enable development of more robust flood guidance tools. Record flood levels and impacts for later update of this table. This information, when used in conjunction with similar information from Tatura, could assist the development of a flood warning / prediction system for Merrigum.
~64mm in 12hrs ~81mm in 24hrs ~92mm in 36hrs	5% AEP (20yr ARI)	<p>The 12 hour rainfall is likely to cause some increase in flows but no real flooding issues in Merrigum.</p> <ul style="list-style-type: none"> All flow paths are running a bit deeper and a bit wider. Velocities still slow. Most of the town on the upstream (i.e. east) side of the railway line is now wet. 17 buildings flooded over-floor, 9 up to a depth of 600mm. Primary school flooded and access along Judd Av compromised. Water beginning to pond on the upstream (i.e. east) side of No 7 channel on the east side of Byrneside - Kyabram Rd. Isolation likely to become an issue. 	<ul style="list-style-type: none"> Consider evacuating the town if flooding likely to get any worse. Review road flooding and adjust signage and closures as necessary. Sandbag or otherwise assist household likely to flood over-floor. Refer to the 10% AEP flood map for Tatura at Appendix F of this MFEP. Consider how to assist nursing staff maintain access to the hospital and aged care facility in Hunter St. Monitor water levels. Check drainage infrastructure, particularly in vicinity of the railway bypass for blockages and clean out as necessary. This could include removing any build-up of soil in the culverts at Gowie St and Hogan St.
~76mm in 12hrs ~99mm in 24hrs ~112mm in 36hrs	2% AEP (50yr ARI)	<p>The 12 hour rainfall is likely to cause some increase in flows at Merrigum with the possibility of some flooding.</p> <ul style="list-style-type: none"> All flow paths are running a bit deeper and a bit wider. Velocities still slow. The Judd Memorial Park and oval, tennis courts and public pool are beginning to flood – the recreational facilities on the west side of the railway line. Public Hall surrounded by water. 35 buildings flooded over-floor, 22 up to 600mm and 1 up to a depth of 1.5m. Water has broken over No 7 channel and is flowing across the Byrneside - Kyabram Rd. 	<ul style="list-style-type: none"> Review road flooding and adjust signage and closures as necessary. Sandbag or otherwise assist household likely to flood over-floor. Refer to the 10% AEP flood map for Tatura at Appendix F of this MFEP. Monitor water levels. Check drainage infrastructure, particularly in vicinity of the railway bypass for blockages and clean out as necessary.
~85mm in 12hrs ~111mm in 24hrs ~128mm in 36hrs	1% AEP (100yr ARI)	<p>The 12 hour rainfall is likely to cause some increase in flows at Merrigum with the possibility of some flooding.</p> <ul style="list-style-type: none"> All flow paths are running a bit deeper and a bit wider. Velocities still slow. 53 buildings flooded over-floor, 32 up to 600mm and 1 up to a depth of 1.5m. All buildings along Waverley Av and around the corner into Morrissey St are flooded over-floor. 	<ul style="list-style-type: none"> Sandbag or otherwise assist household likely to flood over-floor. Refer to the 1% AEP flood map for Tatura at Appendix F of this MFEP. Review road flooding and adjust signage and closures as necessary. Sandbag or otherwise assist household likely to flood over-floor. Refer to the 10% AEP flood map for Tatura at Appendix F of this MFEP. Monitor water levels. Check drainage infrastructure, particularly in vicinity of the railway bypass for

Observed Rainfall	~AEP of flood	Consequence / Impact at Tatura Refer to FloodZoom and to maps at Appendix F	Action Actions may include (but not limited to) evacuation, closure of roads, sandbagging, issue of warnings and who is responsible
		<ul style="list-style-type: none"> Most of the buildings on Judd Av and Wilson Av and 1 in Palmer Ct are flooded over-floor. Railway station is wet and railway line is flooded. 	blockages and clean out as necessary.
	0.2% AEP (500yr ARI)	<ul style="list-style-type: none"> All flow paths are running deeper and a bit wider. Velocities still slow. 73 buildings flooded over-floor. Skate park flooded. 	<ul style="list-style-type: none"> Move caravans and other assets from the northern half of the Caravan Park to higher ground. Review road flooding and adjust signage and closures as necessary. Monitor water levels. Check drainage infrastructure for blockages and clean out as necessary.

APPENDIX D - FLOOD EVACUATION ARRANGEMENTS

Phase 1 - Decision to Evacuate

The Incident Controller may make the decision to evacuate an at-risk community under the following circumstances:

- Properties are likely to become inundated;
- Properties are likely to become isolated and occupants are not suitable for isolated conditions;
- Public health is at threat as a consequence of flooding and evacuation is considered the most effective risk treatment. This is the role of the Health Commander of the incident to assess and manage. Refer to the State Health Emergency Response Plan (SHERP) for details);
- Essential services have been damaged and are not available to a community and evacuation is considered the most effective risk treatment.

The following should be considered when planning for evacuation:

- Anticipated flood consequences and the timing and reliability of predictions;
- Size and location of the community to be evacuated;
- Likely duration of evacuation;
- Forecast weather;
- Flood Models;
- Predicted timing of flood consequences;
- Time required to conduct the evacuation;
- Time available to conduct the evacuation;
- Evacuation priorities and evacuation planning arrangements;
- Access and egress routes available and their potential flood liability;
- Current and likely future status of essential infrastructure;
- Resources required to conduct the evacuation;
- Resources available to conduct the evacuation;
- Shelter including Emergency Relief Centres, Assembly Areas etc.;
- Vulnerable people and facilities;
- Transportation;
- Registration
- People of CALD background and transient populations;
- Safety of emergency service personnel;
- Different stages of an evacuation process.

The decision to evacuate is to be made in consultation with the MERO, MERC, DHHS, Health Commander and other key agencies and expert advice (CMAs and Flood Intelligence specialists).

The table below details evacuation triggers levels for the Goulburn River at Shepparton gauge, if these heights are predicted or are likely to occur, evacuation should be considered

Sector	Gauge	Trigger
Balmoral Estate	Shepparton	11.10
	Seven Creeks	6.60
Victoria Lake Caravan Park	Shepparton	11.18
The Boulevard & Wanganui Estate	Shepparton	11.30
Taylor's & Halls Estate	Shepparton	11.30
Riverpark Estate	Shepparton	11.38
Tarcoola Retirement Homes	Shepparton	11.53
Princess Park Sports Complex	Shepparton	11.66

The table below details time required to door-knock properties to advice of the need to evacuate established areas.

Sector	Likely time required for evacuation (including resource assumptions)
Balmoral Estate	8 hours
Victoria Lake Caravan Park	24 hours
The Boulevard & Wanganui Estate	48 hours
Taylor's & Halls Estate	20 hours
Riverpark Estate	40 hours
Tarcoola Retirement Homes	24 hours
Princess Park Sports Complex	10 hours

Phase 2 – Warning

Warnings may include a warning to prepare to evacuate and a warning to evacuate immediately. Once the decision to evacuate has been made, the at-risk community will be warned to evacuate. Evacuation warnings can be disseminated via methods listed in part 3 of this plan.

Evacuation warning messages will be developed and issued by VICSES in consultation with the MERO, MERC, DHHS and other key agencies and expert advice (CMAs and Flood Intelligence specialists).

Phase 3 – Evacuation

Evacuation will be coordinated by VICPOL. VICSES will provide advice regarding most appropriate evacuation routes and locations for at-risk communities to evacuate to, etc.

VICSES, CFA, AV and Local Government will provide resources where available to support VICPOL/VICROADS with route control and may assist VICPOL in arranging evacuation transportation.

VICPOL will control security of evacuated areas.

Evacuees will be encouraged to move using their own transport where possible. Transport for those without vehicles or other means will be arranged by the MERO.

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Possible Evacuation Routes to be used:

Sector	Evacuation Route	Evacuation route closure point and gauge height of closure
Balmoral Estate	Goulburn Valley Highway	Balmoral Street/GV Highway 11.10m
Victoria Lake Caravan Park	Goulburn Valley Highway	Fitzjohn Street & GV Highway 11.18m
The Boulevard & Wanganui Estate	Balaclava Road, Parkside Drive, Wanganui Road	Balaclava Road, Parkside Drive, Wanganui Road 11.28m
Taylor's & Halls Estate	Goulburn Valley Highway	Guthrie and Longstaff Streets 11.30m
Riverpark Estate	Goulburn Valley Highway	Macintosh & Wilmot Roads and Lachlan Crescent 11.38m
Tarcoola Retirement Homes	Balaclava Road	Balaclava Road/The Boulevard 11.53m
Princess Park Sports Complex	Nixon Street	Nixon and Marungi Streets 11.66m

Landing zones for helicopters are located at:

- Shepparton Airport (Greater Shepparton City Council: Shepparton Aerodrome Manager)
- Sports fields (as necessary)

Special needs groups are identified in Council's "Vulnerable Persons Register". Responsibility to refer to this register resides with Victoria Police. Details of the Register are included in the MEMP. Further information about and access to the Register is by request to Council's MERO or MRM.

Phase 4 – Shelter

Relief Centres and/or assembly areas which cater for people's basic needs for floods may be established to meet the immediate needs of people affected by flooding. The flood relief centres and/or Assembly Areas are listed in the Shepparton MEMP:

VICPOL in consultation with VICSES will liaise with Local Government and DHHS (where regional coordination is required) via the relevant control centre to plan for the opening and operation of relief centres. This can best be achieved through the Emergency Management Team (EMT).

Animal Shelter

Animal shelter compounds will be established for domestic pets and companion animals of evacuees. These facilities may be located at locations detailed below and coordinated by the MERO and Council's Animal Control Officers.

Sector	Animal Shelter (include address)	Comments
Greater Shepparton	Municipal Pound Wanganui Road, Shepparton 5821 2813	Pets and other small animals
Greater Shepparton	Municipal Saleyards New Dookie Road, Shepparton 5821 4462	Large animals and livestock

Phase 5 – Return

Return will be consistent with the Strategic Plan for the Return of Community

The Incident Controller in consultation with VicPol will determine when it is safe for evacuees to return to their properties and will arrange for the notification of the community.

VicPol will manage the return of evacuated people with the assistance of other agencies as required.

Considerations for deciding whether to evacuate include:

- Current flood situation;
- Status of flood mitigation systems;
- Size and location of the community;
- Access and egress routes available and their status;
- Resources required to coordinate the return;
- Special needs groups;
- Forecast weather;
- Transportation particularly for people without access to transport

Disruption to Services

Disruption to a range of services can occur in the event of a flood. This may include road closures affecting school bus routes, water treatment plant affecting potable water supplies, etc.

Service	Impact	Trigger Point for action	Strategy/Temporary Measures
Victoria Lake Caravan Park Sewerage system	Possible backflow of sewerage	11.18m	Turn off pumps and plug the sewer
Victoria Park Lake filling & recycle pumps	Damage to pumps if flooded	11.18m	Remove the electric motors
Sewerage to The Boulevard, Wanganui and Tassiker Estates	Inflow of floodwater into sewerage system-overload	11.28m	GVW to plug sewer system
Sewerage to Taylors Estate and surrounds	Inflow of floodwater into sewerage system-overload	11.30m	GVW to plug sewer system
Midland Highway access across causeway to Mooropna	Loss of access	12.00m	VicRoads to manage access for emergency vehicles only

Essential Community Infrastructure and Property Protection

Essential Community Infrastructure and properties (e.g. residences, businesses, roads, power supply etc.) that require protection are:

Facility	Impact	Trigger Point for action	Strategy/Temporary Measures
Municipal Offices 90 Welsford Street	Loss of MECC	12.00m	Relocate MECC to 315 Doyles Road, Orrvale
Power supply	Loss of electricity, safety	300mm of water around ground level substations	Powercor to sandbag

GVW Treatment Plant	Treatment plant issues, but production will continue.	11.9m	GVW have detailed action plan
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Greater Shepparton City Council will establish sandbag collection points at:

- Shepparton Showgrounds, Thompson Street, Shepparton
- Council depot in Mooroopna Recreation Reserve, Midland Highway, Mooroopna

Rescue

Known high-risk areas/communities where rescues might be required include:

1. **Kialla Settlement, Riverview Drive**
2. **Arcadia Downs Estate**
3. **Kidstown Tourist facility**

APPENDIX E - FLOOD WARNING SYSTEMS

Flood Warning

Flood Warning products and Flood Class Levels can be found on the BoM website. Flood Warning Products include Severe Thunderstorm Warnings, Severe Weather Warnings, Flood Watches and Flood Warnings.

Flood warnings are also available via the VicEmergency App and from the VicEmergency website (<https://emergency.vic.gov.au/respond/>).

Flood Bulletins

VICSES distributes flood emergency information to the media through "Flood Bulletins". Flood Bulletins provide BoM Flood Warning information as well as information regarding possible flood consequences and safety advice, not contained in BoM Flood Warning products. VICSES uses the title Flood bulletin to ensure emphasis is placed upon BoM Flood Warning product titles.

The relevant VICSES Region Headquarters or the established ICC will normally be responsible for drafting, authorising and issuing Flood Bulletins through the One Source, One Message system (OSOM).

Flood Bulletins should refer to the warning title within the Bulletin header, for example Flood Bulletin for Major Flood Warning on the Goulburn River.

Flood Bulletins should follow the structure below:

- What is the current flood situation;
- What is the predicted flood situation;
- What are the likely flood consequences;
- What should the community do in response to flood warnings;
- Where to seek further information;
- Who to call if emergency assistance is required.

It is important that the description of the predicted flood situation is consistent with and reflects the relevant BoM Flood Warning.

Flood Bulletins should be focused on specific gauge (or in the absence of gauges, catchment) reference areas, that is the area in which flood consequences specifically relate to the relevant flood gauge.

Flood Bulletins should be prepared and issued after receipt of each Flood Watch and Flood Warning from the BoM, or after Severe Weather or Thunderstorm Warnings indicating potential for severe flash flooding.

To ensure flood bulletins are released in a timely manner, standardised flood bulletins may be drafted based on different scenarios, prior to events occurring. The standardised flood bulletins can then be adapted to the specifics of the event occurring or predicted to occur.

Local Flood Warning System Arrangements

G-MW monitors levels and flows at gauging stations on the Goulburn River and tributaries upstream of Lake Eildon, between Lake Eildon and Goulburn Weir and downstream of Goulburn Weir to meet its core business requirements and in the past has also provided considerable assistance in flood predictions for Shepparton.

A 1925 agreement established the Loch Garry Flood Protection District to reduce the frequency of flooding to downstream landholders. The operating rules for Loch Garry were developed in 1932 and have until recently changed little in the interim. The original rules required a staged removal of drop bars from the Loch Garry regulator to commence 24 hours after the Goulburn River at Shepparton reached 10.36 m (34 feet). If the river continued to rise at Shepparton, drop bars would be progressively removed until all bars were removed by the time the river reached 10.97 m (36 feet) at Shepparton. Drop bars would be replaced in reverse order when the flood peak at Shepparton has passed.

The operation of the Loch Garry regulator requires timely forecasts of river level at Shepparton to mobilise and deploy work crews and provide sufficient notification to landholders to enable stock to be removed from land that will be flooded.

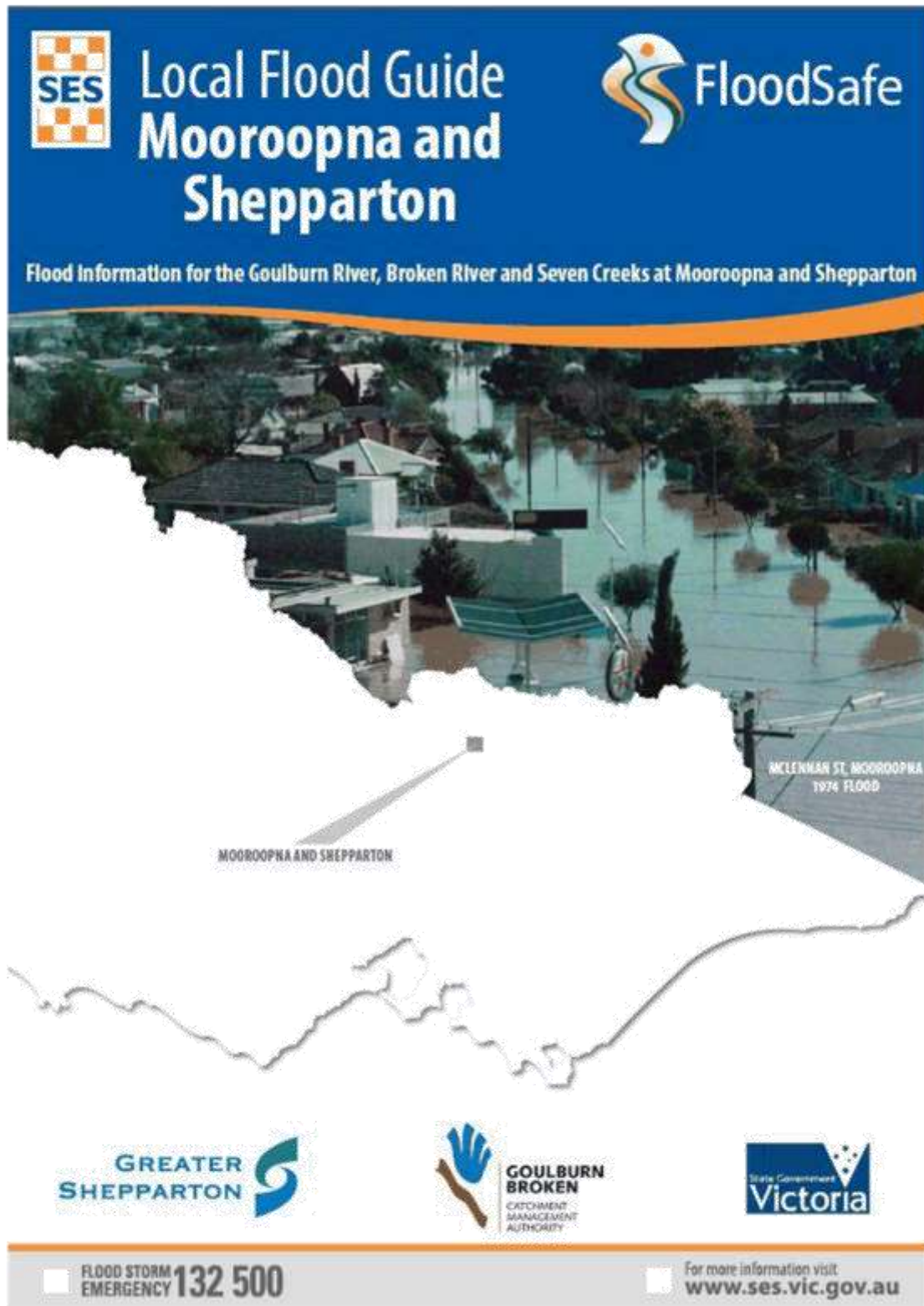
A review by G-MW in early 2006 identified safety issues associated with night time operation of the existing Loch Garry regulator. As a consequence of this review, G-MW has decided to confine operation of the Loch Garry regulator in its current form to daylight hours. As far as is possible, G-MW will operate the Loch Garry regulator to preserve the intent of the 1932 operating rules.

G-MW's existing flood prediction technique for the Goulburn River at Shepparton involves manual extraction of river level data obtained from a variety of telephone based telemark and synthesised voice recorders. The flow for each site is then manually derived from rating tables and entered on a spread sheet where forecasts of peak flows and river levels at Shepparton are produced by lagging flows and making appropriate allowance for losses on the floodplain.

While this flood forecast spread sheet technique has been updated and refined since 2004, including a graphical component, the method is cumbersome, labour intensive and requires a considerable amount of skill to arrive at a reliable estimate of the peak flood level at Shepparton. G-MW believes that it is no longer appropriate for G-MW to provide a flood prediction service for Shepparton, and this role better rests with the Bureau of Meteorology. G-MW is also of the view that the development of a suite of rainfall-runoff models by the Bureau of Meteorology for the Goulburn River and tributaries utilising an enhanced data collection network and sophisticated computer models will render G-MW's present flood forecasting role redundant.

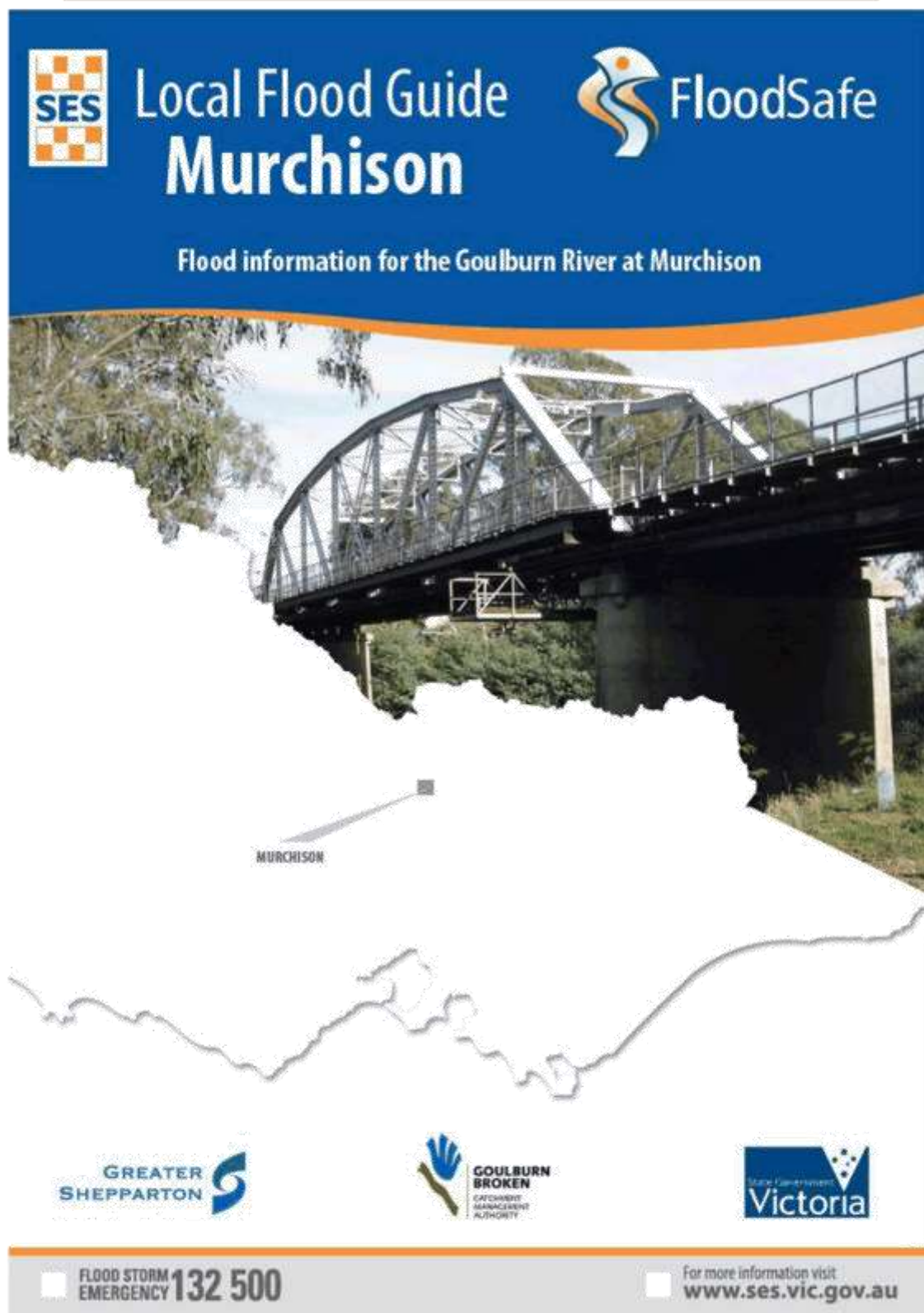
In an exchange of letters G-MW, Bureau of Meteorology and Greater Shepparton City Council have agreed that G-MW will as from 1 July 2006 cease providing a flood forecasting service and the Greater Shepparton City Council has agreed to rely on flood forecasts provided by the Bureau of Meteorology.

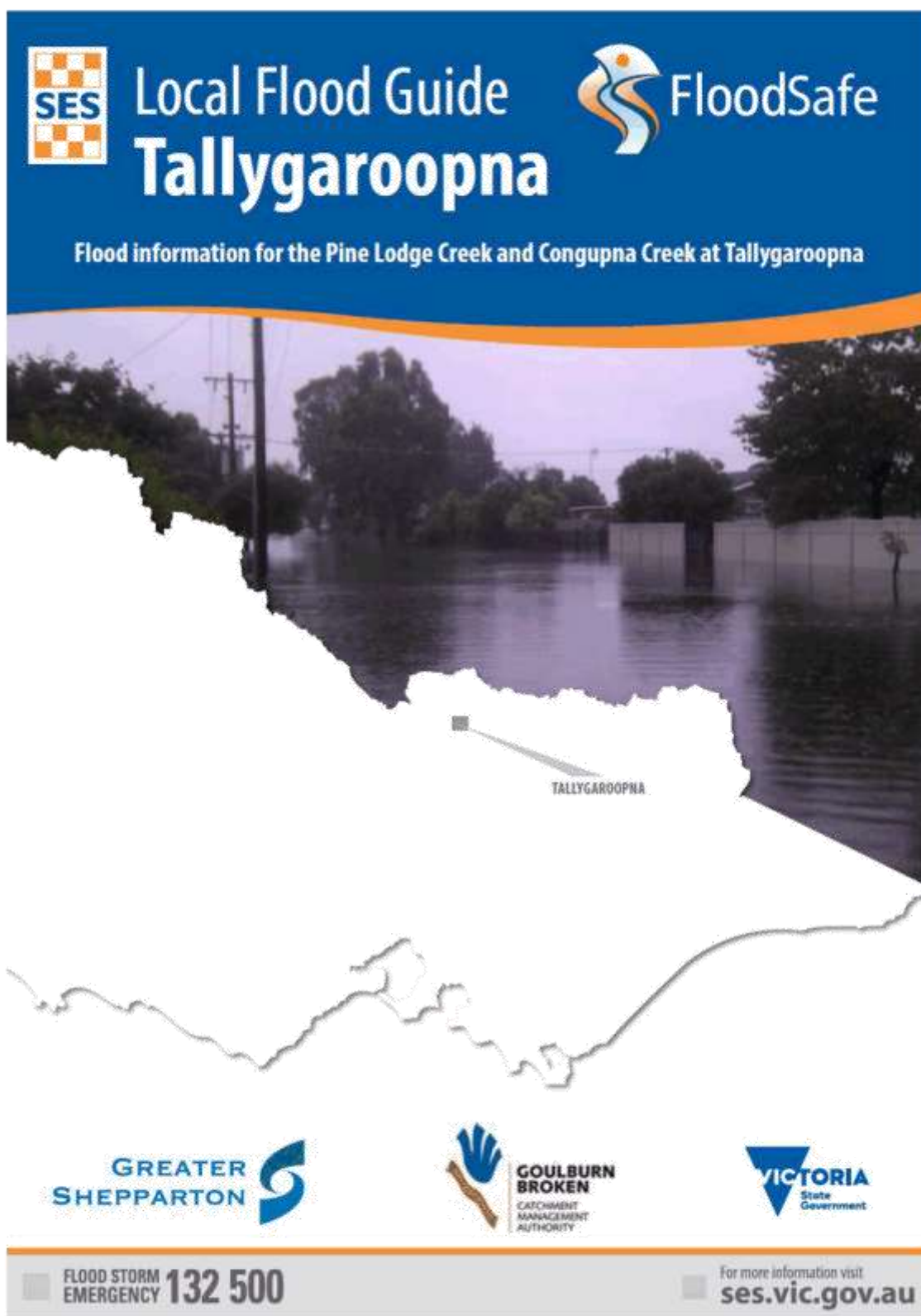
APPENDIX F – LOCAL FLOOD GUIDES



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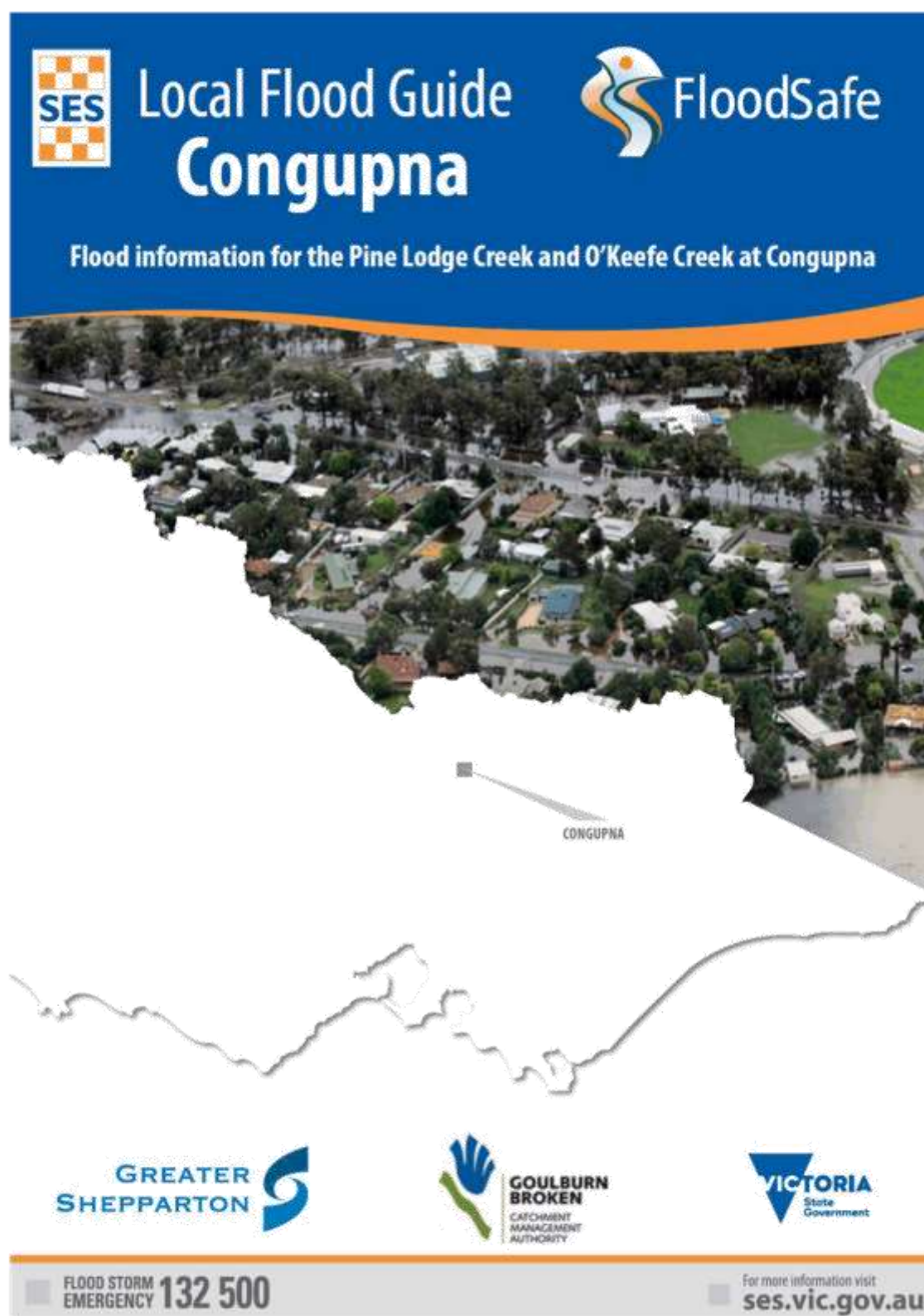
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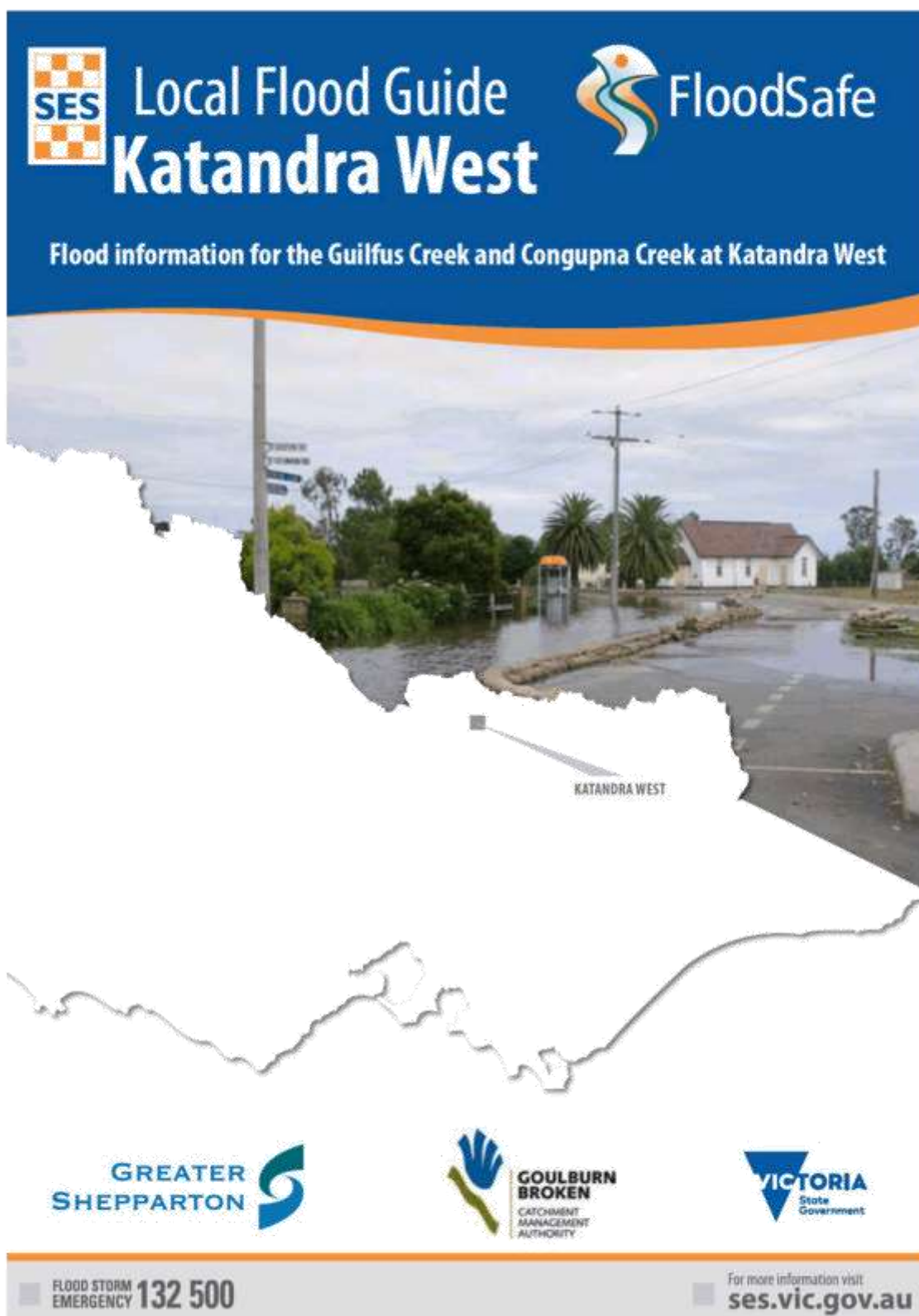




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APPENDIX G – LOCAL KNOWLEDGE ARRANGEMENTS

As control agency for flood in Victoria, VICSES is committed to ensuring the incorporation of local knowledge in decision making before, during and after incidents.

Information from community sources including but not limited to observations, historical information and information about current and possible consequences of an incident may be utilised to help inform the process of incorporating local knowledge into decision making during an incident.

[Community observers, Local Information Officers (LIOs) and other agency networks identified in [this plan/xxx register] will help support this process.

LIOs provide a key communication interface to community observers and other sources of local knowledge.

For the **[Enter Location - Community/Municipality/River system]** community observers identified are:

Community Observer Name	Community Observer contact details	LIO Contact	Key Areas of local knowledge expertise
[Enter Name]	[Enter contact details]	[Enter name of LIO key point of contact]	[Enter key areas of local knowledge expertise that is consistent with the Local Knowledge Policy arrangements]
[Enter Name]	[Enter contact details]	[Enter name of LIO key point of contact]	[Enter key areas of local knowledge expertise that is consistent with the Local Knowledge Policy arrangements]

For the **[Enter VICSES unit location]** the Local Information Officer identified is:

LIO Name	LIO contact details	Community Observer contacts
[Enter Name]	[Enter contact details]	[Enter names of Community observer and other key local knowledge points of contact]

For the **[Enter Location - Community/Municipality/River system]** other agency networks identified are:

- **[Enter other relevant agency network details including the capability and management of these networks and the contact details if appropriate]**

Important Notes:

These arrangements do not permit community observers and existing agency networks any responsibility for operational decisions and do not permit community observers and existing agency networks to direct operational activity, including the management of flood levees.

Information provided from sources of local knowledge must be processed and validated before it can become intelligence to inform decision making.

APPENDIX H – MAPS

Maps are provided, detailing likely affected areas including roads, emergency relief centres etc.



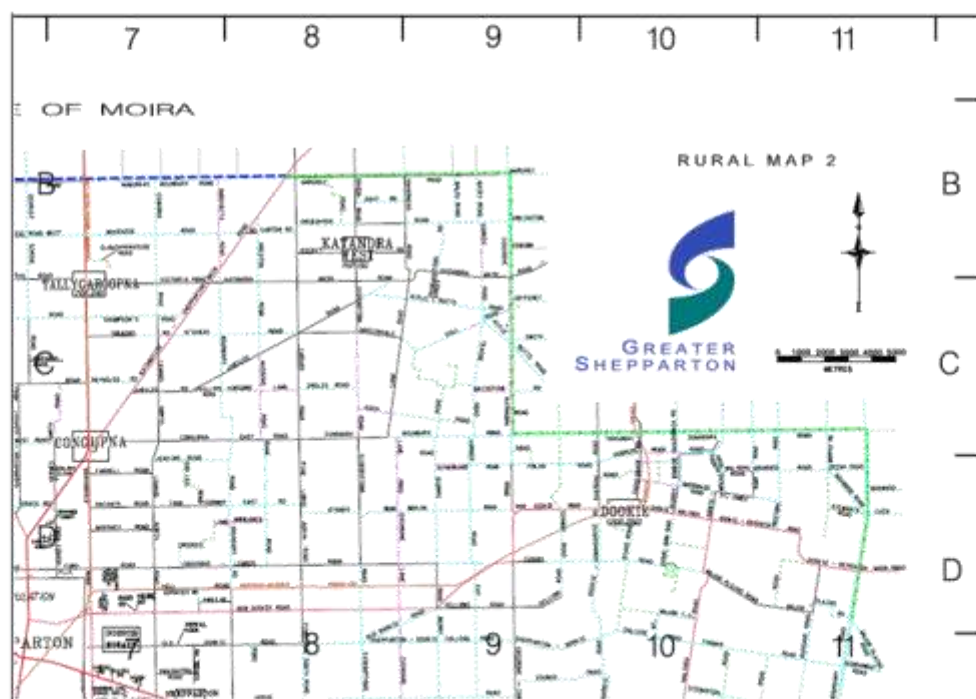
Catchment



Catchment with Roads and other waterways

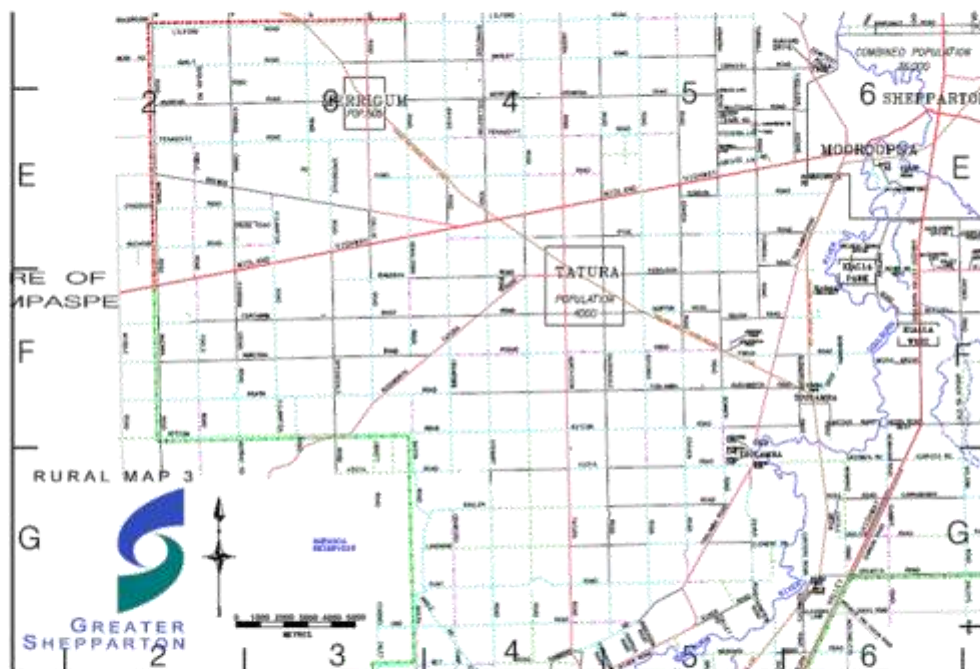
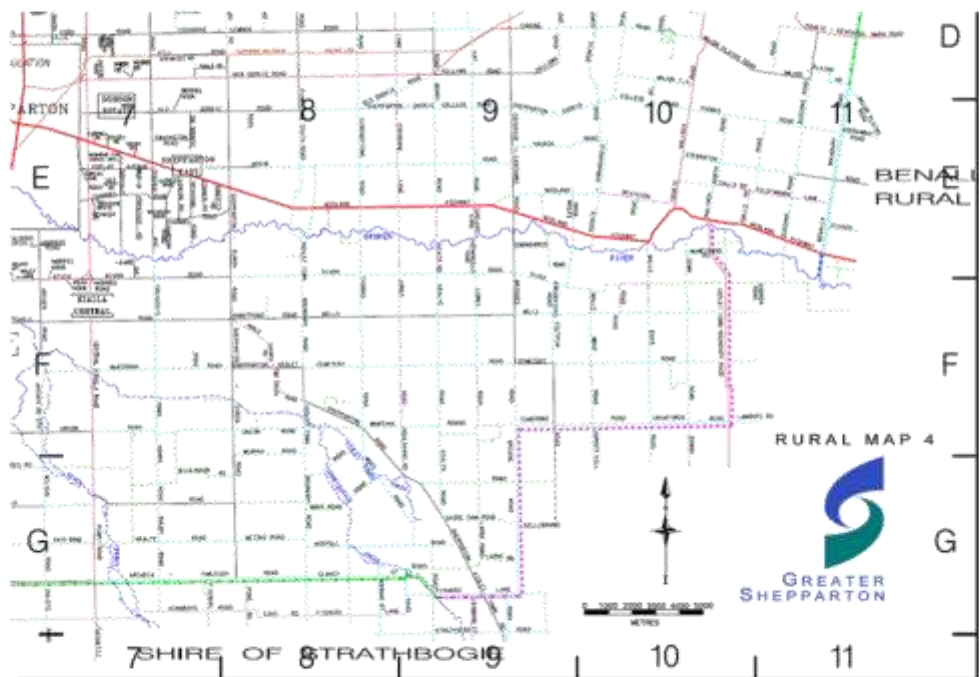
Greater Shepparton City Council Flood Emergency Plan – A Sub-Plan of the MEMP

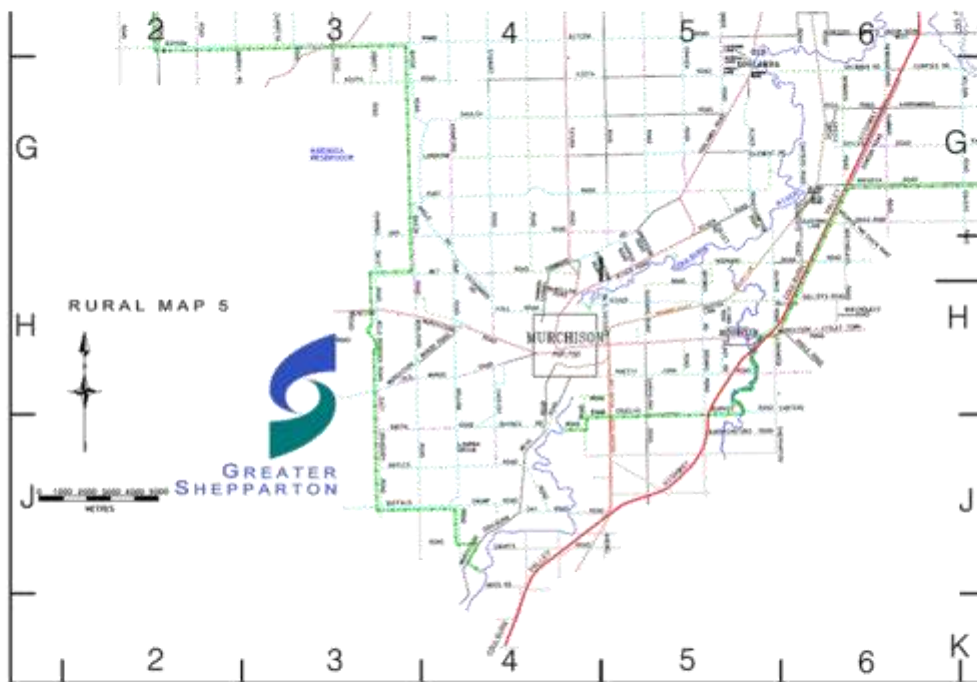
- 144 -

Rural map 1 - Merrigum, Undera, Bunbartha**Rural map 2 - Congupna, Tallygaroopna, Katandra, Dookie**

Greater Shepparton City Council Flood Emergency Plan – A Sub-Plan of the MEMP

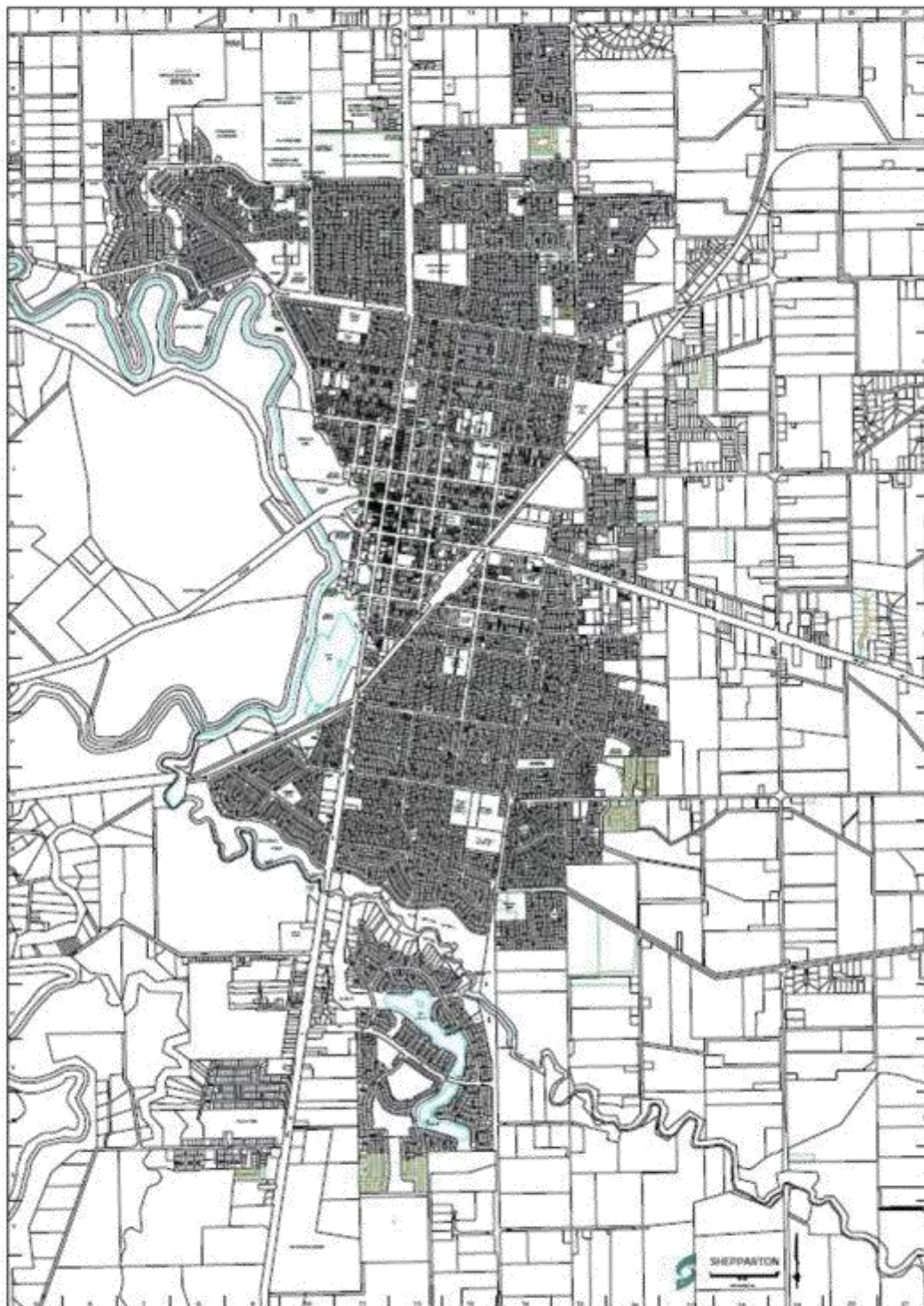
- 145 -

Rural map 3 - Merrigum, Tatura, Kialla Park, Kialla West, Toolamba, Old Toolamba**Rural map 4 - Kialla Central, Shepparton East**

Rural map 5 - Murchison, Old Toolamba, Moorilim**Rural map 6 - Arcadia Downs Estate**

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Shepparton

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The Shepparton Mooroopna Flood Mapping and Flood Intelligence project (Water Technology, 2017) produced a suite of flood maps for each flow dominance scenario (e.g. Goulburn River dominant, Broken River/Seven Creeks dominant, and a neutral or no dominance scenario) that include maximum depth, velocity, water surface and flood hazard, similar to the one above. The suite comprises mapping for seventeen (17) different heights at the Goulburn River at Shepparton gauge. The approximate gauge heights are 9.5 (minor flood level), 9.7, 9.9, 10.1, 10.5, 10.7 (moderate flood level), 10.9, 11.0 (major flood level), 11.1, 11.3, 11.5, 11.7, 11.9, 12.1, 12.2, 12.3 and 12.5 m. There are a total of 204 maps.

All of the flood maps (and reports) are available through FloodZoom.

Further, a deliverable from the study was a web-based flood and property information portal for community use. The portal enables flood maps for the various dominance scenarios (e.g. neutral, Goulburn River dominant, Broken-Sevens dominant) to be displayed as well as flood related information for a user-specified property. That information is presented as a report that includes all available flood information for that property.

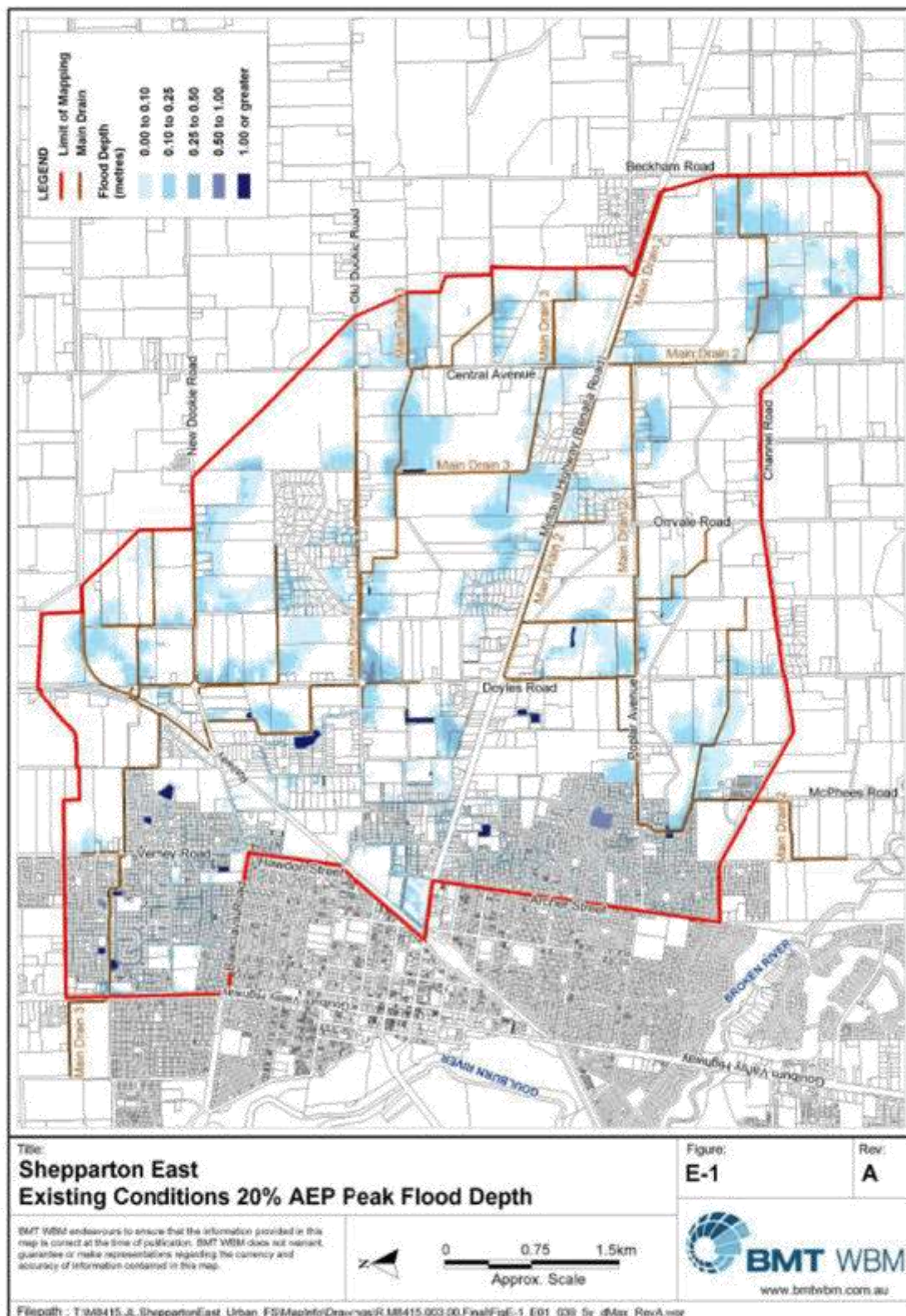
The maps and reports provide a means for community members to inform themselves of the likelihood of their property being inundated and the likely depths of inundation for a range of levels at the Shepparton gauge.

The web-based flood and property information portal can be accessed at <http://www.floodreport.com.au/>

The full range of flood inundation maps for the Shepparton area are kept electronically on Greater Shepparton City Council's Crisisworks and the VICSES G drive: G:\Data\AAA North East Operations\Flood Management\Flood Intelligence and Planning\Shepparton-Mooroopna

Flood mapping is also available through FloodZoom (this will be uploaded on completion of the study).

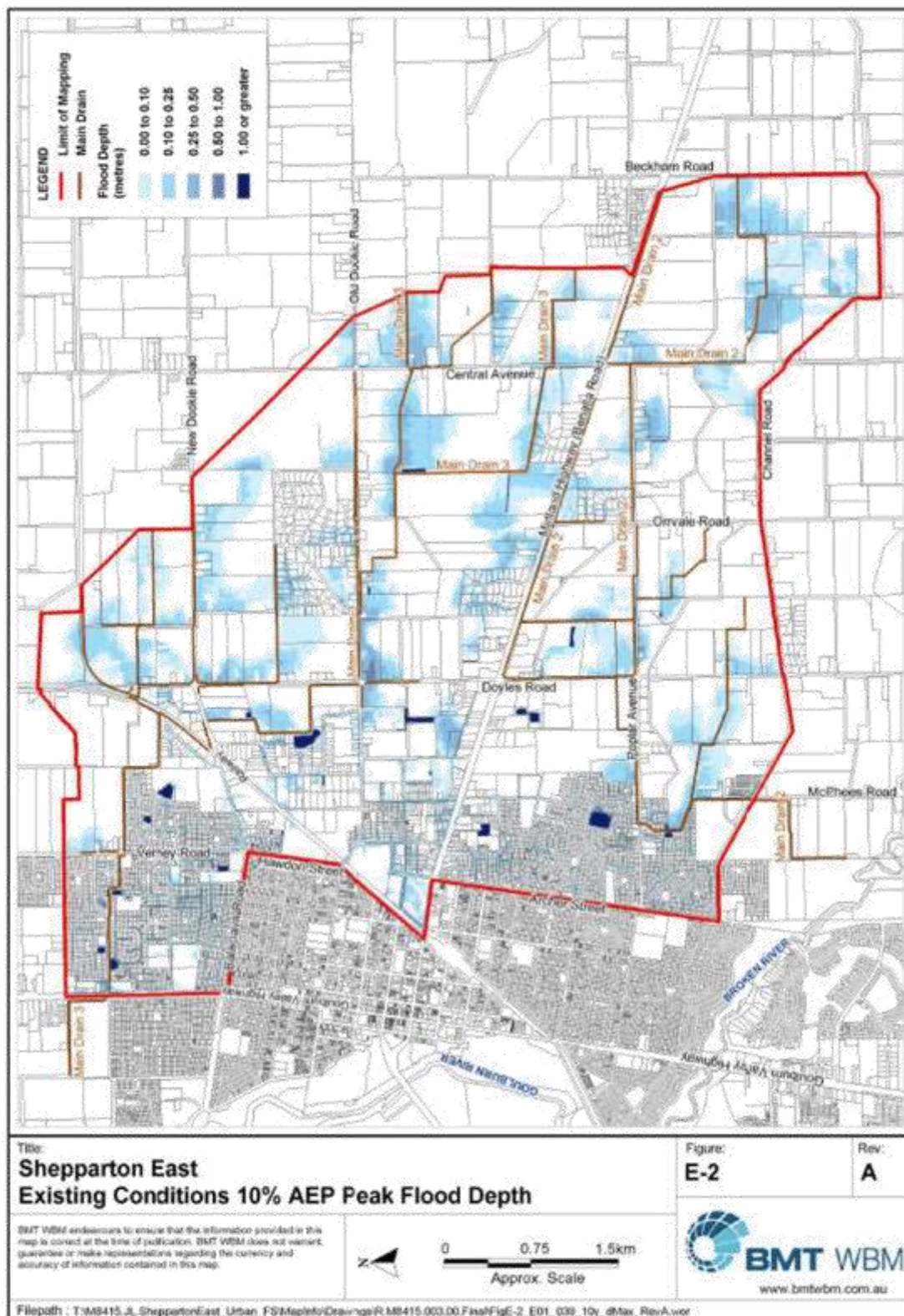
Local Flood Guides are available for all residents within the City of Greater Shepparton to assist them in preparing for future flood events. Refer to Appendix F for a sample.



East Shepparton – 20% AEP peak flood depths

Greater Shepparton City Council Flood Emergency Plan – A Sub-Plan of the MEMP

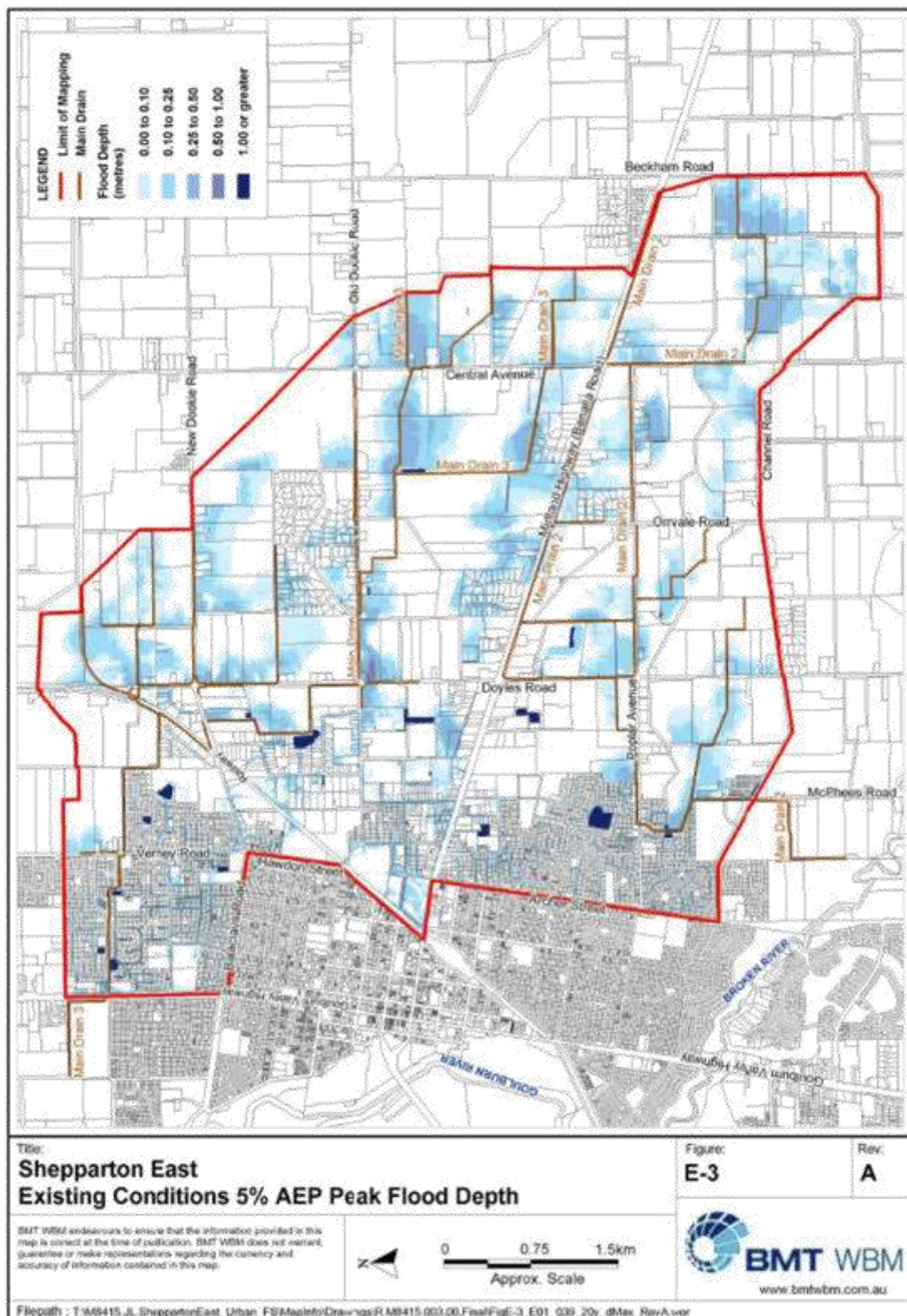
- 150 -



East Shepparton – 10% AEP peak flood depths

Greater Shepparton City Council Flood Emergency Plan – A Sub-Plan of the MEMP

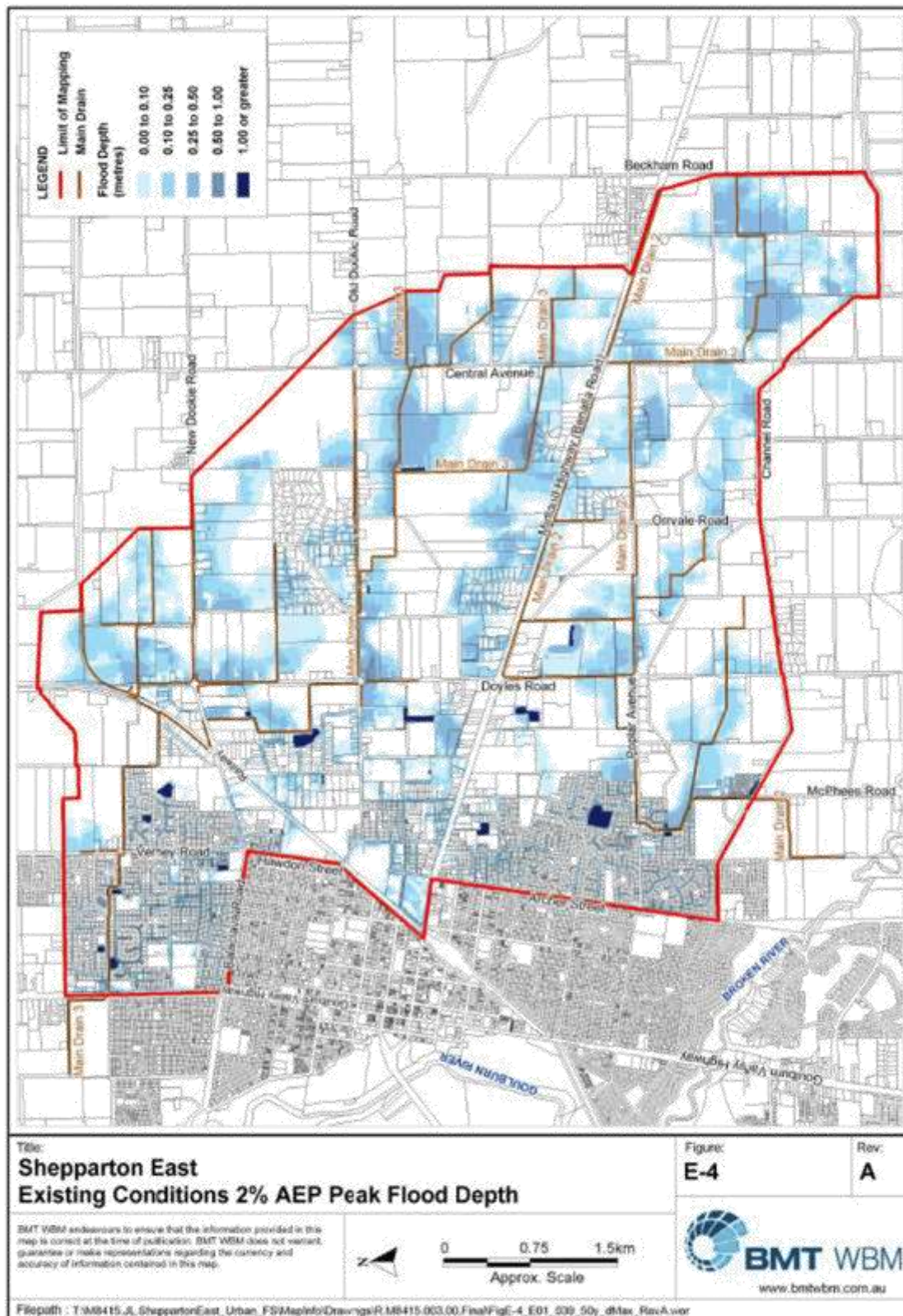
- 151 -



East Shepparton – 5% AEP peak flood depths

Greater Shepparton City Council Flood Emergency Plan – A Sub-Plan of the MEMP

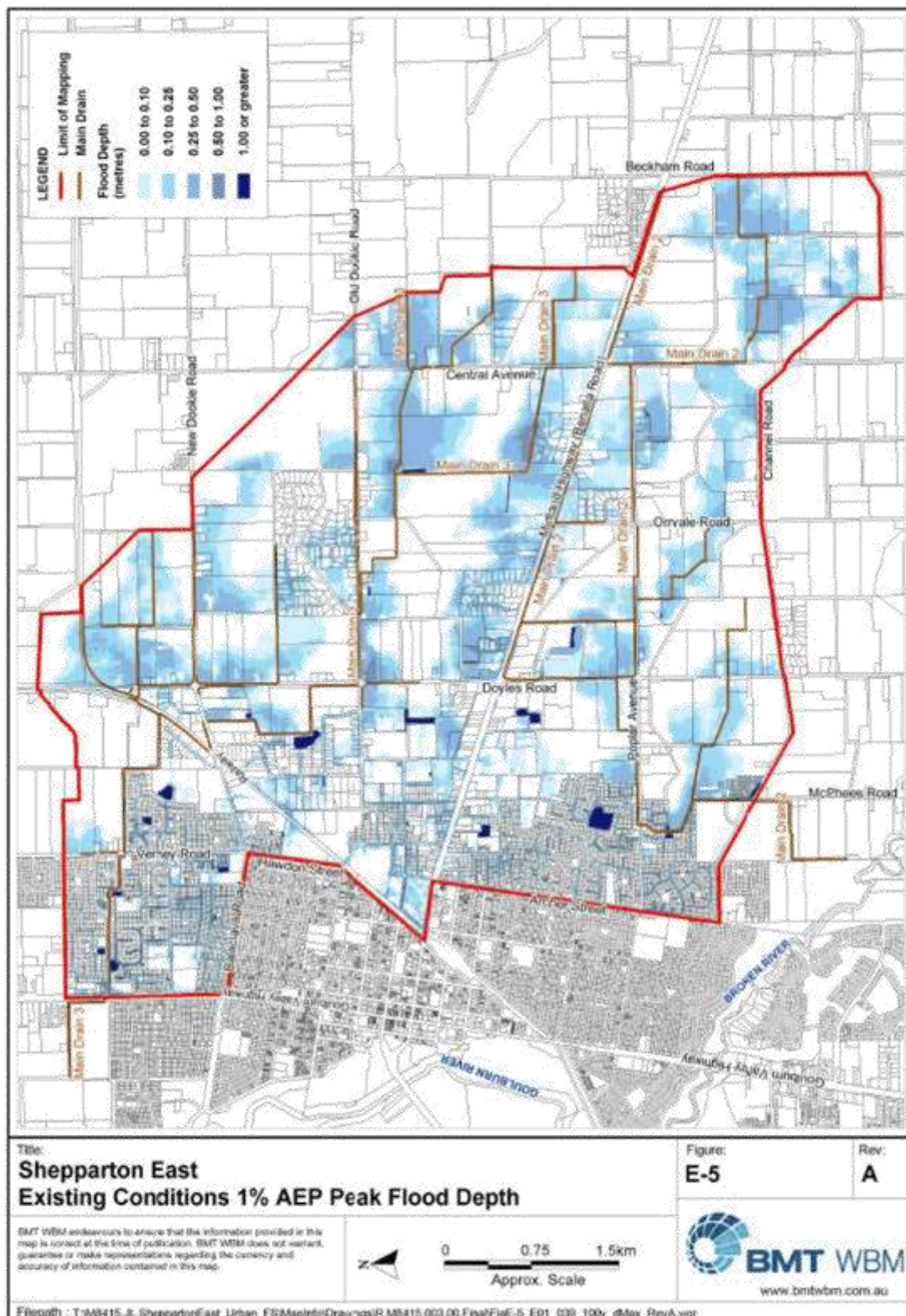
- 152 -



East Shepparton – 2% AEP peak flood depths

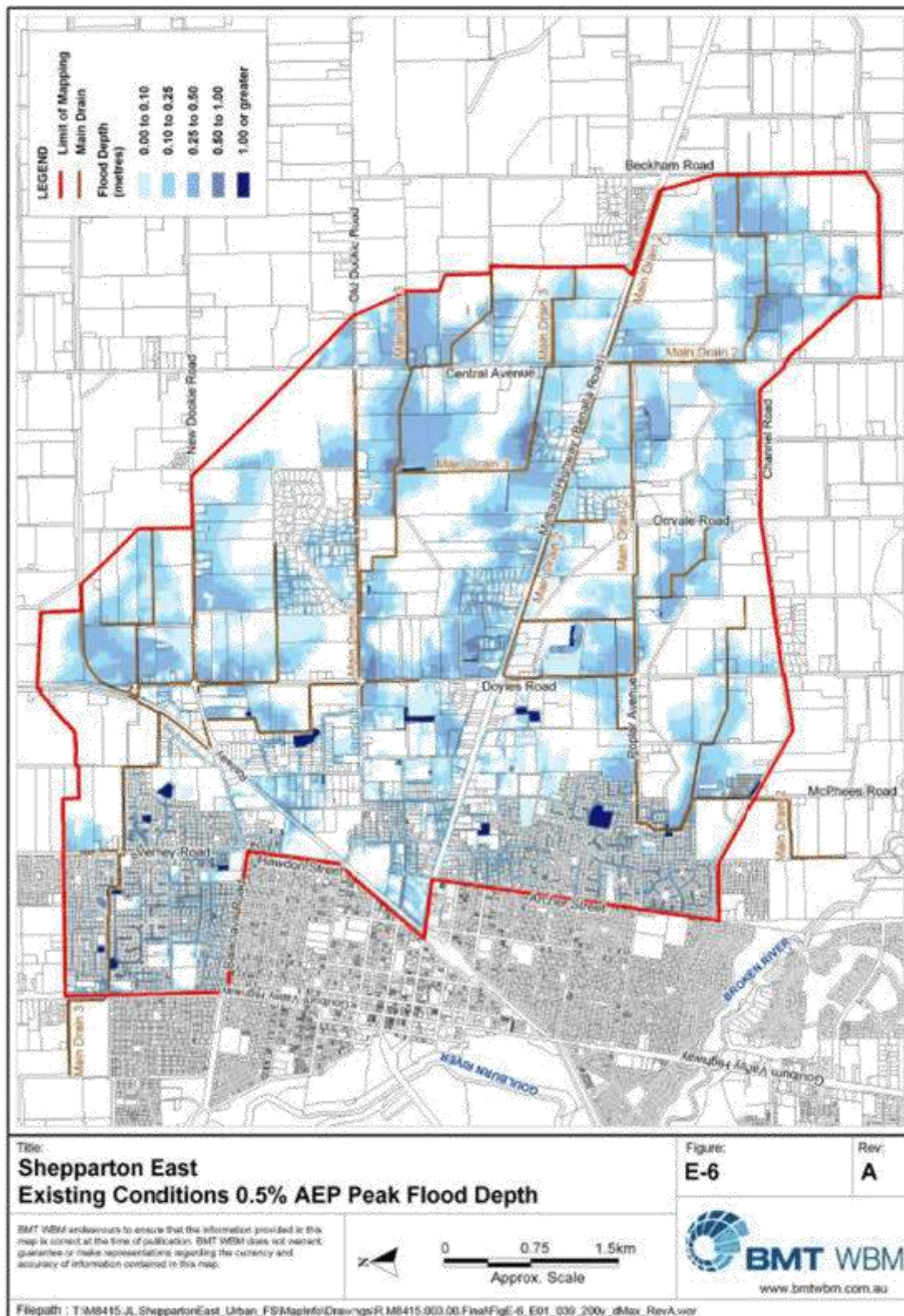
Greater Shepparton City Council Flood Emergency Plan – A Sub-Plan of the MEMP

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East Shepparton – 1% AEP peak flood depths

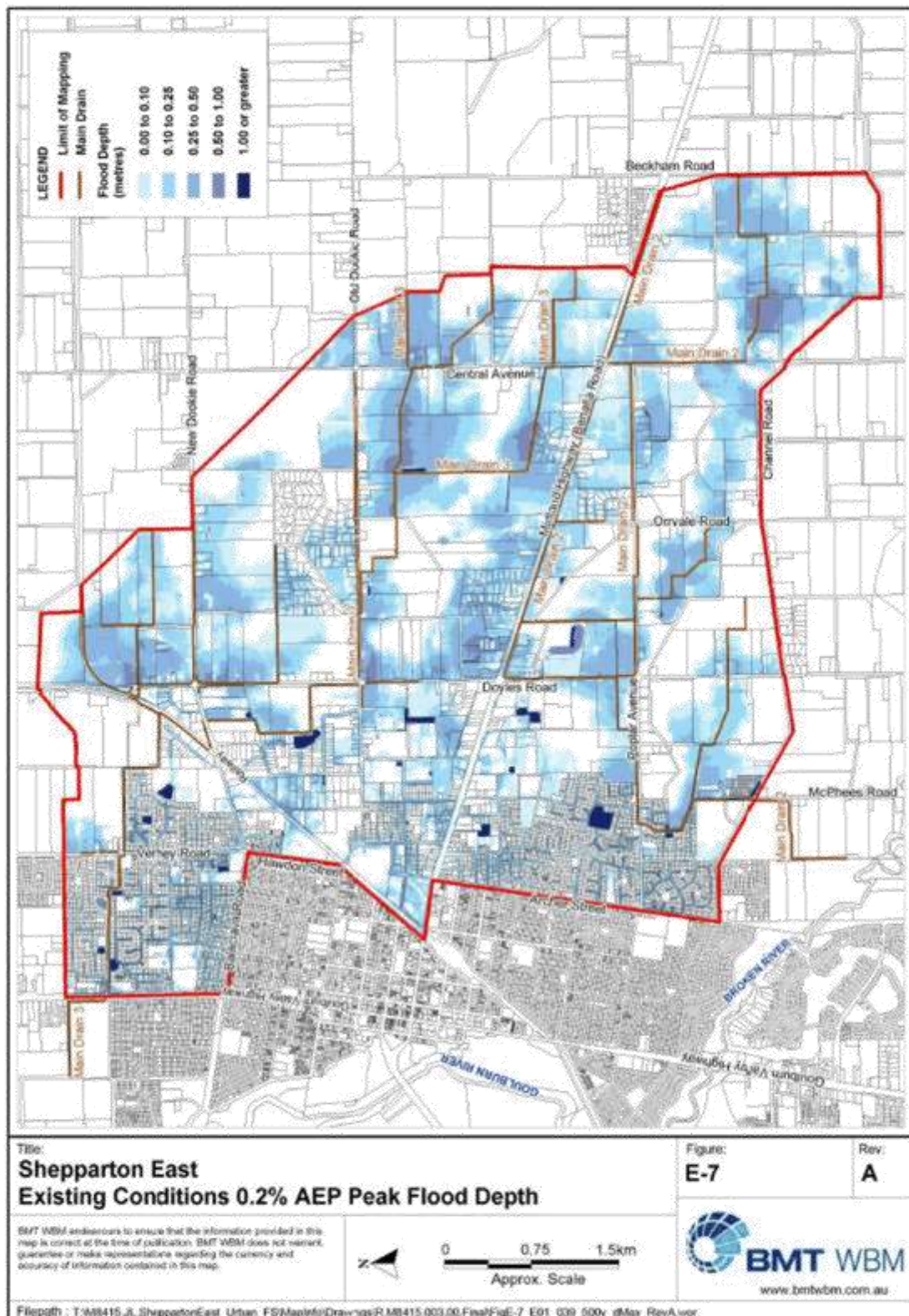
Greater Shepparton City Council Flood Emergency Plan – A Sub-Plan of the MEMP



East Shepparton – 0.5% AEP peak flood depths

Greater Shepparton City Council Flood Emergency Plan – A Sub-Plan of the MEMP

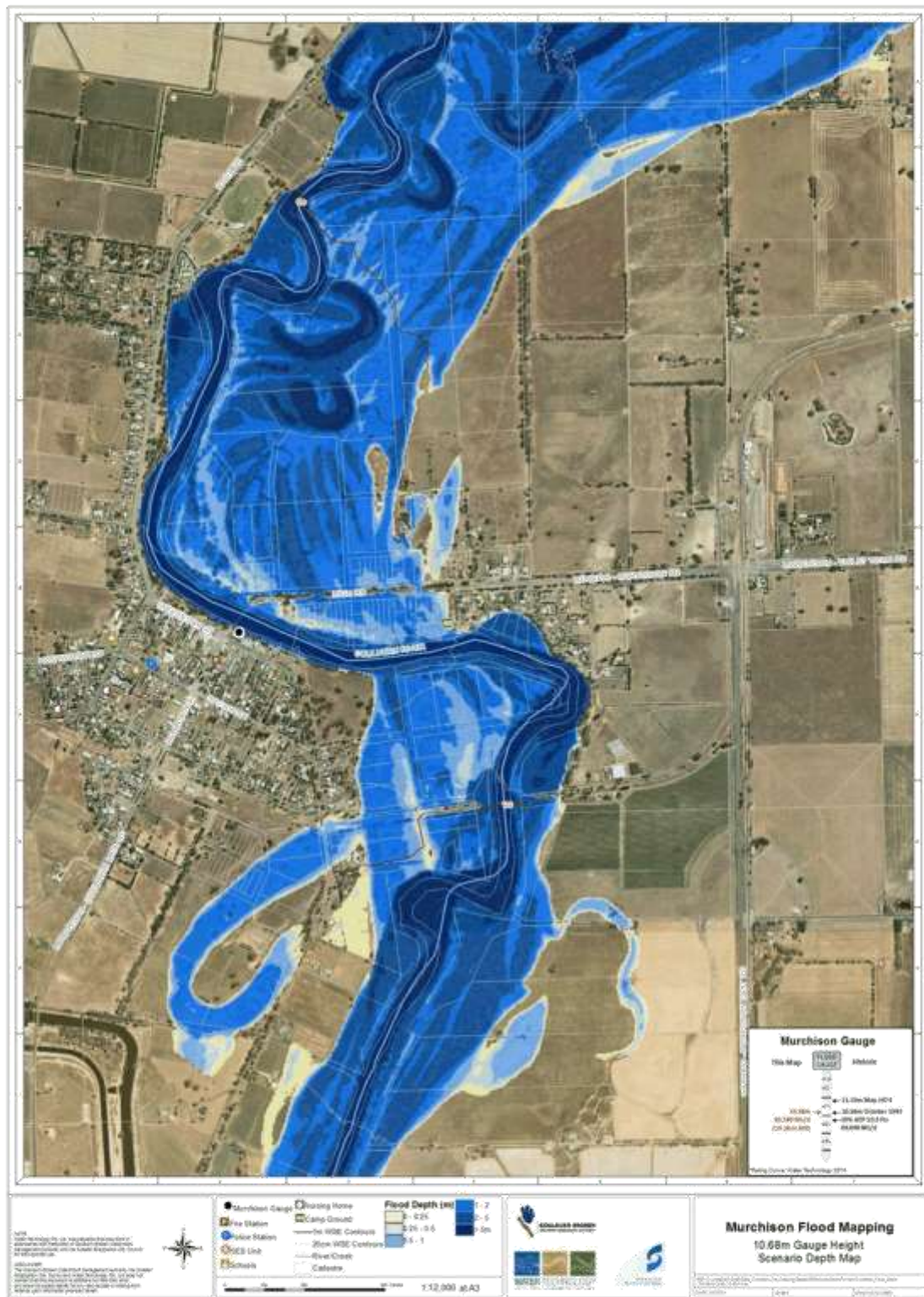
- 155 -



East Shepparton – 0.2% AEP peak flood depths

Greater Shepparton City Council Flood Emergency Plan – A Sub-Plan of the MEMP

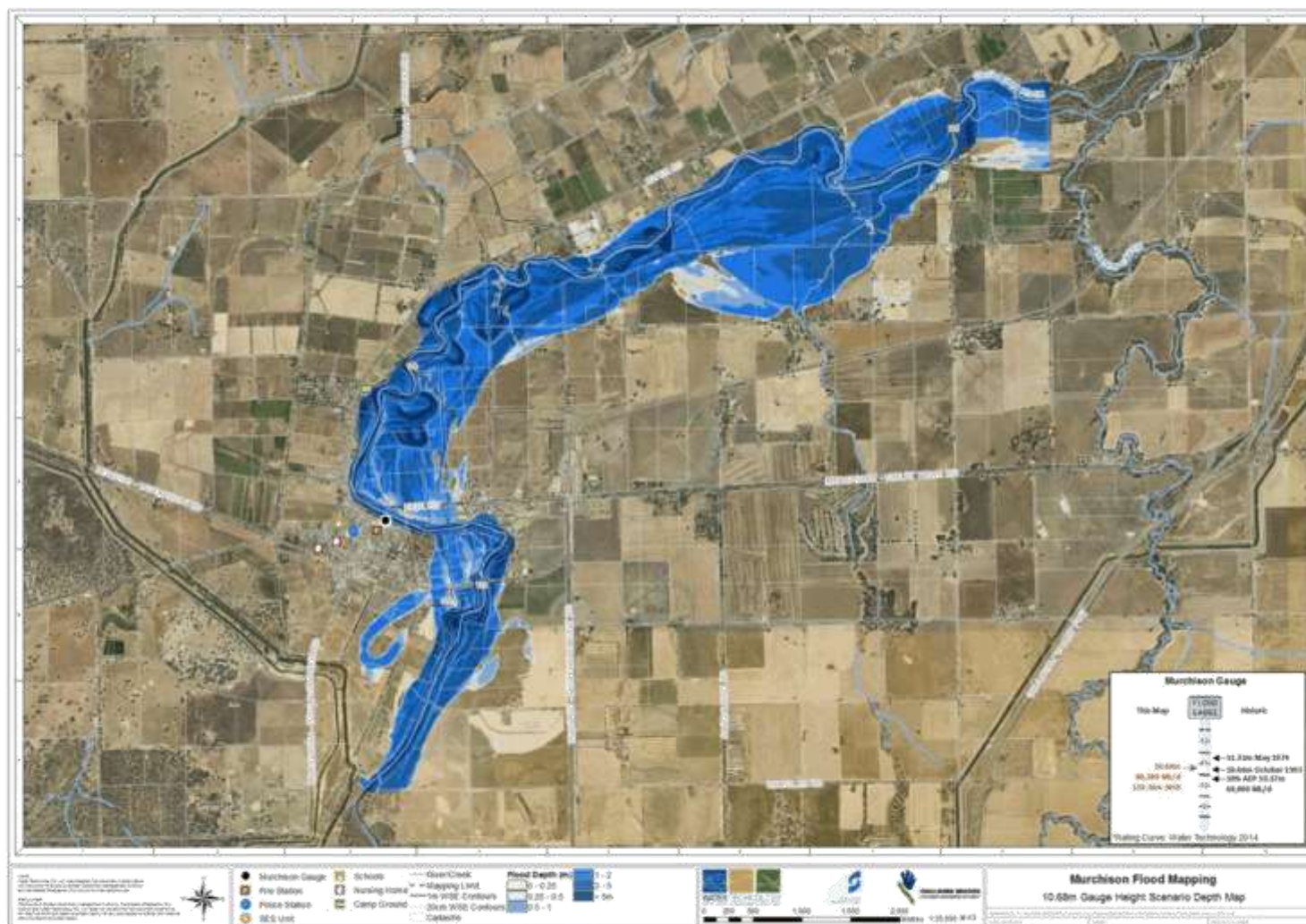
- 156 -



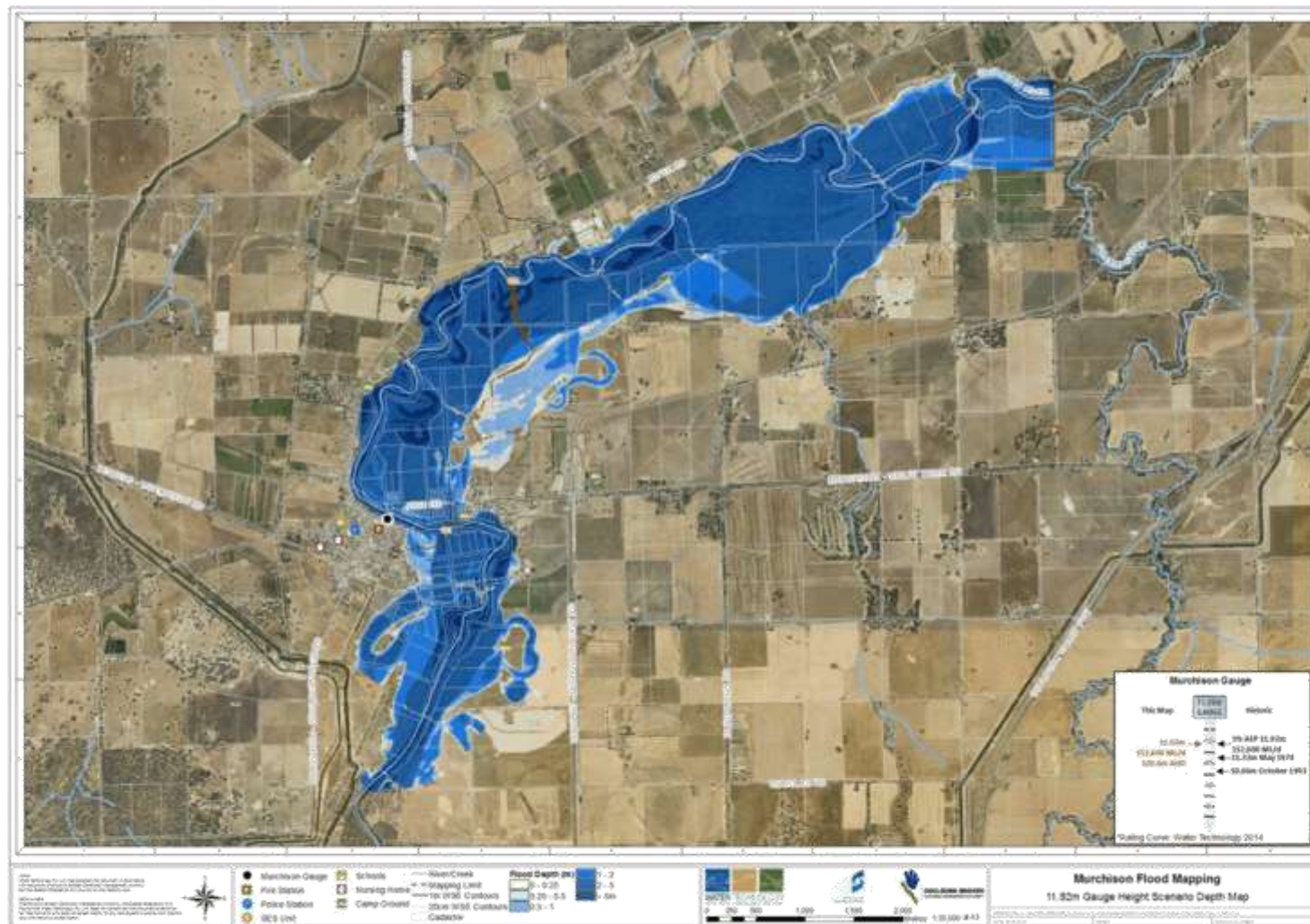
Murchison Township Map 3 – Major Flood Event

Greater Shepparton City Council Flood Emergency Plan – A Sub-Plan of the MEMP

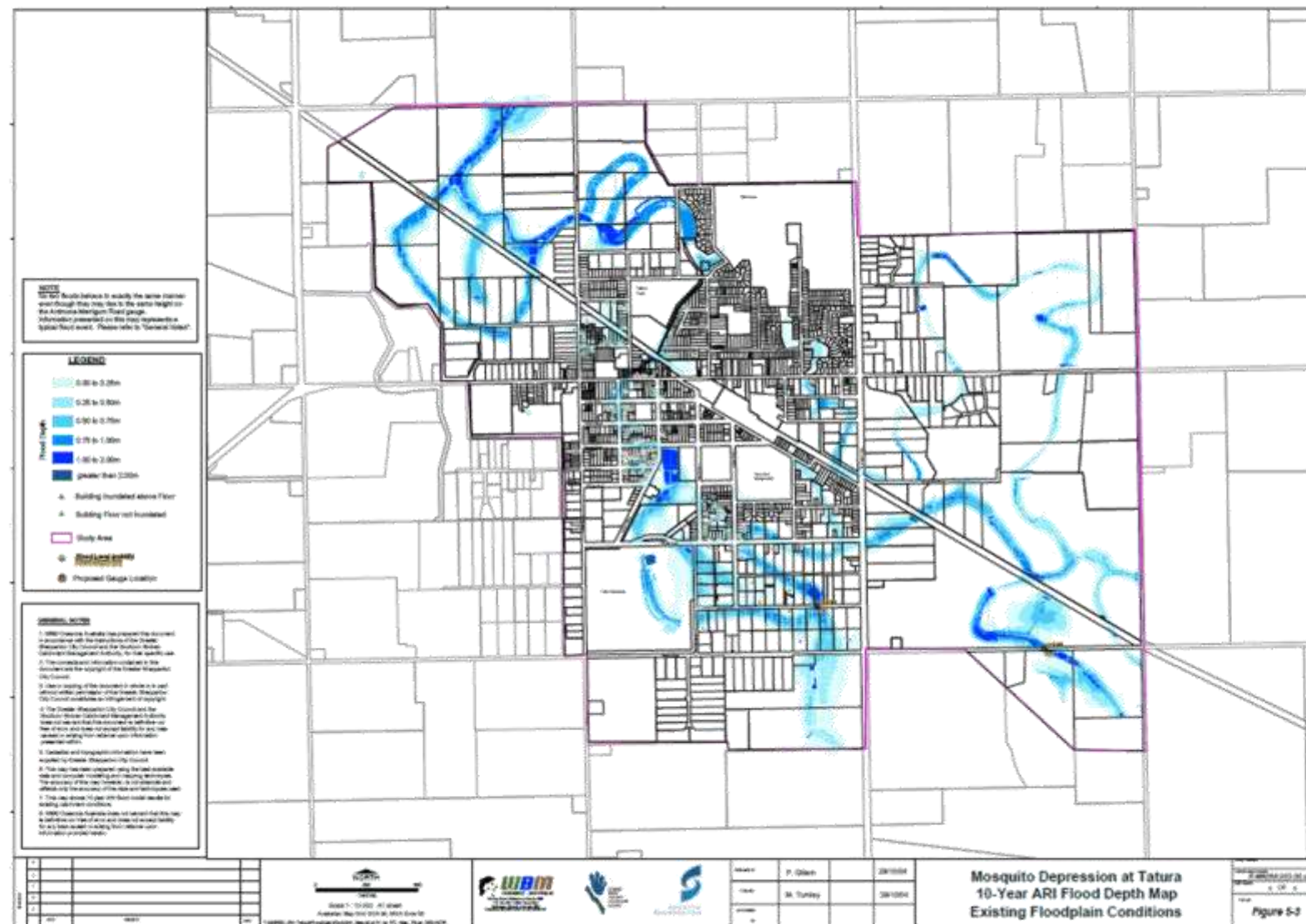
- 157 -



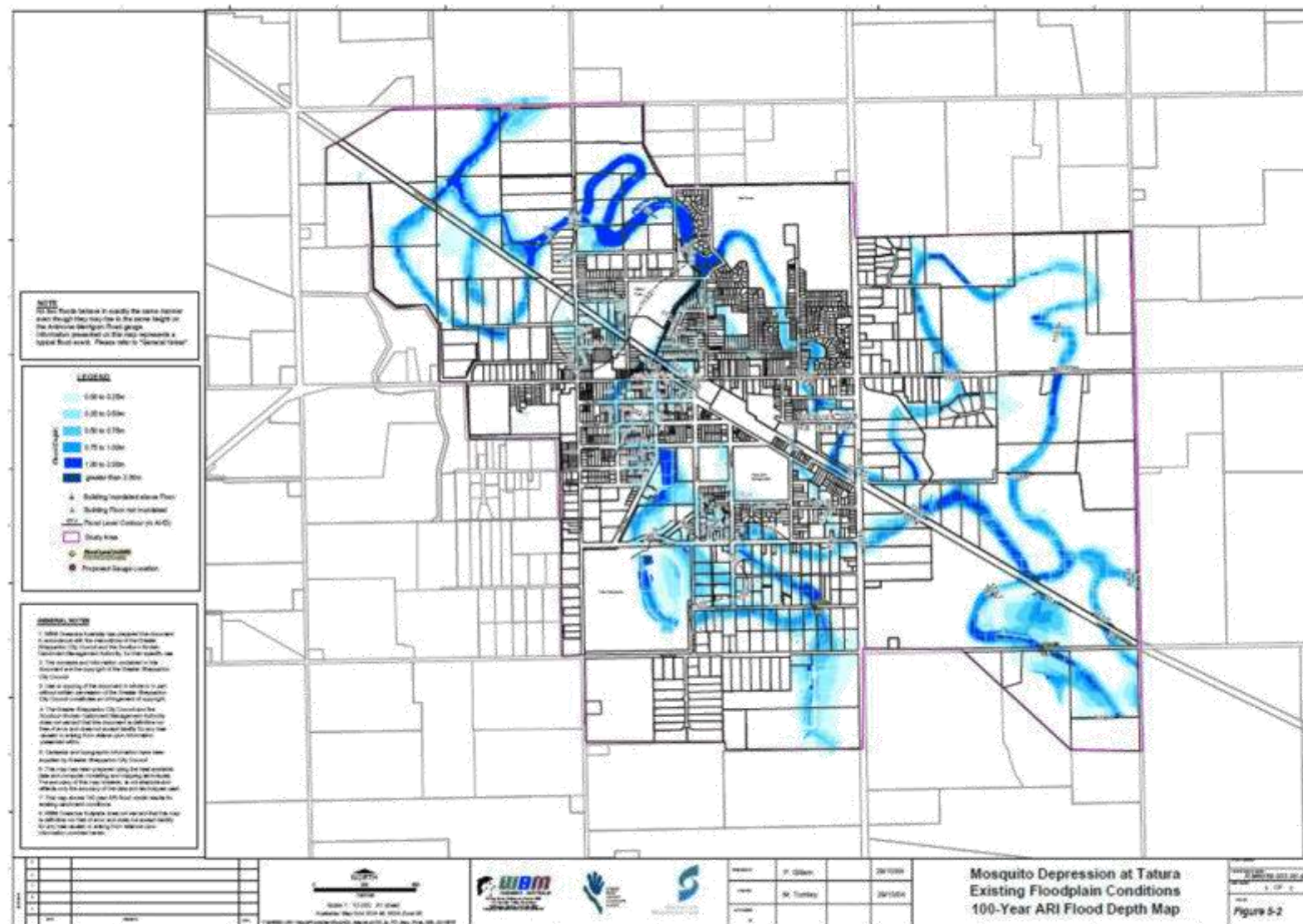
Murchison Rural Map 1 – Major Flood Event



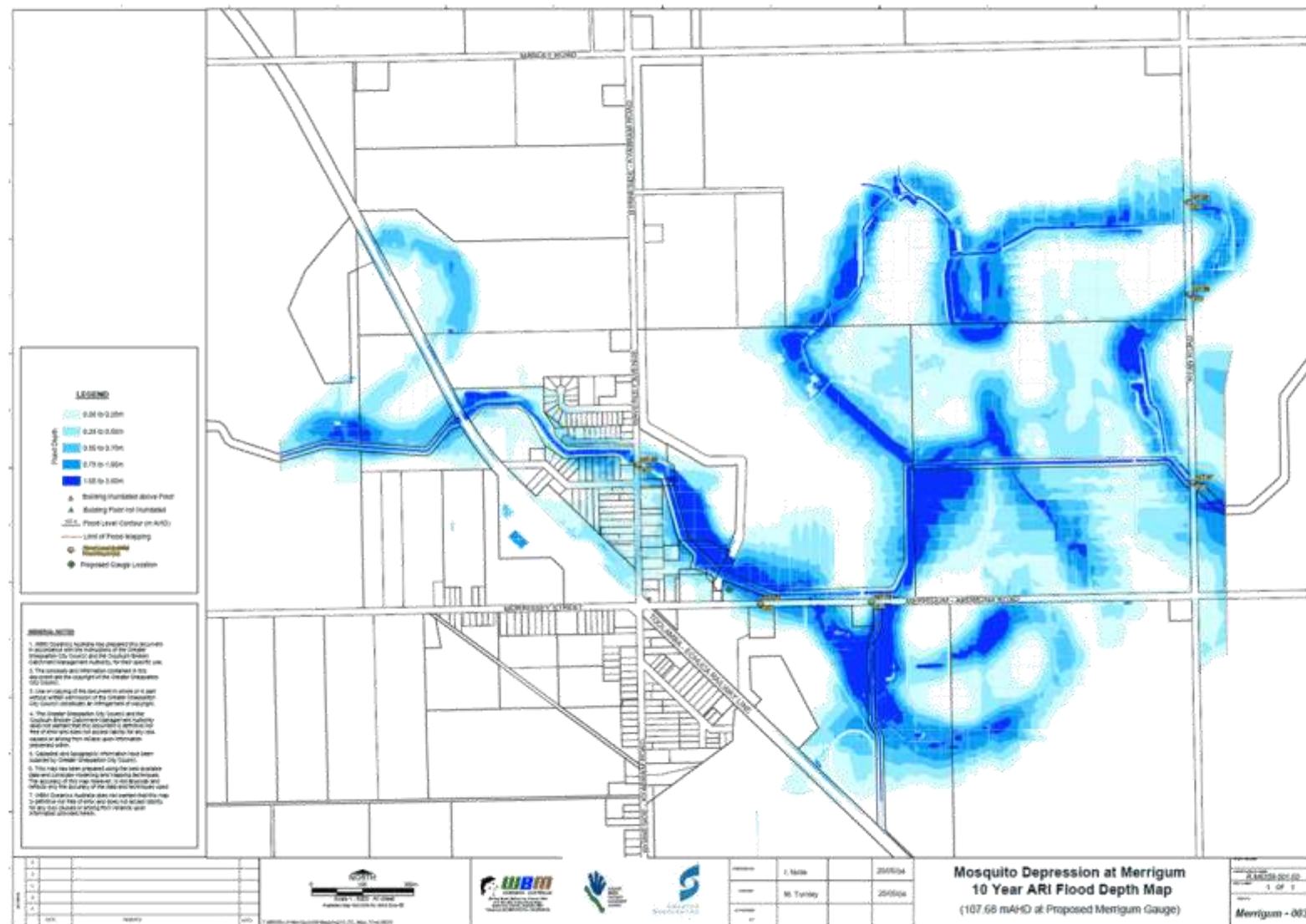
Murchison Rural Map 2 – 1% AEP Flood Event



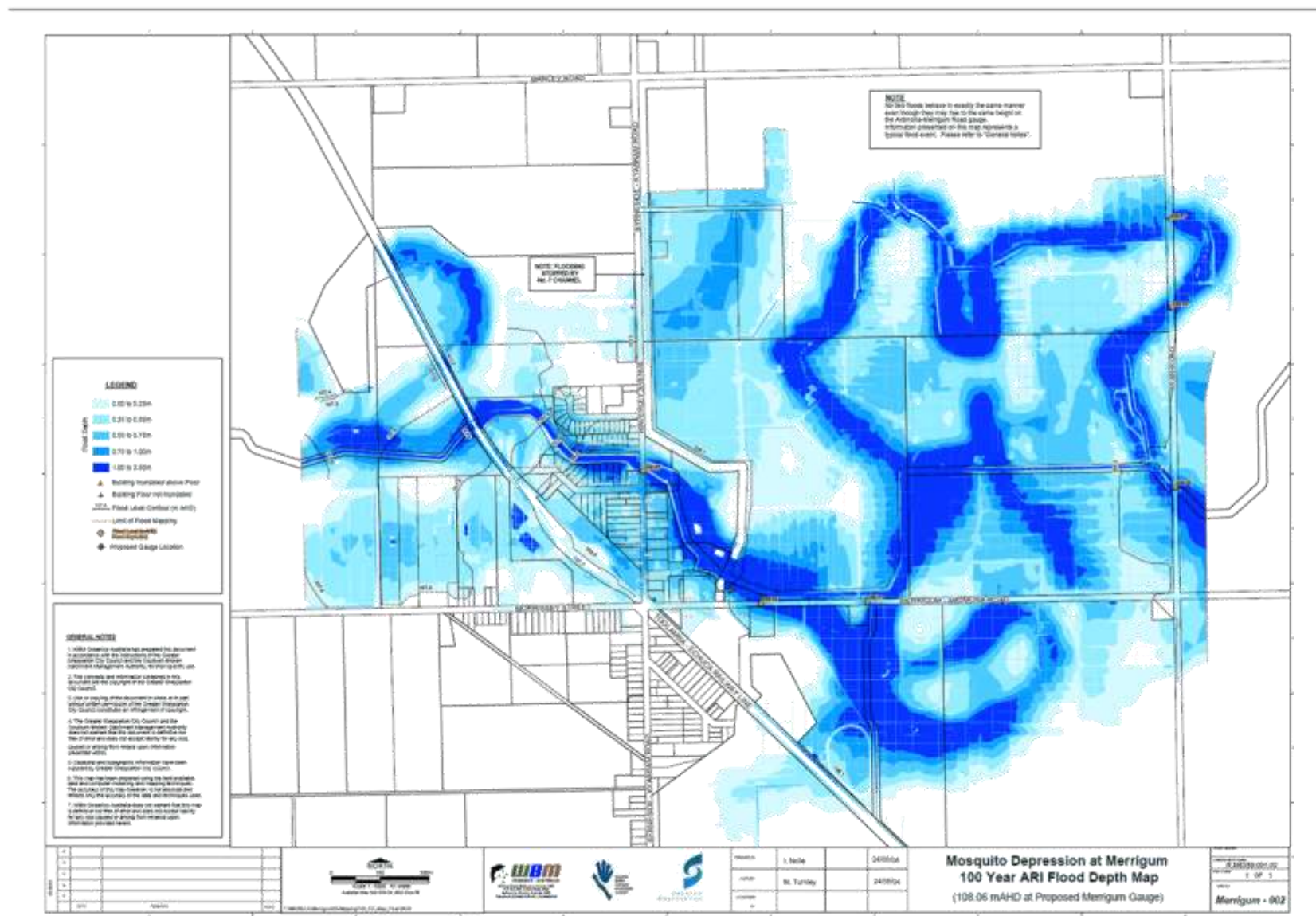
Greater Shepparton City Council Flood Emergency Plan – A Sub-Plan of the MEMP



Greater Shepparton City Council Flood Emergency Plan – A Sub-Plan of the MEMP



Greater Shepparton City Council Flood Emergency Plan – A Sub-Plan of the MEMP



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APPENDIX I – STAFF GAUGES ON THE CREEKS

A number of staff gauges (flood markers) have been installed along Congupna, Dainton's, Pine Lodge, O'Keefe and Guilfus creeks as shown on the following maps.



Greater Shepparton City Council Flood Emergency Plan – A Sub-Plan of the MEMP

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CONGUPNA CREEK

NEW DOOKIE ROAD, 0.3km WEST OF KELLOWS ROAD



	Gauge Reading	Benalla Gauge
October 1993	2.065	5.500
September 2010	1.536	4.430
March 2012	1.646	Not applicable

- Water will peak at this gauge approximately 41 hours after peaking in Benalla
- Road will be first covered 15m west of the bridge at 1.900m on the gauge

CONGUPNA CREEK

TUNGAMAH-BOUNDARY ROAD 0.2km EAST OF SIDEBOTTOM ROAD



	Gauge Reading	Benalla Gauge
October 1993	2.938	5.500
September 2010	2.409	4.430
March 2012	2.519	Not applicable
<ul style="list-style-type: none"> Water will peak at this gauge approximately 53 hours after peaking in Benalla Road will be first covered at 2.074m on the gauge 		
Greg Howard	340 Tungamah Boundary Road	5828 8353 0428 387462

Greater Shepparton City Council Flood Emergency Plan – A Sub-Plan of the MEMP

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CONGUPNA CREEK

KATAMATITE-SHEPPARTON ROAD 0.3km SOUTH OF THOMPSONS ROAD



	Gauge Reading	Benalla Gauge
October 1993	2.585	5.500
September 2010	2.176	4.430
March 2012	2.235	Not applicable

- Water will peak at this gauge approximately 77 hours after peaking in Benalla
- Road will be first covered 20m north of the bridge at 2.125m on the gauge

Pegasus Lodge Stud (Sarah)	Katamatite-Shepparton Road	0431 987535
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Greater Shepparton City Council Flood Emergency Plan – A Sub-Plan of the MEMP

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DAINTONS CREEK

NEW DOOKIE ROAD 0.3km EAST OF SIDEBOTTOM ROAD



	Gauge Reading	Benalla Gauge
October 1993	1.855	5.500
September 2010	1.326	4.430
March 2012	1.436	Not applicable
<ul style="list-style-type: none"> • Water will peak at this gauge approximately 43 hours after peaking in Benalla • Road will be first covered at 1.850m on the gauge 		
Ron & Sandra Anstee	1340 New Dookie Road	5828 8227

Greater Shepparton City Council Flood Emergency Plan – A Sub-Plan of the MEMP

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DAINTONS CREEK

CONGUPNA EAST ROAD 0.3km WEST OF HUDSON ROAD



	Gauge Reading	Benalla Gauge
October 1993	2.500	5.500
September 2010	2.109	4.430
March 2012	2.218	Not applicable

- Water will peak at this gauge approximately 59 hours after peaking in Benalla
- Road will be first covered at 1.995m on the gauge

Alan Reynolds	585 Congupna east Road	5829 9256
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Greater Shepparton City Council Flood Emergency Plan – A Sub-Plan of the MEMP

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PINE LODGE CREEK

NEW DOOKIE ROAD 0.6km EAST OF PINE LODGE NORTH ROAD (CHURCH)



	Gauge Reading	Benalla Gauge
October 1993	2.578	5.500
September 2010	1.838	4.430
March 2012	1.948	Not applicable
<ul style="list-style-type: none"> Water will peak at this gauge approximately 51 hours after peaking in Benalla Road will be first covered 20m west of bridge at 1.623m on the gauge 		
Grant Dainton	1110 New Dookie Road	5828 8311 (w)

Greater Shepparton City Council Flood Emergency Plan – A Sub-Plan of the MEMP

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PINE LODGE CREEK

LEMNOS NORTH ROAD 0.2km NORTH OF CONGUPNA EAST ROAD



	Gauge Reading	Benalla Gauge
October 1993	2.358	5.500
September 2010	1.965	4.430
March 2012	2.208	Not applicable

- Water will peak at this gauge approximately 72 hours after peaking in Benalla
- Road will be first covered at 2.283m on the gauge

John Edwards	765 Lemnos North Road	5829 9101	0459 299101
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Greater Shepparton City Council Flood Emergency Plan – A Sub-Plan of the MEMP

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PINE LODGE CREEK

KATAMATITE-SHEPPARTON ROAD 1.9km NORTH OF CONGUPNA EAST ROAD



	Gauge Reading	Benalla Gauge
October 1993	2.448	5.500
September 2010	2.050	4.430
March 2012	2.300	Not applicable
<ul style="list-style-type: none"> Water will peak at this gauge approximately 78 hours after peaking in Benalla Road will be first covered 30m south of the bridge at 2.328m on the gauge 		
Rob & Liz Grant	3390 Katamatite-Shepparton Road	5829 9206

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O'KEEFE CREEK

NEW DOOKIE ROAD 1.7km WEST OF PINE LODGE NORTH ROAD (CHURCH)



	Gauge Reading	Benalla Gauge
October 1993	2.340	5.500
September 2010	1.710	4.430
March 2012	1.820	Not applicable
<ul style="list-style-type: none"> Water will peak at this gauge approximately 55 hours after peaking in Benalla Road will be first covered at 2.078m on the gauge 		
Maree & Adrian Fitzsimmons	835 New Dookie Road	0418 358516

Greater Shepparton City Council Flood Emergency Plan – A Sub-Plan of the MEMP

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GUILFUS CREEK

KATANDRA MAIN ROAD 0.8km EAST OF BOUNDARY ROAD



	Gauge Reading	Benalla Gauge
October 1993	2.025	5.500
September 2010	1.495	4.430
March 2012	1.795	Not applicable

- Water will peak at this gauge approximately 80 hours after peaking in Benalla
- Road will be first covered 20m west of the bridge at 2.050m on the gauge

Henry Humphreys	Katandra Main Road	5829 8245	0428 298245
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Greater Shepparton City Council Flood Emergency Plan – A Sub-Plan of the MEMP

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APPENDIX J – REFERENCES AND INTEL SOURCES

The following studies may be useful in understanding the nature of flooding within the City of Greater Shepparton.

- **FLOODZOOM** – for all available flood extent, depth and related mapping, studies reports and MFEPs as well as cadastral and related information
- <http://planningschemes.dpcd.vic.gov.au/index.html> Department of Planning and Community Development for planning scheme flood maps
- <http://www.vicwaterdata.net/vicwaterdata/home.aspx> for historical data on water quality, river heights and flows
- <http://www.bom.gov.au> Bureau of Meteorology for river gauge readings and flood warnings
- <http://www.floodvictoria.vic.gov.au> for information on historic floods in Victoria
- <http://www.ses.vic.gov.au> Victoria State Emergency Service
- <http://www.ema.gov.au> Emergency Management in Australia
- <http://www.delwp.vic.gov.au/fire-and-other-emergencies> Department of Environment Land Water and Planning emergency management
- Cardno Lawson Treloar Pty Ltd (2008): *Lake Nillahcootie Flood Study*. Benalla Rural City, December 2008
- COUNCIL and VICSES Geographical Information System (GIS) – these contain layers showing drainage assets, flooding extents, flood related call-out locations, roads, title boundaries and other useful information.
- Goulburn-Broken Catchment Management Authority (2012). *Goulburn-Broken Basin Flood Summary Report: September 2010 - December 2010 - January 2011*. Draft, September 2012
- Greg Sidebottom (2014). *Flood History: Congupna, Dainton's, Pine Lodge, O'Keefe and Guilfus Creeks*. A report to Greater Shepparton City Council, 27th February 2014
- HydroTechnology (1995). *Documentation and Review of the 1993 Victorian Floods, Volume 5 (Lower Goulburn)*. Department of Conservation and Natural Resources, Victoria, March 1995
- Nathan, R and Weinmann, E (1992). *Practical aspects of at-site and regional flood frequency analyses*. Transactions of the Institution of Engineers, Australia. Civil Engineering. Vol CE34, Issue 3
- Sinclair Knight & Partners Pty Ltd (SKP) (1982). *Shepparton – Mooroopna Flood Study*. Prepared for the for State Rivers and Water Supply Commission of Victoria, the City of Shepparton, the Shire of Rodney and the Department of National Development and Energy, June 1982
- Sinclair Knight Merz (SKM) (2002). *Shepparton Mooroopna Floodplain Management Study*. Prepared for the Greater Shepparton City Council, October 2002
- State Rivers and Water Supply Commission Victoria (SRWSC) (1981). *Lake Eildon: Effect on Flood Frequencies*. August 1981
- VICSES, (2013). *Remembering the 1993 Floods*. <http://www.ses.vic.gov.au/media/news/news-items/remembering-the-1993-floods>, accessed June 2015
- Water Technology (2014). *Murchison Flood Mapping Study Report*. May 2014
- Water Technology (2017). *Shepparton Mooroopna: Flood Mapping and Flood Intelligence*. April 2017
- Water Technology (in preparation). *Granite Creeks Regional Flood Mapping*. Prepared for the Department of Environment, Land, Water and Planning
- WBM (2005). *Merrigum Flood Study – Final Report*. September 2005

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- WBM (2006). *Tatura Floodplain Management Plan*. January 2006
 - BMT WBM (2017). *Shepparton East Overland Flow Urban Flood Study – Final Report*. March 2017



10. SUSTAINABLE DEVELOPMENT DIRECTORATE

10.6 Draft Shepparton Mooroopna Flood Mapping and Flood Intelligence Project 2018 and Draft Greater Shepparton City Council Municipal Flood Emergency Plan 2018

Disclosures of conflicts of interest in relation to advice provided in this report
Under section 80C of the *Local Government Act 1989* officers and persons engaged under a contract providing advice to Council must disclose any conflicts of interests, including the type and nature of interest.

No Council officers or contractors who have provided advice in relation to this report have declared a conflict of interest regarding the matter under consideration.

Council Officers involved in producing this report

Author: Acting Manager Environment

Proof reader(s): Team Leader Strategic Planning,
Manager Building and Planning

Approved by: Director Sustainable Development

Other: Manager Environment and Principal Strategic Planner

Executive Summary

The purpose of this report is to request that Council endorse the draft *Shepparton Mooroopna Flood Intelligence and Flood Mapping Project Report* (Draft Report) and release it for public comment, see Attachment 1.

The Draft Report was funded by the Federal and State governments, and Council. It seeks to update the existing information on flood risk within the Shepparton-Mooroopna area. This involved detailed hydrology and hydraulic modelling of the Goulburn River, Seven Creeks and the Broken River for flood mapping, assessing flood risk and the treatment of flood risk.

The Draft Report is an important update of flood intelligence and mapping tools contained within the existing *Shepparton Mooroopna Floodplain Management Study: Floodplain Management Plan, October 2002*.

Preliminary consultation has been undertaken with internal Council Departments, as well as external relevant referral agencies, such as the Goulburn Broken Catchment Management Authority.

Furthermore, the report has been peer reviewed under the Department of Environment, Land, Water and Planning program and will be endorsed by the Goulburn Broken Catchment Management Authority.

In addition, the Draft *Greater Shepparton City Council Municipal Flood Emergency Plan 2018 (MFEP)* has been prepared, see Attachment 2. The purpose of the MFEP is to detail arrangements agreed for the planning, preparedness/prevention, response and recovery from flood incidents within the City of Greater Shepparton.

Council officers recommend that the Draft Report and MFEP be released for public comment. Following consultation, Council officers will review all feedback, comments and submissions received. The final *Shepparton Mooroopna Flood Intelligence and Flood Mapping Project Report* and MFEP are expected to be further considered by Council in early-2019.



10. SUSTAINABLE DEVELOPMENT DIRECTORATE

10.6 Draft Shepparton Mooroopna Flood Mapping and Flood Intelligence Project 2018 and Draft Greater Shepparton City Council Municipal Flood Emergency Plan 2018 (continued)

RECOMMENDATION

That the Council:

1. endorse and release the draft *Shepparton Mooroopna Flood Intelligence and Flood Mapping Project Report July 2018* for public comment for a period of six weeks, commencing on 24 September 2018 and concluding on 7 November 2018;
2. note that Council officers will report on any feedback, comments and submissions received during the public consultation period prior to the consideration of a final *Shepparton Mooroopna Flood Intelligence and Flood Mapping Project Report*;
3. note and release the draft *Greater Shepparton City Council Municipal Flood Emergency Plan 2018* for public comment for a period of six weeks commencing on 24 September and concluding on 7 November 2018; and
4. note that Council officers will report on any feedback, comments and submissions received during the public consultation period prior to the consideration of a final *Greater Shepparton City Council Municipal Flood Emergency Plan*.

**Moved by Cr Sutton
Seconded by Cr Oroszvary**

That the Council:

1. release the draft *Shepparton Mooroopna Flood Intelligence and Flood Mapping Project Report July 2018* for public comment for a period of six weeks, commencing on 24 September 2018 and concluding on 7 November 2018;
2. note that Council officers will report on any feedback, comments and submissions received during the public consultation period prior to the consideration of a final *Shepparton Mooroopna Flood Intelligence and Flood Mapping Project Report*;
3. note and release the draft *Greater Shepparton City Council Municipal Flood Emergency Plan 2018* for public comment for a period of six weeks commencing on 24 September and concluding on 7 November 2018; and
4. note that Council officers will report on any feedback, comments and submissions received during the public consultation period prior to the consideration of a final *Greater Shepparton City Council Municipal Flood Emergency Plan*.

CARRIED.



10. SUSTAINABLE DEVELOPMENT DIRECTORATE

10.6 Draft Shepparton Mooroopna Flood Mapping and Flood Intelligence Project 2018 and Draft Greater Shepparton City Council Municipal Flood Emergency Plan 2018 (continued)

Background

The *Shepparton Mooroopna Floodplain Management Study: Floodplain Management Plan, October 2002* was prepared and implemented through the introduction of a Total Flood Warning System, Flood Warning Charter, and Amendment C23 to the Greater Shepparton Planning Scheme (Planning Scheme) in 2004. Amendment C23 updated the flood controls (Urban Floodway Zone, Floodway Overlay and Land Subject to Inundation Overlay) contained within the Planning Scheme.

Shepparton Mooroopna Floodplain Management Study: Floodplain Management Plan, October 2002

Following the Spring 1993 floods, a Scoping Study was prepared that identified the need for a comprehensive study for Shepparton-Mooroopna. In June 1999, Sinclair Knight Merz Pty Ltd was commissioned by the Greater Shepparton City Council (GSCC) to undertake a comprehensive floodplain management study for Shepparton-Mooroopna.

The main objective of the floodplain management plan was to minimise the economic and social impacts of flooding on the community. This was achieved by investigating the existing nature of flooding and investigating a range of flood mitigation measures.

The mitigation measures investigated included both structural (e.g. levees, floodways) and non-structural options (land use planning, emergency responses).

The study was developed in two stages, Stage 1 comprised of an investigating of flooding and determining of the likelihood and consequences for existing conditions and stage 2 comprised of an investigation of measures to reduce economic and social consequences from flooding.

Shepparton Mooroopna Flood Intelligence and Flood Mapping Project Report July 2018
In 2010, a flood of significance was observed allowing for additional data to be gathered on flood behaviour in the Shepparton and Mooroopna area. This event gave rise to the opportunity to update the *Shepparton Mooroopna Floodplain Management Study: Floodplain Management Plan, October 2002*. Significant advancements in hydrology and hydraulic computer modelling have also been made since this Study was prepared in 2002.

At the Ordinary Council Meeting held on 19 June 2012, Council resolved to engage Water Technology Pty Ltd to prepare the *Shepparton Mooroopna Flood Mapping and Flood Intelligence Project Report* (Contract No.1370) , see Attachment 1. The delay in finalising the Draft Report was as a result of the need for a flood study at Murchison to reconcile hydrologic data and to reach agreement between Water Technology Pty Ltd and the Goulburn Broken Catchment Management Authority (GBCMA) on the hydraulic model calibration of the 1974, 1993 and 2010 flood events, which included a substantial further modelling process for the Murchison area upstream of Shepparton.

**10. SUSTAINABLE DEVELOPMENT DIRECTORATE****10.6 Draft Shepparton Mooroopna Flood Mapping and Flood Intelligence Project 2018 and Draft Greater Shepparton City Council Municipal Flood Emergency Plan 2018 (continued)**

The Draft Report:

- collects and reviews data relevant to flooding within the study area;
- provides a rigorous hydrologic analysis to develop robust design flood estimates for the study area including consideration for the timing and potential combinations of Goulburn River, Broken River and Seven Creeks riverine flooding;
- develops and calibrates a detailed hydraulic model that can predict flood impacts across the complex floodplain;
- provides flood mapping of many potential design flood scenarios;
- develops an online flood mapping portal, www.floodreport.com.au;
- quantifies flood risk at a property specific level; and
- reviews flood warning and emergency response, and an update to the *Municipal Flood Emergency Plan*.

A description of each element of the report is set out below:

Study Area

The study area considered in the Draft Report is upstream of Shepparton to Toolamba, downstream of Shepparton to Loch Garry on the Goulburn River, upstream of Shepparton to Kialla East on the Broken River and upstream of Shepparton to Kialla West on Seven Creeks, see Figure One.



10. SUSTAINABLE DEVELOPMENT DIRECTORATE

10.6 Draft Shepparton Mooroopna Flood Mapping and Flood Intelligence Project 2018 and Draft Greater Shepparton City Council Municipal Flood Emergency Plan 2018 (continued)



Figure One: Study Area Extent.



10. SUSTAINABLE DEVELOPMENT DIRECTORATE

10.6 Draft Shepparton Mooroopna Flood Mapping and Flood Intelligence Project 2018 and Draft Greater Shepparton City Council Municipal Flood Emergency Plan 2018 (continued)

Hydrological Data

Streamflow data is required for the hydrological analysis. These streamflow gauging details include the period of continuous streamflow record for each gauge. The continuous period of record is the period of systematic recording of streamflow via a daily read staff gauge or a continuous recorder. For some streamflow gauges, records are available during flood events only.

During the calibration stage of the project, it was found that recent changes to rating tables applied back over the entire record of data at some gauge sites has significantly changed the peak flow record for some historic flood events. This has a significantly large impact on the results of any flood frequency analysis and resultant design flows for this study area.

Hydrogeology

Shepparton and Mooroopna are located on the floodplain of the Goulburn River, Broken River and Seven Creeks. The total catchment area of the Goulburn River at Shepparton is approximately 16,000 km² (2,525 km² in the Broken River catchment, 1,510 km² in the Seven Creeks/Honeysuckle Creek catchment, 800 km² in the Pranjip Creek catchment and 280 km² on the Castle Creek catchment).

The Draft Report notes that the hydrology approach outlined in the study was similar to the *Shepparton Mooroopna Floodplain Management Study: Floodplain Management Plan, October 2002* with the following updates and enhancements:

- the historical flow series used in flood frequency analysis was updated to include events up to 2012, including the large event in September 2010;
- flood frequency analysis used updated procedures as outlined in the revised edition of Australian Rainfall and Runoff for fitting design distributions;
- streamflow gauge ratings were reviewed, with the most appropriate streamflow data utilised;
- additional routing was carried out within hydraulic models from established gauge locations to the township model boundary to aid in adopting time lags between upstream gauges and model inflow boundaries;
- specific modelling of major breakouts from the Broken River to the Broken Creek catchment was completed for a range of events; and
- recent flood events and available hydrodynamic modelling of the Goulburn was utilised to inform timing of coincident flows for design purposes.

Design Flow Estimates

Flood frequency analysis was previously undertaken for the *Shepparton Mooroopna Floodplain Management Study: Floodplain Management Plan, October 2002*, which included flow data to the year 1999. The flood frequency analysis was updated for this study utilising additional data from 2000 to 2012. There were also some issues identified with the flow gauging data which resulted in changes to the peak flow magnitudes included in the annual series.

A total of eight streamflow gauges were subject to a flood frequency analysis and revised estimates of design flood peaks were calculated.



10. SUSTAINABLE DEVELOPMENT DIRECTORATE

10.6 Draft Shepparton Mooroopna Flood Mapping and Flood Intelligence Project 2018 and Draft Greater Shepparton City Council Municipal Flood Emergency Plan 2018 (continued)

Hydraulic Modelling

A hydraulic model is a mathematical model of a water/sewer/storm system and is used to analyse the system's hydraulic behaviour, this aids in understanding, predicting, and managing water resources.

A detailed combined 1D-2D hydraulic model of the township and surrounding floodplain was developed for the determination of flood levels and extents over a range of flood events primarily to inform flood intelligence for the study area. The calibrated hydraulic model simulates flood flow behaviour of the Goulburn River, Broken River and Seven Creeks, as well as the overbank flow throughout the floodplain, see Figure Two.

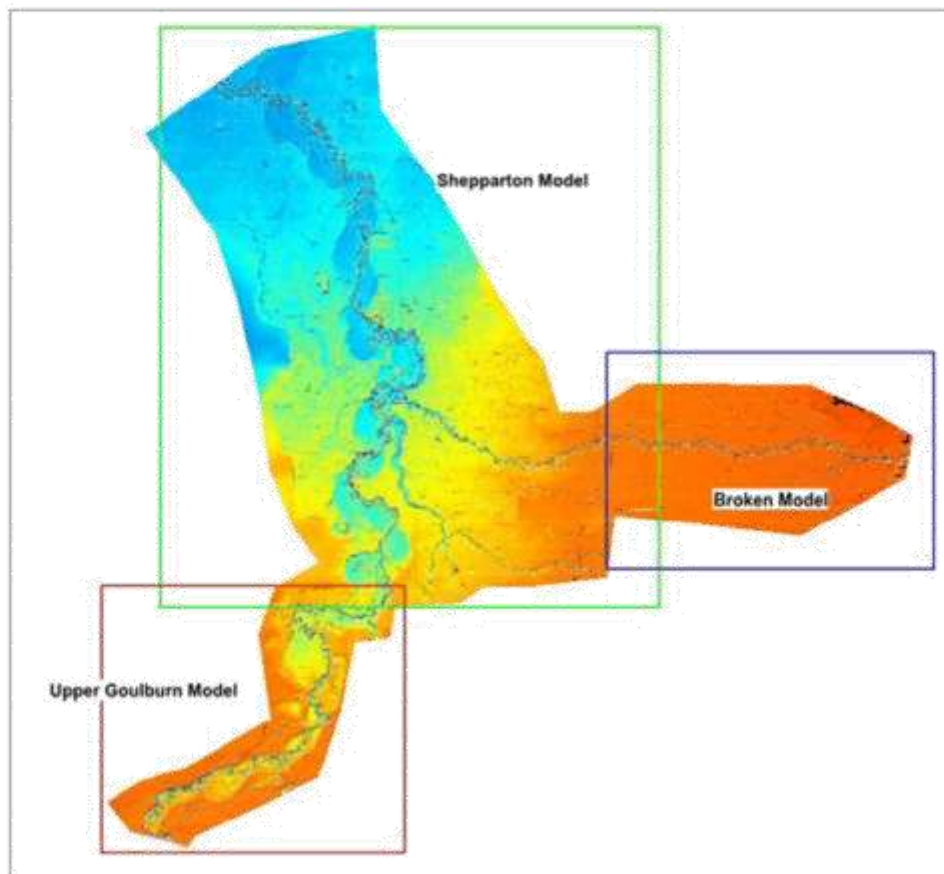


Figure Two: Model Schematic.

The hydraulic modelling software TUFLOW developed by BMT-WBM Pty Ltd was used for this study. TUFLOW is a state-of-the-art tool for floodplain modelling that combines the dynamic coupling of the 1D ESTRY river model and 2D TUFLOW model systems.



10. SUSTAINABLE DEVELOPMENT DIRECTORATE

10.6 Draft Shepparton Mooroopna Flood Mapping and Flood Intelligence Project 2018 and Draft Greater Shepparton City Council Municipal Flood Emergency Plan 2018 (continued)

The model was initially calibrated to the October 1993 and September 2010 flood events, and verified to the May 1974 flood event, with the model calibrated to reproduce the observed flood heights and extents.

Streamflow data was collated for all relevant gauges in the catchment from the Water Information Management System (<http://data.water.vic.gov.au/monitoring.htm>), and directly from Department of Environment Land Water and Planning (DELWP). The data was compared and it was found that the two datasets had significant discrepancies in the instantaneous peak flows and average daily computed flow. This was particularly the case for the Murchison gauge that led to a new flood study for Murchison. This study was funded by DELWP.

Design Flood Modelling

Following the completion of the hydraulic model calibration (i.e. to determine flood extent, depth and velocity), flood frequency analysis was carried out to determine "design" flow input hydrographs, which are routed through the hydraulic model. The design flood mapping ranged from the Minor Flood Class Level at the Shepparton Gauge to a 0.2 AEP (Annual Exceedance Probability) (1 in 500 year) flood. This flood mapping also provided flood intelligence products linked to the stream flow gauge network for property specific locations and the Municipal Flood Emergency Plan (discussed below).

Online Flood Portal

To ensure that the community had access to the flood mapping, a cloud-based flood mapping portal was developed. The portal is online and accessible via www.floodreport.com.au. The flood portal allows users to view flood depth maps across the range of events considered in the Draft Report.

Flood Intelligence

Flood intelligence is a key input in the decision-making process during floods. It helps emergency managers to understand the likely behaviour and consequences of flooding on communities.

These are also intended to assist community to manage their own flood risks, both before and during a flood

Water Technology Pty Ltd partnered with Michael Cawood & Associates Pty Ltd to develop a flood intelligence information system for the *Shepparton Mooroopna Flood Mapping and Flood Intelligence Project*. The major flood intelligence deliverable was an update to the *Greater Shepparton City Council Municipal Flood Emergency Plan: A Sub-Plan of the Municipal Emergency Management Plan*.

The report notes that the provisions of the *Draft Flood Forecast and Warning Service Charter* (Charter was founded on the Total Flood Warning System (TFWS) concept) is adequate to support the TFWS for Shepparton and Mooroopna. A TFWS typically includes the following principles:

- **Data Collection and Collation** – rain and river gauges, data management and display systems.



10. SUSTAINABLE DEVELOPMENT DIRECTORATE

10.6 Draft Shepparton Mooroopna Flood Mapping and Flood Intelligence Project 2018 and Draft Greater Shepparton City Council Municipal Flood Emergency Plan 2018 (continued)

Response set out in the Draft Report

It is noted that rainfall data is available at 3-hourly intervals during smaller floods and more frequently during large floods. Weather radar also covers the area. River level data is available frequently.

Greater Shepparton City Council is a contributing member of the Regional Surface Water Monitoring Partnership which ensures that all data is quality assured and stored in an accessible database, and that the gauge sites and equipment are covered by comprehensive routine and fault fix maintenance arrangements.

- **Prediction** – estimating the flood magnitude and time of onset of particular levels of flooding.

Response set out in the Draft Report

The Bureau of Meteorology (BoM) provide quantitative flood forecast for the sites in the vicinity of Shepparton.

The requirement for a quantitative flood forecast for this site has increased following the work on background studies to the Draft Report.

The mapping requires a (forecast) level at the upstream forecast locations, including at the Goulburn River at Kialla West gauge, to enable determination of dominance and the most appropriate flood mapping set. This drives flood response, e.g. which roads will be affected first, which properties will be flooded, what community assets will be inundated, where sandbags will be required to minimise damage and disruption, etc.

- **Interpretation** – identifying the impacts of the predicted flood levels on the community at risk.

Response set out in the Draft Report

The Greater Shepparton City Council Municipal Flood Emergency Plan has been substantially updated to include flood intelligence from all recent flood and related studies. The work has included development of flood intelligence cards that include consequences across a range of flood levels, for key locations.

The flood maps produced during this study are key to interpreting flood risk along with the summary contained in the MFEP, to develop a targeted emergency response to flooding.

The part of the MFEP that deals with Shepparton, Mooroopna, Kialla and Kialla West includes a set of simple to apply flood forecast tools. These tools can be used to develop a heads-up flood forecast for Shepparton (and the upstream locations) before Benalla, Euroa or Goulburn Weir have peaked. This enables flood dominance to be determined and an appropriate flood map set to be selected at an early stage. This facilitates early planning for and implementation of flood response activities. It also informs community messaging.

Rain and river data, including the latest radar and satellite imagery, is available from the Bureau of Meteorology (BoM) website and through FloodZoom.



10. SUSTAINABLE DEVELOPMENT DIRECTORATE

10.6 Draft Shepparton Mooroopna Flood Mapping and Flood Intelligence Project 2018 and Draft Greater Shepparton City Council Municipal Flood Emergency Plan 2018 (continued)

- **Flood Warning Message Construction** – defining the content of the message, describing what is happening, the expected impact and what action should be taken.

Response set out in the Draft Report

While BoM provide a standardised product, a gap does exist in the value adding that could occur within an Incident Control Centre (ICC) to aid a community's understanding of what the BoM forecast flood height means in terms of local consequences.

One way of closing this gap would be to develop, during non-flood periods, a suite of pre-scripted warning messages that include the value added material for a range of gauge heights.

The intelligence required to populate such messages is available in the MFEP and supported by the updated flood mapping.

- **Message Communication** – disseminating warning information in a timely fashion to people and organisations likely to be affected by a flood.

Response set out in the Draft Report

The Draft Report notes that BoM continues to use the wider media to disseminate flood warnings as does VicSES.

Further to this, Emergency Management Victoria (EMV) has established an app, all warnings from this agency are pushed to the users of the app. The Draft Report recommends that all residents in Shepparton get this app.

- **Response** – generating appropriate and timely actions from the community and from the agencies involved.

Response set out in the Draft Report

With the adoption of the Australasian Inter-service Incident Management System (AIIMS 4) which is a multi-agency operations and emergency management system and the inclusion of technical expertise in the ICC coupled with access to current flood intelligence through MFEP's and flood mapping available through FloodZoom, flood response has improved markedly over the past few years.

Therefore many issues raised relating to this aspect of the TFWS have been addressed.

- **Flood Awareness** – material aimed at raising awareness of flood risk and what to do in the lead up to and during a flood.

Response set out in the Draft Report

As part of the overall study, which led to the Draft Report, Water Technology Pty Ltd developed a web-based flood and property information portal for community use, www.floodreport.com.au.

The portal enables flood maps to be visualised for the various dominance scenarios (e.g. neutral, Goulburn River dominant, Broken-Seven dominant) for a range of



10. SUSTAINABLE DEVELOPMENT DIRECTORATE

10.6 Draft Shepparton Mooroopna Flood Mapping and Flood Intelligence Project 2018 and Draft Greater Shepparton City Council Municipal Flood Emergency Plan 2018 (continued)

Goulburn River at Shepparton gauge heights, as well as allowing the download of a property specific flood report linking gauge heights to flood depths and floor levels.

The maps and reports provide a means for community members to inform themselves of the likelihood of their property being inundated and the likely depths of inundation for a range of levels at the Shepparton gauge. The portal is proposed to replace the property charts produced and disseminated in the early 2000s as well as the now out-dated on-line flood map viewing system hosted by Council since the mid-2000s.

Further to this, it is noted that Local Flood Guides (LFGs) have been developed and are available from VicSES for Shepparton and Mooroopna and for Murchison. LFGs need to be developed for all other locations for which flood studies have been completed (e.g. Kialla and Kialla West, East Shepparton, Tatura, Merrigum and the rural area upstream of Kialla West) as a step in raising awareness of flood risk in these areas.

- **Review** – examining the various aspects of the system with a view to improving performance.

Response set out in the Draft Report

The review process that forms part of the Service Charter (Water Technology, 2006) has not been activated to date. It is apparent that there would be significant value in doing so as it would again draw stakeholder attention to matters that are crucial to improving the TFWS for Shepparton and Mooroopna.

TFWS performance during recent events (most recently in early December 2017) indicates that the TFWS is reasonably well developed. Operational processes seem to be working well with close cooperation between key agencies who openly share data and other information

Having regard to the above, the key findings of the Draft Report can be summarised as follows:

- an update to previous design hydrology of the Goulburn River basin has resulted in an improved understanding of design flooding throughout the system, including resolution of an earlier discrepancy in relation to the Murchison design flows. The Goulburn River at Murchison gauge rating curve has been updated, and this has officially been incorporated into the gauge rating for large flood flows.
- hydraulic modelling in the Shepparton, Mooroopna and surrounding areas has been completed at a higher resolution using better topography data compared to the earlier *Shepparton Mooroopna Floodplain Management Study: Floodplain Management Plan, October 2002*. This has resulted in improved flood mapping for the area.
- flood mapping data has been formatted into the Victoria Flood Database format and has been provided to GBCMA. The flood mapping portal, www.floodreport.com.au, has made the flood mapping accessible to anyone with internet access, and provided a means to obtain property specific flood information to assist in raising community flood awareness.
- comprehensive review of the flood warning system was completed along with a major update to the *Municipal Flood Emergency Plan* for Shepparton, East



10. SUSTAINABLE DEVELOPMENT DIRECTORATE

10.6 Draft Shepparton Mooroopna Flood Mapping and Flood Intelligence Project 2018 and Draft Greater Shepparton City Council Municipal Flood Emergency Plan 2018 (continued)

Shepparton, Mooroopna, Kialla, Murchison, Tallygaroopna, Congupna, Katandra West, Tatura and Merrigum.

The recommendations of the Draft Report align with a number of state and local strategies.

Compliance with supporting strategies and the Greater Shepparton Planning Scheme

Following the widespread floods that occurred across Victoria from 2010 to 2012, the Victorian Government undertook a number of reviews and investigations that culminated in the development of the *Victorian Floodplain Management Strategy 2016*. The Strategy is designed to ensure appropriate response and action is taken in the event of a flood.

The strategy clarified the roles and responsibilities of government agencies and authorities involved in flood management. It aims to improve the evaluation and communication of flood risks so communities and relevant agencies can deliver better-informed action to manage floods.

The *Victorian Floodplain Management Strategy 2016* also required catchment management authorities in regional Victoria to prepare a regional floodplain strategy to be developed. This led to the preparation of the *Goulburn Broken Regional Floodplain Management Strategy 2018-2028*.

This subsequent strategy was prepared to ensure a strategic approach to floodplain management within the Goulburn Broken catchment. It identifies four objectives- building community resilience, reducing legacy flood risk, avoiding future flood risk and managing residual flood risk. Council resolved to accept and support the *Goulburn Broken Regional Floodplain Management Strategy 2018-2028* and to become a signatory to the Strategy as a key partner at the Ordinary Council Meeting held on 17 April 2018.

The Draft Report aligns with both the *Victorian Floodplain Management Strategy 2016* and the *Goulburn Broken Regional Floodplain Management Strategy 2018-2028*.

In addition to these two strategies, the State Planning Policy Framework (SPPF) of the Victoria Planning Provisions requires councils in Victoria to “consider... any floodplain management manual of policy and practice, or catchment management, or river health, wetland or floodplain management strategy adopted by the relevant responsible floodplain management authority”.

The GBCMA, which is the floodplain management authority for the Shepparton-Mooroopna area, adopted the hydraulic model calibration data that informed the Draft Report in 2017.

The *Shepparton East Overland Flow Urban Flood Study 2017* undertook modelling to determine the hydraulic characteristics of flood water passing through the eastern suburbs of Shepparton. It was prepared by BMT WBM Pty Ltd on behalf of the GBCMA and created flood mapping to determine the flood risk for properties, provided estimates for the cost of flood damage and provided a review of mitigation options. The purpose of the Study is to assist with future land use planning to ensure that the SPPF objectives set out at Clause 13.02-1 of the Planning Scheme are met.



10. SUSTAINABLE DEVELOPMENT DIRECTORATE

10.6 Draft Shepparton Mooroopna Flood Mapping and Flood Intelligence Project 2018 and Draft Greater Shepparton City Council Municipal Flood Emergency Plan 2018 (continued)

The hydraulic model calibration data from this Study is also being used by the GBCMA in assessing development proposals within the Shepparton East area.

It is likely that the findings and recommendations of the Study will be integrated with that of the final *Shepparton Mooroopna Flood Intelligence and Flood Mapping Project Report* and implemented through one planning scheme amendment in early 2019.

Council officers recommend that the *Draft Shepparton Mooroopna Flood Intelligence and Flood Mapping Project Report, July 2018* be released for public comment. Following consultation, Council officers will review all feedback, comments and submissions received. The final report is expected to be further considered by Council in late 2018 or early 2019.

Greater Shepparton City Council Municipal Flood Emergency Plan 2018

The *Greater Shepparton City Council Municipal Flood Emergency Plan 2018* (MFEP) was prepared by the Shepparton Flood Sub Committee and with the authority of the Greater Shepparton City Council Municipal Emergency Management Planning Committee pursuant to Section 20 of the *Emergency Management Act 1986* and *Emergency Management Act 2013* (as amended), see Attachment 2.

The MFEP is a sub plan to the *Greater Shepparton City Council Municipal Emergency Management Plan* (MEMP). It is consistent with the *Emergency Management Manual Victoria* (EMMV) and the *Victorian Floodplain Management Strategy* (DELWP, 2016), and takes into account the outcomes of the Community Emergency Risk Assessment (CERA) process undertaken by the Municipal Emergency Management Planning Committee (MEMPC).

The MFEP is consistent with the *Regional Flood Emergency Plan* and the *State Flood Emergency Plan*. The purpose of the MFEP is to detail arrangements agreed for the planning, preparedness/prevention, response and recovery from flood incidents within the City of Greater Shepparton. As such, the scope of the MFEP is to:

- Identify the Flood Risk within the City of Greater Shepparton municipal area;
- Support the implementation of measures to minimise the causes and impacts of flood incidents within the City of Greater Shepparton municipal area;
- Detail Response and Recovery arrangements including preparedness, Incident Management, Command and Control; and
- Identify linkages with Local, Regional and State emergency and wider planning arrangements with specific emphasis on those relevant to flood.

The MFEP is complemented by two other guides, which provide the public with additional information specific to their area:

- Local Flood Guide; and
- Community Information Guide.

Council officers recommend that the *Greater Shepparton City Council Municipal Flood Emergency Plan 2018* be released for public comment. Following consultation, Council officers will review all feedback, comments and submissions received. The final Plan is expected to be further considered by Council in late 2018 or early 2019.



10. SUSTAINABLE DEVELOPMENT DIRECTORATE

10.6 Draft Shepparton Mooroopna Flood Mapping and Flood Intelligence Project 2018 and Draft Greater Shepparton City Council Municipal Flood Emergency Plan 2018 (continued)

Council Plan/Key Strategic Activity

Environment: clean, green environment that makes Greater Shepparton the unique place it is.

Objective 5.6: minimises the consequences of flooding to life, property, community wellbeing and the economy.

Risk Management

Ensuring the appropriate level of community consultation is undertaken will minimise the risks to Council. The Draft Reports comprise an important update of flood intelligence and mapping tools to allow Council to undertake improved planning and emergency management tasks for the Community of Shepparton and Mooroopna. It is recommended that Council endorse the Draft Report and release it for public comment.

It is further recommended that Council note the *Draft Greater Shepparton City Council Flood Emergency Plan 2018* and release it for public comment.

The outputs of the strategy will help minimise risk and damage to property and will ensure that arrangements are agreed for the planning, preparedness/prevention, response and recovery from flood incidents within the City of Greater Shepparton municipal area.

Financial Implications

The *Shepparton Mooroopna Flood Intelligence and Flood Mapping Project Report July 2018* and the *Greater Shepparton City Council Municipal Flood Emergency Plan 2018* (Draft Reports) were undertaken utilising existing Council resources. Releasing the Draft Reports for public comment will result in some costs to Council for advertising and public notice. These costs can be accommodated through the existing budget.

Legal/Statutory Implications

The preparation of the Draft Reports is considered to accord with the *Victorian Charter of Human Rights and Responsibilities Act 2006* (the Charter). No human rights have been negatively impacted upon throughout the process.

The Charter recognises that reasonable restrictions may be placed on the use and development of land, and that there may on occasion be reasonable and acceptable offsite impacts on others. Provided these issues are properly considered, it would be a rare and exceptional case where the exercise of a planning decision in accordance with the regulatory framework is not Charter compatible.

Environmental/Sustainability Impacts

Environmental influences were a key consideration in the preparation of the Draft Report. This includes environmental assets and constraints such as vegetation and river corridors, cultural heritage and wastewater treatment plants.

The recommendation will not result in any negative environmental/sustainability impacts.



10. SUSTAINABLE DEVELOPMENT DIRECTORATE

10.6 Draft Shepparton Mooroopna Flood Mapping and Flood Intelligence Project 2018 and Draft Greater Shepparton City Council Municipal Flood Emergency Plan 2018 (continued)

Social Implications

Endorsement of the Draft Reports will lead to a strategic approach to identification of flood prone areas around Shepparton and Mooroopna which will improve flood emergency planning and lead to a removal of flood damages in areas that may otherwise have been allowed to develop.

The recommendation will not result in any negative social implications.

Economic Impacts

It is not expected that the recommendation to release the Draft Reports for public comment will have any adverse economic impacts.

Consultation

It is recommended that Council endorse the *Draft Shepparton Mooroopna Flood Intelligence and Flood Mapping Project Report* and release it for public comment from 24 September to 7 November 2018.

It is further recommended that Council note the *Greater Shepparton City Council Flood Emergency Plan 2018* and release it for public comment from 24 September to 7 November 2018.

A communications and engagement strategy is currently being prepared in conjunction with the Goulburn Broken Catchment Management Authority. The will include the preparation of information brochures and one-to-one workshops.

Strategic Links

a) Greater Shepparton 2030 Strategy 2006

Topic: Environment

Theme: Floodplain management

Objective 1: To recognise the constraints of the floodplain on the use and development of land and minimise the future economic impacts of flooding.

Objective 3: To minimise the degree of salinity through an integrated regional surface water management program.

b) Other strategic links

Victorian Floodplain Management Strategy 2016

Goulburn Broken Regional Floodplain Management Strategy 2018-2028

Conclusion

The *Shepparton Mooroopna Flood Intelligence and Flood Mapping Project* is an important update of flood intelligence and mapping tools to allow Council to undertake improved planning and emergency management tasks for the Community of Shepparton and Mooroopna.

The draft *Shepparton Mooroopna Flood Intelligence and Flood Mapping Project Report, August 2018* (Draft Report) seeks to update the existing information on flood risk within the Shepparton-Mooroopna area. This involved detailed hydrology and hydraulic modelling of the Goulburn River, Seven Creeks and the Broken River for flood mapping, assessing flood risk and the treatment of flood risk.



10. SUSTAINABLE DEVELOPMENT DIRECTORATE

10.6 Draft Shepparton Mooroopna Flood Mapping and Flood Intelligence Project 2018 and Draft Greater Shepparton City Council Municipal Flood Emergency Plan 2018 (continued)

The Draft Report complements the recommendations of *the Victorian Floodplain Management Strategy 2016* and the *Goulburn Broken Regional Floodplain Management Strategy 2018-2028*.

Council officers recommend that the Draft Report be released for public comment from 24 September 2018 and concluding on 7 November 2018.

Council officers further recommend that that Council note the Municipal Flood Emergency Plan and release for public comment from 24 September 2018 and concluding on 7 November 2018.

Following consultation, Council officers will review all feedback, comments and submissions received. The final Report is expected to be further considered by Council in early-2018.

Attachments

- | | |
|---|----------|
| 1. Draft Shepparton Mooroopna Flood Mapping and Flood Intelligence Final Report August 2018 | Page 581 |
| 2. GSCC Draft Municipal Flood Emergency Plan - V2.3 - July 2018 | Page 689 |

ATTACHMENT TO AGENDA ITEM

Ordinary Meeting

19 March 2019

**Agenda Item 9.3 Goulburn River Valley Tourism Memorandum of
Understanding (MOU) and Greater Shepparton City
Council**

Attachment 1 GRVT MOU 2018-2021 579



MEMORANDUM OF UNDERSTANDING

Between: GOULBURN RIVER VALLEY TOURISM LTD

And: GREATER SHEPPARTON CITY COUNCIL
MITCHELL SHIRE COUNCIL
MURRINDINDI SHIRE COUNCIL
STRATHBOGIE SHIRE COUNCIL



Parties to the Agreement

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The parties to this Memorandum of Understanding (MOU) are:

GOULBURN RIVER VALLEY TOURISM, ACN 148 973 095 a Company Limited by Guarantee registered under the *Corporations Act 2001* and member Councils established under the *Local Government Act 1989*:

GREATER SHEPPARTON CITY COUNCIL

MITCHELL SHIRE COUNCIL

MURRINDINDI SHIRE COUNCIL

STRATHBOGIE SHIRE COUNCIL

Preamble

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1. Memorandums of Understanding (MOUs) covering the periods 1 July 2009 – 30 June 2012, 1 July 2012 – 30 June 2015 and 1 July 2015 – 30 June 2018 have been in place to provide funding to Goulburn River Valley Tourism ('the Company') and its predecessor organisation 'United Approach to Tourism'.
2. Goulburn River Valley Tourism was formally established as a legal entity, a company limited by guarantee, in March 2011.
3. The company has four members, the Councils listed as parties to this MOU. The liability of each member Council is limited to \$100 as per the constitution of the Company. Goulburn River Valley Tourism will not expand its membership base to include new municipal members unless agreed to by the Board and all existing Member Councils.
4. This MOU has been drafted to secure funding with *Greater Shepparton City Council* for a further two year period (1 July 2018 – 30 June 2020) with an option of a one year extension (1 July 2020 – 30 June 2021) for Goulburn River Valley Tourism.
5. This MOU has been drafted to secure funding with *Mitchell Shire Council* a further one year (1 July 2018 – 30 June 2019) with an option of a one year extension (1 July 2019 – 30 June 2020) for Goulburn River Valley Tourism.
6. This MOU has been drafted to secure funding with *Murrindindi Shire Council* a further one year (1 July 2018 – 30 June 2019) for Goulburn River Valley Tourism.
7. This MOU has been drafted to secure funding with *Strathbogrie Shire Council* a further one year (1 July 2018 – 30 June 2019) for Goulburn River Valley Tourism.
8. The Parties to this MOU acknowledge the strategic context within which this MOU is signed, that being the current Victorian Government Reviews into the Victorian Visitor Economy and Regional Service Delivery, and the outcomes such reviews may have on the role of the company, the Goulburn River Valley region ('the region') and this MOU.
9. This MOU may be renegotiated or renewed by further agreement between the parties to this MOU.

10. The Parties to this MOU have recorded their understandings and obligations and as signatories to this document agree to the following:

Goulburn River Valley Tourism

.....

Objectives of Goulburn River Valley Tourism

11. To be the independent peak regional tourism body for the municipalities served by Greater Shepparton City Council, Mitchell Shire Council, Murrindindi Shire Council and Strathbogie Shire Council ('the region').
12. To maximise the economic return from the visitor economy through promoting and developing the tourism industry of the region.

Goulburn River Valley Tourism Role

13. The role of Goulburn River Valley Tourism for the duration of this MOU will be to:
- develop and oversee the delivery of the 2018 – 2021 Strategic Plan for the region
 - develop and oversee the delivery of the yearly Business Plan for the organisation
 - ensure industry relationships are nurtured and developed through communication channels, activities, events, professional development and other appropriate mechanisms
 - ensure regular and formal communication with key stakeholders including Member Councils, Visit Victoria, Regional Tourism Boards, Local Tourism Associations, peak industry bodies and relevant government agencies
 - develop and coordinate policy and mechanisms to provide a consistent approach and application to tourism activities across the region
 - act as an independent voice and advocate on behalf of the tourism industry of the region
 - provide Council and key stakeholders with quarterly statistical reports relating to tourism performance in the region
 - work with other Regional Tourism Boards in particular North East Tourism, Murray Regional Tourism, Daylesford Macedon Ranges and Yarra Ranges Tourism (or their successors) to identify and engage in opportunities of benefit to operators in the Goulburn River Valley region
 - develop self-generating funding to contribute towards the financial sustainability of the Company
 - source, wherever possible, additional funding through industry and funding bodies to support the costs of delivery of projects
 - adhere to all financial and legal responsibilities of the Company.

Member Councils

Objectives of Member Councils

14. To have an effective independent peak regional tourism body for the municipalities served by Greater Shepparton City Council, Mitchell Shire Council, Murrindindi Shire Council and Strathbogie Shire Council.
15. To have Goulburn River Valley Tourism deliver specific strategic functions for the region including:
 - marketing
 - development
 - industry
 - product
 - skills
 - investment
 - engagement
 - advocacy

Member Council Role

16. The role of each Member Council for the duration of this MOU will be to:
 - acknowledge the role of Goulburn River Valley Tourism as the peak regional tourism organisation for the region and actively promote the Heart of Victoria brand and assets via council collateral
 - nominate Directors – one representative and one skills based - in accordance with the Goulburn River Valley Tourism constitution
 - work cooperatively with Goulburn River Valley Tourism on agreed projects, activities and standards in line with the 2018-2021 Strategic Plan.
 - ensure regular communication, both formal and informal, is maintained with Goulburn River Valley Tourism on matters of joint interest
 - support the involvement of relevant Council staff in appropriate Goulburn River Valley Tourism activities
 - recognise and promote Goulburn River Valley Tourism through Council distribution channels as appropriate
 - deliver and coordinate tourism functions at a council level including the management of signage, events, applications, compliance and associated activities
 - work with entities as represented by (but not limited to) Local Tourism Associations, Chambers of Commerce, special interest groups and industry associations to develop tourism at local level
 - manage and staff Visitor Information Centres (where relevant) or assign this function accordingly.

Communication between Parties

17. All parties recognise the importance of regular communication – both formal and informal to the success of tourism in the region and commit to open and regular dialogue.

18. Goulburn River Valley Tourism will:

- report to Member Council CEOs on a six-monthly basis on progress against key performance indicators
- present yearly to Councillors on the activities of Goulburn River Valley Tourism
- attend Council meetings or briefings to discuss or present on tourism related issues if requested
- circulate draft minutes of Board meetings to Representative Directors in a timely manner
- communicate with Council and relevant staff via regular electronic communication
- produce an Annual Report on the financial position and activities of the company
- raise directly with member Councils any issues, concerns, queries or questions it may have in relation to activities, function, performance or obligations under this MOU.

19. Member Councils will:

- ensure that Goulburn River Valley Tourism is briefed on, and kept informed of, tourism matters that have regional significance as and when appropriate
- encourage Councillors to attend yearly Goulburn River Valley Tourism briefings
- provide opportunities for Goulburn River Valley Tourism to brief or present to Councillors as and when deemed necessary
- recognise and promote Goulburn River Valley Tourism through Council distribution channels as appropriate
- raise directly with Goulburn River Valley Tourism any issues, concerns, queries or questions it may have in relation to its activities, function, performance or obligations under this MOU.

Key Performance Indicators

20. The key performance indicators that Goulburn River Valley Tourism will aim to achieve for the life of the MOU will be subject to negotiation between the company and Member Councils on an annual basis. The Key Performance Indicators will be detailed annually in Schedule A of this MOU.
21. Continued investment for years two and three of the MOU will be subject to agreement between Member Councils and Goulburn River Valley Tourism that satisfactory progress has been made against the key performance indicators, detailed in Schedule A of this MOU.

Member Council Investment

22. The agreed level of investment from Member Councils (exclusive of GST) is contained in Schedule B of this MOU. Contributions in years two and three will be subject to CPI increases.
23. By signing this MOU, Member Councils acknowledge that they are committing to expenditure in future budgets, for the life of the MOU, providing Goulburn River Valley Tourism delivers on the key performance indicators as detailed in Schedule A to the satisfaction of Member Councils.
24. Despite Clause 23, should a State Government Regional Tourism Board restructure occur whereby official regions are reduced in number or if the geographical area relevant to this MOU achieves official State Government Regional Tourism Board recognition and funding, each Member Council reserves the right to reconsider its position in relation to this MOU.
25. Despite clause 23, should a member Council withdraw or not extend membership under this MOU, member Councils have the right to reconsider their own membership and withdraw from the MOU.
26. Annual payments are to be made following the receipt of a tax invoice from Goulburn River Valley Tourism. Payments from Councils will be made no later than 30 August each year or 30 days after the date of issue of the invoice, whichever is latest.
27. The In-kind support from Member Councils is contained in Schedule C of this MOU. Nothing in Schedule C reduces the Member Council contributions as outlined in Schedule B of this MOU.

Dispute Resolution

28. If any dispute arises between the parties carrying out the principles of this Memorandum of Understanding, the parties will seek bona fide to resolve that difference or dispute between them.
29. Any disputes arising from this MOU will be first referred to a joint meeting of the Chair of Goulburn River Valley Tourism, one representative from each Member Council and a representative of Visit Victoria. Visit Victoria will convene and manage this process unless it is deemed to be a party to the dispute or otherwise decline to

participate. If Visit Victoria is a party to the dispute or declines, an external independent mediator will oversee the process.

30. Final dispute resolution, if required, will be referred to a Committee consisting of one representative from each Member Council, Goulburn River Valley Tourism, Visit Victoria and an independent industry representative. Visit Victoria will convene the meeting and chair the Dispute Resolution Committee. If Visit Victoria is a party to the dispute or declines, an external independent mediator will convene and chair the Committee.
31. The independent industry representative will be appointed by a group consisting of a representative from each Member Council, Goulburn River Valley Tourism and Visit Victoria or another such external body agreed by the parties to the dispute.
32. An external independent mediator will be appointed by the Mediator President of the Law Society of Victoria or his or her representative if it is deemed Visit Victoria is a party to a dispute or declines to participate. The independent mediator must be a person acceptable to all parties to the dispute.

Parties Agree to be Bound

33. It is the intention that this MOU be binding on the parties without the right of withdrawal from the agreement except where there is fundamental breach of any term or condition of this MOU or where there is a fundamental material change in the strategic context within which Goulburn River Valley Tourism operates.
34. In the case of a dispute, all parties agree that they will not withdraw from this MOU until such time as the prescribed dispute resolution process has been employed and it has been established that a fundamental breach has occurred and that this fundamental breach cannot be remedied to the satisfaction of the parties in dispute.

Terms of MOU

35. Negotiations to renew the extension of the MOU with *Greater Shepparton City Council* must be completed by 31 March 2020. Negotiations to renew the MOU with *Greater Shepparton City Council* for a further period beyond this MOU must be commenced by 31 December 2020 and must be completed by 31 March 2021.
36. Negotiations to renew the extension of the MOU with *Mitchell Shire Council* must be completed by 31 March 2019. Negotiations to renew the MOU with *Mitchell Shire Council* for a further period beyond this MOU must be commenced by 31 December 2019 and must be completed by 31 March 2020.
37. Negotiations to renew the MOU with *Murrindindi Shire Council* for a further period beyond this MOU must be commenced by 31 December 2018 and must be completed by 31 March 2019.
38. Negotiations to renew the MOU with *Strathbogie Shire Council* for a further period beyond this MOU must be commenced by 31 December 2018 and must be completed by 31 March 2019.

39. If Goulburn River Valley Tourism is wound up all funds held will be transferred in line with the Winding Up clause in the Constitution of the company.
40. Each party maintains the right to exercise its individual powers as it sees fit.
41. This Memorandum of Understanding lapses on 30 June 2021 with Greater Shepparton City Council, 30 June 2020 with Mitchell Shire Council and 30 June 2019 with Murrindindi Shire Council and Strathbogie Shire Council.

The parties to this Memorandum of Understanding are:

GOULBURN RIVER VALLEY TOURISM LTD

Signature: _____
Annie Fletcher-Nicholls
Chair - Goulburn River Valley Tourism
Date: ____/____/____
Witness: _____

and

GREATER SHEPPARTON CITY COUNCIL

Signature: _____
Peter Harriott
Chief Executive Officer - Greater Shepparton City Council
Date: ____/____/____
Witness: _____

and

MITCHELL SHIRE COUNCIL

Signature: _____
David Turnbull
Chief Executive Officer - Mitchell Shire Council
Date: ____/____/____
Witness: _____

and

MURRINDINDI SHIRE COUNCIL

Signature: _____
Craig Lloyd
Interim Chief Executive Officer - Murrindindi Shire Council
Date: ____/____/____
Witness: _____

and

STRATHBOGIE SHIRE COUNCIL

Signature: _____
Steve Crawcour
Chief Executive Officer - Strathbogrie Shire Council
Date: ____/____/____
Witness: _____

SCHEDULE A – 2018 2019 Performance Indicators

Goulburn River Valley Tourism has identified several strategic areas of priority for the life of 2018-2021 MOU:

- Marketing
- Development
- Engagement
- Advocacy
- Our Business

The strategic priority areas will be reviewed annually, in accordance with the 2018-2021 Strategic Plan. Subsequent key performance indicators will be developed for incorporation into Schedule A on an annual basis.

The 2018-2019 tactics for delivery and key performance indicators, against the 2018-2021 Strategic Areas, are listed below.

Performance Indicator		Unit of Measure	2018-2019 Target
Marketing			
1.	Number of people reached through consumer campaigns and made aware of the assets of the region via print, online, TV/radio and social distribution channels.	Number (thousands)	200
2.	Consumer interest/intent to visit the region is measured by visitor surveys and increases year to year.	Per cent increase	50%
3.	Value of media coverage generated promoting regional tourism assets and the region in general via print, online, TV/radio and social distribution channels and influencers.	\$ million	1
Development			
4.	Number of tourism operators across the region who receive benefit from GRVT increases. This can be carried out via face-to-face and online workshops, printed and electronic resources, and one-on-one consultation.	Per cent increase	100%
5.	Tailored and industry specific vocational training delivered to tourism operators and their staff to increase the quality of product delivery across the region.	Individuals participating	25
Engagement			
6.	GRVT and Councils partner on the delivery of projects of regional significance, increasing the capacity of the visitor economy.	Number	5
7.	Communication touchpoints with industry increases, and becomes more consistent including workshops, social media, e-newsletters, drop-ins and other events.	Number	52
Advocacy			
8.	Build and maintain key relationships with regional, State and Federal agencies and bureaucrats including relevant MPs, RDV, Visit Victoria, VTIC, Goulburn Partnerships, GMW, Parks Vic, LBTAs and industry groups.	Number	25
9.	Progressive efforts towards achieving official State	Number of	25

	Government Regional Tourism Board recognition and funding.	lobby touch points	
Our Business			
10	Establish new revenue streams in addition to current budget, that enable further marketing, development, engagement and advocacy efforts.	\$ thousand	20
11.	Meet business and governance compliance as required.	Per cent	100

SCHEDULE B – Member Council Investment

.....

The annual investment by Member Councils for the life of this MOU is set out below. It is noted that all amounts are exclusive of GST.

Investment in years two and three of the MOU are subject to CPI ¹ adjustment.

Annual Investment	2017-2018	2018-2019²	2019-2020	2020-2021
Greater Shepparton City Council	\$99,843	\$102,040	\$104,285	\$106,579
Mitchell Shire Council	\$66,562	\$68,027	\$69,524	
Murrindindi Shire Council	\$39,937	\$40,816		
Strathbogie Shire Council	\$39,937	\$40,816		
Total	\$246,282	\$251,700	\$173,809	\$106,579

¹ For the sake of clarity -The CPI (Consumer Price Index) is the all groups, weighted average of the eight capital cities on an annual basis, June to June quarter with the base point of 2016-2017 as published by the Australian Bureau of Statistics - CPI 6401.0 Australia.

² To establish the base 2018-2019 figure in time for the signing of the various MOU contract dates, a 2.2% average has been used to replace the June to June quarter figure.

SCHEDULE C – IN KIND SUPPORT

The in-kind support to be provided by Member Councils for the life of the MOU is set out below.

Nothing in this Schedule prevents Member Councils providing additional in-kind support to Goulburn River Valley Tourism over the life of the MOU. Nothing in this Schedule prevents Goulburn River Valley Tourism making a request for additional in-kind support over the life of the MOU. Such a request can be accepted or rejected by Member Councils.

Greater Shepparton City Council	<ul style="list-style-type: none"> • Meeting space including but not limited to Council facilities as available and required • Hot desk space at the Greater Shepparton Business Centre for up to 25 days per year and use of Wi-Fi network • Support for the delivery of key activities through communication channels, participation in working groups and other appropriate activities • Assistance with staffing regional tourism promotions if required • Office space for the staff of Goulburn River Valley Tourism, including all operational costs such as power, internet, tea/coffee facilities, printing
Mitchell Shire Council	<ul style="list-style-type: none"> • Meeting space including but not limited to Council Chambers as available and required • Hot desk space at Council offices as available and required • Support for the delivery of key activities through communication channels, participation in working groups and other appropriate activities • Assistance with staffing regional tourism promotions if required
Murrindindi Shire Council	<ul style="list-style-type: none"> • Meeting space including but not limited to Council facilities as available and required • Hot desk space at Council offices as available and required • Support for the delivery of key activities through communication channels, participation in working groups and other appropriate activities • Assistance with staffing regional tourism promotions if required • Office space for the staff of Goulburn River Valley Tourism, including all operational costs such as power, internet, tea/coffee facilities, printing
Strathbogie Shire Council	<ul style="list-style-type: none"> • Meeting space including but not limited to the Nagambie Regatta Centre as available and required • Hot desk space at Council offices as available and required • Support for the delivery of key activities through communication channels, participation in working groups and other appropriate activities • Assistance with staffing regional tourism promotions if required

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ATTACHMENT TO AGENDA ITEM

Ordinary Meeting

19 March 2019

Agenda Item 14.1	Councillors Community Interaction and Briefing Program	
Attachment 1	Heritage Advisory Committee - 4 February 2019	594
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Attachment 3	Shepparton Showgrounds Advisory Committee Meeting - 11 February 2019.....	596
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Assemblies of Councillors

Heritage Advisory Committee 4 th February 2019		
Councillors:	Cr Seema Abdullah	
Officers:	Grace Docker, Simone Wood & Anne-Maree Michaelson	
Matter No.	Matters discussed	Councillors Present for Discussion
1.	Apologies	Cr Seema Abdullah
2.	Declarations of Conflicts of Interest	Cr Seema Abdullah
3.	Items to be raised during 'Agenda Item 14 General or other Business'	Cr Seema Abdullah
4.	Confirmation of Meeting Minutes of 3 December 2018	Cr Seema Abdullah
5.	Draft Heritage Strategy 2019-2023	Cr Seema Abdullah
6.	Annual Report	Cr Seema Abdullah
7.	Budget	Cr Seema Abdullah
8.	Cultural Heritage Awards	Cr Seema Abdullah
9.	Heritage Open Day	Cr Seema Abdullah
10.	Report from Grace Docker	Cr Seema Abdullah
11.	Report from Deborah Kemp	Cr Seema Abdullah
12.	Update of Planning Permit Applications within the Heritage Overlay	Cr Seema Abdullah
13.	Reports from Members	Cr Seema Abdullah
14.	General or other Business	Cr Seema Abdullah

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Assemblies of Councillors

Tatura Park Advisory Committee Meeting Monday February 4, 2019		
Councillors:	Cr Fern Summer	
Officers:	Jeremy Roberts Rohan Sali Kim Taylor	
Matter No.	Matters discussed	Councillors Present for Discussion
1	Facility Maintenance	Cr Fern Summer
2	Fees and charges review & finalise recommendation	Cr Fern Summer
3	Elmore site visit	Cr Fern Summer
4	Updating Tatura Park details & photos on Council website	Cr Fern Summer
5	Options for airconditioning in cricket club rooms	Cr Fern Summer
Conflict of Interest Disclosures		
Matter No.	Names of Councillors who disclosed conflicts of interest	Did the Councillor leave the meeting?
NIL		



Assemblies of Councillors

Development Hearings Panel 4 February 2019		
Councillors:	Cr Chris Hazelman	
Officers:	Andrew Dainton, Braydon Aitken, Jonathan Griffin, Janine Saxon, Anne-Marie Michaelson	
Matter No.	Matters discussed	Councillors Present for Discussion
1	Planning Application 2017-340 for 279 Dhurringile Road, Tatura seeking permission for a six lot subdivision in the Low Density Residential Zone	Cr Hazelman
2	Planning Application 2018-257 for 4905 & 4965 Goulburn Valley Highway, Murchison East for use and development for a rural store (grain storage bunkers) and a two lot subdivision and removal of native vegetation	Cr Hazelman
3	Planning Application 2018-159 for 265 Kyabram-Cooma Road, Kyabram for use and development of land for intensive animal husbandry (12,000 free range chickens for egg production)	Cr Hazelman
Conflict of Interest Disclosures		
Matter No.	Names of Councillors who disclosed conflicts of interest	Did the Councillor leave the meeting?
	Nil	No

Record of Assembly of Councillors

Record in accordance with section 80A(1) of the *Local Government Act 1989*

Councillor Briefing Session - 5 February 2019		
Councillors	Cr Kim O'Keeffe, Cr Shelley Sutton, Cr Seema Abdullah, Cr Dinny Adem, Cr Bruce Giovanetti, Cr Chris Hazelman, Cr Dennis Patterson and Cr Fern Summer	
Officers:	Peter Harriott, Geraldine Christou, Phil Hoare, Kaye Thomson, Chris Teitzel, Tim Zak, Peta Bailey, Paul Dainton, Greg McKenzie, Sharlene Still, James Nolan, Fiona LeGassick, Marcus Daniel, Kristen Chasemore and Rebecca Good (not all officers were present for all items).	
Matter No.	Matters discussed	Councillors Present for Discussion
1.	Australian Botanic Gardens Committee - 2017/2018 Annual Report	Cr O'Keeffe (Chair) Cr Sutton Cr Abdullah Cr Adem Cr Giovanetti Cr Hazelman Cr Patterson Cr Summer
2.	Australian Botanic Gardens Committee discussion on the future of the Gardens	Cr O'Keeffe (Chair) Cr Sutton Cr Abdullah Cr Adem Cr Giovanetti Cr Hazelman Cr Patterson Cr Summer
3.	Submissions to Shepparton Mooroopna Flood Mapping and Flood Intelligence Project 2018 and the Greater Shepparton City Council Municipal Flood Emergency Plan 2018	Cr O'Keeffe (Chair) Cr Sutton Cr Abdullah Cr Giovanetti Cr Hazelman Cr Patterson Cr Summer
4.	Council Plan 2018-19 Quarter 2 Progress Report	Cr O'Keeffe (Chair) Cr Sutton Cr Abdullah Cr Giovanetti Cr Hazelman Cr Patterson Cr Summer
5.	Contract 1896 - Provision of Creative & Production Services and Media Buying for Shepparton Show Me	Cr O'Keeffe (Chair) Cr Sutton Cr Abdullah Cr Giovanetti (partial) Cr Hazelman Cr Patterson Cr Summer
Conflict of Interest Disclosures		

Matter No.	Names of Councillors who disclosed conflicts of interest	Did the Councillor leave the meeting?
	Nil	

Record of Assembly of Councillors

Record in accordance with section 80A(1) of the *Local Government Act 1989*

CEO and Councillor Catch up - 5 February 2019		
Councillors	Cr Kim O'Keeffe, Cr Shelley Sutton, Cr Seema Abdullah, Cr Dinny Adem, Cr Bruce Giovanetti, Cr Chris Hazelman, Cr Dennis Patterson and Cr Fern Summer	
Officers:	Peter Harriott	
Matter No.	Matters discussed	Councillors Present for Discussion
1.	Event	Cr O'Keeffe (Chair) Cr Sutton Cr Abdullah Cr Adem Cr Giovanetti Cr Hazelman Cr Patterson Cr Summer
2.	Acting CEO	Cr O'Keeffe (Chair) Cr Sutton Cr Abdullah Cr Adem Cr Giovanetti Cr Hazelman Cr Patterson Cr Summer
3.	Mooroopna Memorial	Cr O'Keeffe (Chair) Cr Sutton Cr Abdullah Cr Adem Cr Giovanetti Cr Hazelman Cr Patterson Cr Summer
4.	SAM Update	Cr O'Keeffe (Chair) Cr Sutton Cr Abdullah Cr Adem Cr Giovanetti Cr Hazelman Cr Patterson Cr Summer
5.	VIC Track Parking	Cr O'Keeffe (Chair) Cr Sutton Cr Abdullah Cr Adem Cr Giovanetti Cr Hazelman Cr Patterson Cr Summer

6.	Botanic Gardens	Cr O'Keeffe (Chair) Cr Sutton Cr Abdullah Cr Adem Cr Giovanetti Cr Hazelman Cr Patterson Cr Summer
Conflict of Interest Disclosures		
Matter No.	Names of Councillors who disclosed conflicts of interest	Did the Councillor leave the meeting?
	Nil	

Record of Assembly of Councillors

Record in accordance with section 80A(1) of the *Local Government Act 1989*

Councillor Briefing Session - 19 February 2019		
Councillors	Cr Kim O'Keeffe, Cr Shelley Sutton, Cr Seema Abdullah, Cr Bruce Giovanetti, Cr Chris Hazelman, Cr Dennis Patterson and Cr Fern Summer	
Officers:	Peter Harriott, Geraldine Christou, Phil Hoare, Kaye Thomson, Chris Teitzel, Sharlene Still, James Nolan, Michael Carrafa, Anthony Nicolaci, Thomas Lyle and Rebecca Good (not all officers were present for all items).	
Matter No.	Matters discussed	Councillors Present for Discussion
1.	Service Review update	Cr O'Keeffe (Chair) Cr Sutton Cr Abdullah Cr Giovanetti Cr Hazelman Cr Patterson Cr Summer
2.	GV Link Solar Farm - Proposed Lease Agreement	Cr O'Keeffe (Chair) Cr Sutton Cr Abdullah Cr Giovanetti Cr Hazelman Cr Patterson Cr Summer
3.	Contract 1865 Construction of new SAM Building	Cr O'Keeffe (Chair) Cr Sutton Cr Abdullah Cr Giovanetti Cr Hazelman Cr Patterson Cr Summer
Conflict of Interest Disclosures		
Matter No.	Names of Councillors who disclosed conflicts of interest	Did the Councillor leave the meeting?
	Nil	

Record of Assembly of Councillors

Record in accordance with section 80A(1) of the *Local Government Act 1989*

CEO and Councillor Catch up - 19 February 2019		
Councillors	Cr Kim O'Keeffe, Cr Shelley Sutton, Cr Seema Abdullah, Cr Bruce Giovanetti, Cr Chris Hazelman, Cr Dennis Patterson and Cr Fern Summer	
Officers:	Peter Harriott	
Matter No.	Matters discussed	Councillors Present for Discussion
1.	Canberra Visit	Cr O'Keeffe (Chair) Cr Sutton Cr Abdullah Cr Giovanetti Cr Hazelman Cr Patterson Cr Summer
2.	Balaclava Road	Cr O'Keeffe (Chair) Cr Sutton Cr Abdullah Cr Giovanetti Cr Hazelman Cr Patterson Cr Summer
3.	Parking	Cr O'Keeffe (Chair) Cr Sutton Cr Abdullah Cr Giovanetti Cr Hazelman Cr Patterson Cr Summer
4.	Telecommunication Towers	Cr O'Keeffe (Chair) Cr Sutton Cr Abdullah Cr Giovanetti Cr Hazelman Cr Patterson Cr Summer
5.	DAMA Designated Area Migration Agreement	Cr O'Keeffe (Chair) Cr Sutton Cr Abdullah Cr Giovanetti Cr Hazelman Cr Patterson Cr Summer
Conflict of Interest Disclosures		
Matter No.	Names of Councillors who disclosed conflicts of interest	Did the Councillor leave the meeting?

	Nil	
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Assemblies of Councillors

Greater Shepparton Early Years Partnership		
Councillors:	Cr Shelley Sutton	
Officers:	Belinda Whitelaw Chris Widdicombe Sally Rose	
Matter No.	Matters discussed	Councillors Present for Discussion
	List main meeting items discussed in the meeting	Please list when any Councillor leaves the meeting.
1	Present and Apologies	Cr Shelley Sutton
2	Minutes of previous meeting	Cr Shelley Sutton
3	Conflict of Interest	Cr Shelley Sutton
4	Best Start <ul style="list-style-type: none"> - Early Years Reference Group Program Logic 2019 	
5	Municipal Early Years Plan <ul style="list-style-type: none"> - Presentation to Council 	Cr Shelley Sutton
6	Evaluation and Data <ul style="list-style-type: none"> - AEDC 2018 – school profiles 	Cr Shelley Sutton
7.	Advocacy Role <ul style="list-style-type: none"> - Implementation of election promise for funded three year old kindergarten - Development and Delivery of Mooroopna Integrated Early Learning Centre (Shepparton Education Plan) 	Cr Shelley Sutton
8.	General Business <ul style="list-style-type: none"> - Out of Home Care Agreement - Early years Reform Rollout - Movement of Programs from DET to DHHS - Updates from Partners 	Cr Shelley Sutton
Conflict of Interest Disclosures		
Matter No.	Names of Councillors who disclosed conflicts of interest	Did the Councillor leave the meeting?
	none	

RiverConnect Implementation Advisory Committee Meeting 24 October 2018		
Councillors:	Cr Dennis Patterson	
Officers:	Meg Pethybridge, Greg McKenzie	
Matter No.	Matters discussed	Councillors Present for Discussion
1.1	Welcome – To new members Jay Whittaker and Matt Crawford, and Farewell to retiring member John Gray.	Cr Patterson (Chair)
1.2	Previous meeting Minutes confirmed, actions completed.	Cr Patterson (Chair)
1.3	Correspondence In: Request for financial sponsorship from Lost Shepparton Out: Nil	Cr Patterson (Chair)
1.4	Budget Annual Figures 2018-2019	Cr Patterson (Chair)
2.1	Communications Working Group Report	Cr Patterson (Chair)
2.2	RiverConnect Education Officer Report	Cr Patterson (Chair)
2.3	Land Management Working Group Report	Cr Patterson (Chair)
2.4	2017-2018 Overview and Planning for 2018-2019	Cr Patterson (Chair)
3.1	Committee Membership Change update	Cr Patterson (Chair)
3.2	VicRoads bypass proposal and project partnerships	Cr Patterson (Chair)
3.3	Recreational Fishing Grant/River Access Project (Jordans Bend, Stuart Reserve, Kaieltheban Park)	Cr Patterson (Chair)
3.4	River Masterplan	Cr Patterson (Chair)
3.5	River Festival	Cr Patterson (Chair)
3.6	Eastbank Lake Wetlands Project update	Cr Patterson (Chair)
3.7	Litter and Illegal Dumping Campaign	Cr Patterson (Chair)
3.8	Shared Paths Masterplan Update	Cr Patterson (Chair)

3.9	Signage projects update	Cr Patterson (Chair)
4.1	Agency Update – no information provided	Cr Patterson (Chair)
Conflict of Interest Disclosures		
Matter No.	Names of Councillors who disclosed conflicts of interest	Did the Councillor leave the meeting?
	Nil	

RiverConnect Signage Committee Meeting 14 February 2019		
Councillors:	Cr Dennis Patterson	
Officers:	Meg Pethybridge, Michael McCorry, Jeremy Bianco, Paul Dainton	
Matter No.	Matters discussed	Councillors Present for Discussion
1.1	Welcome – explain reasons for recommending signage committee and plans for a strategy	Cr Patterson
1.2	Signage currently planned including Parks Victoria Shepparton Regional Park Signage Plan document (in development)	Cr Patterson
1.3	The purpose of signage and types required in the river environment: information/directional/wayfinding vs interpretative/educational	Cr Patterson
1.4	Technology and materials for new signage	Cr Patterson
1.5	Signage upgrades and new signage including potential information hubs	Cr Patterson
1.6	Considerations: land tenure, authorities' signage manuals, legal requirements, current signage plans in place, accessibility, vandalism, appropriate locations, consistency, robustness	Cr Patterson
1.7	Strategy examples from other organisations	Cr Patterson
Conflict of Interest Disclosures		
Matter No.	Names of Councillors who disclosed conflicts of interest	Did the Councillor leave the meeting?
	Nil	

RiverConnect Implementation Advisory Committee Meeting 24 October 2018		
Councillors:	Cr Dennis Patterson	
Officers:	Meg Pethybridge, Sharon Terry	
Matter No.	Matters discussed	Councillors Present for Discussion
1.1	Welcome –	Cr Patterson (Chair)
1.2	Previous meeting Minutes confirmed, actions completed.	Cr Patterson (Chair)
1.3	Correspondence In: Nil Out: Letter to GSCC supporting the proposed Monash Park signage project	Cr Patterson (Chair)
1.4	Budget Remaining budget allocated for 2018-2019.	Cr Patterson (Chair)
2.1	Communications Working Group Report	Cr Patterson (Chair)
2.2	RiverConnect Education Officer Report	Cr Patterson (Chair)
2.3	Land Management Working Group Report	Cr Patterson (Chair)
3.1	Memorandum of Understanding	Cr Patterson (Chair)
3.2	VicRoads bypass proposal and project partnerships	Cr Patterson (Chair)
3.3	Recreational Fishing Grant/River Access	Cr Patterson (Chair)
3.4	Social and private enterprise opportunities	Cr Patterson (Chair)
3.5	Litter and Illegal Dumping Campaign	Cr Patterson (Chair)
3.6	Shared Paths Masterplan Update	Cr Patterson (Chair)
3.7	Signage Strategy Planning	Cr Patterson (Chair)
4.1	Agency Updates	Cr Patterson (Chair)
Conflict of Interest Disclosures		
Matter No.	Names of Councillors who	Did the Councillor leave

	disclosed conflicts of interest	the meeting?
	Nil	

Record of Assembly of Councillors

Record in accordance with section 80A(1) of the *Local Government Act 1989*

Councillor Briefing Session - 26 February 2019		
Councillors	Cr Kim O'Keeffe, Cr Shelley Sutton, Cr Seema Abdullah, Cr Dinny Adem, Cr Bruce Giovanetti, Cr Chris Hazelman and Cr Dennis Patterson	
Officers:	Peter Harriott, Geraldine Christou, Phil Hoare, Kaye Thomson, Chris Teitzel, Majenta Rose, Jacalyn Turner, Sharlene Still, Natarlie Philips, Michael MacDonagh, Grace Docker, Amanda Tingay, Joel Board, Michelle Bertoli and Rebecca Good (not all officers were present for all items).	
Matter No.	Matters discussed	Councillors Present for Discussion
1.	Draft 2019/2020 User Fees and Charges	Cr O'Keeffe (Chair) Cr Sutton Cr Abdullah Cr Giovanetti Cr Patterson
2.	Audit and Risk Management Committee Chair's Annual Report	Cr O'Keeffe (Chair) Cr Sutton Cr Abdullah Cr Giovanetti Cr Patterson
3.	Cultural Heritage Awards	Cr O'Keeffe (Chair) Cr Sutton Cr Abdullah Cr Giovanetti Cr Patterson
4.	Volunteer Strategy 2019-2022	Cr O'Keeffe (Chair) Cr Sutton Cr Abdullah Cr Giovanetti Cr Patterson
5.	Volunteer Policy 07.POL.3 Review	Cr O'Keeffe (Chair) Cr Sutton Cr Abdullah Cr Adem Cr Giovanetti Cr Hazelman Cr Patterson
6.	Greater Shepparton Womens Charter Alliance Advisory Committee Annual Report 2017/2018	Cr O'Keeffe (Chair) Cr Sutton Cr Abdullah Cr Adem Cr Giovanetti Cr Hazelman Cr Patterson

7.	Greater Shepparton Women's Charter Alliance - Action Plan	Cr O'Keeffe (Chair) Cr Sutton Cr Abdullah Cr Adem Cr Giovanetti Cr Hazelman Cr Patterson
8.	Shepparton Art Museum	Cr O'Keeffe (Chair) Cr Sutton Cr Abdullah Cr Adem Cr Giovanetti Cr Hazelman Cr Patterson
Conflict of Interest Disclosures		
Matter No.	Names of Councillors who disclosed conflicts of interest	Did the Councillor leave the meeting?
	Nil	

Record of Assembly of Councillors

Record in accordance with section 80A(1) of the *Local Government Act 1989*

CEO and Councillor Catch up - 26 February 2019		
Councillors	Cr Kim O'Keeffe, Cr Shelley Sutton, Cr Seema Abdullah, Cr Bruce Giovanetti, Cr Chris Hazelman, Cr Dennis Patterson and Cr Fern Summer	
Officers:	Peter Harriott	
Matter No.	Matters discussed	Councillors Present for Discussion
1.	Shepparton Art Museum (SAM)	Cr O'Keeffe (Chair) Cr Sutton Cr Abdullah Cr Giovanetti Cr Hazelman Cr Patterson Cr Summer
Conflict of Interest Disclosures		
Matter No.	Names of Councillors who disclosed conflicts of interest	Did the Councillor leave the meeting?
	Nil	

Record of Assembly of Councillors

Record in accordance with section 80A(1) of the *Local Government Act 1989*

Councillor Briefing Session - 26 February 2019		
Councillors	Cr Kim O'Keeffe, Cr Shelley Sutton, Cr Seema Abdullah, Cr Dinny Adem, Cr Bruce Giovanetti, Cr Dennis Patterson and Cr Fern Summer	
Officers:	Peter Harriott and Kaye Thomson.	
Matter No.	Matters discussed	Councillors Present for Discussion
1.	SAM Foundation Update	Cr O'Keeffe (Chair) Cr Sutton Cr Abdullah Cr Adem Cr Giovanetti Cr Patterson Cr Summer
2.	SAM Contract and Budget	Cr O'Keeffe (Chair) Cr Sutton Cr Abdullah Cr Adem Cr Giovanetti Cr Patterson Cr Summer
Conflict of Interest Disclosures		
Matter No.	Names of Councillors who disclosed conflicts of interest	Did the Councillor leave the meeting?
	Nil	



MINUTES

Shepparton Art Museum - Advisory Committee Meeting

Date: Wednesday 27 February 2019 at 1:00pm
Location: Goulburn Room (Welsford Street, GSCC Office)

Attendees:	Cr Chris Hazelman (Chairperson) Kristine Medson (Community Representative) – left before end of meeting 2.05pm Fran Smullen (Community Representative) Rebecca Coates (SAM Director) Tina Douglas (Community Representative) Ann Fagan (President of Friends of SAM) Claire Lerisch (additional attendance)
Apologies:	Kaye Thomson (GSCC –Director, Community) Rosa Purbrick (Community Representative) John Lawry (Community Representative) John McMaster (Friends of SAM Representative)
Note taker:	Whitney Nankervis (Coordinator: SAM Administration)

Item	Standard Items	Action
	Meeting Opened:	1.07pm
1.	Welcome / Apologies: Apologies were received from the following: Kaye Thomson (GSCC –Director, Community), Rosa Purbrick (Community Representative) John Lawry (Community Representative), John McMaster (Friends of SAM Representative)	
2.	Conflict of Interest on Agenda items:	nil

Item	Reports	Action
3.	Minutes from previous meeting: Minutes from the previous meeting, held 5 December 2018, were circulated with the documents for this December meeting. Motion: To accept minutes for the meeting held 5 December 2018 Moved: Fran Smullen Seconded: Tina Douglas	



Shepparton Art
Museum - Advisory C

4.

Acquisitions:

The acquisition assessment document for this acquisition was circulated with the documents for this November meeting. Rebecca Coates will speak to the acquisition assessment document at this February meeting.

ACQUISITIONS

4.1

Cultural Gift

Mary Tonkin - *With the fallen regnans, Kalorama*

RC spoke to the acquisition document. RC discussed the process of negotiation with the artist and Stuart Purves, Australian Galleries. Mary Tonkin is a well-known landscape artist. Tonkin is not currently represented in SAM. RC reminded the committee of the significance of landscape for the collection, having been the focus of the acquisitions during the inception of the SAM collection in 1936.

CH enquired about the size and fragility of the piece. RC noted the work is framed and while the work is large for a ceramic piece, it is modest in relation to paint sizes.



Motion: To accept this acquisition into the SAM Collection

Moved: Kristine Medson

Seconded: Ann Fagan



SAM - Acquisition
Assessment - Mary T

	<p>4.2</p> <p>Donation</p> <p>Stephen Benwell – <i>Various works by Benwell and other artists</i></p> <p>Noted</p> <p>Claire Liersch was invited to speak to the process around the consideration of potential donations for SAM in advance of the presentation to the Advisory Committee. Works offered include pieces from artist; Stephen Benwell; David Ray; Dr Fiona Murphy; Patsy Hely; Peggie Warren; Tom Sanders; Garry Bish and Vipoo Srivilasa. Stephen Benwell's work is currently represented in the SAM collection. These works enable comprehensive understanding of Benwell's professional development across his career.</p> <p>Committee noted that it was most useful and valuable to gain an understanding of the process around potential acquisition and donations prior to presentation to the Advisory Committee. The next Advisory meeting acquisitions assessments will be produced for these pieces and discussed at that time.</p> <p>KM and CH enquired about the process around permissions of donating works of others. RC explained this is part of the provenance research that is undertaken prior to acquisition presentation. In this case the works were gifts to Benwell from the artists.</p>	
5.	<p>SAM Director's Report:</p> <p>5.1 SAM Local</p> <p>There has been a swell in new memberships in the lead up to SAM Local. The SAM Local exhibition has been and continues to be an important outlet for creativity for individuals and supports artist of all ages and demographics. SAM Local also allows community members to engage with the museum who may not have previously been involved</p> <p>5.2 New SAM</p> <p>Cr Chris Hazelman spoke on New SAM. He noted the extra funds have been endorsed by Council at the Council Meeting Tuesday 26 February 2019, and New SAM will be moving forward. The idea of creating a new SAM building had been part of (some) people's thoughts for the last 20 years. However, it was not until 2012 the idea was presented to Council. There have been many pause points to the project, where Councillors have had the opportunity to reflect and endorse. However Councillors have continued to move forward with the project. There has been some social media backlash on the current decision, however, CH is confident that this will fade and those more vocal in support will become more so. CH reminded the Committee of the opposition to Aquamoves and its role now within the community, a core benefit to all. While there is community concern around the number of jobs that the project will offer for local traders, the contractor has a good track record and this is all part of the contract agreement.</p>	

	<p>CH thanked all supporters and Ann Fagan (President of the Friends of SAM)</p> <p>General discussion around the opening. The opening would need to be an inclusive event, for all members of community to participate in, a free event. The first major exhibition should be part of the opening and should be something all members of the community feel that they have access to, with universal appeal.</p> <p>Marketing and Communication have updated the Question and Answer section on the Council website related to the New SAM. To include these recent step in clear, easy to read language.</p> <p>Kristine Medson left meeting – 2.05pm</p> <p>5.3</p> <p>Australian Ceramic Triennial occurs this year and will be held in Hobart, Tasmania. RC will speak as invited keynote speaker, as acknowledgment of SAM's role as pre-eminent at museum in Australia in the ceramics field, and RC's championing of this role and unique position.</p>	
6.	<p>Friends of Shepparton Art Museum Inc. Report:</p> <p>At the last Friends of SAM committee meeting Ann Fagan (President of the Friends of SAM) was delegated to write a letter in support for continuing work for the New SAM to the Councillors.</p> <p>There are more than 500 members of Friends of SAM. Growth in membership can be seen as a reflection of the interest and support of SAM/New SAM. This number is a conservative estimate as AF is currently counting family memberships as 2 people only.</p> <p>John Lawry has communicated his to setup from the Committee. RC to follow up with his son Michael. AF, Friends President discussed ways best to acknowledge JL influence to the Friends.</p>	
7.	<p>Other Matters:</p> <p>7.1 John Lawry – resignation.</p> <p>Advertising for a new community representative will need to be advertised in time.</p>	
8.	Meeting Closed:	2.13pm
9.	Next Scheduled Meeting: Wednesday 3 April 2019	