

# City of Melton

## Storm and Flood Emergency Plan

### A Sub-Plan of the Municipal Emergency Management Plan

For Melton City Council  
And  
VICSES Unit Melton

Version 6.0  
Reviewed March 2022



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## Distribution List

Copy No.	Issue To:		Date
	Position	Organisation	
Original	MEMP Committee Executive Officer	Melton Council	
1	MEMP Committee Chairperson	Melton Council	
2	MEMO	Melton Council	
3	Deputy MEMO	Melton Council	
4	MRM	Melton Council	
5	Deputy MRM	Melton Council	
6	MERC	Vic Police	
7	Deputy MERC	Vic Police	
8	RERC	Vic Police	
9	North West REMI	Vic Police	
10	Regional Officer Emergency Management	VICSES Central Region	
11	Controller	VICSES Melton Unit	
12	Group Manager	Ambulance Victoria	
13	Assistant Chief Fire Officer, District 14	CFA	
14	Emergency Management Coordinator	Department of Families, Fairness and Housing	
15	Regional Emergency Management Officer	Department of Transport: Burwood office	
16	Commander Western Zone	FRV	
17	Emergency Management Officer	St John Ambulance	
18	Emergency Management Coordinator	Greater Western Water	
19	Coordinator Management Systems	Greater Western Water	
20	Team Leader Hydrology & Flood Warnings	Melbourne Water	
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## Document Transmittal Form / Amendment Certificate

This Municipal Storm and Flood Emergency Plan (MSFEP) will be amended, maintained and distributed as required by the Victoria State Emergency Service (VICSES) in consultation with the City of Melton.

Suggestions for amendments to this Plan should be forwarded to:

VICSES Central Region Sunshine Office  
239 Proximity Drive  
SUNSHINE WEST VIC 3020

Amendments listed below have been included in this Plan and promulgated to all registered copyholders.

Amendment Number	Date of Amendment	Amendment Entered By	Summary of Amendment
<b>Issue date of Flood Emergency Plan – 15 May 2013</b>			
2	29/03/2016	R Butler	Update of Appendix A, B, C, F and addition of Appendix G
3	June 2018	R Butler and J Griffin	Update legislative references, acronyms, inclusion of operational information, Update of Appendix A, B, C, F & G
4	June 2019	M Patton	Endorsed by MEMPC
5	June 2021	R Butler and K Hetey	Application of new template. Updated parts of the body as well as Appendices A, B, C, F and G based on new data made available since previous version. Changes and edits to accommodate the <i>Emergency Management Legislation Amendment Act 2018</i> (EMLA Act) that amended the <i>Emergency Management Act 2013</i> (EM Act 2013).
5.1	February 2022	R Butler & C Brockwell	Adoption of KH Comments & Updates based on meeting with Melton Shire WG
5.2	February 2022	C Brockwell	Minor amendments following MEMPC review
6.0	March 2022	C Brockwell	Endorsed by MEMPC
TBC	TBC	REMPC	Assurance and Approval.

This Plan will be maintained on the VICSES website ([ses.vic.gov.au/plan-and-stay-safe/flood-guides/melton-city-council](https://ses.vic.gov.au/plan-and-stay-safe/flood-guides/melton-city-council)) with a link to from the Melton website.

## List of Abbreviations & Acronyms

The following abbreviations and acronyms are used in the Plan:

The following abbreviations and acronyms are used in the Plan			
AAR	After Action Review	IMS	Incident Management System
AEP	Annual Exceedance Probability	IEMT	Incident Emergency Management Team
AHD	Australian Height Datum (the height of a location above mean sea level in metres)	IMT	Incident Management Team
AIDR	Australian Institute of Disaster Resilience	LSIO	Land Subject to Inundation Overlay
AIIMS	Australasian Inter-service Incident Management System	MECC	Municipal Emergency Coordination Centre
AoCC	Area of Operations Control Centre / Command Centre	MEMO	Municipal Emergency Management Officer
ARI	Average Recurrence Interval	MEMP	Municipal Emergency Management Plan
AV	Ambulance Victoria	MEMPC	Municipal Emergency Management Planning Committee
BoM	Bureau of Meteorology	MERC	Municipal Emergency Response Coordinator
CEO	Chief Executive Officer	MRM	Municipal Recovery Manager
CERA	Community Emergency Risk Assessment	PMF	Probable Maximum Flood
CFA	Country Fire Authority	RAC	Regional Agency Commander
CMA	Catchment Management Authority	RCC	Regional Control Centre
DELWP	Department of Environment, Land, Water and Planning	RDO	Regional Duty Officer
DFFH	Department of Families, Fairness and Housing	RERC	Regional Emergency Response Coordinator
DH	Department of Health	RERCC	Regional Emergency Response Coordination Centre
DJPR	Department of Jobs, Precincts and Regions	SBO	Special Building Overlay
Dol	Department of Infrastructure	SCC	State Control Centre
DoT	Department of Transport	SEMP	State Emergency Management Plan
EMLO	Emergency Management Liaison Officer	SERP	State Emergency Response Plan
EMV	Emergency Management Victoria	SEWS	Standard Emergency Warning Signal
EO	Executive Officer	SHERP	State Health Emergency Response Plan
FO	Floodway Overlay	SOP	Standard Operating Procedure
FRV	Fire Rescue Victoria	VicPol	Victoria Police
FWS	Flood Warning System	VICSES	Victoria State Emergency Service
FZ	Floodway Zone		
IC	Incident Controller		
ICC	Incident Control Centre		

## Glossary

Below are terms defined for the purpose of this plan:

Term	Definition
<b>Annual Recurrence Interval (ARI)</b>	The average, or expected, value of the period between exceedances of a given rainfall or flow total accumulated over a given duration.
<b>Annual Exceedance Probability (AEP)</b>	The probability that a given total rainfall or flow is accumulated over a given duration will be exceeded in any one year.
<b>Flash flooding</b>	Sudden unexpected flooding caused by local heavy rainfall or rainfall in another area. Often defined as flooding which occurs within six hours of the rain which causes flooding.
<b>Flood mapping</b>	The process where the extent of flooding is documented in mapping software based on flood studies and surface elevations.
<b>Floodplain</b>	Area of land adjacent to a creek, river, estuary, lake, dam or artificial channel, which is subject to inundation.
<b>Hot spot</b>	A known flood problem area which has a history of repeat flooding of a road, crossing or property, often highlighted through anecdotal information and customer complaints. It is a localised issue which will vary from council to council.
<b>Natural drainage system</b>	Flow paths which are largely undeveloped by human sources, these include rivers, streams, natural depressions and wetlands. All-natural systems greater than 60 ha are managed by Melbourne Water.
<b>Overland flooding</b>	Flooding by local runoff caused by heavier than usual rainfall. Overland flooding can be caused by local flow exceeding the capacity of an urban stormwater drainage system or by the backwater effects of mainstream flooding causing urban stormwater drainage system to overflow. For local government areas this is over the 5-year ARI in residential or over 10yr ARI in commercial/industrial. For Melbourne Water catchment areas this is for all other ARIs up to the 100yr ARI.
<b>Retarding Basin</b>	A Retarding Basin is a large, open, free draining basin that temporarily stores collected stormwater runoff. These basins are normally maintained in a dry condition between storm events.
<b>Stormwater drainage system</b>	A series of drains and waterways into which surface and stormwater flows. Features of a stormwater drainage system can include underground pipe drains, open channels, retarding basins, floodways, waterway improvements, water sensitive urban design, integrated water management systems and environment protection measures. All drainage under 60 ha is maintained and operated by Council.
<b>Stormwater Runoff</b>	The amount of rainfall that enters the stormwater drainage system, (via pits, pipes, retarding basins, water sensitive structures, harvesting tanks and overland flow paths) after water which is not absorbed into the ground has been taken into account.

## Part 1. INTRODUCTION

### 1.1 Municipal Endorsement

This Municipal Storm and Flood Emergency Plan (MSFEP) has been prepared by City of Melton Municipal Emergency Management Planning Committee (MEMPC) pursuant to Section 20 of the *Emergency Management Act 1986* (as amended).

This MSFEP is a sub plan to the City of Melton Municipal Emergency Management Plan (MEMP). It is consistent with the State Emergency Management Plan (SEMP), State Flood Emergency Plan and State Storm Emergency Plan (sub-plans of the now superseded State Emergency Response Plan and transitioned to be sub-plans of the SEMP).


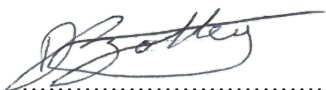
It is also consistent with the Victoria State Emergency Service (VICSES) Central Region Storm and Flood Emergency Plans and the Victorian Flood Management Strategy, and takes into account the outcomes of the Community Emergency Risk Assessment (CERA) process undertaken by the City of Melton MEMPC.

This MSFEP is a result of the cooperative efforts of the City of Melton MEMPC and its member agencies.

Minor and administrative amendments will be made to this MSFEP from time to time without re-presenting the Plan to the MEMPC. Any major structural or policy changes will be considered before adoption.

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

#### Endorsement

	Date: 15 / 03 / 2022
.....	
<b>Brendan Sell</b> <b>MEMPC Chair</b>	
	Date: 18 / 3 / 2022
.....	
<b>Diana Batley</b> <b>Manager Regional Operations – Emergency Management</b> <b>VICSES Central Region</b>	

## 1.2 Purpose and Scope of this Storm and Flood Emergency Plan

The purpose of this MSFEP is to detail arrangements agreed for the planning, preparedness/prevention, response and recovery from storm and/or flood incidents within the City of Melton.

As such, the scope of the Plan is to:

- Identify the storm and flood risk to City of Melton.
- Support the implementation of measures to minimise the causes and impacts of storm and flood incidents within the City of Melton.
- Detail Response and Recovery arrangements including preparedness, Incident Management, Command and Control.
- Identify linkages with Local, Regional and State emergency and wider planning arrangements with specific emphasis on those relevant to storm and/or flood.

## 1.3 Municipal Emergency Management Planning Committee (MEMPC)

Membership of the City of Melton MEMPC is comprised of representatives from various agencies and organisations. Contact lists for the MEMPC membership are available in the Melton MEMP.

## 1.4 Responsibility for Planning, Review and Maintenance of this Plan

This MSFEP must be maintained in order to remain effective. This Plan must be assured, approved and published every three years, or more frequently if required.

VICSES, through the MEMPC, has responsibility for preparing, reviewing, maintaining and distributing this Plan.

The MEMPC may delegate to a subcommittee or working group to meet at least once per year to review the Plan and provide advice back to the MEMPC accordingly.

The plan should be reviewed and where necessary, arrangements and information contained in it should be amended:

- Following any new flood or stormwater drainage study.
- Following a change in non-structural and/or structural flood mitigation measures.
- After the occurrence of a significant storm and/or flood event within the Municipality.

## Part 2. BEFORE: PREVENTION / PREPAREDNESS ARRANGEMENTS

### 2.1 Community Awareness for all Types of Storm and Flooding

Details of this MSFEP will be released to the community through local media, VICSES community education programs and websites (VICSES and the Municipality) upon formal endorsement by City of Melton MEMPC.

VICSES, with the support of City of Melton and Melbourne Water, will coordinate community education programs for storm and flooding within the council area (e.g. Local Flood Guides and public events). Engagement will include raising awareness about the projected impacts on the frequency and intensity of flood and storm events and what actions can be taken to minimise these impacts.

### 2.2 Structural Flood Mitigation Measures

Structural flood mitigation measures existing within the City of Melton area are contained in **Appendix C**.

### 2.3 Non-structural Flood Mitigation Measures

#### 2.3.1 Exercising the Plan

Arrangements for exercising this Plan will be at the discretion of the MEMPC. This Plan should be regularly exercised, preferably on an annual basis, and reviewed following a significant event.

#### 2.3.2 Storm and Flood Warning

Arrangements for storm and flood warning are contained within the State Flood Emergency Plan and State Storm Emergency Plan ([ses.vic.gov.au/em-sector/vicses-emergency-plans](https://ses.vic.gov.au/em-sector/vicses-emergency-plans)), the SEMP and on the Bureau of Meteorology (BoM) website ([bom.gov.au](https://bom.gov.au)).

Specific details of local storm and flood warning system arrangements are provided in **Appendix E**.

#### 2.3.3 Local Knowledge

Community Flood Observers provide local knowledge to VICSES and the Incident Control Centre (ICC) regarding local insights and the potential impacts and consequences of an incident, and may assist with the dissemination of information to community members.

There are no official Community Flood Observers within the Melton Municipality, however local knowledge is incorporated into this plan through consultation with local response agencies. Previous event history and likely operational considerations are noted in the Flood Intelligence Cards in **Appendix C**.

In line with the VICSES Local Knowledge Policy, reviews of this Plan will be undertaken with input from multiple local sources to ensure appropriate local knowledge can be captured before, during and after incidents.

## Part 3. DURING: RESPONSE ARRANGEMENTS

### 3.1 Introduction

#### 3.1.1 Activation of Response

Storm and flood response arrangements may be activated by the VICSES Regional Duty Officer (RDO), Regional Agency Commander (RAC) or Incident Controller (IC).

The VICSES RDO, RAC or IC will activate agencies as required and documented in the VICSES Central Region Storm and Flood Emergency Plans, the State Storm Emergency Plan and the State Flood Emergency Plan ([ses.vic.gov.au/em-sector/vicses-emergency-plans](https://ses.vic.gov.au/em-sector/vicses-emergency-plans)).

#### 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 storm or flood within the City of Melton. These agencies will be engaged through the Incident Emergency Management Team (IEMT).

The general roles and responsibilities of supporting agencies are as agreed within the City of Melton MEMP, the SEMP ([Roles and Responsibilities](#)), State Flood and Storm Emergency Plans and VICSES Central Region Storm and Flood Emergency Plans ([ses.vic.gov.au/em-sector/vicses-emergency-plans](https://ses.vic.gov.au/em-sector/vicses-emergency-plans)).

#### 3.1.3 Municipal Emergency Coordination Centre (MECC)

Where activated, the function, location, establishment and operation of the MECC will be as detailed in the City of Melton MEMP.

Liaison with the MECC will be through the VICSES RDO/IC or established ICC.

In the event that a MECC is not operating, the Melton Council Municipal Emergency Management Officer (MEMO) will be contacted.

#### 3.1.4 Escalation

Most storm and flood incidents are of local concern and an appropriate response can usually be coordinated using local resources. However, when these resources are exhausted, Regional arrangements provide for further resources to be made available, firstly from neighbouring Municipalities on a Regional basis, and then on a State-wide basis.

Resourcing and event escalation arrangements are described in the SEMP.

## 3.2 State Emergency Management Priorities

To provide guidance to the Incident Management Team (IMT) and Incident Emergency Management Team (IEMT), the following State Emergency Management Priorities shall form the basis of incident action planning processes:

1. Protection and preservation of life is paramount.  
This includes:
  - a) Safety of emergency response personnel; and
  - b) Safety of community members including vulnerable community members and visitors/tourists.
2. Issuing of community information and community warnings detailing incident information that is timely, relevant and tailored to assist community members make informed decisions about their safety.
3. Protection of critical infrastructure and community assets that support community resilience.
4. Protection of residential property as a place of primary residence.
5. Protection of assets supporting individual livelihoods and economic production that supports individual and community financial sustainability.
6. Protection of environmental and conservation assets that considers the cultural, biodiversity, and social values of the environment.

Circumstances may arise where the IC is required to vary these priorities, with the exception being that the protection of life should remain the highest. This shall be done in consultation with the State Response Controller and relevant stakeholders based on sound incident predictions and risk assessments.

## 3.3 The Six C's

Arrangements in this MSFEP must be consistent with the Six C's detailed in State and Regional Flood and Storm Emergency Plans. For further information, refer to the SEMP.

- **Control:** Overall direction of response activities in an emergency, operating horizontally across agencies.
- **Command:** Internal direction of personnel and resources of an agency.
- **Coordination:** Bringing together agencies and resources to ensure effective preparation for response and recovery.
- **Consequences:** 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 all communities to support resilience and decision making.

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



### 3.3.1 Control

Sections 5(1)(b) and 5(1)(c) of the *Victoria State Emergency Service Act 2005* detail the authority for VICSES to plan for and respond to storms and floods.

Table 9 of the SEMP ([Roles and Responsibilities](#)) identifies VICSES as the Control Agency for storm and flood. It identifies the Department of Environment, Land, Water and Planning (DELWP) as the Control Agency responsible for dam safety, water and sewerage asset related incidents and other emergencies.

All storm and flood response activities within the City of Melton, 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 his/her delegated representative.

### 3.3.2 Incident Controller (IC)

An IC will be appointed by VICSES (as the Control Agency), to command and control available resources in response to a storm and/or flood event on the advice of the BoM (or other reliable source) that a storm and/or flood event will occur or is occurring. The IC responsibilities are as defined in the SEMP.

### 3.3.3 Incident Control Centre (ICC)

As required, the IC will establish an 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 (VICSES).

Pre-determined Incident Control Centres are located at:

- Sunshine ICC
- Ferntree Gully ICC
- Dandenong ICC

### 3.3.4 Divisions and Sectors

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

Divisions and Sectors may be established to assist with the management of storms and flooding within the Municipality.

Pre-determined Divisional Command locations may include:

- VICSES Wyndham West Unit LHQ, 418 Ballan Road, Wyndham Vale
- VICSES Brimbank Unit LHQ, Stadium Drive, Keilor Park
- VICSES Essendon Unit LHQ, 9 Rutherford St, Aberfeldie
- VICSES Broadmeadows Unit LHQ, 434 Mahoneys Rd, Campbellfield

Sector Command locations are to be allocated on an as needs basis.

### 3.3.5 Incident Management Team (IMT)

The IC will form an IMT in line with Australasian Inter-service Incident Management System (AIIMS) principles. Refer to the SEMP for guidance on IMTs.

### 3.3.6 Incident Emergency Management Team (IEMT)

The IC will establish a multi-agency IEMT to assist with the storm and/or flood response. The IEMT will consist of key personnel, with appropriate authority, from stakeholder agencies and relevant organisations who need to be informed of strategic issues related to incident control and who are able to provide high-level strategic guidance and policy advice to the IC for consideration in developing incident management strategies.

Organisations required within the IEMT (including Melton City Council) will provide an Emergency Management Liaison Officer (EMLO) to the ICC if and as required, as well as other staff and/or resources identified as being necessary, within the capacity of the organisation.

Refer to the SEMP for guidance on IEMTs.

### 3.3.7 On Receipt of a Flood Watch / Severe Weather Warning

The VICSES RDO (until an IC is appointed), will undertake actions as defined within the Flood Intelligence Cards (**Appendix C**). General considerations by the VICSES RDO/IC will be as follows:

- Review storm and flood intelligence to assess likely flood consequences, including:
  - Melton Reservoir storage percentage is noted (Southern Rural Water Duty Officer) ([srw.com.au/SRW\\_Storage/DamChart.aspx?dam=Melton+Reservoir](http://srw.com.au/SRW_Storage/DamChart.aspx?dam=Melton+Reservoir)).
  - Melbourne Water rainfall and river monitoring ([melbournewater.com.au/water-data-and-education/rainfall-and-river-levels - /](http://melbournewater.com.au/water-data-and-education/rainfall-and-river-levels-/)).
- Monitor weather and flood information ([bom.gov.au](http://bom.gov.au)).
- Assess Command and Control requirements.
- Review local resources and consider needs for further resources regarding personnel, property protection, storm/flood rescue and air support.
- Notify and brief appropriate officers. This includes the Regional Control Centre (RCC) (if established), State Control Centre (SCC) (if established), Council (as outlined in the City of Melton MEMP) and other emergency services through the IEMT.
- Assess ICC readiness (including staffing of IMT and IEMT) and open if required.
- Ensure flood bulletins and community information are prepared and issued to the community.
- Monitor watercourses and undertake reconnaissance of low-lying areas.
- Develop media and community information management strategy.
- Ensure storm and flood mitigation works are being checked by owners.
- Develop and issue incident action plan, if required.
- Develop and issue situation report, if required.

### 3.3.8 On Receipt of the First and Subsequent Storm and Flood Warnings

The VICSES RDO (until an IC is appointed) will undertake actions as defined within the Flood Intelligence Cards (**Appendix C**). General considerations by the VICSES RDO/IC will be as follows:

- Develop an appreciation of current flood levels and predicted levels – determine if floodwaters are rising, peaking or falling.
- Review flood and storm 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.
  - What areas may be at risk of building damage.
- Determine what the at-risk community need to know and do as the storm and/or flood develops.
- Warn the at-risk community, ensuring that an appropriate warning and community information strategy is implemented. This includes:
  - The current storm and/or flood situation.
  - Storm and/or flood predictions.
  - What the consequences of predicted activity or 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 storm and/or flood consequence assessment.
- Continue to monitor the flood situation ([bom.gov.au/vic/flood/](http://bom.gov.au/vic/flood/)).
- Continue to conduct reconnaissance of low-lying areas.

## 3.4 Community Information and Warnings

Guidelines for the distribution of community information and warnings are contained in the VICSES Central Region Storm and Flood Emergency Plans, and the State Storm and Flood Emergency Plans.

Community information and warnings communication methods available include:

- Emergency Alert
- Phone messages (including SMS)
- Radio and Television

- Two-way radio
- Mobile and fixed public address systems
- Sirens
- Verbal Messages (i.e. Doorknocking)
- Agency Websites, including VicEmergency website
- VicEmergency Hotline
- Variable Message Signs (i.e. road signs)
- Community meetings
- Newspapers
- Email
- Fax Stream
- Newsletters
- Letter drops
- Social media and/or social networking sites (i.e. Twitter and/or Facebook)

Refer to **Appendix C and E** for any specific details of how community information and warnings are to be provided.

The release of flood bulletins and information with regard to response activities at the time of a flood event is the responsibility of VICSES, as the Control Agency.

Responsibility for public information, including media briefings, rest with VICSES as the Control Agency. Melton City Council will assist VICSES to warn individuals within the community where practicable, including activation of flood warning systems, where they exist.

Other agencies such as the Country Fire Authority (CFA), DELWP and Victoria Police (VicPol) may be requested to assist VICSES with the communication of community storm and/or flood warnings.

In cases where severe flash flooding is predicted, dam failure or landslide is likely or flooding necessitating evacuation of communities is predicted, the IC may consider the use of the Emergency Alert System and Standard Emergency Warning System (SEWS).

The Department of Health (DH) will coordinate information regarding public health and safety precautions.

### 3.5 Media Communication

The IC, through the Public Information Unit established at the ICC, will manage media communication. If the ICC is not established, the VICSES RDO will manage all media communication. Melton City Council will work with the IC/VICSES RDO to assist with the dissemination of public messaging and/or warnings to ensure that consistent and timely messaging occurs.

### 3.6 Impact Assessments (IA)

Impact Assessments (IA) can be conducted in accordance with State doctrine and Standard Operating Procedures (SOPs) to assess and record the extent and nature of damage caused by storms and/or flooding. This information may then be used to provide the basis for further needs assessment and recovery planning by Melton Council, DFFH and other applicable recovery agencies.

The control agency is responsible for coordinating the collection, collation and dissemination of IA information on a whole of government basis during the emergency response.

The purpose, function and conduct of IA are outlined in the State Flood Emergency Plan and the State Storm Emergency Plan. All IA should be conducted in accordance with current State impact assessment doctrine and SOPs.

### 3.7 Preliminary Deployments

When storm impacts and/or flooding are 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 and relief centres (in line with the Melton MEMP).

### 3.8 Response to Flash and Riverine Flooding

Emergency management response to flash/riverine flooding should be consistent with the guideline for the emergency management of flash/riverine flooding contained within the VICSES Central Region Storm and Flood Emergency Plans and the State Storm and Flood Emergency Plans.

When conducting pre-event planning for flash/riverine floods, the following steps should be followed in the order as given:

1. Determine if there are barriers to evacuation by considering warning time, safe routes, and resources available.
2. If evacuation is possible, then evacuation should be the adopted strategy and it must be supported by public information capability and a rescue contingency plan.
3. Where it is likely people will become trapped by floodwaters due to limited evacuation options, safety advice needs to be provided to people at risk advising them not to attempt to flee by entering floodwater if they become trapped, and that it may be safer to seek the highest point within the building and to telephone 000 if they require rescue. This advice needs to be provided even when evacuation may be possible, due the likelihood that not all community members will evacuate.
4. For buildings known to be structurally unsuitable, an earlier evacuation trigger will need to be established (return to step 1 of this cycle).
5. If an earlier evacuation is not possible, then specific preparations must be made to rescue occupants trapped in structurally unsuitable buildings either pre-emptively or as those people call for help.
6. Contact the Municipal Emergency Response Coordinator (MERC), Melton Council MEMO and Municipal Recovery Manager (MRM) at the earliest opportunity to allow relief preparation to commence.

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

Response arrangements for flash and riverine flood events may be contained in **Appendix C**. Refer to the VicTraffic website for road closures ([alerts.vicroads.vic.gov.au/](https://alerts.vicroads.vic.gov.au/)).

### 3.9 Evacuation

In Victoria, evacuation is largely voluntary, however in particular circumstances, legislation provides some emergency services with authority to remove people from areas or prohibit their entry.

The decision to recommend or warn people to prepare to evacuate or to evacuate immediately rests with the IC, and where possible the IEMT.

It is the choice of individuals as to how they respond to this recommendation.

Once the decision is made, VicPol are responsible for the coordination of the evacuation process. VICSES and other agencies will assist where practical. VICSES is responsible for the development and communication of evacuation warnings.

VicPol (and/or delegate to Australian Red Cross) may take on the responsibility of registering people affected by the emergency (through the 'Register.Find.Reunite' program) including those who have been evacuated.

Evacuation operations should be consistent with the Joint Standard Operating Procedure on Evacuation (JSOP3.12). Guidelines for best practice for planning evacuations are provided in Australian Institute for Disaster Resilience Handbook 4, available at: [knowledge.aidr.org.au/resources/handbook-evacuation-planning/](https://knowledge.aidr.org.au/resources/handbook-evacuation-planning/).

Refer to details within the Melton Council MEMP (including Section 5.12: Relocation and Evacuation, and Section 7.5: Evacuation) for further guidance on evacuations for emergencies. If evacuation is determined as appropriate, Melton Council MEMO and MRM should be notified as soon as possible.

Refer to **Appendix D** of this Plan for detailed evacuation arrangements for the City of Melton.

### 3.10 Flood Rescue

VicPol is the designated Control Agency for water rescue and coordinates rescues undertaken during flood events.

In order to activate water rescue services, VICSES as the Control Agency for overall flood response, will identify areas at risk of requiring rescue and notify the Officer in Charge of the Water Police Search and Rescue Squad to request pre-deployment of rescue resources to those areas.

In conducting rescues, VicPol may require the assistance of appropriately trained and equipped personnel. In these circumstances, appropriately trained and equipped VICSES units or other agencies 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.

### 3.11 Aircraft Management

Aircraft can be used for a variety of purposes during storm and/or flood operations including evacuation, resupply, reconnaissance, intelligence gathering and emergency travel.

Air support operations will be conducted under the control of the IC in line with State Aircraft Unit Policy 01- Air Operations. The IC may request aircraft support through the State Aircraft Desk located at the SCC. The SCC will establish priorities.

Suitable airbase facilities are located at:

- Essendon
- Moorabbin

### 3.12 Resupply

Communities, neighbourhoods or households can become isolated during storms and/or 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 indicate that communities, neighbourhoods and/or households may become isolated, and if time permits, VICSES will advise businesses and/or households that they should stock up on essential items.

After the impact, agencies may assist with the transport of essential items to isolated communities and assist with logistics functions.

Resupply operations are to be included as part of the emergency relief arrangements as outlined in the Melton MEMP.

### 3.13 Essential Infrastructure and Property Protection

Essential Infrastructure and Property (e.g. residences, roads, utilities and telecommunications etc.), may be affected in the event of a storm and/or flood.

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

The IC will determine the priorities related to the use of sandbags, which will be consistent with the State Emergency Management Priorities.

Melton Council does not maintain a stock of sandbags. Supplies are available through the VICSES Regional Headquarters.

If VICSES sandbags are becoming limited in supply, then priority will be given to protection of Essential Infrastructure. Other high priorities may include, for example, the protection of historic buildings. If time permits, requests for supplementary supply should be carried out in line with the Melton MEMP.

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 Melbourne Water, Southern Rural Water, Melton Council and VicPol and within appropriate approval frameworks.

Refer to **Appendix C** for further specific details of essential infrastructure requiring protection. Sandbag collection points will be established as needed.

### 3.14 Disruption to Services

Disruption to services, other than essential infrastructure and property, can occur in storm and flood events. Refer to **Appendix C** for specific details of likely disruption to services and proposed arrangements to respond to service disruptions in the City of Melton area.

### 3.15 Levees

Levee owners/operators are responsible for the maintenance, operation and monitoring of their levees. Levee owners/operators must keep the IC informed of levee status' and be prepared to provide expert advice to the IC about the design and construction of their levees.

In accordance with the State Emergency Management Priorities, the IC may assist levee owners to coordinate resources, both technical and physical, to provide advice and affect temporary repairs to, or augmentation of, levees.

Several levees within the City of Melton have been identified in **Appendix A**.

### 3.16 Waste Water related Public Health Issues and Critical Sewerage Assets

The majority of properties are connected to a water sewerage system, however the City of Melton has approximately 250 properties registered as using septic tanks. The location of these properties can be obtained from Melton Council's Environmental Health Coordinator.

Inundation of critical sewerage assets, including septic tanks and sewerage pump stations, may result in water quality problems within the Municipality. Where this is likely to occur or has occurred, the responsible agency for critical sewerage assets – Melbourne Water/Greater Western Water – should undertake the following:

- Advise VICSES and the Melton MEMO of the security of critical sewerage assets to assist preparedness and response activities in the event of a flood.
- Maintain or improve the security of critical sewerage assets.
- Check, and correct where possible, the operation of critical sewerage assets in time of flood.
- Advise the VICSES RDO/IC or established ICC in the event of inundation of critical sewerage assets.

It is the responsibility of the City of Melton Environment Health Coordinator to inspect and report to the Melton MEMO and the ICC on any water quality issues relating to flooding.

General public health information and messages are provided by the City of Melton, DFFH and DH and may contain information that is relevant prior to, during and following an incident.

Information may be provided in sub plans to the MEMP, specific health notifications and, after discussion within the IEMT, may be included in Flood Bulletins.

### 3.17 Road Closures

Melton Council, VicPol and the Department of Transport (DoT) will carry out their formal functions of road closures. This includes the observation and placement of warning signs and road blocks on designated local and regional roads, bridges, walking and bike trails.

VicPol may liaise with Melton Council and DoT about the need to erect warning signs and/or close roads and bridges under its jurisdiction. DoT are responsible for designated main roads and highways and the City of Melton is responsible for the designated local and regional road network.



DoT, VicPol and the Melton Council will communicate community information regarding road closures as outlined in the Melton MEMP.

### **3.18 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.

Major dams with potential to cause structural and community damage (in the event of a failure) within the Municipality are contained in **Appendix A**.

### **3.19 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.

### **3.20 After Action Review**

As the lead agency, VICSES will coordinate the After Action Review (AAR) arrangements for storm/flood operations as soon as practical following an event.

All agencies involved in the storm/flood incident should be represented at the AAR.

## **Part 4. AFTER: EMERGENCY RELIEF AND RECOVERY ARRANGEMENTS**

### **4.1 General**

Arrangements for emergency relief and recovery from a storm or flood incident within the City of Melton are detailed in the Melton Council Relief and Recovery Plan (Part 6 of the Melton MEMP).

### **4.2 Emergency Relief**

The IC determines the need for emergency relief services with advice from the emergency management team (such as the IEMT), including the MRM, in accordance with the SEMP Relief arrangements. The IC is responsible for ensuring that relief arrangements have been considered and implemented where required under the State Emergency Relief and Recovery Plan. This should be carried out in line with the Melton MEMP.

The IC should ensure that the MERC, the Regional Recovery Coordinator and the MRM are kept informed of arrangements for relief.

The range and type of emergency relief services to be provided in response to a storm and/or flood event will be dependent upon the size, impact, and scale of the storm/flood. Refer to the SEMP for further information.

Suitable emergency relief/recovery facilities identified for use during storms and/or floods are detailed in the Melton Council MEMP and the Melton Relief and Recovery Sub-Plan. The MRM will facilitate access to emergency relief/recovery facilities as required. The MEMO will facilitate access to staging areas as required.

### **4.3 Animal Welfare**

Matters relating to the welfare of livestock (including feeding and rescue), are to be referred to the Department of Jobs, Precincts and Regions (DJPR).

Matters relating to companion animals will be shared between Melton Council and RSPCA. Council assists, where possible, in the support and temporary rehoming of displaced companion animals.

Matters relating to the welfare of wildlife are to be referred to DELWP and Melton City Council.

### **4.4 Transition from Response to Recovery**

VICSES, as the Control Agency, is responsible for ensuring effective transition from response to recovery. Transition should occur in consultation with emergency management teams (including the IEMT and MRM). Further information about transition is provided in the SEMP and the Melton MEMP.

# APPENDIX A - FLOOD THREATS FOR CITY OF MELTON

## General

The City of Melton covers a total area of 528 square kilometres and has two main urban townships that are rapidly growing. These are Melton and Caroline Springs, which are located 35 and 19 kilometres west of Melbourne's CBD, respectively. A third 2,500 ha township is planned, Toolern, to be located south-east of the Melton township with an intended population size of around 60,000 people.

Melton sits predominantly within the Werribee River catchment with tributaries including Toolern Creek, Djerriwarrh Creek, Yangardook River, Arnold Creek and Little Blind Creek. These are all north-south draining rivers that connect into the Werribee River south of Melton and Caroline Springs.

Many of the flooding related issues that have occurred within the City are due to the large number of undrained or insufficiently drained roads with steep valleys in the road. Sheet flow through undeveloped farming land adjacent to urban developments has also presented problems throughout the City in recent flooding events.

## Riverine Flooding

Large severe floods within the Municipality generally occur as a result of a moist warm airflow from northern Australia bringing moderate to heavy rainfall over a period of 12 hours or more following a prolonged period of general rainfall. The period of general rainfall "wets up" the catchments and (partially) fills both the on-stream dams and the natural floodplain storage. These combine to increase the runoff generated during the subsequent period of heavy rainfall.

Large but less severe floods result from sequences of cold fronts during winter and spring that progressively wet up the catchments and fill the on-stream dams and the natural floodplain storage. Prolonged moderate to heavy rain leads to major flooding.

## Flash Flooding and Overland Flows

Short duration, high intensity rainfall (usually associated with thunderstorms) can also cause localised flooding within the Municipality along overland flow paths when the local urban drainage system surcharges. Such events, which are mainly confined to the summer months, do not generally create widespread flooding since they only last for a short time and affect limited areas. Flooding from these storms occurs with little warning and localised damage can be severe.

High intensity rainfall, such as that associated with thunderstorms with average rainfall rates of more than 20mm/hour for an hour or more is likely to lead to flash flooding and/or overland flows, across the urbanised parts of the Municipality.

Blocked or capacity impaired stormwater drains can also lead to overland flows and associated flooding: the drain surcharges and excess water flows above ground.

## Description of Major Waterways and Drains

City of Melton manages over 25km of combined waterway adjacent stretches of land and is located predominantly within the Werribee River catchment with tributaries including Toolern Creek, Djerriwarrh Creek, Yangardook River, Arnold Creek and Little Blind Creek. These tributaries drain from north to south through the two townships and connect to the Werribee River at the south of the Melton development. See Catchment Schematics in **Appendix F** for more information.

### *Boggy Creek*

Boggy Creek has three tributaries that begin north and north west of the Melton township, traversing closely along the west side of Melton and merging into the Werribee River to the south west of Melton.

### *Arnolds Creek*

Arnolds Creek begins north-west of the Melton Township, traversing through the centre of Melton and merging into the Werribee River, just south of the Western Freeway.

### *Toolern Creek*

The recent Toolern development encompasses Toolern Creek which traverses along the east side of the Melton Township, flowing south. It then merges into the main reach of the Werribee River at the south side of the City.

### *Kororoit Creek*

Kororoit Creek starts just north of the Municipality, traversing through rural land between the two townships. It then bends to the east and passes through the southern portions of Caroline Springs, just below Lake Caroline.

### *Djerriwarrh Creek*

This tributary begins north-west of the Municipality and traverses along the southern boundary, merging into Werribee River south west of the Melton Township.

### *Werribee River*

The Werribee River flows north-west to south-east, entering the Shire's boundary south of the Melton Township. Creeks starting to the north-west of the City connect into the Werribee River. See **Appendix F** for Werribee River Catchment Schematics.

Melbourne Water Drains & Waterways	Suburb/s	Melbourne Water Drains & Waterways	Suburb/s
Arnolds Creek	Brookfield	Kororoit Creek East Branch	Diggers Rest
Arnolds Creek East Branch	Brookfield, Kurunjang, Melton, Melton West & Toolern Vale	Kororoit Creek West Branch	Diggers Rest & Toolern Vale
Arnolds Creek West Branch	Brookfield & Melton West	Kurung Park Drain	Burnside Heights
Billingham Road Drain	Burnside, Caroline Springs & Rockbank	Lake Caroline Drain	Caroline Springs & Taylors Hill
Botanica Springs Creek	Brookfield	Laverton Main Drain	Ravenhall
Cambrian Way Drain	Melton West	Little Blind Creek	Kurunjang, Melton & Toolern Vale
Centenary Ave Drain	Melton West	Mallee Creek	Eynesbury
Cherrys Diversion Drain	Ravenhall	Mowbray Cres Drain	Kurunjang
Clarkes Drain	Ravenhall	Rees Road Drain	Melton South
Coalville Rd Drain	Burnside Heights	Robinsons Drain	Truganina
Coolibah Creek	Eynesbury	Ryans Creek	Melton
Davis Creek	Mount Cottrell & Tarneit	Skeleton Creek	Truganina
Diggers Creek	Eynesbury	Stony Hill Creek	Caroline Springs & Plumpton
Djerriwarrh Creek	Brookfield, Melton West & Toolern Vale	Tame Street Drain	Diggers Rest
Dohertys Drain	Truganina	Taylors Creek	Plumpton
Dry Creek	Mount Cottrell	Toolern Creek	Eynesbury, Kurunjang, Melton, Melton South, Mount Cottrell & Toolern Vale
Dunes Drain	Truganina	Victoria Avenue Drain	Kurunjang
East Moreton Drain	Burnside Heights & Taylors Hill	Werribee River	Eynesbury, Exford, Melton South & Mount Cottrell
Eynesbury Creek	Eynesbury	Whiteside Drain	Ravenhall
Ironbark Creek	Eynesbury	Yangardook Creek	Toolern Vale
Kororoit Creek	Burnside, Burnside Heights, Caroline Springs, Diggers Rest, Melton, Plumpton, Rockbank & Toolern Vale		

Table A1 – Melbourne Water Drains and Waterways within or bordering the City of Melton

## Historic Storms and Floods

Significant floods (with high flood gauge levels and likely flooding consequences to property and infrastructure) that have occurred within the City of Melton are as follows in the table below.

Event	Werribee River d/s Melton Reservoir (231205D)		Kororoit Creek at Diggers Rest (231106A)		Kororoit Creek at Rockbank (231105B)		Toolern Creek at Melton South (231231A)	
	River Flow	River Level	Rainfall	Creek Level	Rainfall	Creek Level	Rainfall	Creek Level
Normal Water Level / Flow	3 ML/d – 200 ML/d	0.00m – 0.05m	-	0.0m	-	0.3m	-	0.1m
<b>Minor Flood Class</b>	4,000 ML/Day	~1.5m	-	-	-	-	-	-
<b>Moderate Flood Class</b>	35,000 ML/Day	~5.1m	-	-	-	-	-	-
<b>Major Flood Class</b>	50,000 ML/Day	~6.4m	-	-	-	-	-	-
September 1916	-	-	-	-	-	-	-	-
1941	-	-	-	-	-	-	-	-
1952	-	-	-	-	-	-	-	-
1954	-	-	-	-	-	-	-	-
30 <sup>th</sup> June 1977	8,887 ML/d	2.35m	-	-	-	-	-	-
3 <sup>rd</sup> July 1978	20,061 ML/d	4.25m	-	-	-	-	-	-
7 <sup>th</sup> August 1978	23,205 ML/d	4.69m	-	-	-	-	-	-
19 <sup>th</sup> November 1978	38,849 ML/d	6.35m	-	-	-	-	-	-
15 <sup>th</sup> October 1983	<b>70,293 ML/d</b>	<b>8.40m</b>	119mm / 34 hrs	<b>3.87m</b>	-	-	-	<b>3.55m</b>
24 <sup>th</sup> October 1985	30,513 ML/d	5.56m	69mm / 24 hrs	1.35m	-	-	-	1.56m
10 <sup>th</sup> December 1985	13,393 ML/d	3.09m	80mm / 50 hrs	2.84m	-	-	-	2.87m
29 <sup>th</sup> July 1987	13,338 ML/d	3.08m	64mm / 19 hrs	2.18m	-	-	-	1.90m
2 <sup>nd</sup> December 1987	36,936 ML/d	6.19m	85mm / 36 hrs	0.70m	-	-	-	1.67m
10 <sup>th</sup> June 1989	1,458 ML/d	1.02m	35mm / 22 hrs	1.17m	-	-	-	2.18m
11 <sup>th</sup> February 1990	12,038 ML/d	2.86m	30mm / 25 hrs	-	-	-	-	1.70m
12 <sup>th</sup> October 1990	17,832 ML/d	3.87m	40mm / 33 hrs	1.33m	-	-	-	1.20m
15 <sup>th</sup> September 1993	46,772 ML/d	6.98m	91mm / 31 hrs	3.42m	-	-	-	2.41m
23 <sup>rd</sup> October 1995	26,637 ML/d	5.14m	80mm / 33 hrs	1.49m	-	-	-	2.04m
6 <sup>th</sup> November 1995	61,340 ML/d	7.90m	55mm / 61 hrs	1.89m	-	-	-	1.99m

Event	Werribee River d/s Melton Reservoir (231205D)		Kororoit Creek at Diggers Rest (231106A)		Kororoit Creek at Rockbank (231105B)		Toolern Creek at Melton South (231231A)	
	River Flow	River Level	Rainfall	Creek Level	Rainfall	Creek Level	Rainfall	Creek Level
Normal Water Level / Flow	3 ML/d – 200 ML/d	0.00m – 0.05m	-	0.0m	-	0.3m	-	0.1m
<b>Minor Flood Class</b>	4,000 ML/Day	~1.5m	-	-	-	-	-	-
<b>Moderate Flood Class</b>	35,000 ML/Day	~5.1m	-	-	-	-	-	-
<b>Major Flood Class</b>	50,000 ML/Day	~6.4m	-	-	-	-	-	-
24 <sup>th</sup> October 2000	24,052 ML/d	4.82m	80mm / 53 hrs	1.46m	-	-	-	1.28m
3 <sup>rd</sup> February 2005	13,477 ML/d	3.10m	159mm / 31 hrs	2.71m	-	-	-	2.98m
28 <sup>th</sup> November 2010	19,676 ML/d	3.54m	66mm / 40 hrs	1.88m	68mm / 39 hrs	2.21m	52mm / 37 hrs	1.94m
14 <sup>th</sup> January 2011	36,659 ML/d	5.24m	69mm / 55 hrs	2.14m	77mm / 55 hrs	<b>2.40m</b>	70mm / 55 hrs	2.15m
5 <sup>th</sup> February 2011	10,734 ML/d	2.43m	63mm / 13 hrs	1.22m	61mm / 20 hrs	1.62m	60mm / 12 hrs	1.32m
14 <sup>th</sup> September 2016	5,614 ML/d	1.69m	29mm / 19 hrs	1.19m	22mm / 18 hrs	1.61m	20mm / 19 hrs	1.26m
3 <sup>rd</sup> October 2016	9,596 ML/d	2.27m	13mm / 7 hrs	0.74m	11mm / 7 hrs	1.20m	7mm / 7 hrs	0.83m

Table A2 – Selection of Historical Flood Events along the Werribee River, Kororoit Creek & Toolern Creek

## Dam Spilling / Failure

Flooding resulting from failure of the following dams is likely to cause significant structural and community damage within the City of Melton. See Dam Failure in Section 3 of this plan for more information. Note that if the storage capacity is reached and water flows over the spillway, this is not to be referred to as a flow release or a storage breach or failure. Note that only Dams above 100 ML in capacity are included in this list.

Dam	Location	Owner	Dam Capacity	Full Supply Level	Melway Reference
Melton Reservoir	Werribee River Melton South	SRW	14,360 ML	82.56m AHD	Melway 341G2-220J1
Merrimu Reservoir	Pyrites Creek, Coimadaí	SRW	32,215 ML	174.1m AHD	VicMap Central: 6526J2
Pykes Creek Reservoir	Werribee River Tributary, Myrning	SRW	22,119 ML	396.57m AHD	VicMap Central: 6525B1
Lake Caroline Ornamental Lake. (Refer to dam management plan held in MECC)	Stoney Hill Creek at Caroline Springs Town Centre	MCC	120 ML	78.50m AHD	Melway 356 H10

Table A3 – Melbourne Water Reservoirs that pose a risk to the City of Melton from Dam Failure

Service Reservoirs located within the Municipality are listed below.

Service Reservoir	Location	Owner	Material	Reservoir Capacity	Melway Reference
Elevated Water Tank	Hillview Court, Hillside	Greater Western Water	Potable	Unavailable	354 G8
Sydenham Steel Tank	Southbank Walk, Taylors Hill	Melbourne Water	Steel	46.5 ML	356 K3
Greater Western Water Water Storages	Cnr Bulmans Road & Minns Road, Melton West	Greater Western Water	Unavailable	Unavailable	330 F11

Table A4 –Service Reservoirs in the City of Melton



## APPENDIX B - TYPICAL FLOOD PEAK TRAVEL TIMES

In using the information contained in this Appendix, consideration needs to be given to the time of travel of the flood peak. A flood on a 'dry' waterway will generally travel more slowly than a flood on a 'wet' waterway (e.g. the first flood after a dry period will travel more slowly than the second flood in a series of floods). Hence, recent flood history, soil moisture and forecast weather conditions all need to be considered when using the following information to direct flood response activities.

Note that flooding will start some time ahead of the time indicated by the following travel times – these are the time between the flood peaks at respective sites.

### Typical Travel Times

Location From (gauge)	Location To (gauge)	Typical Travel Time	Comments
<b>KOROROIT CREEK</b>			
Diggers Rest	Deer Park	Between 1 to 7 hours	Inflows from tributaries likely to impact on travel times.
<b>WERRIBEE RIVER</b>			
Ballan	d/s Melton Reservoir	Ballan may peak up to 3 hours after d/s Melton Reservoir or up to 14 hours before	Minor at d/s Melton Reservoir. Ballan & Bacchus Marsh just as likely to peak after Melton Reservoir even though it is located upstream. Therefore flood peak travel times between these gauges should be used with caution.
Bacchus Marsh		Bacchus Marsh may peak up to 7 hours after d/s Melton Reservoir, or up to 8 hours before	
Darley		Between 1 to 10 hours	
Ballan	d/s Melton Reservoir	Between 1 to 7 hours	Moderate at d/s Melton Reservoir.
Bacchus Marsh		Between 2 to 8 hours	
Darley		Between 4 to 6 hours	
Ballan	d/s Melton Reservoir	Between 4 to 5 hours	Major at d/s Melton Reservoir.
Bacchus Marsh		Between 2 to 3 hours	
Darley		Around 5 hours	

Table B1 – Typical Flood Travel Times between gauges on Kororoit Creek and the Werribee River

## Historical Travel Times

Flood Event	Location From (gauge)	Location To (gauge)	Flood Peak Travel Time	Flood Class at
<b>KOROROIT CREEK</b>				<b>Deer Park</b>
15 <sup>th</sup> October 1983	Diggers Rest	Deer Park	5.7 hours	Major
10 <sup>th</sup> December 1985	Diggers Rest	Deer Park	2.5 hours	Minor
29 <sup>th</sup> July 1987	Diggers Rest	Deer Park	1.5 hours	Below Minor
15 <sup>th</sup> September 1993	Diggers Rest	Deer Park	2.2 hours	Moderate
6 <sup>th</sup> November 1995	Diggers Rest	Deer Park	6 hours	Below Minor
3 <sup>rd</sup> February 2005	Diggers Rest	Deer Park	1.8 hours	Major
14 November 2010	Diggers Rest	Deer Park	6 hours	Below Minor
28 November 2010	Diggers Rest	Deer Park	2 hours	Below Minor
14 <sup>th</sup> January 2011	Diggers Rest	Deer Park	6 hours	Below Minor
<b>WERRIBEE RIVER</b>				<b>d/s Melton Reservoir</b>
30 <sup>th</sup> June 1977	Ballan	d/s Melton Reservoir	10 hours	Minor
3 <sup>rd</sup> July 1978	Ballan	d/s Melton Reservoir	2 hours	Minor
	Bacchus Marsh		2 hours	
7 <sup>th</sup> August 1978	Ballan	d/s Melton Reservoir	Ballan peaked 1 hour before d/s Melton Res.	Minor
	Bacchus Marsh		3 hours	
19 <sup>th</sup> November 1978	Ballan	d/s Melton Reservoir	4 hours	Moderate
	Bacchus Marsh		2 hours	
	Darley		4 hours	
6 <sup>th</sup> October 1979	Ballan	d/s Melton Reservoir	13 hours	Minor
	Bacchus Marsh		8 hours	
	Darley		6 hours	
15 <sup>th</sup> October 1983	Ballan	d/s Melton Reservoir	4 hours	Major
	Bacchus Marsh		2 hours	
	Darley		5 hours	
24 <sup>th</sup> October 1985	Ballan	d/s Melton Reservoir	Ballan peaked 3 hours before d/s Melton Res.	Minor
	Bacchus Marsh		0 hours	
	Darley		3 hours	
2 <sup>nd</sup> December 1987	Ballan	d/s Melton Reservoir	7 hours	Moderate
	Bacchus Marsh		3 hours	
	Darley		6 hours	
11 <sup>th</sup> February 1990	Ballan	d/s Melton Reservoir	11 hours	Minor
	Bacchus Marsh		6 hours	
	Darley		10 hours	
12 <sup>th</sup> October 1990	Ballan	d/s Melton Reservoir	3 hours	Minor
	Bacchus Marsh		3 hours	
	Darley		2 hours	
15 <sup>th</sup> September 1993	Ballan	d/s Melton Reservoir	1 hour	Moderate
	Bacchus Marsh		8 hours	
	Darley		4 hours	
19 <sup>th</sup> September 1993	Ballan	d/s Melton Reservoir	9 hours	Minor
	Bacchus Marsh		5 hours	
	Darley		3 hours	
23 <sup>rd</sup> October 1995	Ballan	d/s Melton Reservoir	4 hours	Minor
	Bacchus Marsh		2 hours	
	Darley		1 hour	

Flood Event	Location From (gauge)	Location To (gauge)	Flood Peak Travel Time	Flood Class at
6 <sup>th</sup> November 1995	Ballan	d/s Melton Reservoir	5 hours	Major
	Bacchus Marsh		3 hours	
	Darley		5 hours	
24 <sup>th</sup> October 2000	Ballan	d/s Melton Reservoir	0 hours	Minor
	Bacchus Marsh		Bacchus Marsh peaked 4 hours before d/s Melton Res.	
	Darley		10 hours	
3 <sup>rd</sup> February 2005	Ballan	d/s Melton Reservoir	Ballan peaked 1 hour before d/s Melton Res.	Minor
	Bacchus Marsh		Bacchus Marsh peaked 7 hours after d/s Melton Res.	
	Darley		10 hours	
28 <sup>th</sup> November 2010	Ballan	d/s Melton Reservoir	3 hours	Minor
	Bacchus Marsh		Bacchus Marsh peaked 1 hour before d/s Melton Res.	
	Darley		5 hours	
14 <sup>th</sup> January 2011	Ballan	d/s Melton Reservoir	Unavailable	Moderate
	Bacchus Marsh		3 hours	
	Darley		5 hours	
5 <sup>th</sup> February 2011	Ballan	d/s Melton Reservoir	3 hours	Minor
	Bacchus Marsh		4 hours	
	Darley		2 hours	
14 <sup>th</sup> September 2016	Ballan	d/s Melton Reservoir	Unavailable	Minor
	Bacchus Marsh		Unavailable	
	Darley		17 hours	
3 <sup>rd</sup> October 2016	Ballan	d/s Melton Reservoir	Unavailable	Minor
	Bacchus Marsh		Unavailable	
	Darley		6 hours	

Table B2 – Historical Flood Travel Times between gauges on Kororoit Creek and the Werribee River

# APPENDIX C1 – WERRIBEE RIVER & EYNESBURY FLOOD EMERGENCY PLAN

## Overview of Flooding Consequences

The Werribee River and the adjoining towns of Brookfield, Parwan, Exford, Melton South, Eynesbury and Mount Cottrell are located between 30-40km West of Melbourne in a rural setting. The Werribee River is the prominent watercourse in the area, flowing from the West through the Moorabool Shire and the towns of Ballan and Bacchus Marsh. Prolonged rainfall events are the primary concern for the area, which may see the Werribee River or two of its tributaries in Coolibah Creek or Eynesbury Creek flood. If either of these two Creeks flood, the Eynesbury Township may have access cut via Eynesbury Road. See mapping in **Appendix F** for more insight into flooding in the area.

*This Summary table is generated from Victorian Government data. The State of Victoria does not guarantee that the publication is without flaw of any kind or is wholly appropriate for your particular purposes and therefore disclaims all liability for error, loss or damage which may arise from reliance upon it. All persons accessing this information should make appropriate enquiries to assess the currency of the data.*

### Summary of Consequences in a 1% AEP (100yr ARI) flood along Werribee River & Eynesbury

Property					
<b>Properties</b>	<b>0</b>				
Residential	0				
Commercial	0				
Industrial	0				
Public Land	0				
Rural	0				
Essential Infrastructure					
Drainage Facilities	2	Melton Reservoir & Rees Road R/B			
Sewerage Facilities	4	Pumping Stations			
Tourism / Recreation					
Sports Facilities	1	Eynesbury Golf Course			
Government Boundaries					
Local Gov't Areas	1	Melton	CMA	1	Port Phillip & Westernport
Adjacent LGAs	2	Moorabool; & Wyndham	CFA District	1	District 14
SES Resp' Boundary	1	Melton	FRV District	0	

Table C1.1 – Consequence Summary of 1% AEP flood along the Werribee River and Eynesbury in City of Melton

## Gauges and Warnings

Warnings are available for flooding expected along Werribee River at the Melton Reservoir Tail Gauge. For other gauges within the Municipality, Melbourne Water does not provide any flood warning service at this point.

Gauge	Station No.	Location	Owner	Gauge Type	Melway Ref
Lerderberg River upstream of Goodman Creek	231211A	East bank or creek, 100m north of 'Morven' homestead along Lerderberg Gorge Road	SWRMP	Stream Level & Rain	327 F6
Merrimu Reservoir Head Gauge	231233A	North side of Diggers Rest – Coimadai Road	SRW	Reservoir Level	329 A7
Parwan Creek at Parwan	231234A	East bank of the creek. Access from Smiths Road	Melbourne Water	Stream Level & Rain	339 D8
Pykes Creek Reservoir Head Gauge	231203A	North side of Western Freeway bridge, east bank of the channel	SRW	Reservoir Level	-
Werribee River at Ballan	231225B	East bank of the River, south side of Old Melbourne Road	SRW	Stream Level	-
Werribee River at Bacchus Marsh	231200B	South bank of the river along Werribee Vale Road	SWRMP	Stream Level	333 G8
Toolern Creek at Melton South	231231A	East bank along dirt track between Bridge Road and Strathulloh Circuit West	Melbourne Water	Stream Level & Rain	343 A9
Werribee River at Melton Reservoir Head Gauge	231221A	Melton Reservoir Picnic Area	SRW	Reservoir Level	220 J1
Werribee River d/s of Melton Reservoir (Tail Gauge)	231205D	East bank, 300m from Exford Road	SWRMP	Stream Level	220 J2

Table C1.2 – Gauges within the Werribee River catchment

These gauges may provide some warning of expected flooding. See the Melbourne Water website for more information on these gauges (<http://www.melbournewater.com.au/waterdata/rainfallandriverleveldata/Pages/Rainfall-and-river-level-new.aspx>). The BoM website also links a number of these gauges ([http://www.bom.gov.au/cgi-bin/wrap\\_fwo.pl?IDV60201.html](http://www.bom.gov.au/cgi-bin/wrap_fwo.pl?IDV60201.html)). It is advised that residents monitor the BoM website (<http://www.bom.gov.au/vic/warnings/index.shtml?ref=hdr>) and the VicEmergency website (<https://emergency.vic.gov.au/>) for any thunderstorm, flood or severe weather warnings present for their area.

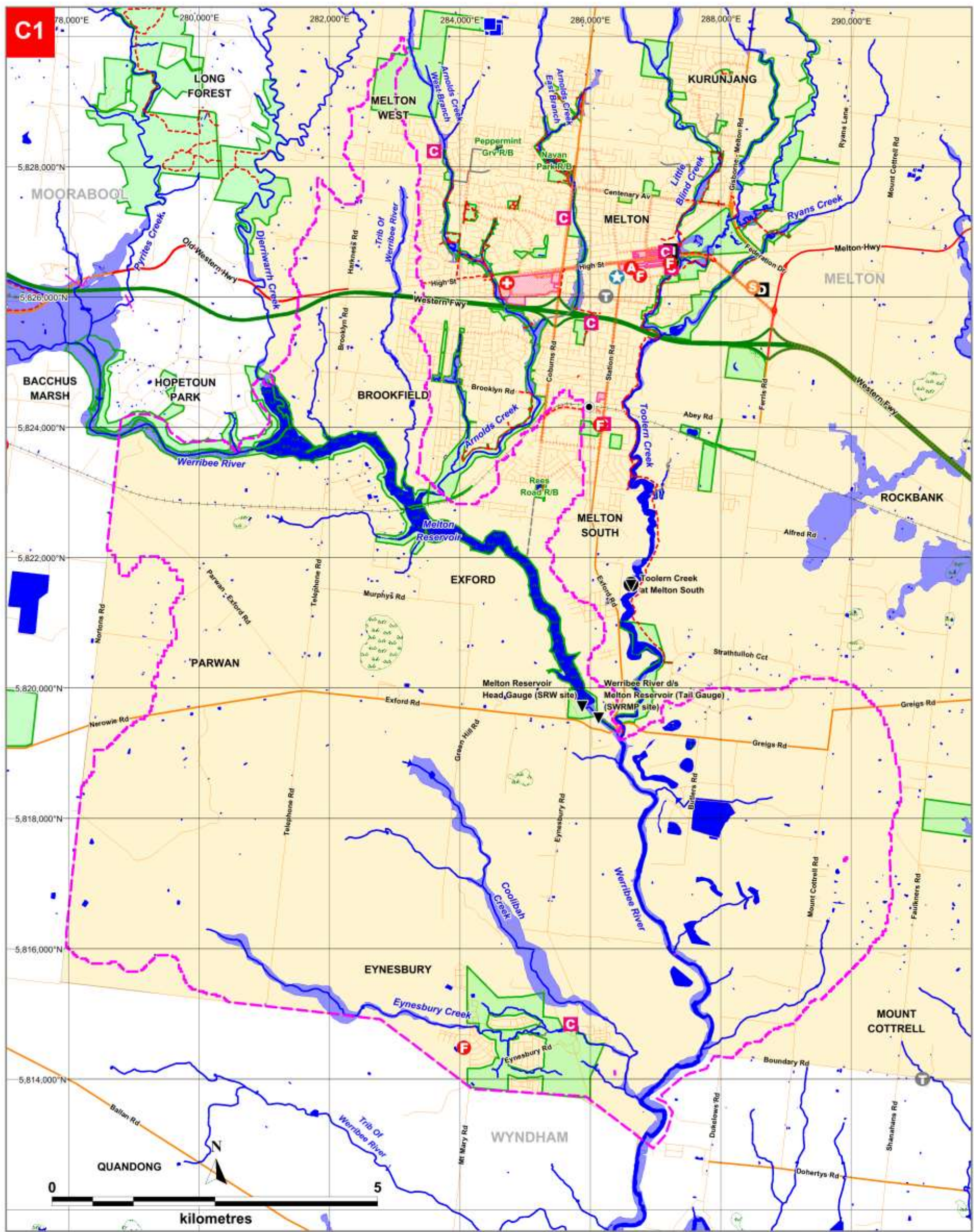
There are currently two flood warning gauges on the Werribee River that could be used to assist with public safety through the issue of flood warnings. These are at Bacchus Marsh and downstream of the Melton Reservoir. Those gauges with flood class levels established are outlined in the table below.

Gauge	River / Creek Flood Class Level or Flow		
	Minor	Moderate	Major
Werribee River at Bacchus Marsh	4.4m	5.2m	5.6m
Werribee River at Melton Reservoir Tail Gauge	4,000 ML/d (~1.5m)	35,000 ML/d (~5.1m)	50,000 ML/d (~6.4m)

Table C1.3 – Gauges with established Flood Class Levels for the City of Melton

At these sites on the Werribee River, the BoM, in consultation with Melbourne Water, will issue flood warnings if levels reach those classified above. This warning will be placed on the BoM website (<http://www.bom.gov.au/vic/warnings/index.shtml>) and the VicEmergency website (<https://emergency.vic.gov.au/>). While the City of Melton monitors these warnings in times of high rainfall, there are no specific guidelines to advise how these situations should be responded to.

# Area Map of Flood Risk along the Werribee River



**CITY OF MELTON**  
 1% AEP (100yr ARI) Flooding  
**C1. Areas of flood risk along Werribee River**

- |                                  |                                 |                    |
|----------------------------------|---------------------------------|--------------------|
| Building                         | Melbourne Water Retarding Basin | Community Centre   |
| Area of Interest                 | Fire Station                    | Telephone Exchange |
| Waterbody                        | Stream Level Gauge              | Ambulance Station  |
| 1% AEP Riverine Flood Extent     | Rain Gauge                      | Police Station     |
| Natural Wetland                  | Bicycle / Walking Trail         | VicSES             |
| Commercial Precinct              | Bus Route (PTV)                 | Municipal Depot    |
| Melbourne Water Stormwater Drain | Embankment                      | Municipal Offices  |
| River / Creek                    | Retail Water Storage            | Hospital           |
| Area boundary for this Appendix  |                                 |                    |



**SES VICTORIA Melbourne Water**

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Figure C1 – Areas of flood risk around the Werribee River in the City of Melton

## Properties at Flood Risk

Properties listed in the table below are at risk from flooding along the Werribee River or the Coolibah and Eynesbury Creeks in the City of Melton. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Werribee River d/s Melton Reservoir (Melbourne Water, October 2017) and the Coolibah and Eynesbury Creeks (Melbourne Water, August 2008) flood mapping and risk assessment programs.

*This Property Flood Risk Table is presented by the Victoria State Emergency Service for the purpose of disseminating emergency management information. The contents of the information have not been independently verified by the Victoria State Emergency Service. No liability is accepted for any damage, loss or injury caused by errors or omissions in this information or for any action taken by any person in reliance upon it.*

Properties at risk from Flooding the Werribee River or in Eynesbury during a 1% AEP event				
Residential	Commercial	Industrial	Rural	Public Use
Street No. at Risk	Street	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
Nil				
<b>Total</b>				
<b>0</b>				

Table C1.4 – Properties at risk of flooding along the Werribee River catchment in the City of Melton

No properties have been identified as being at risk from a 1% AEP flood along either the Werribee River or the Coolibah and Eynesbury Creeks in the City of Melton based on current flood modelling.

## Isolation

- Eynesbury Township may become isolated for a period above the Minor Flood Class Flow if the Coolibah and Eynesbury Creeks are in flood resulting in the inundation of the only access road out of the township, Eynesbury Road which runs northward toward Exford.
- Alternate access via “Haul Road” (as of 2018, unsealed road) can be arranged on a temporary basis by the IC.

No other major isolation risks exist for Brookfield, Parwan, Exford, Melton South and Mount Cottrell. Some localised short-duration isolation may occur due to flash flooding.

## Essential Infrastructure

During an event, see the Public Transport Victoria’s Website for details on delays or alterations to services: <http://ptv.vic.gov.au/live-travel-updates/>. A map of public transport routes within the City of Melton is available via the website at: [https://www.ptv.vic.gov.au/assets/PTV-default-site/more/maps/Local-area-maps/Metropolitan/ba7db7be6d/31\\_Melton\\_LAM.pdf](https://www.ptv.vic.gov.au/assets/PTV-default-site/more/maps/Local-area-maps/Metropolitan/ba7db7be6d/31_Melton_LAM.pdf)

Apart from the roads outlined below, all other essential infrastructure and services areas around the Melton Reservoir and Eynesbury Township are expected to remain unaffected by flooding during a 1% AEP (100yr ARI) event.

## Road Closures

The following roads are subject to closure during flooding around Exford, Melton South and Eynesbury. Check the DoT website for more details: <http://alerts.vicroads.vic.gov.au/>.

DoT Roads flooded in a 1% AEP (100yr ARI) event
<ul style="list-style-type: none"> <li>• Nil</li> </ul>

Table C1.5 – DoT Possible Road Closures during a flooding event

Melton City Council Roads affected in a 1% AEP event	
<b>EYNESBURY</b>	<ul style="list-style-type: none"> <li>• Kevington Drive</li> </ul>
<ul style="list-style-type: none"> <li>• Bendigo Drive</li> </ul>	<ul style="list-style-type: none"> <li>• Rushworth Avenue</li> </ul>
<ul style="list-style-type: none"> <li>• Eynesbury Road</li> </ul>	<ul style="list-style-type: none"> <li>• Walhalla Drive</li> </ul>
<ul style="list-style-type: none"> <li>• Haul Road</li> </ul>	

Table C1.6 – Melton City Council Possible Road Closures during a flooding event



## Flood Mitigation

### Retarding Basins

Melbourne Water Retarding Basin	On Drain/ Waterway	Area	Storage Capacity	Spillway Crest Level	Full Supply Level	Embankment Crest Level	ANCOLD Hazard Rating	Houses In Flow Path (dam breach)	Melway Reference
Rees Road	Rees Road Drain (Werribee River)	1.88 ha	18 ML	N/A	Unavailable	113.5m AHD	Very Low	0	342 G5

Table C1.7 – Melbourne Water Retarding Basins within the Werribee River catchment in the City of Melton

## Sewerage Infrastructure

Sewerage Infrastructure of note during a severe flood event located around the Werribee River is contained within the following table.

### Sewer Pumping Stations

Sewerage Pumping Station	On Drain / Waterway	Bank / Side of Waterway	Operator	Location	Melway Reference
The Grove	Werribee River Tributary	East	Greater Western Water	The Grove, Melton West	336 B9
Charda Court	Werribee River Tributary	East	Greater Western Water	Charda Court, Brookfield	342 B1
Rees Road	Melton Reservoir	North	Greater Western Water	Rees Road, Melton South	342 G7
Toorong Road	Ironbark Creek	-	Greater Western Water	Toorong Road, Eynesbury	226 J3

Table C1.8 – Sewer Pumping Stations within the Werribee River Catchment in the City of Melton

## Control, Command and Coordination

VICSES will assume overall control of the response to flood incidents. Control and coordination of a flood incident shall be carried out at the lowest effective level and in accordance with the SEMP. During significant events, VICSES will conduct incident management using multi-agency resources.

## **Flood Impacts and Operational Considerations (Intelligence Cards)**

The tables on the following pages provide a breakdown of the possible consequences of flooding along the Werribee River and in Eynesbury at various river heights or rain totals within the City of Melton. These tables are to be used only as a guide as no two floods at a location will have identical impacts.

Intelligence Cards have been included for the following locations:

- Downstream of Melton Reservoir, Melton South
- Eynesbury

# FLOOD INTELLIGENCE CARD – MELTON RESERVOIR TAIL GAUGE, WERRIBEE RIVER

Version 4 – June 2021



Note: flood intelligence records are approximations. This is because no two floods at a location, even if they peak at the same height, will have identical impacts. Flood intelligence cards detail the relationship between flood magnitude and flood consequences. More details about flood intelligence and its use can be found in the Australian Emergency Management Manuals flood series.

This Flood Intelligence Card publication is presented by the Victoria State Emergency Service for the purpose of disseminating emergency management information. The contents of the information have not been independently verified by the Victoria State Emergency Service. No liability is accepted for any damage, loss or injury caused by errors or omissions in this information or for any action taken by any person in reliance upon it. **Scan the QR code for the current levels for this gauge.**



LOCATION:	East bank of River, 300m from Exford Road, Melton South
CURRENT LEVEL:	<a href="https://www.melbournwater.com.au/water-data-and-education/rainfall-and-river-levels#reader/231221A">https://www.melbournwater.com.au/water-data-and-education/rainfall-and-river-levels#reader/231221A</a>
STREAM:	Werribee River
GAUGE NUMBER:	231205D
GAUGE ZERO:	58.014m AHD
GAUGE TYPE:	Stream Level

MELWAY REFERENCE:	220 J2
MINOR:	4,000 ML / Day
MODERATE:	35,000 ML / Day
MAJOR:	50,000 ML / Day
LEEVE HEIGHT:	N/A
HIGHEST RECORDED FLOOD:	70,293 ML/d (15 <sup>th</sup> October 1983)

River Flow	Flood Class or Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
4,000 ML/Day	MINOR FLOOD FLOW		
35,000 ML/Day	MODERATE FLOOD FLOW		
50,000 ML/Day	MAJOR FLOOD FLOW		
70,293 ML/d	15 <sup>th</sup> October 1983 Flood Flow Peak		
99,000 ML/d	1% AEP (100yr ARI) Flood Flow (Major)	<b>Properties at Flood Risk</b> <ul style="list-style-type: none"> <li>• Nil</li> </ul> <b>Community Infrastructure Likely Flooded</b> <ul style="list-style-type: none"> <li>• Nil</li> </ul> <b>Water Over Road Werribee River</b> <ul style="list-style-type: none"> <li>• Werribee River and Toolern Creek water at top of bridges on Exford Road and Greigs Road West, Melton South</li> </ul>	VICSES may provide warnings using EM-COP to Melton Council and appropriate agencies as required based on the predictions provided by BoM regarding flood levels and the risk of Flash Flooding. The VICSES RDO in conjunction with the Regional Agency Commander will maintain operational awareness and form an appropriate response arrangement to suit the level of incident.  VICSES to respond on a request by request basis.

River Flow	Flood Class or Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
			Council and DoT (as appropriate) to provide road closure signage under predetermined arrangements.

Table C1.9 – Breakdown of likely consequences at various River gauge level heights along the Werribee River in Melton with operational considerations

# FLOOD INTELLIGENCE CARD – EYNESBURY (UNGAUGED)

Version 2 – June 2021



Note: flood intelligence records are approximations. This is because no two floods at a location, even if they peak at the same height, will have identical impacts. Flood intelligence cards detail the relationship between flood magnitude and flood consequences. More details about flood intelligence and its use can be found in the Australian Emergency Management Manuals flood series.

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CLOSEST RAIN GAUGE:	<b>Toolern Creek at Melton South</b>
LOCATION:	<b>East bank along dirt track between Bridge Road and Strathulloh Circuit West</b>
RECENT RAINFALL:	<a href="https://www.melbournewater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/231231A">https://www.melbournewater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/231231A</a>

MELWAY REF:	<b>343 A9</b>
GAUGE NUMBER:	<b>231231A</b>
GAUGE TYPE:	<b>Stream Level &amp; Rain</b>

Design Rainfall Depths (mm) – Indication of Possible Flooding	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
70mm in 55 hours	14 <sup>th</sup> January 2011 Flood Flow Peak	<b>Event Summary</b> <ul style="list-style-type: none"> <li>Eynesbury Road, Eynesbury flooded at Coolibah Creek</li> </ul>	
20mm in 10 mins; 33mm in 30 mins; 40mm in 1 hour; 49mm in 2 hours; 56mm in 3 hours; or 71mm in 6 hours  Note: rainfall depths are a very rough method of estimating flood events and have been used due to the ungagged nature of the catchment. This should be used as a guide only.	1% AEP (100 year ARI)	<ul style="list-style-type: none"> <li>Note: It is not known at what level infrastructure contained below starts being flooded</li> </ul> <b>Properties at Flood Risk</b> <b>0 Properties in Total</b> <ul style="list-style-type: none"> <li>Nil</li> </ul> <b>Community Infrastructure Likely Flooded</b> <ul style="list-style-type: none"> <li>Eynesbury Historic Homestead Car-park</li> </ul> <b>Essential Infrastructure Likely Impacted</b> <ul style="list-style-type: none"> <li>Nil</li> </ul> <b>Tourism / Recreation Likely Impacted</b> <ul style="list-style-type: none"> <li>Sections of the Eynesbury Golf Course</li> </ul> <b>Water Over Road</b> <b>Coolibah &amp; Eynesbury Creeks</b> <ul style="list-style-type: none"> <li>Eynesbury Road, Eynesbury at Coolibah Creek and Eynesbury Creek bridges</li> <li>Walhalla Drive, Eynesbury</li> <li>Kevington Drive, Eynesbury</li> <li>Bendigo Drive, Eynesbury between Heathcote Drive and Rushworth Avenue</li> <li>Rushworth Avenue, Eynesbury</li> <li>Haul Road, Eynesbury at Eynesbury Creek bridge</li> </ul>	VICSES may provide warnings using EM-COP to Melton Council and appropriate agencies as required based on the predictions provided by BoM regarding flood levels and the risk of Flash Flooding. The VICSES RDO in conjunction with the Regional Agency Commander will maintain operational awareness and form an appropriate response arrangement to suit the level of incident.  VICSES to respond on a request by request basis.  Council and DoT (as appropriate) to provide road closure signage under predetermined arrangements.

Table C1.10 – Breakdown of possible consequences at various rainfall intensities around Eynesbury with operational considerations

# APPENDIX C2 – ARNOLDS CREEK FLOOD EMERGENCY PLAN

## Overview of Flooding Consequences

Arnolds Creek and the adjoining towns of Melton West and Brookfield are located approximately 40km west of Melbourne in a predominantly residential area. Arnolds Creek is the prominent watercourse in the area, flowing from the north where it begins as two branches; east and west. High Intensity, short duration rainfall events are the primary concern for the area and are likely to cause flash flooding in and around the residential drainage network as well as the Creeks. See mapping in **Appendix F** for more insight into flooding in the area.

*This Summary table is generated from Victorian Government data. The State of Victoria does not guarantee that the publication is without flaw of any kind or is wholly appropriate for your particular purposes and therefore disclaims all liability for error, loss or damage which may arise from reliance upon it. All persons accessing this information should make appropriate enquiries to assess the currency of the data.*

Summary of Consequences in a 1% AEP (100yr ARI) flood along Arnolds Creek					
<b>Property</b>					
<b>Properties</b>	<b>121</b>				
Residential	121				
Commercial	0				
Industrial	0				
Public Land	0				
Rural	0				
<b>Community Infrastructure</b>					
Retirement Villages	1	Brookfield Village			
<b>Essential Infrastructure</b>					
Bus Routes	2	455 & 458			
Sewerage Facilities	4	Pumping Stations			
Levees	1	Black Dog Drive to Western Hwy			
Drainage Facilities	2	Retarding Basins			
<b>Government Boundaries</b>					
Local Gov't Areas	1	Melton	CMA	1	Port Phillip & Westernport
Adjacent LGAs	0		CFA District	1	District 14
SES Resp' Boundary	1	Melton	FRV District	0	

Table C2.1 – Consequence Summary of 1% AEP flood along Arnolds Creek

## Gauges and Warnings

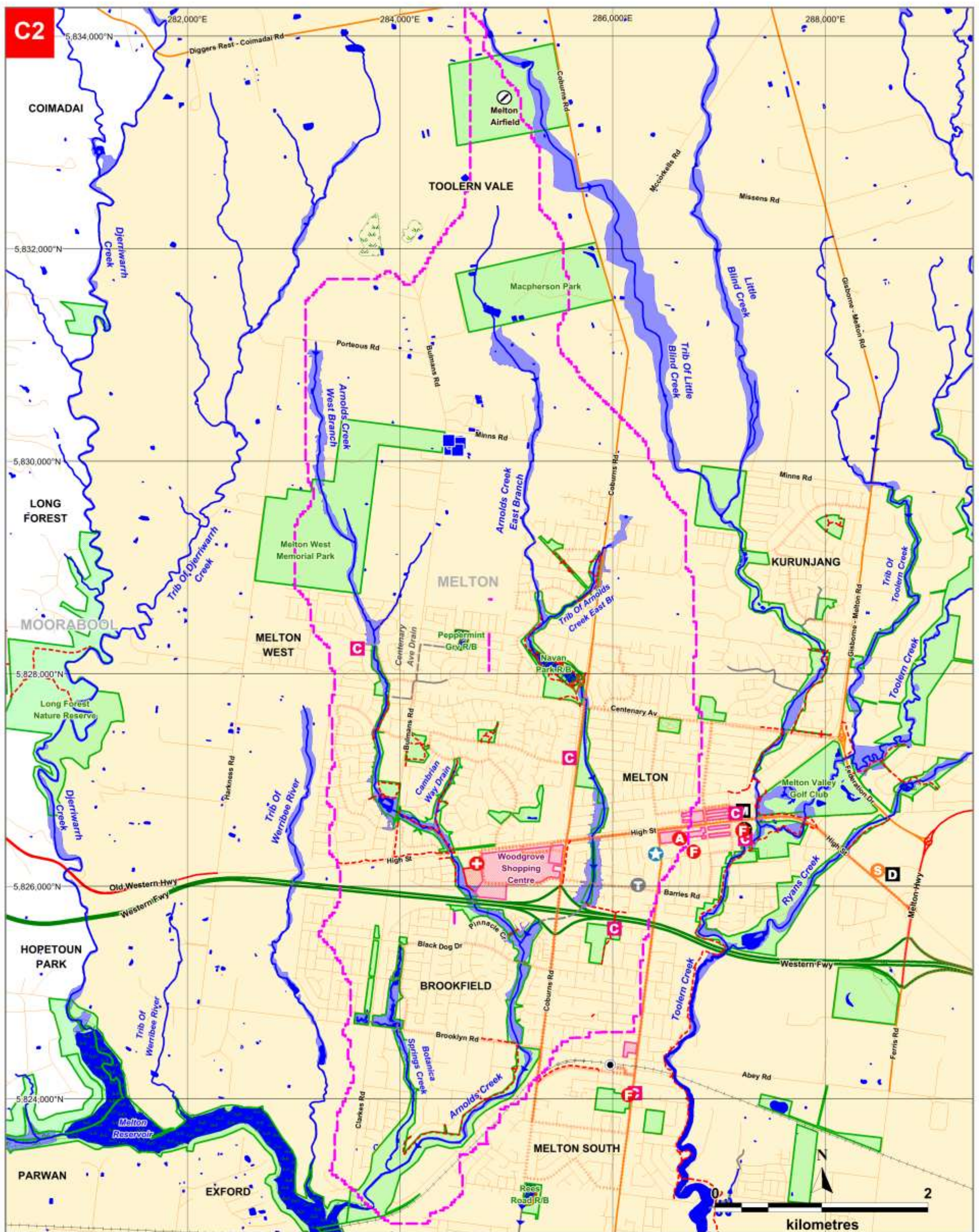
Neither the BoM nor Melbourne Water currently provides flood forecasts for Arnolds Creek. All flood response actions must therefore be driven by rainfall and/or river level observations. Telemetered rain gauges are located at Toolern Vale and Melton South within the Toolern Creek Catchment.

Gauge	Station No.	Location	Level Gauge	Rain Gauge	Melway Reference
Toolern Creek at Melton South (MW)	231231A	East bank along dirt track between Bridge Road and Strathulloh Circuit West	✓	✓	343 A9
Toolern Vale (MW)	587019	Benson Road, 200m from Gisborne – Melton Road		✓	X909 G12

Table C2.2– Gauges within close proximity to the Arnolds Creek Catchment

These Gauges may provide some warning of expected flooding. See the Melbourne Water website for more information on these gauges: <http://www.melbournewater.com.au/waterdata/rainfallandriverleveldata/Pages/Rainfall-and-river-level-new.aspx>. The BoM website also links a number of these gauges at: [http://www.bom.gov.au/cgi-bin/wrap\\_fwo.pl?IDV60201.html](http://www.bom.gov.au/cgi-bin/wrap_fwo.pl?IDV60201.html). It is advised that residents monitor the BoM website <http://www.bom.gov.au/vic/warnings/index.shtml?ref=hdr> and the VicEmergency website <https://emergency.vic.gov.au/> for any thunderstorm, flood or severe weather warnings present for their area.

# Area Map of Flood Risk along Arnolds Creek



Map Produced by VicSES June 2016

## CITY OF MELTON 1% AEP (100yr ARI) Flooding C2. Areas of flood risk along Arnolds Creek

- |                                  |                                 |                    |
|----------------------------------|---------------------------------|--------------------|
| Building                         | Melbourne Water Retarding Basin | Community Centre   |
| Area of Interest                 | Fire Station                    | Telephone Exchange |
| Waterbody                        | Airport / Airfield              | Ambulance Station  |
| 1% AEP Riverine Flood Extent     | Hospital                        | Police Station     |
| Natural Wetland                  | Bicycle / Walking Trail         | VicSES             |
| Commercial Precinct              | Bus Route (PTV)                 | Municipal Depot    |
| Melbourne Water Stormwater Drain | Embankment                      | Municipal Offices  |
| River / Creek                    | Retail Water Storage            |                    |
| Area boundary for this Appendix  |                                 |                    |



**SES VICTORIA**  
**Melbourne Water**

This map publication is presented by the Victoria State Emergency Service for the purpose of disseminating emergency management information. The contents of the information have not been independently verified by the Victoria State Emergency Service. No liability is accepted for any damage, loss or injury caused by users or omissions in this information or for any action taken by any person in reliance upon it.

Figure C2 – Areas of flood risk around Arnolds Creek in the City of Melton



## Properties at Flood Risk

Properties listed in the table below are at risk from flooding around Arnolds Creek. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Arnolds Creek East Branch (Melbourne Water, June 2015), the Arnolds Creek East Tributary (BMT WBM, June 2012) and the Arnolds Creek West Branch (Melbourne Water, June 2015) flood mapping and risk assessment programs.

*This Property Flood Risk Table is presented by the Victoria State Emergency Service for the purpose of disseminating emergency management information. The contents of the information have not been independently verified by the Victoria State Emergency Service. No liability is accepted for any damage, loss or injury caused by errors or omissions in this information or for any action taken by any person in reliance upon it.*

Properties at risk from Flooding along Arnolds Creek during a 1% AEP event				
Residential	Commercial	Industrial	Rural	Public Use
Street No. at Risk	Street	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
1	Alkemade Drive	Melton	Arnolds Creek East Branch	Riverine
2	Alkemade Drive	Melton	Arnolds Creek East Branch	Riverine
3	Alkemade Drive	Melton	Arnolds Creek East Branch	Riverine
5	Alkemade Drive	Melton	Arnolds Creek East Branch	Riverine
7	Alkemade Drive	Melton	Arnolds Creek East Branch	Riverine
9	Alkemade Drive	Melton	Arnolds Creek East Branch	Riverine
11	Alkemade Drive	Melton	Arnolds Creek East Branch	Riverine
13	Alkemade Drive	Melton	Arnolds Creek East Branch	Riverine
15	Alkemade Drive	Melton	Arnolds Creek East Branch	Riverine
17	Alkemade Drive	Melton	Arnolds Creek East Branch	Riverine
19	Alkemade Drive	Melton	Arnolds Creek East Branch	Riverine
21	Alkemade Drive	Melton	Arnolds Creek East Branch	Riverine
23	Alkemade Drive	Melton	Arnolds Creek East Branch	Riverine
2/25	Alkemade Drive	Melton	Arnolds Creek East Branch	Riverine
27	Alkemade Drive	Melton	Arnolds Creek East Branch	Riverine
29	Alkemade Drive	Melton	Arnolds Creek East Branch	Riverine
31	Alkemade Drive	Melton	Arnolds Creek East Branch	Riverine
98	Barries Road	Melton	Arnolds Creek East Branch	Riverine
100	Barries Road	Melton	Arnolds Creek East Branch	Riverine
102	Barries Road	Melton	Arnolds Creek East Branch	Riverine
111	Barries Road	Melton	Arnolds Creek East Branch	Riverine
113	Barries Road	Melton	Arnolds Creek East Branch	Riverine
115	Barries Road	Melton	Arnolds Creek East Branch	Riverine
7	Bell Court	Melton	Arnolds Creek East Branch	Riverine
9	Bell Court	Melton	Arnolds Creek East Branch	Riverine
2	Bryan Court	Melton	Arnolds Creek East Branch	Riverine
4	Bryan Court	Melton	Arnolds Creek East Branch	Riverine
6	Bryan Court	Melton	Arnolds Creek East Branch	Riverine
8	Bryan Court	Melton	Arnolds Creek East Branch	Riverine
10	Bryan Court	Melton	Arnolds Creek East Branch	Riverine
12	Bryan Court	Melton	Arnolds Creek East Branch	Riverine
25	Carina Drive	Melton	Arnolds Creek East Branch	Riverine
27	Carina Drive	Melton	Arnolds Creek East Branch	Riverine

Properties at risk from Flooding along Arnolds Creek during a 1% AEP event

Properties at risk from Flooding along Arnolds Creek during a 1% AEP event				
Residential	Commercial	Industrial	Rural	Public Use
Street No. at Risk	Street	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
29	Carina Drive	Melton	Arnolds Creek East Branch	Riverine
31	Carina Drive	Melton	Arnolds Creek East Branch	Riverine
33	Carina Drive	Melton	Arnolds Creek East Branch	Riverine
35	Carina Drive	Melton	Arnolds Creek East Branch	Riverine
37	Carina Drive	Melton	Arnolds Creek East Branch	Riverine
39	Carina Drive	Melton	Arnolds Creek East Branch	Riverine
41	Carina Drive	Melton	Arnolds Creek East Branch	Riverine
43	Carina Drive	Melton	Arnolds Creek East Branch	Riverine
45	Carina Drive	Melton	Arnolds Creek East Branch	Riverine
47	Carina Drive	Melton	Arnolds Creek East Branch	Riverine
8	Claret Ash Boulevard	Harkness	Arnolds Creek West Branch	Riverine
10	Claret Ash Boulevard	Harkness	Arnolds Creek West Branch	Riverine
111-139	Coburns Road	Brookfield	Arnolds Creek	Riverine
27	Greenhills Drive	Kurunjang	Local Drainage	Flash
487	High Street	Melton	Arnolds Creek East Branch	Riverine
488	High Street	Melton	Arnolds Creek East Branch	Riverine
489	High Street	Melton	Arnolds Creek East Branch	Riverine
491	High Street	Melton	Arnolds Creek East Branch	Riverine
497	High Street	Melton	Arnolds Creek East Branch	Riverine
14	Irving Road	Melton	Arnolds Creek East Branch	Riverine
1	Kinkora Road	Melton	Arnolds Creek East Branch	Riverine
3	Kinkora Road	Melton	Arnolds Creek East Branch	Riverine
5	Kinkora Road	Melton	Arnolds Creek East Branch	Riverine
7	Kinkora Road	Melton	Arnolds Creek East Branch	Riverine
9	Kinkora Road	Melton	Arnolds Creek East Branch	Riverine
10	Kinkora Road	Melton	Arnolds Creek East Branch	Riverine
11	Kinkora Road	Melton	Arnolds Creek East Branch	Riverine
12	Kinkora Road	Melton	Arnolds Creek East Branch	Riverine
13	Kinkora Road	Melton	Arnolds Creek East Branch	Riverine
15	Kinkora Road	Melton	Arnolds Creek East Branch	Riverine
17	Kinkora Road	Melton	Arnolds Creek East Branch	Riverine
19	Kinkora Road	Melton	Arnolds Creek East Branch	Riverine
1	Kinloch Road	Melton	Arnolds Creek East Branch	Riverine
2	Kinloch Road	Melton	Arnolds Creek East Branch	Riverine
3	Kinloch Road	Melton	Arnolds Creek East Branch	Riverine
1/3A	Kinloch Road	Melton	Arnolds Creek East Branch	Riverine
2/3A	Kinloch Road	Melton	Arnolds Creek East Branch	Riverine
4	Kinloch Road	Melton	Arnolds Creek East Branch	Riverine
5	Kinloch Road	Melton	Arnolds Creek East Branch	Riverine
6	Kinloch Road	Melton	Arnolds Creek East Branch	Riverine
7	Kinloch Road	Melton	Arnolds Creek East Branch	Riverine
8	Kinloch Road	Melton	Arnolds Creek East Branch	Riverine
9	Kinloch Road	Melton	Arnolds Creek East Branch	Riverine
10	Kinloch Road	Melton	Arnolds Creek East Branch	Riverine

Properties at risk from Flooding along Arnolds Creek during a 1% AEP event

Properties at risk from Flooding along Arnolds Creek during a 1% AEP event				
Residential	Commercial	Industrial	Rural	Public Use
Street No. at Risk	Street	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
12	Kinloch Road	Melton	Arnolds Creek East Branch	Riverine
14	Kinloch Road	Melton	Arnolds Creek East Branch	Riverine
16	Kinloch Road	Melton	Arnolds Creek East Branch	Riverine
18	Kinloch Road	Melton	Arnolds Creek East Branch	Riverine
20	Kinloch Road	Melton	Arnolds Creek East Branch	Riverine
22	Kinloch Road	Melton	Arnolds Creek East Branch	Riverine
24	Kinloch Road	Melton	Arnolds Creek East Branch	Riverine
1	Lakeview Terrace	Melton West	Arnolds Creek West Branch	Riverine
3	Leafy View Esplanade	Harkness	Arnolds Creek West Branch	Riverine
5	Leafy View Esplanade	Harkness	Arnolds Creek West Branch	Riverine
2	Norma Street	Melton	Arnolds Creek East Branch	Riverine
4	Norma Street	Melton	Arnolds Creek East Branch	Riverine
42	Oldershaw Road	Melton	Arnolds Creek East Branch	Riverine
49	Oldershaw Road	Melton	Arnolds Creek East Branch	Riverine
15	Perry Close	Melton	Arnolds Creek East Branch	Riverine
17	Perry Close	Melton	Arnolds Creek East Branch	Riverine
24	Perry Close	Melton	Arnolds Creek East Branch	Riverine
26	Perry Close	Melton	Arnolds Creek East Branch	Riverine
28	Perry Close	Melton	Arnolds Creek East Branch	Riverine
30	Perry Close	Melton	Arnolds Creek East Branch	Riverine
1	Piccolotto Drive	Melton West	Arnolds Creek West Branch	Riverine
1A	Piccolotto Drive	Melton West	Arnolds Creek West Branch	Riverine
8	Pinnacle Crescent	Brookfield	Arnolds Creek West Branch	Riverine
10	Pinnacle Crescent	Brookfield	Arnolds Creek West Branch	Riverine
12	Pinnacle Crescent	Brookfield	Arnolds Creek West Branch	Riverine
14	Pinnacle Crescent	Brookfield	Arnolds Creek West Branch	Riverine
16	Pinnacle Crescent	Brookfield	Arnolds Creek West Branch	Riverine
33	Quail Crescent	Melton	Arnolds Creek East Branch	Riverine
51	Rosina Drive	Melton	Arnolds Creek East Branch	Riverine
59	Rosina Drive	Melton	Arnolds Creek East Branch	Riverine
61	Rosina Drive	Melton	Arnolds Creek East Branch	Riverine
63	Rosina Drive	Melton	Arnolds Creek East Branch	Riverine
65	Rosina Drive	Melton	Arnolds Creek East Branch	Riverine
67	Rosina Drive	Melton	Arnolds Creek East Branch	Riverine
69	Rosina Drive	Melton	Arnolds Creek East Branch	Riverine
2	Ross Court	Brookfield	Arnolds Creek West Branch	Riverine
5	Ruairi Court	Kurunjang	Local Drainage	Flash
15	Stirling Terrace	Melton West	Arnolds Creek West Branch	Riverine
4	Waterdale Close	Melton West	Arnolds Creek West Branch	Riverine
5	Waterdale Close	Melton West	Arnolds Creek West Branch	Riverine
6	Waterdale Close	Melton West	Arnolds Creek West Branch	Riverine
7	Waterdale Close	Melton West	Arnolds Creek West Branch	Riverine
8	Waterdale Close	Melton West	Arnolds Creek West Branch	Riverine
23	Winfield Drive	Kurunjang	Local Drainage	Flash

Properties at risk from Flooding along Arnolds Creek during a 1% AEP event				
Residential	Commercial	Industrial	Rural	Public Use
Street No. at Risk	Street	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
Total				
121				

Table C2.3 – Properties at risk of flooding along the Arnolds Creek catchment in the City of Melton

## Isolation

- A section of the Brookfield Village Retirement Village, Brookfield is at risk of isolating residents west of the Village Drive bridge during a 100yr ARI Event as Arnolds Creek East and West branch flood. Village Drive is the only vehicle access to that section of the Retirement Village which crosses Arnolds Creek East Branch. A walking path crosses Arnolds Creek West branch which will also likely become impassable.

No major isolation risks exist for areas around Melton West and Brookfield during a 1% AEP (100yr ARI) event. Some localised short-duration isolation may occur due to flash flooding.

## Essential Infrastructure

During an event, see the Public Transport Victoria's Website for details on delays or alterations to services: <http://ptv.vic.gov.au/live-travel-updates/>. A map of public transport routes within the City of Melton is available via the website at: [https://www.ptv.vic.gov.au/assets/PTV-default-site/more/maps/Local-area-maps/Metropolitan/ba7db7be6d/31\\_Melton\\_LAM.pdf](https://www.ptv.vic.gov.au/assets/PTV-default-site/more/maps/Local-area-maps/Metropolitan/ba7db7be6d/31_Melton_LAM.pdf)

Apart from the roads outlined below, all other essential infrastructure and services areas around Melton West and Brookfield are expected to remain unaffected by flooding during a 1% AEP (100yr ARI) event.

## Road Closures

The following roads are subject to closure during flooding around Melton West and Brookfield. Check the DoT website for more details: <http://alerts.vicroads.vic.gov.au/>.

DoT Roads flooded in a 1% AEP (100yr ARI) event
• nil

Table C2.4 – DoT Possible Road Closures during a flooding event

Melton City Council Roads flooded in a 1% AEP (100yr ARI) event		
BROOKFIELD	MELTON	
• Black Dog Drive	• Barries Road	• Lakeview Terrace
• Keating Street	• Kinkora Road	• Leafy View Esplanade
• Menzies Grove	• Kinloch Road	• Meadow Glen Drive
• Scullin Street		• Minns Road
• Village Drive	MELTON WEST	• River Views Road
	• Bulmans Road	• Riverbank Boulevard
	• Claret Ash Boulevard	• Stanford Terrace
	• Coburns Road	

Table C2.5 – Melton City Council Possible Road Closures during a flooding event

## Flood Mitigation

### Retarding Basins

Melbourne Water Retarding Basin	On Drain/ Waterway	Area	Storage Capacity	Spillway Crest Level	Full Supply Level	Embankment Crest Level	ANCOLD Hazard Rating	Houses In Flow Path (dam breach)	Melway Reference
Navan Park	Arnolds Creek East Branch	2.4 ha	256 ML	148.15m AHD	Unavailable	8m height (149.0m AHD)	High A	111	336 H5
Peppermint Grove	Centenary Ave Drain (Arnolds Creek West Branch)	1.77 ha	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable	336 F4

Table C2.6 – Melbourne Water Retarding Basins within the Arnolds Creek catchment in the City of Melton

### Levees

City of Melton Levee	Reach	Side	Levee Height	Levee Length	Expected Level of Protection	ANCOLD Hazard Rating	Consequences of Failure	Melway Reference
Pinnacle Crescent, Arnolds Creek West	Black Dog Drive & Western Highway	South	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable	336 F10 – G11

Table C2.7 – Melbourne Water Levees in the Arnolds Creek Catchment in the City of Melton

## Sewerage Infrastructure

Sewerage infrastructure of note during a severe flood event located around Arnolds Creek is contained within the following table.

### Sewer Pumping Stations

Sewerage Pumping Station	On Drain / Waterway	Bank / Side of Waterway	Operator	Location	Melway Reference
Centenary Avenue	Arnolds Creek East Branch	West	Greater Western Water	Centenary Avenue, Melton	336 J6
Tandara Circuit	Arnolds Creek West Branch	West	Greater Western Water	Tandara Circuit, Melton West	336 F10
Coburns Road	Arnolds Creek West Branch	East	Greater Western Water	Cnr Coburns Road and Brooklyn Road, Brookfield	342 G2

Maplewood Close	Botanica Springs Creek	East	Greater Western Water	Maplewood Close, Brookfield	342 D3
-----------------	------------------------	------	-----------------------	-----------------------------	--------

Table C2.8 – Sewer Pumping Stations within the Arnolds Creek Catchment in the City of Melton

## **Control, Command and Coordination**

VICSES will assume overall control of the response to flood incidents. Control and coordination of a flood incident shall be carried out at the lowest effective level and in accordance with the SEMP. During significant events, VICSES will conduct incident management using multi-agency resources.

## **Flood Impacts and Operational Considerations (Intelligence Cards)**

The tables on the following pages provide a breakdown of the possible consequences of flooding along Arnolds Creek at various rain totals. These tables are to be used only as a guide as no two floods at a location will have identical impacts.

Intelligence Cards have been included for the following locations:

- Arnolds Creek, Melton West

# FLOOD INTELLIGENCE CARD – ARNOLDS CREEK, MELTON WEST (UNGAUGED)

Version 4 – June 2021



Note: flood intelligence records are approximations. This is because no two floods at a location, even if they peak at the same height, will have identical impacts. Flood intelligence cards detail the relationship between flood magnitude and flood consequences. More details about flood intelligence and its use can be found in the Australian Emergency Management Manuals flood series.

This Flood Intelligence Card publication is presented by the Victoria State Emergency Service for the purpose of disseminating emergency management information. The contents of the information have not been independently verified by the Victoria State Emergency Service. No liability is accepted for any damage, loss or injury caused by errors or omissions in this information or for any action taken by any person in reliance upon it. **Scan the QR code for the current levels for this gauge.**

CLOSEST RAIN GAUGE:	<b>Toolern Vale</b>
LOCATION:	<b>Benson Road, 200m from Gisborne – Melton Road</b>
RECENT RAINFALL:	<a href="https://www.melbournewater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/587019">https://www.melbournewater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/587019</a>

MELWAY REF:	<b>X909 G12</b>
GAUGE NUMBER	<b>587019</b>
GAUGE TYPE	<b>Rain</b>

Design Rainfall Depths (mm) – Indication of Possible Flooding	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
23mm in 10 mins; 39mm in 30 mins; 51mm in 1 hour; 63mm in 2 hours; 87mm in 6 hours; or 107mm in 12 hours  Note: rainfall depths are a very rough method of estimating flood events and have been used due to the ungagged nature of the catchment. This should be used as a guide only.	1% AEP (100 year ARI)	<b>Properties at Flood Risk</b> <b>121 Properties in Total</b> <b>Arnolds Creek</b> <ul style="list-style-type: none"> <li>111-139 Coburns Road, Brookfield</li> </ul> <b>Arnolds Creek East Branch</b> <ul style="list-style-type: none"> <li>1, 2, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 2/25, 27, 29 &amp; 31 Alkemade Drive, Melton</li> <li>98, 100, 102, 111, 113 &amp; 115 Barries Road, Melton</li> <li>7 &amp; 9 Bell Court, Melton</li> <li>2, 4, 6, 8, 10 &amp; 12 Bryan Court, Melton</li> <li>25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45 &amp; 47 Carina Drive, Melton</li> <li>487, 488, 489, 491 &amp; 497 High Street, Melton</li> <li>14 Irving Road, Melton</li> <li>1, 3, 5, 7, 9, 10, 11, 12, 13, 15, 17 &amp; 19 Kinkora Road, Melton</li> <li>1, 2, 3, 1/3A, 2/3A, 4, 5, 6, 7, 8, 9, 10, 12, 14, 16, 18, 20, 22 &amp; 24 Kinloch Road, Melton</li> <li>2 &amp; 4 Norma Street, Melton</li> <li>42 &amp; 49 Oldershaw Road, Melton</li> <li>15, 17, 24, 26, 28 &amp; 30 Perry Close, Melton</li> <li>33 Quail Crescent, Melton</li> <li>51, 59, 61, 63, 65, 67 &amp; 69 Rosina Drive, Melton</li> </ul> <b>Arnolds Creek West Branch</b> <ul style="list-style-type: none"> <li>8 &amp; 10 Claret Ash Boulevard, Harkness</li> </ul>	VICSES may provide warnings using EM-COP to Melton Council and appropriate agencies as required based on the predictions provided by BoM regarding flood levels and the risk of Flash Flooding. The VICSES RDO in conjunction with the Regional Agency Commander will maintain operational awareness and form an appropriate response arrangement to suit the level of incident.  VICSES to respond on a request by request basis.  Council and DoT (as appropriate) to provide road closure signage under predetermined arrangements.



Design Rainfall Depths (mm) – Indication of Possible Flooding	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		<ul style="list-style-type: none"> <li>• 1 Lakeview Terrace, Melton West</li> <li>• 3 &amp; 5 Leafy View Esplanade, Harkness</li> <li>• 1 &amp; 1A Piccolotto Drive, Melton West</li> <li>• 8, 10, 12, 14 &amp; 16 Pinnacle Crescent, Brookfield</li> <li>• 2 Ross Court, Brookfield</li> <li>• 15 Stirling Terrace, Melton West</li> <li>• 4, 5, 6, 7 &amp; 8 Waterdale Close, Melton West</li> <li><b>Local Drainage</b></li> <li>• 27 Greenhills Drive, Kurunjang</li> <li>• 5 Ruairi Court, Kurunjang</li> <li>• 23 Winfield Drive, Kurunjang</li> <li><b>Community Infrastructure Likely Flooded</b></li> <li>• Brookfield Village Retirement Village affected by property flooding to northern section of Village across Village Drive Bridge. Bridge may become flooded, cutting access to residents on Keating Street, Menzies, Grove, Reid Street, Lyons Street, Scullin Street, Page Street, Bruce Court and Whitlam Court</li> <li>• Melton Christian College, Brookfield affected by flooding to sports grounds</li> <li><b>Essential Infrastructure Likely Impacted</b></li> <li><b>Arnolds Creek East Branch</b></li> <li>• Bus Route 455 if Coburns Road, Kurunjang flooded</li> <li>• Bus Route 458 if Barries Road, Melton flooded</li> <li><b>Water Over Road</b></li> <li><b>Arnolds Creek East Branch</b></li> <li>• Barries Road, Melton</li> <li>• Coburns Road, Melton West at Highfield Way and north of Centenary Ave Intersection</li> <li>• Kinkora Road, Melton</li> <li>• Kinloch Road, Melton</li> <li>• Minns Road, Melton West ford crossing</li> <li>• Scullin Street, Brookfield</li> <li>• Village Drive, Brookfield</li> <li><b>Arnolds Creek West Branch</b></li> <li>• Bulmans Road, Melton West between Trethowan Avenue &amp; Piccolotto Drive</li> <li>• Leafy View Esplanade, Melton West</li> <li>• Riverbank Boulevard, Melton West</li> <li>• Claret Ash Boulevard, Melton West at Arnolds Creek Bvd roundabout</li> <li>• River Views Road, Melton West</li> <li>• Stanford Terrace, Melton West</li> <li>• Lakeview Terrace, Melton West</li> <li>• Keating Street, Brookfield</li> </ul>	

Table C2.9 – Breakdown of possible consequences at various rainfall intensities around Arnolds Creek with operational considerations

# APPENDIX C3 – TOOLERN CREEK FLOOD EMERGENCY PLAN

## Overview of Flooding Consequences

Toolern Creek, Little Blind Creek and Ryans Creek and the surrounding towns of Toolern Vale, Kurunjang, Melton and Melton South are located between 33-40km north west of Melbourne in a mixed rural and residential setting. Toolern Creek, Little Blind Creek and Ryans Creek are all prominent watercourses in the area, flowing from the north where the three creeks join in Melton. High Intensity, short duration rainfall events can cause flash flooding in and around the urban residential area, while prolonged rainfall may see the creeks flood, causing damage to unsealed roads in the north of the catchment and affecting properties adjoining the creeks. See mapping in **Appendix F** for more insight into flooding in the area.

*This Summary table is generated from Victorian Government data. The State of Victoria does not guarantee that the publication is without flaw of any kind or is wholly appropriate for your particular purposes and therefore disclaims all liability for error, loss or damage which may arise from reliance upon it. All persons accessing this information should make appropriate enquiries to assess the currency of the data.*

**Summary of Consequences in a 1% AEP (100yr ARI) flood along Toolern Creek**

Property					
<b>Properties</b>	<b>15</b>				
Residential	3				
Commercial	0				
Industrial	0				
Public Land	1				
Rural	11				
Community Infrastructure					
Essential Infrastructure					
Major Roads	3	Diggers Rest-Coimadai Road; Gisborne-Melton Road; & High Street			
Bus Routes	2	456 & 943			
Sewerage Facilities	2	Pumping Stations			
Levees	1	Barries Road & Western Hwy			
Airports / Airfields	1	Melton Airfield			
Tourism / Recreation					
Sports Facilities	1	Melton Valley Golf Club			
Recreation Facilities	1	Melton Recreation Reserve			
Government Boundaries					
Local Gov't Areas	1	Melton	CMA	1	Port Phillip & Westernport
Adjacent LGAs	1	Macedon Ranges	CFA District	1	District 14
SES Resp' Boundary	1	Melton	FRV District	0	

Table C3.1 – Consequence Summary of 1% AEP flood along Toolern Creek

## Gauges and Warnings

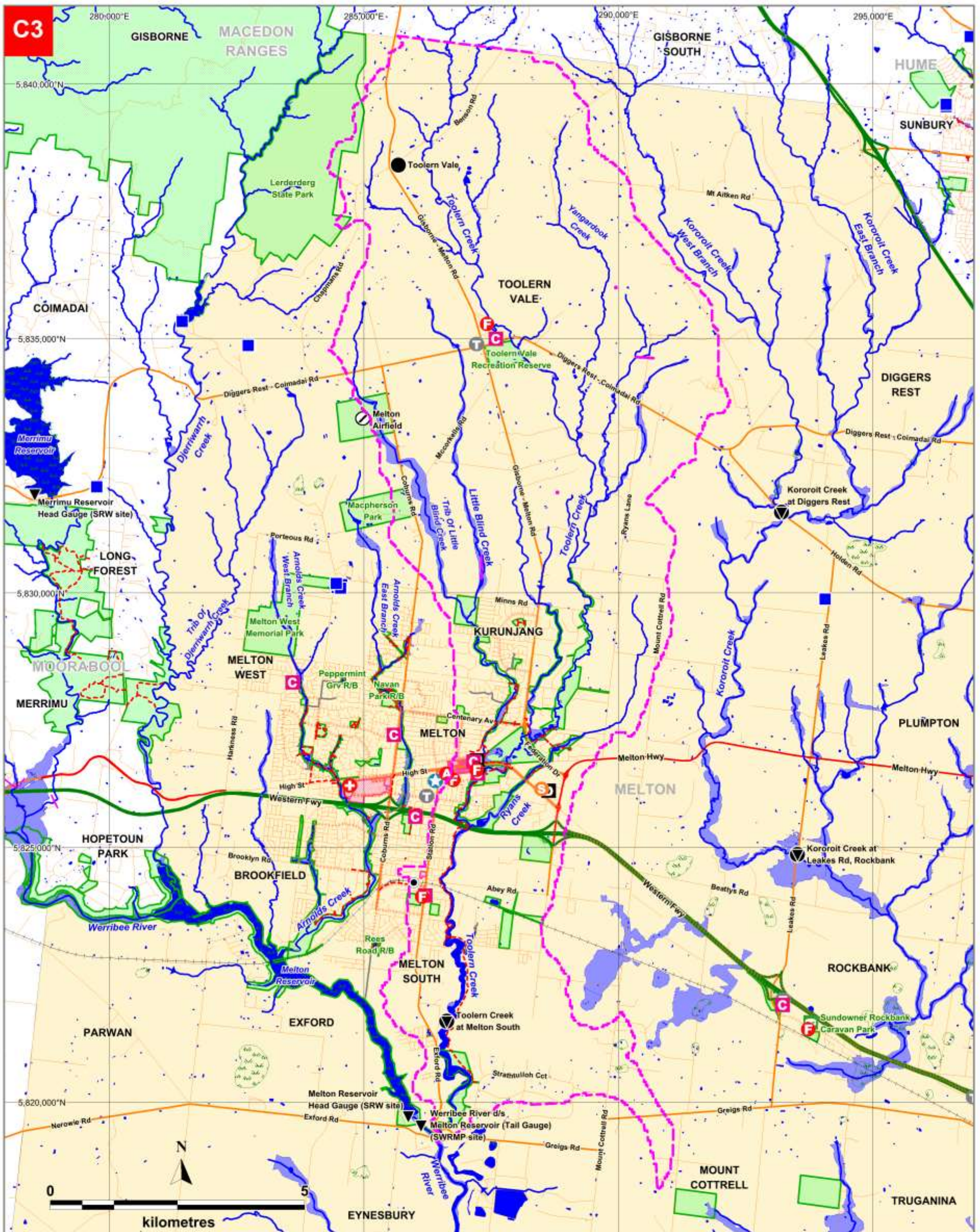
Neither the BoM nor Melbourne Water currently provides flood forecasts for Toolern Creek. All flood response actions must therefore be driven by rainfall and/or river level observations. Telemetered water level/flood gauges are located at Melton South within the Toolern Creek catchment.

Gauges	Station No.	Location	Level Gauge	Rain Gauge	Melway Reference
Toolern Creek at Melton South (MW)	231231A	East bank along dirt track between Bridge Road and Strathulloh Circuit West	✓	✓	343 A9
Toolern Vale (MW)	587019	Benson Road, 200m from Gisborne – Melton Road		✓	X909 G12

Table C3.2 – Gauges within the Toolern Creek catchment

These Gauges may provide some warning of expected flooding. See the Melbourne Water website for more information on these gauges: <http://www.melbournewater.com.au/waterdata/rainfallandriverleveldata/Pages/Rainfall-and-river-level-new.aspx>. The BoM website also links a number of these gauges at: [http://www.bom.gov.au/cgi-bin/wrap\\_fwo.pl?IDV60201.html](http://www.bom.gov.au/cgi-bin/wrap_fwo.pl?IDV60201.html). It is advised that residents monitor the BoM website <http://www.bom.gov.au/vic/warnings/index.shtml?ref=hdr> and the VicEmergency website <https://emergency.vic.gov.au/> for any thunderstorm, flood or severe weather warnings present for their area.

Areas of Flood Risk



Map Produced by VicSES June 2016

**CITY OF MELTON**  
 1% AEP (100yr ARI) Flooding  
**C3. Areas of flood risk along Toolern Creek**

- |                                  |                                 |                    |
|----------------------------------|---------------------------------|--------------------|
| Building                         | Melbourne Water Retarding Basin | Community Centre   |
| Area of Interest                 | Fire Station                    | Telephone Exchange |
| Waterbody                        | Airport / Airfield              | Ambulance Station  |
| 1% AEP Riverine Flood Extent     | Hospital                        | Police Station     |
| Natural Wetland                  | Bicycle / Walking Trail         | VicSES             |
| Commercial Precinct              | Bus Route (PTV)                 | Municipal Depot    |
| Melbourne Water Stormwater Drain | Embankment                      | Municipal Offices  |
| River / Creek                    | Retail Water Storage            | Stream Level Gauge |
| Area boundary for this Appendix  |                                 | Rain Gauge         |
|                                  |                                 | Caravan Park       |



**SES VICTORIA Melbourne Water**

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Figure C3 – Areas of flood risk around Toolern Creek in the City of Melton

## Properties at Flood Risk

Properties listed in the table below are at risk from flooding along Toolern Creek and Little Blind Creek. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Little Blind Creek (Melbourne Water, July 2008) and the Toolern Creek (PB Australia, December 2007) flood mapping and risk assessment programs.

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Properties at risk from Flooding along Little Blind Creek & Toolern Creek during a 1% AEP event				
Residential	Commercial	Industrial	Rural	Public Use
Street No. at Risk	Street	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
1	Buckle Road	Kurunjang	Toolern Creek	Riverine
47	Centenary Avenue	Melton	Little Blind Creek	Riverine
742	Coburns Road	Toolern Vale	Little Blind Creek	Riverine
744-818	Coburns Road	Toolern Vale	Little Blind Creek	Riverine
820-916	Coburns Road	Toolern Vale	Little Blind Creek	Riverine
995-1097	Coburns Road	Toolern Vale	Little Blind Creek	Riverine
14	Darlingsford Boulevard	Melton	Toolern Creek	Riverine
1909	Gisborne-Melton Road	Kurunjang	Toolern Creek	Riverine
1911	Gisborne-Melton Road	Kurunjang	Toolern Creek	Riverine
1913	Gisborne-Melton Road	Kurunjang	Toolern Creek	Riverine
1915	Gisborne-Melton Road	Kurunjang	Toolern Creek	Riverine
2-30	Melton Valley Drive	Melton	Toolern Creek	Riverine
308-374	Minns Road	Kurunjang	Little Blind Creek	Riverine
8	Phar Lap Place	Kurunjang	Toolern Creek	Riverine
410-416	Ryans Lane	Toolern Vale	Toolern Creek	Riverine
<b>Total</b>				
<b>15</b>				

Table C3.3 – Properties at risk of flooding along the Toolern Creek catchment in the City of Melton

## Isolation

No major isolation risks exist for areas around Toolern Vale, Kurunjang, Melton and Melton South during a 1% AEP (100yr ARI) event. Some localised short-duration isolation may occur due to flash flooding.

## Essential Infrastructure

- **Melton Airfield** may become flooded to the eastern edges of the two air strips during a 1% AEP event. The buildings on the premises are expected to remain relatively dry.

During an event, see the Public Transport Victoria's Website for details on delays or alterations to services: <http://ptv.vic.gov.au/live-travel-updates/>. A map of public transport routes within the City of Melton is available via the website at: [https://www.ptv.vic.gov.au/assets/PTV-default-site/more/maps/Local-area-maps/Metropolitan/ba7db7be6d/31\\_Melton\\_LAM.pdf](https://www.ptv.vic.gov.au/assets/PTV-default-site/more/maps/Local-area-maps/Metropolitan/ba7db7be6d/31_Melton_LAM.pdf).

Apart from the roads outlined below, all other essential infrastructure and services areas around Toolern Vale, Kurunjang, Melton and Melton South are expected to remain unaffected by flooding during a 1% AEP (100yr ARI) event.

## Road Closures

The following roads are subject to closure during flooding around Toolern Vale, Kurunjang, Melton and Melton South. Check the DoT website for more details: <http://alerts.vicroads.vic.gov.au/>.

DoT Roads flooded in a 1% AEP (100yr ARI) event
<ul style="list-style-type: none"> <li>• Diggers Rest – Coimadai Road, Toolern Vale east of township</li> </ul>
<ul style="list-style-type: none"> <li>• Gisborne – Melton Road, Kurunjang at Minns Road</li> </ul>
<ul style="list-style-type: none"> <li>• High Street, Melton at Little Blind Creek and Ryans Creek crossings</li> </ul>

Table C3.4 – DoT Possible Road Closures during a flooding event

Melton City Council Roads flooded in a 1% AEP (100yr ARI) event		
MELTON	KURUNJANG	TOOLERN VALE
<ul style="list-style-type: none"> <li>• Centenary Avenue</li> </ul>	<ul style="list-style-type: none"> <li>• Buckle Road</li> </ul>	<ul style="list-style-type: none"> <li>• Bensons Road</li> </ul>
<ul style="list-style-type: none"> <li>• Killarney Drive</li> </ul>	<ul style="list-style-type: none"> <li>• Croxton Drive</li> </ul>	<ul style="list-style-type: none"> <li>• McCorkells Road</li> </ul>
<ul style="list-style-type: none"> <li>• Minns Road</li> </ul>	<ul style="list-style-type: none"> <li>• Minns Road</li> </ul>	<ul style="list-style-type: none"> <li>• McPhersons Road</li> </ul>
<ul style="list-style-type: none"> <li>• Nixon Street</li> </ul>		<ul style="list-style-type: none"> <li>• Missens Road</li> </ul>
<ul style="list-style-type: none"> <li>• Vivians Way</li> </ul>		<ul style="list-style-type: none"> <li>• Ryans Lane</li> </ul>
<ul style="list-style-type: none"> <li>• Yuille Street</li> </ul>		

Table C3.5 – Melton City Council Possible Road Closures during a flooding event

## Flood Mitigation

### Levees

Levee	Reach	Side	Levee Height	Levee Length	Expected Level of Protection	ANCOLD Hazard Rating	Consequences of Failure	Melway Reference
Gretel Grove, Toolern Creek	Western Highway & Barries Road	West	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable	337 A11 - B10

Table C3.6 – Levees in the Toolern Creek Catchment in the City of Melton

## Sewerage Infrastructure

Sewerage infrastructure of note during a severe flood event located around Toolern Vale, Kurunjang, Melton and Melton South is contained within the following two tables.

### Sewer Pumping Stations

Sewerage Pumping Station	On Drain / Waterway	Bank / Side of Waterway	Operator	Location	Melway Reference
Pinkerton Street	Toolern Creek	East	Greater Western Water	Pinkerton Street, Melton	337 C8
Viviannes Way	Toolern Creek	East	Greater Western Water	Viviannes Way, Melton	337 B11

Table C3.7 – Sewer Pumping Stations within the Toolern Creek Catchment in the City of Melton

## Control, Command and Coordination

VICSES will assume overall control of the response to flood incidents. Control and coordination of a flood incident shall be carried out at the lowest effective level and in accordance with the SEMP. During significant events, VICSES will conduct incident management using multi-agency resources.

## **Flood Impacts and Operational Considerations (Intelligence Cards)**

The table on the following pages provide a breakdown of the possible consequences of flooding along Toolern Creek and Little Blind Creek at various creek heights. This table is to be used only as a guide as no two floods at a location will have identical impacts.

Intelligence Cards have been included for the following locations:

- Toolern Creek at Melton South



# FLOOD INTELLIGENCE CARD – MELTON SOUTH GAUGE, TOOLERN CREEK

Version 4 – June 2021



*Note: flood intelligence records are approximations. This is because no two floods at a location, even if they peak at the same height, will have identical impacts. Flood intelligence cards detail the relationship between flood magnitude and flood consequences. More details about flood intelligence and its use can be found in the Australian Emergency Management Manuals flood series.*

*This Flood Intelligence Card publication is presented by the Victoria State Emergency Service for the purpose of disseminating emergency management information. The contents of the information have not been independently verified by the Victoria State Emergency Service. No liability is accepted for any damage, loss or injury caused by errors or omissions in this information or for any action taken by any person in reliance upon it. **Scan the QR code for the current levels for this gauge.***

LOCATION:	East bank along dirt track between Bridge Road and Strathtulloh Circuit West
CURRENT LEVEL:	<a href="https://www.melbournwater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/231231A">https://www.melbournwater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/231231A</a>
STREAM:	Toolern Creek
GAUGE NUMBER:	231231A
GAUGE ZERO:	87.031m AHD
GAUGE TYPE:	Stream Level & Rain

MELWAY REFERENCE:	343 A9
MINOR:	Not Established
MODERATE:	Not Established
MAJOR:	Not Established
LEVEE HEIGHT:	Unavailable
HIGHEST RECORDED FLOOD:	3.55m (15 <sup>th</sup> October 1983)

Creek Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
1.94m	November 2010 Flood Level Peak	<b>Event Summary</b> <ul style="list-style-type: none"> <li>Melton Recreation Reserve flooded at Toolern Creek</li> </ul>	
2.15m	January 2011 Flood Level Peak	<b>Event Summary</b> <ul style="list-style-type: none"> <li>Minns Road, Melton flooded at Toolern Creek crossing</li> <li>Benson Road, Toolern Vale overtopped at Toolern Creek crossing</li> <li>Melton Recreation Reserved flooded at Little Blind Creek just south of High Street</li> <li>Nixon Street flooded at Toolern Creek ford crossing</li> </ul>	<b>Traffic Management – road closures:</b> Alternate routes via clearly signed detours. Alternate routes to be determined by Council Traffic Engineers. Council works crews to install and monitor detour signage. Council Network Inspectors to monitor road conditions, closure signage and detour signage.
2.97m	1% AEP (100yr ARI) Flood Level	<b>Properties at Flood Risk</b> <b>15 Properties in Total</b> <b>Toolern Creek</b> <ul style="list-style-type: none"> <li>410-416 Ryans Lane, Toolern Vale</li> <li>8 Phar Lap Place, Kurunjang</li> <li>1 Buckle Road, Kurunjang</li> <li>14 Darlingsford Boulevard, Melton</li> <li>1909, 1911, 1913 &amp; 1915 Gisborne-Melton Road, Kurunjang</li> <li>2-30 Melton Valley Drive, Kurunjang</li> </ul> <b>Little Blind Creek</b> <ul style="list-style-type: none"> <li>47 Centenary Avenue, Melton</li> <li>742, 744-818, 820-916 &amp; 995-1097 Coburns Road, Toolern Vale</li> </ul>	VICSES may provide warnings using EM-COP to Melton Council and appropriate agencies as required based on the predictions provided by BoM regarding flood levels and the risk of Flash Flooding. The VICSES RDO in conjunction with the Regional Agency Commander will maintain operational awareness and form an appropriate response arrangement to suit the level of incident.  VICSES to respond on a request by request basis.

Creek Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		<ul style="list-style-type: none"> <li>• 308-374 Minns Road, Kurunjang</li> <li><b>Community Infrastructure Likely Flooded</b></li> <li>• Melton Valley Golf Club flooded in parts</li> <li>• Melton Recreation Reserve flooded in parts</li> <li><b>Essential Infrastructure Likely Impacted</b></li> <li>• Melton Airfield affected by flooding which may impact on eastern edges of runways. Buildings at premises likely to remain mainly dry</li> <li><b>Water Over Road</b></li> <li><b>Toolern Creek</b></li> <li>• McPhersons Road, Toolern Vale</li> <li>• Benson Road, Toolern Vale at Toolern Creek crossing</li> <li>• Diggers Rest – Coimadai Road, Toolern Vale 200m east of township near bend</li> <li>• Ryans Lane, Toolern Vale breakout occurs south of Diggers Rest – Coimadai Road intersection then again 700m further south</li> <li>• Minns Road, Melton at Gisborne – Melton Road and between Gisborne – Melton Road and Ryans Lane</li> <li>• Gisborne – Melton Road, Kurunjang at Minns Road</li> <li>• Croxton Drive, Kurunjang</li> <li>• Buckle Road, Kurunjang</li> <li>• Nixon Street, Melton</li> <li>• Viviannes Way, Melton</li> <li><b>Little Blind Creek</b></li> <li>• Missens Road, Toolern Vale</li> <li>• McCorkells Road, Toolern Vale near Coburns Road</li> <li>• Minns Road, Kurunjang between Coburns Road and Gisborne – Melton Road</li> <li>• Centenary Avenue, Melton at Little Blind Creek crossing</li> <li>• Yuille Street, Melton near Unitt Street Intersection</li> <li>• High Street, Melton near Yuille Street</li> <li><b>Ryans Creek</b></li> <li>• Killarney Drive, Melton at both Ryans Creek crossings</li> <li>• High Street, Melton between Reserve Road and Holland Drive</li> </ul>	<p>Council and DoT (as appropriate) to provide road closure signage under predetermined arrangements prompted by notification.</p>
2.98m	3 <sup>rd</sup> February 2005 Flood Level Peak	<p><b>Event Summary</b></p> <ul style="list-style-type: none"> <li>• High Street, Melton flooded at Little Blind Creek</li> </ul>	

Table C3.8 – Breakdown of likely consequences at various Melton South gauge level heights along Toolern Creek with operational considerations

# APPENDIX C4 – KOROROIT CREEK FLOOD EMERGENCY PLAN

## Overview of Flooding Consequences

Kororoit Creek and the surrounding towns of Diggers Rest, Plumpton, Rockbank and Caroline Springs are located between 20 and 38km west of Melbourne in a predominantly rural setting except for Caroline Springs, which contains newly established residential estates. Kororoit Creek is the prominent watercourse in the area, flowing from the north out of Gisborne South in Macedon Ranges Shire. The creek begins as two branches; east and west, where they combine in Diggers Rest. A number of tributaries join the main stream through Plumpton and Rockbank, each containing their own flooding issues mainly relating to overtopped roads. High Intensity, short duration rainfall events can cause flash flooding in and around the Rockbank area where water cannot drain away quick enough due to the flat terrain, while prolonged rainfall may see Kororoit Creek and its tributaries flood. See mapping in **Appendix F** for more insight into flooding in the area.

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Summary of Consequences in a 1% AEP (100yr ARI) flood along Kororoit Creek in City of Melton

Property					
<b>Properties</b>	<b>57</b>				
Residential	22				
Commercial	0				
Industrial	0				
Public Land	0				
Rural	35				
Community Infrastructure					
Essential Infrastructure					
Major Roads	3	Diggers Rest-Coimadai Rd; Melton Hwy & Western Fwy			
Bus Routes	2	456 & 943			
Sewerage Facilities	2	Rockbank Pumping Station & Western Freeway Pumping Station			
Drainage Facilities	6	Retarding Basins			
Tourism / Recreation					
Recreation Facilities	1	Witchmount Estate & Winery			
Government Boundaries					
Local Gov't Areas	1	Melton	CMA	1	Port Phillip & Westernport
Adjacent LGAs	3	Macedon Ranges; Hume; & Brimbank	CFA District	1	District 14
SES Resp' Boundary	1	Melton	FRV District	0	

Table C4.1 – Consequence Summary of 1% AEP flood along Kororoit Creek

## Gauges and Warnings

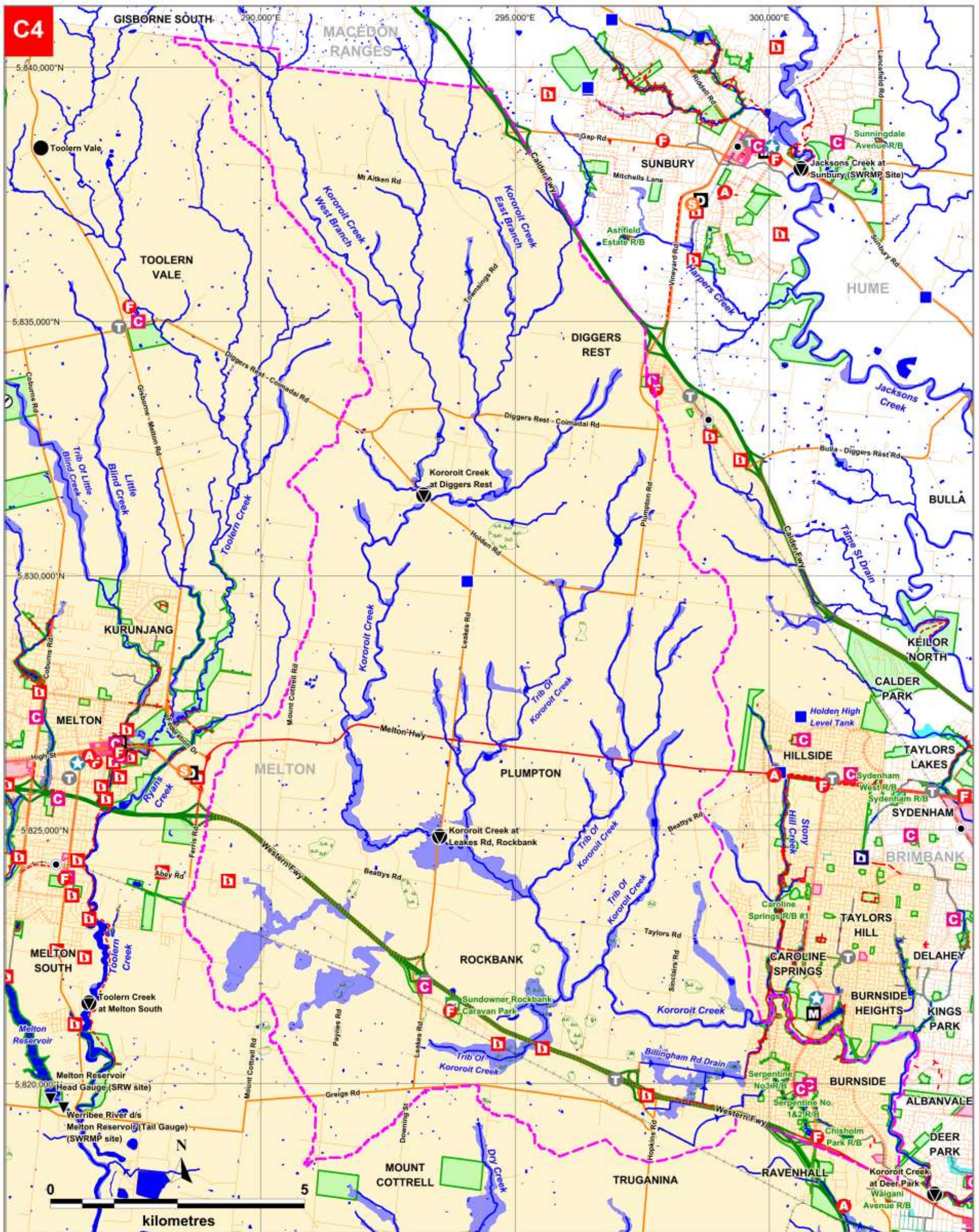
Warnings are available for flooding expected along Kororoit Creek at Deer Park. For other hydrographic/telemetry (river gauges) within the Municipality, Melbourne Water does not provide any flood warning service at this point.

Gauges	Station No.	Location	Level Gauge	Rain Gauge	Melway Reference
Kororoit Creek at Diggers Rest (MW)	231106A	West bank of the creek, north side of Holden Road	✓	✓	332 H8
Kororoit Creek at Rockbank (MW)	231105B	North bank of the creek, east side of Leakes Road	✓	✓	344 J1
Kororoit Creek at Deer Park	231104A	North side of the creek along Millbank Drive near Wandsworth Ave	✓	✓	25C7

Table C4.2 – Gauges within the Kororoit Creek catchment

These Gauges may provide some warning of expected flooding. See the Melbourne Water website for more information on these gauges: <http://www.melbournewater.com.au/waterdata/rainfallandriverleveldata/Pages/Rainfall-and-river-level-new.aspx>. The BoM website also links a number of these gauges at: [http://www.bom.gov.au/cgi-bin/wrap\\_fwo.pl?IDV60201.html](http://www.bom.gov.au/cgi-bin/wrap_fwo.pl?IDV60201.html). It is advised that residents monitor the BoM website <http://www.bom.gov.au/vic/warnings/index.shtml?ref=hdr> and the VicEmergency website <https://emergency.vic.gov.au/> for any thunderstorm, flood or severe weather warnings present for their area.

Area Map of Flood Risk in Kororoit Creek catchment



Map Produced by VicSES June 2018.

**CITY OF MELTON**  
 1% AEP (100yr ARI) Flooding  
**C4. Areas of flood risk along Kororoit Creek**

- |                                  |                                 |                    |
|----------------------------------|---------------------------------|--------------------|
| Building                         | Melbourne Water Retarding Basin | Community Centre   |
| Area of Interest                 | Fire Station                    | Telephone Exchange |
| Waterbody                        | Airport / Airfield              | Ambulance Station  |
| 1% AEP Riverine Flood Extent     | Sewer Pumping Station           | Police Station     |
| Natural Wetland                  | Bicycle / Walking Trail         | Hospital           |
| Commercial Precinct              | Bus Route (PTV)                 | Stream Level Gauge |
| Melbourne Water Stormwater Drain | Embankment                      | Rain Gauge         |
| River / Creek                    | Retail Water Storage            | Caravan Park       |
| Area boundary for this Appendix  | VicSES                          | Municipal Depot    |
|                                  | Municipal Offices               |                    |



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Figure C4 – Areas of flood risk around Diggers Rest, Plumpton, Rockbank, Caroline Springs & Burnside in the City of Melton

## Properties at Flood Risk

Properties listed in the table below are at risk from flooding along Kororoit Creek and its tributaries. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Kororoit Creek (Melbourne Water, May 2016) flood mapping and risk assessment program.

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Properties at risk from Flooding Kororoit Creek						
Residential			Commercial	Industrial	Rural	Public Use
Street No. at Risk in AEP Event			Address	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
20% AEP	5% AEP	1% AEP				
-	31-41	31-41	Alfred Road	Melton South	Rockbank Flats	Riverine
-	52-78	52-78	Alfred Road	Melton South	Rockbank Flats	Riverine
-	59-85	59-85	Alfred Road	Melton South	Rockbank Flats	Riverine
-	16	16	Bay Street	Caroline Springs	Kororoit Creek	Riverine
-	4	4	Brook Street	Caroline Springs	Kororoit Creek	Riverine
-	6	6	Brook Street	Caroline Springs	Kororoit Creek	Riverine
-	-	402	Clarke Road	Rockbank	Billingham Road Drain	Flash
-	-	1-11	Cropley Lane	Truganina	Billingham Road Drain	Flash
-	-	547-555	Leakes Road	Plumpton	Leakes Road Tributary	Riverine
-	-	557-581	Leakes Road	Plumpton	Leakes Road Tributary	Riverine
-	686-718	686-718	Leakes Road	Plumpton	Kororoit Creek	Riverine
720	720	720	Leakes Road	Plumpton	Kororoit Creek	Riverine
722-766	722-766	722-766	Leakes Road	Plumpton	Kororoit Creek	Riverine
-	768-778	768-778	Leakes Road	Plumpton	Kororoit Creek	Riverine
-	780-792	780-792	Leakes Road	Plumpton	Kororoit Creek	Riverine
-	783-815	783-815	Leakes Road	Plumpton	Kororoit Creek	Riverine
794-834	794-834	794-834	Leakes Road	Plumpton	Kororoit Creek	Riverine
-	1871-1963	1871-1963	Melton Highway	Plumpton	Kororoit Creek	Riverine
-	877-907	877-907	Mount Cottrell Road	Melton South	Rockbank Flats	Riverine
-	972-1000	972-1000	Mount Cottrell Road	Melton South	Rockbank Flats	Riverine
-	1008-1046	1008-1046	Mount Cottrell Road	Melton South	Rockbank Flats	Riverine
-	-	123-139	Murray Road	Rockbank	Rockbank Flats	Riverine
-	-	624-648	Neale Road	Rockbank	Billingham Road Drain	Flash
-	-	15	Nullabor Place	Caroline Springs	Billingham Road Drain	Flash
-	-	16	Nullabor Place	Caroline Springs	Billingham Road Drain	Flash
-	-	17	Nullabor Place	Caroline Springs	Billingham Road Drain	Flash
-	-	66-144	Paynes Road	Rockbank	Rockbank Flats	Riverine
-	-	30-46	Sheahan Road	Truganina	Billingham Road Drain	Flash

Properties at risk from Flooding Kororoit Creek						
Residential		Commercial	Industrial	Rural	Public Use	
Street No. at Risk in AEP Event			Address	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
20% AEP	5% AEP	1% AEP				
-	-	37-49	Sheahan Road	Truganina	Billingham Road Drain	Flash
137-235	137-235	137-235	Sinclairs Road	Plumpton	Kororoit Creek	Riverine
-	-	248-256	Sinclairs Road	Rockbank	Billingham Road Drain	Flash
-	-	258-274	Sinclairs Road	Rockbank	Billingham Road Drain	Flash
-	-	276-288	Sinclairs Road	Rockbank	Billingham Road Drain	Flash
-	-	290-302	Sinclairs Road	Rockbank	Billingham Road Drain	Flash
-	-	303-329	Sinclairs Road	Rockbank	Billingham Road Drain	Flash
-	-	304-316	Sinclairs Road	Rockbank	Billingham Road Drain	Flash
-	-	318-324	Sinclairs Road	Rockbank	Billingham Road Drain	Flash
-	-	1	Stewart Crescent	Rockbank	Deanside Drive Tributary	Riverine
-	-	1/2	Stewart Crescent	Rockbank	Deanside Drive Tributary	Riverine
-	-	2/2	Stewart Crescent	Rockbank	Deanside Drive Tributary	Riverine
-	-	3	Stewart Crescent	Rockbank	Deanside Drive Tributary	Riverine
-	-	4	Stewart Crescent	Rockbank	Deanside Drive Tributary	Riverine
-	-	5	Stewart Crescent	Rockbank	Deanside Drive Tributary	Riverine
-	-	6	Stewart Crescent	Rockbank	Deanside Drive Tributary	Riverine
-	-	7	Stewart Crescent	Rockbank	Deanside Drive Tributary	Riverine
-	-	8	Stewart Crescent	Rockbank	Deanside Drive Tributary	Riverine
-	-	9	Stewart Crescent	Rockbank	Deanside Drive Tributary	Riverine
-	-	10	Stewart Crescent	Rockbank	Deanside Drive Tributary	Riverine
-	-	11	Troups Road North	Truganina	Deanside Drive Tributary	Riverine
-	-	14	Troups Road North	Rockbank	Deanside Drive Tributary	Riverine
-	-	18	Troups Road North	Rockbank	Deanside Drive Tributary	Riverine
-	-	20	Troups Road North	Rockbank	Deanside Drive Tributary	Riverine
-	-	104-112	Troups Road North	Rockbank	Deanside Drive Tributary	Riverine
-	-	1	Westcott Parade	Rockbank	Deanside Drive Tributary	Riverine
-	-	3	Westcott Parade	Rockbank	Deanside Drive Tributary	Riverine
-	-	1915-1937	Western Highway	Truganina	Deanside Drive Tributary	Riverine
-	-	2243-2277	Western Highway	Rockbank	Rockbank Flats	Riverine
<b>Totals</b>						
<b>4</b>	<b>17</b>	<b>57</b>				

Table C4.3 – Properties at risk of flooding along the Kororoit Creek catchment in the City of Melton

## Isolation

No major isolation risks exist for areas around Diggers Rest, Plumpton, Rockbank, Caroline Springs and Burnside during a 1% AEP (100yr ARI) event. Some localised short-duration isolation may occur due to flash flooding.

## Essential Infrastructure

During an event, see the Public Transport Victoria's Website for details on delays or alterations to services: <http://ptv.vic.gov.au/live-travel-updates/>. A map of public transport routes within the City of Melton is available via the website at: [https://www.ptv.vic.gov.au/assets/PTV-default-site/more/maps/Local-area-maps/Metropolitan/ba7db7be6d/31\\_Melton\\_LAM.pdf](https://www.ptv.vic.gov.au/assets/PTV-default-site/more/maps/Local-area-maps/Metropolitan/ba7db7be6d/31_Melton_LAM.pdf).

Apart from the roads outlined below, all other essential infrastructure and services areas around Diggers Rest, Plumpton, Rockbank, Caroline Springs and Burnside are expected to remain unaffected by flooding during a 1% AEP (100yr ARI) event.

## Road Closures

The following roads are subject to closure during flooding around Diggers Rest, Plumpton, Rockbank, Caroline Springs and Burnside. Check the DoT website for more details: <http://alerts.vicroads.vic.gov.au/>.

DoT Roads flooded in a 1% AEP (100yr ARI) event
<ul style="list-style-type: none"> <li>Diggers Rest – Coimadai Road, Diggers Rest at Kororoit Creek East Branch crossing</li> </ul>
<ul style="list-style-type: none"> <li>Melton Highway, near Leakes Road Plumpton and east of Plumpton Road at a dip</li> </ul>
<ul style="list-style-type: none"> <li>Western Freeway, Rockbank between BP Service Station and Troups Road North; also west of Paynes Road; and a low point west of Leakes Road exit/entry point</li> </ul>

Table C4.4 – DoT Possible Road Closures during a flooding event

Melton City Council Roads flooded in a 1% AEP (100yr ARI) event			
CAROLINE SPRINGS	DIGGERS REST	PLUMPTON	ROCKBANK
<ul style="list-style-type: none"> <li>Brook Street</li> </ul>	<ul style="list-style-type: none"> <li>Holden Road</li> </ul>	<ul style="list-style-type: none"> <li>Leakes Road</li> </ul>	<ul style="list-style-type: none"> <li>Beattys Road</li> </ul>
<ul style="list-style-type: none"> <li>Caroline Springs Bvd</li> </ul>	<ul style="list-style-type: none"> <li>Mount Aitken Road</li> </ul>	<ul style="list-style-type: none"> <li>Plumpton Road</li> </ul>	<ul style="list-style-type: none"> <li>Imaroo Circuit</li> </ul>
<ul style="list-style-type: none"> <li>Clarke Road</li> </ul>	<ul style="list-style-type: none"> <li>Mullock Drive</li> </ul>	<ul style="list-style-type: none"> <li>Tarleton Road</li> </ul>	<ul style="list-style-type: none"> <li>Mount Cottrell Road</li> </ul>
<ul style="list-style-type: none"> <li>Jamieson Link</li> </ul>	<ul style="list-style-type: none"> <li>Raglan Street</li> </ul>	<ul style="list-style-type: none"> <li>Taylors Road</li> </ul>	<ul style="list-style-type: none"> <li>Paynes Road</li> </ul>
<ul style="list-style-type: none"> <li>Kosciuszko Place</li> </ul>	<ul style="list-style-type: none"> <li>Townships Road</li> </ul>	<b>MELTON SOUTH</b>	<ul style="list-style-type: none"> <li>Sinclairs Road</li> </ul>
<ul style="list-style-type: none"> <li>Monaghans Lane</li> </ul>		<ul style="list-style-type: none"> <li>Alfred Road</li> </ul>	<ul style="list-style-type: none"> <li>Stewart Crescent</li> </ul>
			<ul style="list-style-type: none"> <li>Troups Road North</li> </ul>
			<ul style="list-style-type: none"> <li>Westcott Parade</li> </ul>

Table C4.5 – Melton City Council Possible Road Closures during a flooding event



## Flood Mitigation

### Retarding Basins

Melbourne Water Retarding Basin	On Drain/ Waterway	Area	Storage Capacity	Spillway Crest Level	Full Supply Level	Embankment Crest Level	ANCOLD Hazard Rating	Houses In Flow Path (dam breach)	Melway Reference
Caroline Springs	Stony Hill Creek	2.71 ha	39 ML	96.5m AHD	96.5m AHD	2.0m height (98.5m AHD)	Very Low	0	356 F5
Chisholm Park	Billingham Rd Drain (Kororoit Creek)	1.42 ha	23 ML	71.45m AHD	71.6m AHD	1.1m height (71.7m AHD)	Very Low	0	358 J4
Serpentine No. 1&2	Billingham Rd Drain (Kororoit Creek)	4.26 ha	17 ML	78.5m AHD	79.78m AHD	In-cut	Very Low	0	358 F2
Serpentine No.3	Billingham Rd Drain (Kororoit Creek)	5.35 ha	128 ML	N/A	79.98m AHD	in-cut	Very Low	0	358 E1
Sydenham West	Sydenham West Drain (Kororoit Creek)	1.46 ha	17 ML	115.9m AHD	Unavailable	2.4m height (118.3m AHD)	Very Low	0	3 A11
Waigani Avenue	Cherry's Diversion Drain (Kororoit Creek)	0.65 ha	5 ML	61.5m AHD	62.5m AHD	0.8m height (62.8m AHD)	High C	42	25 A7

Table C4.6 – Melbourne Water Retarding Basins within the Kororoit Creek catchment in the City of Melton

## Sewerage Infrastructure

Sewerage infrastructure of note during a severe flood event located around Kororoit Creek and its Tributaries are contained within the following table.

### Sewer Pumping Stations

Sewerage Pumping Station	On Drain / Waterway	Operator	Location	Level of Protection	Melway Reference
Rockbank	Kororoit Creek Tributary	Melbourne Water	Next to the railway line at Troups Road North, Rockbank	<b>Requires protection in a 1% AEP event. Compromised and damaged in the February 2005 event</b>	355 B11
Western Freeway	Kororoit Creek Tributary	Greater Western Water	McDonalds & BP Roadhouse on Western Freeway, Rockbank		355 D11

Table C4.7 – Sewer Pumping Stations within the Kororoit Creek Catchment in the City of Melton

## **Control, Command and Coordination**

VICSES will assume overall control of the response to flood incidents. Control and coordination of a flood incident shall be carried out at the lowest effective level and in accordance with the SEMP. During significant events, VICSES will conduct incident management using multi-agency resources.

## **Flood Impacts and Operational Considerations (Intelligence Cards)**

The tables on the following pages provide a breakdown of the possible consequences of flooding along Kororoit Creek and its tributaries at various creek heights or rain totals within the City of Melton. These tables are to be used only as a guide as no two floods at a location will have identical impacts.

Intelligence Cards have been included for the following locations:

- Kororoit Creek at Diggers Rest
- Kororoit Creek at Rockbank
- Rockbank Flats

# FLOOD INTELLIGENCE CARD – DIGGERS REST GAUGE, KOROROIT CREEK

Version 4 – June 2021



Note: flood intelligence records are approximations. This is because no two floods at a location, even if they peak at the same height, will have identical impacts. Flood intelligence cards detail the relationship between flood magnitude and flood consequences. More details about flood intelligence and its use can be found in the Australian Emergency Management Manuals flood series.

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LOCATION:	West bank of the creek, north side of Holden Road
CURRENT LEVEL:	<a href="https://www.melbournwater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/231106A">https://www.melbournwater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/231106A</a>
STREAM:	Kororoit Creek
GAUGE NUMBER:	231106A
GAUGE ZERO:	152.662m AHD
GAUGE TYPE	Stream Level & Rain

MELWAY REFERENCE:	332 H8
MINOR:	Not Established
MODERATE:	Not Established
MAJOR	Not Established
LEVEE HEIGHT:	N/A
HIGHEST RECORDED FLOOD:	3.87m (15 <sup>th</sup> October 1983)

Creek Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
2.2m	20% AEP (5yr ARI) Flood Level		
2.55m	10% AEP (10yr ARI) Flood Level		
2.71m	3 <sup>rd</sup> February 2005 Flood Level Peak	<b>Event Summary</b> <ul style="list-style-type: none"> <li>Mount Aitken Road, Diggers Rest overtopped at Kororoit Creek West Branch</li> </ul>	
2.85m	5% AEP (20yr ARI) Flood Level		
3.12m	2% AEP (50yr ARI) Flood Level		
3.71m	1% AEP (100yr ARI) Flood Level	<b>Water Over Road</b> <ul style="list-style-type: none"> <li><b>Kororoit Creek West Branch</b> <ul style="list-style-type: none"> <li>Mount Aitken Road, Diggers Rest</li> </ul> </li> <li><b>Kororoit Creek East Branch</b> <ul style="list-style-type: none"> <li>Raglan Street, Diggers Rest</li> <li>Mount Aitken Road, Diggers Rest</li> <li>Townships Road, Diggers Rest</li> </ul> </li> </ul>	VICSES may provide warnings using EM-COP to Melton Council and appropriate agencies as required based on the predictions provided by BoM regarding flood levels and the risk of Flash Flooding. The VICSES RDO in conjunction with the Regional Agency Commander will maintain operational awareness and form an appropriate response arrangement to suit the level of incident.

Creek Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
			<p>VICSES to respond to RFA's on a request by request basis.</p> <p>Council and DoT (as appropriate) to provide road closure signage under predetermined arrangements.</p>
3.87m	15 <sup>th</sup> October 1983 Flood Level Peak		

Table C4.8 – Breakdown of likely consequences at various Diggers Rest gauge level heights along Kororoit Creek with operational considerations

# FLOOD INTELLIGENCE CARD – ROCKBANK GAUGE, KOROROIT CREEK

Version 4 – June 2021



Note: flood intelligence records are approximations. This is because no two floods at a location, even if they peak at the same height, will have identical impacts. Flood intelligence cards detail the relationship between flood magnitude and flood consequences. More details about flood intelligence and its use can be found in the Australian Emergency Management Manuals flood series.

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LOCATION:	North bank of the creek, east side of Leakes Road
CURRENT LEVEL:	<a href="https://www.melbournwater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/231105B">https://www.melbournwater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/231105B</a>
STREAM:	Kororoit Creek
GAUGE NUMBER:	231105B
GAUGE ZERO:	96.812m AHD
GAUGE TYPE:	Stream Level & Rain

MELWAY REFERENCE:	344 J1
MINOR:	Not Established
MODERATE:	Not Established
MAJOR:	Not Established
LEVEE HEIGHT:	N/A
HIGHEST RECORDED FLOOD:	2.40m (14 <sup>th</sup> January 2011)

Creek Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
2.55m	20% AEP (5yr ARI) Flood Level		
2.60m	10% AEP (10yr ARI) Flood Level		
2.75m	5% AEP (20yr ARI) Flood Level	<p><b>Properties at Flood Risk</b></p> <p><b>4 Properties in Total</b></p> <p><b>Kororoit Creek Main Stream</b></p> <ul style="list-style-type: none"> <li>720, 722-766 &amp; 794-834 Leakes Road, Plumpton</li> <li>137-235 Sinclairs Road, Plumpton</li> </ul> <p><b>Water Over Road</b></p> <p><b>Kororoit Creek Main Stream</b></p> <ul style="list-style-type: none"> <li>Leakes Road, Plumpton at Tarletons Road</li> <li>Tarletons Road, Plumpton at Leakes Road</li> <li>Beattys Road, Rockbank at Kororoit Creek crossing</li> <li>Sinclairs Road, Rockbank north of Neale Road</li> <li>Monaghans Lane / Clarke Road, Caroline Springs at Kororoit Creek crossing. Road contains gates at either side of floodway</li> </ul>	<p>VICSES may provide warnings using EM-COP to Melton Council and appropriate agencies as required based on the predictions provided by BoM regarding flood levels and the risk of Flash Flooding. The VICSES RDO in conjunction with the Regional Agency Commander will maintain operational awareness and form an appropriate response arrangement to suit the level of incident.</p> <p>VICSES to respond on a request by request basis.</p>

Creek Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
			<p>Council and DoT (as appropriate) to provide road closure signage under predetermined arrangements. Alternate routes via clearly signed detours.</p> <p>Alternate routes to be determined by Council Traffic Engineers. Council works crews to install and monitor detour signage. Council Network Inspectors to monitor road conditions, closure signage and detour signage. VicPol assistance required to ensure vehicles do not attempt crossing.</p>
3.10m	2% AEP (50yr ARI) Flood Level	<p><b>Properties at Flood Risk</b>  <b>6 New at Level; 10 Properties in Total</b>  <b>Kororoit Creek Main Stream</b></p> <ul style="list-style-type: none"> <li>• 1871-1963 Melton Highway, Plumpton</li> <li>• 686-718 &amp; 783-815 Leakes Road, Plumpton</li> <li>• 16 Bay Street, Caroline Springs</li> <li>• 4 &amp; 6 Brook Street, Caroline Springs</li> </ul>	VICSES to respond on a request by request basis.
3.30m	1% AEP (100yr ARI) Flood Level	<p><b>Properties at Flood Risk</b>  <b>37 New at Level; 47 Properties in Total</b></p> <p><b>Leakes Road Tributary</b></p> <ul style="list-style-type: none"> <li>• 533-537, 547-555 &amp; 557-581 Leakes Road, Plumpton</li> </ul> <p><b>Deanside Drive Tributary</b></p> <ul style="list-style-type: none"> <li>• 11, 14, 18, 20 &amp; 22-102 Troups Road North, Rockbank</li> <li>• 1,1/2, 2/2, 3, 4, 5, 6, 7, 8, 9 &amp; 10 Stewart Crescent, Rockbank</li> <li>• 1 &amp; 3 Westcott Parade, Rockbank</li> <li>• 1915-1937 Western Highway, Rockbank</li> </ul> <p><b>Billingham Road Drain</b></p> <ul style="list-style-type: none"> <li>• 248-256, 258-274, 276-288, 290-302, 303-329, 304-316 &amp; 318-324 Sinclairs Road, Rockbank</li> <li>• 624-648 Neale Road, Rockbank</li> <li>• 1-11 Cropley Lane, Rockbank</li> <li>• 30-46 &amp; 37-49 Sheahan Road, Rockbank</li> <li>• 402 Clarke Road, Rockbank</li> <li>• 15, 16 &amp; 17 Nullarbor Place, Caroline Springs</li> </ul> <p><b>Tourism / Recreation Likely Impacted</b></p> <ul style="list-style-type: none"> <li>• Witchmount Estate &amp; Winery, Leakes Road Plumpton possibly isolated by flooding across driveway to premises and car-park</li> </ul> <p><b>Essential Infrastructure Likely Impacted</b></p> <ul style="list-style-type: none"> <li>• Bus Routes 456 &amp; 943 if Western Freeway is flooded</li> </ul>	<p>VICSES to respond on a request by request basis.</p> <p><b>Greater Western Water</b>  Protect the pump house via temporary flood protection measures.</p>

Creek Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		<ul style="list-style-type: none"> <li>• Greater Western Water Rockbank sewer pumping station at Troups Road South compromised and alternate sewerage outfall measures put in place via education</li> </ul> <p><b>Water Over Road</b></p> <p><b>Kororoit Creek Main Stream</b></p> <ul style="list-style-type: none"> <li>• Jamieson Link, Caroline Springs</li> <li>• Brook Street, Caroline Springs</li> <li>• Kosciuszko Place, Caroline Springs</li> <li>• Caroline Springs Boulevard, Caroline Springs at Caroline Springs Front Lake</li> </ul> <p><b>Leakes Road Tributary</b></p> <ul style="list-style-type: none"> <li>• Plumpton Road, Diggers Rest near 'Plumpton Park'</li> <li>• Access Road to Excel Quarries, Plumpton off Leakes Road</li> <li>• Melton Hwy, near Leakes Road, Plumpton</li> <li>• Tarletons Road, Plumpton near Leakes Road</li> </ul> <p><b>Beattys Road Tributary</b></p> <ul style="list-style-type: none"> <li>• Holden Road, Plumpton east of Plumpton Road</li> <li>• Plumpton Road, Plumpton north of Melton Hwy and also north of Tarletons Road at a dip</li> <li>• Tarletons Road, Plumpton west of Plumpton Road at a dip</li> </ul> <p><b>Deanside Drive Tributary</b></p> <ul style="list-style-type: none"> <li>• Western Freeway, Rockbank between BP Service Station and Troups Road North</li> <li>• Troups Road North, Rockbank. Majority of road likely affected</li> <li>• Stewart Crescent, Rockbank near Troups Road North</li> <li>• Westcott Parade, Rockbank near Troups Road North</li> </ul> <p><b>Vere Court Tributary</b></p> <ul style="list-style-type: none"> <li>• Melton Hwy, Plumpton east of Plumpton Road at a dip</li> <li>• Beattys Road, Plumpton east of Plumpton Road</li> <li>• Taylors Road, Plumpton east of Plumpton Road</li> </ul> <p><b>Billingham Road Drain</b></p> <ul style="list-style-type: none"> <li>• Sinclairs Road, Rockbank</li> <li>• Neale Road, Rockbank</li> <li>• Western Freeway, Rockbank at Keating Road</li> <li>• Sheahan Road, Rockbank</li> </ul>	<p>Greater Western Water to be advised and preparation for emergency sewerage education.</p> <p>Council and DoT (as appropriate) to provide road closure signage under predetermined arrangements.</p>

Table C4.9 – Breakdown of likely consequences at various Rockbank gauge level heights along Kororoit Creek with operational considerations

## FLOOD INTELLIGENCE CARD – ROCKBANK FLATS (UNGAUGED)

Version 4 – June 2021



Note: flood intelligence records are approximations. This is because no two floods at a location, even if they peak at the same height, will have identical impacts. Flood intelligence cards detail the relationship between flood magnitude and flood consequences. More details about flood intelligence and its use can be found in the Australian Emergency Management Manuals flood series.

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CLOSEST RAIN GAUGE:	<b>Kororoit Creek at Rockbank</b>
LOCATION:	<b>North bank of the creek, east side of Leakes Road</b>
RECENT RAINFALL:	<a href="https://www.melbournewater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/231105B">https://www.melbournewater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/231105B</a>

MELWAY REF:	<b>344 J1</b>
GAUGE NUMBER:	<b>231105B</b>
GAUGE TYPE:	<b>Stream Level &amp; Rain</b>

Design Rainfall Depths (mm) – Indication of Possible Flooding	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
20mm in 10 mins; 34mm in 30 mins; 44mm in 1 hour; 55mm in 2 hours; 76mm in 6 hours; or 94mm in 12 hours  Note: rainfall depths are a very rough method of estimating flood events and have been used due to the ungauged nature of the catchment. This should be used as a guide only.	2% AEP (50 year ARI)	<b>Properties at Flood Risk</b> <b>6 Properties in Total</b> <ul style="list-style-type: none"> <li>31-41, 52-78 &amp; 59-85 Alfred Road, Melton South</li> <li>877-907, 972-1000 &amp; 1008-1046 Mount Cottrell Road, Melton South</li> </ul> <b>Water Over Road</b> <ul style="list-style-type: none"> <li>Alfred Road, Melton South</li> <li>Mount Cottrell Road, Rockbank either side of the Railway Line.</li> </ul>	VICSES may provide warnings using EM-COP to Melton Council and appropriate agencies as required based on the predictions provided by BoM regarding flood levels and the risk of Flash Flooding. The VICSES RDO in conjunction with the Regional Agency Commander will maintain operational awareness and form an appropriate response arrangement to suit the level of incident.  VICSES to respond on a request by request basis.
23mm in 10 mins; 39mm in 30 mins; 51mm in 1 hour; 63mm in 2 hours; 87mm in 6 hours; or 107mm in 12 hours	1% AEP (100-year ARI)	<b>Properties at Flood Risk</b> <b>3 New at Level; 9 Properties in Total</b> <ul style="list-style-type: none"> <li>123-139 Murray Road, Rockbank</li> <li>66-114 Paynes Road, Rockbank</li> <li>2243-2277 Western Highway, Rockbank</li> </ul> <b>Essential Infrastructure Likely Impacted</b>	VICSES may provide warnings using EM-COP to Melton Council and appropriate agencies as required based on the predictions provided by BoM regarding flood levels and the risk of Flash Flooding. The VICSES RDO in conjunction with the Regional Agency Commander will maintain operational



Design Rainfall Depths (mm) – Indication of Possible Flooding	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
<p>Note: rainfall depths are a very rough method of estimating flood events and have been used due to the ungagged nature of the catchment. This should be used as a guide only.</p>		<ul style="list-style-type: none"> <li>• Bus Routes 456 &amp; 943 if Western Freeway is flooded</li> </ul> <p><b>Water Over Road</b></p> <ul style="list-style-type: none"> <li>• Western Freeway, Rockbank west of Paynes Road. Also a low point west of Leakes Road exit/entry</li> <li>• Paynes Road, Rockbank south of the Railway Line and also a small overtopped point possible north of the Western Freeway</li> <li>• Iramoo Circuit, Rockbank. Overtopped point midway between Mount Cottrell Road and Paynes Road</li> </ul>	<p>awareness and form an appropriate response arrangement to suit the level of incident.</p> <p>VICSES to respond on a request by request basis.</p> <p>Council and DoT (as appropriate) to provide road closure signage under predetermined arrangements.</p>

Table C4.10 – Breakdown of possible consequences at various rainfall intensities around Rockbank with operational considerations

# APPENDIX C5 – DRY CREEK & SKELETON CREEK FLOOD EMERGENCY PLAN

## Overview of Flooding Consequences

Dry Creek and Skeleton Creek, along with the surrounding areas of Mount Cottrell and Truganina are located between 23 and 27km west of Melbourne in a rural setting. Dry Creek and Skeleton Creek both flow from north to south, beginning in the area and leaving the City of Melton at Boundary Road before entering the City of Wyndham where the two creeks join. High Intensity, short duration rainfall events can cause flash flooding in and around the rural area where flat terrain causes ponding, while prolonged rainfall may see Dry Creek and Skeleton Creek flood. See mapping in **Appendix F** for more insight into flooding in the area.

*This Summary table is generated from Victorian Government data. The State of Victoria does not guarantee that the publication is without flaw of any kind or is wholly appropriate for your particular purposes and therefore disclaims all liability for error, loss or damage which may arise from reliance upon it. All persons accessing this information should make appropriate enquiries to assess the currency of the data.*

Summary of Consequences in a 1% AEP (100yr ARI) flood along Dry and Skeleton Creeks					
<b>Property</b>					
<b>Properties</b>	<b>10</b>				
Residential	0				
Commercial	0				
Industrial	0				
Public Land	0				
Rural	10				
<b>Community Infrastructure</b>					
<b>Essential Infrastructure</b>					
Major Roads	1	Hopkins Road			
<b>Government Boundaries</b>					
Local Gov't Areas	1	Melton	CMA	1	Port Phillip & Westernport
Adjacent LGAs	1	Wyndham	CFA District	1	District 14
SES Resp' Boundary	1	Melton	FRV District	0	

Table C5.1 – Consequence Summary of 1% AEP flood along Dry and Skeleton Creeks in City of Melton

## Gauges and Warnings

Neither the BoM nor Melbourne Water currently provides flood forecasts for Dry Creek or Skeleton Creek. All flood response actions must therefore be driven by rainfall and/or river level observations. Telemetered water level/flood gauges are located at Hoppers Crossing within the Skeleton Creek catchment.

Gauges	Station No.	Location	Level Gauge	Rain Gauge	Melway Reference
Skeleton Creek at Hoppers Crossing	231110A	East bank of the creek, south side of Sayers Road	✓	✓	203 A6

Table C5.2 – Gauges within the Skeleton Creek catchment

These Gauges may provide some warning of expected flooding. See the Melbourne Water website for more information on these gauges: <http://www.melbournewater.com.au/waterdata/rainfallandriverveldata/Pages/Rainfall-and-river-level-new.aspx>. The BoM website also links a number of these gauges at: [http://www.bom.gov.au/cgi-bin/wrap\\_fwo.pl?IDV60201.html](http://www.bom.gov.au/cgi-bin/wrap_fwo.pl?IDV60201.html). It is advised that residents monitor the BoM website <http://www.bom.gov.au/vic/warnings/index.shtml?ref=hdr> and the VicEmergency website <https://emergency.vic.gov.au/> for any thunderstorm, flood or severe weather warnings present for their area.

Area Map of Flood Risk within the Dry and Skeleton Creeks catchments

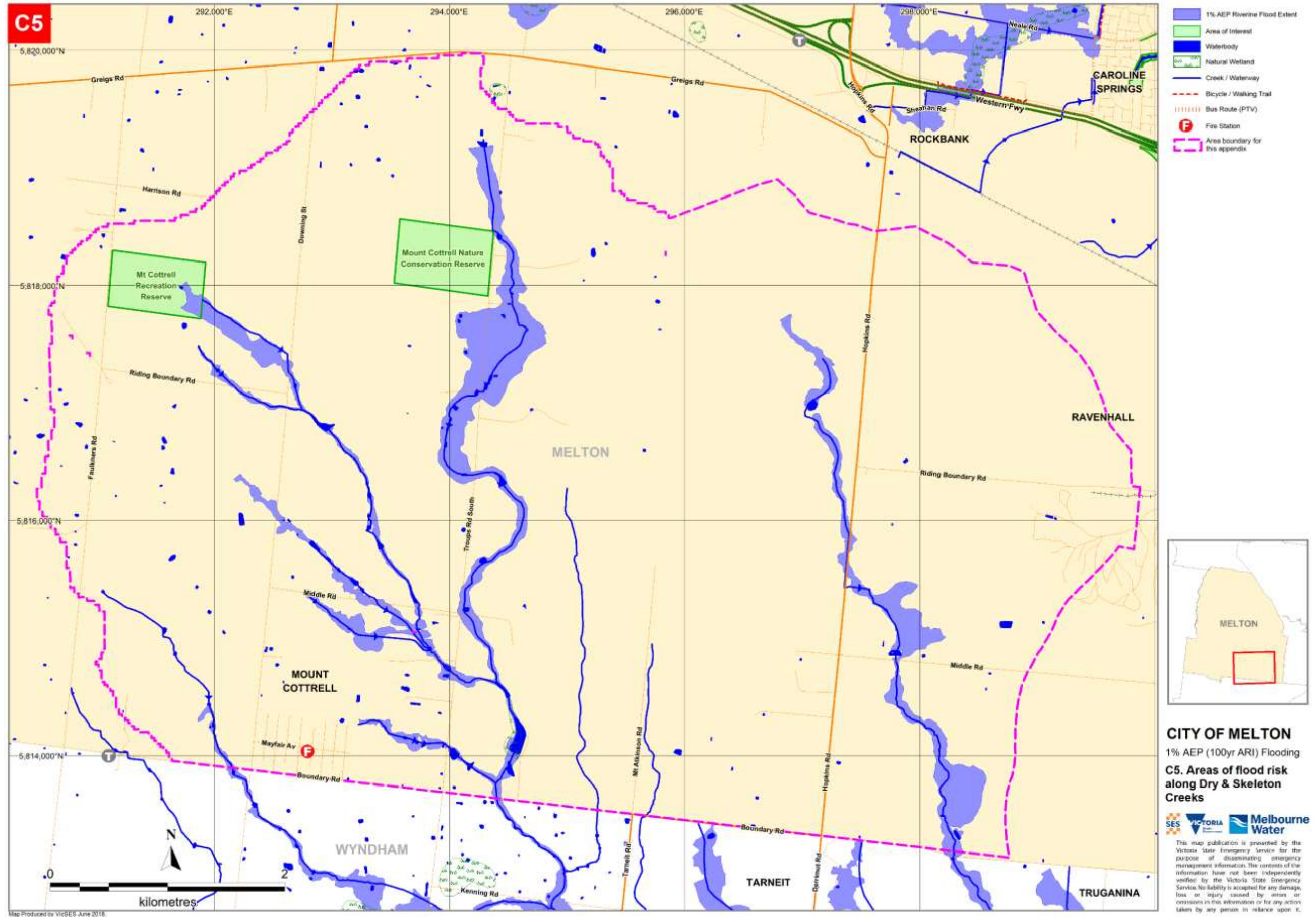


Figure C5 – Areas of flood risk around Mount Cottrell & Truganina in the City of Melton

## Properties at Flood Risk

Properties listed in the table below are at risk from flooding along Dry and Skeleton Creeks in the City of Melton. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Dry Creek (Melbourne Water, July 2008) and the Skeleton Creek (Melbourne Water, July 2008) flood mapping and risk assessment programs.

*This Property Flood Risk Table is presented by the Victoria State Emergency Service for the purpose of disseminating emergency management information. The contents of the information have not been independently verified by the Victoria State Emergency Service. No liability is accepted for any damage, loss or injury caused by errors or omissions in this information or for any action taken by any person in reliance upon it.*

Properties at risk from Flooding along Dry and Skeleton Creeks during a 1% AEP event				
Residential	Commercial	Industrial	Rural	Public Use
Street No. at Risk	Street	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
522-588	Middle Road	Truganina	Skeleton Creek	Riverine
361-395	Troups Road South	Mount Cottrell	Dry Creek	Riverine
397-429	Troups Road South	Mount Cottrell	Dry Creek	Riverine
418-472	Troups Road South	Mount Cottrell	Dry Creek	Riverine
431-533	Troups Road South	Mount Cottrell	Dry Creek	Riverine
474-528	Troups Road South	Mount Cottrell	Dry Creek	Riverine
530-544	Troups Road South	Mount Cottrell	Dry Creek	Riverine
546-562	Troups Road South	Mount Cottrell	Dry Creek	Riverine
564-578	Troups Road South	Mount Cottrell	Dry Creek	Riverine
788-802	Troups Road South	Mount Cottrell	Dry Creek	Riverine
<b>Total</b>				
<b>10</b>				

Table C5.3 – Properties at risk of flooding along the Dry & Skeleton Creek catchments in the City of Melton

## Isolation

Properties along Middle Road and Troups Road South in Mount Cottrell may become isolated for an extended period following a 2% AEP (50yr ARI) event or larger.

## Essential Infrastructure

During an event, see the Public Transport Victoria's Website for details on delays or alterations to services: <http://ptv.vic.gov.au/live-travel-updates/>. A map of public transport routes within the City of Melton is available via the website at: [https://www.ptv.vic.gov.au/assets/PTV-default-site/more/maps/Local-area-maps/Metropolitan/ba7db7be6d/31\\_Melton\\_LAM.pdf](https://www.ptv.vic.gov.au/assets/PTV-default-site/more/maps/Local-area-maps/Metropolitan/ba7db7be6d/31_Melton_LAM.pdf).

Apart from the roads outlined below, all other essential infrastructure and services areas around Mount Cottrell and Truganina are expected to remain unaffected by flooding during a 1% AEP (100yr ARI) event.

## Road Closures

The following roads are subject to closure during flooding around Mount Cottrell and Truganina. Check the DoT website for more details: <http://alerts.vicroads.vic.gov.au/>.

DoT Roads flooded in a 1% AEP (100yr ARI) event
<ul style="list-style-type: none"> <li>Hopkins Road, Truganina north of Middle Road</li> </ul>

Table C5.4 – DoT Possible Road Closures during a flooding event

Melton City Council Roads flooded in a 1% AEP (100yr ARI) event	
MOUNT COTTRELL	TRUGANINA
<ul style="list-style-type: none"> <li>Boundary Road</li> </ul>	<ul style="list-style-type: none"> <li>Boundary Road</li> </ul>
<ul style="list-style-type: none"> <li>Downing Street</li> </ul>	<ul style="list-style-type: none"> <li>Middle Road</li> </ul>
<ul style="list-style-type: none"> <li>Middle Road</li> </ul>	
<ul style="list-style-type: none"> <li>Riding Boundary Road</li> </ul>	
<ul style="list-style-type: none"> <li>Troups Road South</li> </ul>	

Table C5.5 – Melton City Council Possible Road Closures during a flooding event

## Flood Mitigation

No formal Retarding Basins, Pumping Stations or Levees exist around Mount Cottrell and Truganina.

## Sewerage Infrastructure

There is no sewerage infrastructure expected to be within the vicinity of floodwaters during severe flood events around Mount Cottrell and Truganina.

## Control, Command and Coordination

VICSES will assume overall control of the response to flood incidents. Control and coordination of a flood incident shall be carried out at the lowest effective level and in accordance with the SEMP. During significant events, VICSES will conduct incident management using multi-agency resources.

## Flood Impacts and Operational Considerations (Intelligence Cards)

The tables on the following pages provide a breakdown of the possible consequences of flooding along Dry Creek and Skeleton Creek at various creek heights or rain totals within the City of Melton. These tables are to be used only as a guide as no two floods at a location will have identical impacts.

Intelligence Cards have been included for the following locations:

- Dry Creek at Mount Cottrell
- Skeleton Creek at Truganina

# FLOOD INTELLIGENCE CARD – DRY CREEK, MOUNT COTTRELL (UNGAUGED)

Version 4 – June 2021



Note: flood intelligence records are approximations. This is because no two floods at a location, even if they peak at the same height, will have identical impacts. Flood intelligence cards detail the relationship between flood magnitude and flood consequences. More details about flood intelligence and its use can be found in the Australian Emergency Management Manuals flood series.

This Flood Intelligence Card publication is presented by the Victoria State Emergency Service for the purpose of disseminating emergency management information. The contents of the information have not been independently verified by the Victoria State Emergency Service. No liability is accepted for any damage, loss or injury caused by errors or omissions in this information or for any action taken by any person in reliance upon it. **Scan the QR code for the current levels for this gauge.**

CLOSEST RAIN GAUGE:	<b>Skeleton Creek at Hoppers Crossing</b>
LOCATION:	<b>East bank of the creek, south side of Sayers Road, Truganina</b>
RECENT RAINFALL:	<a href="https://www.melbournewater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/231110A">https://www.melbournewater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/231110A</a>

MELWAY REF:	<b>203 A6</b>
GAUGE NUMBER:	<b>231110A</b>
GAUGE TYPE:	<b>Stream Level &amp; Rain</b>

Design Rainfall Depths (mm) – Indication of Possible Flooding	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
19mm in 10 mins; 32mm in 30 mins; 41mm in 1 hour; 52mm in 2 hours; 73mm in 6 hours; or 92mm in 12 hours  Note: rainfall depths are a very rough method of estimating flood events and have been used due to the ungauged nature of the catchment. This should be used as a guide only.	2% AEP (50 year ARI)	<b>Properties at Flood Risk</b> <b>10 Properties in Total</b> <ul style="list-style-type: none"> <li>361-395, 397-429, 418-472, 431-533, 474-528, 530-544, 546-562, 564-578 &amp; 788-802 Troupes Road South, Mount Cottrell. More likely isolated by multiple points of flooding along road.</li> </ul> <b>Water Over Road</b> <ul style="list-style-type: none"> <li>Middle Road, Mount Cottrell</li> <li>Troupes Road South, Mount Cottrell at multiple locations between Greigs Road and Boundary Road</li> </ul>	VICSES may provide warnings using EM-COP to Melton Council and appropriate agencies as required based on the predictions provided by BoM regarding flood levels and the risk of Flash Flooding. The VICSES RDO in conjunction with the Regional Agency Commander will maintain operational awareness and form an appropriate response arrangement to suit the level of incident.  VICSES to respond on a request by request basis.  Council and DoT (as appropriate) to provide road closure signage under predetermined arrangements.
22mm in 10 mins; 37mm in 30 mins; 47mm in 1 hour; 60mm in 2 hours; 85mm in 6 hours; or 106mm in 12 hours	1% AEP (100 year ARI)	<b>Properties at Flood Risk</b> <b>10 Properties in Total</b> <ul style="list-style-type: none"> <li>361-395, 397-429, 418-472, 431-533, 474-528, 530-544, 546-562, 564-578 &amp; 788-802 Troupes Road South, Mount Cottrell. More likely isolated by multiple points of flooding along road.</li> </ul> <b>Water Over Road</b> <ul style="list-style-type: none"> <li>Boundary Road, Mount Cottrell east of Troupes Road South</li> </ul>	VICSES may provide warnings using EM-COP to Melton Council and appropriate agencies as required based on the predictions provided by BoM regarding flood levels and the risk of Flash Flooding. The VICSES RDO in conjunction with the Regional Agency Commander will maintain operational

Design Rainfall Depths (mm) – <i>Indication of Possible Flooding</i>	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
<p>Note: rainfall depths are a very rough method of estimating flood events and have been used due to the ungagged nature of the catchment. This should be used as a guide only.</p>		<ul style="list-style-type: none"> <li>• Downing Street, Mount Cottrell near Riding Boundary Road and north of Middle Road</li> <li>• Middle Road, Mount Cottrell</li> <li>• Riding Boundary Road, Mount Cottrell near Downing Street</li> <li>• Troups Road South, Mount Cottrell at multiple locations between Greigs Road and Boundary Road</li> </ul>	<p>awareness and form an appropriate response arrangement to suit the level of incident.</p> <p>VICSES to respond on a request by request basis.</p> <p>Council and DoT (as appropriate) to provide road closure signage under predetermined arrangements.</p>

Table C5.6 – Breakdown of possible consequences at various rainfall intensities along Dry Creek in the City of Melton with operational considerations



## FLOOD INTELLIGENCE CARD – SKELETON CREEK, TRUGANINA (UNGAUGED)

Version 4 – June 2021



*Note: flood intelligence records are approximations. This is because no two floods at a location, even if they peak at the same height, will have identical impacts. Flood intelligence cards detail the relationship between flood magnitude and flood consequences. More details about flood intelligence and its use can be found in the Australian Emergency Management Manuals flood series.*

*This Flood Intelligence Card publication is presented by the Victoria State Emergency Service for the purpose of disseminating emergency management information. The contents of the information have not been independently verified by the Victoria State Emergency Service. No liability is accepted for any damage, loss or injury caused by errors or omissions in this information or for any action taken by any person in reliance upon it. **Scan the QR code for the current levels for this gauge.***

CLOSEST RAIN GAUGE:	<b>Skeleton Creek at Hoppers Crossing</b>
LOCATION:	<b>East bank of the creek, south side of Sayers Road, Truganina</b>
RECENT RAINFALL:	<a href="https://www.melbournewater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/231110A">https://www.melbournewater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/231110A</a>

MELWAY REF:	<b>203 A6</b>
GAUGE NUMBER:	<b>231110A</b>
GAUGE TYPE:	<b>Stream Level &amp; Rain</b>

Design Rainfall Depths (mm) – Indication of Possible Flooding	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
22mm in 10 mins; 37mm in 30 mins; 47mm in 1 hour; 60mm in 2 hours; 85mm in 6 hours; or 106mm in 12 hours  Note: rainfall depths are a very rough method of estimating flood events and have been used due to the ungauged nature of the catchment. This should be used as a guide only.	1% AEP (100 year ARI)	<b>Properties at Flood Risk</b> <b>1 Properties in Total</b> <ul style="list-style-type: none"> <li>• 522-588 Middle Road, Truganina</li> </ul> <b>Water Over Road</b> <ul style="list-style-type: none"> <li>• Hopkins Road, Truganina north of Middle Road</li> <li>• Middle Road, Truganina near Hopkins Road</li> <li>• Boundary Road, Truganina east of Hopkins Road</li> </ul>	VICSES to respond on a request by request basis.  Council and DoT (as appropriate) to provide road closure signage under predetermined arrangement.

Table C5.7 – Breakdown of possible consequences at various rainfall intensities along Skeleton Creek in the City of Melton with operational considerations

## APPENDIX D - FLOOD EVACUATION ARRANGEMENTS

### Phase 1 - Decision to Evacuate

The IC 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 to conduct the evacuation.
- Time available to conduct the evacuation.
- Evacuation priorities and evacuation planning arrangements.
- Access and egress routes available and their potential flood liability.
- Current and likely future status of essential infrastructure.
- Resources required to conduct the evacuation.
- Resources available to conduct the evacuation.
- Shelter including Emergency Relief Centres, Assembly Areas etc.
- Vulnerable people and facilities.
- Transportation.
- Registration.
- People of CALD background and transient populations.
- Safety of emergency service personnel.
- Different stages of an evacuation process.

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

There are currently no pre-established triggers for evacuation within the Melton City Council area.

## **Phase 2 – Warning**

Warnings may include a warning to prepare to evacuate and a warning to evacuate immediately. Once the decision to evacuate has been made, the at-risk community will be warned to evacuate. Evacuation warnings can be disseminated via methods listed in Part 3 of this plan.

Evacuation warning messages will be developed and issued by VICSES in consultation with the MEMO, MERC, MRM, DFFH and other key agencies and expert advice (CMA's and Flood Intelligence specialists).

## **Phase 3 – Withdrawal**

Withdrawal will be controlled by VicPol. VICSES may provide advice regarding the 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 VicPol/DoT with route control and may assist VicPol in arranging evacuation transportation.

VicPol will control security of evacuated areas.

Evacuees will be encouraged to move using their own transport where possible. Transport for those without vehicles or other means, will be arranged at the request of the IC or via the appointed VicPol Evacuation Manager.

Landing zones for aircraft will be determined by the following:

- The IC will determine the requirements for airborne resources.
- The State Aircraft Desk will deploy and coordinate air resources.
- The pilot in command will determine the safest location to land.

## **Vulnerable People in Emergencies**

Vulnerable people living in the community will be identified through funded agencies, community service organisations or other community networks. Such people will be assessed against the definition of a vulnerable person and may qualify for registration on the Vulnerable Persons Register (VPR). A list of facilities where vulnerable people may be located, is also kept by Council. These may be funded facilities including education, health and childcare, Commonwealth regulated aged care facilities and other locally identified facilities. Further information on Vulnerable People in Emergencies can be obtained from Melton Council's MRM.

## Phase 4 – Shelter

Relief/Recovery Centres and/or assembly areas which cater for people's basic needs for storms/floods may be established to meet the immediate needs of people affected by flooding. The need for Relief Centres will be determined dependent on the location and scale of the event.

Relief/Recovery Centres that may be used are listed in the City of Melton Relief and Recovery Plan (Part 6 of the Melton MEMP).

VicPol, in conjunction with VICSES, will liaise with Local Government and DFFH (where regional coordination is required) via the relevant RCC to plan for the opening and operation of relief centres. This can best be achieved through the IEMT.

### Animal Shelter

The need for animal shelter compounds will be determined dependent on the location and size of the event. Details of emergency relief and recovery arrangements can be found in the City of Melton Recovery Plan (Part 6 of the Melton MEMP).

### Caravans

Whilst there is one caravan park within the City of Melton municipality, it is not located within a flood prone area; hence there is no requirement for caravan evacuation.

## Phase 5 – Return

Return will be consistent with the Strategic Plan for the Return of Community

The IC, 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 storm/flood situation.
- Status of flood mitigation systems.
- Size and location of the community.
- Access and egress routes available and their status.
- Resources required to coordinate the return.
- Special needs groups.
- Forecast weather.
- Transportation, particularly for people without access to transport.

## Disruption to Services

Disruption to a range of services can occur in the event of a flood. This may include road closures affecting school bus routes, water treatment plant affecting potable water supplies etc.

Service	Impact	Trigger Point for action	Strategy/Temporary Measures
Sinclair's Road at Kororoit Creek	Closure of major road due to flooding of Sinclair's Road Ford at Kororoit Creek	1 in 5	Alternate routes via clearly signed detours. Alternate routes to be determined by Council Traffic Engineers. Council works crews to install and monitor detour signage. Council Network Inspectors to monitor road conditions, closure signage and detour signage. VicPol assistance required to ensure vehicles do not attempt crossing.
Nixon Ford at Toolern Creek	Closure of minor local road due to flooding of Nixon Ford at Toolern Creek	1 in 5	Alternate routes via clearly signed detours. Alternate routes to be determined by Council Traffic Engineers. Council works crews to install and monitor detour signage. Council Network Inspectors to monitor road conditions, closure signage and detour signage.
Minns Road at Toolern Creek	Closure of minor local road due to flooding of Nixon Ford at Toolern Creek	1 in 5	Alternate routes via clearly signed detours. Alternate routes to be determined by Council Traffic Engineers. Council works crews to install and monitor detour signage. Council Network Inspectors to monitor road conditions, closure signage and detour signage.
General Transport	General road closures across network	Inundation of road network and associated damage to an extent that it is unsafe for vehicles to use road	Alternate routes via clearly signed detours. Alternate routes to be determined by Council Traffic Engineers. Council works crews to install and monitor detour signage. Council Network Inspectors to monitor road conditions, closure signage and detour signage.
School Bus Services	General road closures across network leading to student pickups being suspended	Inundation of road network and associated damage to an extent that it is unsafe for vehicles to use road	Alternate routes via clearly signed detours. Alternate routes to be determined by Council Traffic Engineers. Council works crews to install and monitor detour signage. Council Network Inspectors to monitor road conditions, closure signage and detour signage. Alternate student collection points to be established.

Table D.1 – Disruption to Services within the City of Melton

## Essential Infrastructure and Property Protection

Essential Community Infrastructure and properties (e.g. residences, businesses, roads, power supply) that require protection are:

Facility	Impact	Trigger Point for action	Strategy/Temporary Measures
Rockbank sewer pumping station – Troups Road North, Rockbank	Loss of pumping station will impact provision of sewerage outfall to the Rockbank township	1 in 100 event	Protect the pump house via temporary flood protection measures. Greater Western Water to be advised and preparation for emergency sewerage education.
Residences in the Gretel Grove area	The Toolern Creek in flood will cause a surcharge of the stormwater drainage system servicing the Gretel Grove area.	Unknown. To be determined	Activate the Gretel Grove flood gate.

Table D.2 – Essential Infrastructure requiring protection from flooding within the City of Melton

City of Melton will establish a sandbag distribution point for sandbags provided by VICSES at the Council Depot, 90 – 92 High Street, Melton.

For small scale events, sandbags can be purchased from hardware stores such as Bunnings. For large scale events, sandbag collection points and filling points will be determined, with the community being informed of these points depending on the nature and proximity of the event.

## **Rescue**

Requests for Melton Council resources to support rescue activities should be forwarded to the MECC or EMLO, if an ICC has been established.

Resources are available from the VICSES Melton Unit to assist with rescue operations – specific details of equipment and resources available can be obtained from the VICSES RDO.

No high-risk areas/communities (i.e. low-lying islands where rescues might be required) have been identified, other than the occurrence of flash flooding over roadways.

## APPENDIX E – STORM AND FLOOD WARNING SYSTEMS

### Storm and Flood Warning

Storm and Flood Warning products and Flood Class Levels can be found on the BoM website and the VicEmergency website. Storm and Flood Warning Products include Severe Thunderstorm Warnings, Severe Weather Warnings, Flood Watches and Flood Warnings – see example on following page.

### Flood Bulletins

VICSES distributes flood emergency information to the media through “Flood Bulletins”. Flood Bulletins provide BoM Flood Warning information as well as information regarding possible flood consequences and safety advice, not contained in BoM Flood Warning products. VICSES uses the title Flood Bulletin to ensure emphasis is placed upon BoM Flood Warning product titles.

The relevant VICSES RDO or the established ICC will normally be responsible for drafting, authorising and issuing of Flood Bulletins, using the VicEmergency system.

Flood Bulletins should refer to the warning title within the Bulletin header, for example Flood Bulletin for Major Flood Warning on Yarra River.

Flood Bulletins should follow the following structure

- What is the current flood situation.
- What is the predicted flood situation.
- What are the likely flood consequences.
- What should the community do in response to flood warnings.
- Where to seek further information.
- Who to call if emergency assistance is required.

It is important that the description of the predicted flood situation is consistent with, and reflects, the relevant BoM Flood Warning.

Flood Bulletins should be focused on specific gauge (or in the absence of gauges, catchment) reference areas, that is the area in which flood consequences specifically relate to the relevant flood gauge.

Flood Bulletins should be prepared and issued after receipt of each Flood Watch and Flood Warning from the BoM, or after Severe Weather or Thunderstorm Warnings indicating potential for severe flash flooding.

To ensure flood bulletins are released in a timely manner, standardised flood bulletins may be drafted based on different scenarios, prior to events occurring. The standardised flood bulletins can then be adapted to the specifics of the event occurring or predicted to occur.

### Local Flood Warning System Arrangements

There are no local arrangements for Flood Warnings Systems in Melton Council.

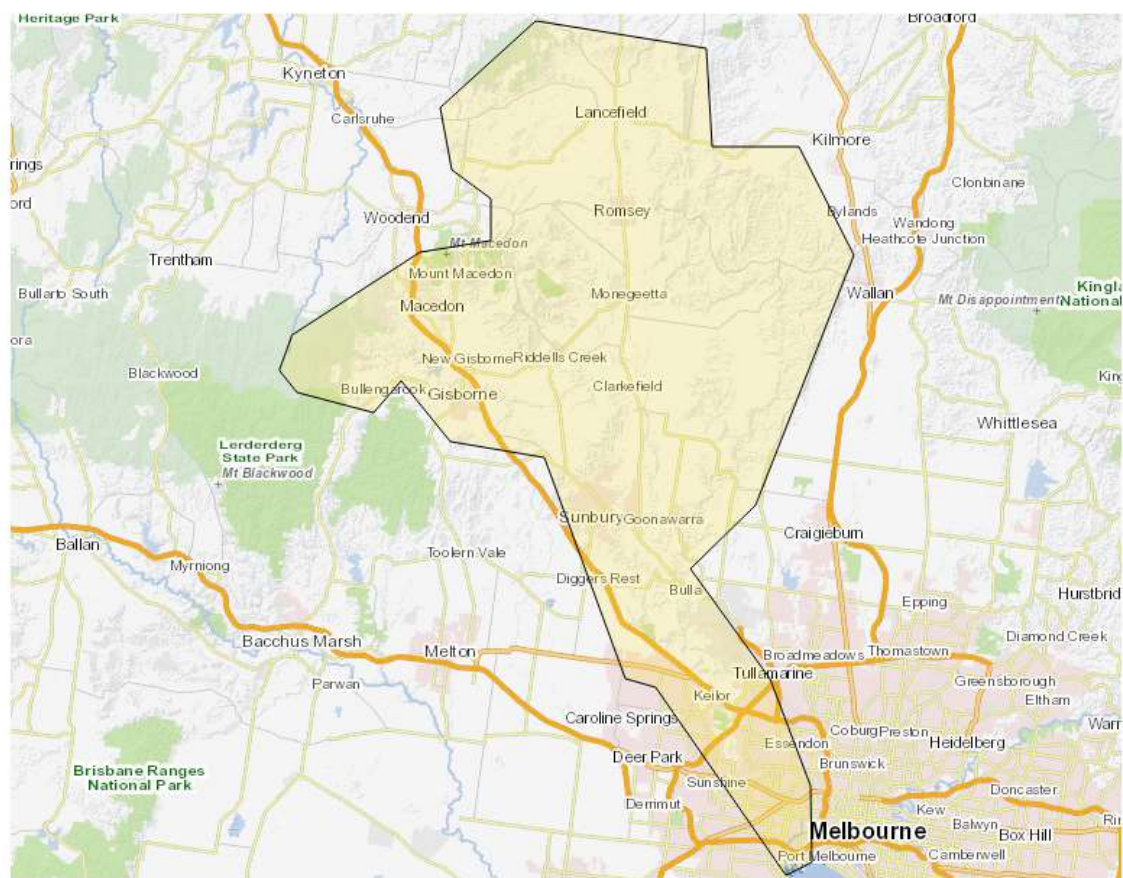
## BOM Flood Warning Example



### ADVICE - FLOOD

**Incident Location:** Maribymong  
**Incident Name:** MaribymongFloodSept2016  
**Issued:** Set at publish time  
**Next Update Expected:**

### Map





## Message

This **Minor Flood Warning** is being issued for Maribymong River.

- The Maribymong River catchment has received rainfall averaging about 31mm since 0900am yesterday. Rainfall totals of 5mm have been forecast for the catchment in the next 2 hours.
- Water levels of the Maribymong River and its tributaries at various locations are rising in response to the rain.
- The level of the Deep Creek at Darraweit Guim is currently 5.41m and rising. It is expected to peak above the Minor Flood Level (5.50m) this morning.
- Minor flooding in the Deep Creek and Maribymong River catchment is expected to affect low lying areas adjacent to the waterway. Minor roads may be closed.

The river heights at 08.14am 14/09/2016 were:

- Deep Creek at Doggetts Bridge, Lancefield: 2.22 metres, rising
- Deep Creek at Darraweit Guim: 5.47 metres, falling
- Deep Creek at Konagaderra: 3.62 metres, falling
- Bolinda Creek at Clarkefield: 1.19 metres, rising
- Deep Creek at Bulla: 2.39 metres, falling
- Rosslynne Reservoir, Head Gauge: 38.52 metres, rising
- Jacksons Creek at Sunbury: 2.13 metres, rising
- Steele Creek at Keilor East: 1.19 metres, rising
- Maribymong River at Keilor North: 3.58 metres, rising
- Maribymong River at Keilor: 1.84 metres, rising
- Maribymong River at Maribymong: 0.04 metres, rising

### **Stay informed - monitor your local conditions and remain alert.**

#### **What you should do:**

- Be prepared to act if your situation changes.
- You should stay informed by listening to emergency broadcasters and monitoring warnings.
- Monitor weather forecasts and river levels. Go to [www.bom.gov.au/vic/warnings](http://www.bom.gov.au/vic/warnings).
- Floodwater is dangerous - never drive, walk or ride through floodwater.

#### **Impacts in your area:**

- Flooding above floor level of a single story home is likely to occur in some locations.
- Local roads may be closed and low bridges may be underwater.
- Areas around rivers and streams may be flooded.

This message was issued by State Emergency Service.

**The next update is expected by 4PM this afternoon or as the situation changes.**

#### **Flood information:**

- For river heights check [www.bom.gov.au](http://www.bom.gov.au) or phone 1300 659 217.
- For urgent animal welfare issues call [Agriculture Victoria](http://www.Agriculture Victoria) on 136 186 or your local vet.

## APPENDIX F – MAPS AND SCHEMATICS

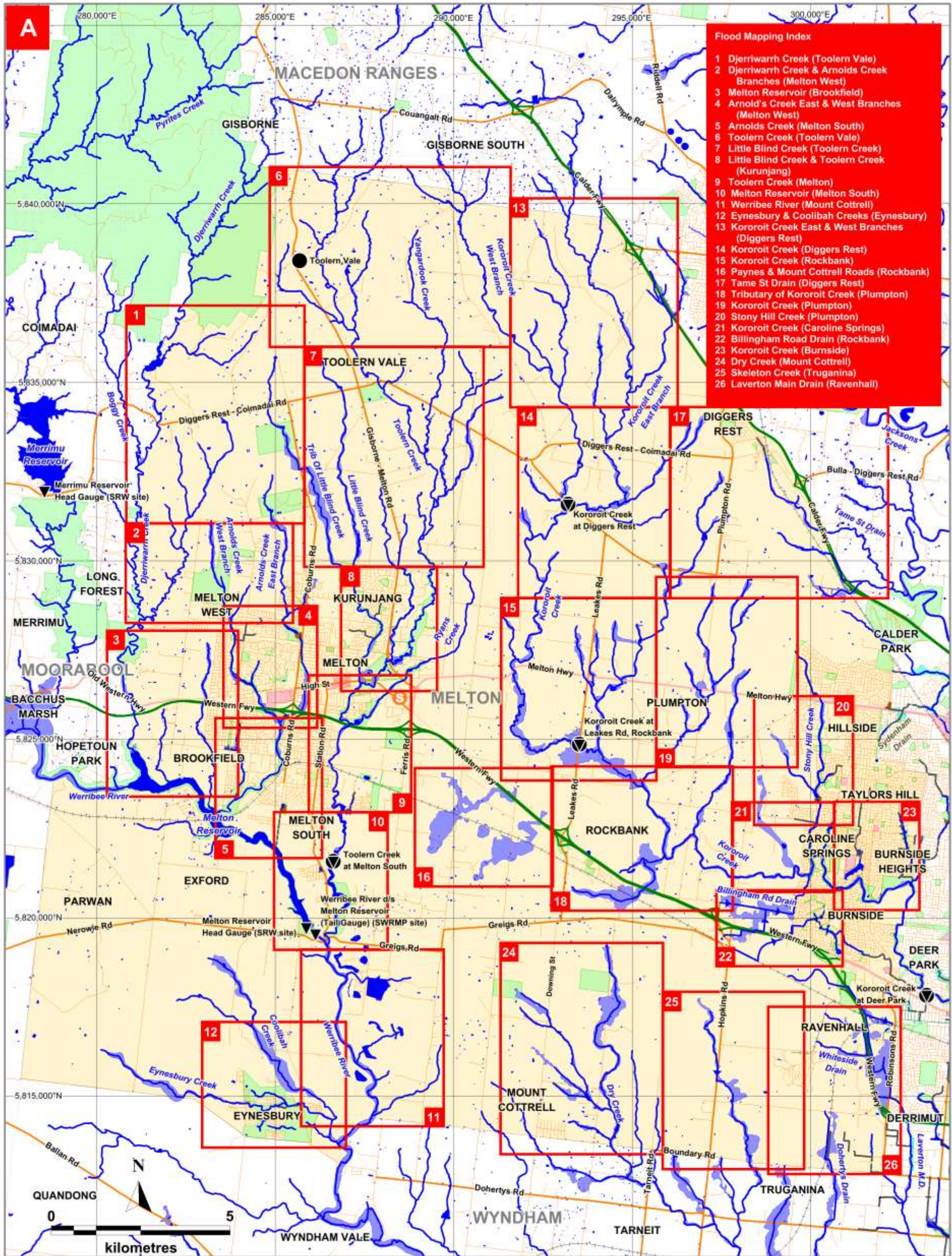
### Overview

Maps considered useful to flood response are included in this Appendix. They include:

- A map outlining a series of flooding hot spot maps within the City of Melton.
- A map showing the Municipal boundary together with the open waterways and underground stormwater drainage pipe network within the City of Melton and the 1% AEP (100-year ARI) flood extents (sourced from Melbourne Water GIS).
- A set of 26 maps showing flooding hot spots within the City of Melton together with the 1% AEP (100-year ARI) flood extents (sourced from the Melbourne Water GIS).
- Schematics detailing the drainage catchments relevant for this municipality.
  - Each Schematic outlines the drainage system comprising of rivers, creeks or storm-water drains contained within one of the major catchments in the Port Phillip and Westernport Region.
  - Within each Schematic, there are details useful to flood response, such as those relating to gauges, towns, rivers, creeks, drains and reservoirs. Historical facts and figures may also be shown.
  - The schematics also detail the response boundaries for VICSES units and local government, and provide a reference link to the corresponding MSFEP.
  - Details within these Catchment Schematics reflect those contained within either other sections of this MSFEP, or refer to other plans. These details have been filtered to contain only key facts. For more information on a gauge, drainage system or town consult the corresponding MSFEP.

#### Note that:

- The mapping/data provided in this Appendix has been developed from Melbourne Water and other sources and taken from historical records and flood modelling. It may not include more recent data or local anecdotal information. It is planned that the mapping/data be updated as further studies or modelling is completed and other Information obtained.
- Maps showing the Special Building Overlay and Land Subject to Inundation Overlay are included in the Melton Planning Scheme, and can be used as a guide for areas that may flood during an event. The maps can be found in hard copy form at the Council's main office or online at the DELWP website: <https://mapshare.vic.gov.au/vicplan/>.
- Maps showing 1 in 100-year ARI (1% AEP) flood extents and floodways (together with volume, height and water quality data) are shown at DELWP's mapshare website: <http://mapshare.maps.vic.gov.au/MapShareVic/index.html?viewer=MapShareVic.PublicSite&ocale=en-AU>.



Flood Mapping Index	
1	Djerriwarrh Creek (Toolern Vale)
2	Djerriwarrh Creek & Arnolds Creek Branches (Melton West)
3	Melton Reservoir (Brookfield)
4	Arnolds Creek East & West Branches (Melton West)
5	Arnolds Creek (Melton South)
6	Toolern Creek (Toolern Vale)
7	Little Blind Creek (Toolern Vale)
8	Little Blind Creek & Toolern Creek (Kurunjang)
9	Toolern Creek (Melton)
10	Melton Reservoir (Melton South)
11	Werribee River (Mount Cottrell)
12	Eynesbury & Coollabah Creeks (Eynesbury)
13	Kororoit Creek East & West Branches (Diggers Rest)
14	Kororoit Creek (Diggers Rest)
15	Kororoit Creek (Rockbank)
16	Paynes & Mount Cottrell Roads (Rockbank)
17	Tame St Drain (Diggers Rest)
18	Tributary of Kororoit Creek (Plumpton)
19	Kororoit Creek (Plumpton)
20	Stony Hill Creek (Plumpton)
21	Kororoit Creek (Caroline Springs)
22	Billingham Road Drain (Rockbank)
23	Kororoit Creek (Burnside)
24	Dry Creek (Mount Cottrell)
25	Skeleton Creek (Truganina)
26	Laverton Main Drain (Ravenhall)

**CITY OF MELTON**  
Version 3: June 2018  
**A - Flood Mapping Index Map**

- 1% AEP Riverine Flood Extent
- 1% AEP Flash Flood Extent
- Reserve / Area of Interest
- Waterbody / Reservoir
- Commercial Precinct
- River / Creek
- Melbourne Water Stormwater Drain
- River Level Gauge
- Rain Gauge
- SES LHQ
- Flood Mapping Border



**SES**

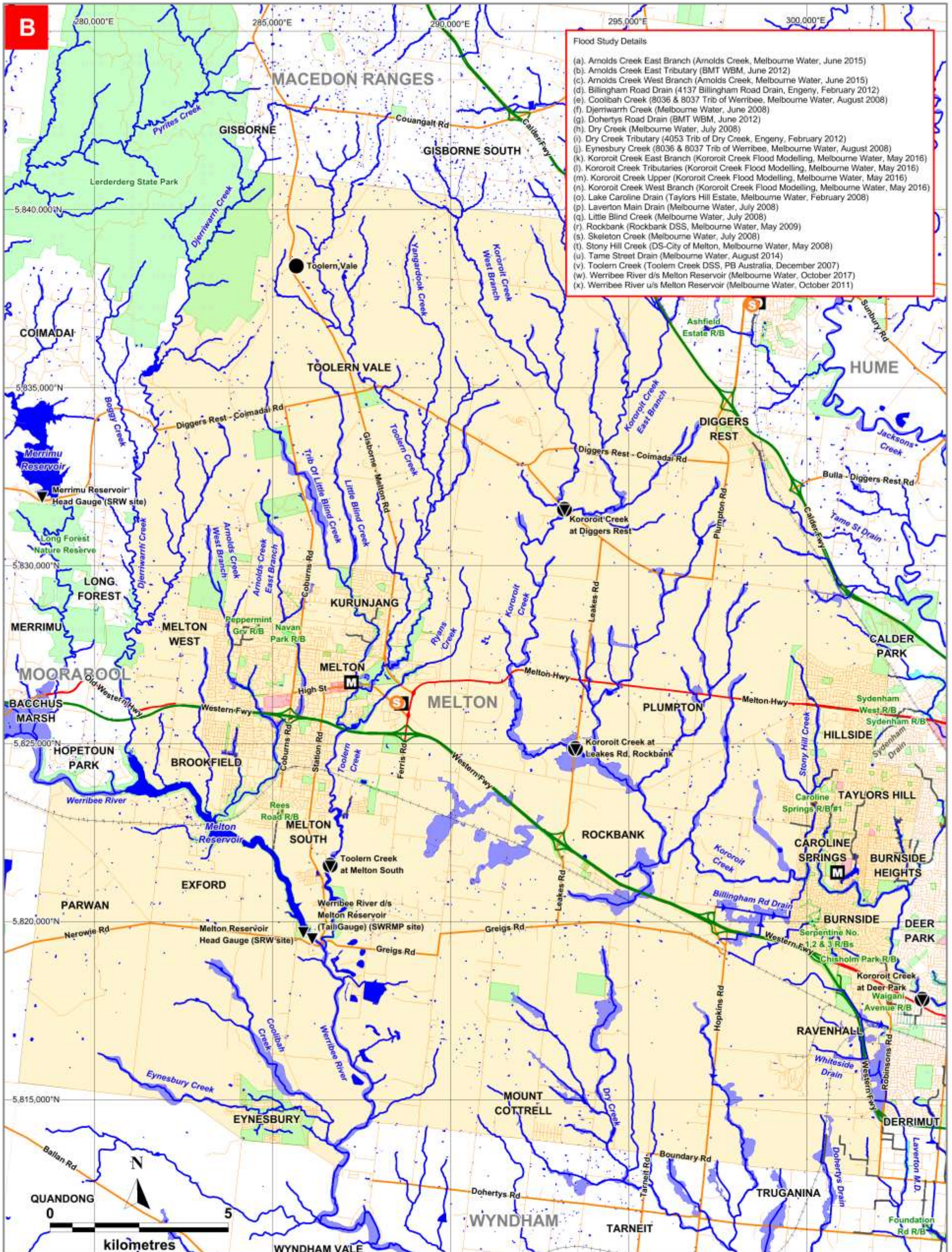


**VICTORIA**  
State Government



**Melbourne Water**

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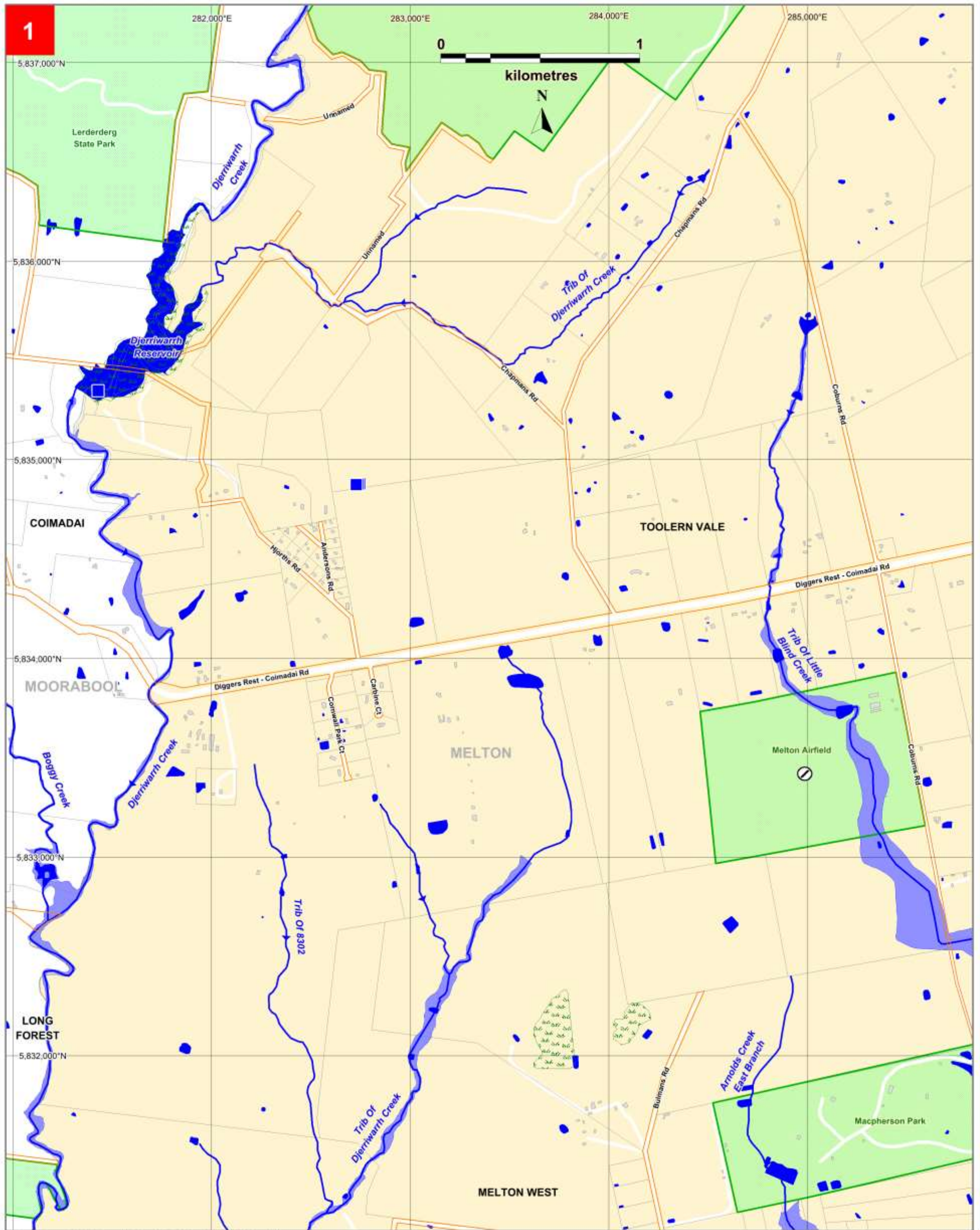
- Flood Study Details**
- (a). Arnolds Creek East Branch (Arnolds Creek, Melbourne Water, June 2015)
  - (b). Arnolds Creek East Tributary (BMT WBM, June 2012)
  - (c). Arnolds Creek West Branch (Arnolds Creek, Melbourne Water, June 2015)
  - (d). Billingham Road Drain (4137 Billingham Road Drain, Engeny, February 2012)
  - (e). Coolibah Creek (8036 & 8037 Trib of Werribee, Melbourne Water, August 2008)
  - (f). Djerrivarrh Creek (Melbourne Water, June 2008)
  - (g). Dohertys Road Drain (BMT WBM, June 2012)
  - (h). Dry Creek (Melbourne Water, July 2008)
  - (i). Dry Creek Tributary (4053 Trib of Dry Creek, Engeny, February 2012)
  - (j). Eynesbury Creek (8036 & 8037 Trib of Werribee, Melbourne Water, August 2008)
  - (k). Kororoit Creek East Branch (Kororoit Creek Flood Modelling, Melbourne Water, May 2016)
  - (l). Kororoit Creek Tributaries (Kororoit Creek Flood Modelling, Melbourne Water, May 2016)
  - (m). Kororoit Creek Upper (Kororoit Creek Flood Modelling, Melbourne Water, May 2016)
  - (n). Kororoit Creek West Branch (Kororoit Creek Flood Modelling, Melbourne Water, May 2016)
  - (o). Lake Caroline Drain (Taylors Hill Estate, Melbourne Water, February 2008)
  - (p). Laverton Main Drain (Melbourne Water, July 2008)
  - (q). Little Blind Creek (Melbourne Water, July 2008)
  - (r). Rockbank (Rockbank DSS, Melbourne Water, May 2009)
  - (s). Skeleton Creek (Melbourne Water, July 2008)
  - (t). Stony Hill Creek (DS-City of Melton, Melbourne Water, May 2008)
  - (u). Tame Street Drain (Melbourne Water, August 2014)
  - (v). Toolern Creek (Toolern Creek DSS, PB Australia, December 2007)
  - (w). Werribee River d/s Melton Reservoir (Melbourne Water, October 2017)
  - (x). Werribee River u/s Melton Reservoir (Melbourne Water, October 2011)

**CITY OF MELTON**  
 Version 3: June 2018  
**B - 1% AEP (100yr ARI) Flood Extent Map**

- 1% AEP Riverine Flood Extent
- 1% AEP Flash Flood Extent
- Reserve / Area of Interest
- Waterbody / Reservoir
- Commercial Precinct
- Melbourne Water Retarding Basin
- River / Creek
- Melbourne Water Stormwater Drain
- River Level Gauge
- Rain Gauge
- SES LHQ
- D Municipal Depot
- M Municipal Offices

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Flood Extent Maps (sourced Melbourne Water GIS)



Flood modelling completed by Melbourne Water, June 2006. Map Produced by VICSES June 2018.

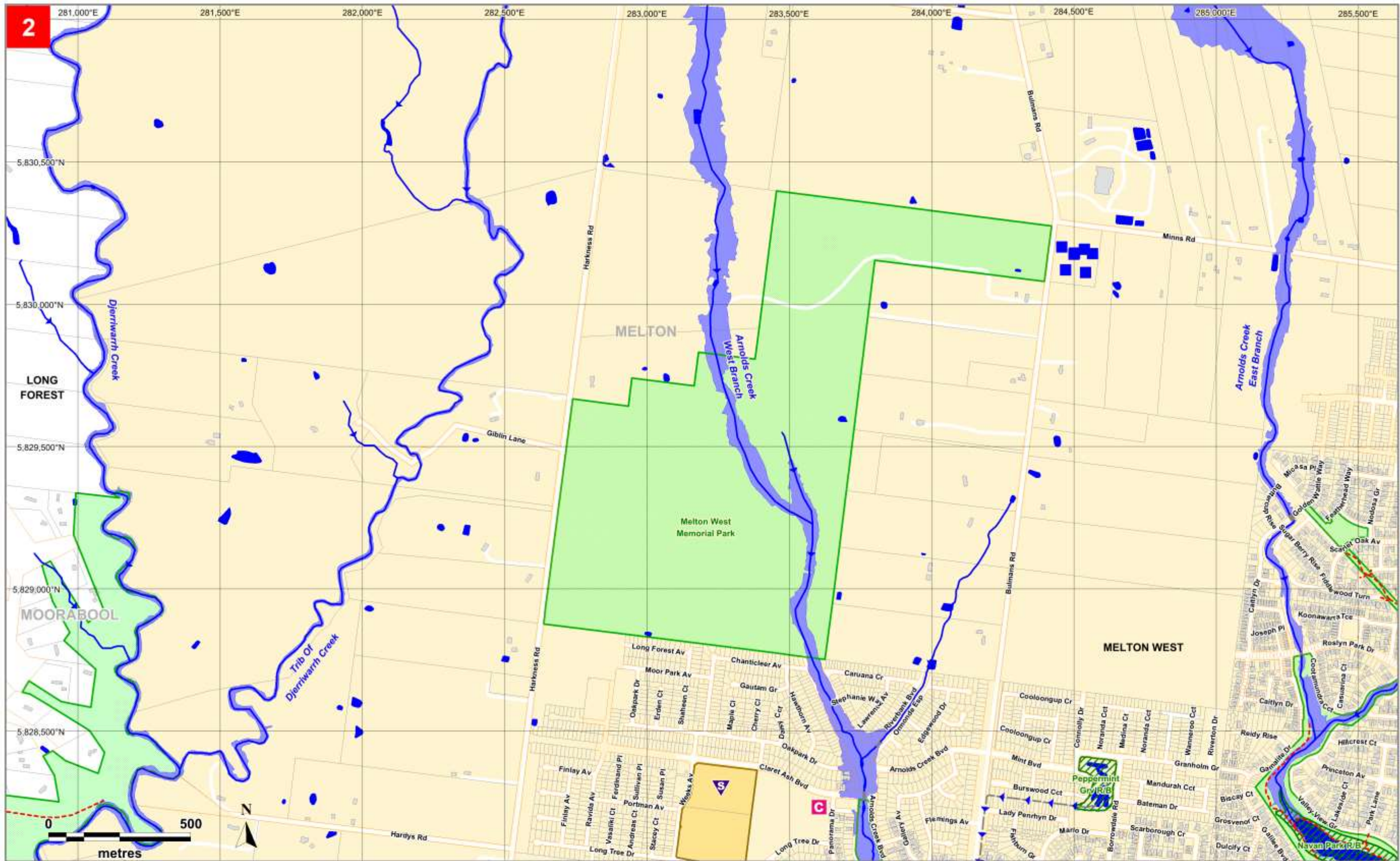
**CITY OF MELTON**  
 1% AEP (100yr ARI) Flooding  
**1. Djerriwarrh Creek**  
 (Toolern Vale)

- Building
- Waterbody
- 1% AEP Riverine Flood Extent (Depth Unavailable)
- Reserve / Park
- Natural Wetland
- River / Creek
- Airport / Airfield
- Retail Water Storage



**SES VICTORIA** **Melbourne Water**

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Flood Mapping completed by Melbourne Water, June 2015. Map Produced by VicSES June 2018.

### CITY OF MELTON

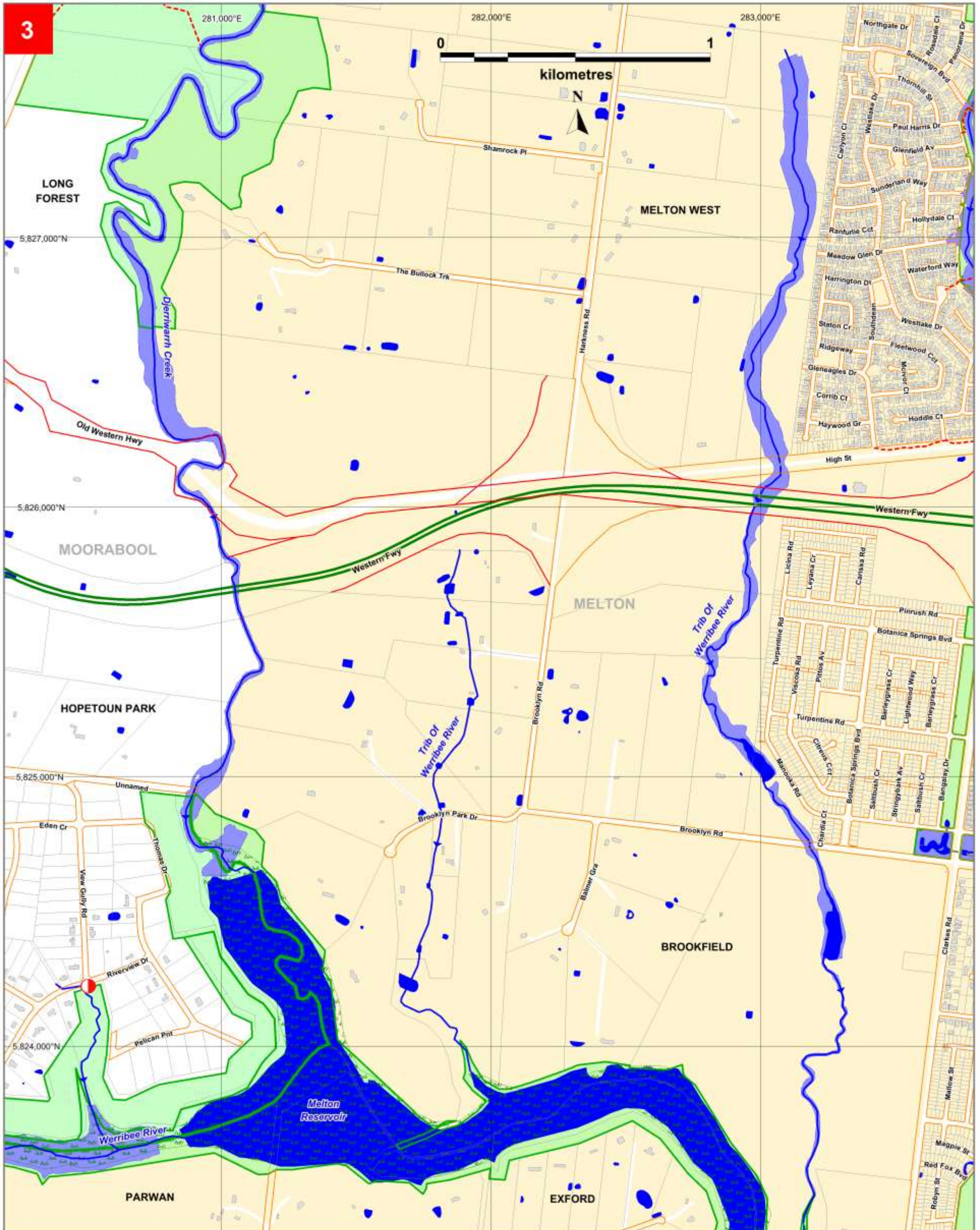
1% AEP (100yr ARI) Flooding

### 2. Djerriwarrh Creek & Arnolds Creek Branches (Melton West)

- |  |                                                  |  |                                  |  |                  |
|--|--------------------------------------------------|--|----------------------------------|--|------------------|
|  | Building                                         |  | Creek / Channel                  |  | Community Centre |
|  | Area of Interest                                 |  | Melbourne Water Stormwater Drain |  | School / College |
|  | Waterbody                                        |  | Bicycle / Walking Trail          |  |                  |
|  | 1% AEP Riverine Flood Extent (Depth Unavailable) |  | Bus Route (PTV)                  |  |                  |
|  | Melbourne Water Retarding Basin                  |  |                                  |  |                  |



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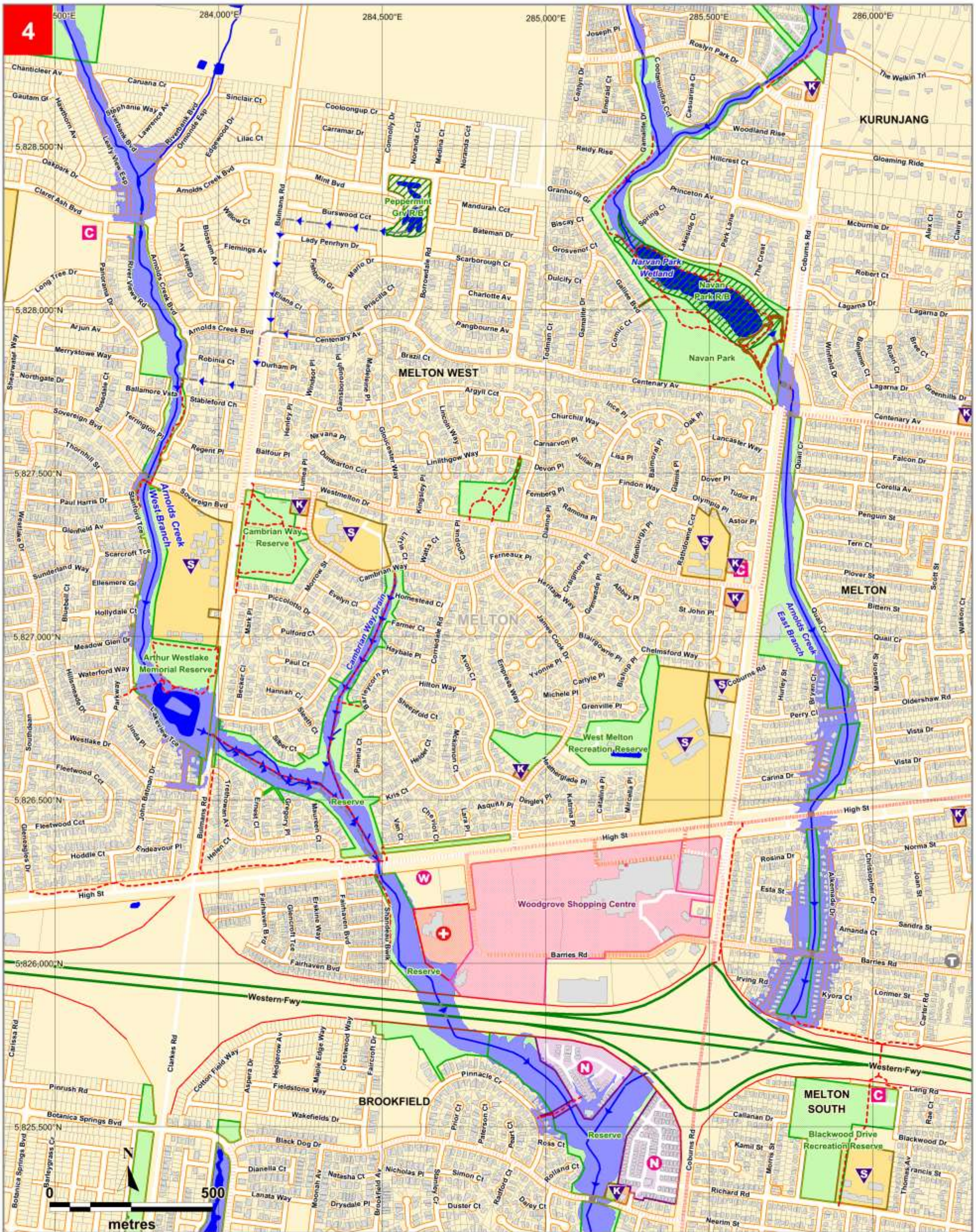
Flood modeling completed by Melbourne Water, June 2008. Map Produced by VICSES June 2018.

**CITY OF MELTON**  
 1% AEP (100yr ARI) Flooding  
**3. Melton Reservoir (Brookfield)**

- Building
- Waterbody
- 1% AEP Riverine Flood Extent (Depth Unavailable)
- Reserve / Park
- Natural Wetland
- River / Creek
- Bicycle / Walking Trail
- Sewer Emergency Relief Point



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Flood modelling completed by Melbourne Water, June 2015. Map Produced by VICSES June 2018.

**CITY OF MELTON**  
 1% AEP (100yr ARI) Flooding  
**4. Arnold's Creek East & West Branches (Melton West)**

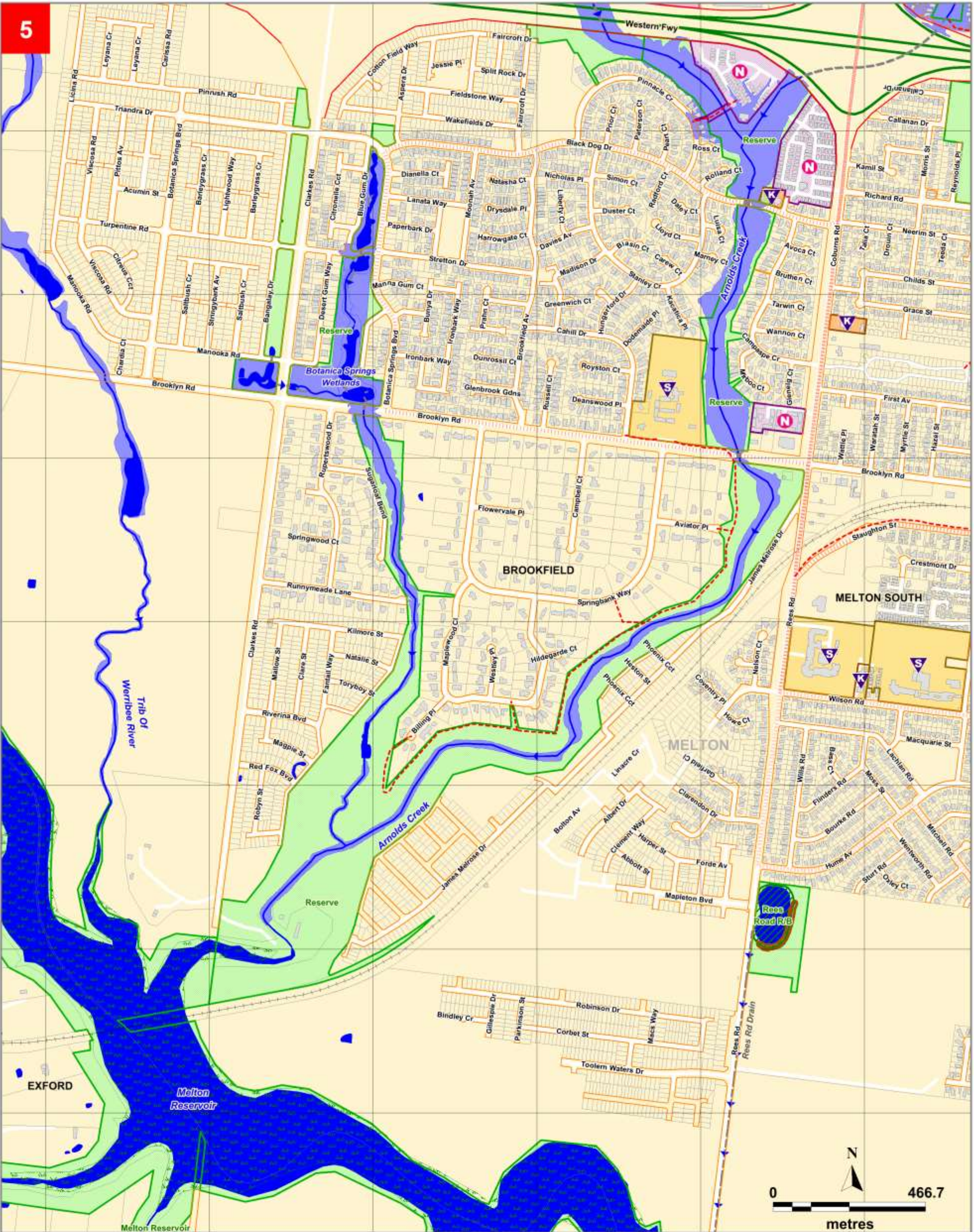
- |  |                                                  |  |                                  |
|--|--------------------------------------------------|--|----------------------------------|
|  | Building                                         |  | Shopping Centre                  |
|  | Waterbody                                        |  | Melbourne Water Stormwater Drain |
|  | 1% AEP Riverine Flood Extent (Depth Unavailable) |  | Embankment                       |
|  | Reserve / Park                                   |  | School / College                 |
|  | Natural Wetland                                  |  | Nursing Home / Aged Care         |
|  | Melbourne Water Retarding Basin                  |  | Kindergarten / Child Care        |
|  | River / Creek                                    |  | Community Centre                 |
|  | Bicycle / Walking Trail                          |  | Hospital                         |
|  | Bus Route (PTY)                                  |  |                                  |



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Flood modelling completed by PB Australia, December 2007. Map Produced by VICSES June 2018.

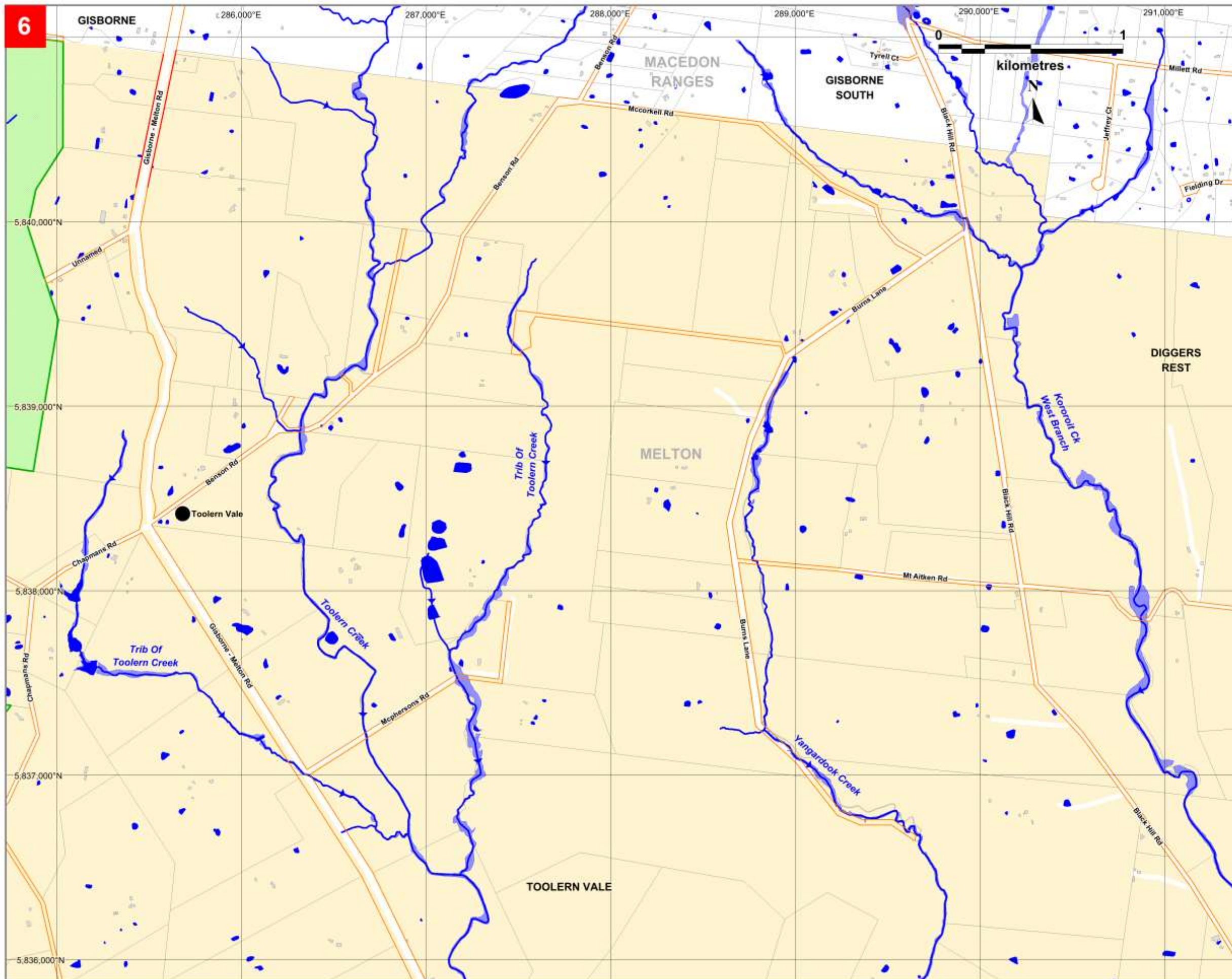
**CITY OF MELTON**  
 1% AEP (100yr ARI) Flooding  
**5. Arnolds Creek**  
**(Melton South)**

- Building
- Waterbody
- 1% AEP Riverine Flood Extent (Depth Unavailable)
- Reserve / Park
- Natural Wetland
- Melbourne Water Retarding Basin
- River / Creek
- Bicycle / Walking Trail
- Bus Route (PTV)
- Melbourne Water Stormwater Drain
- Embankment
- School / College
- Nursing Home / Aged Care
- Kindergarten / Child Care



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- Building
- Area of Interest
- Waterbody
- 1% AEP Riverine Flood Extent (Depth Unavailable)
- Creek / Waterway
- Rain Gauge

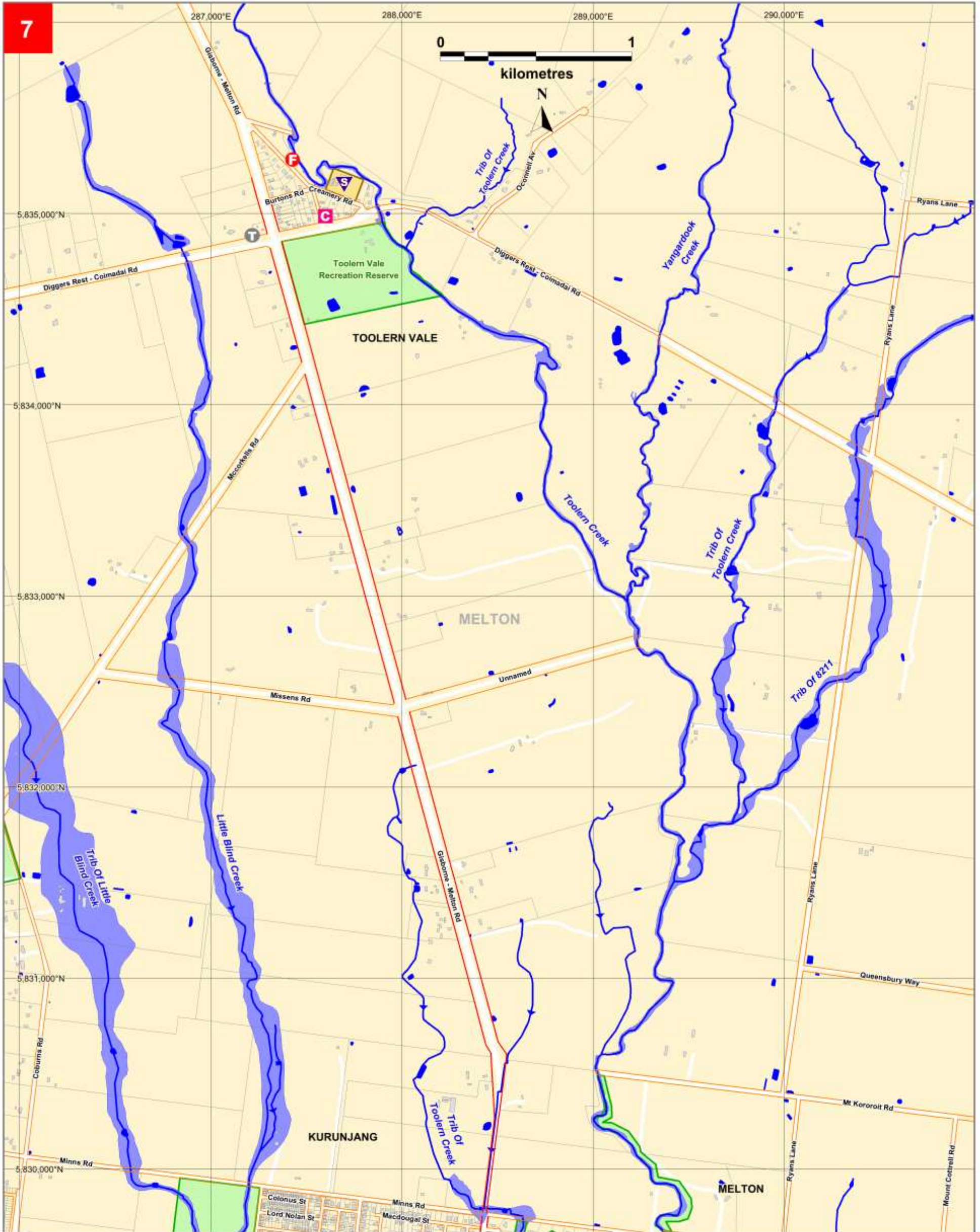


**CITY OF MELTON**  
 1% AEP (100yr ARI) Flooding  
**6. Toolern Creek**  
**(Toolern Vale)**



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Flood modelling completed by PB Australia, December 2007. Map Produced by VicSES June 2018.



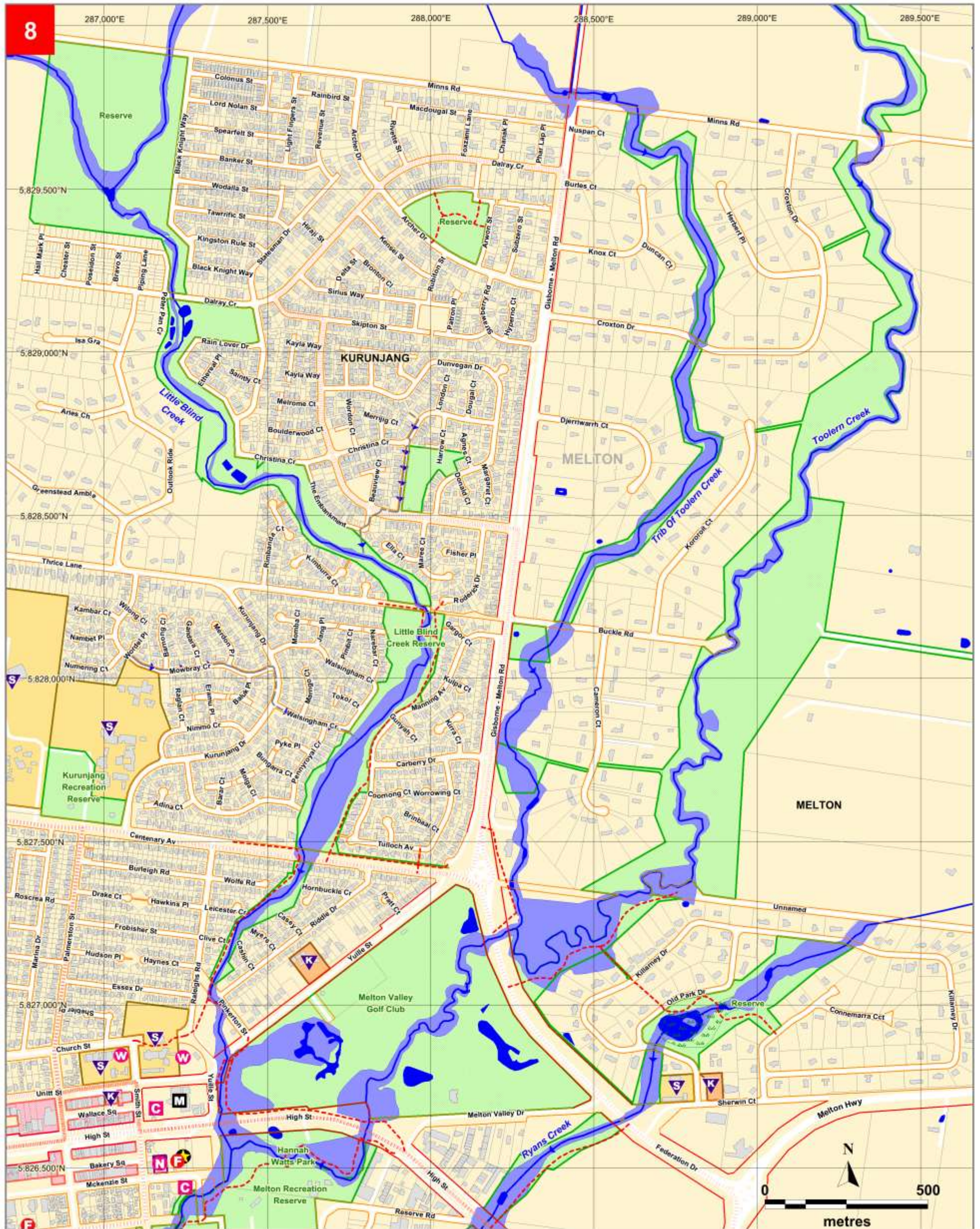
Flood modelling completed by Melbourne Water, June 2008. Map Produced by VICSES June 2018.

- |  |                                                  |  |                  |
|--|--------------------------------------------------|--|------------------|
|  | Building                                         |  | Community Centre |
|  | Waterbody                                        |  | Fire Station     |
|  | 1% AEP Riverine Flood Extent (Depth Unavailable) |  | School / College |
|  | Reserve / Park                                   |  |                  |
|  | River / Creek                                    |  |                  |

**CITY OF MELTON**  
 1% AEP (100yr ARI) Flooding  
**7. Little Blind Creek**  
 (Toolern Vale)



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Toolern Creek Flood modeling completed by PB Australia, December 2007. Little Blind Creek flood modeling completed by Melbourne Water, July 2006. Map Produced by VICBES June 2016.

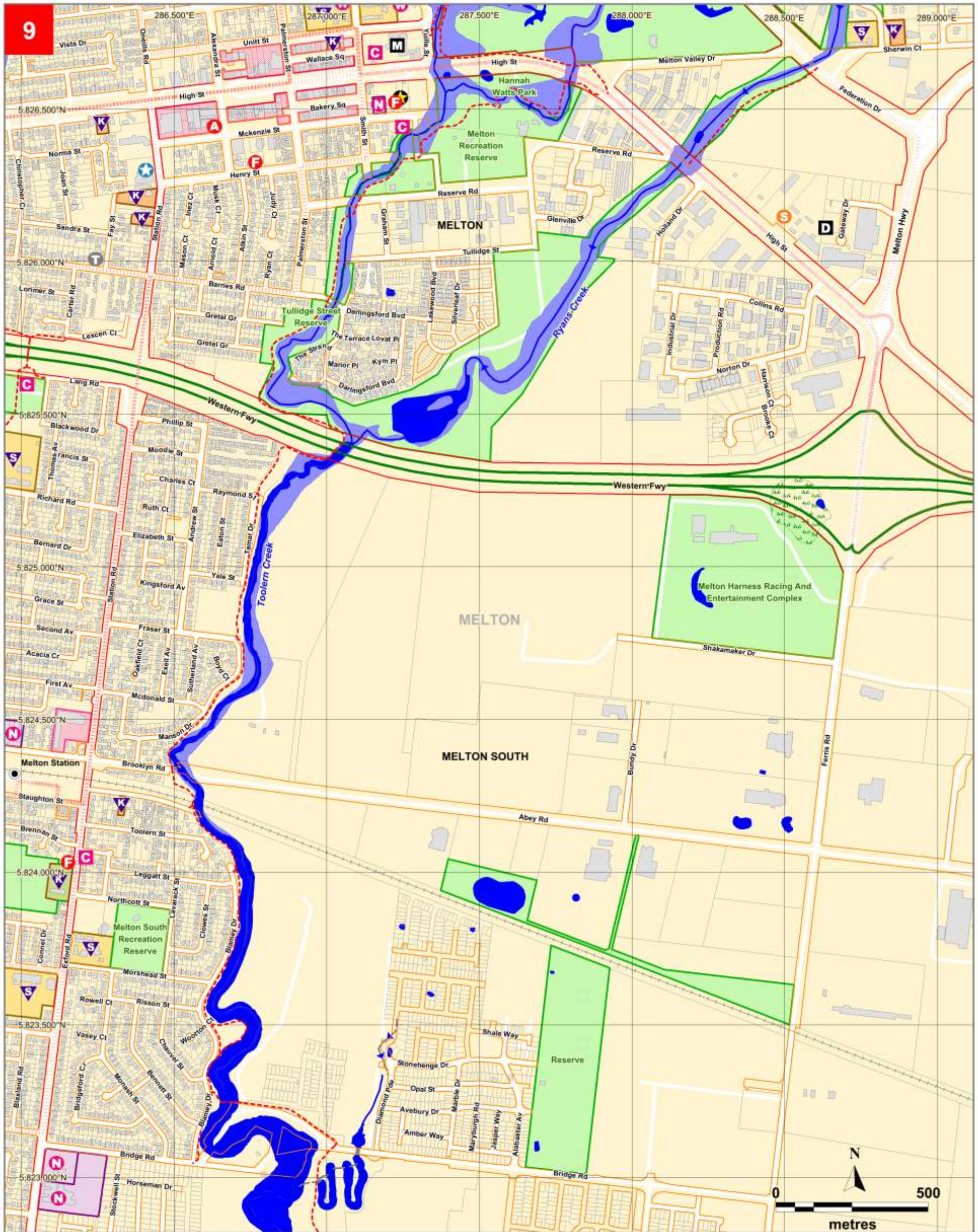
**CITY OF MELTON**  
 1% AEP (100yr ARI) Flooding  
**8. Little Blind Creek & Toolern Creek (Kurunjang)**

- |                                                  |                               |
|--------------------------------------------------|-------------------------------|
| Building                                         | School / College              |
| Waterbody                                        | Nursing Home / Aged Care      |
| 1% AEP Riverine Flood Extent (Depth Unavailable) | Community Centre              |
| Reserve / Park                                   | Fire Station                  |
| Natural Wetland                                  | Kindergarten / Child Care     |
| Shopping Centre                                  | Emergency Coordination Centre |
| River / Creek                                    | Municipal Offices             |
| Bicycle / Walking Trail                          |                               |
| Bus Route (PTV)                                  |                               |



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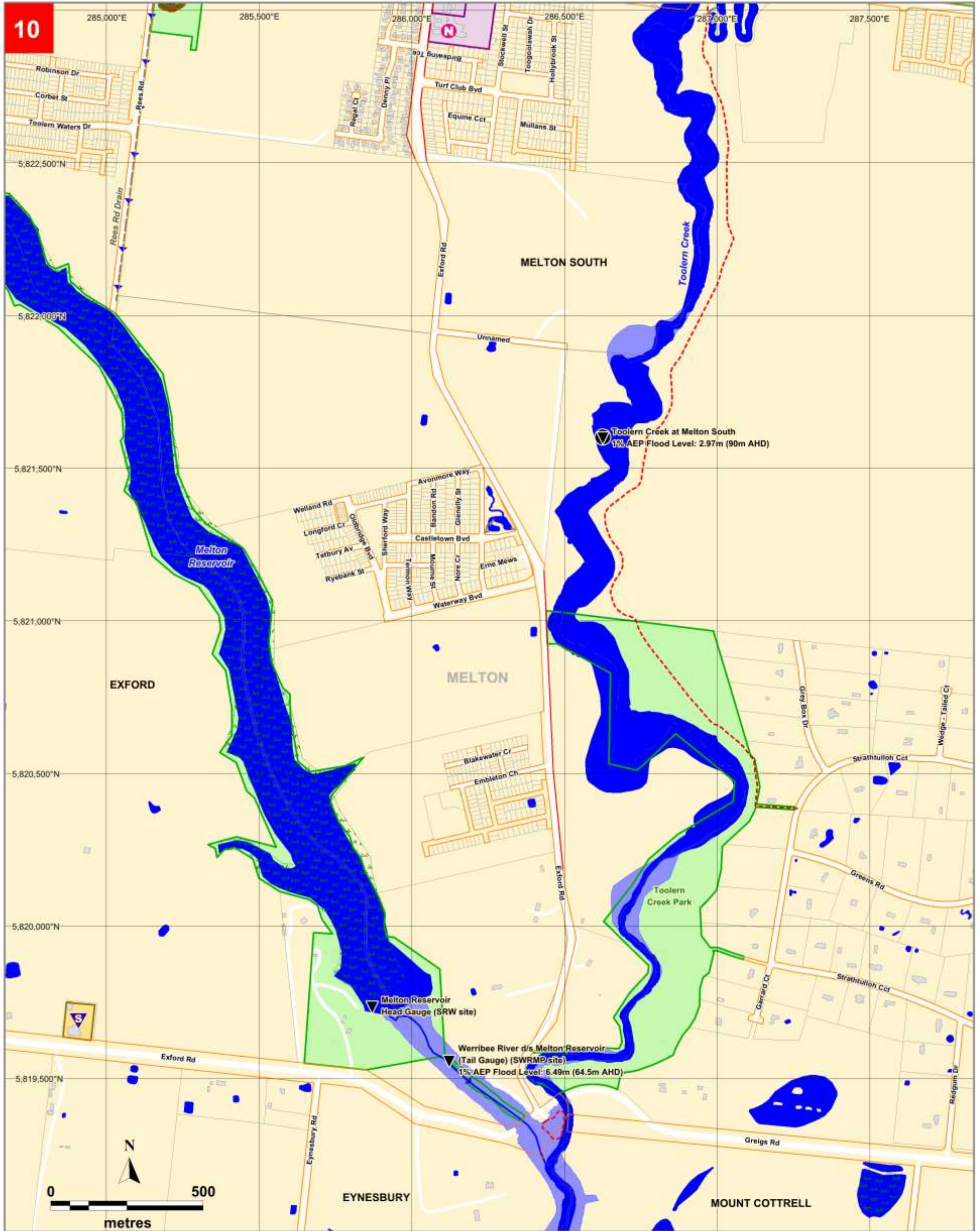
Flood modelling completed by PB Australia, December 2007. Map Produced by VICSES, June 2018

**CITY OF MELTON**  
 1% AEP (100yr ARI) Flooding  
 9. Toolern Creek  
 (Melton)

- |  |                                                  |  |                               |  |                    |
|--|--------------------------------------------------|--|-------------------------------|--|--------------------|
|  | Building                                         |  | School / College              |  | Police Station     |
|  | Waterbody                                        |  | Nursing Home / Aged Care      |  | Telephone Exchange |
|  | 1% AEP Riverine Flood Extent (Depth Unavailable) |  | Community Centre              |  | Municipal Offices  |
|  | Reserve / Park                                   |  | Ambulance Station             |  |                    |
|  | Natural Wetland                                  |  | Fire Station                  |  |                    |
|  | Shopping Centre                                  |  | Kindergarten / Child Care     |  |                    |
|  | River / Creek                                    |  | Emergency Coordination Centre |  |                    |
|  | Bicycle / Walking Trail                          |  |                               |  |                    |
|  | Bus Route (PTV)                                  |  |                               |  |                    |



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Flood modelling completed by Melbourne Water, October 2017. Map Produced by VICSE 5 June 2018.

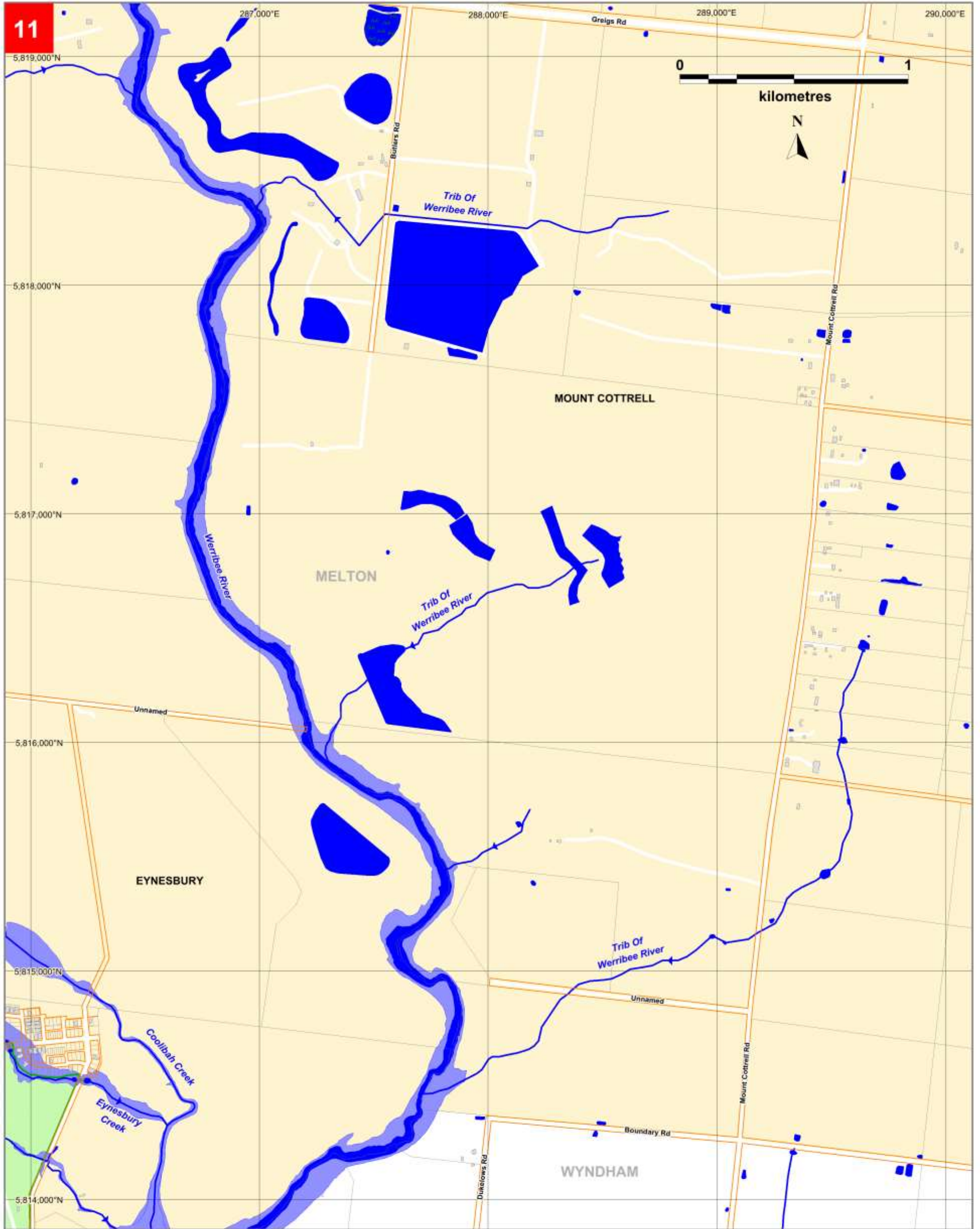
**CITY OF MELTON**  
 1% AEP (100yr ARI) Flooding  
**10. Melton Reservoir**  
**(Melton South)**

- |  |                                                     |  |                                            |
|--|-----------------------------------------------------|--|--------------------------------------------|
|  | Building                                            |  | School / College                           |
|  | Waterbody                                           |  | Nursing Home / Aged Care                   |
|  | 1% AEP Riverine Flood Extent<br>(Depth Unavailable) |  | Stream Level Gauge &<br>1% AEP Flood Level |
|  | Reserve / Park                                      |  | Rain Gauge                                 |
|  | Natural Wetland                                     |  |                                            |
|  | River / Creek                                       |  |                                            |
|  | Melbourne Water<br>Stormwater Drain                 |  |                                            |
|  | Bicycle / Walking Trail                             |  |                                            |



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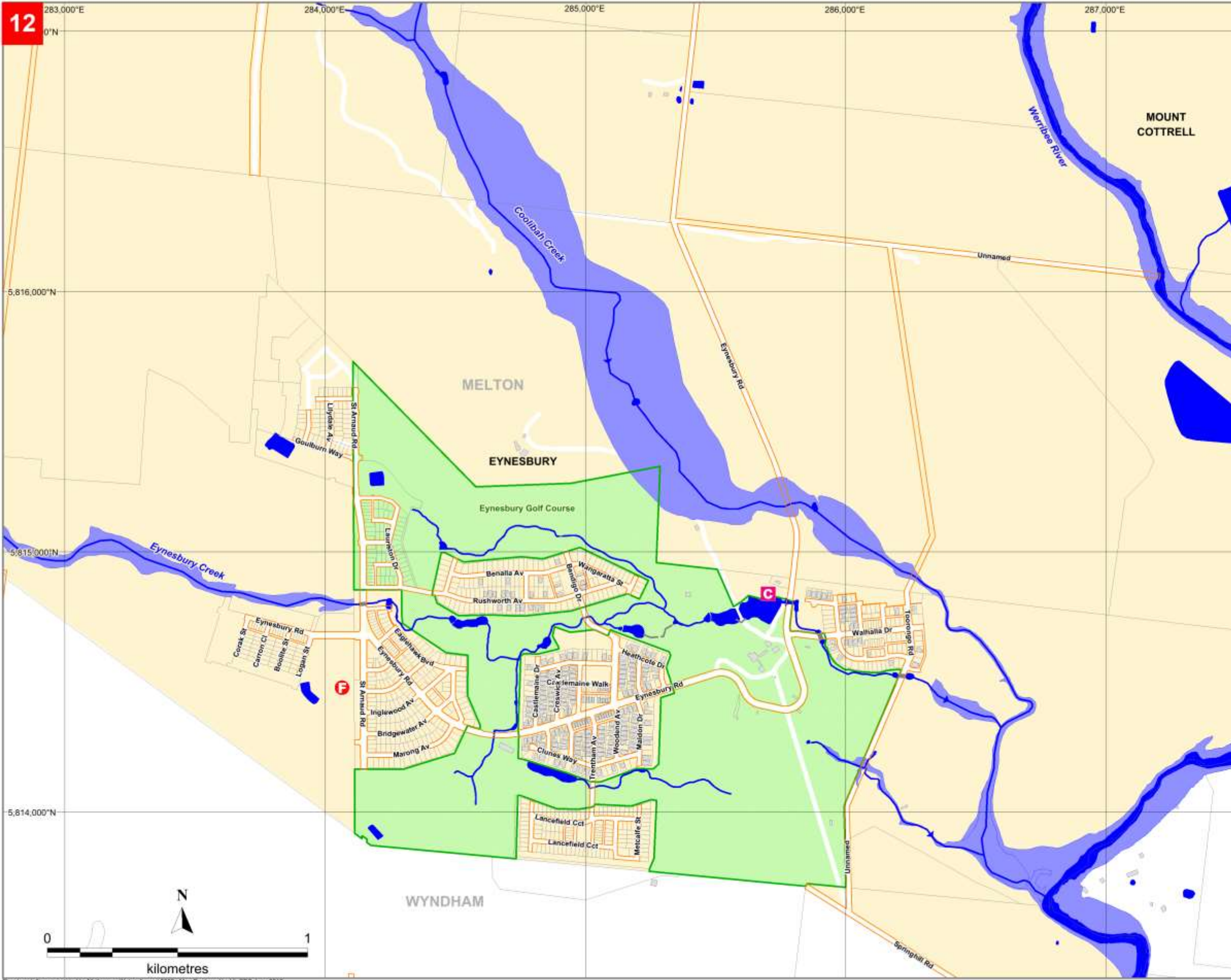
Flood modelling completed by Melbourne Water, October 2017. Map Produced by VICSES June 2018.

- Building
- Waterbody
- 1% AEP Riverine Flood Extent (Depth Unavailable)
- Reserve / Park
- River / Creek

**CITY OF MELTON**  
 1% AEP (100yr ARI) Flooding  
**11. Werribee River**  
**(Mount Cottrell)**



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- Building
- Area of Interest
- Waterbody
- 1% AEP Rivertine Flood Extent (Depth Unavailable)
- Creek / Waterway
- Community Centre
- Fire Station



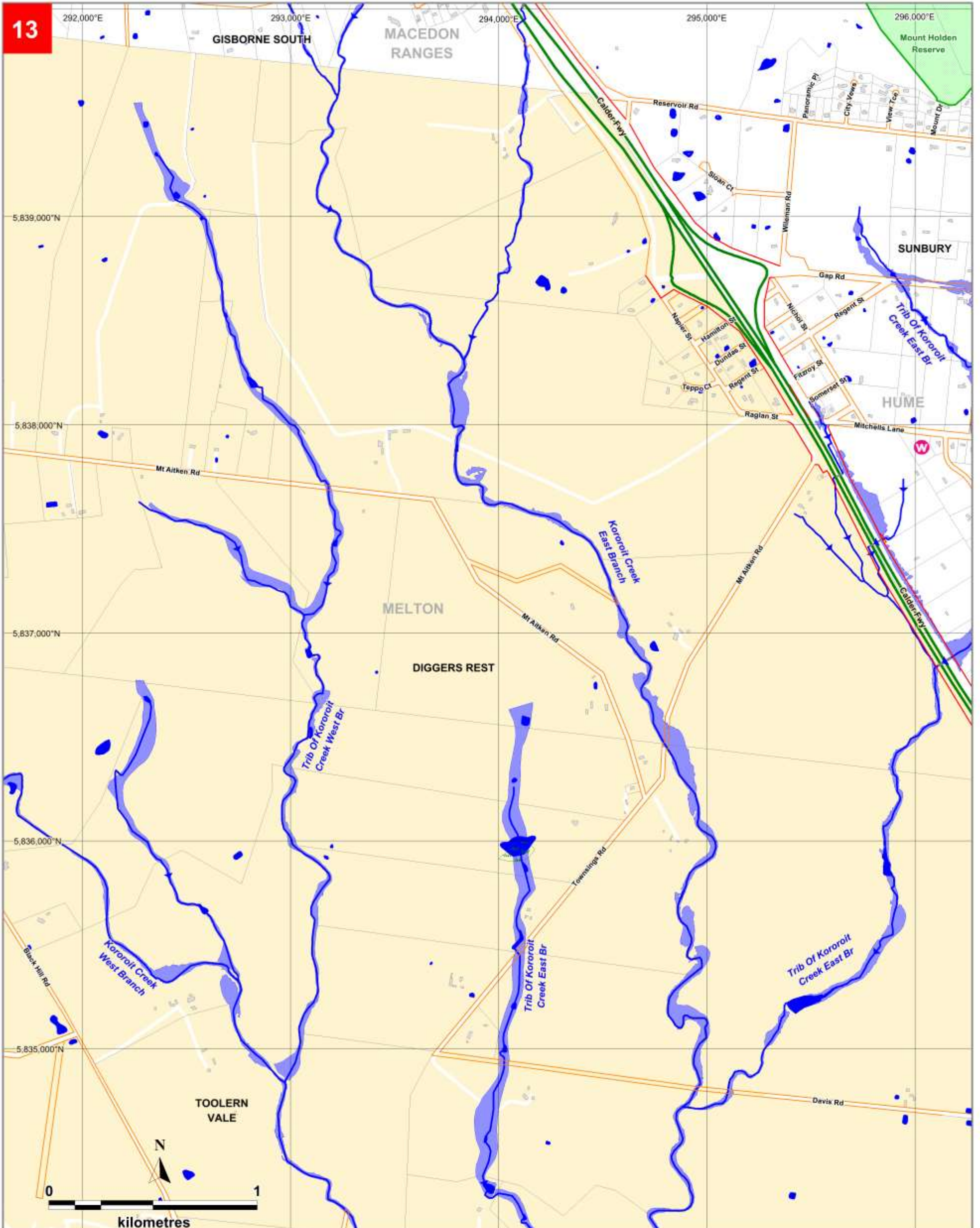
**CITY OF MELTON**  
 1% AEP (100yr ARI) Flooding  
**12. Eynesbury & Coolibah Creeks (Eynesbury)**



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Flood modelling completed by Melbourne Water, August 2008. Map Produced by VicSES June 2018.





Flood modelling completed by Melbourne Water, May 2016. Map Produced by VICSES June 2018.

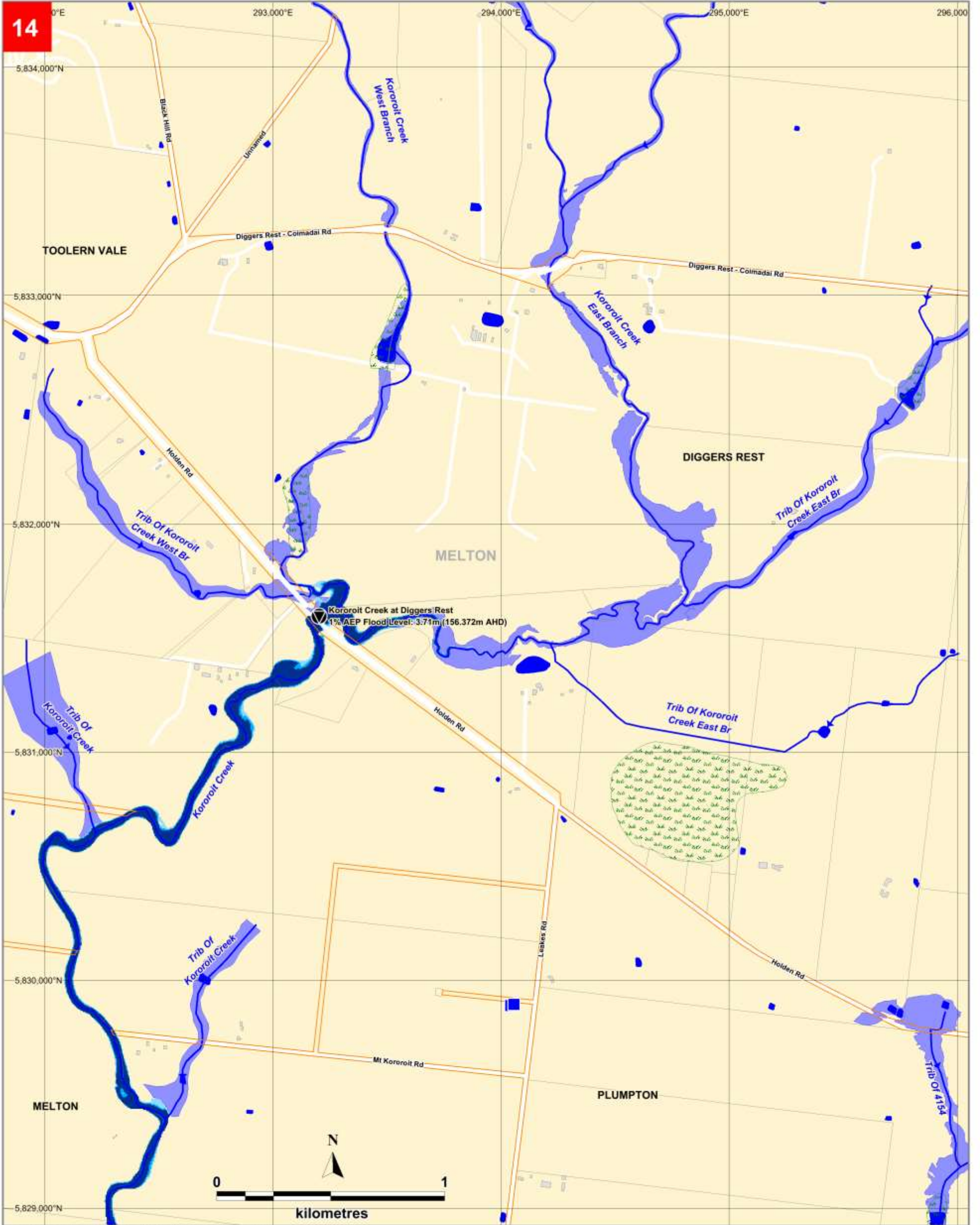
**CITY OF MELTON**  
 1% AEP (100yr ARI) Flooding  
**13. Kororoit Creek East & West Branches (Diggers Rest)**

- Building
- Waterbody
- 1% AEP Riverine Flood Extent (Depth Unavailable)
- Area Of Interest
- River / Creek
- Place Of Worship



**SES VICTORIA** **Melbourne Water**

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Flood modelling completed by Melbourne Water, May 2016. Map Produced by VICSES June 2016.

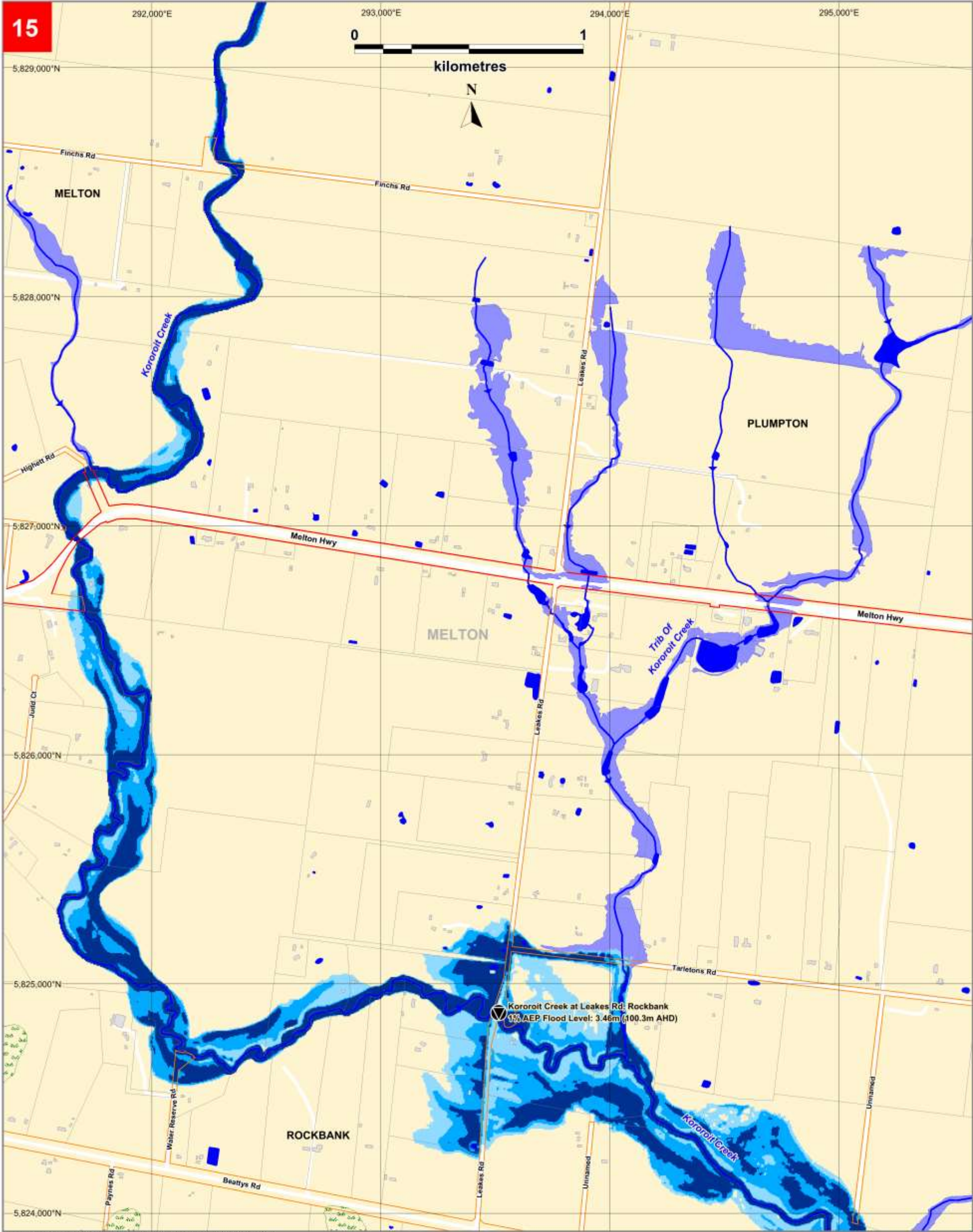
**CITY OF MELTON**  
 1% AEP (100yr ARI) Flooding  
 14. Kororoit Creek  
 (Diggers Rest)

- |                                                     |                                                  |
|-----------------------------------------------------|--------------------------------------------------|
| Building                                            | 1% AEP Riverine Flood Depth<br>Greater than 60cm |
| Waterbody                                           | Between 30cm to 60cm                             |
| 1% AEP Riverine Flood Extent<br>(Depth Unavailable) | Up to 30cm                                       |
| Natural Wetland                                     |                                                  |
| River / Creek                                       |                                                  |
| Stream Level Gauge &<br>1% AEP Flood Level          |                                                  |
| Rain Gauge                                          |                                                  |



**SES VICTORIA Melbourne Water**

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Flood modelling completed by Melbourne Water, May 2016. Map Produced by VICSES June 2016.

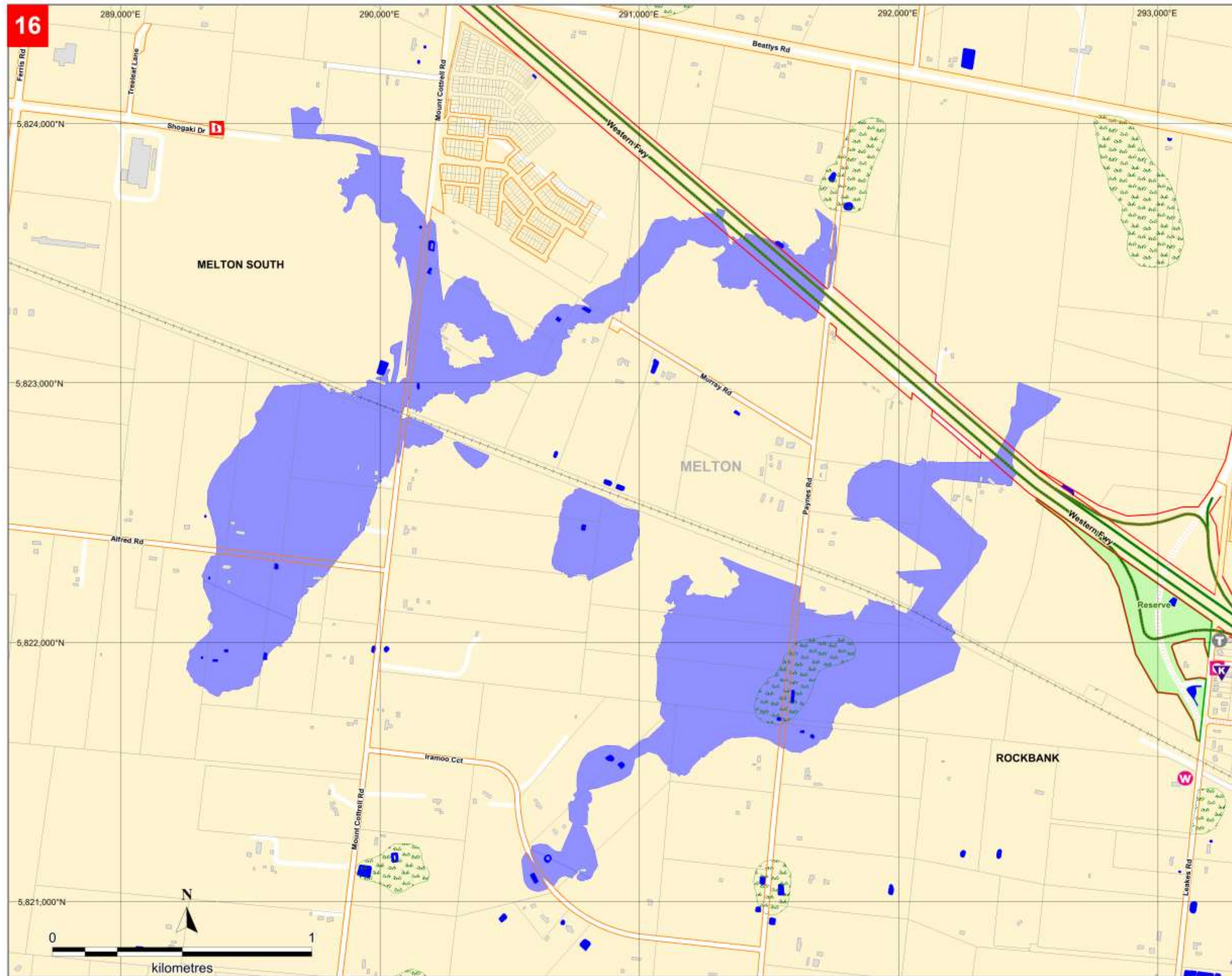
**CITY OF MELTON**  
 1% AEP (100yr ARI) Flooding  
 15. Kororoit Creek  
 (Rockbank)

- |                                                     |                                                  |
|-----------------------------------------------------|--------------------------------------------------|
| Building                                            | 1% AEP Riverine Flood Depth<br>Greater than 60cm |
| Waterbody                                           | Between 30cm to 60cm                             |
| 1% AEP Riverine Flood Extent<br>(Depth Unavailable) | Up to 30cm                                       |
| Natural Wetland                                     |                                                  |
| River / Creek                                       |                                                  |
| Stream Level Gauge &<br>1% AEP Flood Level          |                                                  |
| Rain Gauge                                          |                                                  |



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- Building
- Area of Interest
- Waterbody
- 1% AEP Riverine Flood Extent (Depth Unavailable)
- Natural Wetland
- Creek / Waterway
- Bus Routes (PTV)
- Community Centre
- Kindergarten / Child Care
- Place Of Worship
- Telephone Exchange
- Sewer Pumping Station

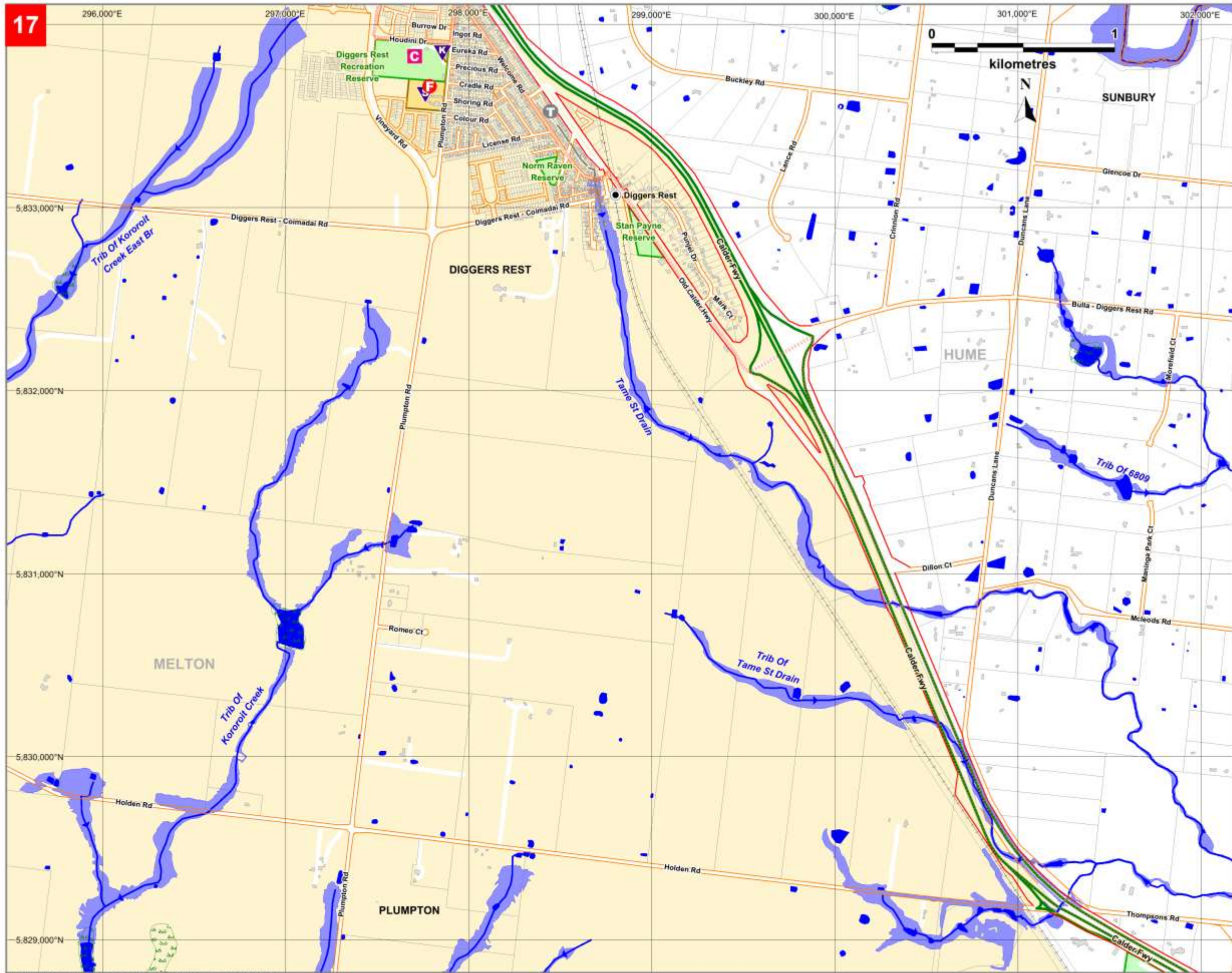


**CITY OF MELTON**  
 1% AEP (100yr ARI) Flooding  
 16. Paynes & Mount Cottrell Roads (Rockbank)



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Flood modelling completed by Melbourne Water, May 2009. Map Produced by VicSES, June 2018.



- Building
- Area of Interest
- Waterbody
- 1% AEP Riverine Flood Extent (Depth Unavailable)
- Natural Wetland
- Creek / Waterway
- Bus Routes (PTV)
- Kindergarten / Child Care
- School / College
- Community Centre
- Fire Station
- Telephone Exchange



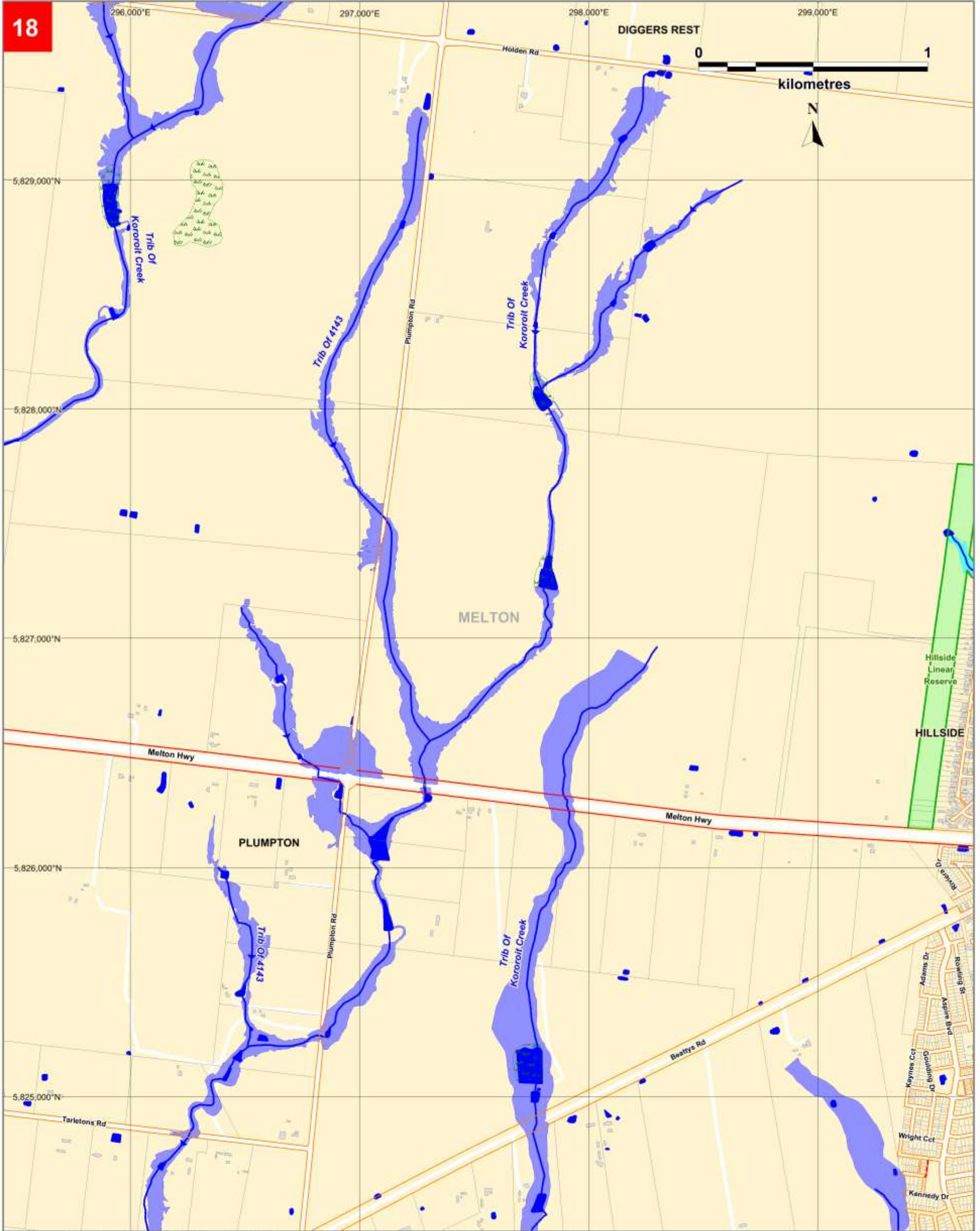
**CITY OF MELTON**  
 1% AEP (100yr ARI) Flooding  
**17. Tame St Drain**  
**(Diggers Rest)**



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Flood modelling completed by Melbourne Water, May 2018. Map Produced by VicSES June 2018.

18



Flood modelling completed by Melbourne Water, May 2016. Map Produced by VICSES, June 2018.

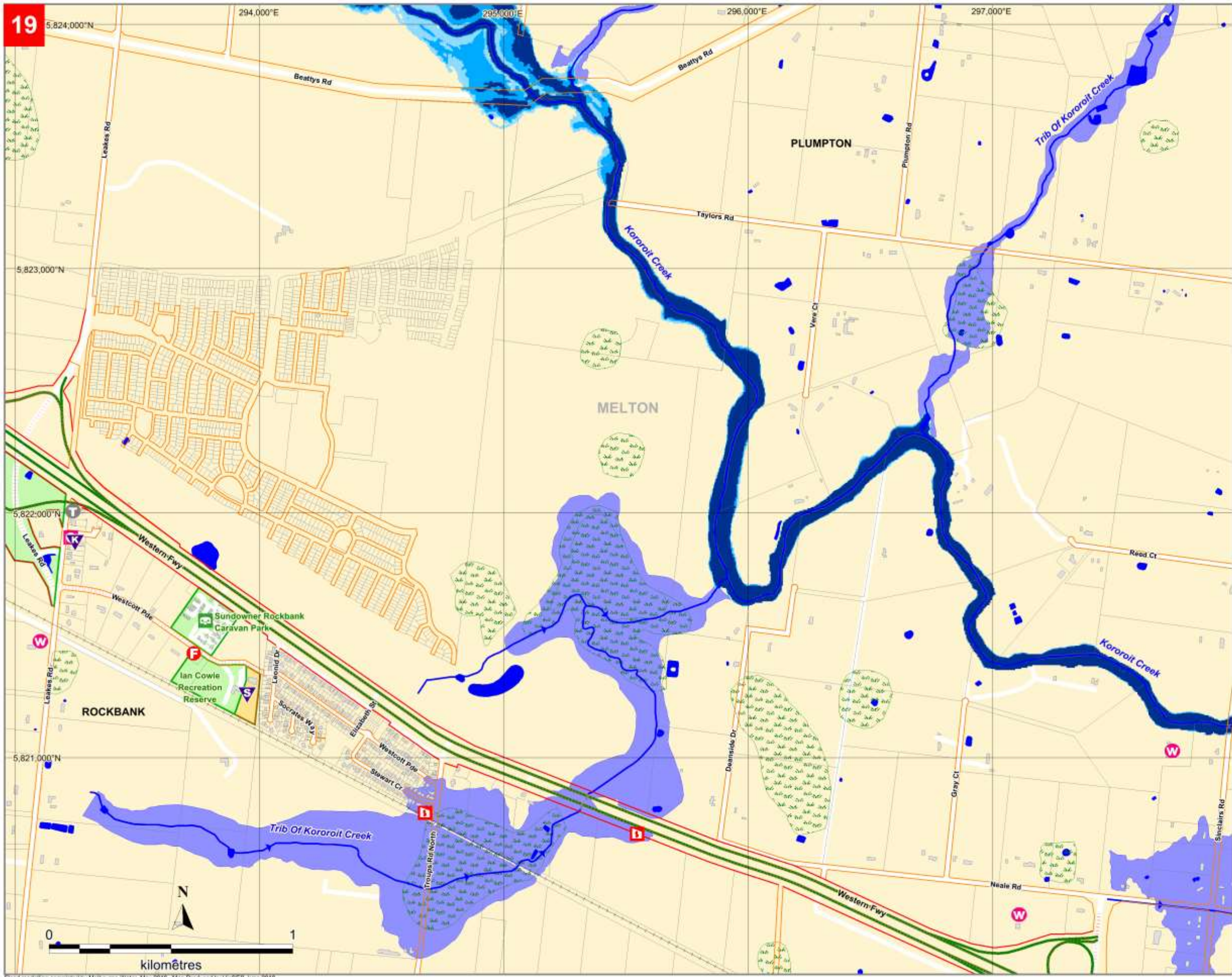
**CITY OF MELTON**  
 1% AEP (100yr ARI) Flooding  
 18. Tributary of Kororoit Creek  
 (Plumpton)

-  Building
-  Waterbody
-  1% AEP Riverine Flood Extent (Depth Unavailable)
-  Natural Wetland
-  River / Creek
-  Area of Interest



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- Building
- Area of Interest
- Waterbody
- 1% AEP Riverine Flood Extent (Depth Unavailable)
- Natural Wetland
- 1% AEP Flood Depth**
- Greater than 60cm
- Between 30cm and 60cm
- Up to 30cm
- Creek / Waterway
- Bus Routes (PTV)
- Community Centre
- Kindergarten / Child Care
- Place Of Worship
- Telephone Exchange
- Fire Station
- School / College
- Caravan Park
- Sewer Pumping Station

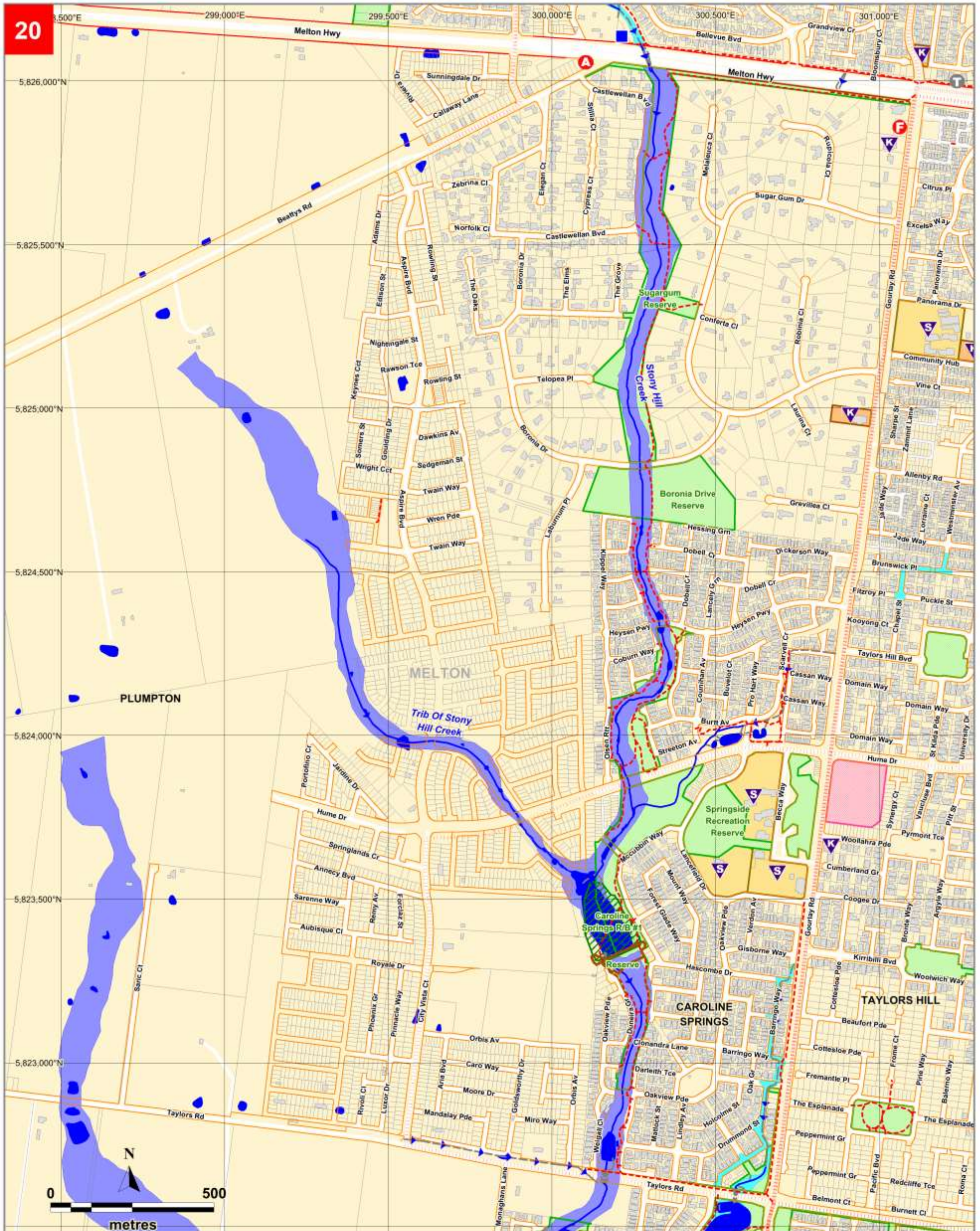


**CITY OF MELTON**  
 1% AEP (100yr ARI) Flooding  
**19. Kororoit Creek (Plumpton)**



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Flood modeling compiled by Melbourne Water, May 2016. Map Produced by VicSES June 2018.



Flood modelling completed by Melbourne Water, June 2008. Map Produced by VICSES June 2018.

**CITY OF MELTON**  
 1% AEP (100yr ARI) Flooding  
**20. Stony Hill Creek**  
**(Plumpton)**

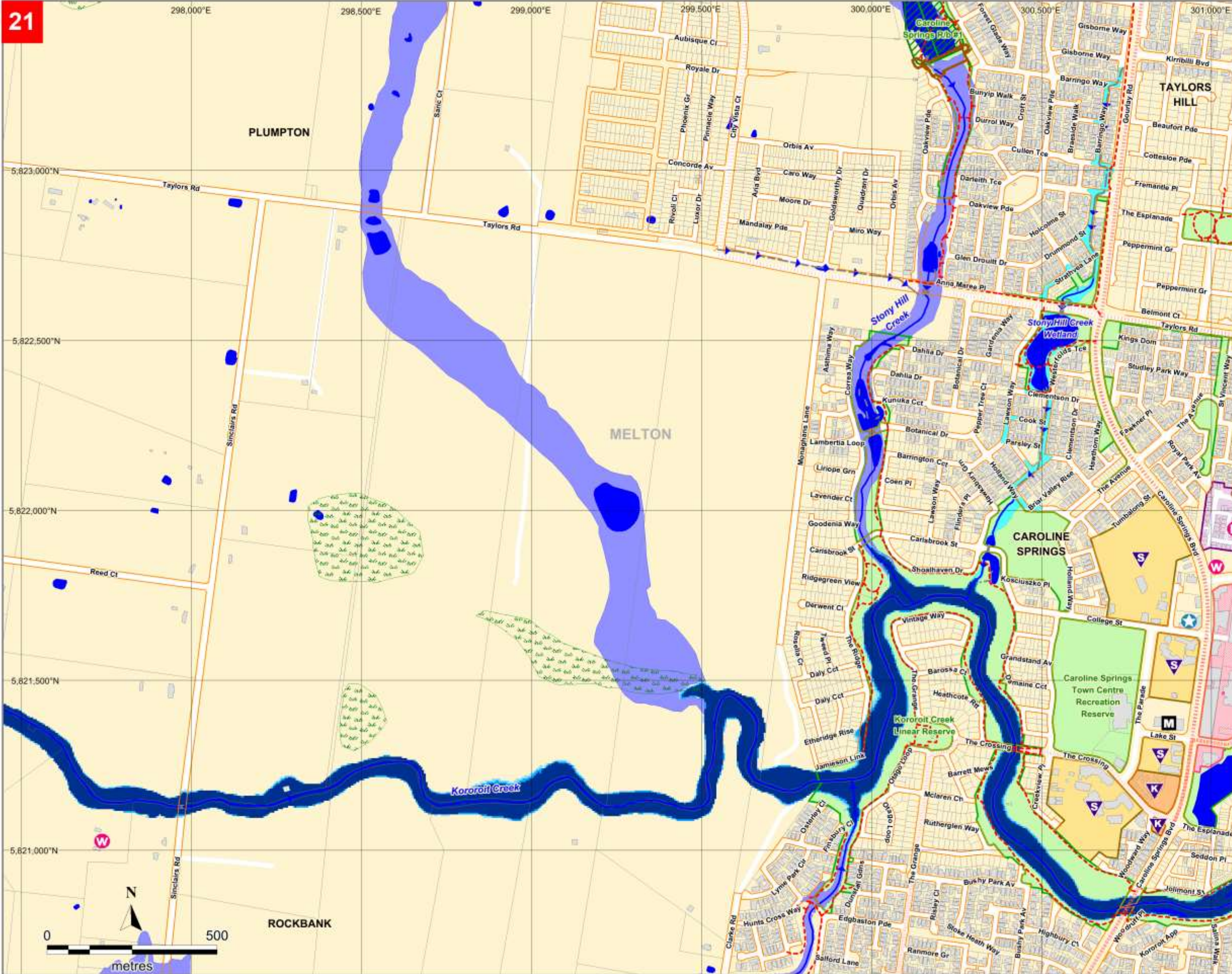
- |                                                  |                                  |                      |
|--------------------------------------------------|----------------------------------|----------------------|
| Building                                         | Shopping Centre                  | Retail Water Storage |
| Waterbody                                        | Melbourne Water Stormwater Drain |                      |
| 1% AEP Riverine Flood Extent (Depth Unavailable) | Embankment                       |                      |
| Reserve / Park                                   | School / College                 |                      |
| 1% AEP Flash Flood Extent (Depth Unavailable)    | Kindergarten / Child Care        |                      |
| Melbourne Water Retarding Basin                  | Ambulance Station                |                      |
| River / Creek                                    | Fire Station                     |                      |
| Bicycle / Walking Trail                          | Telephone Exchange               |                      |
| Bus Route (PTV)                                  |                                  |                      |



**SES VICTORIA** **Melbourne Water**

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- Building
- Area of Interest
- Waterbody
- 1% AEP Riverine Flood Extent (Depth Unavailable)
- Natural Wetland
- 1% AEP Flood Depth**
  - Greater than 60cm
  - Between 30cm and 60cm
  - Up to 30cm
- Shopping Centre
- Melbourne Water Retarding Basin
- Melbourne Water Stormwater Drain
- Bicycle / Walking Trail
- Embankment
- Creek / Waterway
- Bus Routes (PTV)
- Kindergarten / Child Care
- Place Of Worship
- School / College
- Police Station

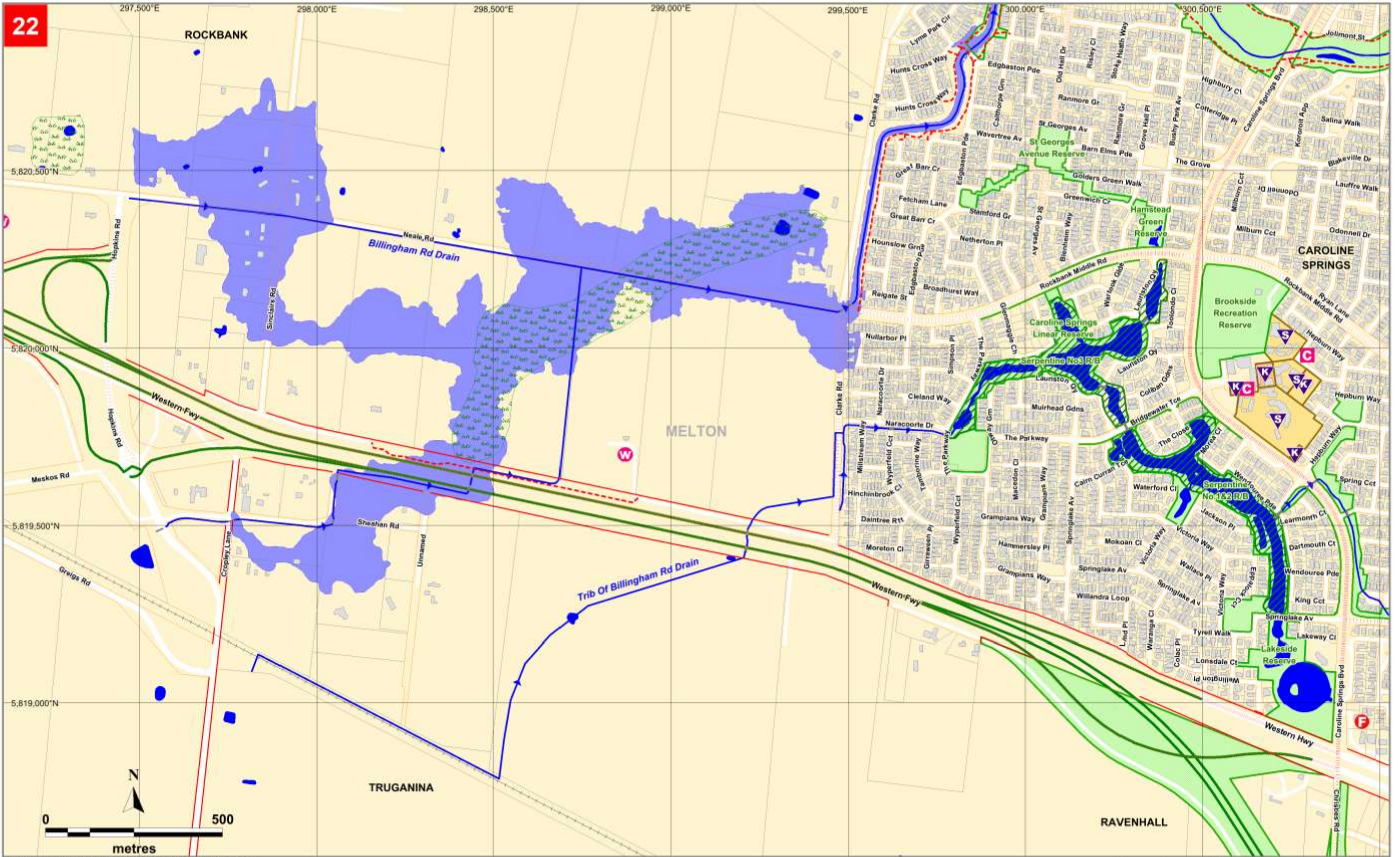


**CITY OF MELTON**  
 1% AEP (100yr ARI) Flooding  
**21. Kororoit Creek**  
 (Caroline Springs)



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Flood modelling completed by Melbourne Water, May 2018. Map Produced by VicSES June 2018



Flood Mapping completed by Engeny, February 2012. Map Produced by VicSES June 2018.

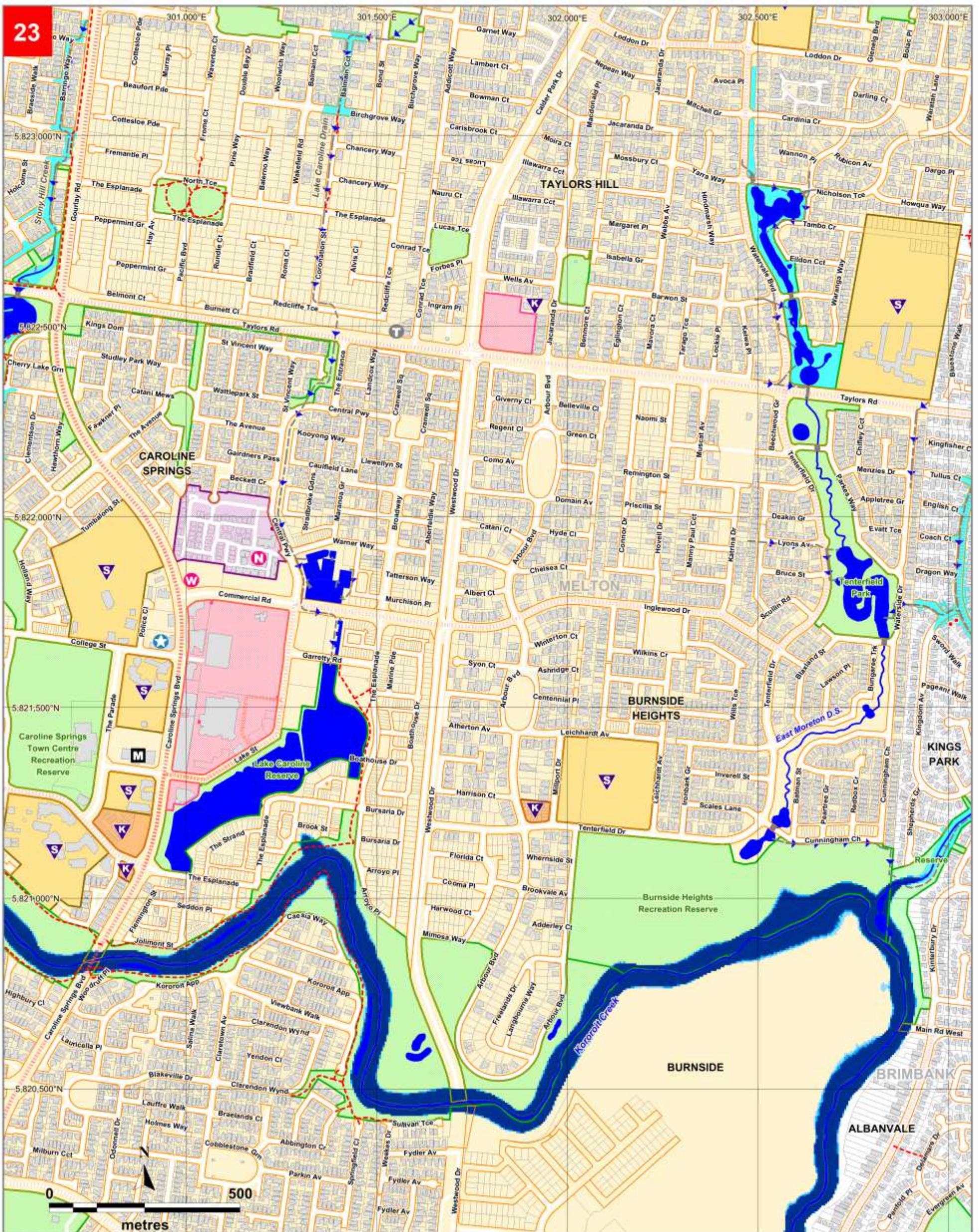
**CITY OF MELTON**  
 1% AEP (100yr ARI) Flooding  
**22. Billingham Road Drain**  
 (Rockbank)

- |                                                  |                                  |                           |
|--------------------------------------------------|----------------------------------|---------------------------|
| Building                                         | Creek / Channel                  | Community Centre          |
| Area of Interest                                 | Melbourne Water Stormwater Drain | School / College          |
| Waterbody                                        | Bicycle / Walking Trail          | Kindergarten / Child Care |
| 1% AEP Riverine Flood Extent (Depth Unavailable) | Bus Route (PTV)                  | Place Of Worship          |
| Melbourne Water Retarding Basin                  |                                  | Fire Station              |
| Natural Wetland                                  |                                  |                           |



**SES VICTORIA** **Melbourne Water**

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Flood modeling completed by Melbourne Water, May 2016. Map Produced by VICSES June 2016.

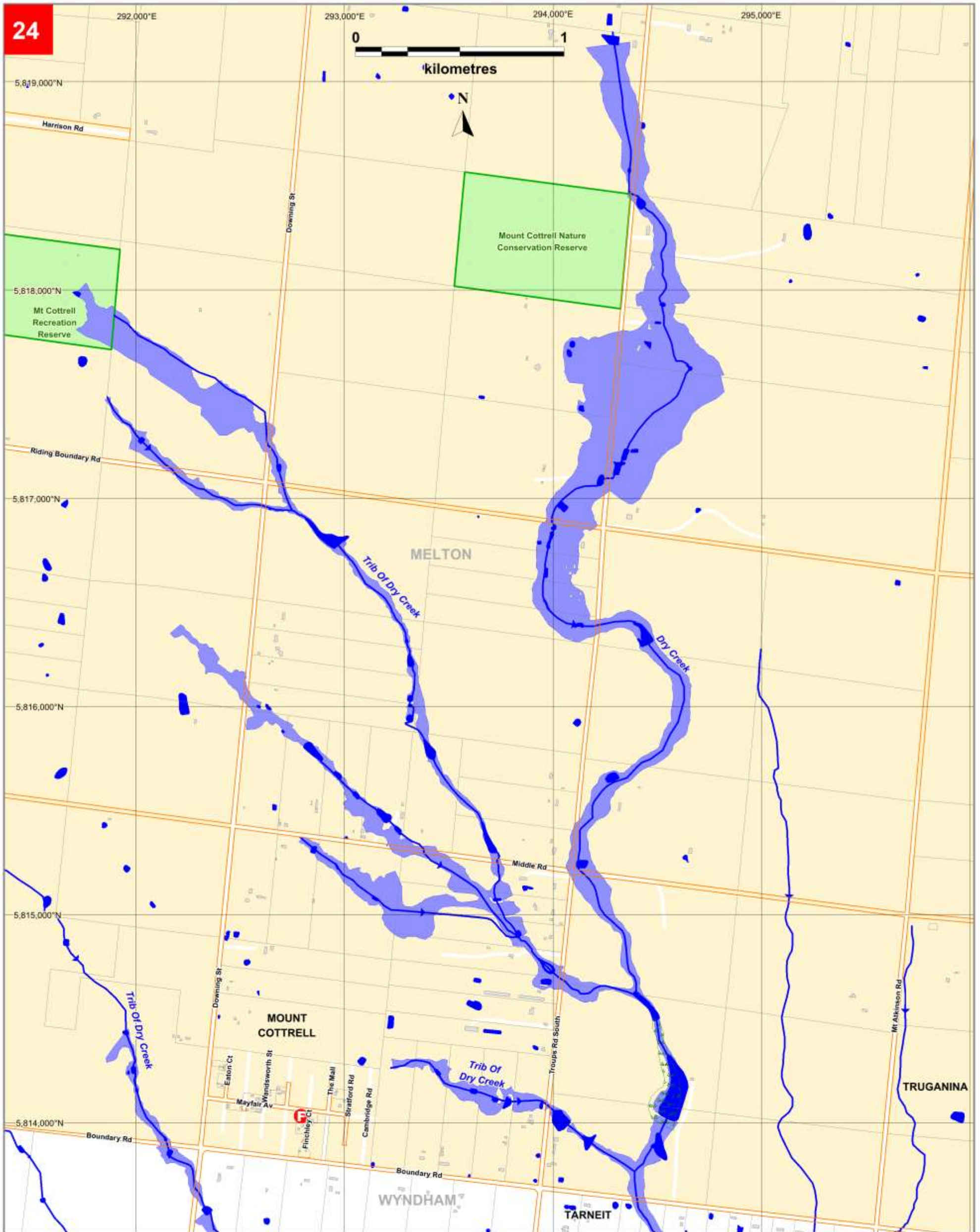
**CITY OF MELTON**  
 1% AEP (100yr ARI) Flooding  
**23. Kororoit Creek (Burnside)**

- |                                                  |                                  |                          |
|--------------------------------------------------|----------------------------------|--------------------------|
| Building                                         | Shopping Centre                  | Place Of Worship         |
| Waterbody                                        | Melbourne Water Stormwater Drain | Nursing Home / Aged Care |
| 1% AEP Riverine Flood Extent (Depth Unavailable) | River / Creek                    | Police Station           |
| Reserve / Park                                   | Bicycle / Walking Trail          |                          |
| 1% AEP Flash Flood Extent (Depth Unavailable)    | Bus Route (PTV)                  |                          |
| 1% AEP Flood Depth Greater than 60cm             | School / College                 |                          |
| Between 30cm 60cm                                | Kindergarten / Child Care        |                          |
| Up to 30cm                                       |                                  |                          |



**SES VICTORIA** **Melbourne Water**

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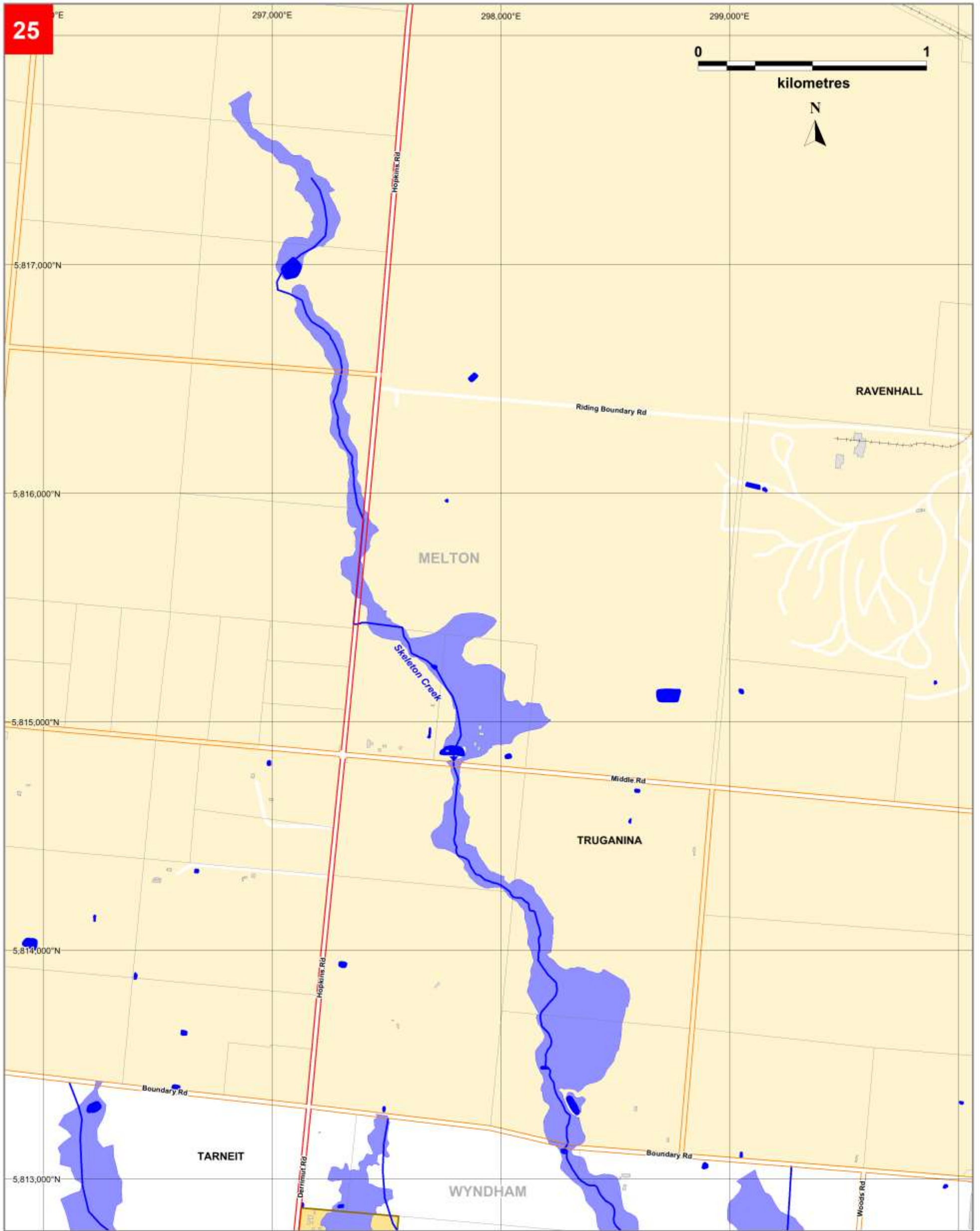
Flood modeling completed by Melbourne Water, July 2008. Map Produced by VICSES June 2018.

-  Building
-  Waterbody
-  1% AEP Rivertine Flood Extent (Depth Unavailable)
-  Reserve / Park
-  River / Creek
-  Fire Station

**CITY OF MELTON**  
 1% AEP (100yr ARI) Flooding  
**24. Dry Creek**  
**(Mount Cottrell)**



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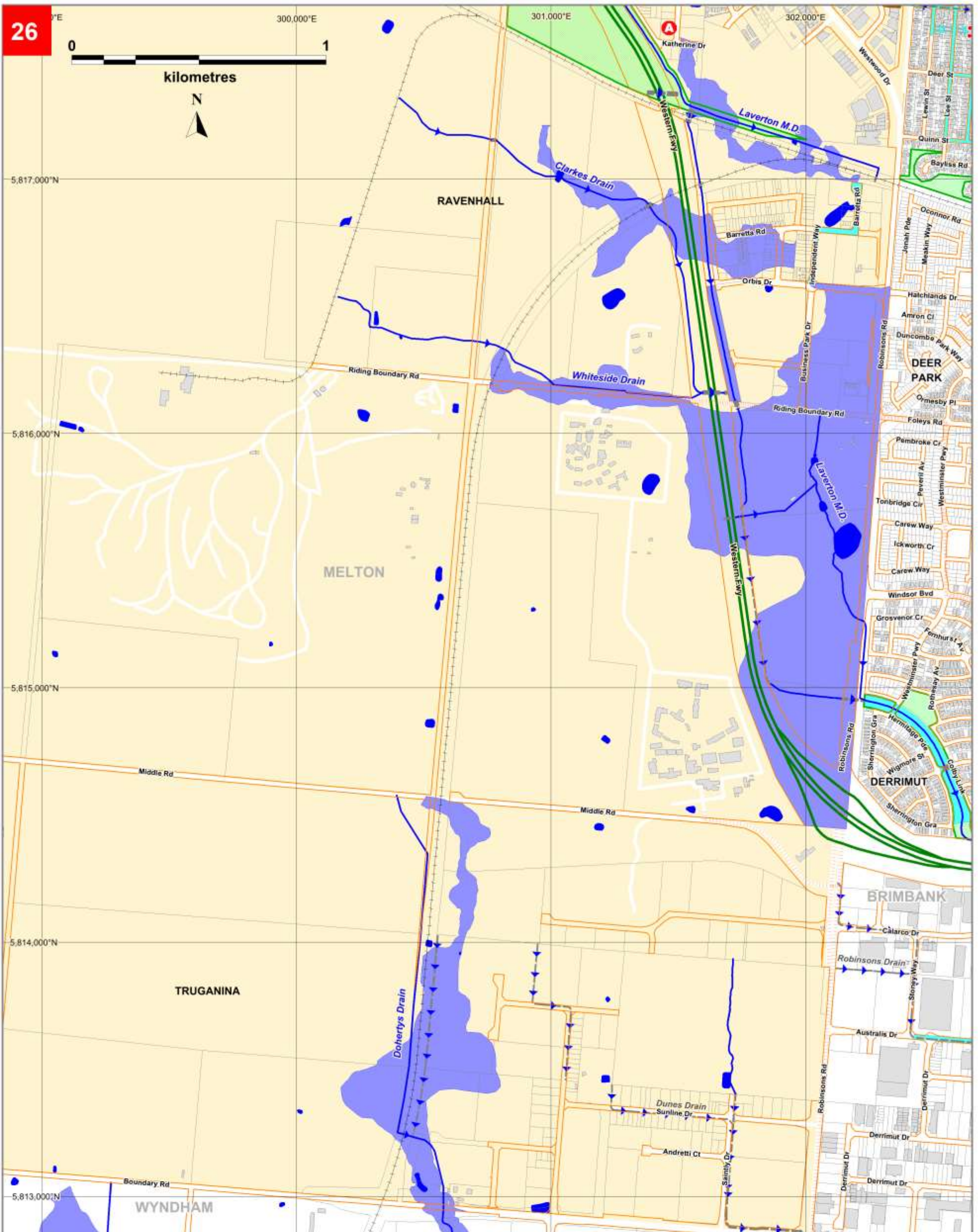
Flood modeling completed by Melbourne Water, July 2008. Map Produced by VICSES June 2018.

-  Building
-  Waterbody
-  1% AEP Riverine Flood Extent (Depth Unavailable)
-  River / Creek

**CITY OF MELTON**  
 1% AEP (100yr ARI) Flooding  
**25. Skeleton Creek**  
 (Truganina)



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Flood modelling completed by Melbourne Water, July 2008. Map Produced by VIC-SES June 2018

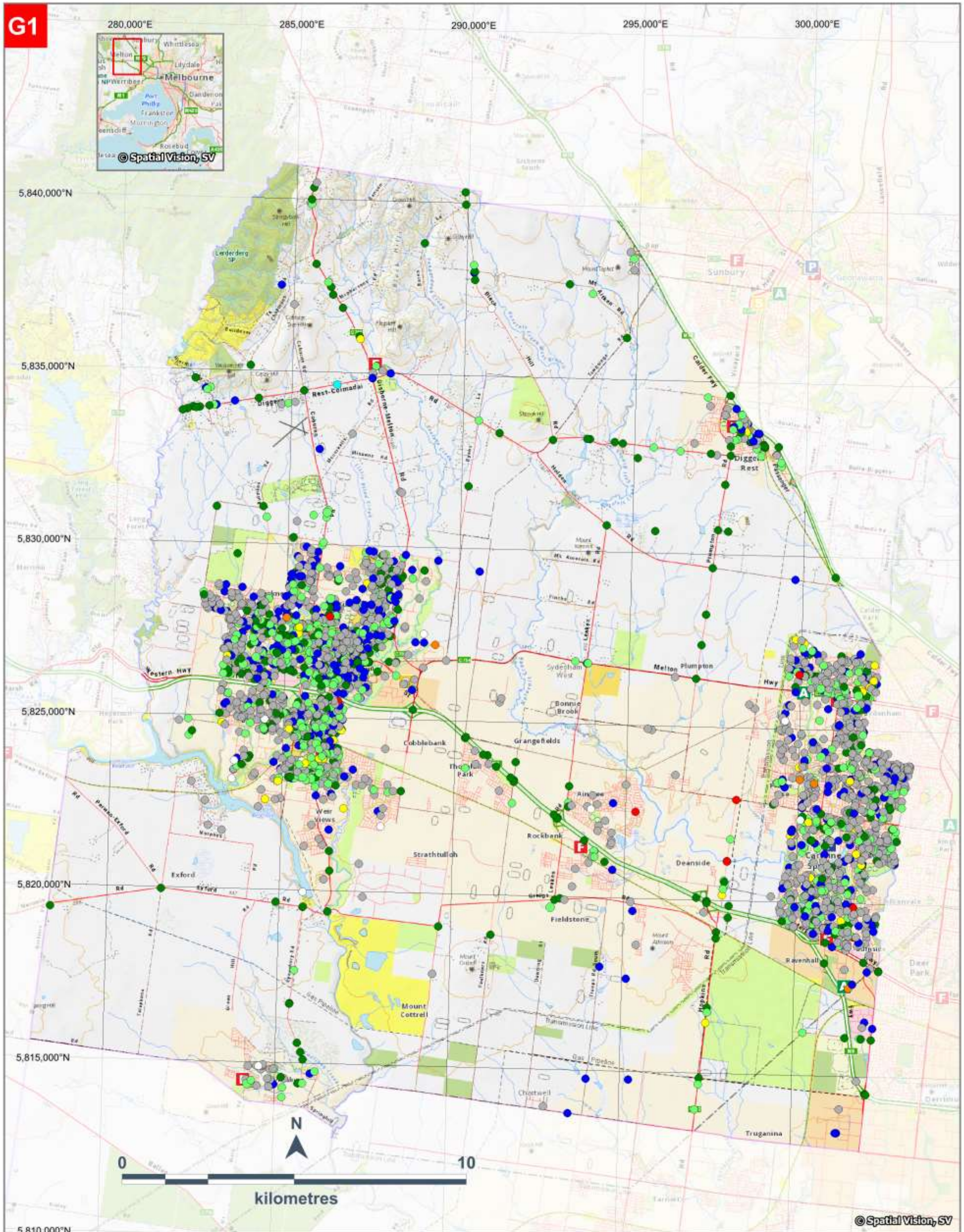
- |                                                                                                                                      |                                                                                                                      |
|--------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
|  Building                                         |  River / Creek                    |
|  Waterbody                                        |  Melbourne Water Stormwater Drain |
|  1% AEP Riverine Flood Extent (Depth Unavailable) |  Bus Routes (PTV)                 |
|  1% AEP Flash Flood Extent (Depth Unavailable)    |  Ambulance Station                |
|  Reserve / Park                                   |                                                                                                                      |

**CITY OF MELTON**  
 1% AEP (100yr ARI) Flooding  
**26. Laverton Main Drain**  
 (Ravenhall)



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# Severe Weather VICSES Requests for Assistance Maps



Map Produced by VICSES February 2022

## CITY OF MELTON

Version 5: February 2022

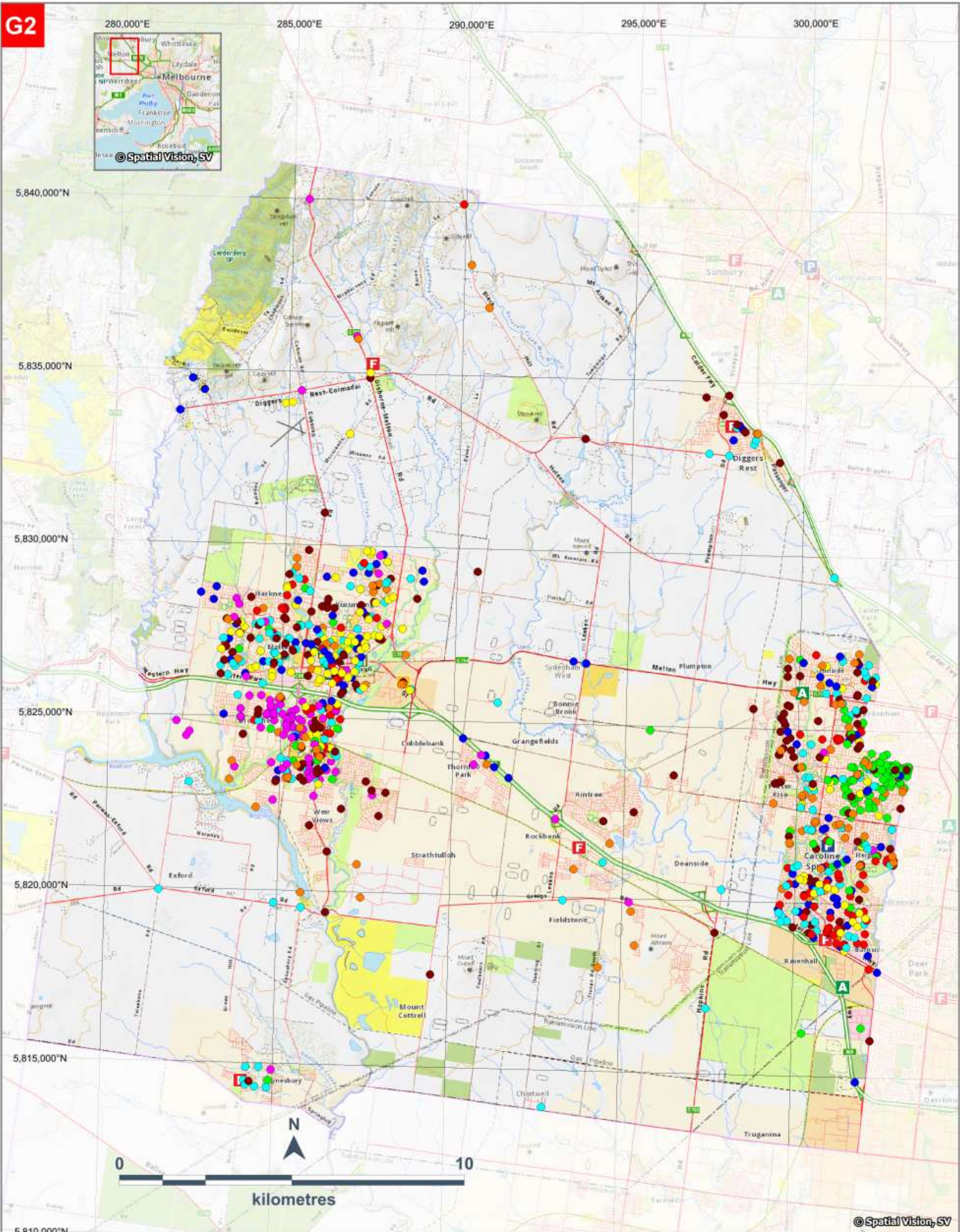
G1. VICSES Severe Weather Requests for Assistance by Job Type (July 2009 - Dec 2021)

- |  |                         |  |                                    |
|--|-------------------------|--|------------------------------------|
|  | Waterbody               |  | Support Other Agency (2)           |
|  | State Emergency Service |  | Building Damage (1,705)            |
|  | Municipal Office        |  | Dam Incident (1)                   |
|  | Police Station          |  | Flooding (479)                     |
|  | Fire Station            |  | Loose Debris / Object / Fence (47) |
|  | Ambulance Station       |  | Other (28)                         |
|  |                         |  | Rescue (10)                        |
|  |                         |  | Sandbag Request (6)                |
|  |                         |  | Tree Down (802)                    |
|  |                         |  | Tree Down Traffic Hazard (434)     |

LAND USE	
	Residential
	Commercial and Business
	Industrial
	Public Parks / Cemeteries / Recreation
	Utilities and Local Government Facilities
	Education



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Map Produced by VICSES February 2022.

## CITY OF MELTON

Version 5: February 2022

### G2. VICSES Severe Weather Requests for Assistance by Event (July 2009 - December 2021)

- Waterbody
- State Emergency Service
- Municipal Office
- Police Station
- Fire Station
- Ambulance Station

- VICSES Severe Weather RFAs (Storm or Flood)**  
Where >100 Requests Received for Month
- February 2010 (113)
  - March 2010 (142)
  - December 2011 (148)
  - October 2013 (158)
  - October 2016 (111)
  - January 2019 (103)
  - October 2021 (183)
  - November 2021 (105)

- LAND USE**
- Residential
  - Commercial and Business
  - Industrial
  - Public Parks / Cemeteries / Recreation
  - Utilities and Local Government Facilities
  - Education



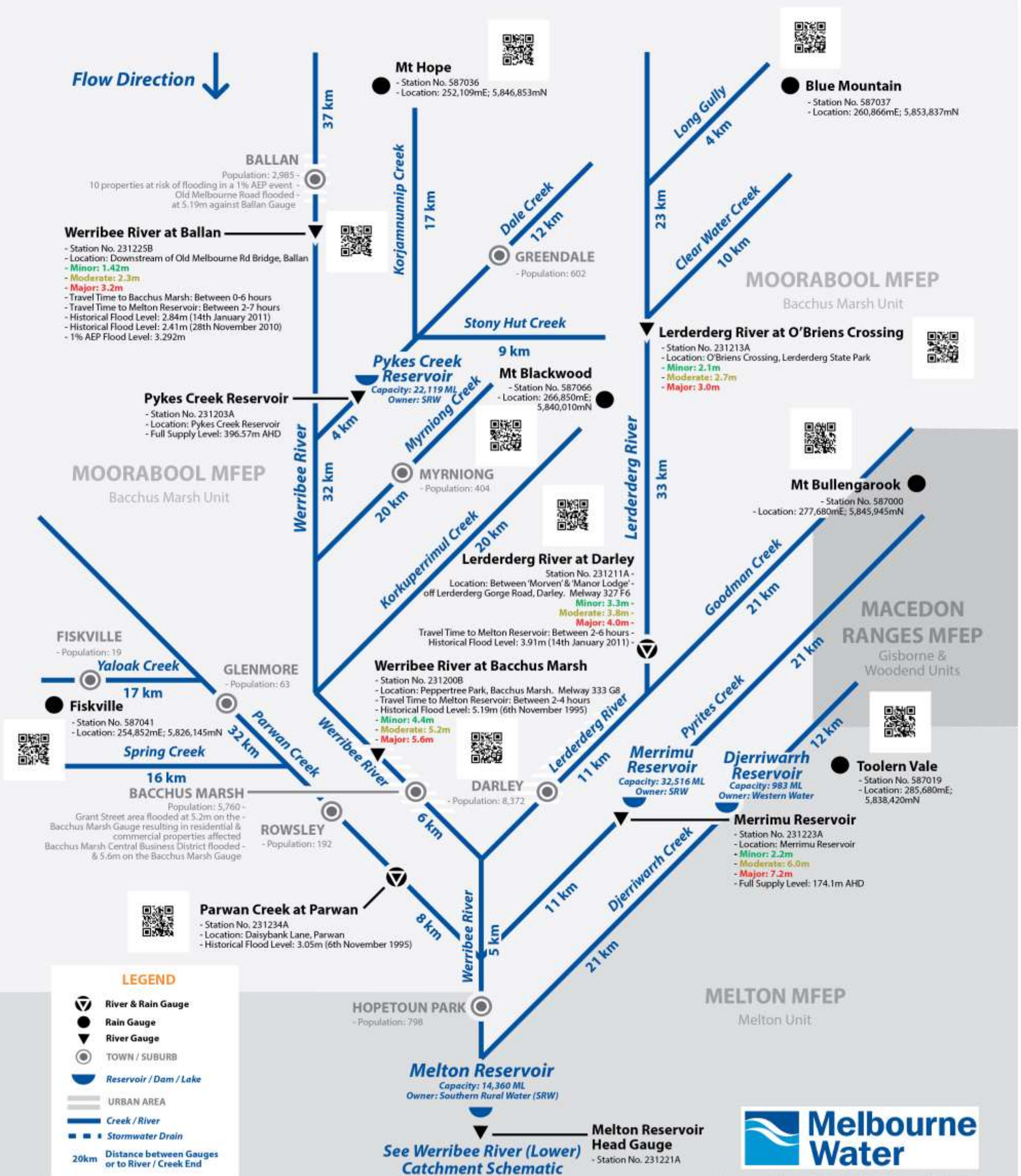
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# Werribee River (Upper) Catchment Schematic

Version 3 - June 2021



Schematic Not To Scale

Information Sources: Melbourne Water Flood Warning Manual; Municipal Flood Emergency Plans; Melbourne Water GIS; Melbourne Water HYDSTRA Database; ABS Census 2016

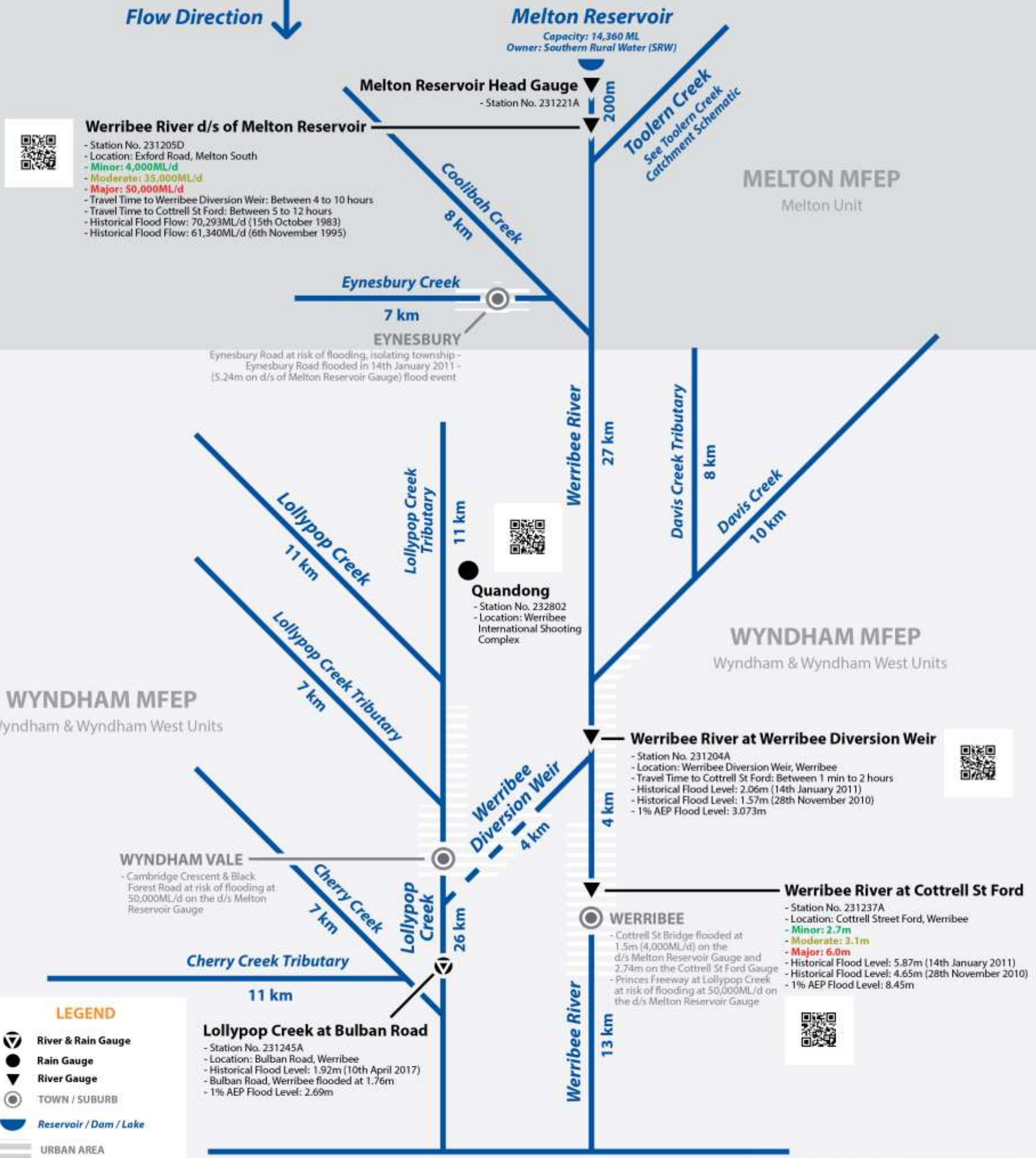
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# Werribee River (Lower) & Lollypop Creek Catchment Schematic

Version 4 - June 2021

Flow Direction ↓



**Werribee River d/s of Melton Reservoir**

- Station No. 231205D
- Location: Exford Road, Melton South
- Minor: 4,000ML/d
- Moderate: 35,000ML/d
- Major: 50,000ML/d
- Travel Time to Werribee Diversion Weir: Between 4 to 10 hours
- Travel Time to Cottrell St Ford: Between 5 to 12 hours
- Historical Flood Flow: 70,293ML/d (15th October 1983)
- Historical Flood Flow: 61,340ML/d (6th November 1995)

**WYNDHAM MFEP**  
Wyndham & Wyndham West Units

**WYNDHAM VALE**  
- Cambridge Crescent & Black Forest Road at risk of flooding at 50,000ML/d on the d/s Melton Reservoir Gauge

**LEGEND**

- River & Rain Gauge
- Rain Gauge
- River Gauge
- TOWN / SUBURB
- Reservoir / Dam / Lake
- URBAN AREA
- Creek / River
- Stormwater Drain
- 20km Distance between Gauges or to River / Creek End

Schematic Not To Scale

Information Sources: Melbourne Water Flood Warning Manual; Municipal Flood Emergency Plans; Melbourne Water GIS; Melbourne Water HYDSTRA Database; ABS Census 2016



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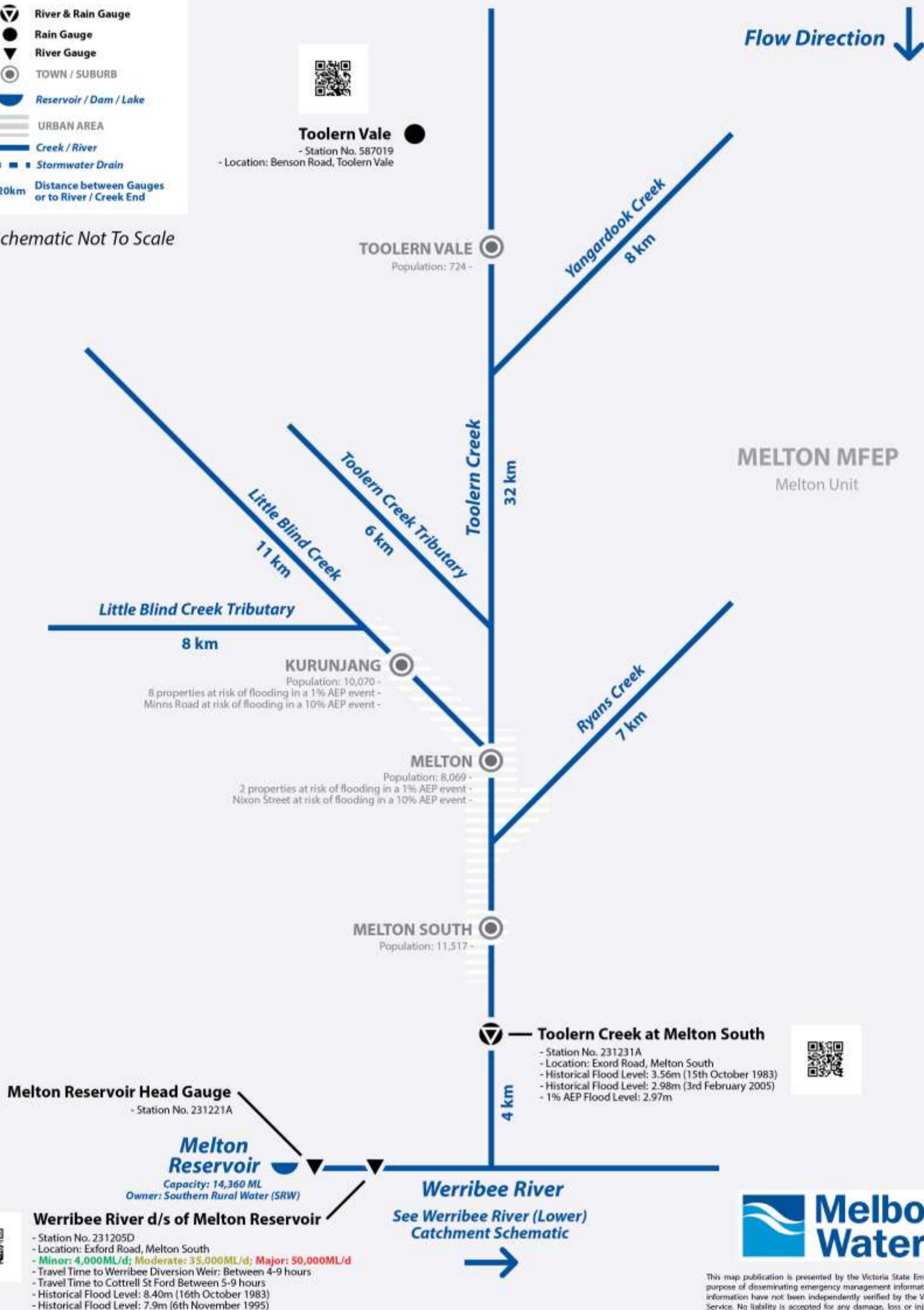
# Toolern Creek Catchment Schematic

Version 3 - June 2021

**LEGEND**

- River & Rain Gauge
- Rain Gauge
- River Gauge
- TOWN / SUBURB
- Reservoir / Dam / Lake
- URBAN AREA
- Creek / River
- Stormwater Drain
- 20km Distance between Gauges or to River / Creek End

Schematic Not To Scale



Information Sources: Melbourne Water Flood Warning Manual; Municipal Flood Emergency Plans; Melbourne Water GIS; Melbourne Water HYDSTRA Database; ABS Census 2016

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# Kororoit Creek & Stony Creek Catchment Schematic

Version 5 - June 2021

### LEGEND

- Stream Level & Rain Gauge
- Rain Gauge
- Stream Level Gauge
- TOWN / SUBURB
- URBAN AREA
- Creek / River
- Stormwater Drain
- 20km Distance between Gauges or to River / Creek End

Schematic Not To Scale

Flow Direction ↓

### HUME MFEP

Broadmeadows, Craigieburn & Sunbury Units

**Toolern Vale**  
 - Station No. 587019  
 - Location: 285,680mE; 5,838,420mN

**Kororoit Creek at Diggers Rest**  
 - Station No. 231106A  
 - Location: Holden Road, Diggers Rest  
 - Travel Time to Deer Park: Between 1-7 hours  
 - Travel Time to Brooklyn: Between 4-9 hours  
 - Historical Flood Level: 2.71m February 2005  
 - Historical Flood Level: 3.42m September 1993  
 - 1% AEP Flood Level: 3.71m

### MELTON MFEP

Melton Unit

**Kororoit Creek at Rockbank**  
 - Station No. 231105B  
 - Location: Leakes Road, Rockbank  
 - 1% AEP Flood Level: 3.3m

**ROCKBANK**  
 Population: 1,536  
 34 properties at risk of flooding over-floor in a 1% AEP Event  
 - Western Freeway flooded in a 1% AEP Event

**CAROLINE SPRINGS**  
 3 properties at risk of flooding over-floor in a 1% AEP Event

**St Albans**  
 - Station No. 587051  
 - Location: Water Tanks on Taylors Road, St Albans

**Kororoit Creek at Deer Park**  
 - Station No. 231104A  
 - Location: Cavendish Drive, Deer Park  
 - Minor: 3.6m  
 - Moderate: 4.0m  
 - Major: 4.5m  
 - Travel Time to Brooklyn: Between 1-3 hours  
 - Historical Flood Level: 5.32m February 2005  
 - 1% AEP Flood Level: 5.1m

DEER PARK

**Sunshine North**  
 - Station No. 587004  
 - Location: City West Water Office on St Albans Road, Sunshine North

**ST ALBANS**  
 - 94 properties at risk of flooding over-floor in a 1% AEP Event along Jones Creek  
 - 21 properties at risk of flooding over-floor in a 1% AEP Event along Upper Stony Creek

### BRIMBANK MFEP

Brimbank Unit



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**Kororoit Creek at Brooklyn**  
 Station No. 231107  
 Location: Federation Trail near Westside Drive, Brooklyn  
 Historical Flood Level: 4.01m February 2005  
 1% AEP Flood Level: 5.33m

**SUNSHINE**  
 - 18 properties at risk of flooding over-floor in a 1% AEP Event along Stony Creek  
 - 36 properties at risk of flooding in a 1% AEP Event along Kororoit Creek

### Stony Creek at Spotswood

- Station No. 230112A  
 - Location: Bena Street, Yarraville  
 - Historical Flood Level: 2.22m (5<sup>th</sup> February 2011)  
 - 1% AEP Flood Level: 4.62m

### HOBSONS BAY MFEP

Hobsons Bay Unit

**ALTONA**  
 Racecourse Road, Altona flooded at 3.8m against Brooklyn Gauge (20% AEP Event)  
 Werribee Railway Line via Altona flooded at 3.8m against Brooklyn Gauge (10% AEP Event)

### MARIBYRNONG MFEP

Footscray Unit

**YARRAVILLE**  
 - 21 properties at risk of flooding over-floor in a 1% AEP Event along Stony Creek

Port Phillip Bay

**Yarra River**  
 See Yarra River Catchment Schematic

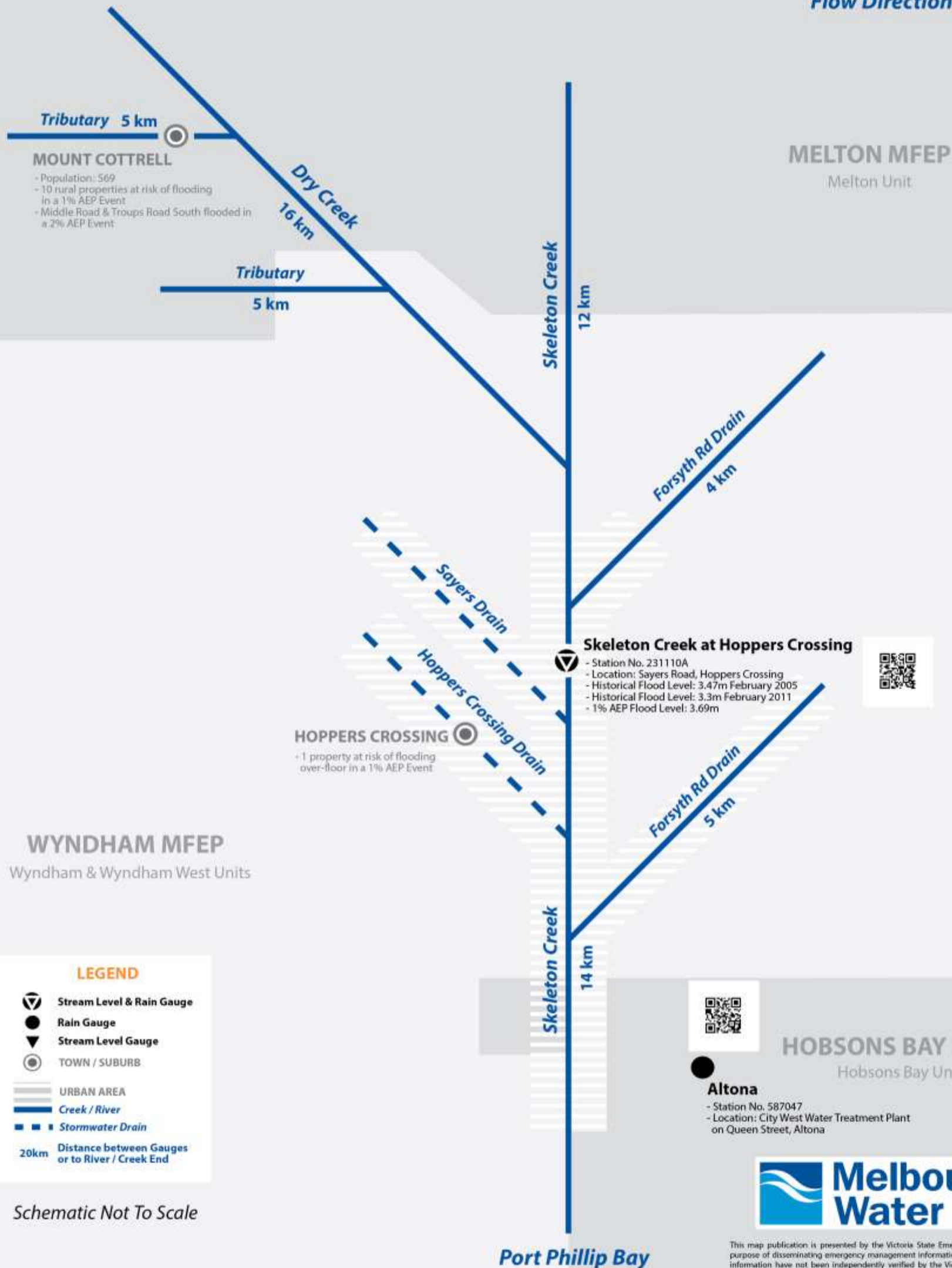
Information Sources: Melbourne Water Flood Warning Manual; Municipal Flood Emergency Plans; Melbourne Water GIS; Melbourne Water HYDSTRA Database; ABS Census 2016



# Skeleton Creek Catchment Schematic

Version 5 - June 2021

Flow Direction ↓



Schematic Not To Scale

Information Sources: Melbourne Water Flood Warning Manual; Municipal Flood Emergency Plans; Melbourne Water GIS; Melbourne Water HYDSTRA Database; ABS Census 2016

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## APPENDIX G – SEVERE WEATHER (STORM) EVENTS

### Overview

Melton municipality is susceptible to severe weather events because of a combination of its undulating terrain, isolated mature trees and wind exposed properties. Storm events the City of Melton may be subject to include wind storms, dust storms, hailstorms, heavy rain leading to flash flooding and thunderstorms (including lightning activity). There have also been isolated occurrences of atmospheric downbursts/microburst in adjacent municipalities.

Older homes may be more susceptible to damage, as can properties undergoing development and renovation. Blocked drains and pits, or drainage systems that may be insufficiently sized for the level of development in the City of Melton also contribute to the effects of storm activity. New estates under construction can be particularly vulnerable as construction works can interfere with natural drainage pathways, while excavations may impact on stability of existing trees.

Severe storm activity could result in injuries and increase in road accidents. Damaging wind events will tend to lead to trees down, with damage to the built and natural environment. Obstructions across roads could disrupt services, affect community functioning and have great potential for road traffic delays. Infrastructure near waterways such as pedestrian bridges may become damaged either directly, or from debris that has been washed into the current.

This Appendix uses Request for Assistance (RFA) data from VICSES to display areas at risk from severe weather events.

### Large Storm Events

Typically, VICSES Melton Unit would expect to be impacted by a large storm event on average once a year (more than 40 RFAs per event) for incidents within Melton, with a number of months resulting in 100+ RFAs.

Since 2009, the following larger storm events have occurred in the City of Melton:

- December 2011 –The result of an intense storm with large hail on Christmas Day that moved across the north-west metropolitan suburbs causing significant building damage and some flooding issues.
- June 2014 and October 2016 – Severe weather events with fierce winds led to many RFAs for building damage and tree down related issues, which led to secondary traffic issues and road closures as a result of trees across roads.
- December 2016 – Heavy rainfall caused building damage and flash flooding to roads and property.
- December 2017 - Heavy rain led to building damage and issues with flooding of properties and roads.
- January 2019 – Storm affecting Melton resulting in 103 RFAs
- October / November 2021 – Wind and rain event that resulted in 288 calls for help to the SES across the shire.

## VICSES Requests for Assistance

VICSES records requests for assistance made by the public during severe weather events. Additional calls may have been made directly to Council during these events. **Table G1** below is a breakdown of requests by suburb and damage type during the period July 2009 to December 2021 in relation to severe weather and storm events.

VICSES Request for Assistance (July 2009 – December 2021)					
Suburb	Building Damage	Flooding	Tree Down	Tree Down Traffic Hazard	Other *
Aintree	11	1	1	1	2
Brookfield	101	16	26	20	7
Burnside	35	11	5	6	2
Burnside Heights	70	8	16	13	2
Caroline Springs	226	56	61	44	9
Cobblebank	7	3	0	1	0
Deanside	0	0	1	0	1
Diggers Rest	32	13	27	34	2
Exford	5	0	0	3	2
Eynesbury	17	2	9	8	2
Fieldstone	0	0	1	0	0
Fraser Rise	19	5	2	0	3
Grangefields	2	0	0	1	0
Harkness	40	14	10	4	3
Hillside (Greater Melbourne)	81	24	33	13	11
Hillside (Melton)	72	14	14	7	0
Kurunjang	131	50	41	31	8
Melton	212	69	104	46	7
Melton South	189	52	120	35	16
Melton West	180	85	83	60	4
Mount Cottrell	2	4	0	2	0
Plumpton	10	4	2	8	2
Ravenhall	4	5	2	6	1
Rockbank	9	1	7	19	1
Strathulloh	7	1	2	1	0
Taylors Hill	208	25	18	18	2
Thornhill Park	4	0	1	1	0
Toolern Vale	12	10	13	34	4
Truganina	4	4	3	10	1
Weir Views	10	2	0	2	1

Table G1 – Breakdown of severe weather RFAs received by VICSES Melton Unit by suburb in City of Melton

\*Assist Agency, Fence Down, Landslide, Loose Debris/Objects, Rescue Persons Trapped, Rescue Structure Collapse, Rescue Vehicle into Structure and Sandbag Request

**Table G2** is a breakdown of requests for assistance by date (month) and damage type.

VICSES Request for Assistance (July 2009 – December 2021)					
Date	Building Damage	Flooding	Tree Down	Tree Down Traffic Hazard	Other*
July 2009	7	1	0	0	0
August 2009	20	8	10	0	0
September 2009	13	4	1	0	0
October 2009	3	0	0	0	0
November 2009	18	2	1	5	0
December 2009	6	0	0	0	0
January 2010	5	1	3	0	0
February 2010	61	1	3	48	0
March 2010	78	1	0	63	0
April 2010	3	0	0	1	0
May 2010	2	0	0	0	0
June 2010	5	1	4	0	0
July 2010	0	0	0	0	0
August 2010	3	1	1	0	0
September 2010	8	7	2	0	0
October 2010	13	1	0	10	0
November 2010	24	1	4	44	0
December 2010	15	3	1	13	0
January 2011	18	4	3	49	4
February 2011	6	3	4	4	0
March 2011	1	1	0	0	0
April 2011	1	0	2	0	0
May 2011	2	0	0	0	0
June 2011	0	1	1	0	0
July 2011	3	2	1	0	0
August 2011	1	0	0	0	0
September 2011	10	4	4	1	0
October 2011	20	0	0	14	0
November 2011	9	0	1	5	0
December 2011	119	5	2	22	0
January 2012	13	4	5	0	0
February 2012	22	4	7	3	0
March 2012	3	2	1	0	0
April 2012	2	1	2	0	0
May 2012	3	0	1	3	0
June 2012	4	2	1	2	0
July 2012	2	0	0	0	0
August 2012	8	1	7	1	0
September 2012	17	19	7	1	0
October 2012	2	1	1	0	0
November 2012	8	1	1	0	0
December 2012	9	11	5	0	0
January 2013	4	2	0	0	0
February 2013	25	6	6	3	0
March 2013	0	0	0	0	0
April 2013	4	0	1	0	0
May 2013	2	0	0	0	0
June 2013	6	0	0	2	0
July 2013	7	3	2	0	1
August 2013	4	9	2	0	0
September 2013	6	5	5	0	0
October 2013	95	39	24	0	0
November 2013	4	0	1	0	0
December 2013	4	1	2	0	0
January 2014	10	5	9	0	0



VICSES Request for Assistance (July 2009 – December 2021)					
Date	Building Damage	Flooding	Tree Down	Tree Down Traffic Hazard	Other*
February 2014	4	3	8	0	0
March 2014	1	2	0	0	0
April 2014	5	1	1	0	0
May 2014	0	0	1	0	0
June 2014	24	17	9	1	0
July 2014	11	7	8	0	0
August 2014	5	0	0	0	0
September 2014	13	3	1	0	0
October 2014	4	1	2	0	0
November 2014	9	2	3	1	0
December 2014	8	6	4	1	0
January 2015	10	2	6	0	0
February 2015	17	5	15	0	0
March 2015	9	15	5	0	0
April 2015	2	0	1	0	0
May 2015	1	0	2	0	0
June 2015	1	2	0	0	0
July 2015	5	2	0	0	0
August 2015	2	0	0	0	0
September 2015	1	0	0	0	0
October 2015	1	3	2	0	0
November 2015	13	11	10	3	0
December 2015	25	7	7	0	0
January 2016	15	2	0	3	0
February 2016	1	1	2	0	0
March 2016	6	3	1	0	0
April 2016	3	0	0	0	0
May 2016	5	6	1	0	0
June 2016	5	6	1	0	0
July 2016	23	9	2	5	0
August 2016	3	1	1	0	0
September 2016	4	1	1	2	1
October 2016	0	0	0	0	0
November 2016	8	5	2	0	0
December 2016	7	2	1	0	0
January 2017	4	3	1	2	0
February 2017	9	3	1	4	0
March 2017	10	1	1	0	0
April 2017	27	0	1	7	0
May 2017	2	0	0	0	0
June 2017	0	0	2	0	0
July 2017	31	9	8	0	0
August 2017	3	1	1	0	0
September 2017	2	0	2	0	0
October 2017	0	2	1	0	0
November 2017	7	0	1	2	0
December 2017	26	2	3	11	0
January 2018	20	1	1	8	0
February 2018	4	9	1	0	0
March 2018	10	0	2	0	0
April 2018	5	3	1	0	0
May 2018	6	2	1	0	0
June 2018	6	0	3	2	0
July 2018	10	3	4	0	0
August 2018	6	1	1	0	0
September 2018	1	2	1	0	0
October 2018	5	1	1	0	0

VICSES Request for Assistance (July 2009 – December 2021)					
Date	Building Damage	Flooding	Tree Down	Tree Down Traffic Hazard	Other*
November 2018	10	2	6	3	1
December 2018	10	2	1	4	0
January 2019	62	19	16	4	2
February 2019	6	5	2	4	0
March 2019	6	4	2	3	0
April 2019	2	0	0	0	0
May 2019	7	0	1	1	0
June 2019	11	1	1	3	1
July 2019	2	2	2	0	2
August 2019	4	0	3	0	0
September 2019	4	0	1	1	0
October 2019	4	3	4	1	0
November 2019	13	15	9	4	0
December 2019	8	2	5	2	3
January 2020	27	9	2	17	3
February 2020	8	4	3	3	1
March 2020	8	0	0	1	0
April 2020	11	9	5	3	2
May 2020	2	0	1	1	0
June 2020	1	0	1	0	0
July 2020	1	0	0	0	0
August 2020	3	4	1	1	0
September 2020	6	8	2	1	5
October 2020	13	8	0	4	0
November 2020	17	9	5	13	0
December 2020	15	15	12	0	5
January 2021	21	2	0	21	2
February 2021	1	0	1	1	0
March 2021	5	1	3	0	0
April 2021	1	0	2	0	0
May 2021	2	6	0	3	1
June 2021	17	3	13	8	7
July 2021	5	0	5	1	3
August 2021	2	0	2	0	2
September 2021	16	3	6	2	2
October 2021	57	17	63	24	22
November 2021	55	8	26	7	9
December 2021	14	1	7	8	2

Table G2 – Breakdown of severe weather RFAs received by VICSES Melton Unit in the City of Melton by month

\*Assist Agency, Dam Incident, Fence Down, Landslide, Loose Debris / Objects, Rescue Persons Trapped, Rescue Structure Collapse, Rescue Vehicle into Structure and Sandbag Request

# Activation Triggers

Triggers for activation in flood and storm have been identified as follows:

## VICSES Flood Readiness and Activation Trigger Considerations - V4.0 - August 2019

CD19/34826

Readiness Level	RL 1 - Low to Moderate	RL 2 -High	RL 3(A) - Very High	RL 3 (B) - VERY HIGH	RL 4 - SEVERE	RL 5 - EXTREME
<b>Activation Considerations</b>	<b>Minor</b>		<b>Moderate</b>		<b>Moderate to Major (high end event)</b>	
<b>Flood Prediction</b>	Flood watch issued and/or minor flood warning issued.	Minor flood warning issued.	Low to mid range moderate flood warning issued. 0-1 other rivers in minor flood. Low consequences for built environment based on risk.	Mid to high range moderate flood warning issued. 2+ other rivers in minor flood. Moderate consequences for built environment based on risk.	Major flood warning issued. 2+ other rivers in moderate flood. Moderate risks and consequences for built environment, and economic impacts.	2+ major flood warnings issued. 2+ other rivers in moderate flood. Significant risks and consequences to built environment, and economic impacts. Forecast to exceed 1 in 100 year riverine event. Dam failure considered very likely.
<b>Flood Behaviour</b>	Anticipated continued light rain. Catchments able to absorb predicted rain for consecutive days but may lead to flooding. Nil impacts or consequences predicted unless identified.	Anticipated continued rain. Catchments able to absorb predicted rain for consecutive days with minor flooding occurring. Low lying areas next to water courses are inundated. Minor roads may be closed and low level bridges submerged. In urban areas inundation may affect some backyards and buildings below the floor level as well as bicycle and pedestrian paths. In rural areas removal of stock and equipment may be required.	Anticipated continued rain. Catchments likely to be saturated and unable to absorb continued rain. Areas of inundation are more substantial in size but consequence is low. Main traffic routes may be affected. Unlikely for buildings to be affected above the floor level. Evacuation of flood affected areas may start to be considered. In rural areas, removal of stock is required.	Anticipated continued rain. Catchments are saturated and unable to absorb continued rain. Areas of inundation are more substantial. Main traffic routes may be affected. Some buildings may be affected above the floor level. Evacuation of flood affected areas may be planned for. In rural areas removal of stock is required. Impact assessment may be required.	Anticipated continued heavy rain. Catchments are saturated and unable to absorb continued rain and runoff. Extensive rural areas and/or urban areas are inundated. Many buildings may be affected above floor level. Properties and towns are likely to be isolated. Major rail and traffic routes closed. Evacuation of flood affected areas likely. Utility services likely to be impacted. Impact assessment required.	Anticipated significant extreme weather event that will lead to rapidly rising river conditions. Catchments are saturated and unable to absorb current or additional runoff. Extensive rural areas and/or urban areas are inundated. Many buildings may be affected above the floor level. Properties and towns are likely to be isolated. Major rail and traffic routes closed. Evacuation of flood affected areas likely. Utility services will be impacted. Impact assessment required.
<b>Readiness and Activation</b>	<b>VICSES - Business As Usual - Operations</b>			<b>Multi Agency Operations under JSOP 2.03</b>		
<b>State</b>	SCC Monitoring (white) SDO monitoring SAC aware	SCC Monitoring (white) SDO monitoring SAC aware	SCC Monitoring (white) / Tier 1 (blue) SDO and SAC - 60 minute recall or in place.	SCC Tier 1 (blue) Where 1 level 2 ICC is activated. SDO and SAC - in place. SOCC - 60 minute recall or in place.	SCC Tier 2 (orange) Where 2+ Level 2 ICCs, or 1 Level 3 ICC is activated. SDO and SAC - in place. SOCC - in place. Night shift on standby, or remote SDO, SAC and SOCC to be rostered.	SCC Tier 3 (red) Where 3+ Level 2 ICCs, or 2+ Level 3 ICC is activated. SDO and SAC - in place for day and night shifts. SOCC - in place for day and night shifts at multiple ESTA locations.
<b>Region</b>	RDO monitoring RAC aware	RDO actively monitoring RAC monitoring	Regional Command - 60 minute recall or in place RAC and RDO - 60 minute recall or in place	Rural - Regional Command in place at RCC or Regional Office, RC notified. Metro - RCC open with base RCT in place. Rural - RDO and RAC in place at RCC or Regional Office. Metro - RC, RAC and RDO in place at RCC.	RCC open - RCT in place, other relevant agencies available on immediate recall. RC, RAC and RDO in place at RCC. Night shift on standby, or remote RDO and RAC to be rostered.	RCC open - Full RCT in place. RC, RAC and RDO in place at RCC for day and night shifts.
<b>Incident</b>			Base IMT on 60 minute recall.	Base IMT in place	Rural - Base IMT in place, with Core IMT on 60 minute recall. Metro - Core IMT in place.	Rural - Core IMT in place, with Full IMT on 60 minute recall. Metro - Full IMT in place.
<b>Effect</b>	<b>Potential Consequences</b>					
<b>People</b>	Some minor inconvenience around local roads.		Increased number of roads being impacted. Traffic management plan should be considered.		Significant number of roads impacted. Traffic management plan is required. Some major roads closed with isolation or evacuation possible.	
<b>Remote Communities</b>	Inconvenience only.		Some minor isolation and loss of utilities of individual properties or remote communities is likely.		Community isolation likely with resupply requirements as well as evacuation considerations needed.	
<b>Health</b>	Little impact expected. Some local issues might be encountered, but managed locally within own facility plans.		Consideration for review and familiarisation with facility plans. VICPOL and DHHS to review Vulnerable persons list.		Highly likely some hospitals and vulnerable people will become isolated and require evacuation.	
<b>Critical Infrastructure</b>	Nil impact.		May require some preparatory work and discussion with owner of infrastructure.		Significant work likely to be required to protect critical infrastructure. Contingency plans put in place if loss of the infrastructure occurs.	
<b>Public Infrastructure</b>	Limited impact.		Some disruption to access to parks and low lying community areas and infrastructure.		Significant damage to road infrastructure and community facilities. Long term closure of key community facilities likely.	
<b>Essential Community Infrastructure</b>	Possible power disruptions.		Likely short term power disruptions.		Power disruptions likely, with some substations impacted and potential long term outages.	
<b>Power</b>	Little impact expected some local issues might be encountered but managed locally.		Increased potential but still managed locally. May be minor sewerage overflow issues in isolated areas.		Highly likely that some infrastructure will be impacted. Water authorities should develop or initiate their plans to address issues. Significant potential for pollutants including sewerage in water.	
<b>Water Utilities</b>	Nil impact.		Minimal impact to individual premises only.		Significant impact with loss of landlines and mobile powers which will affect people's capacity to receive warnings and information.	
<b>Telecommunications</b>	Little impact expected. Some local issues might be encountered but managed locally.		Increased potential for infrastructure damage and disruption but still managed locally.		Likely that some infrastructure will be impacted, supply authorities should develop or initiate their plans to address issues.	
<b>Gas</b>	Unlikely to impact.		Some minor roads may be impacted with possible disruption to critical needs supplies such as milk.		Highly likely for roads to be cut and egress and access impacted. Major roads potentially cut in some locations, traffic diversions in place. Potential rescue of trapped persons in vehicles. Expected impact on rail routes. Economic impact likely with loss of commercial transport routes.	
<b>Road Network</b>	Limited impact on public transport routes.		Impact to public transport routes may occur but likely to be minimal with diversions possible.		Public transport impacts will occur with roads and rail lines cut and no alternative route available. Significant disruption to people movement likely.	
<b>Public Transport</b>	Unlikely impact.		Some impact expected. Traffic management plan for school buses should be considered.		Some school and preschools may be inundated. School bus routes closures.	
<b>Education</b>	Maybe cancelled due to weather conditions only.		Some public events may need to be cancelled or rescheduled due to safety of patrons either whilst at event or travelling to/from the event.		Likely cancellation of major events due to risk, and potential flooding impact on venue or ability to attend or leave event.	
<b>Public Events</b>	Unlikely that event(s) will be impacted but consideration must be given to any event occurring to ensure it is safe to continue.		Potential impact on tourist locations if area not safe to visit or isolated due to road closures.		May impact on high value tourist locations and facilities with long term impacts in the social and economic environment of communities.	
<b>Tourism</b>	No impact likely with landowners managing any localised issues.		Potential impact with losses to live stock, fencing and crops including high intensive farming of produce and tree farms.		Substantial impact to live stock, fencing (widespread), farm machinery and crops. Short and long term impacts to high intensive produce farming due to loss of soil and erosion. Highly likely need for stock movement support and fodder resupply for isolated stock.	
<b>Agriculture</b>	Minimal impact, some minor watercourse erosion.		Stream erosion and loss of vegetation around watercourses.		Significant disturbance to soil and vegetation.	
<b>Animal welfare</b>	Minimal impact likely.		Some disturbance along watercourses may occur but likely to be minimal.		Potential for significant disturbance especially of flood of significance in area and flood of record height.	
<b>Environmental</b>	Relief and recovery activity unlikely, may be some local issues.		Increased potential for relief and recovery activity but likely to be managed locally by LGA with support of DHHS.		Formal arrangements put in place for relief and recovery activity. Regional Recovery Commander appointed. Health Commander in place. Demands on relief and recovery to be substantial and potentially long term.	
<b>Cultural Heritage</b>						
<b>Relief and Recovery</b>						

Regional Agency Commander (VICSES) provides advice to the Regional Controller - State Agency Commander (VICSES) provides advice to State Response Controller re: forecast, impacts, and consideration for varying the actual number, distribution and level of IMT required.

Readiness Level	RL 1 - Low to Moderate	RL 2 - High	RL 3(A) - Very High	RL 3 (B) - VERY HIGH	RL 4 - SEVERE	RL 5 - EXTREME
<b>Activation Considerations</b>	Thunderstorm Forecast Chart (TFC), issued daily			Severe Weather Intelligence Briefing (SWIB), issued Tuesday & Friday		
<b>Storm Prediction or Warning</b>	SWIB - no colour. No thunderstorms. No severe weather.	SWIB - no colour. TFC shows thunderstorms possible. No severe weather warning (SWW). No severe thunderstorm warning (STW).	SWIB - no colour. TFC - severe thunderstorms possible. SWW - issued for winds and/or possible heavy rainfall. STW - issued for wind and/or heavy rainfall and/or hail. Storm surge - forecast with minimal impacts.	SWIB - coloured yellow. TFC - shows severe thunderstorms likely. SWW - issued for wind* and/or heavy rainfall. STW - issued for wind* and/or heavy rainfall and/or hail. Storm surge - forecast with greater impacts.	SWIB - coloured orange for winds* and/or rainfall. TFC - shows severe thunderstorms likely; including potential for large hail, damaging winds*, and heavy rainfall leading to flash flooding. SWW - issued for damaging winds* and/or heavy rainfall. STW - issued for wind* and/or heavy rainfall and/or hail. Storm tide (normal tide) - forecast.	SWIB - coloured red for damaging to destructive winds* and/or very heavy rainfall. TFC - shows severe thunderstorms likely including potential for giant hail, damaging/destructive winds, heavy rainfall leading to flash flooding. SWW - issued for damaging or destructive winds* or heavy rainfall. STW - issued for super cells possible, heavy rain and/or very dangerous thunderstorm warning issued. Storm tide (high tide) - forecast.
<b>Storm Behaviour</b>	No thunderstorms. No severe weather.	Wind - gusts < 90km/h Rain - rates not conducive to flash flooding. Hail - small (<2cm).	SWIB - 50km/hr+ average winds*, gusts* reaching 90-100 km/hr for prolonged periods. TFC - possibility of thunderstorms may or may not include small hail (<3cm). SWW / STW - chance of flash flooding and damaging winds considered possible.	SWIB - 60km/hr+ average winds*, gusts* reaching over 100km/hr (101-109 km/hr) for 6 or more hour period. TFC - severe thunderstorms possible, high possibility of 3 or 4cm hail, wind gusts* over 100km/hr. SWW - heavy rainfall leading to flash flooding across districts considered possible. STW - localised flash flooding rates of >20mm per 30mins likely.	SWIB - 70km/hr+ average winds*, damaging gusts* reaching over 110km/hr (110-120 km/hr) for 3 or more hour period. TFC - severe thunderstorms likely. SWW - heavy rainfall leading to flash and/or riverine flooding across districts considered likely. STW - possibility of hail of 4-5cm, wind gusts* >110km/hr. Potential for super cell, squall or tornado. Localised flash flooding rates of >30mm per 30mins likely.	SWIB - very unstable weather conditions including 80km/hr+ average winds*, damaging (120km/hr) gusts* for 3 or more hour period certain. TFC - severe thunderstorms likely. SWW - heavy rainfall leading to flash and/or riverine flooding across districts considered very likely. STW - super cells including hail >5cm, wind gusts* >120km/hr. Localised flash flooding rates of >40mm per 30mins. Squalls or tornado likely.
*Consideration: Add 10km/hr to average winds and/or gusts when considering Alpine district predictions and/or warnings based on time of day, time of year, altitude, and area of prediction.						
<b>Storm Activity</b>	Local level Unit response Active RFAs per Unit: Rural 1 - 20 Urban/Metro 1 - 60	Local level Unit response Active RFAs per Unit: Rural 20 - 30 Urban/Metro 60 - 75	Local level Unit response with additional local agency support Active RFAs per Unit: Rural 20 - 30 Urban/Metro 60 - 75 Active RFAs per Region: Rural 60 - 100 Urban/Metro 200 - 250	Multi-unit response with increasing multi-agency response. Active RFAs per Region: Rural 100 - 250 Urban/Metro 250 - 400 ESTA - Critical Incident Response Plan (CIRP) Level 1 activated.	Multi-unit response with multi-agency support and high level of multi-agency response activity (e.g. fire alarms). Active RFAs per Region: Rural 250 - 500 Urban/Metro 400 - 1,000 ESTA - Critical Incident Response Plan (CIRP) Level 2 activated. Event creation has increased to 2-4 per minute. <15 calls waiting.	Multi-unit response and high level of multi-agency response activity with significant impacts across municipalities. Active RFAs per Region: Rural 500+ Urban/Metro 1,000+ ESTA - Critical Incident Response Plan (CIRP) Level 3 activated. Event creation has increased to 4+ per minute. 15+ calls waiting.
<b>Readiness and Activation</b>	VICSES - Business As Usual - Operations			Multi Agency Operations under JSOP 2.03		
<b>State</b>	SCC Monitoring (white) SDO monitoring SAC aware	SCC Monitoring (white) SDO monitoring SAC aware	SCC Monitoring (white) / Tier 1 (blue) SDO and SAC - 60 minute recall or in place. SOCC - 60 minute recall or in place.	SCC Tier 1 (blue) Where 1 level 2 ICC is activated. SDO and SAC - in place. SOCC - in place.	SCC Tier 2 (orange) Where 2+ Level 2 ICCs, or 1 Level 3 ICC is activated. SDO and SAC - in place. SOCC - in place. Night shift on standby, or remote SDO, SAC and SOCC to be rostered.	SCC Tier 3 (red) Where 3+ Level 2 ICCs, or 2+ Level 3 ICC is activated. SDO and SAC - in place for day and night shifts. SOCC - in place for day and night shifts at multiple ESTA locations.
<b>Region</b>	RDO monitoring RAC aware	RDO actively monitoring RAC monitoring	Regional Command - 60 minute recall or in place RAC and RDO - 60 minute recall or in place	Rural - Regional Command in place at RCC or Regional Office. RC notified. Metro - RCC open with base RCT in place Rural - RDO and RAC in place at RCC or Regional Office. Metro - RC, RAC and RDO in place at RCC.	RCC open - RCT in place, other relevant agencies available on immediate recall. RC, RAC and RDO in place at RCC. Night shift on standby, or remote RDO and RAC to be rostered.	RCC open - Full RCT in place. RC, RAC and RDO in place at RCC for day and night shifts.
<b>Incident</b>			RAC and RDO - 60 minute recall or in place at RCC or Regional Office. Optional support form: Resource Officer Management Support Officer Warnings & Advice Officer Intelligence Officer	Rural - Base IMT on 60 minute recall. Metro - Base IMT in place	Rural - Base IMT in place, with Core IMT on 60 minute recall. Metro - Core IMT in place.	Rural - Core IMT in place, with Full IMT on 60 minute recall. Metro - Full IMT in place.
<b>Effect</b>	<b>Potential Consequences</b>					
<b>People</b>	Some minor inconvenience around local roads.		Increased number of roads being impacted. Traffic management plan should be considered.		Significant number of roads impacted. Traffic management plan is required. Some major roads closed with tree blockages or flash flooding impacts.	
<b>Remote Communities</b>	Inconvenience only.		Some minor isolation and loss of utilities of individual properties or remote communities is likely.		Community isolation and loss of food/supplies potential with resupply requirements dependant on time of power or access outages.	
<b>Health</b>	Little impact expected. Some local issues might be encountered, but managed locally within own facility plans.		Consideration for review and familiarisation with facility plans. VICPOL and DHHS to review Vulnerable persons list.		Highly likely vulnerable people impacted by power outage will require relocation. Communities without power for days needing support.	
<b>Critical Infrastructure</b>	Nil impact.		May require some preparatory work and discussion with owner of infrastructure.		Significant work likely to be required to protect critical infrastructure. Contingency plans put in place if loss of the infrastructure occurs.	
<b>Public Infrastructure Essential Community Infrastructure</b>	Limited impact.		Some disruption to access to parks and vegetated community areas and infrastructure. Some minor damage to community infrastructure.		Significant damage to community infrastructure and community facilities. Long term closure of key community facilities likely.	
<b>Power</b>	Possible power disruptions.		Likely short term power disruptions.		Power disruptions almost guaranteed, with potential long term outages.	
<b>Water Utilities</b>	Little impact expected some local issues might be encountered but managed locally.		Increased potential but still managed locally. May be minor sewerage overflow issues in isolated areas.		Highly likely that some infrastructure will be impacted, water authorities should develop or initiate their plans to address issues. Significant potential for pollutants including sewerage in water and loss of power will exacerbate the impacts.	
<b>Telecommunications</b>	Unlikely impacts.		Minimal impact to individual premises only.		Significant impact with loss of landlines and mobile powers which will affect peoples capacity to receive warnings and information. Commercial Business impacts with loss of phone services.	
<b>Gas</b>	Little impact expected. Some local issues might be encountered but managed locally.		Increased potential for infrastructure damage and disruption but still managed locally.		Likely that some infrastructure will be impacted, supply authorities should develop or initiate their plans to address issues.	
<b>Road Network</b>	Unlikely impacts.		Some minor roads may be impacted with possible disruption to critical needs supplies such as milk.		Highly likely for roads to be cut and egress and access impacted. Major roads potentially cut in some locations traffic diversions in place. Potential rescue of trapped persons in vehicles highly likely. Expected impact on rail routes. Economic impact likely with loss of power and utilities supply for lengthy period.	
<b>Public Transport</b>	Limited impact on public transport routes.		Impact to public transport routes may occur but likely to be minimal with diversions possible		Public transport impacts will occur with roads and rail lines cut and no alternative route available. Significant disruption to people movement likely.	
<b>Education</b>	Unlikely impacts.		Some impact expected. Traffic management plan for school buses should be considered.		Some school and preschools may be impacted by utilities loss and damage to infrastructure. School bus routes closed for period of time.	
<b>Public Events</b>	May be cancelled due to weather conditions only.		Some public events may need to be cancelled or rescheduled due to safety of patrons either whilst at event or travelling to/from the event.		Public events impacted likely cancellation of major events due to wind impacts and risk, and potential flooding impact on venue or ability to attend or leave event.	
<b>Tourism</b>	Unlikely that event(s) will be impacted but consideration must be given to any event occurring to ensure it is safe to continue.		Potential impact on tourist locations if area not safe to visit or isolated due to road closures.		May impact on high value tourist locations and facilities with long term impacts in the social and economic environment of communities.	
<b>Agriculture Animal welfare</b>	No impact likely with landowners managing any localised issues.		Potential impact with losses to live stock, fencing and crops including high intensive farming of produce and tree farms.		Substantial impact to crops, including high intensive produce farming (vegetables and fruit) and tree farms with short and long term impacts due to loss of crops. Economic impact to area.	
<b>Environmental</b>	Minimal impact.		Potential for stream erosion and loss of vegetation around watercourses. Minor tree damage.		Significant disturbance to vegetation with some areas heavily impacted.	
<b>Cultural Heritage</b>	Minimal impact likely.		Some disturbance along watercourses may occur, but likely to be minimal.		Potential for impact on historical structures and features.	
<b>Relief and Recovery</b>	Relief and recovery activity unlikely may be some local issues.		Increased potential for relief and recovery activity, but likely to be managed locally by LGA with support of DHHS.		Formal arrangements put in place for relief and recovery activity. Regional Recovery Commander appointed. Health Commander in place. Demands on relief and recovery to be substantial and potentially long term.	

Regional Agency Commander (VICSES) provides advice to the Regional Controller - State Agency Commander (VICSES) provides advice to State Response Controller re: forecast, impacts, and consideration for varying the actual number, distribution and level of IMT required.