

Ararat Rural City Council

FLOOD EMERGENCY PLAN

A Sub-Plan of the Municipal Emergency
Management Plan

For Ararat Rural City Council
and
VICSES Ararat, Ballarat and Stawell Units

Version 1, December 2019



Ararat Rural City



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Distribution of MFEP

Once endorsed and signed the, MFEP should be distributed to all MFEP committee members, MEMPC Chair, council, MERO, Deputy MERO, Representatives from; BoM, CMA, DELWP, Parks Victoria, Ambulance Victoria, VicRoads, DHHS, relevant utilities, MFB, MERC, RERC, Police station, VICSES Units, VICSES Regional office, CFA Brigades, CFA Regional office.

Document Transmittal Form / Amendment Certificate

This Municipal Flood Emergency Plan (MFEP) will be amended, maintained and distributed as required or every 3 years facilitated by VICSES in consultation with the Municipal Emergency Management Planning Committee (MEMPC)

Suggestions for amendments to this Plan should be forwarded to VICSES Regional Office via MidWest@ses.vic.gov.au.

The VICSES MFEP template 5.3 was used to develop this Plan.

Amendments listed below have been included in this Plan and updated as a new version.

Amendment Number	Date of Amendment	Amendment Entered By	Summary of Amendment
1.0	May 2019	Gavin Kelly	Translation from old template into VICSES V 5.3 template.
2.0	August 2019	Clare Mintern	Update with minor amendments.
3.0	October 2013	Clare Mintern	Incorporated MEMPC feedback.

This Plan will be maintained on the VICSES website at www.ses.vic.gov.au/get-ready/your-local-flood-information and Ararat Rural City website <https://www.ararat.vic.gov.au/page/HomePage.aspx>

List of Abbreviations & Acronyms

The following abbreviations and acronyms are used in the Plan

AAR	After Action Review	IEMT	Incident Emergency Management Team
AEP	Annual Exceedance Probability	JSOP	Joint Standard Operations Procedure
AHD	Australian Height Datum (the height of a location above mean sea level in metres)	IMS	Incident Management System
AIDR	Australian Institute of Disaster Resilience	LSIO	Land Subject to Inundation Overlay
AIIMS	Australasian Inter-service Incident Management System	MEMO	Municipal Emergency Management Officer
AoCC	Area of Operations Control Centre / Command Centre	MEMP	Municipal Emergency Management Plan
ARI	Average Recurrence Interval	MEMPC	Municipal Emergency Management Planning Committee
ARMCANZ	Agricultural & Resource Management Council of Australia & New Zealand	MERC	Municipal Emergency Response Coordinator
AV	Ambulance Victoria	MERO	Municipal Emergency Resource Officer
BoM	Bureau of Meteorology	MFB	Metropolitan Fire Brigade
CEO	Chief Executive Officer	MFEP	Municipal Flood Emergency Plan
CERA	Community Emergency Risk Assessment	MFEPCC	Municipal Flood Emergency Planning Committee
CFA	Country Fire Authority	MRM	Municipal Recovery Manager
CMA	Catchment Management Authority	PMF	Probable Maximum Flood
RERC	Regional Emergency Response Coordinator	RAC	Regional Agency Commander
RERCC	Regional Emergency Response Coordination Centre	RCC	Regional Control Centre
DHHS	Department of Health and Human Services	RDO	Regional Duty Officer
DELWP	Department of Environment, Land, Water and Planning	SAC	State Agency Commander
EMLO	Emergency Management Liaison Officer	SBO	Special Building Overlay
EMMV	Emergency Management Manual Victoria	SCC	State Control Centre
EMT	Emergency Management Team	SDO	State Duty Officer
ERC	Emergency Relief Centre	SERP	State Emergency Response Plan
EO	Executive Officer	SEWS	Standard Emergency Warning Signal
FO	Floodway Overlay	VICSES	Victorian State Emergency Service
IIA	Initial Impact Assessment		

Part 1. Introduction

1.1 Approval and Endorsement

This Municipal Flood Emergency Plan (MFEP) has been prepared by VICSES, Wimmera CMA, Glenelg Hopkins CMA and Ararat Rural City staff and with the authority of the Ararat Rural City Council Municipal Emergency Management Planning Committee (Ararat Rural City MEMPC) pursuant to Section 20 of the Emergency Management Act 1986 (as amended).

VICSES staff has undertaken consultation with the Ararat Rural City staff, Wimmera CMA staff, Glenelg Hopkins CMA staff and Ballarat VICSES Unit members regarding the arrangements contained within this plan.

This MFEP is a sub plan to the Ararat Rural City Shire Emergency Management Plan (MEMP), is consistent with the Emergency Management Manual Victoria (EMMV) and the Victorian Floodplain Management Strategy (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 Mid West Regional Flood Emergency Plan (RFEP) and the State Emergency Response Plan (SERP) – Flood sub-plan.

This MFEP is a result of the cooperative efforts of the MFPC and its member agencies.

This Plan is approved by the VICSES Regional Manager.

This Plan is endorsed by the Ararat Rural City MEMPC as a sub-plan to the MEMP.

Approval

Stephen Warren

Date 4th December 2019

Grampians Mid West Region VICSES Regional Manager



Endorsement

Cr Peter Beales



Date 31 5/4/2020 2020

Chair – Municipal Emergency Management Planning Committee

1.2 Purpose and Scope of this Flood Emergency Plan

The purpose of this MFEP is to detail arrangements agreed for managing a flood emergency before, during and after it occurs or potentially occurs within Ararat Rural City.

As such, the scope of the Plan is to:

- Identify the local flood risk;
- Support the implementation of mitigation and planning measures to minimise the causes and impacts of flooding;
- Detail emergency management arrangements;
- Identify linkages with Local, Regional and State emergency and wider planning arrangements with a specific emphasis on those relevant to flood.

1.3 Municipal Flood Planning Committee (MFPC)

Membership of the Ararat Rural City Flood Planning Committee (MFPC) comprises of the following representatives from the following agencies and organisations:

- VICSES (i.e. Unit Controller & Regional Officer – Emergency Management) (Chair),
- Council (i.e. Municipal Emergency Manager, Drainage Engineer, Statutory Planning Officer)
- Victoria Police (i.e. Municipal Emergency Response Co-ordinator) (MERC),
- Catchment Management Authority (CMA), - Wimmera and Glenelg Hopkins
- Department of Health and Human Services (DHHS) as required,
- Department of Environment, Land, Water and Planning (DELWP) as required,
- Grampians Wimmera Mallee Water
- Bureau of Meteorology as required,
- Local community representatives and
- CFA as required

1.4 Responsibility for Planning, Review & Maintenance of this Plan

This MFEP must be maintained in order to remain effective.

VICSES through the MFPC has responsibility for facilitating the preparation, review, maintenance and distribution of this plan.

The MFPC will meet at least once per year. The plan should be reviewed following:

A new flood study;

A significant change in flood mitigation measures;

After the occurrence of a significant flood event within the Municipality;

Or if none of the above occur, every 3 years.

Part 2. BEFORE: Prevention / preparedness arrangements

2.1 Community Engagement and Awareness

Details of this MFEP will be released to the community through; local media, any FloodSafe engagement initiatives and websites (VICSES and the Municipality) upon formal adoption by VICSES and the Municipality. VICSES with the support of Ararat Rural City, Wimmera and Glenelg Hopkins CMA's will coordinate targeted community flood engagement programs within the council area.

Refer to appendix H (LFG and FloodSafe Information. Attach any broader FloodSafe details).

2.2 Structural Flood Mitigation Measures

There are no structural flood mitigation measures within the Ararat Rural City area.

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. It is recommended that the MFEP is exercised on annual basis and reviewed in line with Section 1.4.

2.3.2 Flood Warning

Arrangements for Bureau issued Flood Watch and Flood Warning products are contained within the SERP Sub Plan – Flood (www.ses.vic.gov.au/em-sector/vicses-emergency-plans) and on the Bureau of Meteorology (BoM) website www.bom.gov.au.

Details on Warnings issued by VICSES through VicEmergency and VICSES channels are outlined in **Appendix D**.

2.3.3 Local Knowledge

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 H**.

Part 3. DURING: Response arrangements

3.1 Introduction

3.1.1 Activation of Response

Flood response arrangements may be activated by the Regional Duty Officer (RDO) VICSES – Mid West Region or Regional Agency Commander (RAC).

The VICSES Incident Controller (IC)/RDO will activate agencies as required as documented in the State Emergency Response Plan - Flood.

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 Ararat Rural City . These agencies will be engaged through the IEMT (Incident Emergency Management Team) when enacted or via the RAC when the IEMT is not enacted.

The general roles and responsibilities of supporting agencies are as agreed within the: MEMP, EMMV (Part 7 'Emergency Management Agency Roles') and SERP Sub Plan - Flood and Regional Flood Emergency Plan.

3.1.3 Emergency Coordination Centre or equivalent

If established, liaison with the emergency coordination centre will be through the established Division/Sector Command and through Municipal involvement in the IEMT, in particular the Municipal Emergency Response Coordinator (MERC). The VICSES RDO / ICC will liaise with the centre directly if no Division/Sector Command is established.

The function, location, establishment and operation of an emergency coordination centre if relevant will be as detailed in the MEMP.

3.1.4 Escalation

Many 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 Part 3 of the EMMV.

3.2 The six C's

Arrangements in this MFEP must be consistent with the 6 C's detailed in State and Regional Flood Emergency Plans and the MEMP. For further information, refer to Part 3 of the EMMV.

- **Command:** Overall direction of response activity in an emergency.
- **Control:** Internal direction of personnel and resources within an agency.
- **Coordination:** Bringing together agencies and resources to ensure effective preparation for response and recovery.
- **Consequence:** Management of the effect of emergencies on individuals, communities, infrastructure and the environment.
- **Communication:** Engagement and provision of information across agencies and proactively with the community around preparation, response and recovery in emergencies.
- **Community Connection:** Understanding and connecting with trusted networks, leaders and communities around resilience and decision making.

Specific details of arrangements for this plan are to be provided in **Appendix C**.

3.2.1 Control

Functions 5(a) and 5(c) at Part 2 of *the Victoria State Emergency Service Act 1986 (as amended)* detail the authority for VICSES to plan for and respond to flood.

Part 7 of the EMMV prepared under the *Emergency Management Act 1986 (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 Ararat Rural City including those arising from a dam failure or retarding basin / levee bank failure incident will therefore be under the control of the appointed IC, or delegated representative.

3.2.2 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 IC responsibilities are as defined in Part 3 of the EMMV.

3.2.3 Incident Control Centre (ICC)

As required, the IC 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 ICC locations are available in the MEMP.

3.2.4 Divisions and Sectors

To ensure that effective Command and Control arrangements are in place, the IC may establish Divisions and sectors depending upon the complexity of the event and resource capacities.

The following Divisions and Sectors may be established to where applicable to assist with the management of flooding within the Municipality:

Incident Level	ICC / ICP	Division	Division Control Point	Sector	Sector Control Point
Level 2-3	Horsham ICC	Ararat	Ararat LHQ	East	TBD as needed
			Ararat LHQ	West	TBD as needed
		Moyston	Ararat LHQ	TBD as needed	TBD as needed
		Pomonal	Ararat LHQ	TBD as needed	TBD as needed
		Wickliffe	Willaura CFA	TBD as needed	TBD as needed
Level 1	Ararat LHQ				

3.2.5 Incident Management Team (IMT)

The IC will form an Incident Management Team (IMT).

Refer to Part 3 of the EMMV for guidance on IMTs and Incident Management Systems (IMs).

3.2.6 Incident Emergency Management Team (IEMT)

The IC will establish a multi-agency Incident Emergency Management Team (IEMT) to assist the flood response. The IEMT consists of key personnel (with appropriate authority) from stakeholder agencies and relevant organisations who need to be informed of strategic issues related to incident control. They are able to provide high level strategic guidance and policy advice to the IC for consideration in developing incident management strategies.

Organisations, including Ararat Rural City, required within the IEMT 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 3 of the EMMV for guidance on IEMTs.

3.2.7 On Receipt of a Flood Watch / Severe Weather Warning

SOP008 and SOP009 outline in detail the actions to be undertaken upon receipt of a Flood Watch/Flood Warning or Severe Weather Warning. VICSES RDO (until an incident controller is appointed) or IC will undertake actions as defined within the flood intelligence cards (**Appendix C**). General considerations by the IC/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 IEMT) and open if required
- Ensure flood warnings and community information is prepared and issued to the community where required
 - Flood (Riverine and flash) Warnings are managed by the RDO/RAC
 - Severe Weather/ Thunderstorm warnings are managed by SDO/SAC
- Develop media and public information management strategy
- Monitor watercourses and undertake reconnaissance of low-lying areas
- Ensure flood mitigation works are being checked by owners
- Develop and issue incident action plan, if required
- Develop and issue situation report, if required

3.2.8 On Receipt of the First and Subsequent Flood Warnings

VICSES RDO (until an incident controller is appointed) or IC will undertake actions as defined within the flood intelligence cards (**Appendix C**). General considerations by the IC/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

3.3 Initial Impact assessment

Initial impact assessments will 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. Initial recovery planning will be undertaken by the Ararat Rural City Council. DHHS will assist. This information may then be used to provide the basis for further needs assessment and recovery planning by DHHS and recovery agencies.

3.4 Preliminary Deployments

When flooding is expected to be severe enough to cut access to towns, suburbs and/or communities the IC 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.

3.5 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 Emergency Response Plan - Flood.

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. Advice should be given to not attempt to flee by entering floodwater if they become trapped, it may be safer to seek the highest point within the building and to telephone 000 if they require rescue.
4. For buildings known to be structurally un-suitable 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.
6. Contact the Ararat Rural City MERC and MERO at the earliest opportunity to allow for relief preparation to commence.

Due to the rapid development of flash flooding it will often be difficult, to establish relief centres ahead of actually triggering the evacuation. This is normal practice but this is insufficient justification for not adopting evacuation.

Refer to **Appendix C** for response arrangements for flash flood events.

3.6 Evacuation

The IC decides whether to warn people to evacuate or if it is recommended to evacuate immediately.

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 EMMV Part 8, Appendix 9 and the Evacuation Guidelines for guidance of evacuations for flood emergencies.

Refer to **Appendix C** of this Plan and the MEMP for additional local evacuation considerations for the municipality.

3.7 Flood Rescue

VICSES may conduct flood rescues. 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.

Victoria Police Rescue Coordination Centre should be notified of any rescues that occur: (03) 9399 7500

The following resources are available within Ararat Rural City to assist with rescue operations:

- Flood Rescue boats are located at Ballarat Regional Office and the Ballarat Unit.
- Ballarat, Bacchus Marsh and Ararat has a land based Swift Rescue Team.
- HEMS 4 Rescue helicopter is located at Stawell.

3.8 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 IC

The IC may request aircraft support through the State Air Desk located at the SCC will establish priorities.

Suitable airbase facilities are located at:

- Stawell Aerodrome, Aerodrome Road, west of Stawell. DELWP has a dedicated firebombing airbase facility that could be used as an airbase during flood events.

3.9 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.

3.10 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 Ararat Rural City Council maintains a small stock of sandbags that will be made available at community collection points in Ararat and Wickliffe, refer to Appendix G for location maps and further details. Back-up sandbag supplies are available through the VICSES Regional Headquarters. The IC will determine the priorities related 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 in consultation with the CMA, LGA and VICPOL and within appropriate approval frameworks.

The IC will ensure that owners of Essential Community Infrastructure are kept advised of the flood situation. Essential Community Infrastructure providers must keep the IC informed of their status and ongoing ability to provide services.

Contact your local VICSES representative for the most current Sandbag Guidelines or download it from IMT Toolbox in EMCOP- Operations.

Refer to **Appendix C** for further specific details of essential infrastructure requiring protection and location of sandbag collection points.

3.11 Disruption to Services

Disruption to services other than essential community infrastructure and property can occur in flood events. Refer to **Appendix C** for specific details of likely disruption to services and proposed arrangements to respond to service disruptions in Ararat Rural City.

3.12 Road Closures

Ararat Rural City and Regional Roads Victoria 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. Ararat Rural City staff should also liaise with and advise Regional Roads Victoria as to the need or advisability of erecting warning signs and / or of closing roads and bridges under its jurisdiction. Regional Roads Victoria is responsible for designated main roads and highways and councils are responsible for the designated local and regional road network.

Regional Roads Victoria and the Ararat Rural City will communicate community information regarding road closures. Information will be updated on the VIC Traffic website: <https://traffic.vicroads.vic.gov.au/>

Refer to **Appendix C** for specific details of potential road closures.

3.13 Dam Spilling/ 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.

DELWP have developed Dam Safety Emergency Plans for municipalities where it is applicable.

Major dams with potential to cause structural and community damage within the Municipality are contained in **Appendix A**. The main Lake that influences flooding within Ararat Rural City Council is Greenhill Lake. Key actions needed when Greenhill Lake spills are listed in **Appendix C1**.

3.14 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 responsibility agency for the critical sewerage asset 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.

It is the responsibility of the Ararat Rural City Environmental Health Officer to inspect and report to the MERO and the ICC on any water quality issues relating to flooding.

3.15 Access to Technical Specialists

VICSES Manages contracts with private technical specialists who can provide technical assistance in the event of flood operations or geotechnical expertise. Refer to VICSES SOP061 for the procedure to engage these specialists.

3.16 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. AFTER: Emergency relief and recovery arrangements

4.1 General

Arrangements for recovery from a flood incident within the Ararat Rural City is detailed in the Ararat Rural City MEMP.

4.2 Emergency Relief

The decision to recommend the opening of an emergency relief centre sits with the IC. The IC is responsible for ensuring that relief arrangements have been considered and implemented where required under the State Emergency Relief and Recovery Plan (Part 4 of the EMMV).

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 details of the range of emergency relief services that may be provided.

Suitable relief facilities identified for use during floods are detailed in **Appendix D** and the MEMP.

Details of the relief arrangements are available in the MEMP.

4.3 Animal Welfare

Matters relating to the welfare of livestock and companion animals (including feeding and rescue) are to be referred to Agriculture Victoria.

Requests for emergency supply and/or delivery of fodder to stranded livestock or for livestock rescue are passed to Agriculture Victoria.

Matters relating to the welfare of wildlife are to be referred to DELWP.

4.4 Transition from Response to Recovery

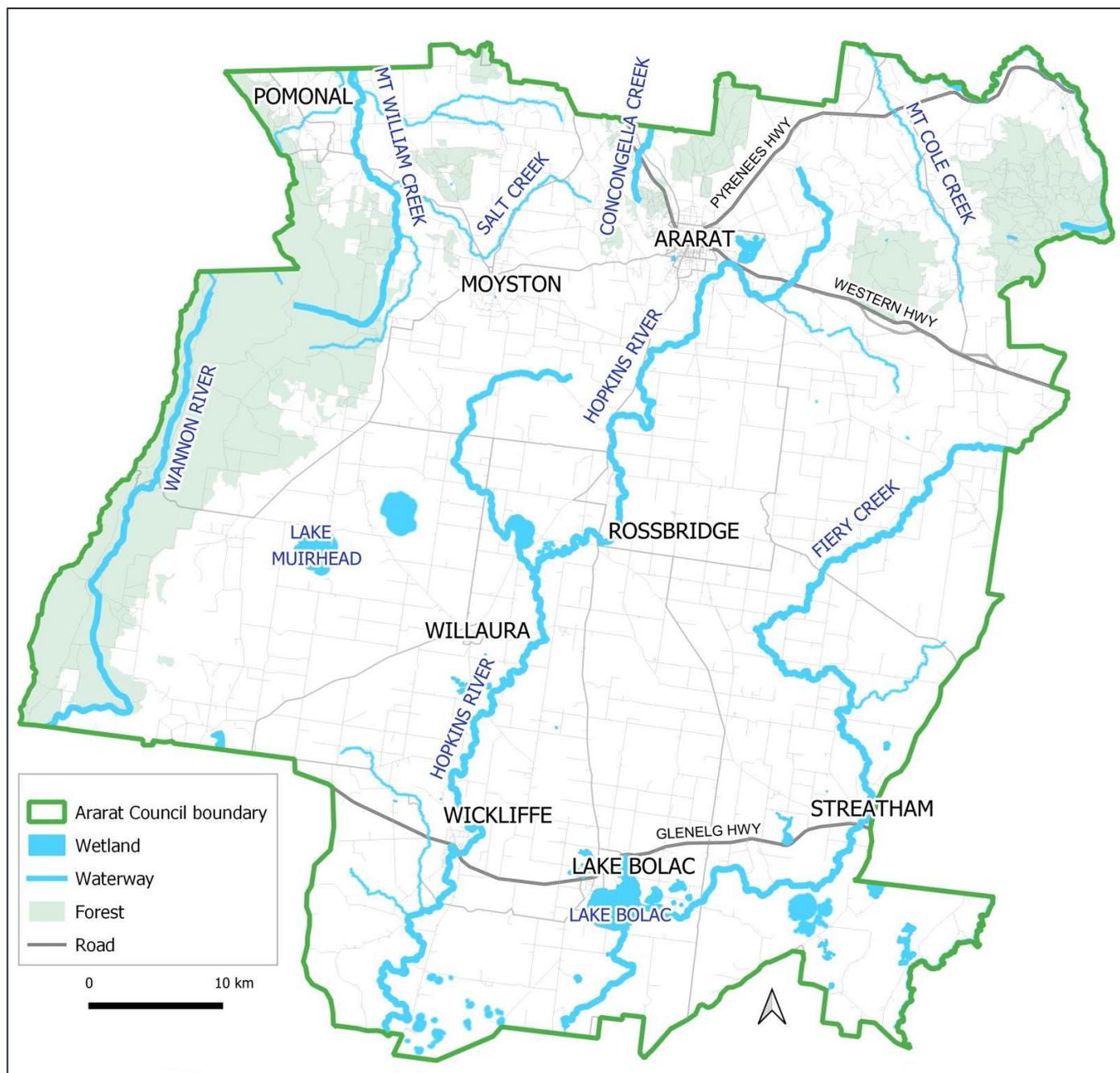
VICSES as the Control Agency is responsible for ensuring effective transition from response to recovery. This transition will be conducted in accordance with existing arrangements as detailed in Part 3 of the EMMV or location of the transition arrangements are available in the MEMP.

Appendix A: Ararat Flood Threats

This Appendix is to provide a broad overview of flood risk within the Municipality. Detailed Flood Risk Information for Individual Communities should be detailed in **Appendix C**.

5.1 Riverine Flooding

The Ararat Rural City Council has a long history of riverine flood events. Towns impacted by riverine flooding include; Ararat, Wickliffe, Pomonal and Moyston. Flooding affects a large number of buildings, many roads often causing significant damage and risk to life. Significant areas of farmland surrounding these towns are also prone to flooding within the Hopkins River and Mount William Creek floodplain. Refer to the map below.



5.2 Major Waterways

The major waterways within the Ararat Rural City Council are listed in the table below.

Waterway	Description
Hopkins River	The Hopkins River has a catchment area of 1,347 km ² . The upper catchment area of the Hopkins River includes the Grampians National Park and the western uplands areas around Ararat. The majority of the catchment is flat with the Hopkins River meandering across a low grade floodplain. Antecedent conditions within the catchment play an important role in the losses within the catchment due to the flat nature and multiple storages along the tributaries of the Hopkins River.
Mount William Creek	Mount William Creek drains the eastern slope of the Mount William Mountain Range of the Grampians National Park. The Mount William Creek Catchment has an approximate area of 1,450 km ² . Towns within the Catchment include Pomonal and Moyston. Moyston is located south of Salt Creek, a tributary of Mount William Creek. Millers Creek flows through Pomonal, also a tributary of Mount William Creek.
Millers Creek	Millers Creek drains the eastern slope of the Mount William Mountain Range of the Grampians National Park. West of Pomonal Millers Creek is very steep and incised. The capacity of Millers Creek is large enough to contain flows of most flood events until it reaches Pomonal Road where the landscape flattens and flood flow becomes broad and shallow. Flooding east of Pomonal frequently cuts access to roads during small flood events, 5 year ARI events.
Fiery Creek	Fiery Creek drains the south eastern slope of Mount Cole and the Mount Cole-Beeripmo State Forest. Fiery Creek flows south through Raglan and Streatham, terminating in Lake Bolac to the south of the Ararat Rural City Council.

Flood History

Flood events within the Ararat Rural City Council have been infrequent over the last decade. The most significant recent flood event was recorded in 2011, refer to a list of significant flood events below.

Year	Description
2019	Ararat experienced a flash flood event in February 2019, severely impacting the Ararat College (Barkly Street). This event caused damage in excess of \$100,000.
2012	Flooding impacted Mount William Creek.
January 2011	This is the largest flood on record, causing extensive damage in Ararat, Moyston, Pomonal, Wickliffe and surrounding farmland within the floodplain. Mount William recorded 279mm over four days, causing extensive damage to buildings, roads, fences, and farmland.
September 2010	This event was smaller than the 2011 flood event, causing minor flooding in Mount William Creek and the Hopkins River.
2002	Flooding impacted Mount William Creek.
1997	Flooding impacted Mount William Creek.
1996	Flooding impacted Mount William Creek.
1992	Flooding impacted Mount William Creek.

1989	Flooding impacted Ararat and along the Hopkins River.
1982	Flooding impacted Ararat and along the Hopkins River.
1975	Flooding impacted Mount William Creek.
1957	Flooding impacted Mount William Creek.
1956	Flooding impacted Mount William Creek.
1933	Flooding impacted Ararat and along the Hopkins River.
1922	Flooding impacted Mount William Creek.
1909	Major flooding occurred in Wickliffe and along the Hopkins River and Mount William Creek.

5.3 Building Damages

Refer to the table below for property and building damages for flood events within the Ararat Rural City Council. The table also provides an indication of when a Level 2 and 3 Incident Control Centre (ICC) will be required, based on the number of above floor damages.

Average Recurrence Interval (ARI)	Total number of properties flooded (buildings flooded above floor)				Total damages for the Ararat Rural City Council.
	Ararat (Appendix C1)	Moyston (Appendix C2)	Pomonal (Appendix C3)	Wickliffe (Appendix C4)	
5	9 (2)			0 (0)	9 (2)
10	15 (3)			0 (0)	15 (3)
20	44 (9)			0 (0)	44 (9)
50	68 (24)			2 (0)	70 (24)
100	90 (38)			9 (3)	99 (41)
200	103 (45)			12 (6)	115 (51)
500				16 (11)	
Probable Maximum Flood		3 (3)	2 (2)	16 (16)	

 Level 2 ICC
 Level 3 ICC

5.4 Dams or Lakes that influence flooding

Dams or lakes that influence flooding within the Ararat Rural City Council area are listed below.

Location	Owner	Full Supply level/volume	Comments
Greenhill Lake Reservoir, Western Highway, east of Ararat.	Ararat Rural City Council	4,555 ML	Greenhill Lake Reservoir is located 4 km to the east of Ararat has a maximum storage volume of 4,555 ML. The Lake is fed by several small tributaries of the Hopkins River. The spillway is a 60m broad-crested weir, located to the south-western corner of the Lake. During flood events the Lake often spills and cuts access downstream along the Western Highway. For location maps and further detail refer to Appendix C1.
Oliver's Gully Reservoir, Tobin Street, Ararat.	GWMWater	340 ML	This is a small storage located west of Ararat. It's a secondary storage which no longer receives runoff from the upstream catchment. This Reservoir provides potable water supply for Ararat. A spillway on the north east corner enables spilling of high flows to the South Drainage Line. This storage has little impact on flooding in Ararat.
Alexandra Lake, Vincent Street, Ararat.	Ararat Rural City Council	< 30 ML	This Lake receives stormwater from the local drainage network. During significant flood events the Lake can spill, causing minor nuisance flooding across Vincent Street to the east of the Lake. This Lake has little impact on flooding in Ararat.

Refer to Appendix C1 for more detail regarding Ararat lakes and reservoirs.

5.5 Levees

There are no formal levees within the Ararat Rural City Council.

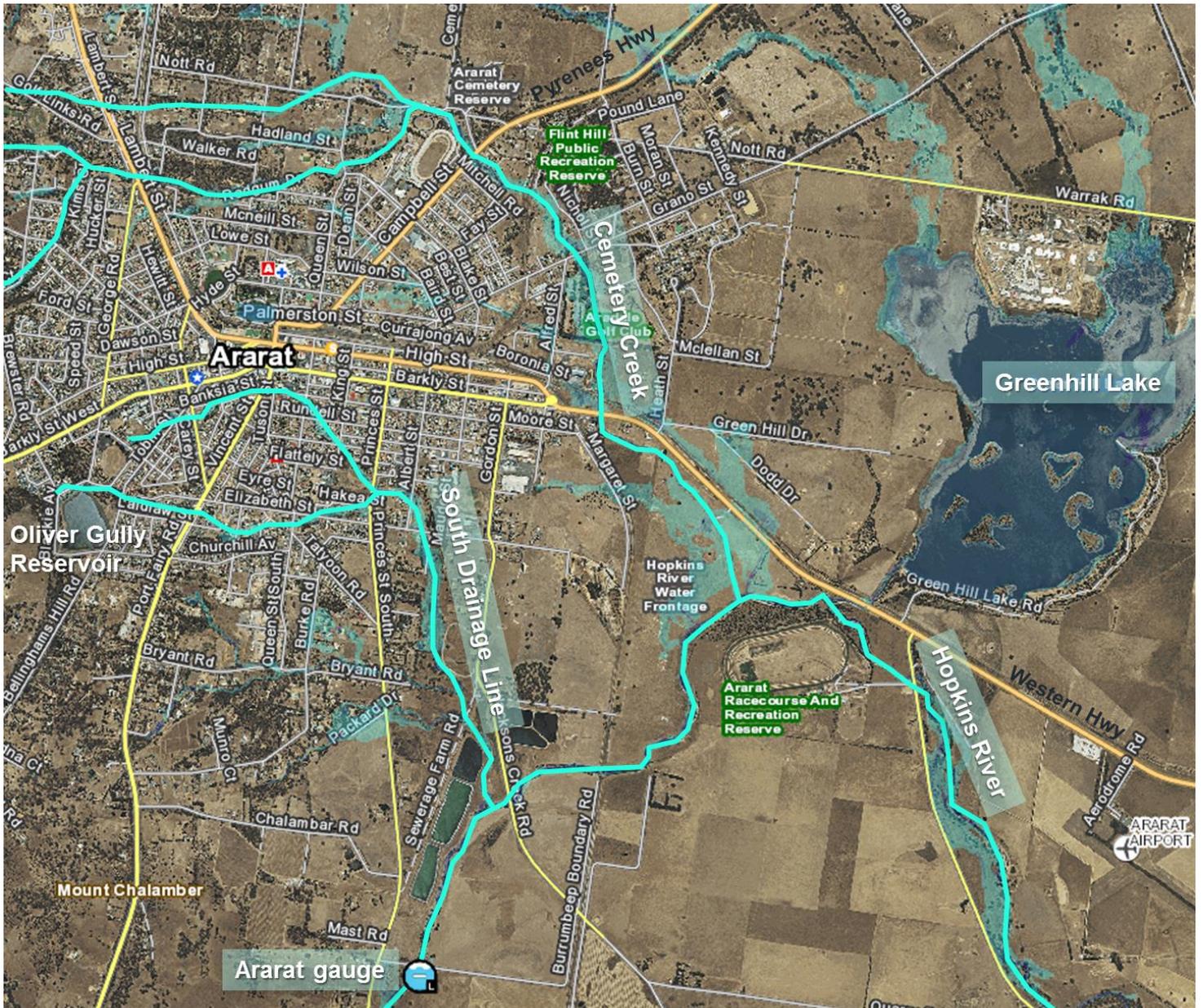
Appendix B: Typical flood peak travel times

Source (Mid West Catchment Flood Intelligence Summary)

Location From	Location To	Typical Travel Time	Comments	Duration
Ararat (Hopkins River)				
Start of rainfall (upper catchment)	Ararat	1 - 2 hours	Begin to rise from normal levels	18 - 20 hours
Start of rainfall (upper catchment)	Ararat	6 - 10 hours	To peak	
Moyston (Mt William Creek)				
Start of rainfall (upper catchment)	Moyston	2 - 4 hours	Begin to rise from normal levels	18 - 20 hours
Start of rainfall (upper catchment)	Moyston	4 - 8 hours	To peak	
Pomonal (Mt William Creek tributaries)				
Start of rainfall (upper catchment)	Pomonal	2 - 4 hours	Begin to rise from normal levels	18 - 20 hours
Start of rainfall (upper catchment)	Pomonal	4 - 8 hours	To peak	
Wickliffe (Hopkins River)				
Start of rainfall (upper catchment)	Wickliffe	6 - 8 hours	Begin to rise from normal levels	20 - 26 hours
Start of rainfall (upper catchment)	Wickliffe	24 - 68 hours	To peak	

Appendix C1: Ararat Flood Emergency Plan

Several small tributaries to the Hopkins River flow through Ararat. The most significant of these is Cemetery Creek. Cemetery Creek flows from west to east around the northern extent of Ararat then turns to the south flowing into the Hopkins River at the Ararat Racecourse. A smaller tributary known as the South Drainage Line is located in the south of Ararat and flows into the Hopkins River further downstream near the waste water treatment facility (Sewerage Farm Road). The catchment area of the Hopkins River upstream of Ararat is approximately 236 km² and includes sections of the Langhi Ghiran State Park and western uplands areas.



Historic Flood Events

Ararat has a long history of flooding occurring from both the Hopkins River and the smaller tributaries. Notable flood events include 1933, 1982, 2010, 2011 and 2019.

The January 2011 flood event is considered the largest event on record in the Hopkins River catchment. During 2011 flood event flooding overtopped the Western Highway and inundated the Ararat Racecourse. Flooding was also observed in the Cemetery Creek and some of the other tributaries that pass through Ararat.



Flooding east of Ararat along the Western Highway (downstream of Greenhill Lake) during the January 2011 flood (Water Technology 2011).



Flooding east of Ararat along the Western Highway (adjacent to Heath Street) during the January 2011 flood (Water Technology 2011).

During the February 2019 flood event, flooding severely impacted the Ararat College (Barkly Street) causing damage to a number of buildings. Repair costs were in excess of \$100,000, refer to flood photos below.



Flooding impacting the Ararat College during the February 2019 flood event.

Flood Warning and Triggers

Flooding in the local tributaries around Ararat including Cemetery Creek and South Drainage Line has relatively short duration. Critical durations for design flood modelling indicated the 1-2 hour storms result in the most critical flooding (Water Technology 2017). The local tributaries generally peak within 3-4 hours from commencement of rainfall. Flood flow down the Hopkins River is relatively slow taking several hours to rise and 6 to 10 hours to peak.

Riverine flooding from the Hopkins River has little impact on the study area with only road closures and closure of the Ararat Racecourse as the main impacts. Given the Ararat stream gauge on the Hopkins River is downstream of Ararat, it doesn't provide warning for Ararat. However the Ararat stream gauge does provide an indication of the flood magnitude of events that occur in Ararat.

The Ararat Prison rain gauge (pluviograph measures rainfall intensity) is the only monitoring gauge that provides an indication of flood warning. However, there are properties that may experience above floor flooding in a relatively short time after the onset of rain, 3-4 hours. Due to the short warning time available, it's important that VICSES takes action to door knock houses with high flood risk (the first 3 houses impacted by over floor flooding: 24 Packard Drive, 28 Queen Street and 52 King Street) when a heavy rainfall events are predicted that may lead to flooding.

Lakes and Storages

The only significant storage that influences flooding in Ararat is Greenhill Lake. Greenhill Lake has a maximum storage volume of 4,555ML and is located 4km east of Ararat. The Lake is fed by several small tributaries of the Hopkins River. The spillway is a 60m broad-crested weir, located to the south-west corner of the Lake, refer to photo below. There is a lack of data available regarding the stage-storage relationship.



Oliver's Gully Reservoir is a smaller water storage located in the west of Ararat. It's a GWM Water secondary storage which no longer receives runoff from the upstream catchment. It has been considered offline for the purpose of the Ararat Flood Investigation (Water Technology 2017)

Flood Impacts and Actions Required

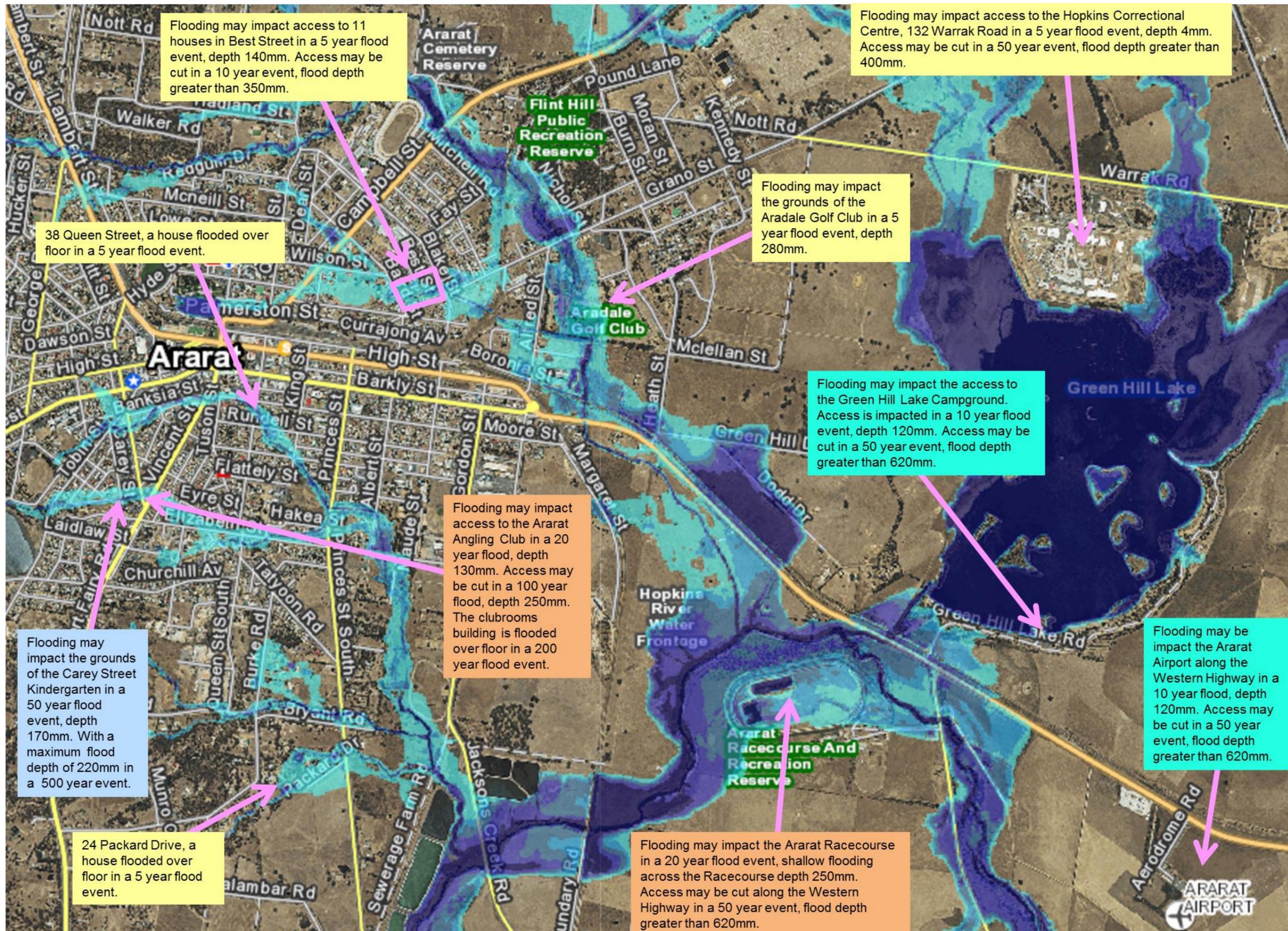
Key assets at risk of flooding in Ararat are listed in the table below.

Asset register				
Asset Name and location	Average Recurrence Interval (ARI)	Consequence / Impact	Mitigation/ Action	Lead Agency
Buildings at 38 Queen Street and 24 Packard Drive	5 year flood	Buildings at 38 Queen Street and 24 Packard Drive may be flooded above floor.	Sandbag buildings as needed. Ensure the Council relief Centre is on stand -by.	VICSES Council
Aradale Golf Club, Grano Street.	5 year flood	Flooding begins to impact the grounds of the Aradale Golf Club during a 5 year flood event, depth 0.28m	Notify the Aradale Golf Club that the grounds may be impacted by flooding.	Council
Ararat Railway Line (adjacent to the Ararat Racecourse)	5 year flood	Flooding begins to impact the Railway Line during a 5 year flood event, depth 0.26m. Access may be cut during a 10 year flood, depth 0.76m.	Notify VLINE that the Railway Line may be impacted by flooding.	VLINE
A building at 52 King Street.	10 year flood	An additional building at 52 King Street may be flooded above floor.	Sandbag buildings as needed.	VICSES Council
Western Highway	10 year flood	Access is impacted by flooding during a 10 year flood event, depth 0.12m. Access is cut during a 50 year flood, depth 0.62m.	Deploy road closure signs and undertake traffic management as needed.	Regional Roads Victoria
Ararat Airport	10 year flood	Access is impacted by flooding during a 10 year flood event, depth 0.12m. Access is cut during a 50 year flood, depth 0.62m.	Notify the Ararat Airport managers that access may be impacted by flooding.	Council
13 houses in Best Street (refer to maps below for houses impacted)	10 year flood	Access is cut to 13 houses in Best Street during a 10 year flood event, depth 350mm.	Evacuate houses before access is cut.	Victoria Police
Ararat Angling Club, 5 View Point Street	20 year flood	Access may be impacted by flooding during a 20 year flood, depth 0.13m. Access may be cut during a 100 year flood, depth 0.25m. The clubrooms are flooded above floor during a 200 year flood.	Notify the Ararat Angling Club that access may be impacted by flooding.	Council
Ararat Racecourse and Recreation Reserve, 8679 Western Highway	20 year flood	Breakouts from the Hopkins River causes shallow flooding 0.25m across the Racecourse during a 20 year flood event. Access is cut to the Racecourse along the Western Highway during a 50 year flood, 0.62m depth.	Notify the Ararat Racecourse that access may be impacted by flooding.	Council
Green Hill Lake Campground, Green Hill Lake Road	50 year flood	Access is impacted by flooding during a 10 year flood event, depth 0.12m. Access is cut during a 50 year flood, depth 0.62m.	Notify campers that access may be impacted by flooding. Evacuate before access is cut during a 50 year flood.	Council
Carey Street Kindergarten, 11 Carey Street	50 year flood	The grounds of the Carey Street Kindergarten begin to be impacted by shallow flooding during a 50 year flood event, depth 0.17m. With a maximum depth of 0.22m during a 500 year flood event.	Notify Carey Street Kindergarten that the grounds may be impacted by flooding.	Council
Hopkins Correctional Centre, 132 Warrak Road.	50 year flood	Access is impacted by shallow flooding during a 5 year flood event, depth 0.04m. Access is cut during a 50 year flood, depth 0.40m. The grounds of the Correctional Centre are not impacted by flooding.	Notify the Correctional Centre that access may be impacted by flooding.	Department of Justice

For more detailed information regarding buildings and roads impacted refer to the Ararat Flood Intelligence Card and flood impact maps below. Also refer to the Ararat flood depth maps in **Appendix E**.



Ararat roads impacted by flooding over the 200 year ARI flood extent.

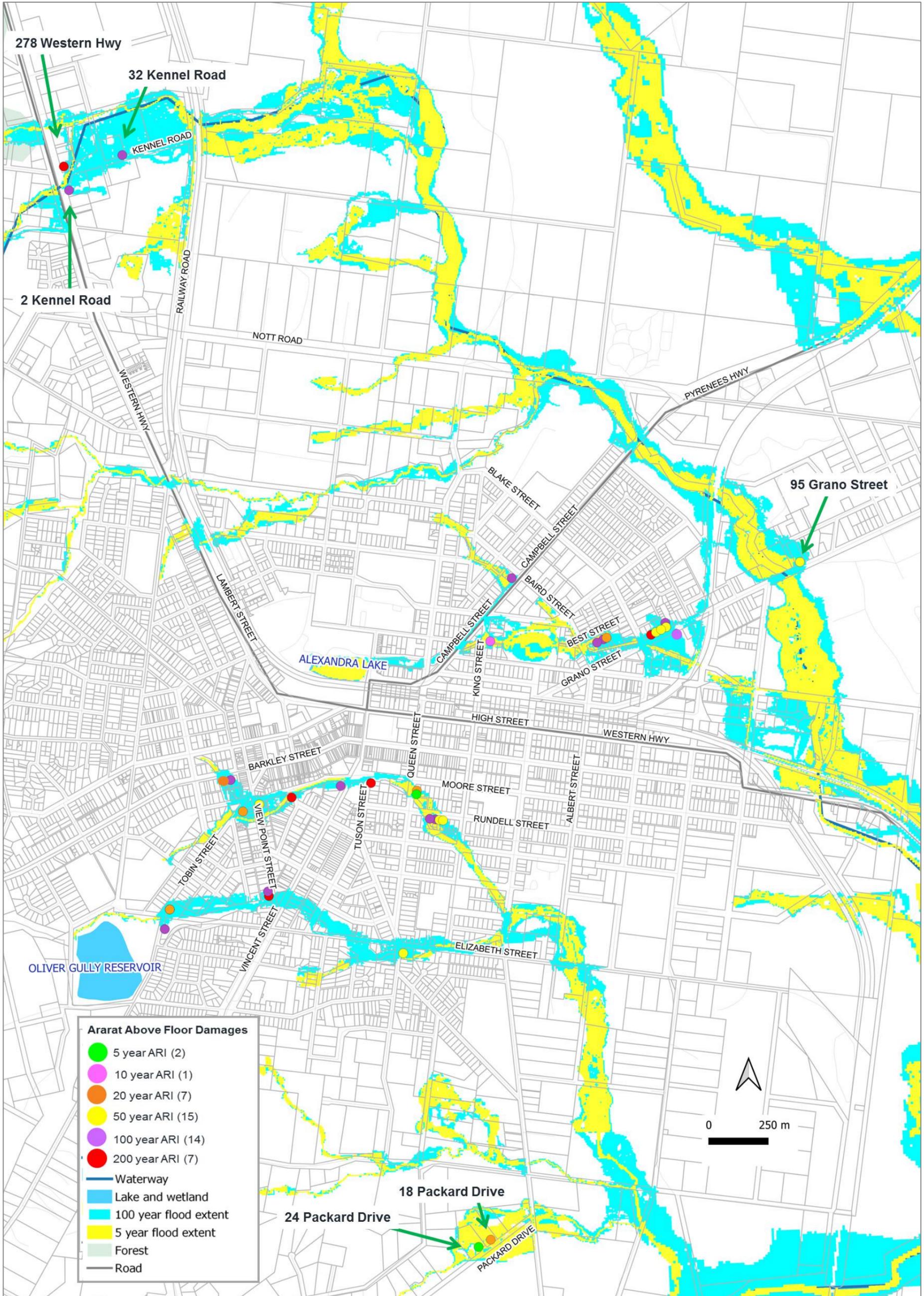


Ararat assets impacted by flooding over the 200 year ARI flood extent.

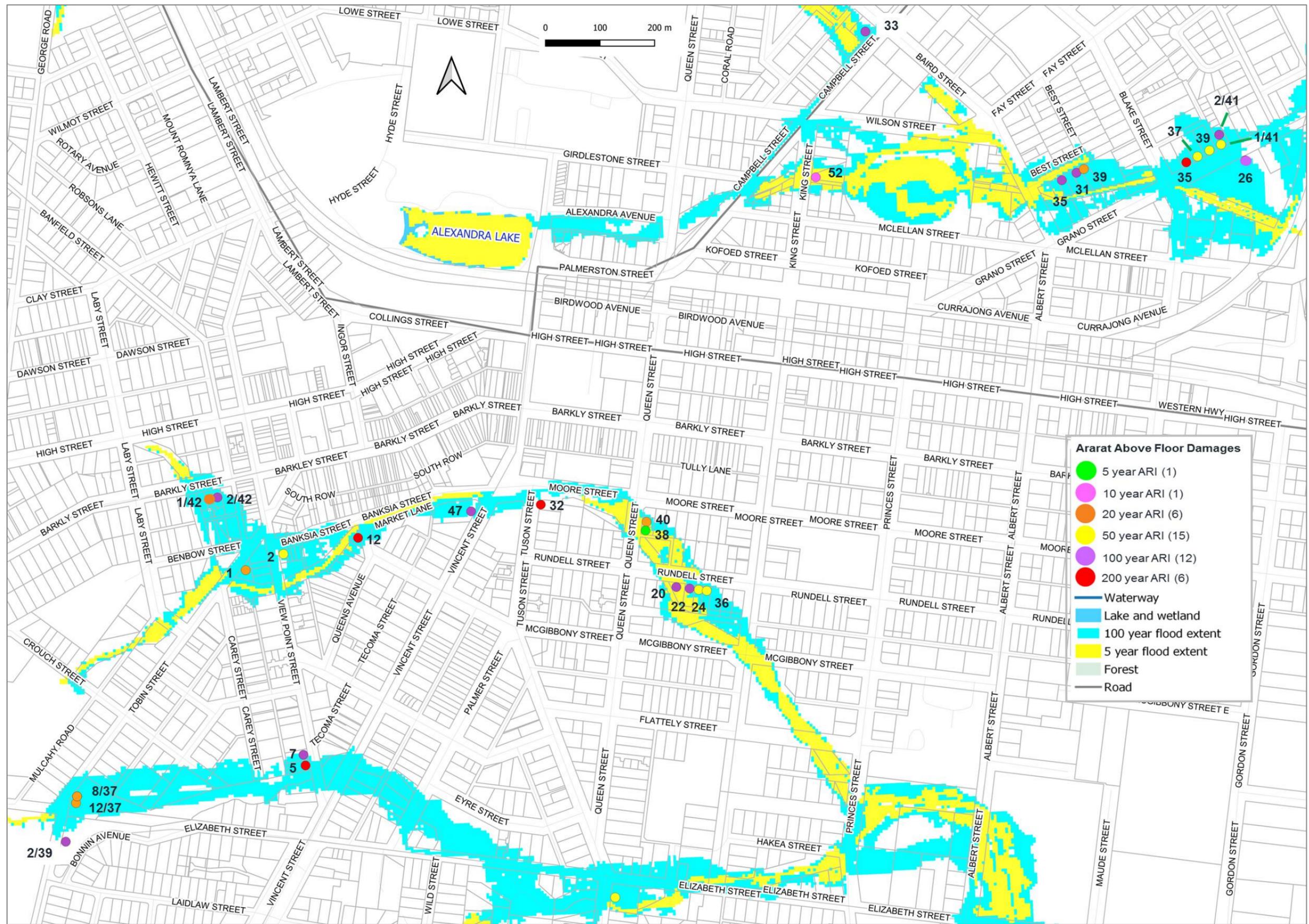
Ararat Flood Intelligence Card (Hopkins River)

Flood travel time					Time from start of rain to steep rise in floodwater 1 - 2 hours			
					Time from start rainfall to flood peak 6 - 10 hours			
					Riverine flooding duration: 20 hours			
Observed rainfall (mm)	Hopkins River, Ararat gauge height 236219 (m)	Average Recurrence Interval (ARI) (Water Tech 2017)	Hopkins River at Ararat design flows (ML/d)	Ararat total number buildings flooded (above floor) Water Tech 2017	Consequence / Impact	Houses/ buildings flooded / isolated	Roads Impacted	Action Actions may include (but not limited to) Evacuation, closure of road, sandbagging, issue warning and who is responsible
~25 mm in 1 hour to ~55 mm in 12 hours	2.08	5	1,495	9 (2)	Properties in Queen Street (South drain), Lobella Drive and Packard St are impacted. Warrak Road begins overtopping. Shallow flooding across Pyrenees Highway (near corner of Noahs Ark Rd). Significant overbank flooding along the Hopkins River.	X2 buildings are flooded above floor: 38 QUEEN STREET, 24 PACKARD DRIVE	Western Highway depth 0m Princes Street/Tatooon Road depth 0.15m Campbell Street (Pyrenees Hwy) 0.3m Grano Street depth 0m Elizabeth Street depth 0m Railway line depth 0.26m	VICSES activate CFA ground observers to take photos and record flood levels at key crossings. Council and Regional Roads Victoria to deploy road closure signs and undertake traffic management as needed. VICSES sandbag buildings as needed. Victoria Police evacuate buildings as needed. Council clear debris from waterway crossings, drains and culvers as needed.
54 to 62 mm over a 40 hour period	2.48	August 2010	2,333		Flooding recorded in Cemetery Creek.			Refer to actions listed above.
~30 mm in 1 hour to ~65 mm in 12 hours	2.66	10	2,756	15 (3)	A property in King Street (north drain) is impacted. Queen, King, Princes and Albert Streets are impacted (south drain). Warrak Road overtopping.	X1 additional building is flooded above floor: 52 KING STREET	Western Highway depth 0.12m Princes Street/Tatooon Road depth 0.18m Campbell Street (Pyrenees Hwy) 0.41m Grano Street depth 0m Elizabeth Street depth 0m Railway line depth 0.76m	Refer to actions listed above.
33 to 54 mm over a 28 hour period	2.82	September 2010	3,197		Flooding recorded in Cemetery Creek.			Refer to actions listed above.
~35 mm in 1 hour to ~75 mm in 12 hours	3.31	20	5,728	44 (10)	Flooding across Grano Street from Cemetery Creek. Breakouts from the Hopkins River, across the race track.	X6 additional buildings are flooded above floor: X3 TOBIN STREET (1, 8/37, 12/37), 18 PACKARD DRIVE, 40 QUEEN STREET, 29 BEST STREET.	Western Highway depth 0.15m Princes Street/Tatooon Road depth 0.21m Campbell Street (Pyrenees Hwy) 0.45m Grano Street depth 0.21m Elizabeth Street depth 0m Railway line depth 1.24m	Refer to actions listed above.
149 to 178 mm over 72 hours, with intense burst of up to 17mm/hr	3.56	January 2011	8,294		Overtopping of the Western Highway and inundation of the Ararat Racecourse and Cemetery Creek.			
~45 mm in 1 hour to ~90 mm in 12 hours		50	11,146	68 (25)	Campbell Street overtopping at North Drain and Tobin Street and King Street overtopping at South Drain.	X15 additional buildings are flooded above floor: X7 TOBIN STREET (1-4/37, 6-7/37, 11/37), X4 GRANO STREET (37, 39, 1/41, 95-97), X2 RUNDELL STREET (24, 26), 2 BANKSIA STREET, 1 QUEEN STREET S.	Western Highway depth 0.62m Princes Street/Tatooon Road depth 0.26m Campbell Street (Pyrenees Hwy) 0.49m Grano Street depth 0.37m Elizabeth Street depth 0.12m Railway line depth 1.80m	Refer to actions listed above.
~50 mm in 1 hour to ~100 mm in 12 hours		100	15,552	90 (39)	Significant breakouts from the Hopkins River leading to overtopping of the Western Highway and Geelong Road and the Ararat racecourse.	X14 additional buildings are flooded above floor: X2 TOBIN STREET (5/37, 2/39), X2 RUNDELL STREET (20, 22), X2 BEST STREET (31, 35), X2 KENNEL ROAD (2, 31), 33 CAMPBELL STREET, 47-49 VINCENT STREET, 2/42 BARKLY STREET, 7 VIEW POINT STREET, 2/41 GRANO STREET, 26-28 GRANO STREET.	Western Highway depth 0.75m Princes Street/Tatooon Road depth 0.35m Campbell Street (Pyrenees Hwy) 0.51m Grano Street depth 0.43m Elizabeth Street depth 0.18m Railway line depth 2.13m	Refer to actions listed above.
		200	20,822	103 (46)		X7 additional buildings are flooded above floor: X2 TOBIN STREET (9/37, 3/39), 21 QUEENS AVENUE, 5 VIEW POINT STREET, 278 WESTERN HIGHWAY, 32 TUSON STREET, 35 GRANO STREET.	Western Highway depth 0.85m Princes Street/Tatooon Road depth 0.46m Campbell Street (Pyrenees Hwy) 0.56m Grano Street depth 0.48m Elizabeth Street depth 0.22m	Refer to actions listed above.

							Railway line depth 2.18m	
		500	29,030				Western Highway depth 1.01m Princes Street/Tatyoan Road depth 0.56m Campbell Street (Pyrenees Hwy) 0.63m Grano Street depth 0.54m Elizabeth Street depth 0.27m Railway line depth 2.22m	Refer to actions listed above.



Ararat above floor building damages during a range of design flood events (Water Technology 2017).



Ararat above floor building damages during a range of design flood events (Water Technology 2017).

Ararat Property Inundation Table (Water Technology 2017)

Colours used in the property table below are the same used in the Ararat over floor building damages map above. Green, buildings flooded above floor in a 5 year ARI flood event. Pink, building flooded above floor in a 10 year ARI flood event, etc.

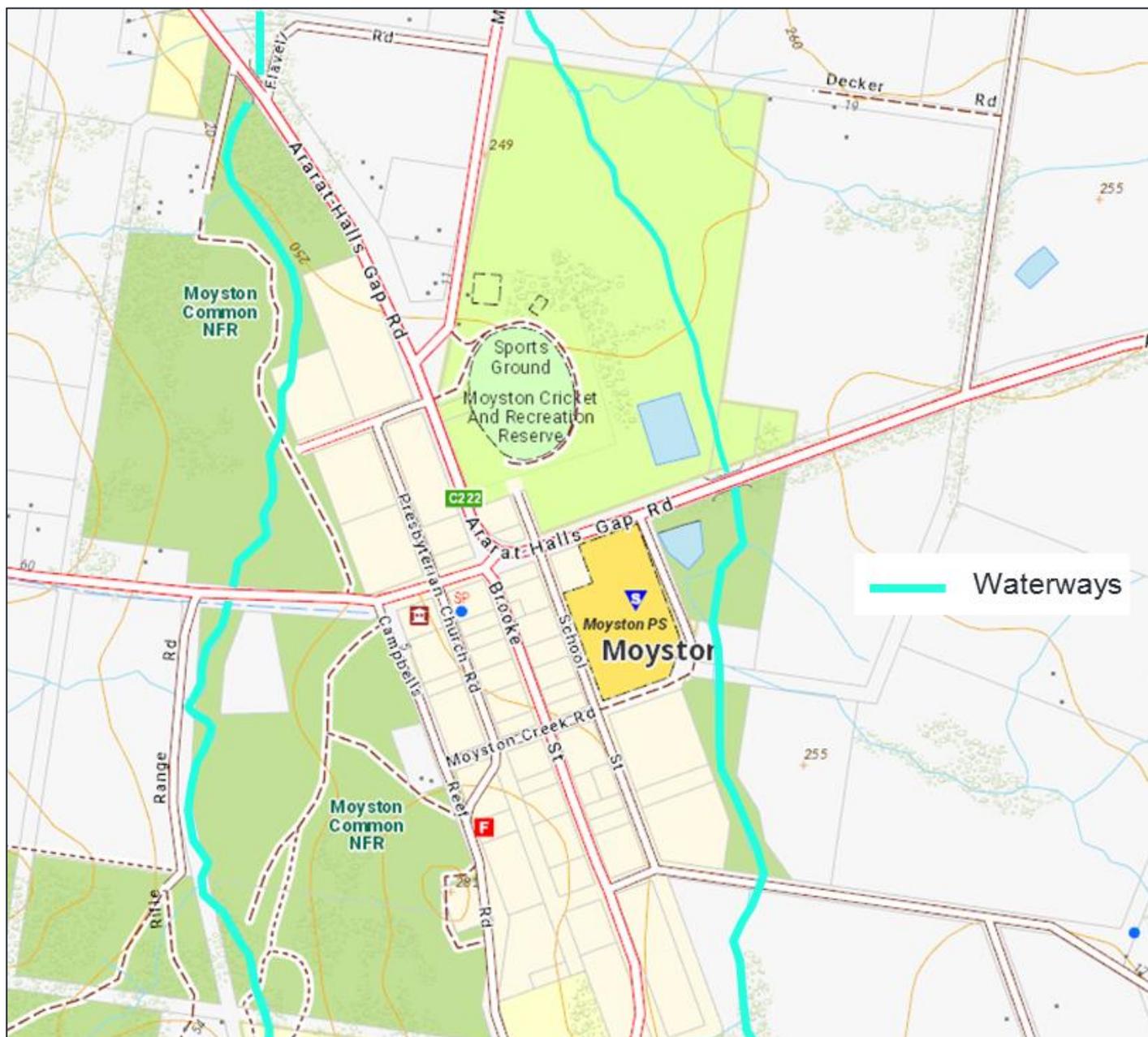
No	Address	Within ~100mm of flooding over-floor						Building Type	Comments
		Depth of over-floor flooding for each ARI (m)							
		5	10	20	50	100	200		
1	38 QUEEN STREET	0.264	0.334	0.418	0.532	0.561	0.571	Residential	
2	24 PACKARD DRIVE	0.049	0.051	0.049	0.05	0.054	0.061	Residential	
3	52 KING STREET		0.01	0.033	0.052	0.066	0.079	Residential	
4	1/42 BARKLY STREET			0.505	0.543	0.571	0.587	Residential	
5	1 TOBIN STREET			0.17	0.271	0.329	0.372	Commercial	
6	12/37 TOBIN STREET			0.074	0.175	0.227	0.293	Residential	
7	18 PACKARD DRIVE			0.059	0.067	0.075	0.085	Residential	
8	8/37 TOBIN STREET			0.038	0.143	0.237	0.326	Residential	
9	40 QUEEN STREET			0.035	0.136	0.185	0.214	Residential	
10	29 BEST STREET			0.001	0.047	0.076	0.102	Residential	
11	3/37 TOBIN STREET				0.364	0.409	0.47	Residential	
12	4/37 TOBIN STREET				0.307	0.341	0.378	Residential	
13	1/41 GRANO STREET				0.179	0.197	0.206	Residential	Building abutted from 20yr onwards
14	2 BANKSIA STREET				0.14	0.16	0.169	Residential	
15	37 GRANO STREET				0.13	0.156	0.17	Residential	
16	11/37 TOBIN STREET				0.112	0.179	0.255	Residential	
17	7/37 TOBIN STREET				0.111	0.171	0.244	Residential	
18	6/37 TOBIN STREET				0.084	0.136	0.188	Residential	
19	95-97 GRANO STREET				0.076	0.143	0.215	Residential	
20	2/37 TOBIN STREET				0.076	0.13	0.194	Residential	
21	39 GRANO STREET				0.059	0.078	0.087	Residential	
22	1/37 TOBIN STREET				0.04	0.087	0.145	Residential	
23	1 QUEEN STREET S				0.027	0.08	0.141	Residential	
24	24 RUNDELL STREET				0.018	0.054	0.092	Residential	
25	26 RUNDELL STREET				0.009	0.054	0.093	Residential	
26	5/37 TOBIN STREET					0.455	0.49	Residential	
27	33 CAMPBELL STREET					0.189	0.373	Commercial	
28	47-49 VINCENT STREET					0.139	0.176	Commercial	
29	2/42 BARKLY STREET					0.054	0.089	Residential	
30	7 VIEW POINT STREET					0.048	0.118	Residential	
31	22 RUNDELL STREET					0.029	0.069	Residential	
32	35 BEST STREET					0.015	0.041	Residential	
33	2 KENNEL ROAD					0.014	0.043	Residential	
34	20 RUNDELL STREET					0.011	0.057	Residential	
35	31 BEST STREET					0.009	0.035	Residential	

No	Address	Within ~100mm of flooding over-floor						Building Type	Comments
		Depth of over-floor flooding for each ARI (m)							
		5	10	20	50	100	200		
36	2/41 GRANO STREET					0.007	0.017	Residential	
37	2/39 TOBIN STREET					0.006	0.103	Residential	
38	31 KENNEL ROAD					0.005	0.007	Residential	
39	26-28 GRANO STREET					0.43	0.438	Residential	
40	3/39 TOBIN STREET						0.113	Residential	
41	9/37 TOBIN STREET						0.073	Residential	
42	21 QUEENS AVENUE						0.071	Community	
43	5 VIEW POINT STREET						0.06	Residential	
44	278 WESTERN HIGHWAY						0.024	Commercial	
45	32 TUSON STREET						0.008	Commercial	
46	35 GRANO STREET						0.005	Residential	

Appendix C2: Moyston Flood Emergency Plan

The main waterways that contribute to flooding in Moyston are unnamed tributaries of Salt Creek, refer to map below. These waterways join Salt Creek 1.5km north of Moyston.

Moyston has been subject to extensive and frequent flash flood events, significant events include 1911, 1912, 1922, 1956, 1957, 1975, 1992, 1993, 1994, 1996, 1997, 2002, 2011 and 2012 (BMT 2014).



January 2011 Flood Event

During the January 2011 flood event Mount William recorded 279 mm over four days. This flood was the most severe recent event, causing extensive damage to buildings, roads, fences and farmland. Widespread flooding caused significant disruption to main roads surrounding Moyston, refer to flood photos below.



Flooding surrounding a property in Moyston during the January 2011 event.



Flooding surrounding a property in Moyston during the January 2011 event.

A local landholder who lives north of Moyston along the Ararat-Halls Gap Road provided information regarding flood impacts in Moyston during the January 2011 flood event. This landholder mentioned that floodwater was 30m from a building on their property. They said there was a lot of flooding along the Moyston West Road and the Ararat-Halls Gap Road. They also observed sheet flooding running off the upslope on their property. They said that if they didn't have a fence around their house their house would have been flooded.

It is important to note that while there has been an assessment of buildings at risk of flooding, given the steep landscape in and surrounding Moyston it is likely that heavy rainfall events will cause localised flooding of additional buildings not listed within this plan.

Flood Warning and Triggers

Flooding in Moyston can develop quickly as a result heavy rainfall. Runoff from the steep hills surrounding Moyston as a result of a heavy rainfall event can cause the rapid rise of floodwater within 2-4 hours from rainfall. The flood peak may occur between 4-8 hours from the start of rainfall.

Refer to the Moyston Flood Intelligence Card below for rainfall triggers that relate to flood magnitude. The closest rainfall gauges are located at Mount William and Moyston. An important factor to consider when using rainfall intensity to determine the likely flood magnitude is the saturation of the catchment (wetness). The forecast or observed rainfall is more likely to translate to flooding if it occurs on a wet catchment, if streamflow is present along the waterways before the rainfall event. If rainfall occurs on a dry catchment, a significant percentage of rainfall is likely to be lost to infiltration, and will not translate to runoff and flooding. Refer to Appendix H Local Knowledge Arrangements for contact details of flood observers in Moyston to determine the current saturation conditions of the catchment prior to the forecast heavy rainfall event.

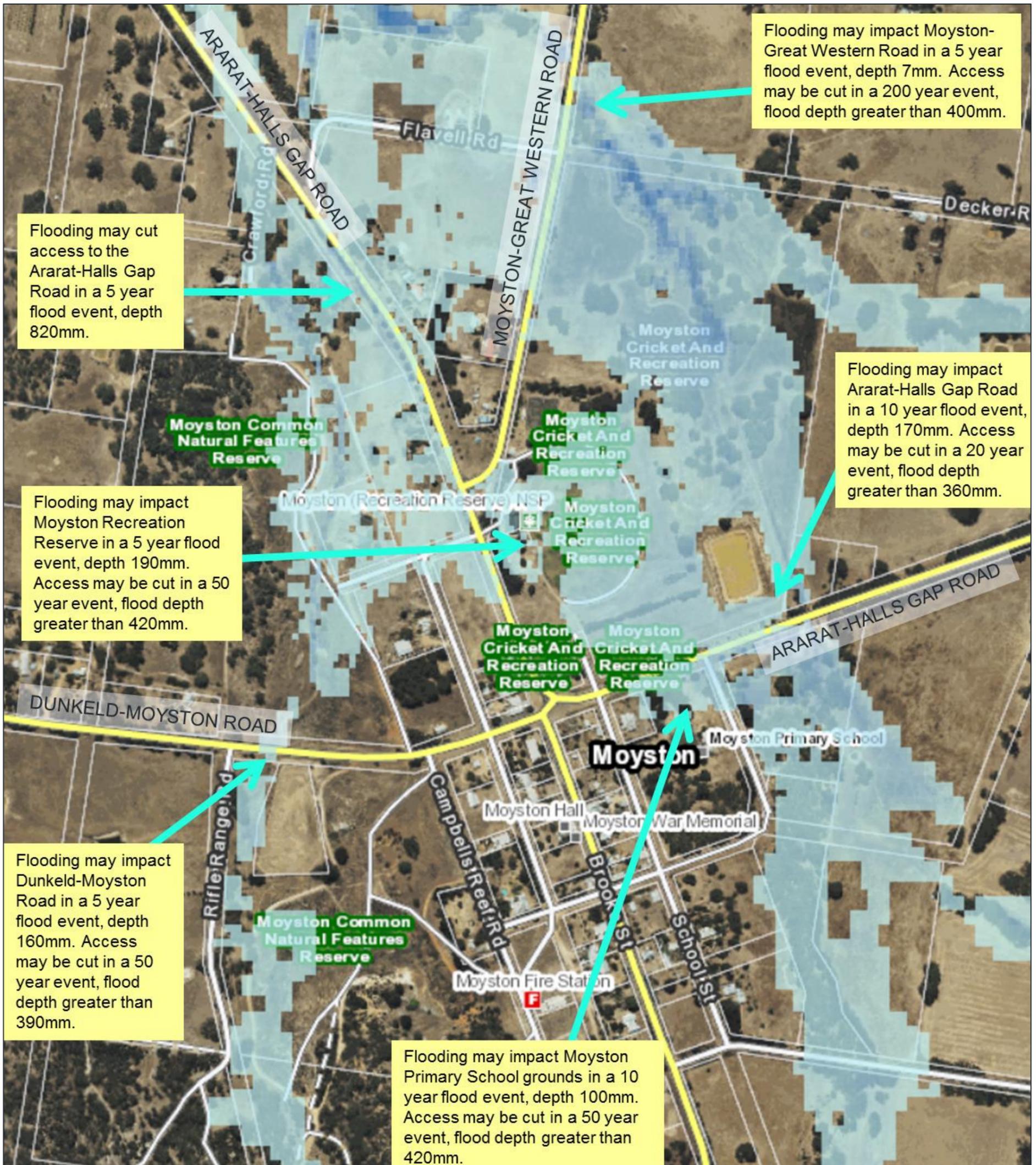
Flood Impacts and Required Actions

Key assets at risk of flooding in Moyston are listed in the table below.

Asset register

Asset Name and location	Average Recurrence Interval (ARI)	Consequence / Impact	Mitigation/ Action	Lead Agency
Moyston Recreation Reserve Oval, Ararat-Halls Gap Road.	5 year flood	Flooding may impact access to the Moyston Recreation Reserve during a 5 year flood, depth 0.19m. Access may be cut during a 50 year flood, depth 0.42m.	Notify the Moyston Recreation Reserve managers.	Council
Ararat-Halls Gap Road	5 year flood	Flooding may cut access to the Ararat-Halls Gap Road during a 5 year flood, depth 0.82m.	Deploy road closure signs and undertake traffic management as needed.	Regional Roads Victoria
Moyston-Great Western Road	5 year flood	Flooding may impact the Moyston-Great Western Road during a 5 year flood, depth 0.07m. Flooding may cut access during a 200 year flood, depth 0.40m.	Deploy road closure signs and undertake traffic management as needed.	Council
Dunkeld- Moyston Road	5 year flood	Flooding may impact the Dunkeld-Moyston Road during a 5 year flood, depth 0.16m. Flooding may cut access during a 50 year flood, depth 0.39m.	Deploy road closure signs and undertake traffic management as needed.	Council
Moyston Primary School, 1349 Ararat-Halls Gap Road.	10 year flood	School grounds may be impacted by flooding, depth 0.10m. Access may be cut in 50 year flood, depth 0.42m.	Notify school of flooding impacting their school grounds.	VICSES
3 buildings are flooded above floor; 1401 Ararat-Halls Gap Road, 8 Presbyterian Church Road and 190 Pollands Road.	Probable Maximum Flood (PMF)	Buildings are flooded above floor.	Sandbag buildings and undertake evacuations as needed.	VICSES Victoria Police

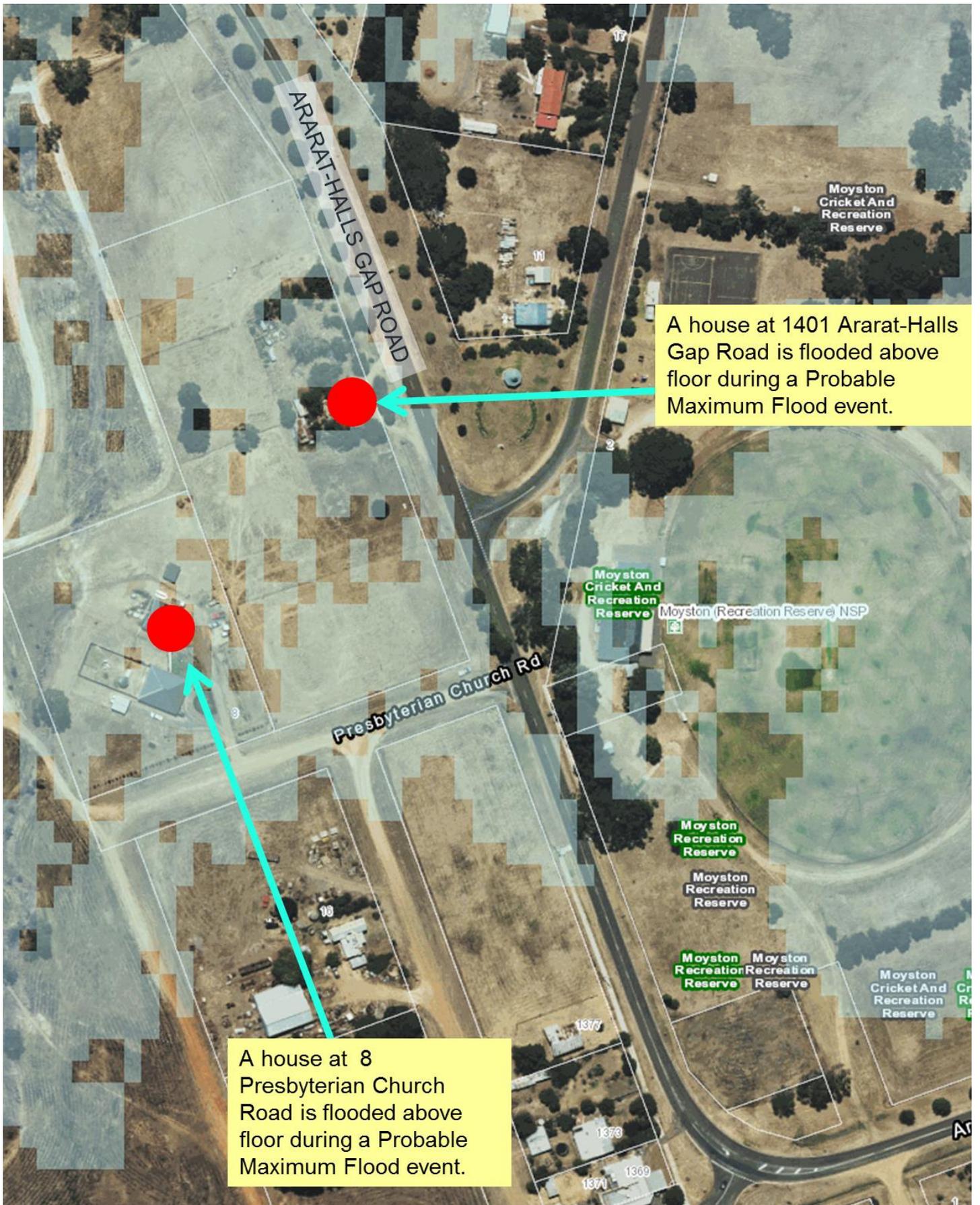
For more detailed information regarding buildings and roads impacted refer to the Moyston Flood Intelligence Card and flood damages/impact maps below. Also refer to the Moyston flood depth maps in **Appendix E**.



Moyston roads and assets impacted by flooding with the 200 year ARI flood extent.

Moyston Flood Intelligence Card (Salt Creek Tributaries)

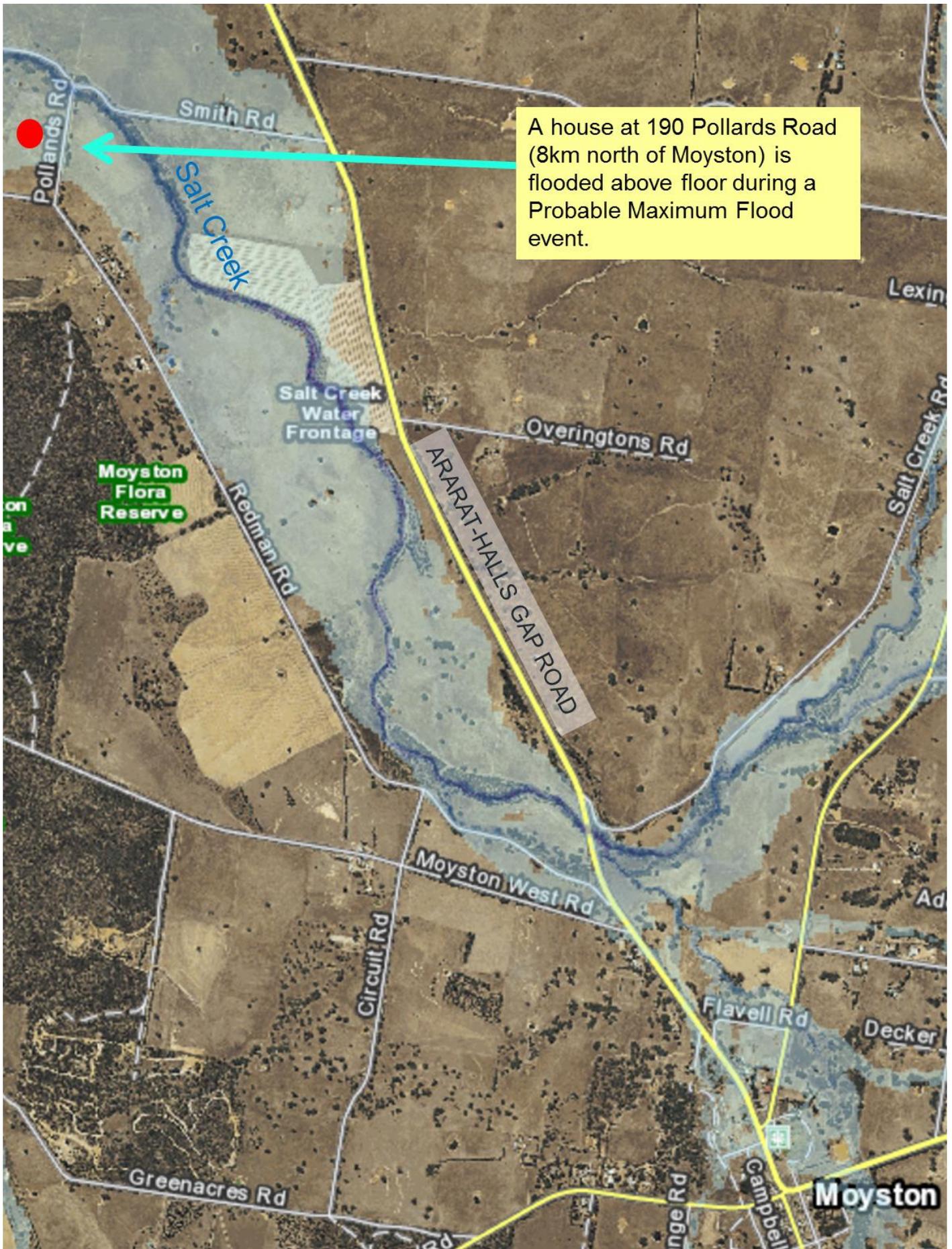
Flood travel time					Time from start of rain to steep rise in floodwater 2 - 4 hours	
					Time from start rainfall to flood peak 4 - 8 hours	
					Riverine flooding duration: 1 day	
Design rainfall in Upper Mt William Catchment (mm) (BMT 2014)	Average Recurrence Interval (ARI) (BMT 2014)	Moyston damages total number buildings flooded (above floor)	Consequence / Impact	Houses/ buildings flooded / isolated	Roads Impacted	Action Actions may include (but not limited to) Evacuation, closure of road, sandbagging, issue warning and who is responsible
~50 mm in 12 hours to ~65 mm in 24 hours	5		Heavy rain will result in rapid rises of stormwater and riverine flooding. Refer to the Moyston and Mount William telemetered rain gauge (AWS). Minor flooding, mainly within channel of waterways. In Moyston, flooding breaks out to the north at the Recreation Reserve. Road closed signs may be needed along the Ararat - Halls Gap Road.	Moyston Primary School grounds depth 0m	Ararat-Halls Gap Road depth 0.82m Moyston-Dunkeld Road depth 0.16m Moyston-Great Western Road depth 0.07m	VICSES activate ground observers to take photos and record flood levels at key crossings. Council and Regional Roads Victoria to deploy road closure signs along the Ararat-Halls Gap Road and undertake traffic management as needed. Council clear debris from waterway crossings, drains and culvers as needed.
~60 mm in 12 hours to ~75 mm in 24 hours	10		In addition to flooding described above there are minor increase in flooding depth and extent. Flooding starts to impact the Moyston Primary School grounds. Road closed signs may be needed at the Dunkeld- Moyston Road and Moyston - Rocky Point Road.	Moyston Primary School grounds depth 0.10m	Ararat-Halls Gap Road depth 0.88m Moyston-Dunkeld Road depth 0.21m Moyston-Great Western Road depth 0.09m	Refer to actions listed above.
~75 mm in 12 hours to ~90 mm in 24 hours	20		Flooding on local roads is getting more extensive and deeper.	Moyston Primary School grounds depth 0.30m	Ararat-Halls Gap Road depth 0.97m Moyston-Dunkeld Road depth 0.29m Moyston-Great Western Road depth 0.11m	Refer to actions listed above.
~90 mm in 12 hours to ~110 mm in 24 hours	50		Access/egress may be cut to a house, 8 Presbyterian Church Road. Main roads in Moyston are impassable.	Moyston Primary School grounds depth 0.42m	Ararat-Halls Gap Road depth 1.06m Moyston-Dunkeld Road depth 0.39m Moyston-Great Western Road depth 0.22m	Refer to actions listed above.
~105 mm in 12 hours to ~125 mm in 24 hours	100 year event January 2011		134.6 mm in 24 hours with a monthly total of 289.6 mm recorded at Mount William. In Moyston one house was flooded (off Moyston West Road) above floor from overland flow. A large number of roads were impassable due to deep and high velocity flood flow.	Moyston Primary School grounds depth 0.48m	Ararat-Halls Gap Road depth 1.10m Moyston-Dunkeld Road depth 0.47m Moyston-Great Western Road depth 0.30m	Refer to actions listed above.
	200		Due to high velocities community advice should recommend limiting travel until floodwater subsides.	Moyston Primary School grounds depth 0.53m	Ararat-Halls Gap Road depth 1.12m Moyston-Dunkeld Road depth 0.56m Moyston-Great Western Road depth 0.40m	Refer to actions listed above.
	Probable Maximum Flood (PMF)	3 (3)	x3 houses are flooded above floor.	Moyston Primary School grounds depth 0.75m Houses flooded above floor: 1401 Ararat-Halls Gap Road, 8 Presbyterian Church Road, 190 Pollands Road.	Ararat-Halls Gap Road depth 1.25m Moyston-Dunkeld Road depth 1.13m Moyston-Great Western Road depth 0.75m	VICSES sandbag buildings as needed. Victoria Police evacuate buildings as needed.



A house at 1401 Ararat-Halls Gap Road is flooded above floor during a Probable Maximum Flood event.

A house at 8 Presbyterian Church Road is flooded above floor during a Probable Maximum Flood event.

Moyston buildings flooded over floor with the 200 year ARI flood extent.



Moyston building flooded over floor with the 200 year ARI flood extent.

Moyston Property Inundation Table (BMT 2014)

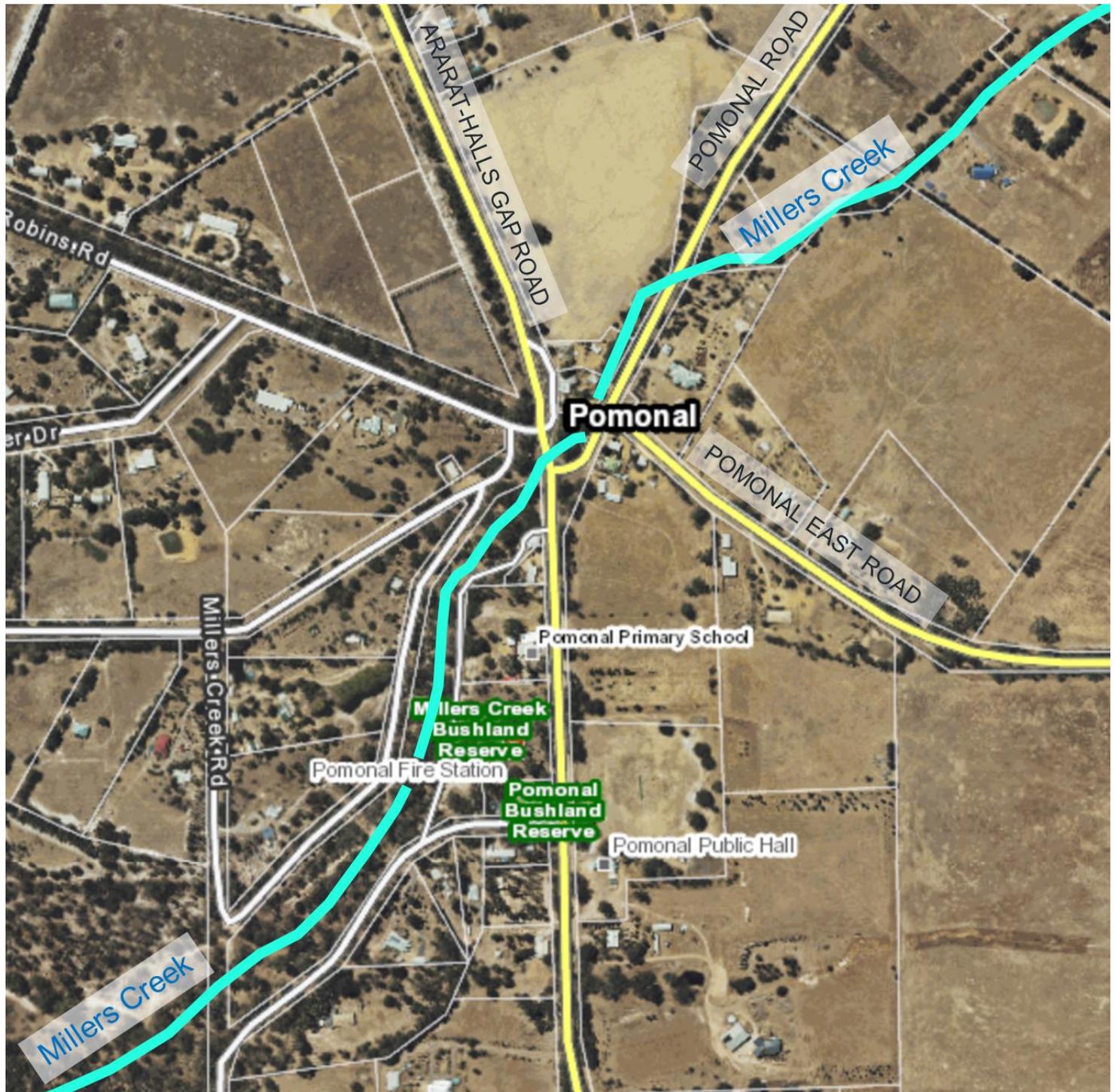
Colours used in the property table below are the same used in the Moyston above floor damages map above. Red, buildings flooded above floor in a Probable Maximum Flood (PMF) event.

No	Address	Within ~100mm of flooding over-floor					Building Type / Comments
		Depth of over-floor flooding for each ARI					
		50	100	200	500	PMF	
1	1401 Ararat-Halls Gap Road					8.26	Residential
2	8 Presbyterian Church Road					8.04	Residential
3	190 Pollands Road					7.98	Residential

Appendix C3: Pomonal West Flood Emergency Plan

Pomonal is located on the eastern slope of the Mount William Mountain Range of the Grampians National Park. Millers Creek is one of several small tributaries of Mount William Creek that drain the eastern slope of the Mount William Mountain Range within Pomonal, refer to the map below. Millers Creek joins Mount William Creek north of Pomonal adjacent to Lake Fyans.

Pomonal has been subject to extensive and frequent flash flood events, significant events include 1911, 1912, 1922, 1956, 1957, 1975, 1992, 1993, 1994, 1996, 1997, 2002, 2011 and 2012 (BMT 2014).



January 2011 Flood Event

During the January 2011 flood event Mount William recorded 279 mm over four days. This flood was the most severe recent event, causing extensive damage to buildings, roads, fences and farmland. Widespread flooding caused significant disruption to main roads surrounding Moyston, refer to flood photos below.



Flooding at the Halls Gap Zoo in Pomonal during the 2011 flood event.



Flooding at the Halls Gap Zoo in Pomonal during the January 2011 event.



Flooding along Redman Road, east of Pomonal during the January 2011 event.

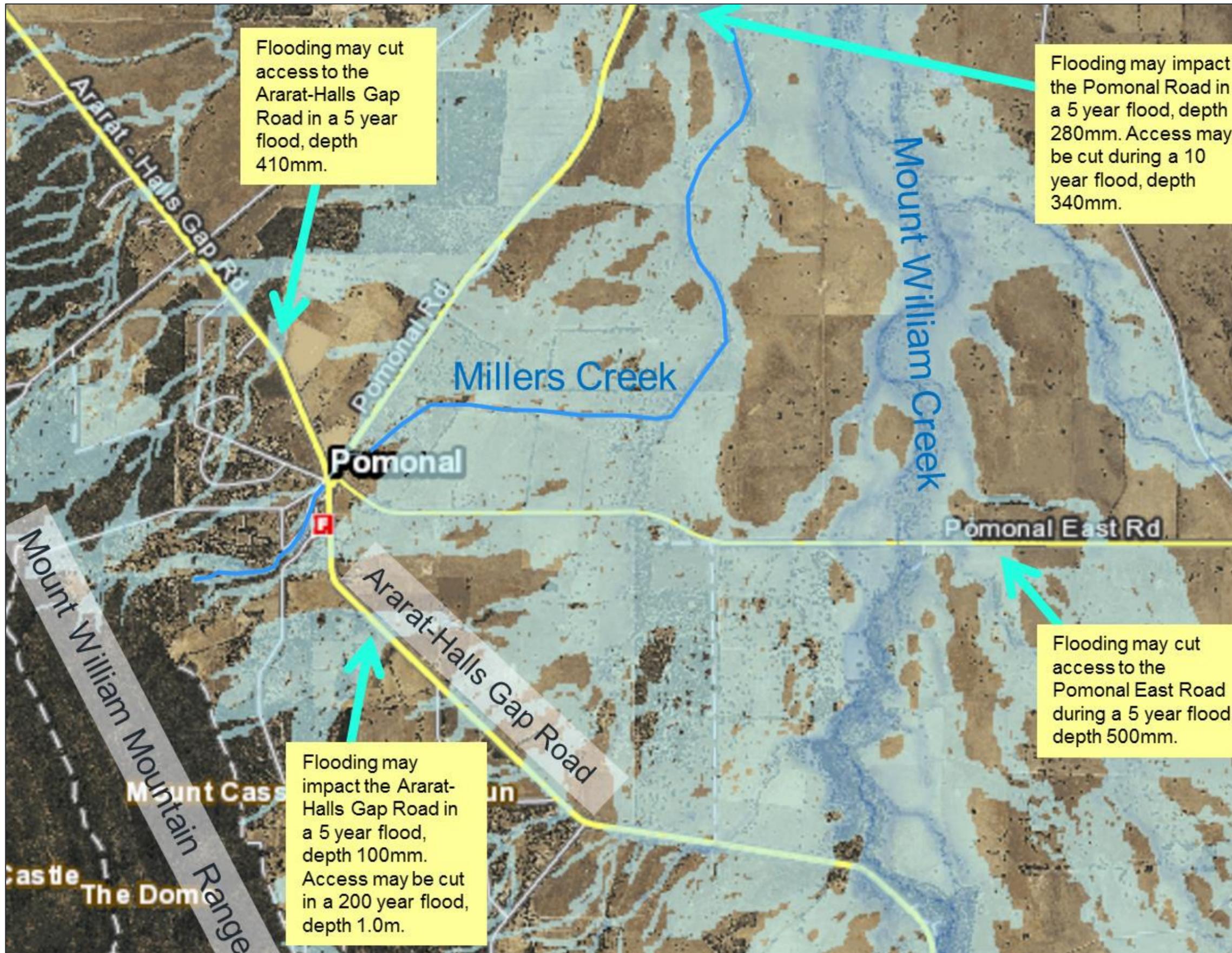


Flooding at the Lady Somers Bridge, east of Pomonal during the January 2011 event.

Flood Warning and Triggers

Flooding in Pomonal can develop quickly as a result heavy rainfall. Runoff from the steep mountain range adjacent to Pomonal as a result of a heavy rainfall event can cause the rapid rise of floodwater within 2-4 hours from rainfall. The flood peak may occur between 4-8 hours from the start of rainfall.

Refer to the Pomonal Flood Intelligence Card below for rainfall triggers that relate to flood magnitude. The closest rainfall gauges are located at Mount William and Moyston. An important factor to consider when using rainfall intensity to determine the likely flood magnitude is the saturation of the catchment (wetness). The forecast or observed rainfall is more likely to translate to flooding if it occurs on a wet catchment, if streamflow is present along the waterways before the rainfall event. If rainfall occurs on a dry catchment, a significant percentage of rainfall is likely to be lost to infiltration, and will not translate to runoff and flooding. Refer to Appendix H Local Knowledge Arrangements for contact details of flood observers in Pomonal to determine the current saturation conditions of the catchment prior to the forecast heavy rainfall event.



Pomonal roads impacted by flooding with the 100 year flood extent (BMT 2014).

Flood Impacts and Required Actions

It is important to note that while there has been an assessment of buildings at risk of flooding, given the steep slopes in and surrounding Pomonal it is likely that heavy rainfall events will cause localised flooding of additional buildings not listed within this plan.

Key assets in Pomonal at risk of flooding are listed in the table below.

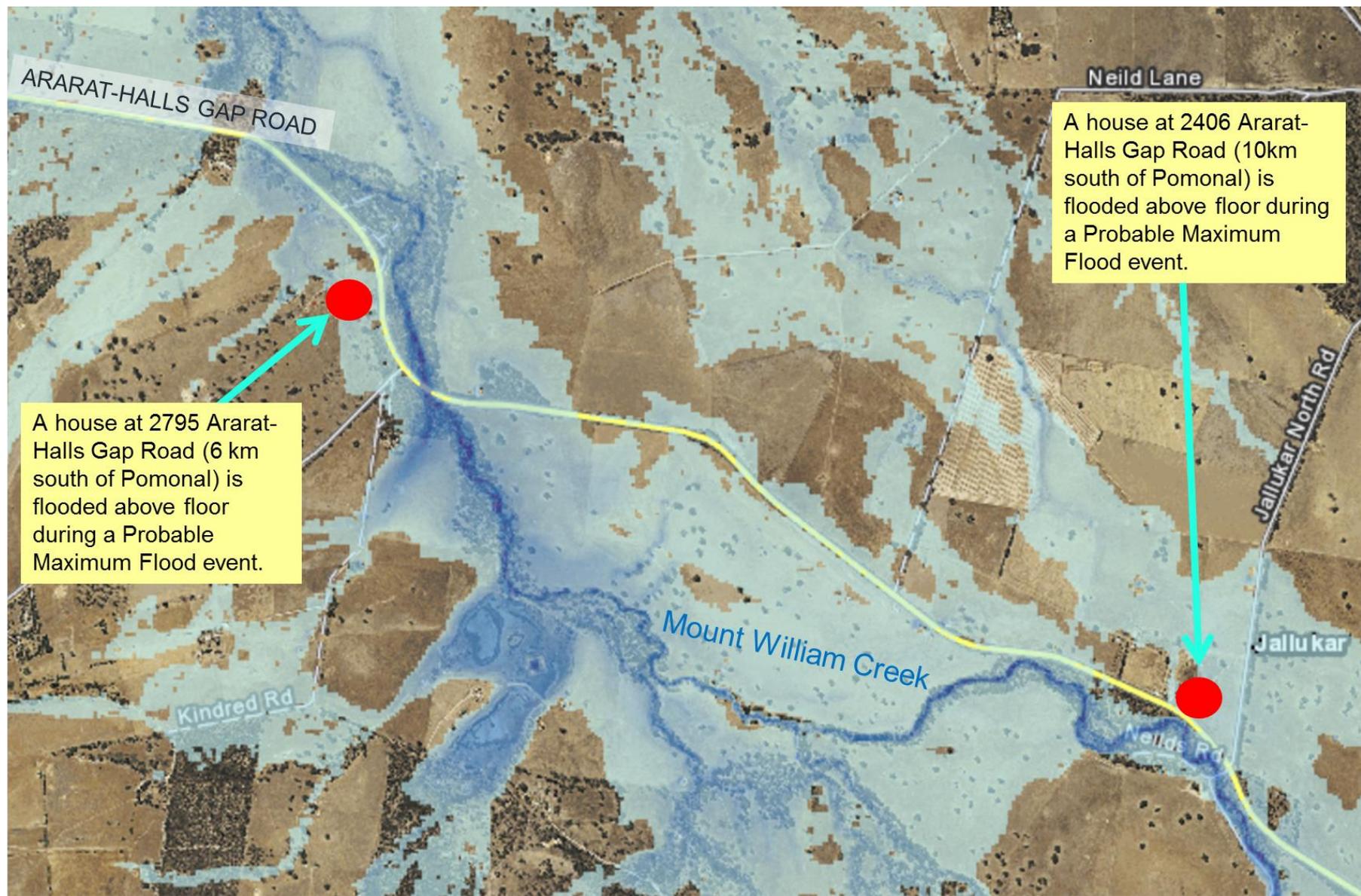
Asset register

Asset Name and location	Average Recurrence Interval (ARI)	Consequence / Impact	Mitigation/ Action	Lead Agency
Ararat-Halls Gap Road, north of Pomonal,	5 year flood	Flooding may cut access to the Ararat-Halls Gap Road during a 5 year flood, depth 0.41m.	Deploy road closure signs and undertake traffic management as needed.	Regional Roads Victoria
Ararat-Halls Gap Road, south of Pomonal,	5 year flood	Flooding may impact the Ararat-Halls Gap Road during a 5 year flood, depth 0.10m. Flooding may cut access during a 200 year flood, depth 1.0m.	Deploy road closure signs and undertake traffic management as needed.	Regional Roads Victoria
Pomonal Road	5 year flood	Flooding may impact the Pomonal Road during a 5 year flood, depth 0.28m. Flooding may cut access during a 10 year flood, depth 0.34m.	Deploy road closure signs and undertake traffic management as needed.	Council
Pomonal East Road	5 year flood	Flooding may impact the Pomonal East Road during a 5 year flood, depth 0.28m. Flooding may cut access during a 10 year flood, depth 0.34m.	Deploy road closure signs and undertake traffic management as needed.	Council
Pomonal Hall, 3360 Ararat-Halls Gap Road.	5 year flood	Shallow flooding may surround the Pomonal Hall during a 5 year flood event.	Notify the managers of the Pomonal Hall.	Council
x2 buildings are flooded above floor; 2406 Ararat-Halls Gap Road and 2795 Ararat-Halls Gap Road.	Probable Maximum Flood (PMF)	Buildings are flooded above floor.	Sandbag buildings and undertake evacuations as needed.	VICSES Victoria Police

For more detailed information regarding buildings and roads impacted refer to the Pomonal Flood Intelligence Card and flood asset impact maps above. Also refer to the Pomonal flood depth maps in **Appendix E**.

Pomonal Flood Intelligence Card (Millers Creek)

Flood travel time				Time from start of rain to steep rise in floodwater 2 - 4 hours		
				Time from start rainfall to flood peak 4 - 8 hours		
				Riverine flooding duration: 1 day		
Design rainfall in Upper Mt William Catchment (mm) (BMT 2014)	Average Recurrence Interval (ARI) (BMT 2014)	Pomonal damages total number buildings flooded (above floor)	Consequence / Impact	Houses/ buildings flooded / isolated	Roads Impacted	Action Actions may include (but not limited to) Evacuation, closure of road, sandbagging, issue warning and who is responsible
~50 mm in 12 hours to ~65 mm in 24 hours	5		Heavy rain will result in rapid rises of flooding. Refer to the Moyston and Mount William telemetered rain gauge (AWS). There are very high velocities along the gully lines draining the Mount William Mountain Range. There is extensive shallow flooding to the north east of Pomonal, north of Pomonal East Road. As flood depths increase a large number of roads are impassable, high velocities are very dangerous for pedestrians and motorists.		Pomonal East Road depth 0.50m Pomonal Road depth 0.28m Ararat-Halls Gap Road (north) depth 0.41m Ararat-Halls Gap Road (south) depth 0.10m	VICSES activate ground observers to take photos and record flood levels at key crossings. Council and Regional Roads Victoria to deploy road closure signs and undertake traffic management as needed. Council clear debris from waterway crossings, drains and culvers as needed.
~60 mm in 12 hours to ~75 mm in 24 hours	10		There are minor increases in flooding depth and extent. Road closed signs may be needed at the Ararat - Halls Gap Road, Pomonal East Road, Ararat - Halls Gap Road and Pomonal Road.		Pomonal East Road depth 0.57m Pomonal Road depth 0.34m Ararat-Halls Gap Road (north) depth 0.45m Ararat-Halls Gap Road (south) depth 0.11m	Refer to actions listed above.
~75 mm in 12 hours to ~90 mm in 24 hours	20		Flooding on local roads is getting more extensive and deeper.		Pomonal East Road depth 0.61m Pomonal Road depth 0.40m Ararat-Halls Gap Road (north) depth 0.47m Ararat-Halls Gap Road (south) depth 0.12m	Refer to actions listed above.
~90 mm in 12 hours to ~110 mm in 24 hours	50	1 (0)	Main roads in Pomonal are impassable.		Pomonal East Road depth 0.69m Pomonal Road depth 0.46m Ararat-Halls Gap Road (north) depth 0.48m Ararat-Halls Gap Road (south) depth 0.15m	Refer to actions listed above.
~105 mm in 12 hours to ~125 mm in 24 hours	100 year event January 2011	1 (0)	134.6 mm in 24 hours with a monthly total of 289.6 mm recorded at Mount William. A large number of roads were impassable due to very high velocity floodwater over most main road waterway crossings.		Pomonal East Road depth 0.78m Pomonal Road depth 0.50m Ararat-Halls Gap Road (north) depth 0.49m Ararat-Halls Gap Road (south) depth 0.28m	Refer to actions listed above.
	200	1 (0)	Due to high velocities community advice should recommend limiting travel until floodwater subsides.		Pomonal East Road depth 0.83m Pomonal Road depth 0.54m Ararat-Halls Gap Road (north) depth 0.49m Ararat-Halls Gap Road (south) depth 1.0m	Refer to actions listed above.
	Probable Maximum Flood (PMF)	2 (2)	X2 houses are flooded above floor.	x2 houses are flooded above floor at 2406 Ararat-Halls Gap Road and 2795 Ararat-Halls Gap Road.	Pomonal East Road depth 1.27m Pomonal Road depth 1.37m Ararat-Halls Gap Road (north) depth 0.5m Ararat-Halls Gap Road (south) depth 1.50m	VICSES sandbag buildings as needed. Victoria Police evacuate buildings as needed.



Moyston buildings flooded above floor with the 100 year ARI flood extent.

Pomonal Property Inundation Table (BMT 2014)

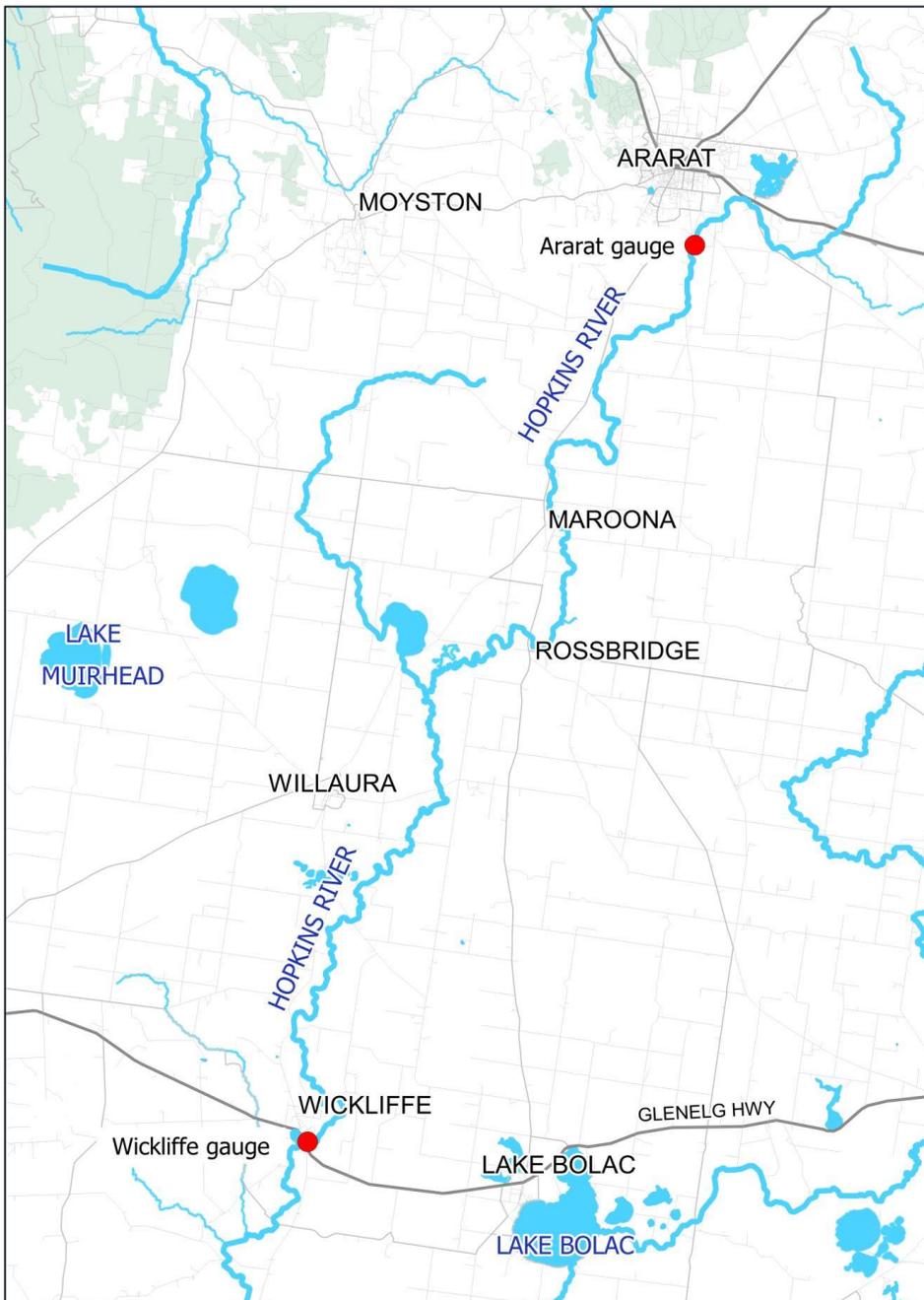
Colours used in the property table below are the same used in the Pomonal above floor damages map above. Red, buildings flooded above floor in a Probable Maximum Flood (PMF) event.

No	Address	Depth of over-floor flooding for each ARI					Building Type / Comments
		50	100	200	500	PMF	
1	2406 Ararat-Halls Gap Road					0.09	Residential
2	2795 Ararat-Halls Gap Road					0.73	Residential

Appendix C4: Wickliffe Flood Emergency Plan

Wickliffe is impacted by flooding from the Hopkins River. The upper catchment area of the Hopkins River includes the Grampians National Park and the western uplands areas around Ararat. Two stream gauges along the Hopkins River, the Ararat and Wickliffe stream gauges provide flood warning for Wickliffe, refer to the map below for the gauge locations. The Wickliffe gauge is 50 km south of the Ararat gauge. Historic flood events show that the travel time between the Ararat and Wickliffe gauges can vary between 24 and 68 hours. Refer to the flood intelligence card below for the Wickliffe flood triggers.

The Hopkins River stream records show that Wickliffe has experienced frequent flood events since 1920, with the largest recent flood event occurring in January 2011. Significant flood events also occurred in 1960 (8,052 ML/d), 1975 (8,665 ML/d), 1983 (11,007 ML/d) and 1986 (8,873 ML/d).



Historic flood events

The January 2011 flood event is the largest flood event recorded for Wickliffe. A flood peak of 5.89m (24,796 ML/d) reached Wickliffe on the 15th of January 2011. The January 2011 event occurred following unusual high intensity rainfall, large volumes of rainfall was recorded from the 10th to 14th of January 2011. Rainfalls were in the order of 112 mm and 172 mm over this period and were highest in the north of the catchment. At the time of this rainfall the catchment was already reasonably saturated due to a wet summer across the region. The January 2011 flood event inundated the majority of the houses and businesses within the main street of Wickliffe, refer to the floor photo below. The Glenelg Highway was impassable to traffic from 6am on the 17th of January to Monday the 17th of January.



Wickliffe during the January 2011 flood event (Cardno 2012).

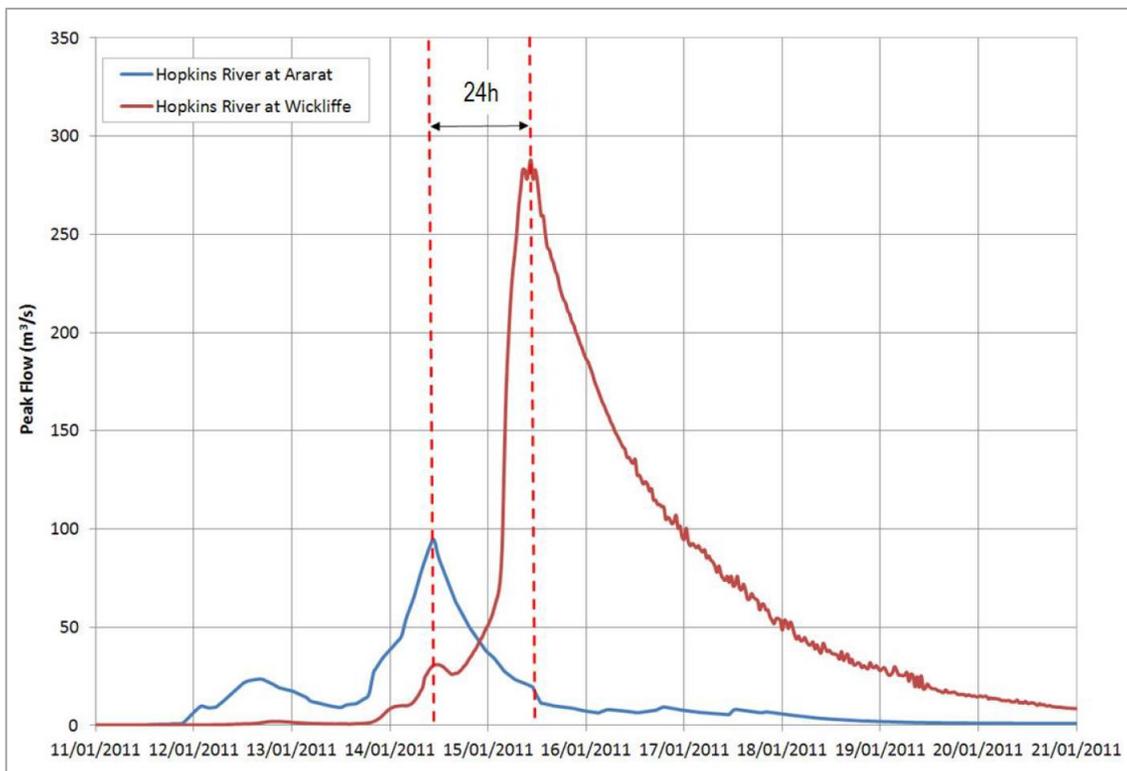


VICSES launching their rescue boat adjacent to the Wickliffe main street during the January 2011 flood event (Cardno 2012).

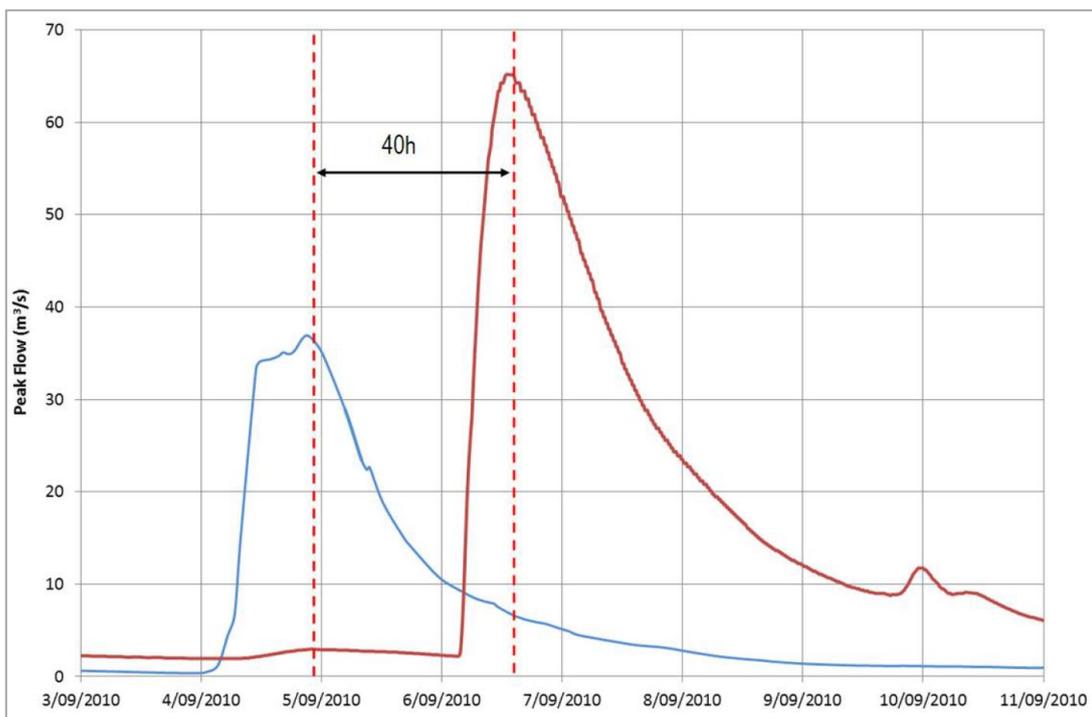
Flood Warning Time

During the January 2011 flood event there was approximately 24 hours delay between the peak at Ararat and the peak at Wickliffe, refer to the hydrographs for this event below. The peak was maintained at Wickliffe for a number of hours. An analysis undertaken (Cardno 2012) of stream flow data for the Ararat and Wickliffe gauges show that historic flood peak travel times of vary between 24 hours and 68 hours, refer to the table and hydrographs below.

Event	Hopkins River at Ararat gauge		Hopkins River at Wickliffe gauge		Travel time (hours)
	Peak (ML/d)	Date and time	Peak (ML/d)	Date and time	
Jan 2011	8,285	14/01/2011 10:43 am	24,796	15/01/2011 11:15 am	24
Aug 1992	3,741	30/08/1992 2:33 am	5,624	31/08/1992 14:50 pm	36
Jun/Jul 1989	4,337	31/07/1989 12:30 pm	4,415	2/08/1989 14:36 pm	38
Sep 2010	3,188	4/09/2010 21:09 pm	5,624	6/09/2010 12:45 pm	40
Dec 2010	3,490	8/12/2010 9:00 am	4,898	11/12/2010 5:00 am	68



Hopkins River stream gauge flows at Ararat and Wickliffe for the January 2011 flood event (Cardno 2012).



Hopkins River stream gauge flows at Ararat and Wickliffe for the September 2010 flood event (Cardno 2012).

Flood Impacts and Required Actions

Key assets at risk of flooding in Wickliffe are listed in the table below.

Asset register				
Asset Name and location	Average Recurrence Interval (ARI)	Consequence / Impact	Mitigation/ Action	Lead Agency
The Glenelg Highway (to the north of Wickliffe).	10 year flood	Access/egress may be impacted by flooding in a 10 year flood, depth 130mm. Access may be cut in a 50 year flood, depth greater than 430mm.	Deploy road closure sign as needed.	Regional Roads Victoria
Walker Street (Main Street in Wickliffe)	50 year flood	Access/egress may be impacted by flooding in a 50 year flood, depth 300mm. Access may be cut in a 100 year flood, depth greater than 420mm.	Notify residents in Walker Street that access may be cut. Deploy road closure sign as needed. Evacuate as needed	VICSES Council Victoria Police
The Wickliffe Hotel, 62 Walker Street	100 year flood	The Wickliffe Hotel may be impacted by flooding below floor during a 100 year flood, depth 100mm. The Hotel is flooded above floor in a Probable Maximum Flood event.	Suspend rail services during the flood event	VLIN
X3 buildings, the Wickliffe CFA shed and a house at 8 and 40 Walker Street.	100 year flood	Buildings are flooded above floor.	Sandbag as needed. Evacuate as needed.	VICSES Victoria Police
The Glenelg Highway Bridge, south of Wickliffe.	500 year flood	The Glenelg Highway Bridge is overtopped in a 500 year flood event.	Access is already cut to adjacent sections of the Glenelg Highway, no further action required.	-

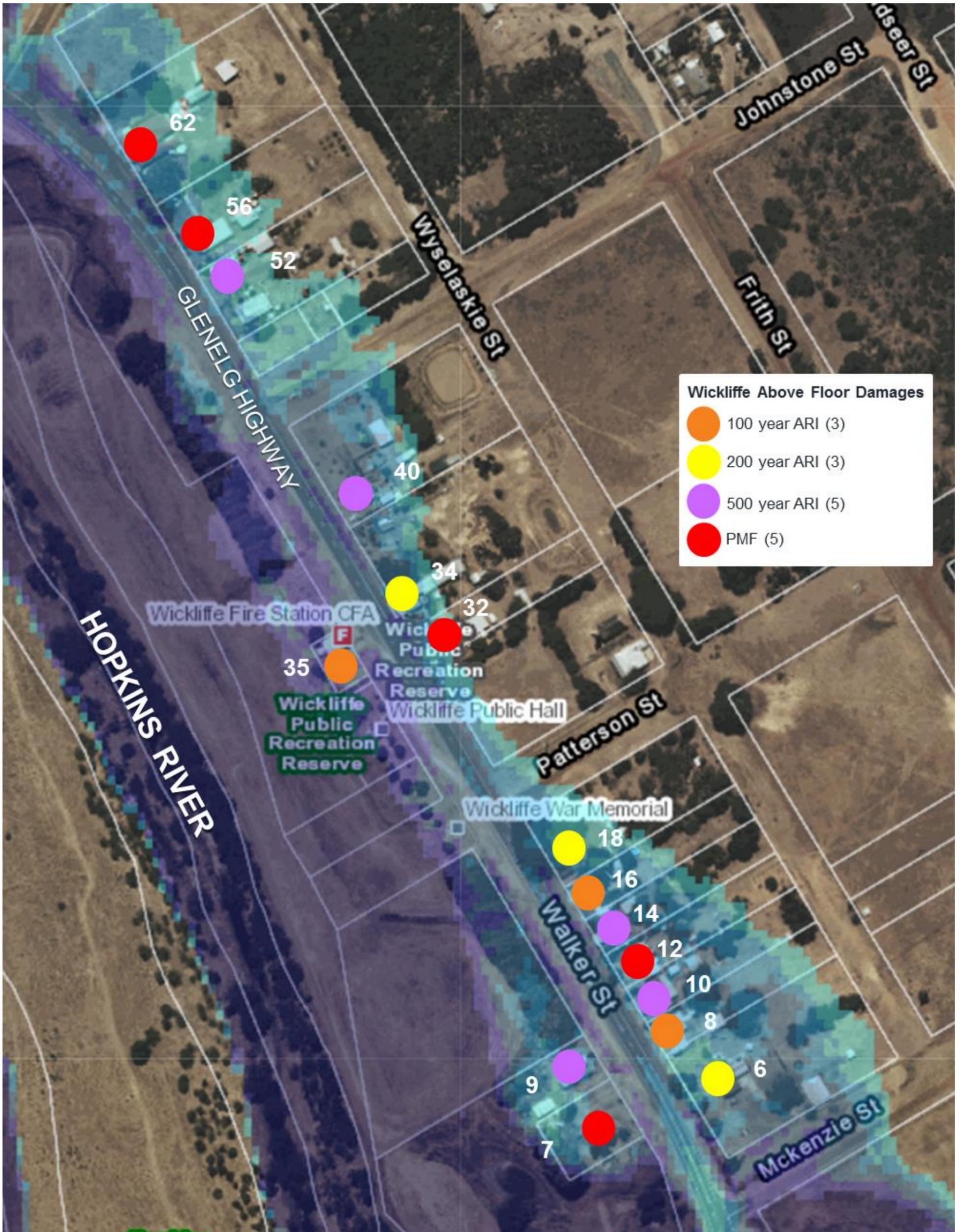
For more detailed information regarding buildings and roads impacted refer to the Wickliffe Flood Intelligence Card and flood damages/impact maps below. Also refer to the Wickliffe flood depth maps in **Appendix E**.



Wickliffe assets and roads impacted by flooding with the 500 year ARI flood extent.

Wickliffe Flood Intelligence Card (Hopkins River)

Flood travel time						Time from start of rain to steep rise in floodwater 6 - 8 hours			
						Time from start rainfall to flood peak at Wickliffe 24 - 68 hours			
						Riverine flooding duration: 20 - 26 hours			
Observed rainfall (mm) assumes rainfall across whole catchment	Hopkins River, Ararat gauge height 236219 (m)	Hopkins River, Wickliffe gauge height 236202 (m)	Average Recurrence Interval (ARI) (Cardno 2012)	Hopkins River at Wickliffe Design Flows (ML/d)	Wickliffe damages total number buildings flooded (above floor)	Consequence / Impact	Houses/ buildings flooded / isolated	Roads Impacted	Action Actions may include (but not limited to) Evacuation, closure of road, sandbagging, issue warning and who is responsible
	2.82	4.13	August 1992	5,572		No observed flood impacts.			
~40mm in 12 hours to ~80mm in 48 hours		4.28	5	5,788	0 (0)	No roads overtopped in the immediate vicinity of Wickliffe.		Walker Street depth 0m Glenelg Highway depth 0m	VICSES monitor rainfall and stream gauge levels.
		4.39	October 1986						
		4.40	Proposed minor flood level						VICSES activate CFA ground observers to take photos and record flood levels at key crossings.
~65mm in 18 hours to ~90mm in 48 hours		4.48	10	7,369	0 (0)	Depths increased by around 200mm. Water beginning to encroach on the Glenelg Highway on the west side of town and a short section (~10m) overtopped to a depth of around 50mm.		Walker Street depth Glenelg Highway depth 0.13m	Council and Regional Roads Victoria to deploy road closure signs due to water over the Glenelg Highway and the west of the town. Undertake traffic management as needed.
		4.50	September 1983			No significant damages.			
~75mm in 18 hours to ~110mm in 48 hours		4.68	20	9,485	0 (0)	Depths increased by around 200mm. Water continuing to encroach on the Glenelg Highway on the west side of town and a section around 200m long overtopped to a depth of around 150mm. Water beginning to encroach on the Highway near the Bridge on the south side of town. No other roads overtopped in the immediate vicinity of Wickliffe.		Walker Street depth 0m Glenelg Highway depth 0.20m	Refer to actions listed above.
		5.00	Proposed moderate flood level						Refer to actions listed above.
~85mm in 12 hours to ~130mm in 48 hours		5.18	50	13,140	2 (0)	Extent of flooding increasing upstream of the Highway Bridge and depths increased by around 500mm. Section of the Highway is overtopped through town over an approx 20m length to a depth of around 50mm. Properties fronting Walker Street beginning to get wet (2 properties wetted) but no over-floor flooding although the CFA building is very close.		Walker Street depth 0.30m Glenelg Highway depth 0.43m	In addition to actions listed above: VICSES to check on residents in Walker Street.
		5.30	Proposed major flood level						VICSES to notify residents with buildings at risk of flooding to enact their evacuation plan (raise valuable items at risk of flooding).
~95mm in 12 hours to ~150mm in 48 hours		5.58	100	16,932	9 (3)	Full length of Walker Street impacted by flooding with several buildings flooded above floor and several with flooding very close. Water on Walker Street around 150mm deep. Highway overtopped for over 300m on west side of town. Water up to approximately 500mm deep.	X3 buildings are flooded above floor: 6, 16 Walker Street and the CFA Station at 35 Walker Street.	Walker Street depth 0.42m Glenelg Highway depth 0.64m	VICSES sandbag houses as needed. VICSES evacuate buildings as needed Council should close Walker Street to traffic.
		5.88	200	21,519	12 (6)	The Glenelg Highway Bridge is close to being overtopped. Flood depths on the floodplain have increased by around 300mm. Flooding along Walker Street is up to 400mm deep.	X3 additional buildings are flooded above floor; 6, 18, 34 Walker Street.	Walker Street depth 0.55m Glenelg Highway depth 0.84m	In addition to actions listed above: VICSES ensure the Wickliffe bridge is closed.
	3.26	5.89	January 2011	24,796	(13)	11 houses, the Hotel and Cookie's Old Store were flooded above floor.			
		6.08	500	29,234	16 (11)	Water is a further 200 to 300mm deeper. The Bridge is also overtopped to a depth of around 100mm.	X5 additional buildings are flooded above floor; 9, 10, 14, 40, 52 Walker Street.	Walker Street depth 0.90m Glenelg Highway depth 1.22m	Refer to actions listed above.
		13.38	PMF		16 (16)	In parts of the floodplain flood depth is over 5m deep.	X5 additional buildings are flooded above floor; 7, 12, 32, 56, 62 Walker Street (Hotel).	Walker Street depth 8.68m Glenelg Highway depth 9.44m	Refer to actions listed above.



Wickliffe above floor building damages and the Wickliffe 500 year ARI flood extent (Cardno 2012).

Wickliffe Property Inundation Table (Cardno 2012)

Colours used in the property table below are the same used in the Miners Rest and Burrumbeet Creek Catchment above floor damages map above. Orange, buildings flooded above floor in a 100 year ARI flood event. Yellow, buildings flooded above floor in a 200 year ARI flood event, etc.

No	Address	Within ~100mm of flooding over-floor						Building Type / Comments
		Depth of over-floor flooding for each ARI						
		20	50	100	200	500	PMF	
1	35 Walker Street			0.13	0.34	0.64	8.7	CFA
2	16 Walker Street			0.05	0.18	0.35	8.32	Residential
3	8 Walker Street			0.005	0.2	0.34	8.11	Residential
4	18 Walker Street				0.19	0.38	8.39	Residential
5	34 Walker Street				0.02	0.32	8.35	Residential
6	6 Walker Street				0.008	0.16	7.75	Residential
7	40 Walker Street					0.066	8.17	Residential
8	10 Walker Street					0.14	7.9	Residential
9	14 Walker Street					0.12	7.98	Residential"
10	52 Walker Street					0.1	8.33	Residential
11	9 Walker Street					0.04	8.02	Residential
12	62 Walker Street						8.26	Hotel
13	32 Walker Street						8.04	Residential
14	7 Walker Street						7.98	Residential
15	56 Walker Street						7.95	Residential
16	12 Walker Street						7.72	Residential

Appendix D: Flood evacuation arrangements

Phase 1 - Decision to Evacuate

The decision to evacuate is to be made in consultation with the MERO, MERC, DHHS, Health Commander and other key agencies and expert advice (CMA's and Flood Intelligence specialists).

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 their 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 and 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;
- Is cross border assistance required or evacuation to another municipality relief centre;
- Resources required and 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.

Phase 2 – Warning

Warnings may include a warning to 'prepare to evacuate' and a warning to 'evacuate now'. Once the decision to evacuate has been made, the at-risk community will be warned to evacuate. Evacuation warnings should be disseminated via methods listed in section 3.3 of this plan.

Phase 3 – Withdrawal

Victoria Police is the responsible agency for evacuation. VICSES will provide advice regarding most appropriate evacuation routes and locations for at-risk communities to evacuate to.

VICSES, CFA, AV and Local Government will provide resources where available to support Victoria Police/ Regional Roads Victoria with route control and may assist Victoria Police in arranging evacuation transportation.

Victoria Police 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.

Landing zones for helicopters are located at:

- Stawell Airport

Special needs groups will be/are identified in Council's 'vulnerable persons register'. In addition, special needs groups are listed in the Ararat MEMP. This can be done through community network organisations.

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.

Victoria Police 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.

Phase 5 – Return

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, truck routes, water treatment plant affecting potable water supplies etc.

Appendix E: Public Information and Warnings

VICSES uses EM-COP Public Publishing to distribute riverine and flash flood warnings in Victoria. The platform enables automatic publishing to the VicEmergency app, website and hotline (1800 226 226). Communities can also access this information through VICSES social media channels (Victoria State Emergency Service on Facebook and VICSES News on Twitter) and emergency broadcasters, such as Sky News TV and various radio stations (current list available via the [EMV website](#)).

VICSES Regions (or ICCs where established) lead the issuing of warnings for riverine flood events when pre-determined triggers are met (issuing of a BOM Flood Watch or Warning), and share locally tailored information via the standard VICSES communication channels (social media, traditional media, web and face to face). These activities are coordinated by the VICSES RDO and approved by the VICSES RAC, or the PIO and IC respectively (when an ICC is active).

If verified reports are received of flash flooding posing, or resulting in, a significant threat to life or property, VICSES Regions (or ICCs) will issue a flash flood warning product via EM-COP.

VICSES at the state tier (or SCC Public Information Section) plays an important role in sharing riverine and flash flood information via state-based standard communication channels.

During some emergencies, VICSES may alert communities by sounding a local siren, or by using the Emergency Alert (EA) platform to send an SMS to mobile phones or a voice message to landlines. The use of sirens for higher-end warnings has been pre-determined, and mapped to relevant warning templates in EM-COP.

EM-COP Public Publishing Business Rules for Riverine and Flash Flood are available in the **Public Information tab of the IMT Toolbox**, providing further guidance on specific triggers, roles and responsibilities. VICSES SOP057 and JSOP 04.01 provide further guidance.

	<p>EMERGENCY ALERT</p> <p>As required, subject to individual circumstances, weather conditions, potential impacts and duration.</p> <p>Refer VICSES SOP057.</p>	<p>As required, based on conditions, changed conditions or impacts of the flood event.</p> <p>Circumstances which warrant the use of EA include:</p> <ul style="list-style-type: none"> • EA is likely to contribute to saving lives and property • EA is likely to be the most effective way to warn the community in an actual or likely emergency • Alternative channels have been considered and alone may not achieve objectives • Time is of the essence and specific action following the receipt of the warning is required <p>The message is of critical importance and needs to be delivered to a specific geographic area</p>
<p>Pre-populated Ararat, Pomonal, Moyston and Wickliffe Emergency Alert key messages for a severe flash flood event</p> <p>High velocity floodwater may cause risk to life for pedestrians and motorist. Access to main roads may be cut. Advise to shelter in place if it is safe to do so. The flood peak is likely to pass within several hours.</p>		

	<p>EMERGENCY ALERT</p> <p>As required, subject to individual circumstances, weather conditions, potential impacts and duration.</p> <p>Refer VICSES SOP057.</p>	<p>As required, based on conditions, changed conditions or impacts of the flood event.</p> <p>Circumstances which warrant the use of EA include:</p> <ul style="list-style-type: none"> • EA is likely to contribute to saving lives and property • EA is likely to be the most effective way to warn the community in an actual or likely emergency • Alternative channels have been considered and alone may not achieve objectives • Time is of the essence and specific action following the receipt of the warning is required <p>The message is of critical importance and needs to be delivered to a specific geographic area</p>
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Pre-populated Ararat, Pomonal, Moyston and Wickliffe Emergency Alert key messages for a severe flood event

The BOM have issued a Severe Weather Warning: Heavy Rain

Heavy rainfall forecast by the BOM may lead to Flash Flooding ???. Falls are expected to be between ???mm and ???mm. Locally heavier falls are possible due to embedded thunderstorms that could cause severe flooding.

Locations which may be affected could include: Ararat, Pomonal, Moyston and Wickliffe.

Widespread flooding may occur.

Keep clear of creeks and storm drains

Stay clear of fast moving floodwater. Floodwater is expected to rise quickly and will cause risk to life for pedestrians and motorist.

Flooding may cause inundation of buildings in Ararat and Wickliffe.

Properties are likely to be isolated. If your property is impacted by flooding, we advise you to shelter in place if it is safe to do so.

The flood peak is likely to pass quickly, within several from the start of rainfall.

Floodwater may cut access to main roads, avoid driving until the storm and floodwater has subsided.

Waterways likely to be affected include:

- Salt Creek
- Millers Creek
- Mount William Creek
- Hopkins River
- Cemetery Creek
- South Drainage Line (downstream of Oliver Gully Reservoir)

SES advises that all community members should:

Never walk, ride or drive through floodwater, Never allow children to play in floodwater, Stay away from waterways and stormwater drains during and after heavy rain, Keep well clear of fallen power lines Be aware that in fire affected areas, rainfall run-off into waterways may contain debris such as ash, soil, trees and rocks, and heavy rainfall increases the potential for landslides and debris across roads.

For emergency assistance contact the SES on 132 500.

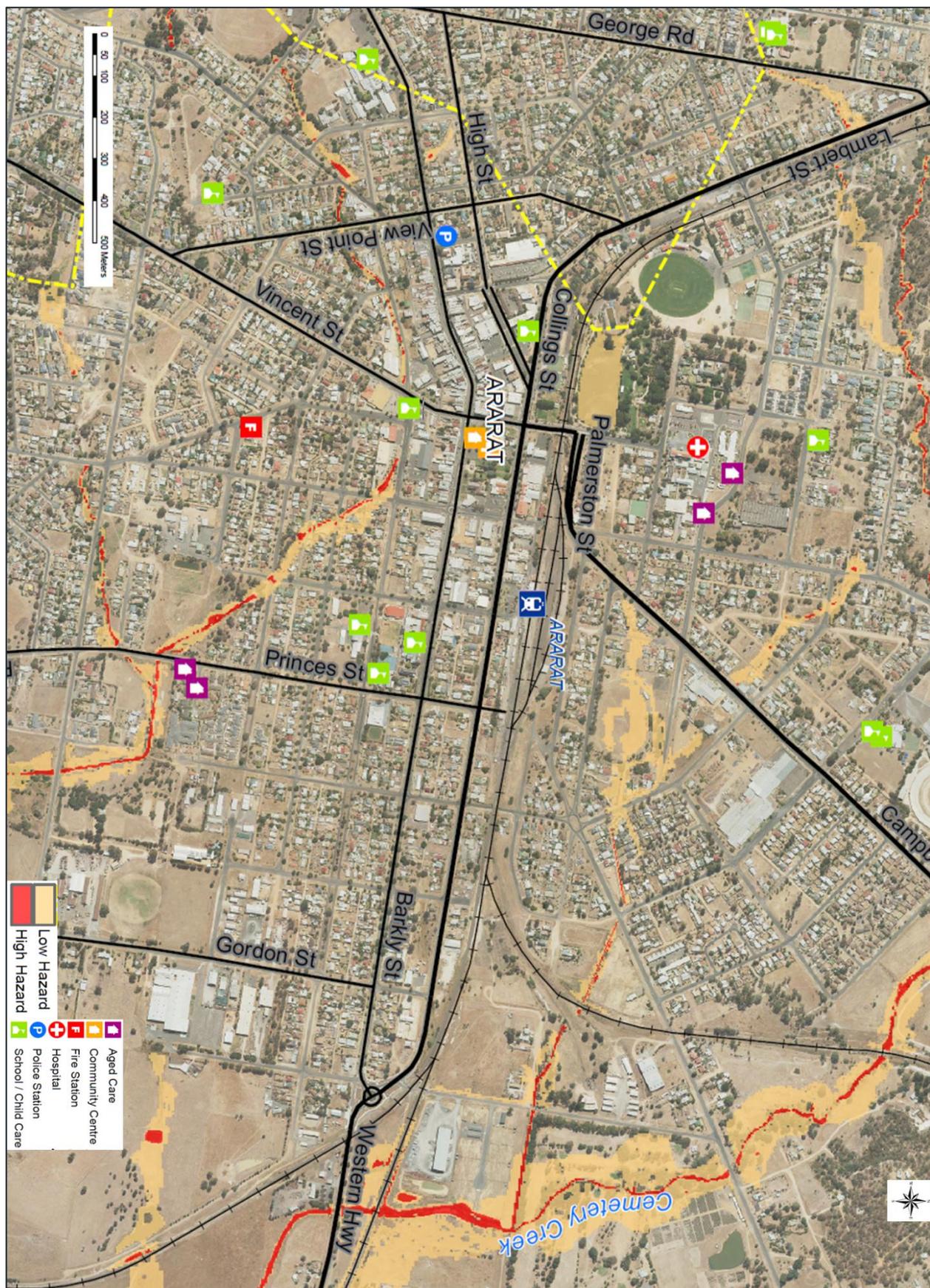
Current Road and Traffic Information is available at the VicRoads website: <http://traffic.vicroads.vic.gov.au>

Weather Forecast:

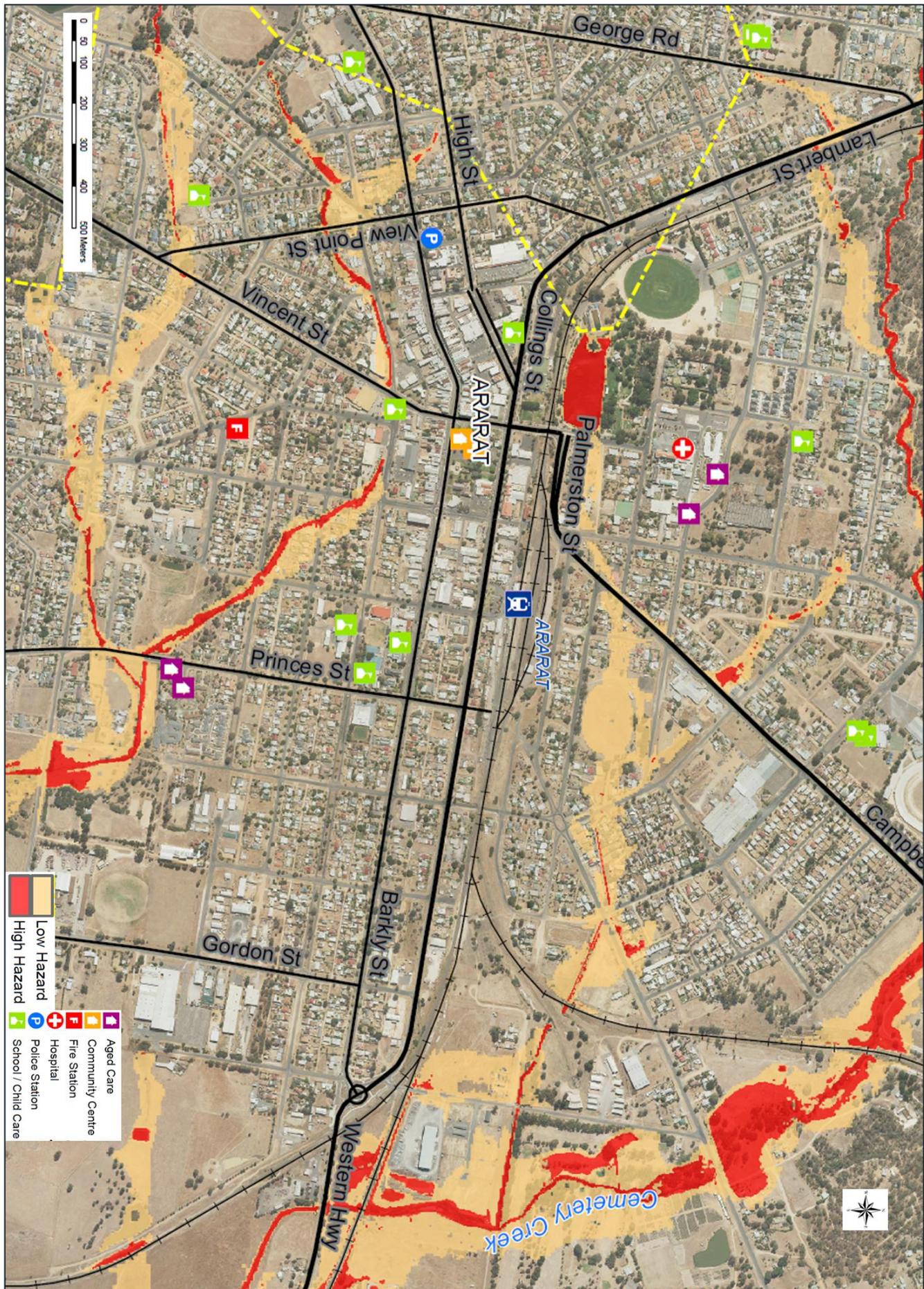
For the latest weather forecast see <http://www.bom.gov.au/vic/forecasts/>

Appendix F: Flood Maps

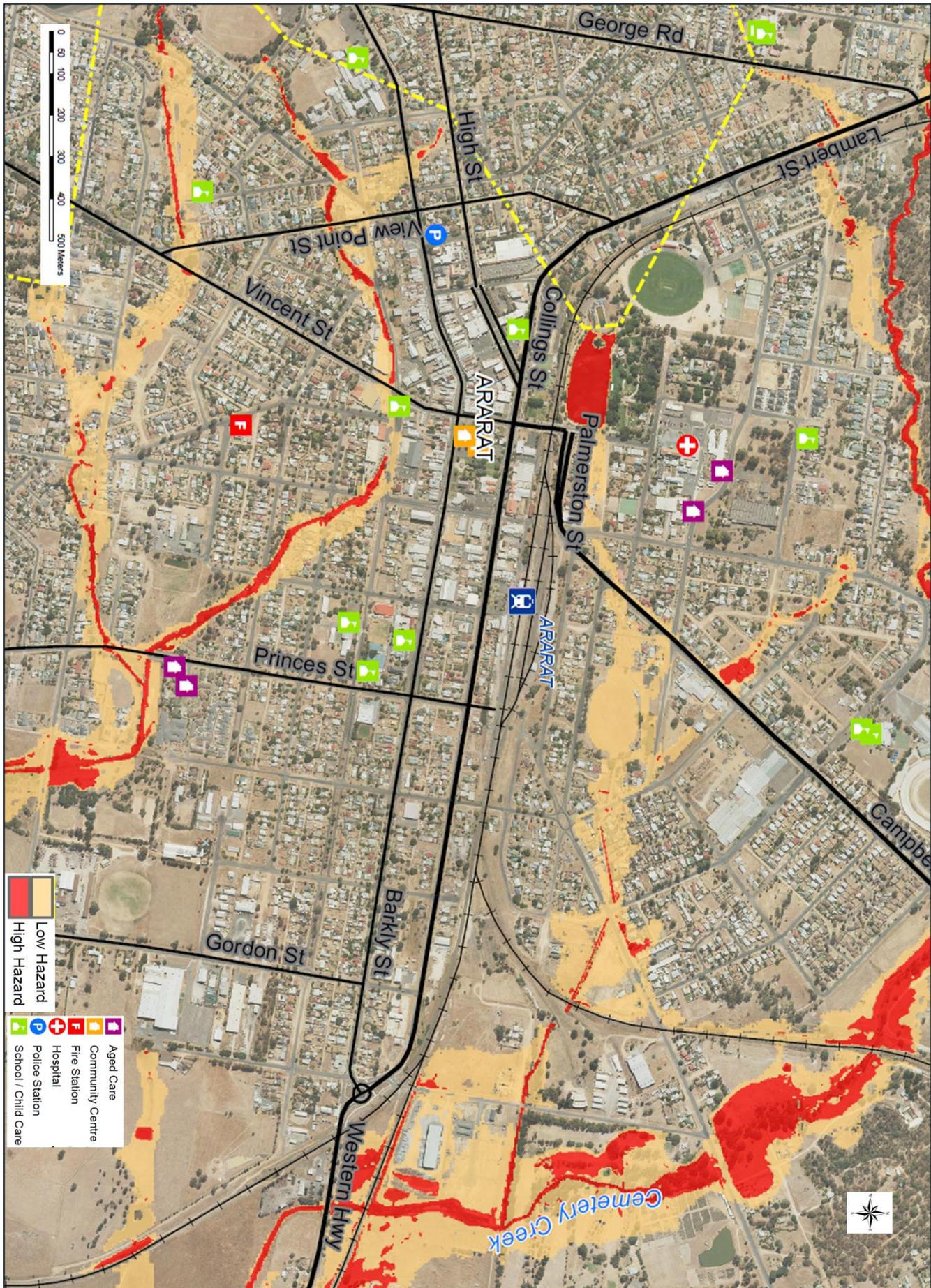
1.1. Ararat Flood Extent Maps. Ararat 5 year ARI flood extent map (Water Technology 2017).



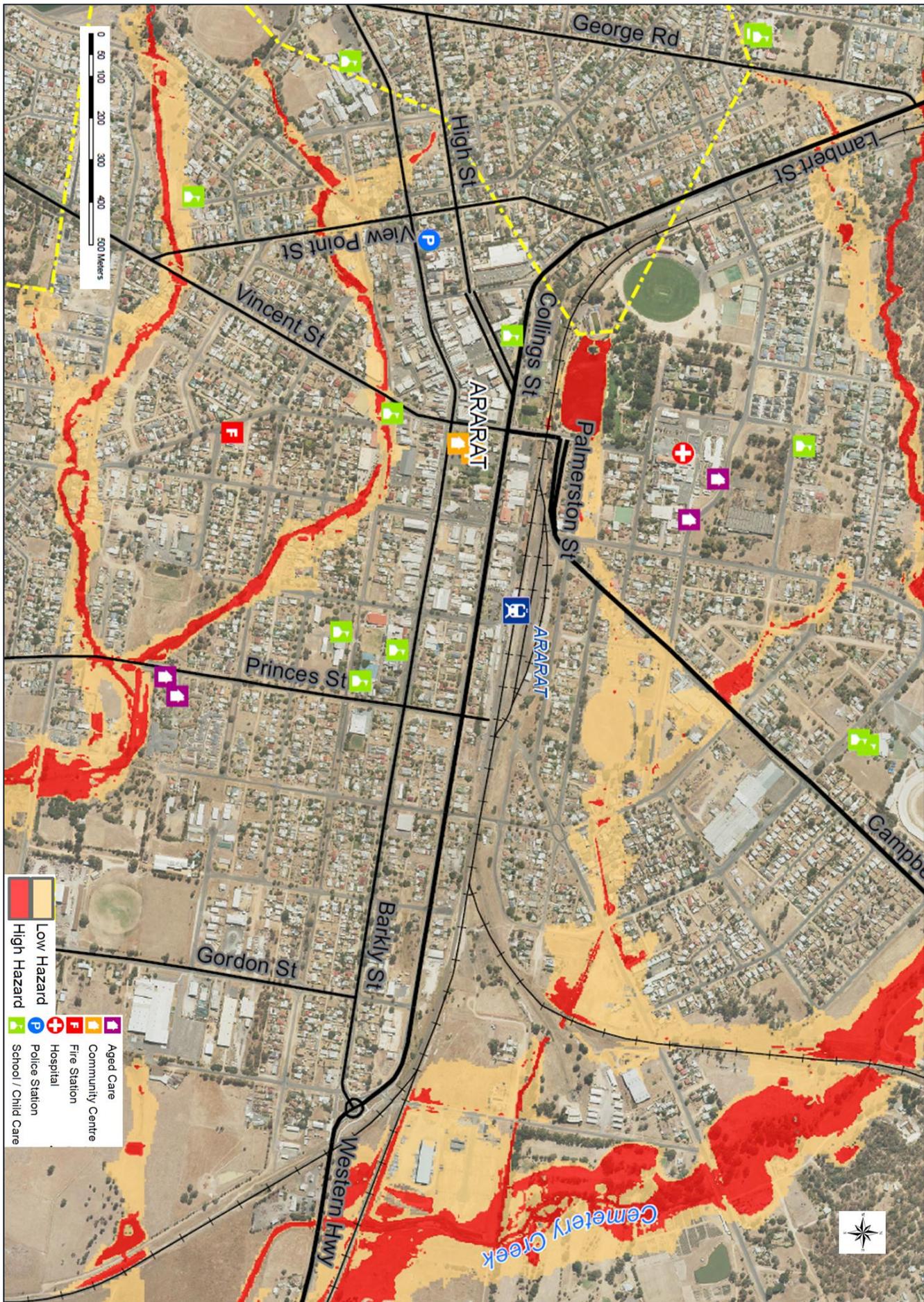
Ararat 50 year ARI flood extent map (Water Technology 2017).



Ararat 100 year ARI flood extent map (Water Technology 2017).



Ararat 500 year ARI flood extent map (Water Technology 2017).



1.2. **Moyston Flood Extent Maps.** Moyston 5 year ARI flood extent map (BMT 2014).



Moyston 50 year ARI flood extent map (BMT 2014).



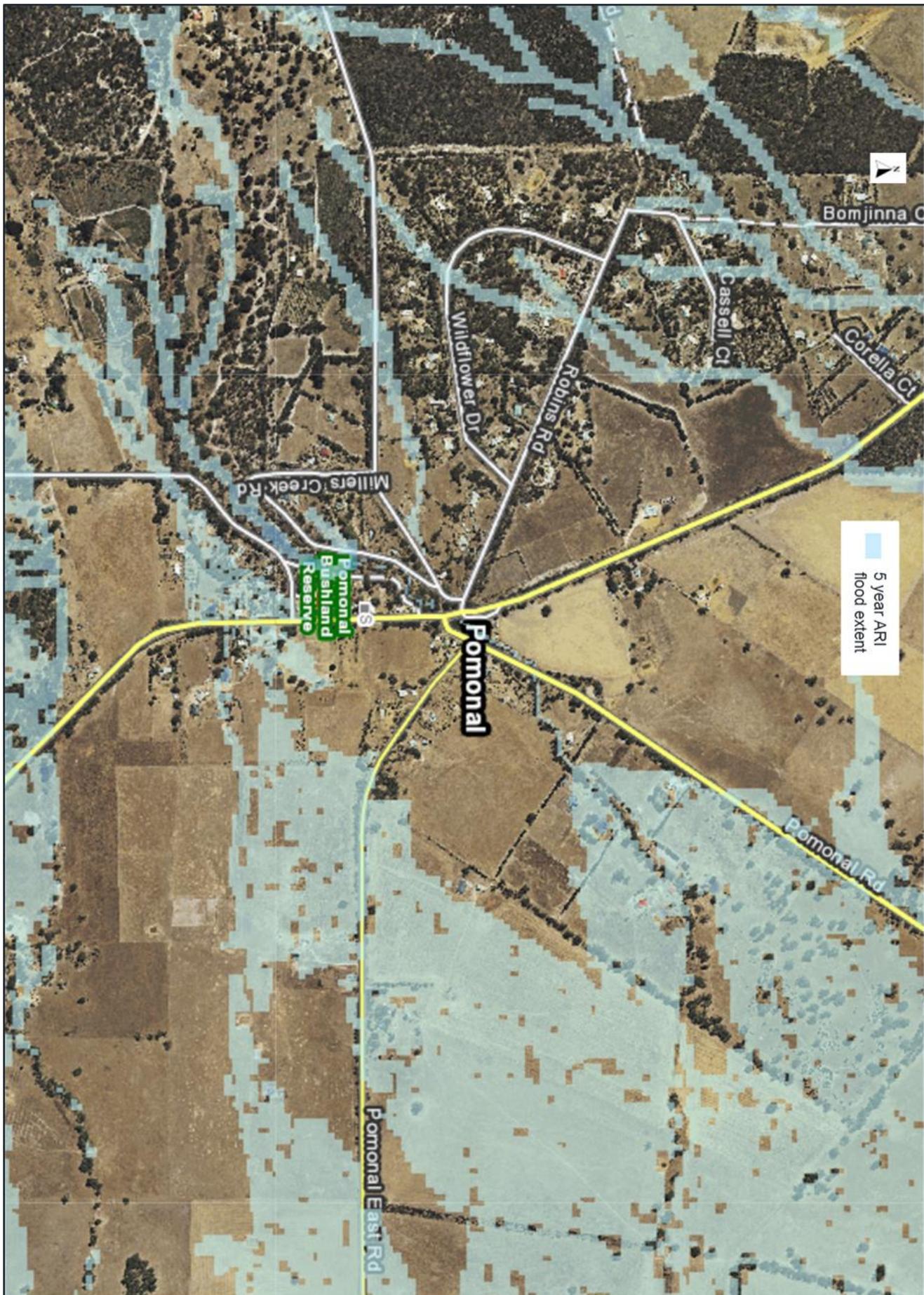
Moyston 100 year ARI flood extent map (BMT 2014).



Moyston 200 year ARI flood extent map (BMT 2014).



1.3. **Pomonal Flood Extent Maps.** Pomonal 5 year ARI flood extent map (BMT 2014).



Pomonal 50 year ARI flood extent map (BMT 2014).



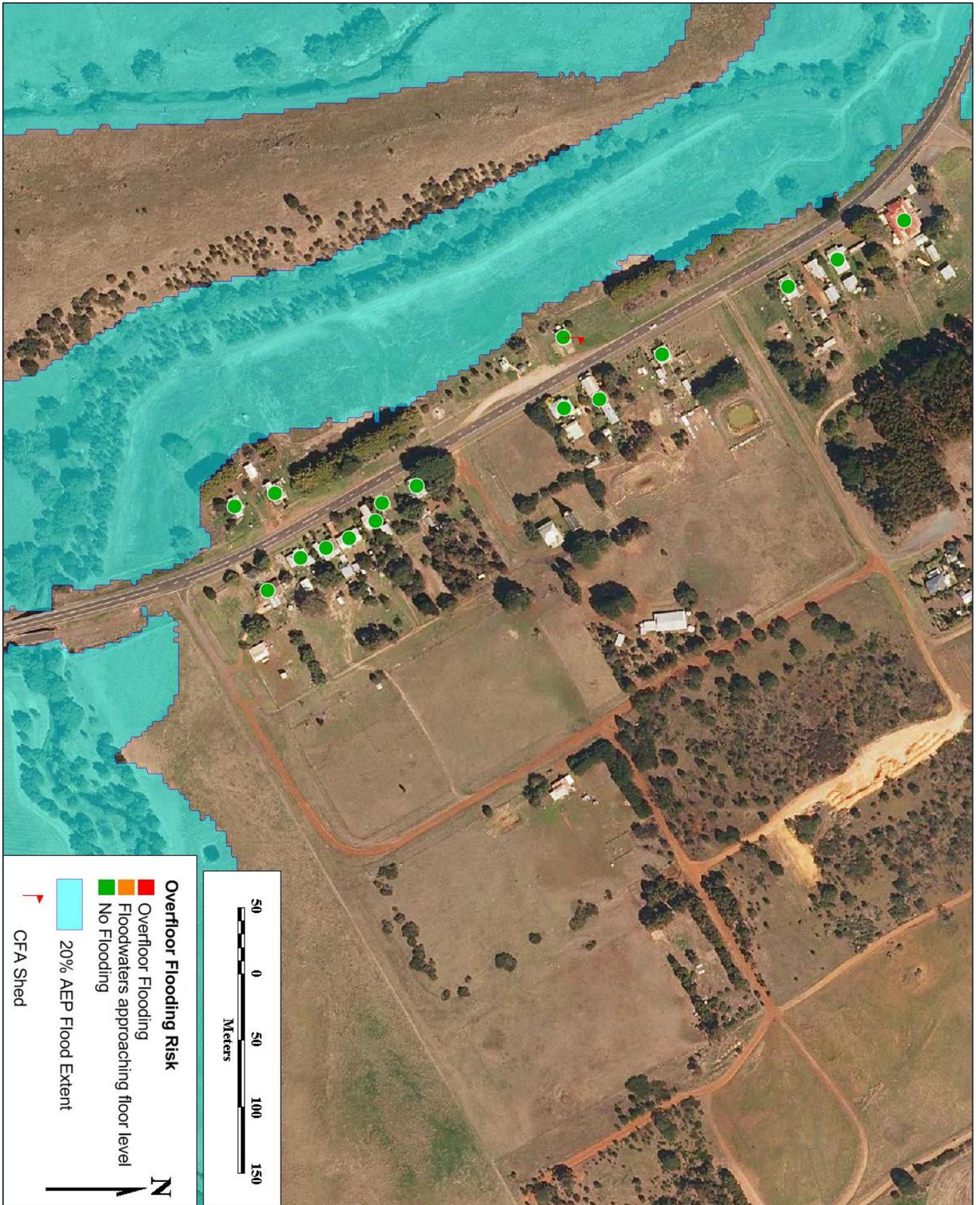
Pomonal 100 year ARI flood extent map (BMT 2014).



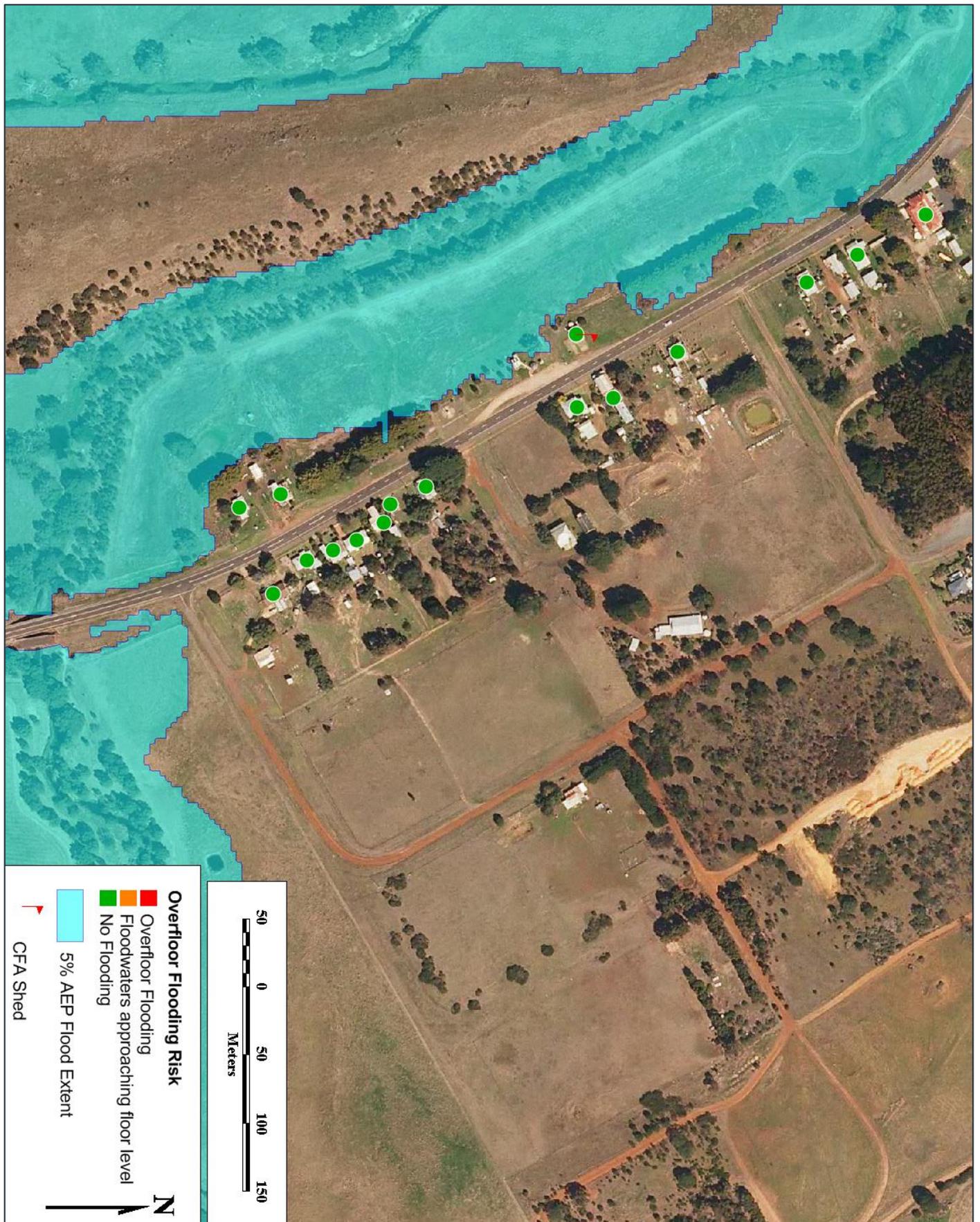
Pomonal 200 year ARI flood extent map (BMT 2014).



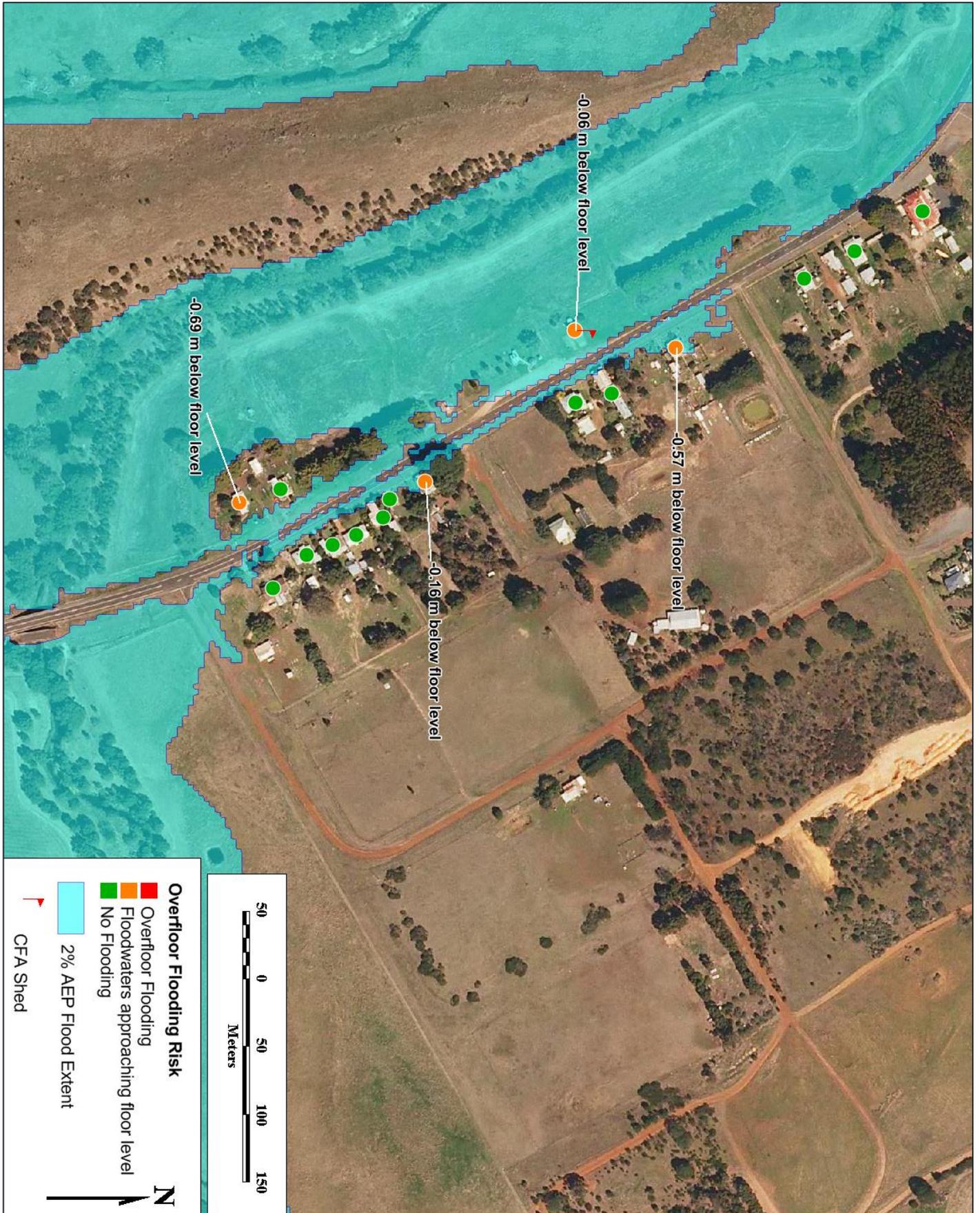
1.4. **Wickliffe Flood Depth Map.** Wickliffe 5 year ARI flood depth map (Cardno 2012).



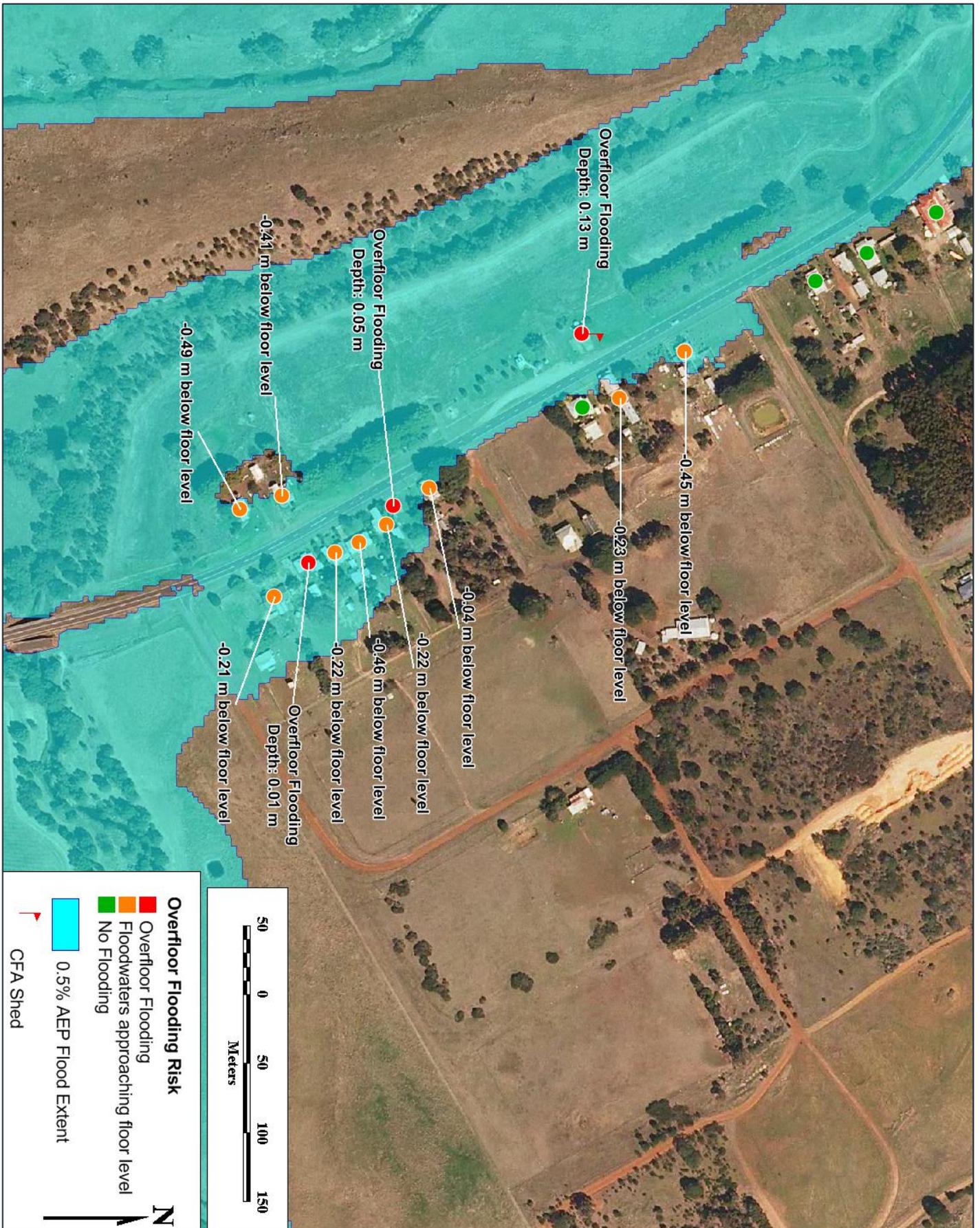
Wickliffe 20 year ARI flood depth map (Cardno 2012).



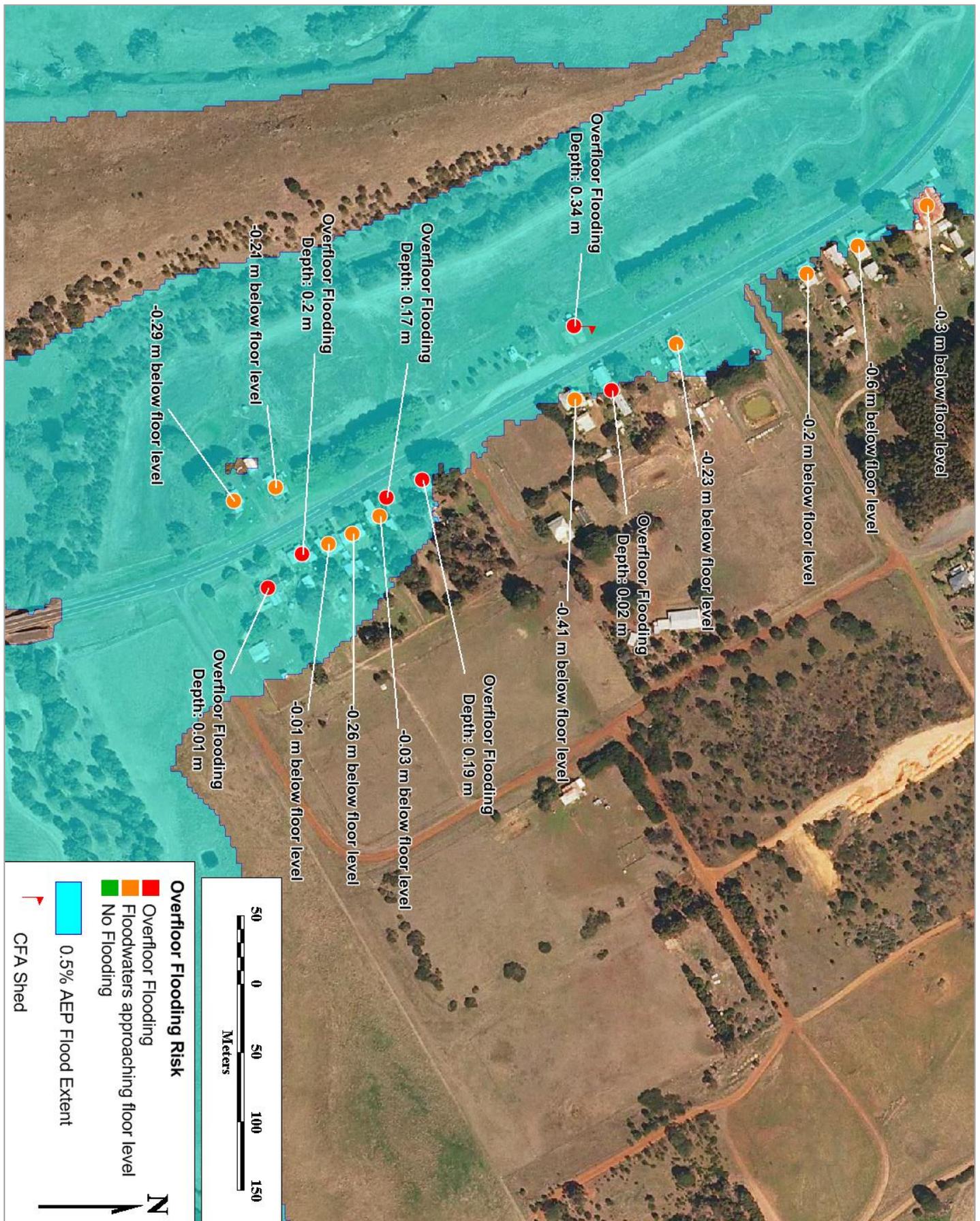
Wickliffe 50 year ARI flood depth map (Cardno 2012).



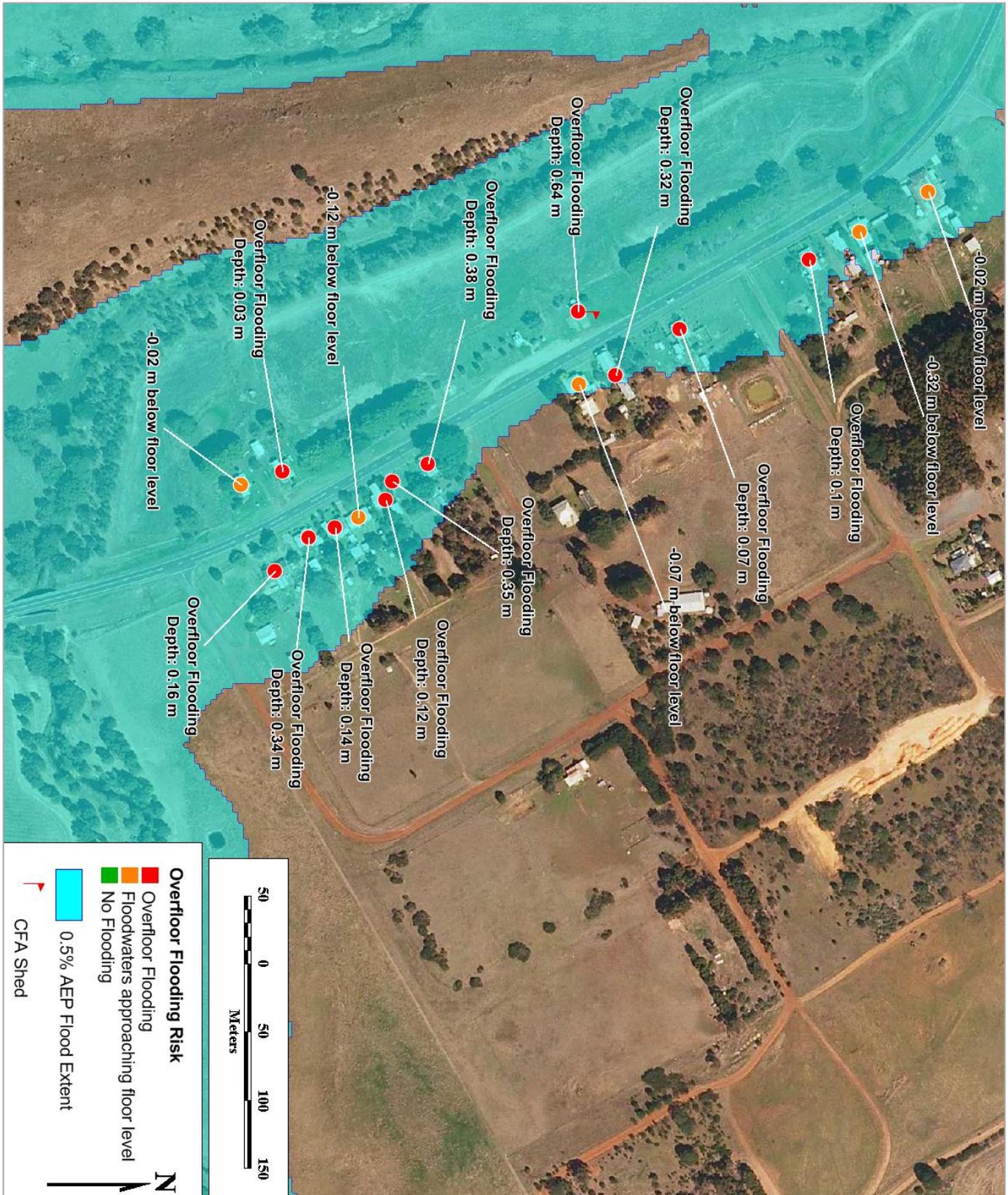
Wickliffe 100 year ARI flood depth map (Cardno 2012).



Wickliffe 200 year ARI flood depth map (Cardno 2012).



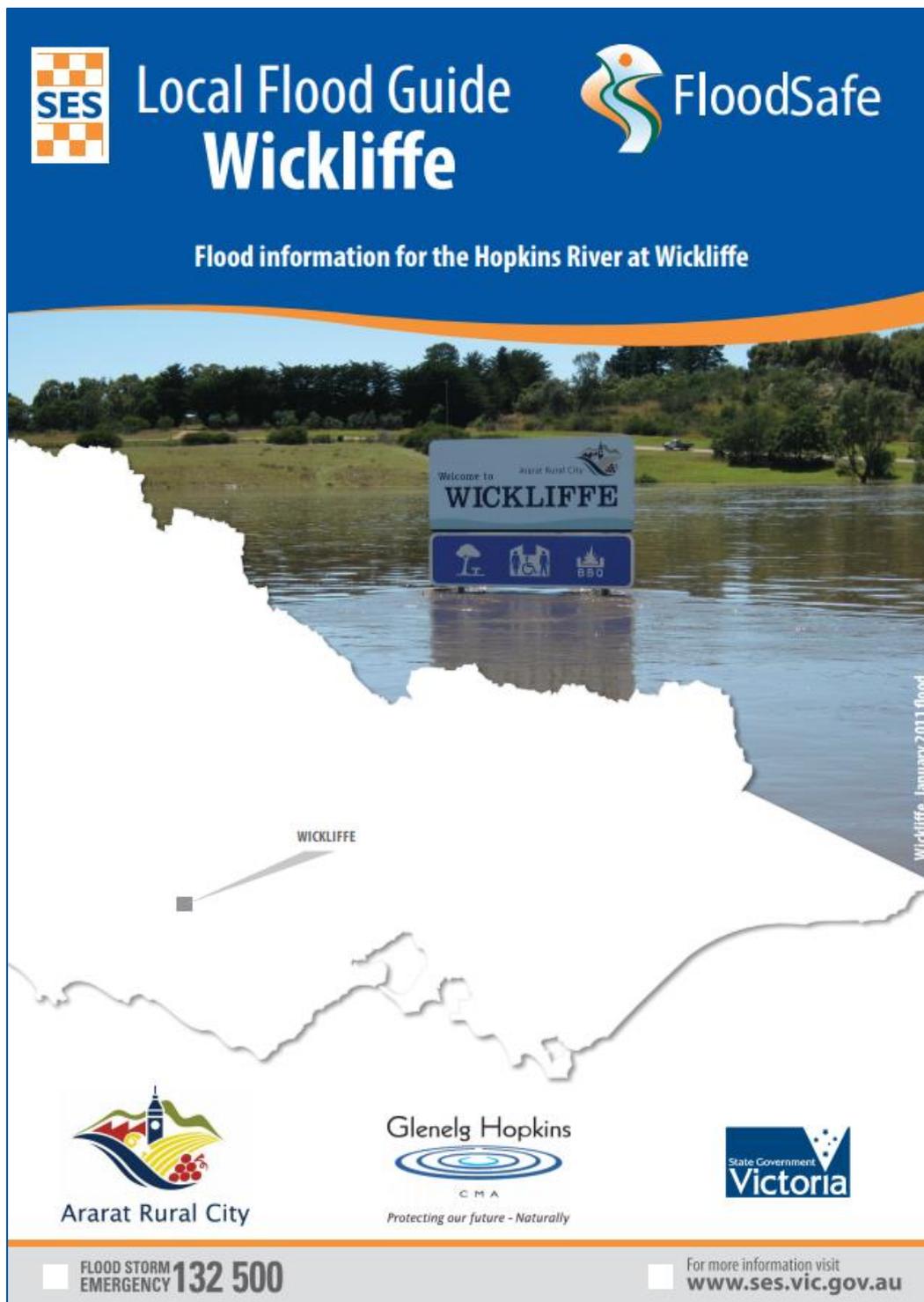
Wickliffe 500 year ARI flood depth map (Cardno 2012).



Appendix G: Local flood information

Refer to the link below for the Local Flood Guide developed for the Ararat Rural City Council;

- Wickliffe Local Flood Guide
<https://www.ses.vic.gov.au/documents/112015/134840/Wickliffe+local+flood+guide/92824bc4-a976-4b39-a302-0ebe116c9e88>



Appendix H: Ararat Community Sandbag Collection Points

Triggers to start prefilling sandbags and setting up community sandbag collection points;

- BOM flood watch has been issued for the town/catchment area
- Significant rainfall is predicted for the town/catchment area (greater than 50mm)
- BOM has high certainty the rainfall event will impact a town/catchment area listed below.
- Flooding is imminent

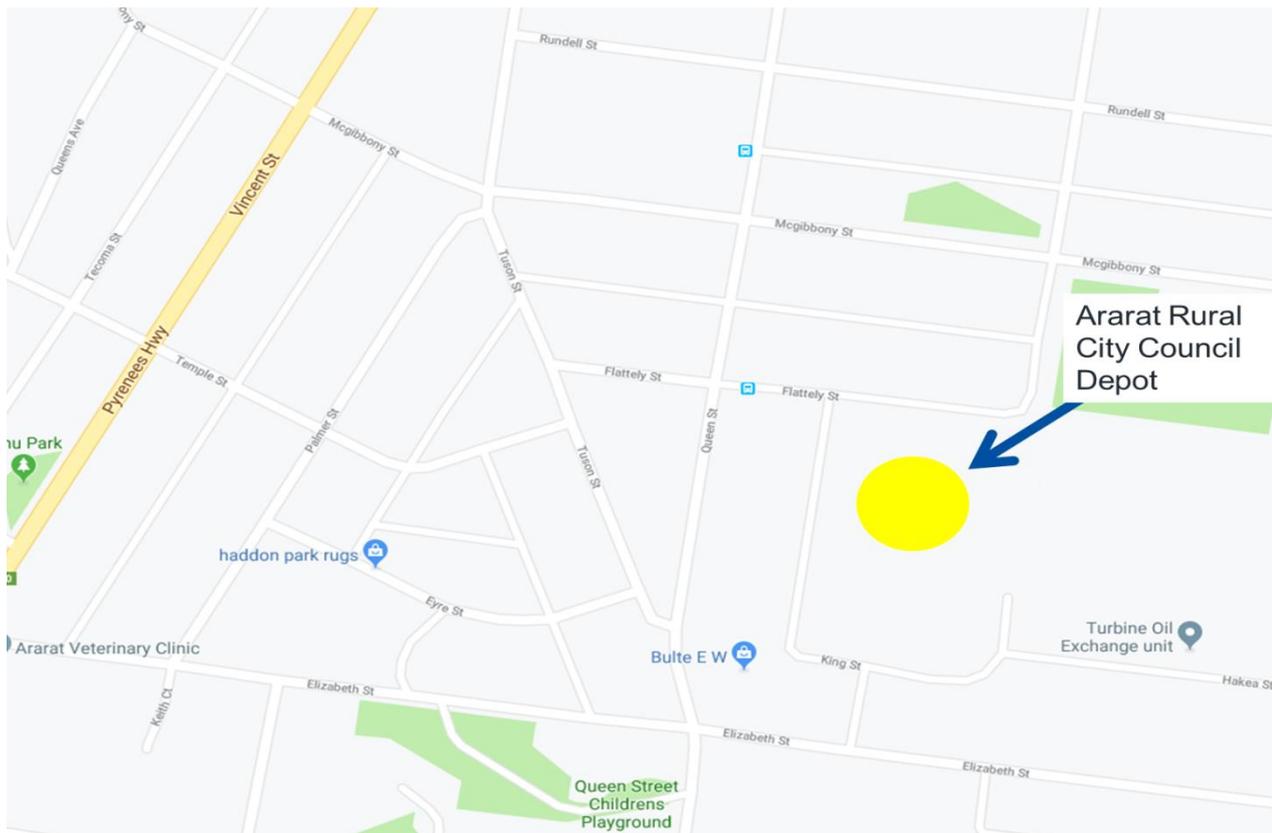
When needed community sandbag collection points will be set up at;

- Ararat Rural City Council Depot: corner of Flattely Street and King Street, Ararat.
- Wickliffe Recreation Reserve: 1765 Willaura-Wickliffe Road, Wickliffe.

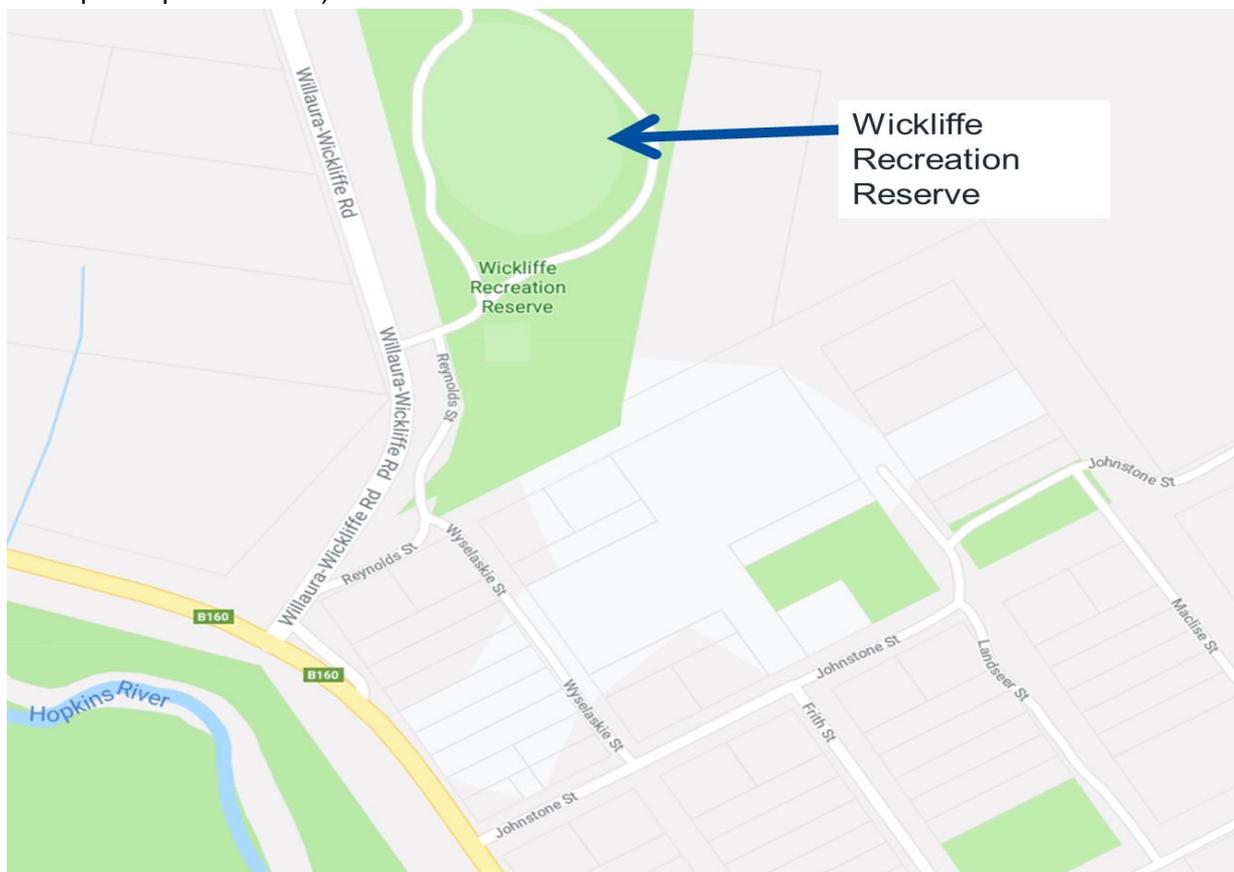
Refer to the list below of key tasks that may be undertaken to prepare sandbag filling and community sandbag collection points.

Agency	Task Description
VICSES	Deliver sandbags to the council depot or other nominated sandbag filling point to prefill the sandbags.
Ararat Rural City Council	Deliver sand to sandbag filling points documented below.
Ararat Rural City Council / VICSES / CFA	Deliver prefilled sandbags either directly to buildings that need to be sandbagged or to the nominated community Sandbag collection point. Provide staff/volunteers to set up the community sandbag point. Provide staff/volunteers to distribute prefilled sandbags to the community.
Ararat Rural City Council / VICSES	Notify the community of the location of the community sandbag collection point via local radio and social media channels.

Ararat sandbag filling and community collection point: the Ararat Rural City Council Depot, 11-25 Flattely Street, Ararat (refer to map and photo below).



Wickliffe sandbag filling and community collection point: 1765 Willaura-Wickliffe Road, Wickliffe (refer to map and photo below).



Appendix I: 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 and agency staff will help support this process.

For the Ararat Rural City region community observers identified are:

Town	Observer Details	Community Observer Name	Contact Details
Ararat	Ararat VICSES Unit Duty Officer	Duty Officer	0448 053 886
Ararat	Ararat VICSES Deputy Unit Controller	Jan Rilloraza	0400 513 102
Moyston	Moyston CFA Brigade Captain	Michael Davies	0427 622 153
Pomonal	Pomonal CFA Brigade Captain	David Gething	0419 327 507
Pomonal	Local resident	David Tepper	0408 747 112
Wickliffe	Wickliffe CFA Brigade Captain	Bill Walker	0417 519 523