City of Brimbank

Storm and Flood Emergency Plan

A Sub-Plan of the Municipal Emergency Management Plan

For Brimbank City Council
And
VICSES Unit Brimbank

Version 5.1
Reviewed December 2022

Brimbank City Council

VICTORIA State Government

SES

This Page is Intentionally Blank

Table of Contents

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 Brimbank City Council.

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
0.0	March 2012	VICSES	Draft Layout
0.1	April 2012	A Barnard	Draft document for discussion with Council
1.0	14th November 2012	A Barnard	Data Updated Inclusion of Dams
2.0	June 2014	R Butler	Appendix A, B, C, F & G Updated
3.0	February 2018	R Butler and J Griffin	Appendix A, B, C, F & G Updated, updates to legislative and administrative sections.
4.0	June 2020	R Butler	New template applied. Appendix A, B, C, F & G Updated
4.1	September 2020	M Patton	Endorsement & update FRV references
5.0	August 2021	K Hetyey	Standardisation of references and changes and edits to accommodate the *Emergency Management Legislation Amendment Act 2018* (EMLA Act) that amended the *Emergency Management Act 2013* (EM Act 2013).
5.0	April 2022	C Brockwell	Further legislation updates and preparation for MEMPC review
5.0	June 2022	MEMPC	MEMPC Endorsement
5.1	December 2022	R Butler	Update of Appendix A, B, C1 and G based on impacts from October 2022 Maribyrnong River flood event

This Plan will be maintained on the VICSES website (ses.vic.gov.au/plan-and-stay-safe/flood-guides/brimbank-city-council).

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
DoI	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
Annual Recurrence Interval (ARI)	The average, or expected, value of the period between exceedances of a given rainfall or flow total accumulated over a given duration.
Annual Exceedance Probability (AEP)	The probability that a given total rainfall or flow is accumulated over a given duration will be exceeded in any one year.
Flash flooding	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.
Flood mapping	The process where the extent of flooding is documented in mapping software based on flood studies and surface elevations.
Floodplain	Area of land adjacent to a creek, river, estuary, lake, dam or artificial channel, which is subject to inundation.
Hot spot	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.
Natural drainage system	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.
Overland flooding	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. Note that not all overland flows cause flooding under the definition in the Brimbank City Service Plan Appendices.
Retarding Basin	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.
Stormwater drainage system	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 Brimbank Council.
Stormwater Runoff	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 Approval and Endorsement

This Municipal Storm and Flood Emergency Plan (MSFEP) has been prepared by Brimbank City Council 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 Brimbank Municipal Emergency Management Plan (MEMP). It is consistent with the VICSES Central Region Emergency Response Plan – Storm and Flood sub-plans, State Emergency Management Plan (SEMP) – Storm and Flood sub-plans and the Victorian Flood Management Strategy. It takes into account the outcomes of the Community Emergency Risk Assessment (CERA) process undertaken by the Brimbank MEMPC.

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

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

Endorsement

This Plan was endorsed by the City of Brimbank MEMPC on 29 JUNE 2022 as a sub-plan to the MEMP for a period of three years.

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 to and recovery from storm and/or flood incidents within the City of Brimbank

As such, the scope of the Plan is to:

- Identify the storm and flood risk to the City of Brimbank.
- Support the implementation of measures to minimise the causes and impacts of storm and flood incidents within the City of Brimbank.
- 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 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 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 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 the VICSES website upon formal adoption by the MEMPC.

VICSES, with the support of the City of Brimbank 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

Refer to **Appendix A and C** for detailed information of structural flood mitigation measures.

2.3 Non-structural Flood Mitigation Measures

2.3.1 Exercising the Plan

Arrangements for exercising this Plan will be at the discretion of the MEMPC. This Plan should be regularly exercised, preferably on an annual basis, 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, State Storm Emergency Plan (ses.vic.gov.au/about-us/state-and-regional-emergency-plans), the SEMP and on the Bureau of Meteorology (BoM) website (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 Brimbank 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 Emergency Response Plan – Storm and Flood sub-plans and the SEMP – Storm and Flood sub-plans (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 and flood within the City of Brimbank. 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 Brimbank MEMP, the SEMP (Roles and Responsibilities), VICSES Central Region Emergency Response Plan – Storm and Flood sub-plans and the SEMP – Storm and Flood sub-plans (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 Brimbank MEMP.

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

In the event that the MECC is not operating, the Brimbank 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 services 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 Emergency Plans. For further information, refer to the SEMP.

- **Command:** Internal direction of personnel and resources of an agency.
- **Control:** Overall direction of response activities in an emergency, operating horizontally across agencies.
- **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 Brimbank, 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 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 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 Emergency 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 Brimbank 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:
    - Melbourne Water rainfall and river monitoring (melbournewater.com.au/water-data-and-education/rainfall-and-river-levels - /).
- Monitor weather and flood information (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 Regional Control Centre (RCC) (if established), State Control Centre (SCC) (if established), Brimbank City Council and other emergency services through the IEMT.
- Assess ICC readiness (including staffing of IMT and IEMT) and open if required.
- Ensure flood warnings and community information are prepared and issued to the community, where required (see **Appendix E)**
- 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 storm and flood intelligence to assess likely flood consequences. Consider:
  - What areas may be at risk of inundation.
  - What areas may be at risk of isolation.
  - What areas may be at risk of indirect affects as a consequence of power, gas, water, telephone, sewerage, health, transport or emergency service infrastructure interruption.
  - What are the characteristics of the populations at risk.
- Determine what the at-risk community need to know and do as the storm and/or flood develops.
- Warn the at-risk community by 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/).
- 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 Emergency Response Plan – Storm and Flood sub-plans and SEMP – Storm and Flood sub-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 the VicEmergency website
- VicEmergency Hotline
- Variable Message Signs (i.e. road signs)
- Community meetings
- Newspapers
- Email
- Newsletters
- Letter drops
- Social media and/or social networking sites (i.e. Twitter and/or Facebook)

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

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

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

Other agencies 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. Brimbank 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 Brimbank 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 State Storm Emergency Plan. All IAs 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 Brimbank MEMP).

3.8 Response to Flash Flooding 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 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 MERC, Brimbank City 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/).

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/.

Refer to details within the Brimbank City Council MEMP for further guidance on evacuations for emergencies. If evacuation is determined as appropriate, Brimbank 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 Brimbank.

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 a 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 Interagency Aviation Operating Policy – Victoria (IAOP) 01 - Air Operations. The IC may request aircraft support through the State Aircraft Desk located at the SCC. Prioritisation and allocation of aircraft will be undertaken by the State Air Desk, in consultation with the SRC.

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 Brimbank 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 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 the use of sandbags, which will be consistent with the State Emergency Management Priorities.

The City of Brimbank maintains a small stock of sandbags (approximately 200), the Brimbank VICSES Unit carries around 1000 sandbags and back-up 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 Brimbank 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, Brimbank 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 Brimbank.

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.

3.16 Waste Water related Public Health Issues and Critical Sewerage Assets

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

- Advise VICSES and the Brimbank 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 Brimbank Environmental Health Officer to inspect and report to the Brimbank MEMO and the ICC on any water quality issues relating to flooding.

General public health information and messages are provided by Brimbank Council, DFFH and DH and may contain information that is relevant prior to, during and following an incident. Information may also be provided in sub plans to the MEMP, specific health notifications and, after discussions within the IEMT, may be included in Flood Bulletins.

3.17 Road Closures

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

VicPol may liaise with Brimbank 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 City of Brimbank is responsible for the designated local and regional road network.

DoT, VicPol and the City of Brimbank will communicate community information regarding road closures as outlined in the Brimbank 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**. There are also a number of smaller private dams which could cause damage if they failed.

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 Brimbank are detailed in Part 6 of the Brimbank 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 Brimbank 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 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 floods are detailed in the Brimbank MEMP and the Brimbank Relief and Recovery 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

Animal management in Brimbank is undertaken through Council's Domestic Animal Management Plan (DAMP). The requirement in Brimbank is not expected to be excessive or involve large livestock animals.

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

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

Further information can also be found in the Victorian Emergency Animal Welfare Plan and the City of Brimbank Relief and Recovery Plan.

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 Brimbank MEMP.

APPENDIX A - FLOOD THREATS FOR CITY OF BRIMBANK

General

Brimbank Municipality covers an area of 123 square kilometres and is located between 11 and 23 km west and northwest of the Melbourne CBD. It is bounded by the City of Hume to the north, the Cities of Maribyrnong and Moonee Valley to the east, Hobsons Bay and Wyndham to the south, and the Shire of Melton to the east. In 2016 Brimbank was estimated to have a population of 205,741[1].

Formed by the junction of Deep and Jacksons Creeks on the northern boundary of the Municipality, Maribyrnong River is the main waterway that passes through Brimbank City. Kororoit Creek is the second major waterway that flows through the Municipality, passing through roughly the southern half of the City.

The Municipality consists of 25 established and new suburbs, including five districts or planning areas, each containing a town centre and a network of smaller, supporting villages. The districts are Deer Park (includes Albanvale, Cairnlea, Deer Park and Derrimut), Keilor (Keilor, Keilor Park and parts of Keilor East, Tullamarine, Keilor Lodge and Taylors Lakes), St Albans (Kings Park, St Albans and Kealba), Sunshine (Albion, Ardeer, Sunshine, Sunshine North and Sunshine West and parts of Brooklyn) and Sydenham (Calder Park, Delahey, Keilor Downs, Keilor North and parts of Hillside, Keilor Lodge and Taylors Lakes). Older areas of housing in Brimbank include Sunshine, Ardeer and St Albans, while much of the residential growth in recent times has been in Delahey, Sydenham, Taylors Lakes and Cairnlea.

Brimbank Municipality contains a mix of industrial and commercial developments as well as educational, recreational and community facilities. Major features of the City include Victoria University (St Albans and Sunshine campuses), Calder Park Motorsport Complex, Watergardens Town Centre, Sunshine Hospital, St Albans and Sunshine leisure centres. There are also a number of important public spaces in the Municipality, including Brimbank Park, Organ Pipes National Park and Horseshoe Bend Children's Farm, Sunshine Golf Club and Keilor Public Golf Course.

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.

Water level rises through Brimbank are expected to occur fairly rapidly following a heavy rainfall event, with flooding upstream of Maribyrnong River possibly taking as little as 3 hours (from Deep Creek) to 6 hours (from Jacksons Creek) to reach the Municipality.

Flooding on Kororoit, Taylors, Steele and Jones Creeks tends to rise and fall quickly.

[1] *http://profile.id.com.au/brimbank/population-estimate*

Flash Flooding & 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.

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

Tidal Flooding & Storm Surges

Moderate to heavy rainfall, coupled with a high or incoming tide from Port Phillip Bay can exacerbate flooding within the Municipality or create areas of flooding in and around the drainage network (Maribyrnong River is tidal to Solomon's Ford in Avondale Heights). Due to the proximity of the Municipality to Port Phillip Bay and its flat terrain, tidal flows from Port Phillip Bay may reduce the capacity of the stormwater drains to discharge runoff back into the bay, while extreme storm events can cause backflow to the point where water surcharges back above ground around the drainage pits and channels.

Description of Major Waterways and Drains

There are five major waterways running through the City of Brimbank:

- **Maribyrnong River**, begins at the confluence of Jacksons and Deep Creeks in Keilor North, just west of Melbourne Airport. The river partially forms the northern boundary of the Municipality in Keilor, enters the City, then forms the eastern boundary at Sunshine North. Much of the stormwater in the northern half of Brimbank discharges into the river, either directly or indirectly via Taylors Creek. See **Appendix F** for more details.

- **Kororoit Creek**, which partially forms Brimbank's western boundary at Albanvale, enters the City of Brimbank at Deer Park. Flowing through the southern half of the Municipality, including Deer Park, Ardeer, Albion, Sunshine and Brooklyn, it receives a number of drains and Jones Creek. It leaves Brimbank at Brooklyn and continues on to flow into Port Phillip at Altona. See **Appendix F** for a schematic of Kororoit Creek.

- **Jones Creek** commences in Cairnlea as the continuation of St Albans West and Gladstone St Drains. It flows generally southeast before discharging into Kororoit Creek at Ardeer.

- **Taylors Creek** flows roughly parallel to the Maribyrnong with branches rising in Sydenham and Calder Park. The western section of Taylors Creek runs through Sydenham, Taylors Lakes and Watergardens Town Centre in an easterly direction and continues to create a series of Retarding Basins east of Kings Road. After receiving several drains it flows east, then southeast through Keilor Lodge and Keilor Downs, before discharging into the Maribyrnong River at Keilor.

- **Stony Creek** exists as both natural waterway and a drain, beginning in St Albans at the junction of St Albans East Drain (South) and St Albans South Drain. It doglegs southeast and southwest, continues as a drain under the Western Ring Road, then runs south and east as Stony Creek again between Furlong Road to just north of Ballarat Road, where it reverts back to a drain, Sunshine Main Drain. From the intersection of Duke and Matthews Streets in Sunshine, it once again becomes Stony Creek and leaves the municipality at Sunshine Road, to discharge into the Yarra River at Spotswood. See **Appendix F** for more details.

For a description of the other main watercourses and drains within the City of Brimbank, refer to the table below. To view their locations, see Map B in **Appendix F**.

Waterway or Drain	Description
Maribyrnong River	The Maribyrnong River is a major waterway and partially forms the northern and eastern boundary of the municipality. Much of the stormwater in the northern half of Brimbank discharges into the river, either directly or via Taylors Creek. The most flood prone land along the Maribyrnong within the Municipality stretches from Keilor North and Keilor Lodge to Keilor, Kealba and Sunshine North.
Kororoit Creek	Kororoit Creek is the secondary waterway in Brimbank, and receives a number of drains and Jones Creek. It flows through generally the southern districts of the Municipality, flowing through Deer Park, Ardeer, Albion, Sunshine and Brooklyn.
Taylors Creek	Taylors Creek flows roughly parallel to the Maribyrnong. Its branches rise in Sydenham and Calder Park and flow through Sydenham, Taylors Lakes, Keilor Lodge and Keilor Downs, before discharging into the Maribyrnong at Keilor. A number of flood mitigation reservoirs form Taylors Lakes, after which the eponymous suburb is named.
Taylors Creek (East)	As the continuation of Taylors Creek (West), the waterway continues east through the Taylors Lakes Retarding Basins, the last of which is Lake Kingfisher, after which it receives Agonis Drive Drain from the north. It flows east, then southeast and discharges into the Maribyrnong River at Keilor.

Waterway or Drain	Description
Taylors Creek (West)	The western section of Taylors Creek runs through Watergardens Town Centre in an easterly direction, creating Ibis Lake, the first of the Taylors Lakes Retarding Basins, east of Kings Road. Here it also receives Honeyeaters Crescent Drain, discharging into it from the north. From Lake Sheduck the waterway becomes Taylors Creek (East).
Jones Creek	Jones Creek commences in Cairnlea as the continuation of St Albans West and Gladstone St Drains. It flows generally southeast before discharging into Kororoit Creek at Ardeer.
Stony Creek	Stony Creek exists as both a natural waterway and a drain. It begins just east of the bend in Laurel Street, St Albans, at the junction of St Albans East Drain (South) and St Albans South Drain. It doglegs southeast and southwest, continues as a drain under the Western Ring Road, then runs south and east as Stony Creek again between Furlong Road to just north of Ballarat Road, where it reverts to being a drain, Sunshine Main Drain. From the intersection of Duke and Matthews Streets in Sunshine, it once again becomes Stony Creek and leaves the municipality at Sunshine Road, to discharge into the Yarra River at Spotswood.
Steele Creek	Steele Creek rises in Tullamarine near Melbourne Airport and a short section of it flows into the Municipality through Keilor Park, from where it also leaves. Just before leaving Brimbank, it receives Steele Creek North just west of the Western Ring Road.
Burgess Street Drain	The drain runs in a southerly direction from Brooklyn north of Geelong Road and leaves the Municipality closely following Burgess Street into the City of Hobsons Bay.
Central Avenue Drain	The drain runs in a southerly direction from the corner of Wright Street and Central Avenue, Sunshine, then runs southwest at the corner of First Avenue to discharge into Kororoit Creek.
Cherry's Diversion Drain	The drain commences at the Waigani Avenue Retarding Basin and runs east under Egan Street, south under Lake Boga Avenue, east under Deer Street, then north under Hogan Street until the Ballarat Road intersection, from which it discharges directly into Kororoit Creek. This latter part of the drain is natural channel.
Cumberland Street Drain	The drain begins at Somers Street, Sunshine North near the Melbourne Knights Soccer Club and proceeds south under Cumberland Street and Augusta Crescent, then continues southwest approximately from Essex Street to Ballarat Road, then south to the intersection of Hertford Road and Dulcie Street, Sunshine, then under Alexandra Ave to Devonshire Road, where it enters Sunshine Main Drain just south of Devonshire Road.
Fairbairn Road Drain	The drain begins at the Boundary Road/Fairbairn Road roundabout in Laverton North and runs east under Boundary Road and then Silverton Close where it discharges into Kororoit Creek.
Furlong Road Drain	The drain runs from the Furlong Road/Lovell Drive roundabout in St Albans and runs south under Lovell Drive to discharge into Jones Creek.
Gladstone Street Drain	The drain runs from Kings Road near Stevensville Primary School in St Albans in a general southerly direction between Douglas Avenue and Moffatt Street. At Main Road it runs under Jefferson Street then turns east under Gladstone Street, after which it discharges into the Gladstone Street Retarding Basin.
Glengala Drain (East)	The drain is the continuation of Glengala Drain (West). It runs under Briar Way and continues southeast until the Western Ring Road. From here it turns in an easterly direction until approximately the Special Developmental School on Mounsey Street. From here it runs north to discharge into Kororoit Creek. Part of the drain is natural channel.
Glengala Drain (West)	The drain runs from the corner of Whitesides Avenue and Allison Street in Sunshine West, south and east into Lorna Crescent, then south under Ardeer South Primary School to Ralph Reserve. From here it runs southeast until Briar Way. From here the continuation is Glengala Drain (East). Part of the drain is natural channel.
Kealba Park Drain (East)	The drain is the continuation of Kealba Park Drain (West). It runs under Sunshine Avenue until the intersection with Wimmera Crescent. From here it heads in an approximately easterly direction to discharge into Taylors Creek just south of Green Gully Road in the Kulin Wetlands.
Kealba Park Drain (West)	The drain runs from the corner of Copernicus Way and Aquanita Crescent (near the Monmia Primary School), Keilor Downs and runs under Copernicus Way until its junction with Sunshine Avenue. From here it continues as Kealba Park Drain (East).
Keilor Main Drain	The drain runs from the corner of Old Calder Highway and Eagling Street in Keilor and runs approximately under Old Calder Highway and enters Maribyrnong River just northeast of Bonfield Street.
Kellaway Street Drain	The drain runs from Gum Street in Sunshine West in a south-easterly direction until Fairbairn Road. From here it runs in a similar south-easterly direction until discharging into Kororoit Creek.
Kurung Park Drive Drain (North)	The drain commences at Overton Lea Boulevard, Sydenham just south of Stagecoach Crescent. It continues under Overton Lea Boulevard until the intersection with Hume Drive, which it follows until Copperfield Drive. It runs under Copperfield Drive until Yeats Drive, which it runs under until just past Ryland Circuit. From here it continues as Kurung Park Drive Drain (South).

Waterway or Drain	Description
Kurung Park Drive Drain (South)	The drain is the continuation of Kurung Park Drive Drain (North). It runs south under the reserve on Goldsmith Avenue until Taylors Road. It runs under Kurung Drive (a branch running under the western half of Kurung Drive joins it east of Gillespie Road) until the reserve west of Kings Park Primary School. It then runs southwest and discharges into Kororoit Creek. Part of the drain is natural channel.
St Albans East Drain (North)	The drain runs south from the corner of Fox and Grace Streets, St Albans, until Eisner Street. From here it runs approximately southeast until the Station/Blendon/Glyndon Avenues roundabout. From here it runs under Station Avenue. From Bernbanks Avenue on the drain is known as St Albans East Drain (South).
St Albans East Drain (South)	The drain is the continuation of St Albans East Drain (North). It runs southeast until Main Road, then runs under Grantham Parade. It continues southwest past the Grantham Parade/Magnolia Street roundabout until it joins St Albans Drain South. From here it continues as Stony Creek.
St Albans South Drain	The drain runs southeast from Main Road East, St Albans, just west of Collins Street, until Percy Street. From here, it heads more easterly, then south easterly again after St Albans Heights Primary School, until joining the St Albans East Drain (South) just east of St Albans Meadows Primary School. From here it continues as Stony Creek.
St Albans West Drain (North)	The drain runs from the Radio Mast restricted area in Delahey in a general southeast direction until Taylors Road. It then splits into two branches. One branch runs south under Charles Street, while the other one doglegs south between Charles and Theodore Streets. When they reach Henry Street, they both head west along Henry Street and recombine west of the railway line at Regan Street. The drain then heads southwest until Margrave Street and the continuation is known as St Albans West Drain (South).
St Albans West Drain (South)	The drain is the continuation of St Albans West Drain (North). It runs generally south between Jamieson and Shirley Streets in St Albans. East of Brimbank College it runs southeast and drains into the Gladstone Street Retarding Basin. Part of the drain is natural channel.
Station Road North Drain	The drain runs from the reserve on Billingham Road southeast to Welwyn Parade, then east to the Station Road North Drain Wetland adjoining Kororoit Creek. Part of the drain is natural channel.
Sunshine Main Drain	The drain runs southeast from Sunshine Plaza in Sunshine. Just south of Devonshire Road the Cumberland Street Drain discharges into it. It continues in a general south-easterly direction to the intersection of Duke and Matthews Streets where it continues as Stony Creek. Part of the drain is natural channel.
Sydenham Drain	The drain runs northeast from the intersection of Hannah Avenue and Community Hub, Sydenham. North of the Sydenham Retarding Basin at Melton Hwy it receives the Sydenham West Drain that runs from the Sydenham West Retarding Basin. It continues northeast to Marlborough Way, then east to discharge into Taylors Creek.
Wanaka Drive Drain (East)	The drain is the continuation of Wanaka Drive Drain (West). It runs east under Cocoparra Crescent, Wyperfeld Avenue and Wanaka Drive, until just east of Rotoroa Court. It then runs northeast and drains into Taylors Creek. Part of the drain is natural waterway.
Wanaka Drive Drain (West)	The drain runs from Sydenham Road, Sydenham, just west of the railway crossing with Kings Road. It heads generally north and east to Remus Way Childrens Centre/Kindergarten at Parmelia Drive, which it runs under until Lionheart Avenue. It then runs under Lionheart Avenue until just north of Condor Place, then runs east to Chichester Drive. From here it continues as Wanaka Drive Drain (East). Part of the drain is natural waterway.
Westmoreland Road Diversion Drain	The drain runs in two directions. Both drains commence at the intersection of Westmoreland and Warwick Roads, Sunshine North. One drain runs east under Warwick Road, then south under Cumberland Street (as Cumberland Street Drain) until St Andrews Drive, which it then runs under and discharges into Maribyrnong River. The other drain runs south under Westmoreland Road, west under Eastcote Street, south under Charles Street, west under Phoenix Street until Coronation Street, then south to Ballarat Road. It runs under Ballarat Road until St Albans Road, then turns south to discharge into Kororoit Creek at Derby Road, Albion.

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

Historic Storms and Floods

Significant floods (with high flood gauge levels and/or likely flooding consequences to property and infrastructure) that have occurred within the City of Brimbank are as follows in the table below. It is rare that a storm will affect all catchments in the Municipality in the one event, except in the most extreme situations. Results below highlighted in black indicate when either stream level rise was significant enough to cause riverine flooding or when rainfall was significant enough to cause flash flooding; while results in grey indicate either stream level rise or rainfall that was unlikely enough to contribute to flooding at or around the gauge location. These results have been included to show the relationship between these catchments and others that were recorded to indicate flooding.

Note that the % AEP results are for rainfall. It is expected that some rainfall 'losses' will occur meaning that not all rain will translate to an equivalent level % AEP flood event. Use the % AEP rainfall as a guide only for the area around the gauge location.

Event	Maribyrnong River Keilor North (230237A)	Maribyrnong River Keilor (230105A)		Kororoit Creek at Deer Park (231104A)		Kororoit Creek at Brooklyn (231107A)		St Albans (587051)	
	River Level	Rainfall at Gauge	River Level	Rainfall at Gauge	Creek Level	Rainfall at Gauge	Creek Level	Rainfall at Gauge	% AEP Rainfall
Normal Water Level	0.25m		0.30m	-	0.75m	-	0.22m		
Minor Flood Class	-		3.5m		3.6m		-		
Moderate Flood Class	-		5.4m		4.0m		-		
Major Flood Class	-		6.1m		4.5m		-		
7th March 1919	-	-	-	-	-	-	**5.67m**	-	-
29th January 1963	-	-	-	-	-	-	3.77m	-	-
15th May 1974	-	-	7.22m	-	-	-	3.66m	-	-
18th September 1975	-	-	7.43m	-	-	-	-	-	-
10th October 1975	-	-	4.22m	-	-	-	-	-	-
21st October 1975	-	-	5.84m	-	-	-	-	-	-
24th October 1975	-	-	6.93m	-	-	-	-	-	-
1st November 1975	-	-	4.84m	-	-	-	-	-	-
23rd September 1976	-	-	5.41m	-	-	-	-	-	-
16th October 1976	-	-	5.17m	-	-	-	-	-	-
8th April 1977	-	-	7.31m	-	-	-	4.12m	-	-
19th June 1977	-	-	5.87m	-	-	-	-	-	-
30th June- 1st July 1977	-	-	6.34m	-	-	-	-	-	-
13th September 1977	-	-	4.24m	-	-	-	-	-	-
4th July 1978	-	-	4.33m	-	-	-	-	-	-
8th August 1978	-	-	7.70m	-	-	-	-	-	-

Event	Maribyrnong River Keilor North (230237A)	Maribyrnong River Keilor (230105A)		Kororoit Creek at Deer Park (231104A)		Kororoit Creek at Brooklyn (231107A)		St Albans (587051)	
	River Level	Rainfall at Gauge	River Level	Rainfall at Gauge	Creek Level	Rainfall at Gauge	Creek Level	Rainfall at Gauge	% AEP Rainfall
Normal Water Level	0.25m		0.30m	-	0.75m	-	0.22m		
Minor Flood Class	-		3.5m		3.6m		-		
Moderate Flood Class	-		5.4m		4.0m		-		
Major Flood Class	-		6.1m		4.5m		-		
13th August 1978	-	-	4.09m	-	-	-	-	-	-
19th September 1978	-	-	4.95m	-	-	-	-	-	-
27th September 1978	-	-	4.19m	-	-	-	-	-	-
19th November 1978	-	-	6.42m	-	-	-	-	-	-
16th October 1983	-	121mm / 34 hrs	5.78m	98mm / 33 hrs	4.90m	88mm / 33 hrs	4.02m	-	-
10th December 1985	-	70mm / 69 hrs	4.01m	60mm / 63 hrs	3.88m	42mm / 63 hrs	2.46m	-	-
30th July 1987	-	75mm / 34 hrs	5.75m	74mm / 32 hrs	3.57m	60mm / 32 hrs	1.56m	-	-
11th June 1989	-	23mm / 20 hrs	4.81m	21mm / 20 hrs	2.94m	14mm / 17 hrs	1.72m	30mm / 48 hrs	-
18th July 1990	-	39mm / 11 hrs	4.00m	28mm / 10 hrs	1.59m	29mm / 6 hrs	0.98m	27mm / 6 hrs	-
15th September 1993	-	57mm / 28 hrs	6.84m	72mm / 28 hrs	-	60mm / 29 hrs	2.24m	71mm / 24 hrs	17% AEP
25th October 2000	5.89m	75mm / 41 hrs	4.25m	65mm / 41 hrs	2.44m	64mm / 47 hrs	1.92m	67mm / 48 hrs	35% AEP
3rd February 2005	5.96m	133mm / 24 hrs	4.26m	**150mm / 24 hrs**	**5.32m**	135mm / 31 hrs	4.01m	171mm / 48 hrs	1% AEP
5th September 2010	5.50m	13mm / 27 hrs	3.79m	16mm / 20 hrs	1.40m	15mm / 20 hrs	0.92m	15mm / 24 hrs	-
28th November 2010	6.18m	45mm / 72 hrs	4.49m	47mm / 72 hrs	3.20m	24mm / 29 hrs	2.16m	48mm / 72 hrs	-
15th January 2011	**7.06m**	53mm / 48 hrs	5.61m	59mm / 48 hrs	3.25m	92mm / 73 hrs	2.15m	66mm / 48 hrs	36% AEP
25th December 2011	0.72m	13mm / 15 mins	0.68m	6mm / 1 min	2.43m	5mm / 1 min	1.89m	11mm / 1 min	> 1% AEP
18th August 2012	5.64m	-	4.04m	24mm / 12 hrs	3.04m	6mm / 15 hrs	2.14m	21mm / 12 hrs	-
27th January 2016	0.30m	11mm / 15 mins	0.34m	18mm / 30 mins	1.49m	16mm / 10 mins	1.85m	4mm / 2 mins	14% AEP
15th September 2016	5.56m	20mm / 17 hrs	3.81m	21mm / 17 hrs	2.03m	20mm / 18 hrs	1.52m	21mm / 24 hrs	-
6th November 2018	0.70m	46mm / 2 hrs	0.68m	32mm / 2 hrs	2.25m	30mm / 2 hrs	1.78m	35mm / 2 hrs	9% AEP
15th January 2020	0.52m	31mm / 30 mins	-	18mm / 10 mins	2.68m	33mm / 1 hr	1.85m	71mm / 1 hr	1% AEP
14th October 2022	-	33mm / 48 hrs	**8.63m**	31mm / 48 hrs	2.40m	36mm / 48 hrs	1.67m	31mm / 48 hrs	3 EY

Table A1 – Selection of Historical Flood Events along the Maribyrnong River and Kororoit Creek

14th October 2022 – Major Flooding on the Maribyrnong River

On the 14th October 2022, the Maribyrnong River at Keilor peaked at 8.63m, above the major flood level which was the highest recorded flood at the Keilor gauge. Rainfall occurred over a 48 hour period from the 12th October, largely falling in the upper Deep and Jacksons Creeks catchments.

In the Deep Creek catchment, the Lancefield North rain gauge recorded 164mm over 72 hours to 5pm 14th October 2022 while the Darraweit Guim gauge peaked at 7.22m, above the major flood level.

While in the Jacksons Creek catchment, the Mount Macedon rain gauge recorded 141mm over the same 72 hour period contributing to the Rosslynne Reservoir at Gisborne spilling on the 13th October 2022.

Impacts experienced in the City of Brimbank included areas adjacent to the Maribyrnong River in Keilor such as farm land on Arundel and Milburn Roads, and properties around Flora and Hunter Streets.

Dam Spilling / Failure

Dam Name	Location	Owner	Waterways downstream	Dam Capacity	Full Supply Level	Spillway Crest Level	Flood Class Levels (head gauge)	Map Reference
Keilor Golf Course Water Storage Dam	Keilor Golf Course, 540 Calder Freeway, Keilor North	Brimbank Council		7.4ML	Unavailable		N/A	Melway 3 K7
Operation Centre Dam	Keilor Park Drive, Keilor Park	Brimbank Council		0.7ML	Unavailable		N/A	Melway 15 C4
Green Gully Reserve Stormwater Storage Dam	151D Green Gully Road, Keilor Downs	Brimbank Council		5.9ML	Unavailable		N/A	Melway 14 D6
Rosslynne Dam	3km northwest of Gisborne	Southern Rural Water	Jacksons Creek into Maribyrnong River	25,400ML	50.90m (head gauge) 450.9m AHD	50.91m (head gauge) 450.91m AHD	Minor: 51.4m Moderate: 51.7m Major: 52.1m	VicMap Book 6443 F1

Table A2 – Brimbank City Reservoirs

Flooding resulting from failure of the Rosslynne Dam is likely to cause significant structural and community damage within the City of Brimbank. 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.

The dams owned by the council noted above are relatively small in size and are listed for reference. See Figure A4 on the following page.

Service Reservoirs

Service Reservoirs located within the Municipality are listed below.

Service Reservoir Name	Location	Owner	Material	Reservoir Capacity	Melway Reference
St Albans Steel Tank No.1	227 Taylors Road St Albans	Melbourne Water	Steel	30.6ML	13 H9
St Albans Steel Tank No.2	227 Taylors Road St Albans	Melbourne Water	Steel	30.6ML	13 H9
St Albans Steel Tank No.3	227 Taylors Road St Albans	Melbourne Water	Steel	30.6ML	13 H9

Table A3 – Melbourne Water Service Reservoirs in the City of Brimbank

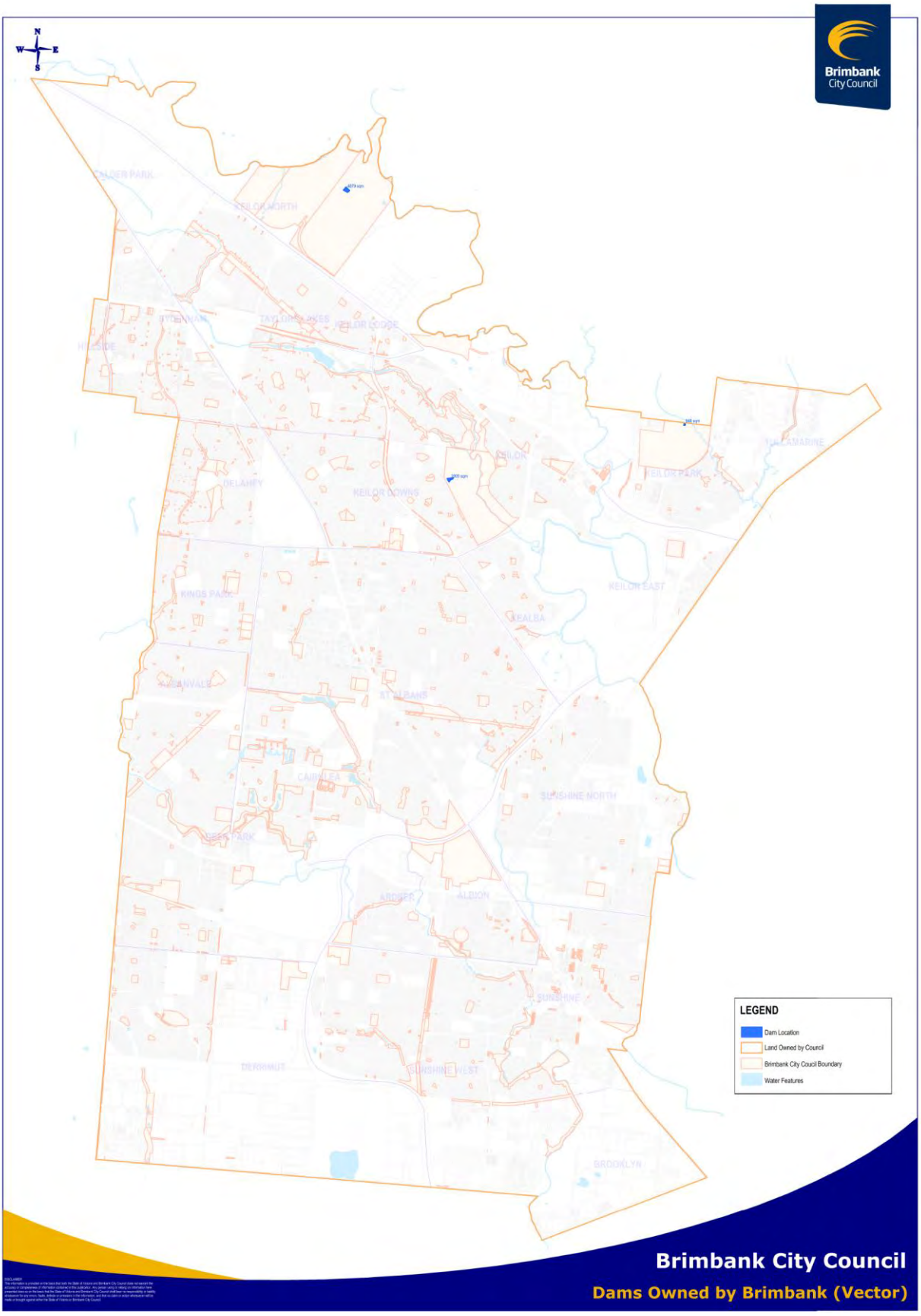


Figure A4 – Brimbank City Council Owned Dams

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	Location To	Typical Travel Time	Flood Class Level at Keilor	Comments
MARIBYRNONG RIVER (DEEP, EMU AND JACKSONS CREEKS)				
Darraweit Guim	Keilor	Between 9 and 20 hours	Minor Flood	Inflows from Jacksons and Emu Creeks likely to significantly impact travel times to Keilor
		Between 6 and 18 hours	Moderate Flood	
		Between 4 and 16 hours	Major Flood	
Clarkefield	Keilor	Between 10 and 18 hours	Minor Flood	Inflows from Deep and Jacksons Creeks likely to significantly impact travel times to Keilor
		Between 8 and 17 hours	Moderate Flood	
		Between 5 and 16 hours	Major Flood	
Sunbury	Keilor	Between 7 and 14 hours	Minor Flood	Inflows from Deep and Emu Creeks likely to significantly impact travel times to Keilor
		Between 5 and 13 hours	Moderate Flood	
		Between 4 and 12 hours	Major Flood	
Bulla	Keilor	Between 4 and 10 hours	Minor Flood	Inflows from Jacksons Creek likely to significantly impact travel times to Keilor
		Between 3 and 8 hours	Moderate Flood	
		Between 2 and 5 hours	Major Flood	
Keilor	Maribyrnong	Between 1 and 8 hours	Minor Flood	Inflows from Steele Creek as well as tidal flows up to Maribyrnong may impact travel times to Maribyrnong
		Between 1 and 4 hours	Moderate Flood	
		Between 2 and 5 hours	Major Flood	
KORORoit CREEK				
Diggers Rest	Deer Park	Between 1 and 7 hours	-	
Deer Park	Brooklyn	Between 1 minute and 3 hours	-	Inflows from Jones Creek and the Stony Creek diversion may impact travel times to Brooklyn.

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

Historical Travel Times

Flood Event	Location From	Location To	Flood Peak Travel Time	Flood Class at
KORONOIT CREEK				**DEER PARK**
15th October 1983	Diggers Rest	Deer Park	6 hours	Major
10th December 1985	Diggers Rest	Deer Park	3 hours	Minor
29th July 1987	Diggers Rest	Deer Park	1 hour	Below Minor
3rd February 2005	Diggers Rest	Deer Park	2 hours	Major
13th November 2010	Diggers Rest	Deer Park	6 hours	Below Minor
28th November 2010	Diggers Rest	Deer Park	2 hours	Below Minor
13th January 2011	Diggers Rest	Deer Park	7 hours	Below Minor
14th January 2011	Diggers Rest	Deer Park	6 hours	Below Minor
18th August 2012	Diggers Rest	Deer Park	7 hours	Below Minor
10th December 1985	Deer Park	Brooklyn	3 hours	Minor
29th July 1987	Deer Park	Brooklyn	Less than 1 hour	Below Minor
3rd February 2005	Deer Park	Brooklyn	1 hour	Major
13th November 2010	Deer Park	Brooklyn	3 hours	Below Minor
28th November 2010	Deer Park	Brooklyn	2 hours	Below Minor
13th January 2011	Deer Park	Brooklyn	3 hours	Below Minor
14th January 2011	Deer Park	Brooklyn	3 hours	Below Minor
18th August 2012	Deer Park	Brooklyn	3 hours	Below Minor
MARIBYRNONG RIVER				**KEILOR**
18th September 1975	Clarkefield	Keilor	20 hours	Major
	Bulla		4 hours	
	Keilor	Maribyrnong	2 hours	
21st October 1975	Darraweit Guim	Keilor	8 hours	Moderate
	Clarkefield		11 hours	
	Bulla		Keilor peaked 5 hours before Bulla	
	Keilor	Maribyrnong	Less than 1 hour	
24th October 1975	Darraweit Guim	Keilor	15 hours	Major
	Clarkefield		17 hours	
	Sunbury		12 hours	
	Bulla		5 hours	
	Keilor	Maribyrnong	17 hours	
23rd September 1976	Darraweit Guim	Keilor	1 hour	Moderate
	Clarkefield		10 hours	
	Sunbury		6 hours	
	Bulla		2 hours	
	Keilor	Maribyrnong	8 hours	
7th-8th April 1977	Darraweit Guim	Keilor	2 hours	Major
	Clarkefield		Less than 1 hour	
	Sunbury		5 hours	
	Bulla		3 hours	
	Keilor	Maribyrnong	3 hours	
19th June 1977	Darraweit Guim	Keilor	9 hours	Moderate
	Clarkefield		8 hours	
	Sunbury		7 hours	
	Bulla		3 hours	
	Keilor	Maribyrnong	2 hours	

Flood Event	Location From	Location To	Flood Peak Travel Time	Flood Class at
MARIBYRNONG RIVER				**KEILOR**
30th June-1st July 1977	Darraweit Guim	Keilor	10 hours	Major
	Clarkefield		5 hours	
	Sunbury		4 hours	
	Bulla		3 hours	
	Keilor	Maribyrnong	Less than 1 hour	
8th August 1978	Darraweit Guim	Keilor	7 hours	Major
	Clarkefield		15 hours	
	Sunbury		7 hours	
	Bulla		3 hours	
	Keilor	Maribyrnong	2 hours	
19th -20th September 1978	Darraweit Guim	Keilor	11 hours	Minor
	Clarkefield		13 hours	
	Sunbury		9 hours	
	Bulla		Less than 1 hour	
	Keilor	Maribyrnong	2 hours	
16th October 1983	Darraweit Guim	Keilor	9 hours	Moderate
	Clarkefield		11 hours	
	Sunbury		5 hours	
	Bulla		9 hours	
	Keilor	Maribyrnong	2 hours	
30th July 1987	Darraweit Guim	Keilor	6 hours	Moderate
	Clarkefield		9 hours	
	Sunbury		8 hours	
	Bulla		3 hours	
	Keilor	Maribyrnong	2 hours	
11th June 1989	Darraweit Guim	Keilor	10 hours	Minor
	Clarkefield		14 hours	
	Sunbury		9 hours	
	Bulla		Less than 1 hour	
	Keilor	Maribyrnong	1 hour	
18th-19th July 1990	Darraweit Guim	Keilor	12 hours	Minor
	Clarkefield		13 hours	
	Sunbury		8 hours	
	Bulla		10 hours	
	Keilor	Maribyrnong	1 hour	
15th September 1993	Darraweit Guim	Keilor	4 hours	Major
	Clarkefield		9 hours	
	Sunbury		-	
	Bulla		2 hours	
	Keilor	Maribyrnong	3 hours	
24th October 2000	Darraweit Guim	Keilor	20 hours	Minor
	Clarkefield		34 hours	
	Sunbury		27 hours	
	Bulla		8 hours	
	Keilor	Maribyrnong	5 hours	

Flood Event	Location From	Location To	Flood Peak Travel Time	Flood Class at
MARIBYRNONG RIVER				**KEILOR**
3rd February 2005	Darraweit Guim	Keilor	5 hours	Minor
	Clarkefield		4 hours	
	Sunbury		Less than 1 hour	
	Bulla		4 hours	
	Keilor	Maribyrnong	Maribyrnong peaked 5 hours before Keilor	
5th September 2010	Darraweit Guim	Keilor	18 hours	Minor
	Clarkefield		28 hours	
	Sunbury		14 hours	
	Bulla		5 hours	
	Keilor	Maribyrnong	3 hours	
28th November 2010	Darraweit Guim	Keilor	9 hours	Minor
	Clarkefield		13 hours	
	Sunbury		8 hours	
	Bulla		10 hours	
	Keilor	Maribyrnong	5 hours	
14th-15th January 2011	Darraweit Guim	Keilor	19 hours	Moderate
	Clarkefield		14 hours	
	Sunbury		10 hours	
	Bulla		6 hours	
	Keilor	Maribyrnong	3 hours	
18th August 2012	Darraweit Guim	Keilor	9 hours	Minor
	Clarkefield		10 hours	
	Sunbury		7 hours	
	Bulla		5 hours	
	Keilor	Maribyrnong	3 hours	
15th September 2016	Darraweit Guim	Keilor	18 hours	Minor
	Clarkefield		17 hours	
	Sunbury		11 hours	
	Bulla		5 hours	
	Keilor	Maribyrnong	11 hours	
14th October 2022	Darraweit Guim	Keilor	11 hours	Major
	Clarkefield		11 hours	
	Sunbury		7 hours	
	Bulla		5 hours	
	Keilor	Maribyrnong	4 hours	

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

APPENDIX C1 – MARIBYRNONG RIVER FLOOD EMERGENCY PLAN

Overview of Flooding Consequences

Keilor and Keilor North and their surrounding regions comprise the northern regions of the City of Brimbank while Kealba and Sunshine North comprise the eastern regions. High intensity, short duration rainfall events can cause flash flooding in all these areas, while prolonged rainfall events may cause the Maribyrnong River to flood. At Minor flood level on the Maribyrnong River at Keilor, the Flora Street bridge is likely to be overtopped, isolating the rural property and farmland on the northern bank of the river. Arundel Road is at risk of flooding during a 1% AEP flood event.

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 the Maribyrnong River					
Property					
Properties	**23**				
Residential	10				
Commercial	0				
Industrial	0				
Public Land	0				
Rural	13	Properties on Flora Street at risk of Isolation at Minor flood level at Keilor			
Community Infrastructure					
Essential Infrastructure					
Sewerage Facilities	2	Emergency Relief Points			
Drainage Facilities	4	Weirs			
Tourism / Recreation					
Recreation Facilities	4	Brimbank Park; Caroline Chisholm Park; Gumms Corner; and Organ Pipes National Park			
Government Boundaries					
Local Government Areas	1	Brimbank	CMA	1	Port Phillip & Westernport
Adjacent LGAs	2	Hume & Moonee Valley	CFA District	0	
SES Response Boundary	1	Brimbank	FRV District	1	Western

Table C1.1 – Consequence Summary of 1% AEP flood along the Maribyrnong River in Brimbank

Gauges and Warnings

Warnings are available for flooding expected along the Maribyrnong River at Keilor. Flood class levels for the Keilor gauge are detailed in table C1.3 and are used in the issuing of a flood warning for the lower Maribyrnong River. Other level / flood gauges within the Maribyrnong River catchment are also contained within table C1.2.

Gauge	Station No.	Location	Stream Level & Flow Gauge	Rain Gauge	Map Reference
Deep Creek at Lancefield	230119A	At Doggetts Bridge on Kilmore-Lancefield Road, Lancefield	✓		VicMap Central: 6277 D9
Romsey	587117	Portingsales Lane, Romsey		✓	VicMap Central: 6361 C3
Deep Creek at Darraweit Guim	230100A	East side of the creek, 200m South of Beveridge – Darraweit Guim Road, Wallan	✓	✓	VicMap Central: 6362 E8
Bolinda Creek at Clarkefield	230211A	North side of the creek, west side of Lancefield Rd, Clarkefield	✓		VicMap Central: 6361 A14
Deep Creek at Konagaderra	230107A	West side of the creek 200m north of The Ridge Walking Trail, Oaklands Junction	✓	✓	Melway: 365 C2
Deep Creek at Bulla	230102A	South side of the creek at Bulla Rd bridge, Bulla	✓		Melway: 177 A6
Bulla	587014	105 Loemans Rd, Bulla		✓	Melway: 177 A10
Jacksons Creek at Rosslynne Reservoir	230103A	Rosslynne Reservoir, Gisborne	✓	✓	VicMap Central: 6443 F1
Jacksons Creek at Sunbury	230104A	West side of the Creek, north side of Sunbury Road bridge, Sunbury	✓	✓	Melway: 382 H5
Maribyrnong River d/s Jacksons Creek, Keilor North	230237A	Southwest side of River in Sydenham Park, Keilor North	✓		Melway: 4 B7
Maribyrnong River at Keilor	230105A	South side of the River in Brimbank Park, Keilor East	✓	✓	Melway: 14 J8

Table C1.2 – Gauges within the Maribyrnong River catchment impacting flooding in the City of Brimbank

These Gauges may provide some warning of expected flooding. See the Melbourne Water website for more information on these gauges: melbournewater.com.au/waterdata/rainfallandriverleveldata/Pages/Rainfall-and-river-level-new.aspx. It is advised that residents monitor the BoM website bom.gov.au and the VicEmergency website emergency.vic.gov.au for any thunderstorm, flood or severe weather warnings present for their area.

Gauge	River / Creek Flood Class Level		
	Minor	Moderate	Major
Deep Creek at Darraweit Guim	5.5m	6.1m	6.5m
Jacksons Creek at Rosslynne Reservoir	51.4m	51.7m	52.1m
Maribyrnong River at Keilor	3.5m	5.4m	6.1m

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

At these sites on within the Maribyrnong River catchment, the BoM, in consultation with Melbourne Water, will issue flood warnings if levels reach those classified above. This warning will be placed on the Bureau's website (bom.gov.au/vic/warnings/index.shtml) and the VicEmergency website emergency.vic.gov.au. While the City of Brimbank 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 Maribyrnong River

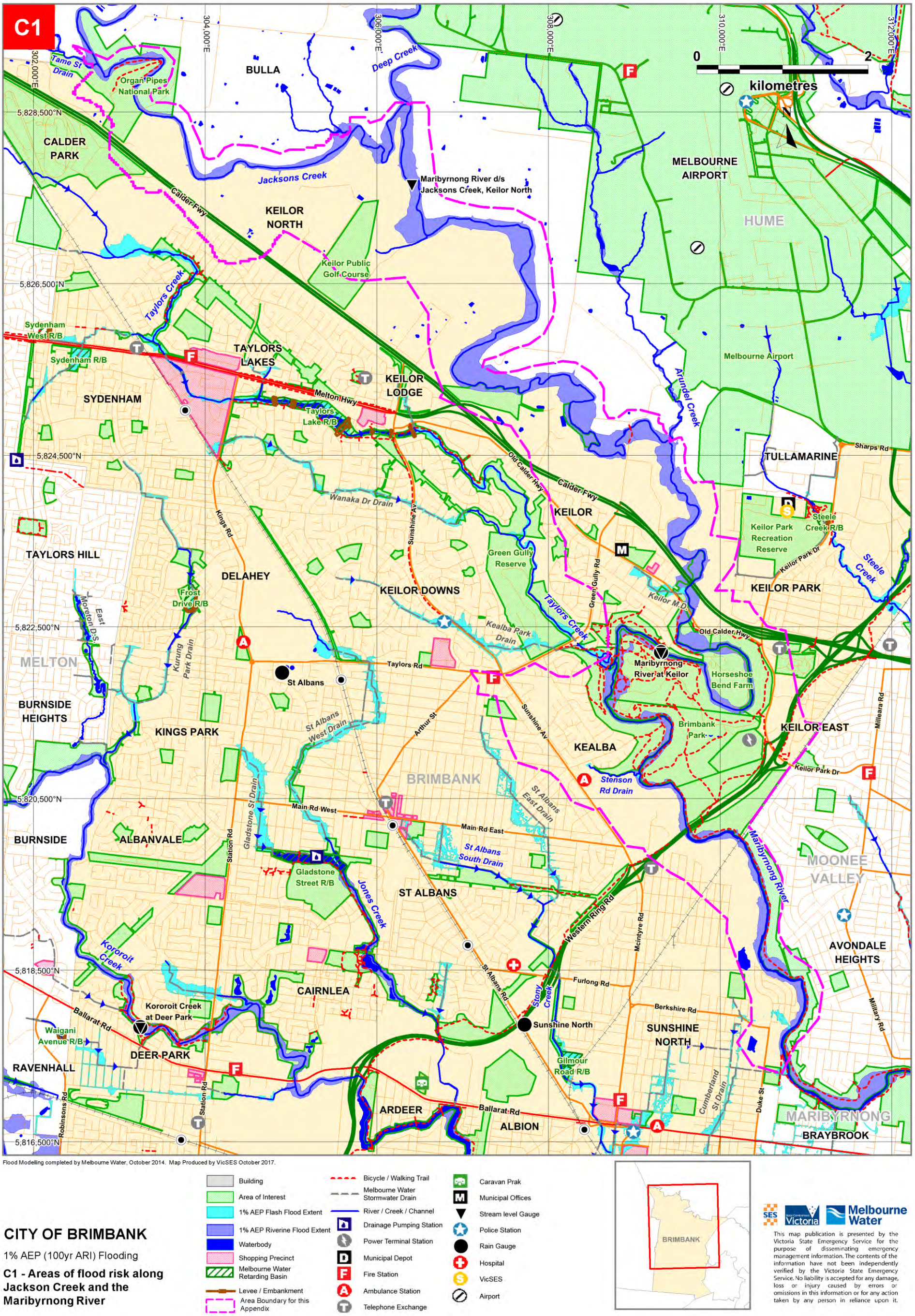


Figure C1 – Areas of flood risk along the Maribyrnong River in the City of Brimbank

Properties at Flood Risk

Properties listed in the table below are at risk from flooding along the Maribyrnong River or its tributaries (excluding the Taylors Creek system) in the City of Brimbank. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Maribyrnong River (Melbourne Water, October 2014) flood mapping and risk assessment program and as part of the impact assessment into the 14th October 2022 flood event.

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 during a 1% AEP event

Residential	Commercial	Industrial	Rural	Public Use

Street No. at Risk	Street	Suburb	Along Melbourne Water Watercourse	Isolation Risk	Riverine Flood Risk	Flash Flood Risk
8-10	Arabin Street	Keilor	Keilor Main Drain			✓
160	Arundel Road	Keilor	Maribyrnong River		✓	
10	Eagling Street	Keilor	Keilor Main Drain			✓
12	Eagling Street	Keilor	Keilor Main Drain			✓
14	Flora Street	Keilor	Keilor Main Drain			✓
60	Flora Street	Keilor Park	Maribyrnong River	✓		
80	Flora Street	Keilor Park	Maribyrnong River	✓		
100	Flora Street	Keilor Park	Maribyrnong River	✓		
120	Flora Street	Keilor Park	Maribyrnong River	✓		
46	Grogan Road	Keilor North	Maribyrnong River		✓	
1/9	Hunter Street	Keilor	Keilor Main Drain			✓
2/9	Hunter Street	Keilor	Keilor Main Drain			✓
11	Hunter Street	Keilor	Keilor Main Drain			✓
13/16	Hunter Street	Keilor	Maribyrnong River		✓	
6/20	Hunter Street	Keilor	Maribyrnong River		✓	
11	Kennedy Street	Keilor	Keilor Main Drain			✓
53	Milburn Road	Keilor	Maribyrnong River		✓	
71	Milburn Road	Keilor	Maribyrnong River		✓	
127	Milburn Road	Keilor	Maribyrnong River		✓	
167	Milburn Road	Keilor	Maribyrnong River		✓	
177	Milburn Road	Keilor	Maribyrnong River		✓	
181	Milburn Road	Keilor	Maribyrnong River		✓	
193	Milburn Road	Keilor	Maribyrnong River		✓	
1/660	Old Calder Highway	Keilor	Maribyrnong River		✓	
2/660	Old Calder Highway	Keilor	Maribyrnong River		✓	
3/660	Old Calder Highway	Keilor	Maribyrnong River		✓	
4/660	Old Calder Highway	Keilor	Maribyrnong River		✓	
5/660	Old Calder Highway	Keilor	Maribyrnong River		✓	
6/660	Old Calder Highway	Keilor	Maribyrnong River		✓	
7/660	Old Calder Highway	Keilor	Maribyrnong River		✓	
8/660	Old Calder Highway	Keilor	Maribyrnong River		✓	
765	Old Calder Highway	Keilor	Keilor Main Drain			✓
767	Old Calder Highway	Keilor	Keilor Main Drain			✓

Properties at risk from Flooding during a 1% AEP event						
Residential		Commercial	Industrial	Rural		Public Use
Street No. at Risk	Street	Suburb	Along Melbourne Water Watercourse	Isolation Risk	Riverine Flood Risk	Flash Flood Risk
769	Old Calder Highway	Keilor	Keilor Main Drain			✓
775	Old Calder Highway	Keilor	Keilor Main Drain			✓
777	Old Calder Highway	Keilor	Keilor Main Drain			✓
779-783	Old Calder Highway	Keilor	Keilor Main Drain			✓
785	Old Calder Highway	Keilor	Keilor Main Drain			✓
787	Old Calder Highway	Keilor	Keilor Main Drain			✓
Total						
39						

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

Isolation

An isolation risk exists for properties north of the Maribyrnong River on Flora Street. With Flora Street crossing the Maribyrnong River via a small bridge, this bridge is at risk of over-topping at the Minor flood Level on the Keilor gauge, cutting access to the rural properties and plantation at 60, 80, 100 and 120 Flora Street. Flooding Isolation was experienced in September 2016 and as recently as October 2022. During the October 2022 major flood event, isolation of these properties occurred for a period of 32 hours.

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: ptv.vic.gov.au/live-travel-updates. A map of public transport routes within the City of Brimbank is available via the website at: ptv.vic.gov.au/assets/default-site/more/maps/metropolitan-local-area-maps/6_Brimbank_LAM_April-2022-NN.pdf

Apart from the roads outlined below, all other essential infrastructure and services areas around Maribyrnong River (or Keilor North, Keilor, Kealba and Sunshine North) are expected to remain predominantly dry during a 1% AEP (100yr ARI) event.

Road Closures

The following roads are subject to closure during flooding around Maribyrnong River. Check the VicRoads website for more details: alerts.vicroads.vic.gov.au.

VicRoads Roads likely flooded in a 1% AEP (100yr ARI) event
• Nil

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

Brimbank City Council Roads likely flooded in a 1% AEP (100yr ARI) event	
KEILOR	• Flora Street
• Arabin Street	• Hunter Street
• Arundel Road	• Kennedy Street

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

Flood Mitigation

A number of weirs exist along the stretch of the Maribyrnong River in the City of Brimbank. No formal Retarding Basins, Pumping Stations or Levees exist along Maribyrnong River in the City of Brimbank.

Weirs

Weir Name	On Drain / Waterway	Owner	Location	Melway Reference
Arundel Road Weir	Maribyrnong River	Melbourne Water	Arundel Road, Keilor	14 H2
Brimbank Park Ford	Maribyrnong River	Melbourne Water	Brimbank Park, Keilor	14 H8
Garden Avenue Weir	Maribyrnong River	Melbourne Water	Garden Avenue, Keilor	14 J8
McNab's Road Weir	Maribyrnong River	Melbourne Water	Between McNabs Road and Koronis Road, Keilor	14 C1

Table C1.7 – Weirs along the Maribyrnong River in the City of Brimbank

Sewerage Infrastructure

Sewer Emergency Relief Points

There are two Sewer Emergency Relief Points along the Maribyrnong River that will likely affect floodwater conditions should they be activated. Contact the Infrastructure Operator EMLO/Duty Officer for information on any recent or planned releases at a Sewer Emergency Relief Point as part of a Dynamic Risk Assessment (DRA) if work is to be conducted at or downstream of the outlet.

On Drain / Waterway	Bank / Side of Waterway	Operator	Location	Melway Reference
Maribyrnong River	West	City West Water	Garden Avenue, Keilor	14 J8
Maribyrnong River	West	City West Water	Brimbank Park, Keilor	14 H8

Table C1.8 – Sewer Emergency Relief Points along the Maribyrnong River in the City of Brimbank

Control, Command and Coordination

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

Flood Impacts & Operational Considerations (Intelligence Cards)

The tables on the following pages provide a breakdown of the possible consequences of flooding along the Maribyrnong River at various river heights within Brimbank. 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:

- Maribyrnong River at Keilor North
- Maribyrnong River at Keilor

FLOOD INTELLIGENCE CARD – MARIBYRNONG RIVER d/s JACKSONS CREEK GAUGE, KEILOR NORTH

Version 5 – November 2022

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	**Southwest side of River in Sydenham Park, Keilor North**
WEBSITE:	melbournewater.com.au/water/rainfall-and-river-levels#/reader/230237A
STREAM:	**Maribyrnong River downstream of Jacksons Creek**
GAUGE NUMBER:	**230237A**
GAUGE ZERO:	**30.38m AHD**
GAUGE TYPE	**Stream Level**

MELWAY REFERENCE:	**4 B7**
MINOR:	**Not Established**
MODERATE:	**Not Established**
MAJOR	**Not Established**
LEVEE HEIGHT:	**N/A**
HIGHEST RECORDED FLOOD:	**9.77m (14th October 2022)**

River Height	Flood Class or Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
5.5m		**Properties at Flood Risk** **4 Properties in Total** • 60, 80, 100 & 120 Flora Street, Keilor Park (Isolation Risk) **Water Over Road** • Flora Street	• VICSES may provide warnings via VicEmergency to the community (including Brimbank Council and appropriate agencies as required) based on 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.
5.56m	15th September 2016 Flood Level Peak	**Event Summary** • Flora Street bridge overtopped isolating properties on the north bank of the Maribyrnong River	
6.18m	28th November 2010 Flood Level Peak	**Nil Information Available**	
7.06m	14th January 2011 Flood Level Peak	**Nil Information Available**	
9.77m	14th October 2022 Flood Level Peak	**Event Summary** 19 properties impacted by flooding along Arundel Road, Milburn Road, Old Calder Highway and Hunter Street in Keilor 4 properties on Flora Street isolated for a period of 32 hours	

River Height	Flood Class or Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		Rosslynne Reservoir commenced spilling 14 hours before peak occurred at Keilor • Arundel Road Trestle Bridge damaged	
	1% AEP (100yr ARI) Flood Level	**Nil Information Available**	

Table C1.10 – Breakdown of likely consequences at various Keilor North gauge level heights along the Maribyrnong River with operational considerations

FLOOD INTELLIGENCE CARD – MARIBYRNONG RIVER GAUGE, KEILOR

Version 5 – November 2022

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	**South side of the River in Brimbank Park, Keilor East**
WEBSITE:	melbournewater.com.au/water/rainfall-and-river-levels#/reader/230105A
STREAM:	**Maribyrnong River**
GAUGE NUMBER:	**230105A**
GAUGE ZERO:	**10.684m AHD**
GAUGE TYPE	**Stream Level**

MELWAY REFERENCE:	**14 J8**
MINOR:	**3.5m**
MODERATE:	**5.4m**
MAJOR	**6.1m**
LEVEE HEIGHT:	**N/A**
HIGHEST RECORDED FLOOD:	**8.63m (14th October 2022)**

River Height	Flood Class or Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
3.5m	**Minor Flood Level**	**Properties at Flood Risk** **4 Properties in Total** • 60, 80, 100 & 120 Flora Street, Keilor Park (Isolation Risk) **Water Over Road** • Flora Street	VICSES may provide warnings via VicEmergency to the community (including Brimbank 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.
3.81m	15th September 2016 Flood Level Peak	**Event Summary** • Flora Street bridge overtopped isolating properties on the north bank of the Maribyrnong River	
5.4m	**Moderate Flood Level**		
5.61m	15th January 2011 Flood Level Peak		

River Height	Flood Class or Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
6.1m	**Major Flood Level**		
6.8m	15th September 1993 Flood Level Peak		
7.31m	8th April1977 Flood Level Peak		
7.43m	18th September 1975 Flood Level Peak		
7.69m	1% AEP (100yr ARI) Flood Level (Major)	**Properties at Flood Risk** **1 Property New at Level: 5 properties in Total** • 46 Grogan Road, Keilor North	
7.77m	8th August 1978 Flood Level		
8.63m	14th October 2022 Flood Level	**Event Summary** 19 properties impacted by flooding along Arundel Road, Milburn Road, Old Calder Highway and Hunter Street in Keilor 4 properties on Flora Street isolated for a period of 32 hours Rosslynne Reservoir commenced spilling 14 hours before peak occurred at Keilor Arundel Road Trestle Bridge damaged	

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

APPENDIX C2 – TAYLORS CREEK FLOOD EMERGENCY PLAN

Overview of Flooding Consequences

Sydenham, Taylors Lakes, Keilor Downs and their surrounding regions comprise some of the northern regions of the City of Brimbank. Much of this area is dominated by recent residential growth, particularly around Taylors Lakes and Sydenham. High intensity, short duration rainfall events can cause flash flooding in these areas. Taylors Creek flows from Taylors Lakes & Sydenham into the Maribyrnong River at Keilor.

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 access this information should make appropriate enquiries to assess the currency of the data.

Summary of Consequences in a 1% AEP (100yr ARI) flood along Taylors Creek					
Property					
Properties	**17**	Over-Floor Flooding Risk			
Residential	17				
Commercial	0				
Industrial	0				
Public Land	0				
Rural	0				
Community Infrastructure					
Health Facilities	1	Sydenham Medical Centre			
Care Facilities	1	Estia Health			
Schools / Colleges	3	Overnewton Anglican Community College; Taylors Lakes Primary School (access restriction); and Taylors Lakes Secondary College (access restriction)			
Child Care/Kindergartens	2	Barbary Crescent Preschool (access restriction); and Taylors Lakes Kindergarten			
Essential Infrastructure					
Major Roads	3	Melton Highway, Kings Road & Sunshine Avenue			
Bus Routes	7	420 and 461 along Kings Road. 476 and 483 along Sunshine Avenue. 460, 462, 476 and 943 along Melton Highway			
Police Stations	1	Keilor Downs (possible access restriction)			
Sewerage Facilities	1	Emergency Relief Point			
Drainage Facilities	8	Retarding Basins			
Tourism / Recreation					
Sports Facilities	1	Taylors Lake Tennis Club at Lionheart Reserve			
Recreation Facilities	3	Green Gully Reserve; Lionheart Reserve; and Parmelia Drive Reserve			
Government Boundaries					
Local Government Areas	1	Brimbank	CMA	1	Port Phillip & Westernport
Adjacent LGAs	1	Melton	CFA District	0	
SES Response Boundary	1	Brimbank	FRV District	1	Western

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

Gauges and Warnings

Neither the Bureau of Meteorology nor Melbourne Water currently provides flood forecasts for Taylors Creek. All flood response actions must therefore be driven by rainfall and / or river level observations. Telemetered water level / flood gauges are located at St Albans and Keilor within the Jones Creek and Maribyrnong River catchments respectively.

Melbourne Water Gauges	Station No.	Location	Stream Level & Flow Gauge	Rain Gauge	Melway Reference
Maribyrnong River d/s Jacksons Creek, Keilor North	230237A	Southwest side of River in Sydenham Park, Keilor North	✓		4 B7
St Albans	587051	St Albans Reservoir Tanks on Taylors Road, St Albans		✓	13 H9

Table C2.2 – Hydrographic Monitoring Stations within adjacent catchments to Taylors Creek

These Gauges may provide some warning of expected flooding. See the Melbourne Water website for more information on these gauges: melbournewater.com.au/waterdata/rainfallandriverleveldata/Pages/Rainfall-and-river-level-new.aspx. It is advised that residents monitor the Bureau of Meteorology's website bom.gov.au and the VicEmergency website emergency.vic.gov.au for any thunderstorm, flood or severe weather warnings present for their area.

Area Map of Flood Risk

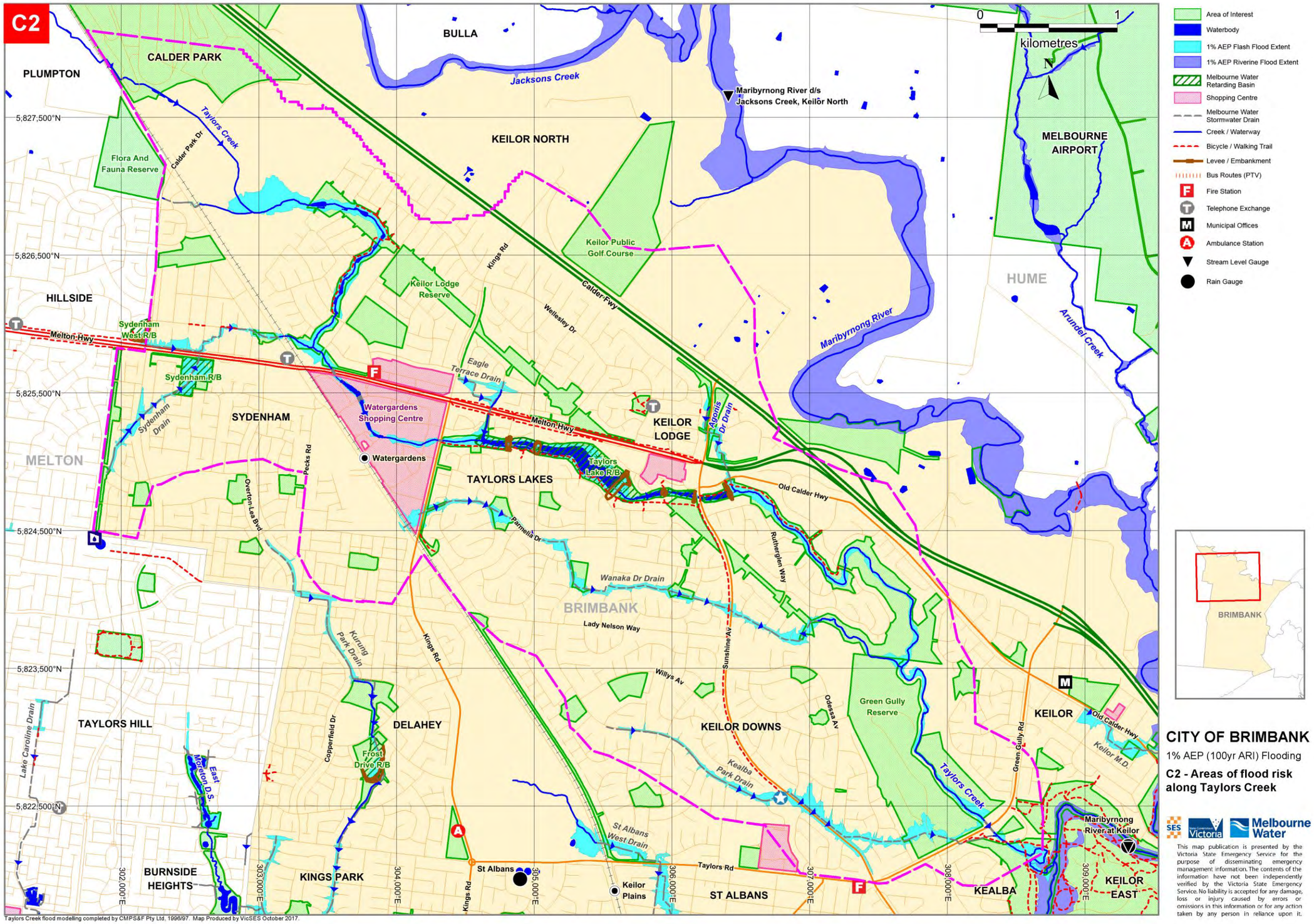


Figure C2 – Areas of flood risk around Taylors Creek in the City of Brimbank

Properties at Flood Risk

Properties listed in the table below are at risk from flooding over-floor. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Drainage Survey – City of Brimbank (CMPS&F Pty Ltd, 1996/97) 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 Over-Floor						
Residential			Commercial	Industrial	Rural	Public Use
Street No. at Risk in AEP Event			Address	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
5% AEP	2% AEP	1% AEP				
		✓	23 Bellbird Avenue	Taylors Lakes	Honeyeater Crescent Drain	Flash
	✓	✓	1 Gloucester Court	Sydenham	Sydenham Drain	Flash
✓	✓	✓	14 Homestead Drive	Keilor Downs	Kealba Park Drain	Flash
		✓	37 Lionheart Avenue	Taylors Lakes	Wanaka Drain	Flash
		✓	1/558 Melton Highway	Sydenham	Sydenham Drain	Flash
		✓	2/558 Melton Highway	Sydenham	Sydenham Drain	Flash
✓	✓	✓	572 Melton Highway	Sydenham	Sydenham Drain	Flash
	✓	✓	22 Normanby Street	Sydenham	Sydenham Drain	Flash
✓	✓	✓	13 Rethel Close	Keilor Downs	Kealba Park Drain	Flash
	✓	✓	15 Rethel Close	Keilor Downs	Kealba Park Drain	Flash
✓	✓	✓	17 Rethel Close	Keilor Downs	Kealba Park Drain	Flash
		✓	4 Rotoroa Court	Taylors Lakes	Wanaka Drain	Flash
✓	✓	✓	320 Sunshine Avenue	Keilor Downs	Kealba Park Drain	Flash
✓	✓	✓	6 Tarella Drive	Keilor Downs	Kealba Park Drain	Flash
	✓	✓	32 Wanaka Drive	Taylors Lakes	Wanaka Drain	Flash
	✓	✓	34 Wanaka Drive	Taylors Lakes	Wanaka Drain	Flash
✓	✓	✓	52 Wimmera Crescent	Keilor Downs	Kealba Park Drain	Flash
Totals						
7	12	17				

Table C2.3 – Properties at risk of flooding along within the Taylors Creek catchment in the City of Brimbank

Isolation

No major isolation risks exist for areas around Taylors Creek 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. ptv.vic.gov.au/live-travel-updates. A map of Public Transport routes around Taylors Creek is available via the website at: ptv.vic.gov.au/assets/default-site/more/maps/metropolitan-local-area-maps/6_Brimbank_LAM_April-2022-NN.pdf

Apart from the roads outlined below, all other essential infrastructure and services areas around Taylors Creek are expected to remain predominantly dry during a 1% AEP (100yr ARI) event.

Road Closures

The following roads are subject to closure during flooding around Taylors Creek. Check the VicRoads website for more details: alerts.vicroads.vic.gov.au

VicRoads Roads likely flooded in a 1% AEP (100yr ARI) event
• Melton Highway, Sydenham eastbound between Calder Park Drive and Carrington Street
• Kings Road, Taylors Lakes south of Watergardens Circuit Road
• Sunshine Avenue, Keilor Downs between Tarella Drive and Copernicus Way
• Sunshine Avenue, Taylors Lakes at Wanaka Drive
• Sunshine Avenue, Taylors Lakes at Santa Monica Drive

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

Brimbank City Council Roads likely flooded in a 1% AEP (100yr ARI) event			
HILLSIDE	• Wirilda Place	• Meade Way	• Grampians Court
• Chris Court	**KEILOR LODGE**	**TAYLORS LAKES**	• Lionheart Avenue
• Community Hub	• Malibu Grove	• Australia Drive	• Parmelia Drive
• Gregg Court	**SYDENHAM**	• Barbary Crescent	• Sydenham Road
• Hannah Avenue	• Benjamin Court	• Bellbird Avenue	• Rotoroa Court
KEILOR DOWNS	• Breadalbane Court	• Chichester Drive	• Wanaka Drive
• Copernicus Way	• Carrington Street	• Cocoparra Crescent	• Wyperfeld Avenue
• Ulmara Place	• Dundee Way	• Eagle Terrace	

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

Flood Mitigation

Retarding Basins

Melbourne Water Retarding Basin	On Drain/ Waterway	Spillway Crest Level	Full Supply Level	1% AEP Flood Level	Embankment Crest Height	Storage Capacity	ANCOLD Hazard Rating	Houses in Flow Path (dam breach)	Melway Reference
Sydenham	Sydenham Drain	Unavailable	Unavailable	112.0m AHD	3.05m	72ML	High C	4	3 B12
Sydenham West	Sydenham West Drain	115.9m AHD	Unavailable	Unavailable	2.4m height (118.3m AHD)	17 ML	Very Low	0	3 A11
Taylors Lake, Taylors Lakes	Taylors Creek	88.0m AHD	Unavailable	89.5m AHD	89.5m AHD	315ML	Very Low	0	13 J1
Taylors Lakes/Heron Lake	Taylors Creek	81.65m AHD	81.65m AHD	83.1m AHD	81.65m AHD	0.3ML	Very Low	Unavailable	13 K2
Taylors Lakes/Ibis Lake	Taylors Creek	91.2m AHD	91.2m AHD	94.1m AHD	91.2m AHD	6.0ML	Very Low	Unavailable	13 G1
Taylors Lakes/ Lake Kingfisher	Taylors Creek	76.6m AHD	76.6m AHD	78.2m AHD	76.6m AHD	5.0ML	Very Low	Unavailable	14 A2
Taylors Lakes/ Lake Shelduck	Taylors Creek	89.5m AHD	89.5m AHD	91.1m AHD	89.5m AHD	5.0ML	Very Low	Unavailable	13 H1
Taylors Lakes/ Lake Spoonbill	Taylors Creek	78.6m AHD	78.6m AHD	80.2m AHD	78.6m AHD	0.3ML	Very Low	Unavailable	14 A2

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

Sewerage Infrastructure

Sewer Emergency Relief Points

There are Sewer Emergency Relief Points within the Taylors Creek catchment that will likely affect floodwater conditions should they be activated. Contact the Infrastructure Operator EMLO/Duty Officer for information on any recent or planned releases at a Sewer Emergency Relief Point as part of a Dynamic Risk Assessment (DRA) if work is to be conducted at or downstream of the outlet.

On Drain / Waterway	Bank / Side of Waterway	Operator	Location	Melway Reference
Victoria Road Drain	-	City West Water	Darlington Grove, Sydenham	3 B9

Table C2.7 – Sewer Emergency Relief Points in the Taylors Creek Catchment in the City of Brimbank

Command, Control and Coordination

VICSES will assume overall control of the response to flood incidents. Other agencies will be requested to support operations as detailed in this Plan. Control and coordination of a flood incident shall be carried out at the lowest effective level and in accordance with the 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 Taylors Creek and its tributaries at various rain totals within Brimbank. 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:

- Taylors Creek and Its Stormwater Tributaries

FLOOD INTELLIGENCE CARD – TAYLORS CREEK & ITS STORMWATER TRIBUTARIES (UNGAUGED)

Version 4 – May 2020

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 rain totals for this gauge.***

CLOSEST RAIN GAUGE	**St Albans**
LOCATION	**St Albans Reservoir Tanks on Taylors Road, St Albans**
WEBSITE	melbournewater.com.au/water/rainfall-and-river-levels#/reader/587051

MELWAY REF:	**13 H9**
GAUGE NUMBER	**587051**
GAUGE TYPE	**Rain**

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	**Annual Exceedance Probability (% AEP)**	**Consequence / Impact**	**Operational Considerations**
15.8mm in 10 mins; 26.7mm in 30 mins; 35.1mm in 1 hour; 44mm in 2 hours; 61.5mm in 6 hours; or 76.2mm 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.	5% AEP (20-year ARI)	**Properties at Flood Risk (above floor)** **7 Properties in Total** **Kealba Park Drain** • 1 & 17 Rethel Close, Keilor Downs • 14 Homestead Drive Keilor Downs • 320 Sunshine Avenue Keilor Downs • 6 Tarella Drive Keilor Downs • 52 Wimmera Crescent, Keilor Downs **Sydenham West Drain** • 572 Melton Highway, Sydenham	VICSES may provide warnings via VicEmergency to the community (including Brimbank 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
19.8mm in 10 mins; 33.2mm in 30 mins; 43.5mm in 1 hour; 54mm in 2 hours; 74.7mm in 6 hours; or 91.9mm 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)	**Properties at Flood Risk (above floor)** **12 Properties in Total** **Kealba Park Drain** • 13, 15 & 17 Rethel Close, Keilor downs • 14 Homestead Drive, Keilor Downs • 320 Sunshine Avenue, Keilor Downs • 6 Tarella Drive, Keilor Downs • 52 Wimmera Crescent, Keilor Downs **Sydenham Drain** • 1 Gloucester Court, Sydenham • 22 Normanby Street, Sydenham **Sydenham West Drain** • 572 Melton Highway, Sydenham **Wanaka Drain** • 32 & 34 Wanaka Drive Taylors Lakes **Community Infrastructure Flooded** Medical Centre, Melton Highway Sydenham over-floor flooding	
23.2mm in 10 mins; 38.7mm in 30 mins; 50.4mm in 1 hour; 62.3mm in 2 hours; 85.4mm in 6 hours; or 104.5mm 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)	**Properties at Flood Risk (over-floor)** **17 Properties in Total** **Honeyeater Crescent Drain** • 23 Bellbird Avenue, Taylors Lakes **Kealba Park Drain** • 13, 15 & 17 Rethel Close, Keilor downs • 14 Homestead Drive, Keilor Downs • 320 Sunshine Avenue, Keilor Downs • 6 Tarella Drive, Keilor Downs • 52 Wimmera Crescent, Keilor Downs **Sydenham Drain** • 1 Gloucester Court, Sydenham • 22 Normanby Street, Sydenham **Sydenham West Drain** • Units 1-2/558 & 572 Melton Highway, Sydenham **Wanaka Drain** • 32 & 34 on Wanaka Drive, Taylors Lakes • 37 Lionheart Avenue, Taylors Lakes • 4 Rotoroa Court, Taylors Lakes **Community Infrastructure Flooded** • Sydenham Medical Centre, Melton Highway Sydenham over-floor flooding risk	

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		• Overnewton Anglican Community College Taylors Lakes Campus flooding to sports grounds • Taylors Lakes Primary School, restricted access from Chichester Drive and Barbary Crescent • Taylors Lakes Secondary College, restricted access from Lionheart Avenue • Barbary Crescent Preschool, Chichester Drive Taylors Lakes, access restricted from Barbary Crescent and Chichcester Drive • Taylors Lakes Kindergarten, Cocoparra Crescent Taylors Lakes, yard flooding and restricted access from Cocoparra Crescent • Keilor Downs Police Station possible restricted access with flooding to Copernicus Way and Shine Avenue • Estia Health Nursing Home 2-6 Copernicus Way, Keilor Downs flooding to carpark with restricted access **Water Over Road (above 300mm depth)** **Agonis Drive Drain** • Malibu Grove Keilor Lodge **Eagle Terrace Drain** • Eagle Terrace Taylors Lakes **Honeyeater Crescent Drain** • Bellbird Avenue Taylors Lakes **Kealba Park Drain** • Copernicus Way Keilor Downs • Sunshine Avenue Keilor Downs • Ulmara Place Keilor Downs • Wirilda Place Keilor Downs **Sydenham Drain** • Chris Court Hillside • Community Hub Hillside • Gregg Court Hillside • Hannah Avenue Hillside • Benjamin Court Sydenham • Breadalbane Ct Sydenham • Carrington Street Sydenham • Dundee Way Sydenham • Meade Way Sydenham **Sydenham West Drain** • Melton Highway Sydenham, eastbound between Calder Park Drive and Carrington St **Taylors Creek** • Sunshine Avenue Taylors Lakes **Wanaka Drive Drain** • Australia Drive Taylors Lakes • Chichester Drive Taylors Lakes • Cocoparra Crescent Taylors Lakes • Grampians Court Taylors Lakes	

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		• Lionheart Avenue Taylors Lakes • Parmelia Drive Taylors Lakes • Rotoroa Court Taylors Lakes • Sunshine Avenue Taylors Lakes • Sydenham Road Taylors Lakes • Wanaka Drive Taylors Lakes • Wyperfeld Avenue Taylors Lakes	

Table C2.8 – Breakdown of possible consequences at various rainfall intensities around Taylors Lakes with operational considerations

APPENDIX C3 – STONY CREEK FLOOD EMERGENCY PLAN

Overview of Flooding Consequences

The St Albans, Sunshine and Sunshine North areas incorporate a large section of the City of Brimbank, ranging from the north to the south of the municipality. This area consists of residential and industrial sites, as well businesses and public land. High intensity, short duration rainfall events can cause flash flooding in these areas.

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 access this information should make appropriate enquiries to assess the currency of the data.

Summary of Consequences in a 1% AEP (100yr ARI) flood along Stony Creek					
Property					
Properties	**38**				
Residential	26				
Commercial	6				
Industrial	0				
Public Land	6				
Rural	0				
Community Infrastructure					
Schools / Colleges	1	St Albans Secondary College			
Child Care / Kindergartens	1	St Albans East Preschool			
Essential Infrastructure					
Major Roads	3	Anderson Road; Ballarat Road; and Main Road East			
Bus Routes	5	215, 408, 419, 903 & 941			
Police Stations	1	Sunshine (flooding to carparking and surrounding roads likely)			
Government Buildings	1	Sunshine Magistrates Court (flooding to carparking and surrounding roads likely)			
Drainage Facilities	1	Gilmour Road Retarding Basin			
Sewerage Facilities	2	Emergency Relief Points			
Tourism / Recreation					
Recreation Facilities	1	Sunshine Leisure Centre carpark likely flooded			
Government Boundaries					
Local Gov't Areas	1	Brimbank	CMA	1	Port Phillip & Westernport
Adjacent LGAs	1	Maribyrnong	CFA District	0	
SES Resp' Boundary	1	Brimbank	FRV District	1	Western

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

Gauges and Warnings

Neither the Bureau of Meteorology nor Melbourne Water currently provides flood forecasts for the Stony Creek. All flood response actions must therefore be driven by rainfall and / or river level observations. Telemetered water level / flood gauges are located downstream at Spotswood within the catchment.

Melbourne Water Gauges	Station No.	Location	Stream Level & Flow Gauge	Rain Gauge	Melway Reference
Stony Creek at Spotswood	230112A	South side of the creek, west of Williamstown Road bridge	✓	✓	41 J11
Sunshine North	587004	City West Water Office, St Albans Road, Sunshine North		✓	26 E7

Table C3.2 – Hydrographic Monitoring Stations within the Stony Creek catchment

A rain gauge is located in Sunshine North. This Gauge may provide some warning of expected flooding. See the Melbourne Water website for more information on these gauges: melbournewater.com.au/waterdata/rainfallandriverleveldata/Pages/Rainfall-and-river-level-new.aspx. It is advised that residents monitor the Bureau of Meteorology's website bom.gov.au and the VicEmergency website emergency.vic.gov.au for any thunderstorm, flood or severe weather warnings present for their area.

Area Map of Flood Risk

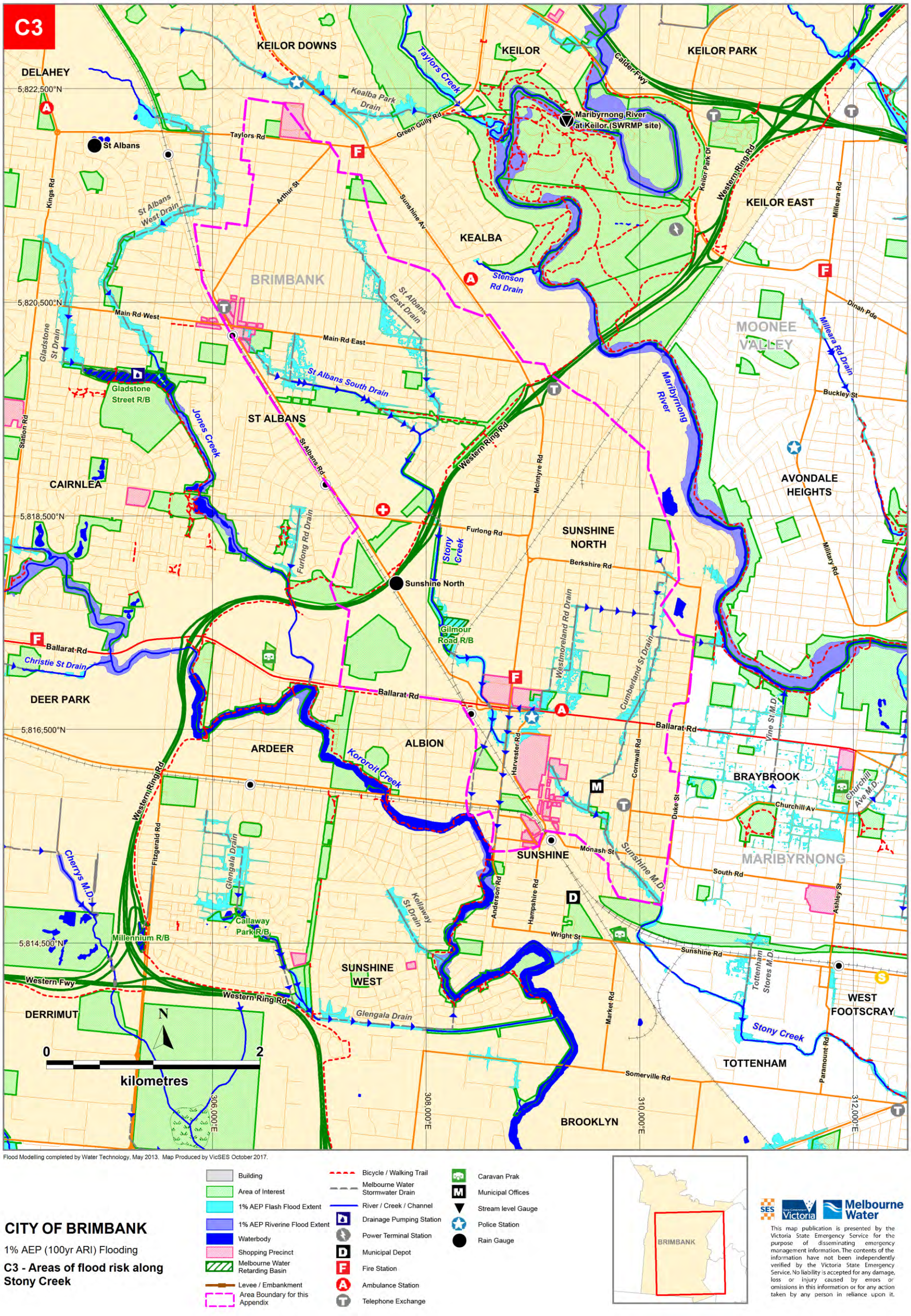


Figure C3 – Areas of flood risk around Stony Creek in the City of Brimbank and area covered by this Appendices

Properties at Flood Risk

Properties listed in the table below are at risk from flooding over-floor. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Stony Creek (Melbourne Water and Water Technology, May 2013) 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 Over-Floor

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				
		✓	23 Albert Street	Sunshine North	Cumberland St Drain	Flash
		✓	155 Anderson Road	Sunshine	Anderson Road Diversion Drain	Flash
	✓	✓	1/472 Ballarat Road	Sunshine North	Westmoreland Road Drain	Flash
	✓	✓	2/472 Ballarat Road	Sunshine North	Westmoreland Road Drain	Flash
	✓	✓	474 Ballarat Road	Sunshine North	Westmoreland Road Drain	Flash
	✓	✓	476 Ballarat Road	Sunshine North	Westmoreland Road Drain	Flash
	✓	✓	478 Ballarat Road	Sunshine North	Westmoreland Road Drain	Flash
	✓	✓	1 Belfort Street	St Albans	St Albans East Drain	Flash
		✓	76-78 Biggs Street	St Albans	St Albans East Drain	Flash
		✓	48 Grantham Parade	St Albans	St Albans East Drain	Flash
		✓	1/131 Harvester Road	Sunshine	Westmoreland Road Drain	Flash
		✓	3/131 Harvester Road	Sunshine	Westmoreland Road Drain	Flash
		✓	4/131 Harvester Road	Sunshine	Westmoreland Road Drain	Flash
		✓	315 Main Road	St Albans	St Albans South Drain	Flash
		✓	2 Northumberland Road	Sunshine North	Cumberland St Drain	Flash
	✓	✓	1/18-20 Percy Street	St Albans	St Albans South Drain	Flash
	✓	✓	2/18-20 Percy Street	St Albans	St Albans South Drain	Flash
	✓	✓	3/18-20 Percy Street	St Albans	St Albans South Drain	Flash
	✓	✓	4/18-20 Percy Street	St Albans	St Albans South Drain	Flash
	✓	✓	5/18-20 Percy Street	St Albans	St Albans South Drain	Flash
	✓	✓	6/18-20 Percy Street	St Albans	St Albans South Drain	Flash
	✓	✓	7/18-20 Percy Street	St Albans	St Albans South Drain	Flash
	✓	✓	8/18-20 Percy Street	St Albans	St Albans South Drain	Flash
	✓	✓	9/18-20 Percy Street	St Albans	St Albans South Drain	Flash
	✓	✓	10/18-20 Percy Street	St Albans	St Albans South Drain	Flash
	✓	✓	11/18-20 Percy Street	St Albans	St Albans South Drain	Flash
	✓	✓	12/18-20 Percy Street	St Albans	St Albans South Drain	Flash
	✓	✓	13/18-20 Percy Street	St Albans	St Albans South Drain	Flash
	✓	✓	14/18-20 Percy Street	St Albans	St Albans South Drain	Flash
	✓	✓	185 Phoenix Street	Sunshine North	Westmoreland Road Drain	Flash
	✓	✓	3 St Albans Road	St Albans	St Albans South Drain	Flash
		✓	1/24 Victor Street	Sunshine North	Cumberland St Drain	Flash

Properties at risk from Flooding Over-Floor						
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				
		✓	2/24 Victor Street	Sunshine North	Cumberland St Drain	Flash
		✓	3/24 Victor Street	Sunshine North	Cumberland St Drain	Flash
		✓	28 Victor Street	Sunshine North	Cumberland St Drain	Flash
		✓	31 Victor Street	Sunshine North	Cumberland St Drain	Flash
✓	✓	✓	2/5 Walter Street	Sunshine	Sunshine Main Drain	Flash
	✓	✓	4 Wilby Court	St Albans	St Albans High School Drain	Flash
Totals						
1	24	38				

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

Isolation

No major isolation risks exist for areas around Sunshine, Sunshine North and St Albans. Some localised short-duration isolation may occur due to flash flooding.

Essential Infrastructure

During a 2% AEP (50-year ARI) flood event, the area surrounding the **Sunshine Police Station** and the **Sunshine Magistrates Court** is likely to be flooded, impacting Ballarat Road, Foundry Road, the private access road and carparking. Harvester Road and Anderson Road south of Foundry Road will also likely be flooded.

During an event, see the Public Transport Victoria's Website for details on delays or alterations to services. ptv.vic.gov.au/live-travel-updates/. A map of Public Transport routes within Brimbank is available via the website at: ptv.vic.gov.au/assets/default-site/more/maps/metropolitan-local-area-maps/6_Brimbank_LAM_April-2022-NN.pdf

Apart from the roads outlined below, all other essential infrastructure and services areas around St Albans, Sunshine and Sunshine North are expected to remain predominantly dry during an intense rainfall event.

Road Closures

The following roads are subject to closure during flooding around St Albans, Sunshine and Sunshine North. Check the VicRoads website for more details: alerts.vicroads.vic.gov.au

VicRoads Roads likely flooded in a 1% AEP event
• Anderson Road, Sunshine between Ballarat Road and the railway line between Albion and Sunshine stations
• Ballarat Road, Sunshine between Anderson Road and Westmoreland Road
• Main Road East, St Albans east of the Railway line crossing

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

Brimbank City Council Roads likely flooded in a 1% AEP event			
ST ALBANS	• Magnolia Street	• Jessie Street	• Cary Street
• Beaver Street	• Mullhall Drive	• Kevin Street	• Clayton Street
• Belfort Street	• Rosslare Parade	• Matthews Street	• Cumberland Street
• Bernbanks Avenue	• Swindon Street	• Parsons Street	• Essex Street
• Clarke Avenue	• Toledo Road	• Pizzey Street	• Gilmour Road
• Crosby Court	• Woods Street	• Service Street	• Lincoln Street
• Eisner Street	**SUNSHINE**	• Walter Street	• Northumberland Road
• Errington Road	• Alfred Street	**SUNSHINE NORTH**	• Phoenix Street
• Grantham Parade	• Barnard Court	• Albert Street	• Sofia Court
• Harmon Avenue	• Dawson Street	• Annastasia Way	• Suffolk Road
• Larissa Road	• Foundry Road	• Augusta Crescent	• Victor Street
• Laurel Street	• Harvester Road	• Camperdown Avenue	• Wiltshire Street

Table C3.5 – Brimbank 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 Height (Level)	ANCOLD Hazard Rating	Population at Risk (dam breach)	Melway Reference
Gilmour Road Retarding Basin	Stony Creek	3.84 ha	Unavailable	Unavailable	Unavailable	0m	Low	Unavailable	26 F8

Table C3.6 – Melbourne Water Retarding Basins within the Stony Creek catchment in the City of Brimbank

Sewerage Infrastructure

Sewer Emergency Relief Points

There are Sewer Emergency Relief Points within the Stony Creek catchment that will likely affect floodwater conditions should they be activated. Contact the Infrastructure Operator EMLO/Duty Officer for information on any recent or planned releases at a Sewer Emergency Relief Point as part of a Dynamic Risk Assessment (DRA) if work is to be conducted at or downstream of the outlet.

On Drain / Waterway	Bank / Side of Waterway	Operator	Location	Melway Reference
St Albans High School Drain	-	City West Water	St Albans High School, 289 Main Road East, St Albans	26 B2
Stony Creek	-	City West Water	Cary Street, Sunshine North	26 F8

Table C3.7 – Sewer Emergency Relief Points in the Stony Creek Catchment in the City of Brimbank

Command, Control and Coordination

VICSES will assume overall control of the response to flood incidents. Other agencies will be requested to support operations as detailed in this Plan. Control and coordination of a flood incident shall be carried out at the lowest effective level and in accordance with the 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 Stony Creek at various rain totals within Brimbank. 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:

- Stony Creek and Its Stormwater Tributaries

FLOOD INTELLIGENCE CARD – STONY CREEK & ITS STORMWATER TRIBUTARIES (UNGAUGED)

Version 4 – May 2020

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 rain totals for this gauge.***

CLOSEST RAIN GAUGE	**Sunshine North**
LOCATION	**City West Water Office, St Albans Road, Sunshine North**
WEBSITE	melbournewater.com.au/water/rainfall-and-river-levels#/reader/587004

MELWAY REF:	**26 E7**
GAUGE NUMBER	**587004**
GAUGE TYPE	**Rain**

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
10.8mm in 10 mins; 18.5mm in 30 mins; 24.5mm in 1 hour; 30.8mm in 2 hours; 43.5mm in 6 hours; or 54.2mm 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.	20% AEP (5-year ARI)	**Properties at Flood Risk (over-floor)** **1 Property in Total** **Sunshine Main Drain** • 2/5 Walter Street, Sunshine **Water Over Road (above 300mm depth)** **St Albans East Drain** • Grantham Parade St Albans **St Albans South Drain** • Beaver Street St Albans **Sunshine Main Drain** • Alfred Street Sunshine • Jessie Street Sunshine • Kevin Street Sunshine • Parsons Street Sunshine • Walter Street Sunshine **Westmoreland Road Drain** • Sofia Court Sunshine North	VICSES may provide warnings via VicEmergency to the community (including Brimbank 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
15.7mm in 10 mins; 26.6mm in 30 mins; 34.9mm in 1 hour; 43.5mm in 2 hours; 60.4mm in 6 hours; or 74.6mm 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.	5% AEP (20-year ARI)	**Properties at Flood Risk (over-floor)** **24 Properties in Total** **St Albans High School Drain** • 4 Wilby Court, St Albans **St Albans East Drain** • 1 Belfort Street, St Albans **St Albans South Drain** • Units 1-14/18-20 Percy Street, St Albans • Shops at 3 St Albans Road, St Albans **Sunshine Main Drain** • 2/5 Walter Street Sunshine **Westmoreland Road Drain** • 1/472, 2/472, 474 & 478 Ballarat Road, Sunshine North • 185 Phoenix Street, Sunshine North **Community Infrastructure Likely Flooded** • Victoria Legal Aid, Ballarat Road Sunshine North, flooding over-floor **Water Over Road (above 300mm depth)** **Cumberland Street Drain** • Albert Street Sunshine North • Augusta Crescent Sunshine North • Suffolk Road Sunshine North **St Albans East Drain** • Grantham Parade St Albans • Larisa Road St Albans • Toledo Road St Albans **St Albans South Drain** • Beaver Street St Albans **Stony Creek (Upper)** • Camperdown Avenue Sunshine North • Cary Street Sunshine North **Sunshine Main Drain** • Alfred Street Sunshine • Dawson Street Sunshine • Jessie Street Sunshine • Kevin Street Sunshine	

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		• Parsons Street Sunshine • Pizzey Street Sunshine • Service Street Sunshine • Walter Street Sunshine **Westmoreland Road Drain** • Sofia Court Sunshine North	
23.2mm in 10 mins; 38.8mm in 30 mins; 50.5mm in 1 hour; 62.4mm in 2 hours; 85.5mm in 6 hours; or 104.5mm 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)	**Properties at Flood Risk (over-floor)** **38 Properties in Total** **Anderson Road Diversion Drain** • 155 Anderson Road Sunshine **Cumberland Street Drain** • Units 1-3, 28 & 31 Victor Street Sunshine North • 23 Albert Street Sunshine North • 2 Northumberland Road Sunshine North **St Albans East Drain** • 1 Belfort Street St Albans • 76-78 Biggs Street St Albans • 48 Grantham Parade St Albans **St Albans High School Drain** • 4 Wilby Court St Albans **St Albans South Drain** • Units 1-14/18-20 Percy Street St Albans • 315 Main Road St Albans • Shops at 3 St Albans Road St Albans **Sunshine Main Drain** • 2/5 Walter Street Sunshine **Westmoreland Road Drain** • 1/472, 2/472, 474, 476 & 478 Ballarat Road Sunshine North • 1/131, 3/131 & 4/131 Harvester Road Sunshine • 185 Phoenix Street, Sunshine North **Community Infrastructure Likely Flooded** • Sunshine Magistrates Court, Foundry Road, entry and carpark flooded • Sunshine Police Station, Ballarat Road Sunshine, entry and carpark flooded • Sunshine Leisure Centre, Kennedy Street Sunshine, carpark likely flooded • St Albans East Preschool, Station Avenue, St Albans	

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		• St Albans Secondary College, 289 Main Road East, St Albans **Water Over Road (above 300mm depth)** **Anderson Road Diversion Drain** • Anderson Road Sunshine (d/s of Stony Creek Upper juncture) (VicRoads) **Cumberland Street Drain** • Albert Street Sunshine North • Alexandra Avenue Sunshine • Augusta Crescent Sunshine North • Ballarat Road Sunshine North (between Stonemark Street and Cornwall Road) (VicRoads) • Cumberland Street Sunshine North • Essex Street Sunshine North • Lincoln Street Sunshine North • Northumberland Road Sunshine North • Phoenix Street Sunshine North • Suffolk Road Sunshine North • Victor Street Sunshine North • Wiltshire Street Sunshine North **St Albans East Drain** • Belfort Street St Albans • Bernbanks Ave St Albans • Clarke Avenue St Albans • Crosby Court St Albans • Eisner Street St Albans • Errrington Road St Albans • Grantham Parade St Albans • Harmon Avenue St Albans • Larisa Road St Albans • Magnolia Street St Albans • Swindon Street St Albans • Toledo Road St Albans • Woods Street St Albans **St Albans South Drain** • Beaver Street St Albans • Magnolia Street St Albans	

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		• Main Road East, St Albans • Mulhall Drive St Albans • Rosslare Parade St Albans **Stony Creek (Upper)** • Laurel Street St Albans • Annastasia Way Sunshine North • Ballarat Road Sunshine North (between St Albans Road and McIntyre Road) (VicRoads) • Camperdown Avenue Sunshine North • Cary Street Sunshine North • Clayton Street Sunshine North • Gilmour Road Sunshine North **Sunshine Main Drain** • Alfred Street Sunshine • Barnard Court Sunshine • Dawson Street Sunshine • Jessie Street Sunshine • Kevin Street Sunshine • Matthews Street Sunshine • Parsons Street Sunshine • Pizzey Street Sunshine • Service Street Sunshine • Walter Street Sunshine **Westmoreland Road Drain** • Anderson Road Sunshine (between Ballarat Road and Stony Creek Upper juncture) (VicRoads) • Foundry Road Sunshine • Harvester Road Sunshine • Ballarat Road Sunshine North (near Victoria University Sunshine Campus (VicRoads) • Sofia Court Sunshine North • Suffolk Road Sunshine North	

Table C3.8 – Breakdown of possible consequences at various rainfall intensities around Stony Creek and its stormwater drain tributaries with operational considerations

APPENDIX C4 – KORORROIT CREEK / JONES CREEK FLOOD EMERGENCY PLAN

Overview of Flooding Consequences

Kororoit Creek is the secondary waterway in Brimbank, flowing generally through the southern districts of the Municipality including Deer Park, Ardeer, Albion, Sunshine & Brooklyn before leaving the Municipality at Princes Highway in Brooklyn and discharging into the Yarra River at Spotswood. As Kororoit Creek flows south, it receives several drains and Jones Creek. As the flows are through established residential areas, parts of these suburbs are likely to be flood affected during high intensity rainfall events, impacting on a number of properties and roads in the region. The tables below outline the various consequences of a 1% AEP flood along Kororoit Creek and the Kororoit Creek Tributaries in Brimbank.

Summary of Consequences in a 1% AEP (100yr ARI) flood along Kororoit Creek (Deer Park to Brooklyn)					
Property					
Properties	**38**				
Residential	28				
Commercial	0				
Industrial	10				
Public Land	0				
Rural	0				
Community Infrastructure					
Childcare / Kindergartens	1	Deer Park Playgroup			
Essential Infrastructure					
Major Roads	1	Anderson Rd			
Tourism / Recreation					
Sports Facilities	1	More Park Softball			
Recreation Facilities	1	Kororoit Creek Trail			
Government Boundaries					
Local Government Areas	1	Brimbank	CMA	1	Port Phillip & Westernport
Adjacent LGAs	0		CFA District	0	
SES Response Boundary	1	Brimbank	FRV District	1	Western

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

Summary of Consequences in a 1% AEP (100yr ARI) flood along Jones Creek					
Property					
Properties	94				
Residential	90				
Commercial	0				
Industrial	4	Including TIC Group Warehouse on Ragen Street			
Public Land	0				
Rural	0				
Community Infrastructure					
Schools / Colleges	1	Stevensville Primary School Sports Grounds			
Essential Infrastructure					
Major Roads	3	Kings Road, Main Road West & Taylors Road			
Bus Routes	5	418, 420, 421, 424 & 942			
Drainage Facilities	5	4 Retarding Basins and 1 Pumping Station			
Tourism / Recreation					
Government Boundaries					
Local Gov't Areas	1	Brimbank	CMA	1	Port Phillip & Westernport
Adjacent LGAs	0		CFA District	0	
SES Resp' Boundary	1	Brimbank	FRV District	1	Western

Table C4.2 – Consequence Summary of 1% AEP flood along Jones Creek and other Kororoit Creek Tributaries

Gauges and Warnings

Warnings are available for flooding expected along Kororoit Creek at Deer Park. Flood class levels for the Deer Park gauge are detailed in table C4.4 and are used in the issuing of a flood warning for Kororoit Creek. Other level / flood gauges within the Kororoit Creek catchment are also contained within table C4.3.

Melbourne Water Gauges	Station No.	Location	Stream Level & Flow Gauge	Rain Gauge	Melway Reference
Kororoit Creek at Brooklyn	231107A	West bank of the creek, north side of the Federation Bicycle Trail bridge, Brooklyn	✓	✓	40 G10
Kororoit Creek at Deer Park	231104A	North side of the creek along Millbank Drive, near Wandsworth Ave, Deer Park	✓	✓	25 C7
Kororoit Creek at Diggers Rest	231106A	West bank of the creek, north side of Holden Road, Diggers Rest	✓	✓	332 H8
Kororoit Creek at Rockbank	231105B	North bank of the creek, east side of Leakes Road, Rockbank	✓	✓	344 J1

Table C4.3 – Hydrographic Monitoring Stations 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: melbournewater.com.au/waterdata/rainfallandriverleveldata/Pages/Rainfall-and-river-level-new.aspx. It is advised that residents monitor the Bureau of Meteorology's website bom.gov.au and the VicEmergency website emergency.vic.gov.au for any thunderstorm, flood or severe weather warnings present for their area.

Those gauges with flood class levels established are outlined in the table below.

Hydrographic Monitoring Station	River / Creek Flood Class Level		
	Minor	Moderate	Major
Kororoit Creek at Deer Park	3.6	4.0	4.5

Table C4.4 – Hydrographic Monitoring Stations with established Flood Class Levels for the City of Brimbank

At these sites on the Maribyrnong River and Kororoit Creek, the Bureau of Meteorology (the Bureau) in consultation with Melbourne Water will issue flood warnings if levels reach those classified above. This warning will be placed on the Bureau's website (**bom.gov.au/vic/warnings/index.shtml**) and the VicEmergency website emergency.vic.gov.au. While the City of Brimbank 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

Figure C4 – Areas of flood risk around Kororoit Creek in the City of Brimbank and area covered by this Appendices

Properties at Flood Risk

Properties listed in the table below are at risk from flooding along Kororoit Creek. 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 2011) 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 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				
	✓	✓	16 Ardoyne Street	Sunshine	Kororoit Creek	Riverine
		✓	1 Boreham Street	Sunshine	Kororoit Creek	Riverine
		✓	1/2 Boreham Street	Sunshine	Kororoit Creek	Riverine
		✓	2/2 Boreham Street	Sunshine	Kororoit Creek	Riverine
		✓	39 Cannon Street	Sunshine	Kororoit Creek	Riverine
		✓	25 Central Avenue	Sunshine	Kororoit Creek	Riverine
		✓	27 Central Avenue	Sunshine	Kororoit Creek	Riverine
		✓	39 Dunbar Avenue	Sunshine	Kororoit Creek	Riverine
		✓	46 Dunbar Avenue	Sunshine	Kororoit Creek	Riverine
		✓	1A Dundalk Street	Sunshine	Kororoit Creek	Riverine
		✓	1 Dundalk Street	Sunshine	Kororoit Creek	Riverine
		✓	2A Dundalk Street	Sunshine	Kororoit Creek	Riverine
		✓	2 Dundalk Street	Sunshine	Kororoit Creek	Riverine
		✓	3 Dundalk Street	Sunshine	Kororoit Creek	Riverine
		✓	5 Dundalk Street	Sunshine	Kororoit Creek	Riverine
		✓	7 Dundalk Street	Sunshine	Kororoit Creek	Riverine
		✓	9 Dundalk Street	Sunshine	Kororoit Creek	Riverine
		✓	5 Hampton Avenue	Sunshine	Kororoit Creek	Riverine
		✓	1 Mayne Street	Sunshine West	Kororoit Creek	Riverine
		✓	3/13 Mayne Street	Sunshine West	Kororoit Creek	Riverine
		✓	20 Mernda Street	Sunshine West	Kororoit Creek	Riverine
		✓	22 Mernda Street	Sunshine West	Kororoit Creek	Riverine
		✓	24 Mernda Street	Sunshine West	Kororoit Creek	Riverine
		✓	26 Mernda Street	Sunshine West	Kororoit Creek	Riverine
		✓	28 Mernda Street	Sunshine West	Kororoit Creek	Riverine
		✓	30 Mernda Street	Sunshine West	Kororoit Creek	Riverine
		✓	1/32 Mernda Street	Sunshine West	Kororoit Creek	Riverine
	✓	✓	2/32 Mernda Street	Sunshine West	Kororoit Creek	Riverine
		✓	34 Mernda Street	Sunshine West	Kororoit Creek	Riverine
		✓	36 Mernda Street	Sunshine West	Kororoit Creek	Riverine
		✓	1 Millbank Drive	Deer Park	Kororoit Creek	Riverine
		✓	720 Old Geelong Road	Brooklyn	Kororoit Creek	Riverine
		✓	15 Ormond Avenue	Sunshine	Kororoit Creek	Riverine

Properties at risk from Flooding along 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					
		✓	17 Ormond Avenue	Sunshine	Kororoit Creek	Riverine	
	✓	✓	1 Patterson Avenue	Sunshine	Kororoit Creek	Riverine	
	✓	✓	5 Patterson Avenue	Sunshine	Kororoit Creek	Riverine	
	✓	✓	7 Patterson Avenue	Sunshine	Kororoit Creek	Riverine	
	✓	✓	31 Western Avenue	Sunshine	Kororoit Creek	Riverine	
Totals							
0	6	38					

Table C4.4 – Properties at risk of flooding along the Kororoit Creek in the City of Brimbank

Properties listed in the table below are at risk from flooding over-floor along a number of Kororoit Creek tributaries in the City of Brimbank. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Jones Creek (Melbourne Water and GHD, June 2010) 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 over-floor along Jones 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				
		✓	1/40 Adams Street	St Albans	Gladstone St Drain	Flash
		✓	2/40 Adams Street	St Albans	Gladstone St Drain	Flash
		✓	2/5 Buchanan Street	St Albans	Gladstone St Drain	Flash
		✓	3/5 Buchanan Street	St Albans	Gladstone St Drain	Flash
	✓	✓	2/7 Buchanan Street	St Albans	Gladstone St Drain	Flash
✓	✓	✓	3/7 Buchanan Street	St Albans	Gladstone St Drain	Flash
	✓	✓	1/9 Buchanan Street	St Albans	Gladstone St Drain	Flash
	✓	✓	2/9 Buchanan Street	St Albans	Gladstone St Drain	Flash
	✓	✓	3/9 Buchanan Street	St Albans	Gladstone St Drain	Flash
	✓	✓	4/9 Buchanan Street	St Albans	Gladstone St Drain	Flash
	✓	✓	5/9 Buchanan Street	St Albans	Gladstone St Drain	Flash
	✓	✓	1/11 Buchanan Street	St Albans	Gladstone St Drain	Flash
✓	✓	✓	2/11 Buchanan Street	St Albans	Gladstone St Drain	Flash
		✓	23 Carbine Way	Keilor Downs	St Albans West Drain	Flash
		✓	31 Carbine Way	Keilor Downs	St Albans West Drain	Flash
		✓	33 Carbine Way	Keilor Downs	St Albans West Drain	Flash
		✓	35 Carbine Way	Keilor Downs	St Albans West Drain	Flash
		✓	8 Charles Street	St Albans	St Albans West Drain	Flash
		✓	1/88-90 Conrad Street	St Albans	St Albans West Drain	Flash
		✓	2/88-90 Conrad Street	St Albans	St Albans West Drain	Flash

Properties at risk from Flooding over-floor along Jones 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				
		✓	3/88-90 Conrad Street	St Albans	St Albans West Drain	Flash
		✓	4/88-90 Conrad Street	St Albans	St Albans West Drain	Flash
		✓	5/88-90 Conrad Street	St Albans	St Albans West Drain	Flash
		✓	6/88-90 Conrad Street	St Albans	St Albans West Drain	Flash
		✓	7/88-90 Conrad Street	St Albans	St Albans West Drain	Flash
		✓	8/88-90 Conrad Street	St Albans	St Albans West Drain	Flash
		✓	9/88-90 Conrad Street	St Albans	St Albans West Drain	Flash
		✓	10/88-90 Conrad Street	St Albans	St Albans West Drain	Flash
		✓	1/99 Conrad Street	St Albans	St Albans West Drain	Flash
		✓	2/99 Conrad Street	St Albans	St Albans West Drain	Flash
		✓	3/99 Conrad Street	St Albans	St Albans West Drain	Flash
		✓	2/12 Douglas Avenue	St Albans	Gladstone St Drain	Flash
	✓	✓	42A Douglas Avenue	St Albans	Gladstone St Drain	Flash
	✓	✓	68B East Esplanade	St Albans	St Albans West Drain	Flash
✓	✓	✓	68A East Esplanade	St Albans	St Albans West Drain	Flash
		✓	1/141 Fox Street	St Albans	St Albans West Drain	Flash
		✓	2/141 Fox Street	St Albans	St Albans West Drain	Flash
		✓	3/141 Fox Street	St Albans	St Albans West Drain	Flash
		✓	4/141 Fox Street	St Albans	St Albans West Drain	Flash
		✓	5/141 Fox Street	St Albans	St Albans West Drain	Flash
		✓	6/141 Fox Street	St Albans	St Albans West Drain	Flash
		✓	7/141 Fox Street	St Albans	St Albans West Drain	Flash
		✓	8/141 Fox Street	St Albans	St Albans West Drain	Flash
		✓	9/141 Fox Street	St Albans	St Albans West Drain	Flash
		✓	10/141 Fox Street	St Albans	St Albans West Drain	Flash
		✓	68B Henry Street	St Albans	St Albans West Drain	Flash
		✓	7 Hook Street	St Albans	St Albans West Drain	Flash
		✓	9 Hook Street	St Albans	St Albans West Drain	Flash
		✓	1/11 Hook Street	St Albans	St Albans West Drain	Flash
		✓	13 Hook Street	St Albans	St Albans West Drain	Flash
		✓	24 Jamieson Street	St Albans	St Albans West Drain	Flash
		✓	2/24 Jamieson Street	St Albans	St Albans West Drain	Flash
	✓	✓	3/44 Kings Road	St Albans	Gladstone St Drain	Flash
		✓	4/46 Kings Road	St Albans	Gladstone St Drain	Flash
		✓	1/36-38 Kodre Street	St Albans	St Albans West Drain	Flash
		✓	2/36-38 Kodre Street	St Albans	St Albans West Drain	Flash
		✓	3/36-38 Kodre Street	St Albans	St Albans West Drain	Flash
		✓	1 Lahy Street	St Albans	Gladstone St Drain	Flash
		✓	1/1 Leilani Court	Keilor Downs	St Albans West Drain	Flash
		✓	2/1 Leilani Court	Keilor Downs	St Albans West Drain	Flash
		✓	2 Leilani Court	Keilor Downs	St Albans West Drain	Flash
		✓	13 Leilani Court	Keilor Downs	St Albans West Drain	Flash
		✓	1/255 Main Road	St Albans	Gladstone St Drain	Flash

Properties at risk from Flooding over-floor along Jones 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				
		✓	2/255 Main Road	St Albans	Gladstone St Drain	Flash
		✓	2/484-486 Main Road	St Albans	Gladstone St Drain	Flash
	✓	✓	3/484-486 Main Road	St Albans	Gladstone St Drain	Flash
	✓	✓	6/484-486 Main Road	St Albans	Gladstone St Drain	Flash
	✓	✓	9/484-486 Main Road	St Albans	Gladstone St Drain	Flash
	✓	✓	13 Margrave Street	St Albans	St Albans West Drain	Flash
		✓	53 Moffat Street	St Albans	Gladstone St Drain	Flash
		✓	2/57 Moffat Street	St Albans	Gladstone St Drain	Flash
	✓	✓	63-65 Moffat Street	St Albans	Gladstone St Drain	Flash
	✓	✓	1/63-65 Moffat Street	St Albans	Gladstone St Drain	Flash
	✓	✓	2/63-65 Moffat Street	St Albans	Gladstone St Drain	Flash
	✓	✓	3/63-65 Moffat Street	St Albans	Gladstone St Drain	Flash
	✓	✓	4/63-65 Moffat Street	St Albans	Gladstone St Drain	Flash
	✓	✓	5/63-65 Moffat Street	St Albans	Gladstone St Drain	Flash
	✓	✓	6/63-65 Moffat Street	St Albans	Gladstone St Drain	Flash
	✓	✓	51 Regan Street	St Albans	St Albans West Drain	Flash
		✓	2/24 Shirley Street	St Albans	St Albans West Drain	Flash
✓	✓	✓	1/28 Shirley Street	St Albans	St Albans West Drain	Flash
✓	✓	✓	2/28 Shirley Street	St Albans	St Albans West Drain	Flash
✓	✓	✓	3/28 Shirley Street	St Albans	St Albans West Drain	Flash
		✓	1/30 Shirley Street	St Albans	St Albans West Drain	Flash
		✓	4/30 Shirley Street	St Albans	St Albans West Drain	Flash
✓	✓	✓	1/40 Shirley Street	St Albans	St Albans West Drain	Flash
✓	✓	✓	2/40 Shirley Street	St Albans	St Albans West Drain	Flash
✓	✓	✓	3/40 Shirley Street	St Albans	St Albans West Drain	Flash
		✓	3 Vule Street	St Albans	St Albans West Drain	Flash
	✓	✓	1/8 Vule Street	St Albans	St Albans West Drain	Flash
✓	✓	✓	2/8 Vule Street	St Albans	St Albans West Drain	Flash
		✓	3/10 Vule Street	St Albans	St Albans West Drain	Flash
		✓	12 Vule Street	St Albans	St Albans West Drain	Flash
		✓	40 Washington Street	St Albans	St Albans West Drain	Flash
Totals						
10	33	94				

Table C4.5 – Properties at risk of flooding along Kororoit Creek Tributaries in the City of Brimbank

Isolation

No major isolation risks exist for areas around Deer Park, Keilor Downs, Kings Park, St Albans, Sunshine and Sunshine West. 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. ptv.vic.gov.au/live-travel-updates. A map of Public Transport routes within around Kororoit

and Jones Creeks is available via the website at: ptv.vic.gov.au/assets/default-site/more/maps/metropolitan-local-area-maps/6_Brimbank_LAM_April-2022-NN.pdf

Apart from the roads outlined below, all other essential infrastructure and services areas around Deer Park, Keilor Downs, Kings Park, St Albans, Sunshine and Sunshine West are expected to remain predominantly dry during an intense rainfall event.

Road Closures

The following roads are subject to closure during flooding around Deer Park, Keilor Downs, Kings Park, St Albans, Sunshine and Sunshine West. Check the VicRoads website for more details: alerts.vicroads.vic.gov.au

VicRoads Roads flooded in a 1% AEP (100yr ARI) event
• Anderson Road, Sunshine at Derby Road
• Kings Road St Albans between McLeod Road and Douglas Avenue
• Main Road West St Albans between Adams Street and Moffat Street
• Main Road West St Albans between Cleveland Street and Washington Street
• Princes Highway Brooklyn at Old Geelong Road
• Taylors Road Keilor Downs at Carbine Way and also the Railway Underpass

Table C4.6 – VicRoads Possible Road Closures during a flooding event

Brimbank City Council Roads flooded in a 1% AEP (100yr ARI) event			
BROOKLYN	• Conrad Street	• Kodre Street	**SUNSHINE**
• Old Geelong Road	• Denton Avenue	• Lovell Drive	• Central Avenue
DEER PARK	• Douglas Avenue	• Margrave Street	• Ormond Avenue
• Gurnung Drive	• East Esplanade	• Moffat Street	• Patterson Avenue
• Millbank Drive	• Fox Street	• Theodore Street	**SUNSHINE WEST**
KEILOR DOWNS	• George Street	• Power Street	• Fairbairn Road
• Hispano Road	• Helen Street	• Regan Street	• Gum Street
• Leilani Court	• Henry Street	• Rita Street	• Lachlan Road
ST ALBANS	• Hook Street	• Shirley Street	• Mernda Street
• Buchanan Street	• Jefferson Street	• Vule Street	• Wendy Way
• Charles Street	• Keats Street	• Washington Street	• Wright Street

Table C4.7 – Brimbank City Council Possible Road Closures during a flooding event

Flood Mitigation

Retarding Basins

Melbourne Water Retarding Basin	On Drain/ Waterway	Spillway Crest Level	Full Supply Level	1% AEP Flood Level	Embankment Crest Height	Storage Capacity	ANCOLD Hazard Rating	Houses in Flow Path (dam breach)	Melway Reference
Callaway Park, Sunshine West	Glengala Drain	Unavailable	Unavailable	37.2m AHD	N/A In-cut	12.5 ML	Unclassified	Unavailable	356 F5
Frost Drive, Delahey	Kurung Park Drain	Unavailable	88.1m AHD	Unavailable	89.3m AHD	24 ML	High C	42	13 E7
Gladstone Street, Cairnlea	Jones Creek	N/A	Unavailable	Unavailable	1.9m	98 ML	Very Low	0	25 H2
Waigani Avenue, Ravenhall (in City of Melton)	Cherry's Diversion Drain	61.5m AHD	62.5m AHD	Unavailable	0.8m height (62.8m AHD)	5 ML	High C	42	25 A7

Table C4.8 – Melbourne Water Retarding Basins within the Kororoit Creek & Jones Creek catchments in Brimbank

Pumping Stations

Melbourne Water Pumping Station	Suburb	Owner	Pumps	Melway Reference
Cairnlea Pump Station	Gladstone Street Retarding Basin, Cairnlea	Melbourne Water	Jones Creek to Gladstone Street Drain	25 J2

Table C4.9 – Melbourne Water Pumping Stations along Jones Creek

Sewerage Infrastructure

There is no sewerage Infrastructure expected to impact or be impacted by floodwaters during severe flood events within the Kororoit Creek catchment in or directly upstream of the City of Brimbank.

Command, Control and Coordination

VICSES will assume overall control of the response to flood incidents. Other agencies will be requested to support operations as detailed in this Plan. Control and coordination of a flood incident shall be carried out at the lowest effective level and in accordance with the 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 Jones Creek at various creek heights or rain totals within Brimbank. 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 Deer Park
- Kororoit Creek at Brooklyn
- Jones Creek & Kororoit Creek's Stormwater Tributaries

FLOOD INTELLIGENCE CARD – DEER PARK GAUGE, KORORROIT CREEK

Version 4 – May 2020

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	**North side of the creek along Millbank Drive, near Wandsworth Ave, Deer Park**
WEBSITE	melbournewater.com.au/water/rainfall-and-river-levels#/reader/231104A
STREAM:	**Kororoit Creek**
GAUGE NUMBER:	**231104A**
GAUGE ZERO:	**47.602m AHD**
GAUGE TYPE	**Stream Level & Rain**

MELWAY REFERENCE:	**25 C7**
MINOR:	**3.6m**
MODERATE:	**4.0m**
MAJOR	**4.5m**
LEVEE HEIGHT:	**N/A**
HIGHEST RECORDED FLOOD:	**5.32m (3rd February 2005)**

Creek Height	Flood Class or Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
3.6m	**Minor Flood Level**	• Nil expected in City of Brimbank	VICSES may provide warnings via VicEmergency to the community (including Brimbank 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.
4.0m	**Moderate Flood Level** 20% AEP (5yr ARI) Flood Level	• Nil expected in City of Brimbank	
4.5m	**Major Flood Level**		
4.8m	5% AEP (20yr ARI) Flood Level	**Properties at Flood Risk** **6 Properties in Total**	

Creek Height	Flood Class or Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
	(Moderate)	• 16 Ardoyne Street, Sunshine • 2/32 Mernda Street, Sunshine West • 1, 5 & 7 Patterson Avenue, Sunshine • 31 Western Avenue, Sunshine **Community Infrastructure Likely Flooded** • Kororoit Creek Trail flooded at various locations **Water Over Road (over 300mm depth)** • Ormond Avenue, Sunshine • Patterson Avenue, Sunshine	
5.32m	3rd February 2005 Flood Level Peak		
5.9m	1% AEP (100yr ARI) Flood Level (Major)	**Properties at Flood Risk** **32 New at Level; 38 Properties in Total** • 1, 1/2 & 2/2 Boreham Street, Sunshine • 39 Cannon Street, Sunshine • 25 & 27 Central Avenue, Sunshine • 39 & 46 Dunbar Avenue, Sunshine • 1, 1A, 2, 2A, 3, 5, 7 & 9 Dundalk Street, Sunshine • 1 & 3/13 Mayne Street, Sunshine West • 20, 22, 24, 26, 28, 30, 1/32, 34 & 36 Mernda Street, Sunshine West • 1 Millbank Drive, Deer Park • 720 Old Geelong Road, Brooklyn • 15 & 17 Ormond Avenue, Sunshine **Community Infrastructure Likely Flooded** • Deer Park Playgroup at 1 Millbank Drive, Deer Park **Tourism / Recreation Likely Impacted** • More Park Softball Fields on Esmond Street, Ardeer **Water Over Road (over 300mm depth)** • Anderson Road, Sunshine at Derby Road • Gurnung Drive, Deer Park • Mernda Street, Sunshine West • Millbank Drive, Deer Park	

Table C1.10 – Breakdown of likely consequences at various Deer Park gauge level heights along Kororoit Creek with operational considerations

FLOOD INTELLIGENCE CARD – BROOKLYN GAUGE, KORORoit CREEK

Version 1 – May 2020

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	**West bank of the creek, north side of the Federation Bicycle Trail bridge**
WEBSITE:	melbournewater.com.au/water/rainfall-and-river-levels#/reader/231107A
STREAM:	**Kororoit Creek**
GAUGE NUMBER:	**231107A**
GAUGE ZERO:	**7.567m AHD**
GAUGE TYPE	**Stream Level & Rain**

MELWAY REFERENCE:	**40 G10**
MINOR:	**Not Established**
MODERATE:	**Not Established**
MAJOR	**Not Established**
LEVEE HEIGHT:	**5.33m to 6.23m (in Hobsons Bay)**
HIGHEST RECORDED FLOOD:	**5.67m (7th March 1919)**

Creek Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
3.57m	20% AEP (5yr ARI) Flood Level	• Nil expected in City of Brimbank	VICSES may provide warnings via VicEmergency to the community (including Brimbank Council and appropriate agencies as required) based on 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.
3.86m	10% AEP (10yr ARI) Flood Level	• Nil expected in City of Brimbank	
4.01m	February 2005 Flood Level		

Creek Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
4.33m	5% AEP (20yr ARI) Flood Level	**Properties at Flood Risk** **6 Properties in Total** • 16 Ardoyne Street, Sunshine • 2/32 Mernda Street, Sunshine West • 1, 5 & 7 Patterson Avenue, Sunshine • 31 Western Avenue, Sunshine **Community Infrastructure Likely Flooded** • Kororoit Creek Trail flooded at various locations **Water Over Road (over 300mm depth)** • Ormond Avenue, Sunshine • Patterson Avenue, Sunshine	
4.90m	2% AEP (50yr ARI) Flood Level		
5.33m	1% AEP (100yr ARI) Flood Level	**Properties at Flood Risk** **30 New at Level; 36 Properties in Total** • 1, 1/2 & 2/2 Boreham Street, Sunshine • 39 Cannon Street, Sunshine • 25 & 27 Central Avenue, Sunshine • 39 & 46 Dunbar Avenue, Sunshine • 1, 1A, 2, 2A, 3, 5, 7 & 9 Dundalk Street, Sunshine • 1 & 3/13 Mayne Street, Sunshine West • 20, 22, 24, 26, 28, 30, 1/32, 34 & 36 Mernda Street, Sunshine West • 720 Old Geelong Road, Brooklyn • 15 & 17 Ormond Avenue, Sunshine **Water Over Road (over 300mm depth)** • Mernda Street, Sunshine West	

Table C1.11 – Breakdown of likely consequences at various Brooklyn gauge level heights along Kororoit Creek with operational considerations

FLOOD INTELLIGENCE CARD – JONES CREEK & KORONOIT CREEK STORMWATER TRIBUTARIES (UNGAUGED)

Version 4 – May 2020

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	**St Albans**
LOCATION	**St Albans Reservoir Tanks on Taylors Road, St Albans**
WEBSITE	melbournewater.com.au/water/rainfall-and-river-levels#/reader/587051

MELWAY REF:	**13 H9**
GAUGE NUMBER	**587051**
GAUGE TYPE	**Rain**

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
10.8mm in 10 mins; 18.5mm in 30 mins; 24.5mm in 1 hour; 30.8mm in 2 hours; 43.5mm in 6 hours; or 54.2mm 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.	20% AEP (5-year ARI)	**Properties at Flood Risk (Over-Floor)** **10 Properties in Total** **Gladstone Street Drain** • 3/7 & 2/11 Buchanan Street St Albans **St Albans West Drain** • 68A East Esplanade St Albans • Units 1-3/28 & Units 1-3/40 Shirley Street, St Albans • 2/8 Vule Street, St Albans **Essential Infrastructure Likely Impacted** • Bus Routes 418 & 421 if Taylors Road is flooded **Water Over Road (above 300mm depth)** **Furlong Road Drain** • Denton Avenue St Albans **Gladstone Street Drain** • Myuna Drive Kings Park • Keats Street St Albans **St Albans West Drain** • Charles Street St Albans • East Esplanade St Albans • George Street St Albans • Helen Street St Albans • Henry Street St Albans • Hook Street St Albans	VICSES may provide warnings via VicEmergency to the community (including Brimbank 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
		• Margrave Street St Albans • Power Street St Albans • Rita Street St Albans • Taylors Road, Keilor Downs at Railway Underpass	
15.7mm in 10 mins; 26.6mm in 30 mins; 34.9mm in 1 hour; 43.5mm in 2 hours; 60.4mm in 6 hours; or 74.6mm 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.	5% AEP (20-year ARI)	**Properties at Flood Risk (Over-Floor)** **33 Properties in Total** **Gladstone Street Drain** • 2/7, 3/7, 1/9, 2/9, 3/9, 4/9, 5/9, 1/11 & 2/11 Buchanan Street, St Albans • 42A Douglas Avenue, St Albans • 3/44 Kings Road, St Albans • 3/484-486, 6/484-486 & 9/484-486 Main Road, St Albans • 63-65 & Units 1-6/63-65 Moffat Street, St Albans **St Albans West Drain** • 68B & 68A East Esplanade, St Albans • 13-15 Margrave Street, St Albans • 51 Regan Street, St Albans • 1/28, 2/28, 3/28, 1/40, 2/40 & 3/40 Shirley Street, St Albans • 1/8 & 2/8 Vule Street, St Albans **Essential Infrastructure Likely Impacted** • Bus Routes 418 & 421 if Taylors Road is flooded. Routes 424 & 942 if Main Road West is flooded. Route 420 if Kings Road is flooded. **Water Over Road (above 300mm depth)** **Furlong Road Drain** • Denton Avenue St Albans • Lovell Drive St Albans **Gladstone Street Drain** • Keats Street St Albans • Kings Road St Albans between McLeod Road and Douglas Avenue • Main Road West St Albans between Adams Street and Moffat Street • Moffat Street St Albans **St Albans West Drain** • Hispano Drive Keilor Downs • Leilani Court Keilor Downs • Charles Street St Albans • Conrad Street St Albans • East Esplanade St Albans • Fox Street St Albans • George Street St Albans • Helen Street St Albans • Henry Street St Albans • Hook Street St Albans • Main Road West St Albans between Cleveland Street and Washington Street • Margrave Street St Albans	

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		• Power Street St Albans • Rita Street St Albans • Shirley Street St Albans • Taylors Road, Keilor Downs at Railway Underpass • Vule Street St Albans	
23.2mm in 10 mins; 38.8mm in 30 mins; 50.5mm in 1 hour; 62.4mm in 2 hours; 85.5mm in 6 hours; or 104.5mm 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)	**Properties at Flood Risk (Over-Floor)** **94 Properties in Total** **Gladstone Street Drain** • 1/40 & 2/40 Adams Street, St Albans • 2/5, 3/5, 2/7, 3/7, 1/9, 2/9, 3/9, 4/9, 5/9, 1/11 & 2/11 Buchanan Street, St Albans • 2/12 & 42A Douglas Avenue, St Albans • 3/44 & 4/46 Kings Road, St Albans • 1 Lahy Street, St Albans • 1/255, 2/255, 2/484-486, 3/484-486, 6/484-486 & 9/484-486 Main Road, St Albans • 53, 2/57, 63-65 & Units 1-6/63-65 Moffat Street, St Albans **St Albans West Drain** • 23, 31, 33 & 35 Carbine Way, Keilor Downs • 8 Charles Street, St Albans • Units 1-10/88-90 & Units 1-3/99 Conrad Street, St Albans • 68B & 68A East Esplanade, St Albans • 1/141, 2/141, 3/141, 4/141, 5/141, 6/141, 7/141, 8/141, 9/141 & 10/141 Fox Street, St Albans • 68B Henry Street, St Albans • 7, 9, 1/11 & 13 Hook Street, St Albans • 24 & 2/24 Jamieson Street, St Albans • 1/36-38, 2/36-38 & 3/36-38 Kodre Street, St Albans • 1/1, 2/1, 2 & 13 Leilani Court, Keilor Downs • 13-15 Margrave Street, St Albans • 51 Regan Street, St Albans • 2/24, 1/28, 2/28, 3/28, 1/30, 4/30, 1/40, 2/40 & 3/40 Shirley Street, St Albans • 3, 1/8, 2/8, 3/10 & 12 Vule Street, St Albans • 40 Washington Street, St Albans **Community Infrastructure Flooded** **Gladstone Street Drain** • Stevensville Primary School sports grounds flooded **Essential Infrastructure Likely Impacted** • Bus Routes 418 & 421 if Taylors Road is flooded. Routes 424 & 942 if Main Road West is flooded. **Water Over Road (above 300mm depth)** **Furlong Road Drain** • Denton Avenue St Albans	

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		• Lovell Drive St Albans **Gladstone Street Drain** • Douglas Avenue, St Albans • Jefferson Street, St Albans • Keats Street, St Albans • Kings Road, St Albans, between McLeod Road and Douglas Avenue • Main Road West, St Albans between Adams Street and Moffat Street • Moffat Street, St Albans **St Albans West Drain** • Hispano Drive, Keilor Downs • Leilani Court, Keilor Downs • Charles Street, St Albans • Conrad Street, St Albans • East Esplanade, St Albans • Fox Street, St Albans • George Street, St Albans • Helen Street, St Albans • Henry Street, St Albans • Hook Street, St Albans • Kodre Street, St Albans • Main Road West, St Albans, between Cleveland Street and Washington Street • Margrave Street, St Albans • Power Street, St Albans • Regan Street, St Albans • Rita Street, St Albans • Shirley Street, St Albans • Taylors Road, Keilor Downs at Carbine Way and at the Railway Underpass • Vule Street, St Albans • Washington Street, St Albans	

Table C1.12 – Breakdown of possible consequences at various rainfall intensities around Jones Creek with operational considerations

APPENDIX D - FLOOD EVACUATION ARRANGEMENTS

Phase 1 - Decision to Evacuate

The Incident Controller may make the decision to evacuate an at-risk community under the following circumstances:

- Properties are likely to become inundated;
- Properties are likely to become isolated and occupants are not suitable for isolated conditions;
- Public health is at threat as a consequence of flooding and evacuation is considered the most effective risk treatment. This is the role of the Health Commander of the incident to assess and manage. Refer to the State Health Emergency Response Plan (SHERP) for details);
- Essential services have been damaged and are not available to a community and evacuation is considered the most effective risk treatment.

The following should be considered when planning for evacuation:

- Anticipated flood consequences and 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 MEMO, MERC, MRM, DFFH, Health Commander and other key agencies and expert advice (CMA's and Flood Intelligence specialists).

Triggers for evacuation, e.g. specific flood heights are predicted or are likely to occur will be considered when planning evacuation.

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 most appropriate evacuation routes and locations for at-risk communities to evacuate to.

Emergency Services 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.

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 Brimbank Council's MRM.

Phase 4 – Shelter

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

Relief/Recovery Centres and/or Assembly Areas that may be used are listed in the MEMP.

VicPol in consultation with VICSES will liaise with Local Government and DFFH (where regional coordination is required) via the relevant control centre to plan for the opening and operation of relief centres. This can best be achieved through the Incident Emergency Management Team (IEMT).

Animal Shelter

The need for animal shelter compounds will be determined dependant on the location and size of the event.

Details of emergency relief and recovery arrangements can be found in the City of Brimbank Relief and Recovery Plan.

Caravans

There are no caravan parks of note within the Brimbank City Council area.

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.

This table will be populated as a more detailed analysis of the flood risk is completed.

Service	Impact	Trigger Point for Action	Strategy / Temporary Measures

Essential Infrastructure and Property Protection

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

This table will be populated as a more detailed analysis of the flood risk is completed.

Facility	Impact	Trigger Point for Action	Strategy / Temporary Measures

For small-scale events, sandbags can be purchased from some hardware and garden suppliers. For larger 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 Brimbank 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 Brimbank SES Unit to assist with rescue operations – specific details of equipment and resources available can be obtained via 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 & FLOOD WARNING SYSTEMS

Public Information and Warnings

Storm and Flood Warning products and Flood Class Levels can be found on the BoMand the VicEmergency websites. Storm and Flood Warning Products include Severe Thunderstorm Warnings, Severe Weather Warnings, Flood Watches and Flood Warnings.

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

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

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

VICSES at the state tier (or SCC Public Information Section) lead the issuing of warnings for severe weather and storm when pre-determined triggers are met and plays an important role in sharing riverine and flash flood information via state-based standard communication channels.

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

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

Local Flood Warning System Arrangements

There is one local arrangement in place relating to Local Flood Warnings, that will be enacted in conjuction with official BOM Flood Warnings (if applicable) .

This local arrangement information can be found on the Maribyrnong River Gauge, Keilor and Maribyrnong River d/s Jacksons Creek Gauge Flood Intelligence Cards in Appendix C1 .

APPENDIX F – MAPS AND SCHEMATICS

Overview

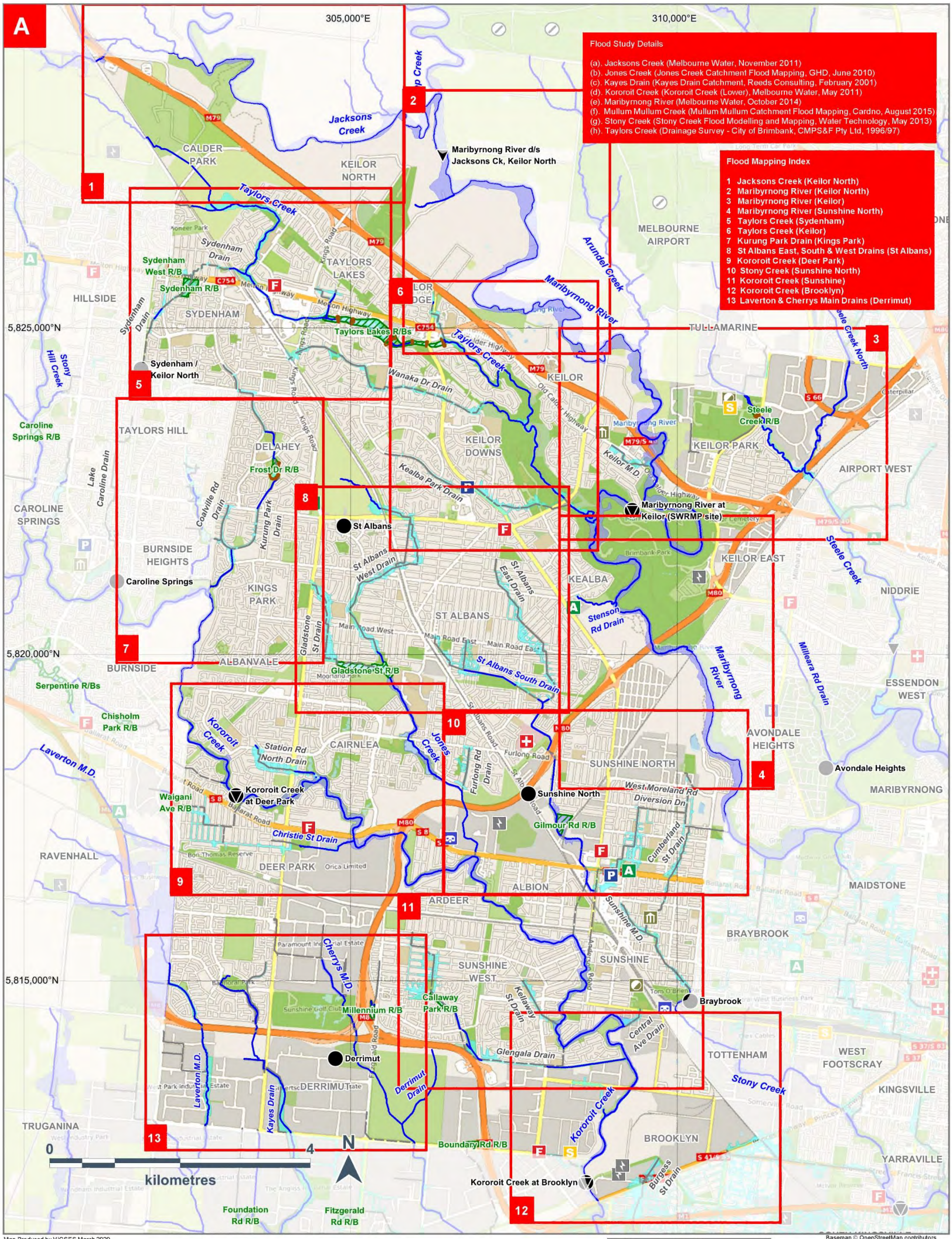
Maps considered useful to flood response are included in this Appendix. They include:

- A map outlining a series of flooding hot spot maps within the City of Brimbank.
- A map showing the Municipal boundary together with the open waterways and underground stormwater drainage pipe network within the City of Brimbank and the 1% AEP (100-year ARI) flood extents (sourced from Melbourne Water GIS).
- A set of 13 maps showing flooding hot spots within the City of Brimbank 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 & 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 SES Units and local government, and provide a reference link to the corresponding Municipal Flood Emergency Plan.
    - Details within these Catchment Schematics reflect those contained within either other sections of this Municipal Flood Emergency Plan or refer to other Municipal Flood Emergency Plans. These details have been filtered to contain only key facts. For more information on a gauge, drainage system or town consult the corresponding Flood Emergency Plan

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 Brimbank Planning Scheme can be used as a guide to 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 Department of Environment, Land, Water & Planning (DELWP) website 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 mapshare.maps.vic.gov.au/MapShareVic/index.html?viewer=MapShareVic.PublicSite&locale=en-AU
- Note that not all waterways or drains are included in the schematics, only those that are likely to contribute to flooding further on along the drainage system. Note also the flow direction; the schematics either flow from the top of the page to the bottom, or vice versa.

City of Brimbank Municipal Maps (sourced Melbourne Water GIS)



B

Flood Study Details

(a). Jacksons Creek (Melbourne Water, November 2011)
(b). Jones Creek (Jones Creek Catchment Flood Mapping, GHD, June 2010)
(c). Kayes Drain (Kayes Drain Catchment, Reeds Consulting, February 2001)
(d). Kororoit Creek (Kororoit Creek (Lower), Melbourne Water, May 2011)
(e). Maribyrnong River (Melbourne Water, October 2014)
(f). Mullum Mullum Creek (Mullum Mullum Catchment Flood Mapping, Cardno, August 2015)
(g). Stony Creek (Stony Creek Flood Modelling and Mapping, Water Technology, May 2013)
(h). Taylors Creek (Drainage Survey - City of Brimbank, CMPS&F Pty Ltd, 1996/97)

305,000°E 310,000°E
5,825,000°N 5,820,000°N 5,815,000°N

Jacksons Creek Deep Creek Taylors Creek Sydenham Drain Sydenham West R/B Sydenham R/B Stony Hill Creek Taylors Creek Wanaka Dr Drain Taylors Lakes R/Bs Maribyrnong River d/s Jacksons Ck, Keilor North Arundel Creek Maribyrnong River Steele Creek North Booths St R/B Steele Creek R/B Maribyrnong River at Keilor (SWRMP site) Steele Creek Stenson Rd Drain Maribyrnong River Milleara Rd Drain Kororoit Creek Station Rd North Drain Jones Creek Furlong Rd Drain West Moreland Rd Diversion Dn Christie St Drain Cumberland St Drain Sunshine M.D. Cherrys M.D. Laverton M.D. Kayes Drain Derrimut Drain Glengala Drain Central Ave Drain Stony Creek Kororoit Creek Burgess St Drain Kororoit Creek at Brooklyn Derrimut Millennium R/B Callaway Park R/B Boundary Rd R/B Foundation Rd R/B Fitzgerald Rd R/B Gladstone St R/B Serpentine R/Bs Chisholm Park R/B Waigani Ave R/B Frost Dr R/B Caroline Springs R/B Sydenham / Keilor North Kororoit Creek at Deer Park St Albans Caroline Springs Derrimut Braybrook Avondale Heights Sunshine North

CALDER PARK KEILOR NORTH MELBOURNE AIRPORT GLADSTONE PARK HILLSIDE SYDENHAM TAYLORS LAKES KEILOR LODGE TULLAMARINE KEILOR KEILOR PARK AIRPORT WEST TAYLORS HILL DELAHEY KEILOR DOWNS KEILOR EAST CAROLINE SPRINGS BURNSIDE HEIGHTS KINGS PARK KEALBA NIDDRIE ST ALBANS BURNSIDE ALBANVALE CAIRNLEA ESSENDON WEST AVONDALE HEIGHTS SUNSHINE NORTH MARIBYRNONG RAVENHALL DEER PARK ALBION ARDEER MAIDSTONE SUNSHINE WEST SUNSHINE BRAYBROOK TOTTENHAM WEST FOOTSCRAY KINGSVILLE TRUGANINA DERRIMUT BROOKLYN YARRAVILLE

0 4 kilometres

Map Produced by VICSES March 2020.

Basemap © OpenStreetMap contributors

N

CITY OF MANNINGHAM

Version 4: March 2020

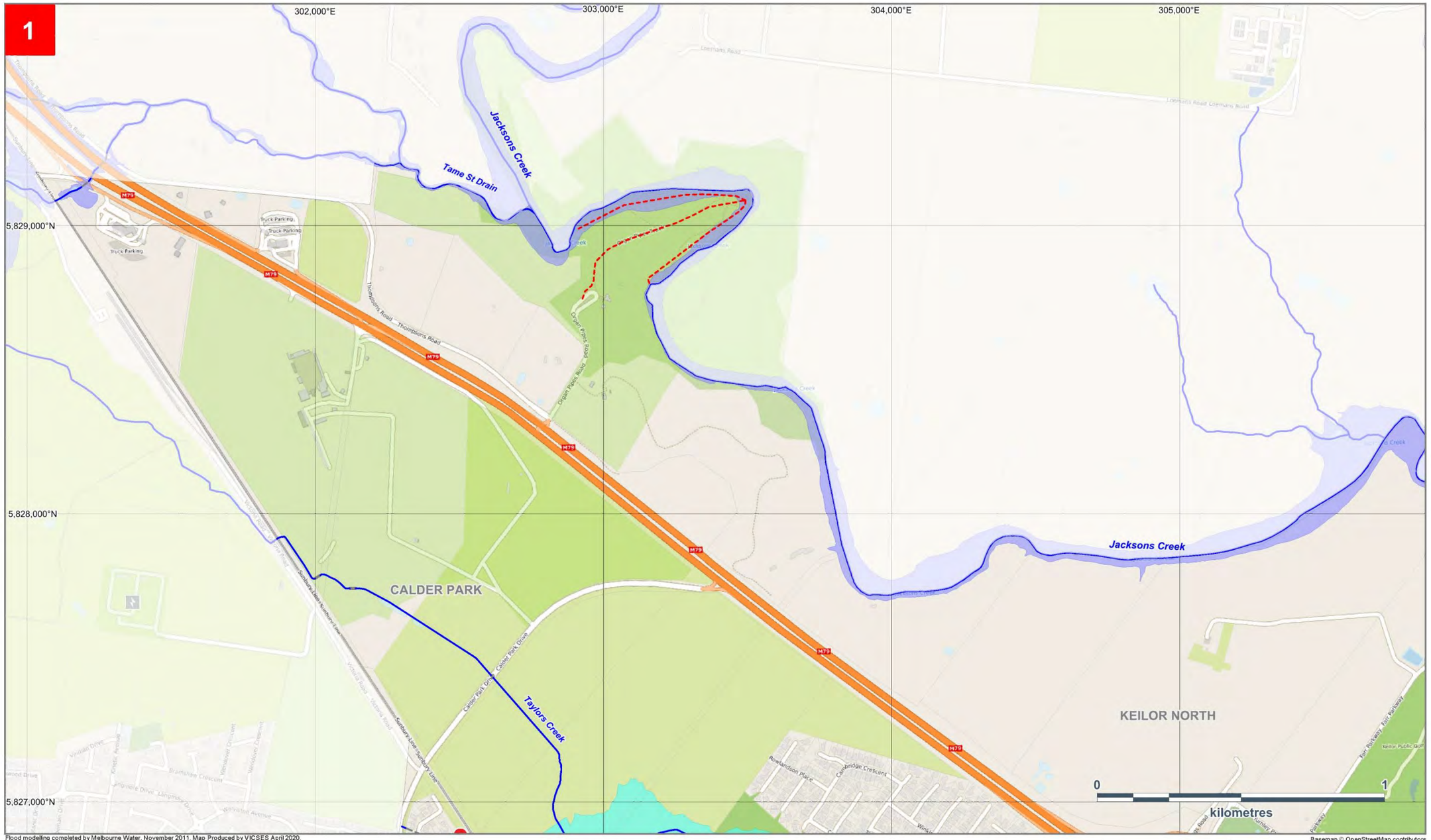
B. 1% AEP (100yr ARI) Flood Mapping

- Waterbody
- 1% AEP Flash Flood Extent
- 1% AEP Riverine Flood Extent
- Melbourne Water Retarding Basin
- Melbourne Water Stormwater Drain
- Waterway
- Embankment
- Stream Level Gauge
- Rain Gauge
- Power Terminal Station
- Municipal Offices
- Municipal Depot
- Police Station
- Ambulance Station
- Hosptial
- Caravan Park
- Fire Station
- State Emergency Service
- Airport

MELBOURNE

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

Flood Extent Maps (sourced Melbourne Water GIS)



Flood modelling completed by Melbourne Water, November 2011. Map Produced by VICSES April 2020.

Basemap © OpenStreetMap contributors

N

CITY OF BRIMBANK

1% AEP (100yr ARI) Flooding

1. Jacksons Creek (Keilor North)

- Building
- Waterbody
- Reserve / Parkland
- 1% AEP Riverine Flood Extent (Depth Unavailable)
- Waterway
- Bicycle / Walking Trail
- Power Terminal Station

SES VICTORIA State Government Melbourne Water

2

306,000°E 307,000°E 308,000°E

0 1 kilometres

5,828,000°N 5,827,000°N 5,826,000°N 5,825,000°N

BULLA

MELBOURNE AIRPORT

KEILOR NORTH

KEILOR

KEILOR LODGE

TAYLORS LAKES

Maribyrnong River d/s Jacksons Ck, Keilor North

Maribyrnong River

Arundel Creek

Taylors Creek

Taylors Lakes Retarding Basin - Lake Spoonbill

Taylors Lakes Retarding Basin - Lake Kingfisher

Agonis Dr Drain

Public Golf Course

Kiuna Road

Oakbank Road

Highland Road

Grogan Road

Nordic Avenue

Messina Crescent

Rivoli Place

Medici Court

Turin Place

Melton Highway

Sunshine Avenue

Santa Monica Drive

Laguna Close

Avila Place

Old Calder Highway

Overnewton Road

Arundel Road

Browns Road

Pindari Avenue

M79

C754

Maribyrnong River flood modelling completed by Melbourne Water, October 2015. Map Produced by VICSES May 2020.

Basemap © OpenStreetMap contributors

N

CITY OF BRIMBANK

1% AEP (100yr ARI) Flooding

2. Maribyrnong River (Keilor North)

- Building
- Waterbody
- 1% AEP Riverine Flood Extent (Depth Unavailable)
- 1% AEP Flash Flood Extent (Depth Unavailable)
- Melbourne Water Retarding Basin
- Bicycle / Walking Trail
- Road Likely requiring closure during 1% AEP event
- Melbourne Water Stormwater Drain
- Waterway
- Embankment
- Kindergarten / Child Care
- School / College
- Telehphone Exchange
- Aged Care Facility
- Stream Level Gauge & 1% AEP Flood Level

BRIMBANK

3

309,000°E
310,000°E
311,000°E
312,000°E
313,000°E
5,824,000°N
5,823,000°N
5,822,000°N

KEILOR
KEILOR PARK
AIRPORT WEST
Maribyrnong River
Steele Creek
Steele Creek North
Steele Creek Retarding Basin
Keilor M.D.
Airport West Drain
Maribyrnong River at Keilor (SWRMP site)
1% AEP Flood Level: 7.69m (18.375m AHD)

0
1
kilometres

Flood modelling completed by Melbourne Water, October 2014. Map Produced by VICSES April 2020.

Basemap © OpenStreetMap contributors

N

CITY OF BRIMBANK

1% AEP (100yr ARI) Flooding

3. Maribyrnong River (Keilor)

- Building
- Waterbody
- Reserve / Parkland
- 1% AEP Riverine Flood Extent (Depth Unavailable)
- 1% AEP Flash Flood Extent (Depth Unavailable)
- Melbourne Water Retarding Basin
- Waterway
- Bicycle / Walking Trail
- Underground Stormwater Drain
- Embankment
- 1% AEP Over-Floor Flooding Risk
- Road Likely Requiring Closure during 1% AEP Event
- VICSES Unit LHQ
- Power Terminal Station
- Stream Level Gauge & 1% AEP Flood Level
- Rain Gauge
- School / College
- Child Care / Kindergarten
- Aged Care Facility
- Place Of Worship
- Telphone Exchange
- Sewer Emergency Relief Point
- Municipal Offices
- Municipal Depot

4

309,000°E
310,000°E
311,000°E
5,821,000°N
5,820,000°N
5,819,000°N
5,818,000°N
0
1
kilometres

KEILOR
KEILOR EAST
KEALBA
ST ALBANS
SUNSHINE NORTH
AVONDALE HEIGHTS
BRIMBANK

Maribyrnong River
Stenson Rd Drain
Brimbank Road
Keilor Park Drive
Commercial Place
Williams Avenue
Disney Avenue
Cain Avenue
Webber Parade
Slater Parade
Beckett Avenue
Park Drive
Stenson Road
Orbital Drive
Dowling Street
Cook Avenue
Driscolls Road
Glenbar Court
Harefield Crescent
Sunshine Avenue
Main Road East
McIntyre Road
Railway Road
Baldwin Avenue
Balfour Avenue
Whitehill Avenue
Somerset Drive
Plymouth Close
Tennant Street
Sproul Street
Munro Avenue
Alvina Street
Tania Street
Henley Gardens
Park Drive
Rothray Avenue
Harvester Avenue
Lance Road
Ayton Street
Berkshire Road
Somers Street
Sunnybank Rise
Halong Drive
Riverbend Way
Rice Flower Road
Riverside Place
Buckley Street
Rivercross Drive
Knights Stadium
North Eastern Standard Gauge Line
Albion – Jacana Line
M80

Maribyrnong River flood modelling completed by Melbourne Water, October 2014. Map Produced by VICSES May 2020.

Basemap © OpenStreetMap contributors

N

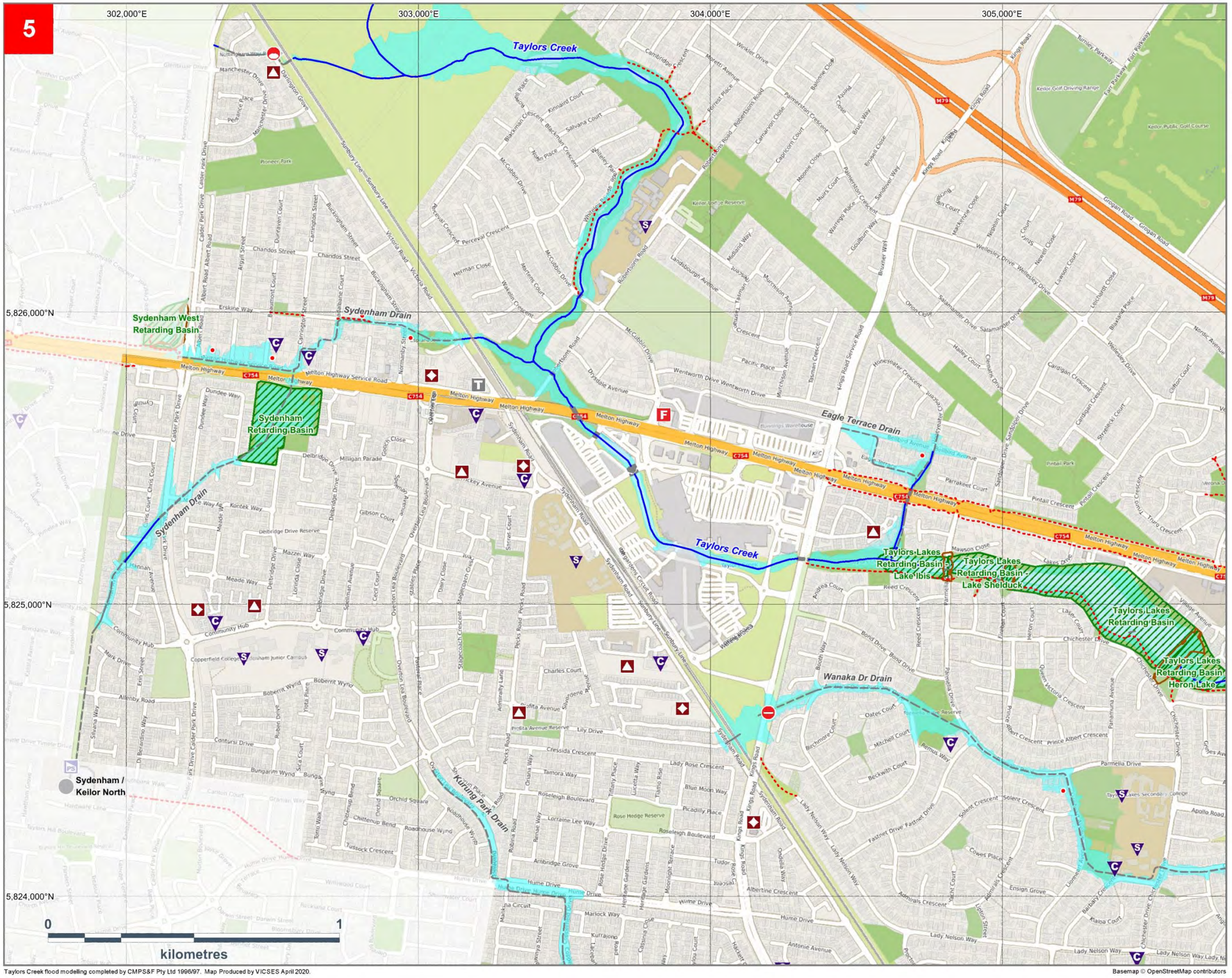
CITY OF BRIMBANK

1% AEP (100yr ARI) Flooding

4. Maribyrnong River (Sunshine North)

- Building
- Waterbody
- 1% AEP Riverine Flood Extent (Depth Unavailable)
- 1% AEP Flash Flood Extent (Depth Unavailable)
- Bicycle / Walking Trail
- Melbourne Water Stormwater Drain
- Waterway
- Kindergarten / Child Care
- School / College
- Telehphone Exchange
- Aged Care Facility
- Police Station
- Power Terminal Station
- Place Of Worship
- Ambulance Station
- 1% AEP Over-Floor Flooding Risk

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


5
302,000°E
303,000°E
304,000°E
305,000°E
5,826,000°N
5,825,000°N
5,824,000°N
Taylors Creek
Sydenham West Retarding Basin
Sydenham Drain
Sydenham Retarding Basin
Eagle Terrace Drain
Taylors Lakes Retarding Basin Lake Ibis
Taylors Lakes Retarding Basin Lake Sheldduck
Taylors Lakes Retarding Basin
Taylors Lakes Retarding Basin Heron Lake
Wanaka Dr Drain
Kurting Park Drain
Sydenham / Keilor North
Melton Highway
Melton Highway Service Road
Sydenham Road
Kings Road
Robertsons Road
Roberts Road
Taylors Hill Boulevard
Keilor Golf Course Reserve
Keilor Golf Driving Range
Keilor Public Golf Course
Pioneer Park
Rose Hedge Reserve
Pintail Park
Profita Avenue Reserve
Delbridge Drive Reserve
Bunnings Warehouse
Copperfield College - Sydenham Junior Campus
Community Hub
M79
Sunbury Line
0
1
kilometres
Building
Waterbody
Resere / Parkland
1% AEP Flash Flood Extent (Depth Unavailable)
Melbourne Water Retarding Basin
Embankment
Bicycle / Walking Trail
Melbourne Water Stormwater Drain
Waterway
Place of Worship
Kindergarten / Child Care
School / College
Sewer Emergency Relief Point
Telehphone Exchange
Aged Care Facility
1% AEP Over-Floor Flooding Risk
Road Likely Requiring Closure during 1% AEP Event
Rain Gauge
BRIMBANK
N
CITY OF BRIMBANK
1% AEP (100yr ARI) Flooding
5. Taylors Creek (Sydenham)
SES
VICTORIA State Government
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 errors or omissions in this information or for any action taken by any person in reliance upon it.
Taylors Creek flood modelling completed by CMPS&F Pty Ltd 1996/97. Map Produced by VICSES April 2020.
Basemap © OpenStreetMap contributors

6

306,000°E

307,000°E

308,000°E

0 1

kilometres

5,825,000°N

5,824,000°N

5,823,000°N

5,822,000°N

KEILOR NORTH

KEILOR LODGE

TAYLORS LAKES

KEILOR

KEILOR DOWNS

KEALBA

ST ALBANS

Maribyrnong River

Taylors Lakes Retarding Basin - Lake Spoonbill

Taylors Lakes Retarding Basin - Lake Kingfisher

Wanaka Dr Drain

Kealba Park Drain

Taylors Creek

Taylors Creek Linear Park

St Albans West Drain

Melton Highway

Old Calder Highway

Taylors Road

Green Gully Road

Green Gully Road Service Road

Old Calder Highway Service Road

Sunshine Avenue

M79

Taylors Creek flood modelling completed by CMPS&F Pty Ltd, 1996/97. Map Produced by VICSES May 2020.

Basemap © OpenStreetMap contributors

N

CITY OF BRIMBANK

1% AEP (100yr ARI) Flooding

6. Taylors Creek (Keilor)

- Building
- Waterbody
- 1% AEP Riverine Flood Extent (Depth Unavailable)
- 1% AEP Flash Flood Extent (Depth Unavailable)
- Melbourne Water Retarding Basin
- Bicycle / Walking Trail
- Melbourne Water Stormwater Drain
- Waterway
- Embankment
- Kindergarten / Child Care
- School / College
- Telehphone Exchange
- Aged Care Facility
- Fire Station
- Police Station
- Sewer Emergency Relief Point
- 1% AEP Over-Floor Flooding Risk

1% AEP Flash Flood Depth

- Greater than 60cm
- Between 30cm and 60
- Up to 30cm

BRIMBANK

SES VICTORIA State Government 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 errors or omissions in this information or for any action taken by any person in reliance upon it.

7

0 1 kilometres

302,000°E 303,000°E 304,000°E

5,823,000°N 5,822,000°N 5,821,000°N 5,820,000°N

TAYLORS HILL

BURNSIDE HEIGHTS

BURNSIDE

DELAHEY

KINGS PARK

ALBANVALE

DEER PARK

CAIRNLEA

Caroline Springs

Frost Dr Retarding Basin

Kururng Park Drain

Coalville Rd Drain

Kororoit Creek

Kororoit Creek flood modelling completed by Melbourne Water, May 2011. Map Produced by VICSES May 2020.

Basemap © OpenStreetMap contributors

N

CITY OF BRIMBANK

1% AEP (100yr ARI) Flooding

7. Kurung Park Drain (Kings Park)

Building
Waterbody
1% AEP Flash Flood Extent (Depth Unavailable)

1% AEP Flood Depth
Greater than 60cm
Between 30cm and 60cm
Up to 30cm
Melbourne Water Retarding Basin

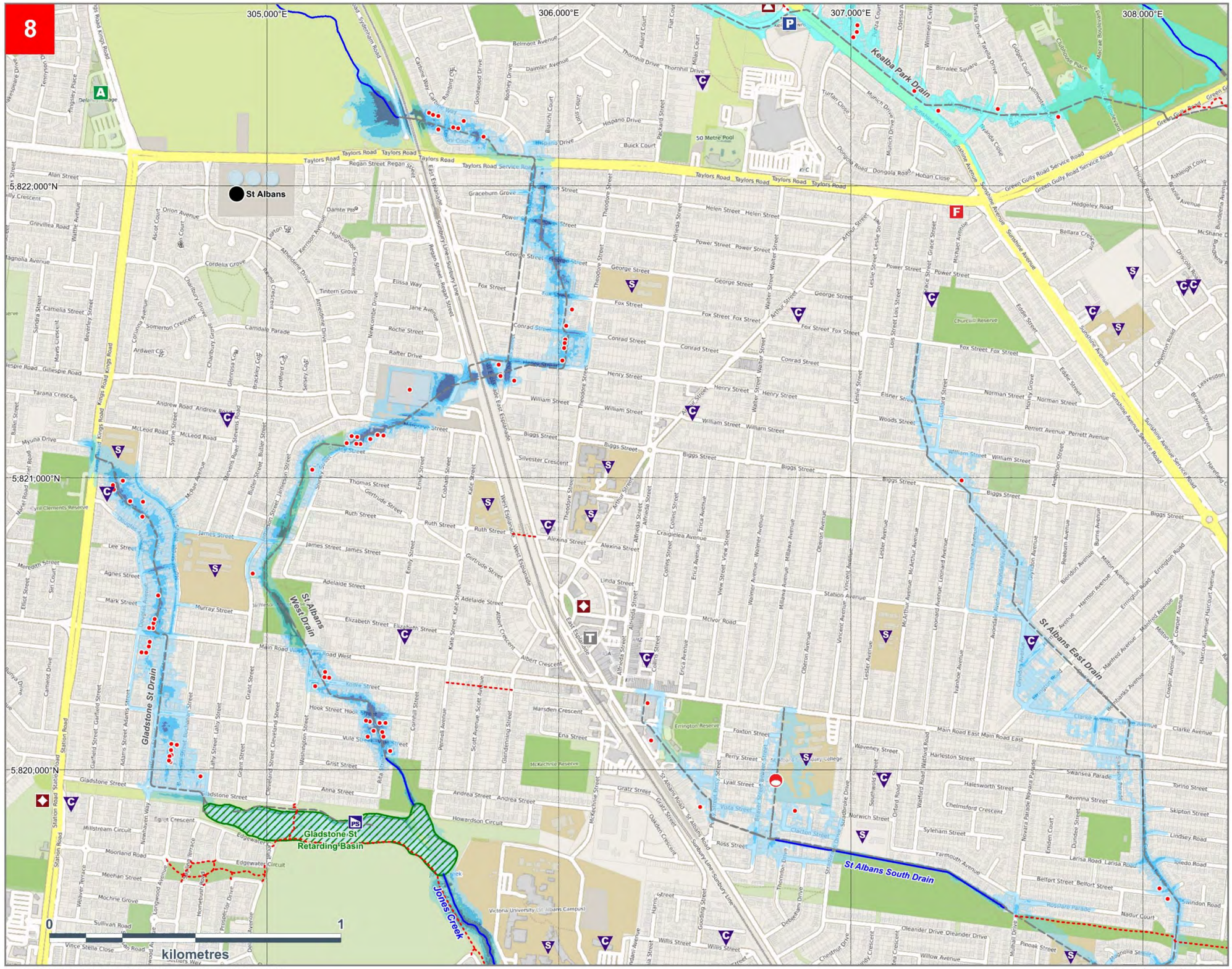
Bicycle / Walking Trail
Melbourne Water Stormwater Drain
Waterway
Embankment
Kindergarten / Child Care
School / College
Telehphone Exchange
Aged Care Facility

Ambulance Station
1% AEP Over-Floor Flooding Risk
Place Of Worship
Rain Gauge

BRIMBANK

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

8



Building
Waterbody
Resere / Parkland
1% AEP Flash Flood Extent (Depth Unavailable)
Melbourne Water Retarding Basin

1% AEP Flood Depth

Greater than 60cm
Between 30cm and 60cm
Up to 30cm
Bicycle / Walking Trail
Melbourne Water Stormwater Drain
Waterway
Place of Worship
Kindergarten / Child Care
School / College
Sewer Emergency Relief Point
Telehphone Exchange
Aged Care Facility
1% AEP Over-Floor Flooding Risk
Drainage Pumping Station
Rain Gauge
Fire Station
Police Station
Ambulance Station

N

CITY OF BRIMBANK

1% AEP (100yr ARI) Flooding

8. St Albans East, South & West Drains (St Albans)

Jones Creek flood modelling completed by GHD, June 2010. Map Produced by VICSES April 2020.

Basemap © OpenStreetMap contributors

9

303,000°E
304,000°E
305,000°E
306,000°E
5,819,000°N
5,818,000°N
5,817,000°N

ALBANVALE
BURNSIDE
RAVENHALL
DEER PARK
CAIRNLEA
ST ALBANS
ARDEER

Kororoit Creek
Jones Creek
Station Rd North Drain
Christie St Drain
Waigani Ave Retarding Basin

Kororoit Creek at Deer Park
1% AEP Flood Level: 5.9m (53.5m AHD)

0
1
kilometres

Kororoit Creek flood modelling completed by Melbourne Water, May 2011. Map Produced by VICSES April 2020.

Basemap © OpenStreetMap contributors

- Building
- Waterbody
- Resere / Parkland
- 1% AEP Flash Flood Extent (Depth Unavailable)

1% AEP Flood Depth

- Greater than 60cm
- Between 30cm and 60cm
- Up to 30cm
- Bicycle / Walking Trail
- Melbourne Water Stormwater Drain
- Waterway
- Place of Worship
- Kindergarten / Child Care
- School / College
- Telehphone Exchange
- Aged Care Facility
- 1% AEP Over-Floor Flooding Risk
- Stream Level Gauge & 1% AEP Flood Level
- Rain Gauge
- Fire Station

BRIMBANK

N

CITY OF BRIMBANK

1% AEP (100yr ARI) Flooding

9. Kororoit Creek (Deer Park)

SES VICTORIA State Government Melbourne Water

10

307,000°E 308,000°E 309,000°E 310,000°E 311,000°E

5,818,000°N

5,817,000°N

ST ALBANS

CAIRNLEA

ALBION

ARDEER

SUNSHINE NORTH

AVONDALE HEIGHTS

SUNSHINE

BRAYBROOK

Sunshine North

Furlong Rd Drain

Stony Creek

Jones Creek

Kororoit Creek

Gilmour Rd Retarding Basin

West Moreland Rd Diversion Dn

Westmoreland Rd Drain

Cumberland St Diversion Drain

Maribyrnong River

Ballarat Road

M80

0 1 kilometres

Flood modelling completed by Melbourne Water, October 2014. Map Produced by VICSES April 2020.

Basemap © OpenStreetMap contributors

N

CITY OF BRIMBANK

1% AEP (100yr ARI) Flooding

10. Stony Creek (Sunshine North)

- Building
- Waterbody
- Reserve / Parkland
- 1% AEP Riverine Flood Extent (Depth Unavailable)
- Melbourne Water Retarding Basin

1% AEP Flood Depth

- Greater than 60cm
- Between 30cm and 60cm
- Up to 30cm

- Waterway
- Bicycle / Walking Trail
- Underground Stormwater Drain
- 1% AEP Over-Floor Flooding Risk
- Ambulance Station
- Fire Station
- Hospital
- Power Terminal Station

- School / College
- Child Care / Kindergarten
- Aged Care Facility
- Place Of Worship
- Sewer Emergency Relief Point
- Caravan Park
- Police Station
- Rain Gauge

11

306,000°E 307,000°E 308,000°E 309,000°E 310,000°E

5,816,000°N

5,815,000°N

5,814,000°N

ARDEER

ALBION

SUNSHINE

BRAYBROOK

SUNSHINE WEST

TOTTENHAM

BROOKLYN

DERRIMUT

Kororoit Creek

Glengala Drain

Callaway Park Retarding Basin

Kellaway St Drain

Central Ave Drain

Stony Creek

Derrimut Drain

Braybrook

0 1 kilometres

Flood modelling completed by Melbourne Water, October 2014. Map Produced by VICSES April 2020.

Basemap © OpenStreetMap contributors

N

CITY OF BRIMBANK

1% AEP (100yr ARI) Flooding

11. Kororoit Creek (Sunshine)

- Building
- Waterbody
- Reserve / Parkland
- 1% AEP Flash Flood Extent (Depth Unavailable)
- Melbourne Water Retarding Basin

1% AEP Flood Depth

- Greater than 60cm
- Between 30cm and 60cm
- Up to 30cm

- Waterway
- Bicycle / Walking Trail
- Underground Stormwater Drain
- 1% AEP Over-Floor Flooding Risk
- Municipal Offices
- Telephone Exchange

- School / College
- Child Care / Kindergarten
- Aged Care Facility
- Place Of Worship
- Rain Gauge
- Caravan Park

12

307,000°E 308,000°E 309,000°E 310,000°E

5,814,000°N 5,813,000°N 5,812,000°N

Kellaway St Drain

Central Ave Drain

Stony Creek

Glengala Drain

Kororoit Creek

Fairbairn Rd Drain

Burgess St Drain

Boundary Rd Retarding Basin

Kororoit Creek at Brooklyn
1% AEP Flood Level: 5.33m (12.9m AHD)

Braybrook

BRAYBROOK

SUNSHINE

SUNSHINE WEST

TOTTENHAM

DERRIMUT

BROOKLYN

LAVERTON NORTH

0 1
kilometres

Kororoit Creek flood modelling completed by Melbourne Water, May 2011. Map Produced by VICSES April 2020.

Basemap © OpenStreetMap contributors

- Building
- Waterbody
- Resere / Parkland
- 1% AEP Flash Flood Extent (Depth Unavailable)

1% AEP Flood Depth

- Greater than 60cm
- Between 30cm and 60cm
- Up to 30cm
- Melbourne Water Retarding Basin
- Bicycle / Walking Trail
- Melbourne Water Stormwater Drain
- Waterway
- Kindergarten / Child Care
- School / College
- Rain Gauge
- VICSES Regional Headquarters
- Fire Station
- Power Terminal Station
- Caravan Park
- Stream Level Gauge & 1% AEP Flood Level
- 1% AEP Over-Floor Flooding Risk

N

CITY OF BRIMBANK

1% AEP (100yr ARI) Flooding

12. Kororoit Creek (Brooklyn)

SES VICTORIA State Government Melbourne Water

13

303,000°E 304,000°E 305,000°E 306,000°E

5,815,000°N

5,814,000°N

5,813,000°N

RAVENHALL

DERRIMUT

SUNSHINE WEST

LAVERTON NORTH

Millennium Retarding Basin

Laverton M.D.

Kayes Drain

Cherrys M.D.

Derrimut

0 1 kilometres

Building
Waterbody
Resere / Parkland
1% AEP Flash Flood Extent (Depth Unavailable)
1% AEP Riverine Flood Extent (Depth Unavailable)
Melbourne Water Retarding Basin
Bicycle / Walking Trail
Melbourne Water Stormwater Drain
Waterway
Kindergarten / Child Care
School / College
Rain Gauge

BRIMBANK

N

CITY OF BRIMBANK

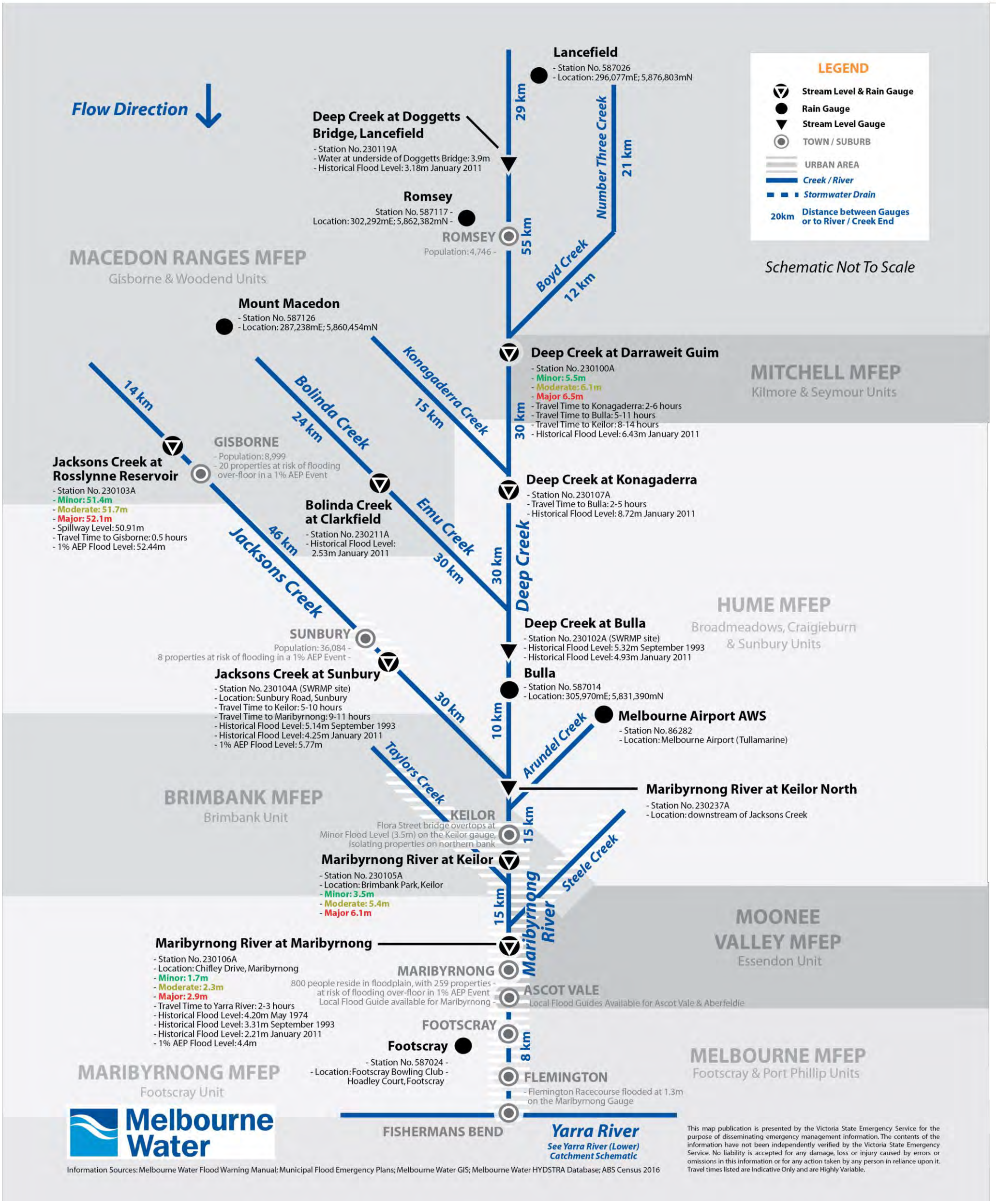
1% AEP (100yr ARI) Flooding

13. Laverton, Kayes and Cherrys Drains (Derrimut)

Laverton Main Drain flood modelling completed by WBCM Group, January 2008. Kayes Drain flood modelling completed by Reeds Consulting, February 2001. Map Produced by VICSES April 2020.

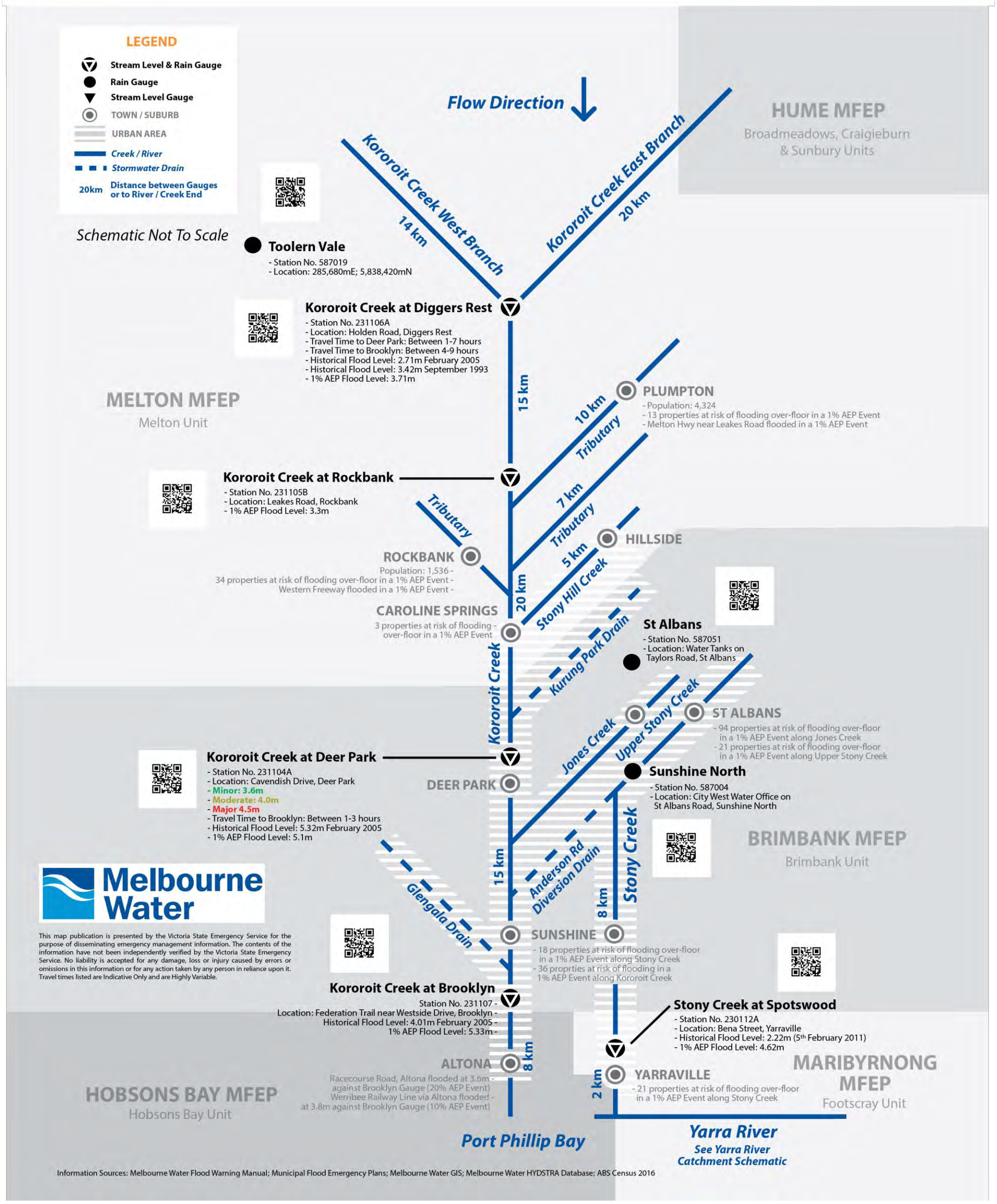
Maribyrnong River Catchment Schematic

Version 4 - January 2020



Kororoit Creek & Stony Creek Catchment Schematic

Version 5 - June 2021



APPENDIX G – SEVERE WEATHER (STORM) EVENTS

Overview

Brimbank municipality is susceptible to severe weather events because of a combination of its undulating terrain, urban boundary location and wind exposed properties. The City of Brimbank may be subject to severe weather events such as windstorms, hailstorms, and thunderstorms (including lightning activity). There have also been occurrences of atmospheric downbursts/microburst within Brimbank and adjacent municipalities.

Severe storm activity could result in injuries and obstructions across roads which can disrupt services, affect community functioning and have great potential for road traffic delays and an increase in road accidents.

This Appendix uses Request for Assistance data from the Victoria State Emergency Service (VICSES) to display areas at risk from severe weather events.

Large Storm Events

Typically, Brimbank Unit would expect to be impacted by a large storm event once per year (more than 40 RFA's per day).

Since 2009, the following larger storm events have occurred in the Brimbank area:

- 25th 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 and over 1,500 RFAs to the SES.
- October 2013 – Windstorm event which saw **223 RFA's** received
- October 2016 – Flood and storm event which saw **318 RFA's** received, coinciding with major floods impacting Victoria across the state (biggest flood event since 2011).
- 29th October 2021 – Storm event resulting in **240 RFAs** for Brimbank

VICSES Requests for Assistance (RFAs)

The Victoria State Emergency Service records requests for assistance made by the public during severe weather events. Table G1 below is a breakdown of requests by suburb and damage type during the period July 2009 and November 2022.

VICSES Request for Assistance (July 2009 – November 2022)					
Suburb	Building Damage	Flooding	Tree Down	Tree Down Traffic Hazard	Other *
Albanvale	38	13	44	26	7
Albion	29	15	21	20	3
Ardeer	18	7	5	7	2
Brooklyn	0	0	1	8	1
Cairnlea	48	4	26	43	4
Calder Park	0	1	0	10	0
Deer Park	125	43	102	71	16
Delahey	113	18	18	19	5
Derrimut	47	9	10	5	6
Hillside	5	3	8	3	1
Kealba	43	8	32	20	0
Keilor	423	67	62	59	10
Keilor Downs	317	54	53	51	6
Keilor East	6	1	2	8	1
Keilor Lodge	17	4	10	7	0
Keilor North	0	0	2	4	0
Keilor Park	53	6	30	21	19
Kings Park	47	14	46	23	2
St Albans	297	84	208	122	27
Sunshine	86	32	60	39	17
Sunshine North	75	22	56	19	9
Sunshine West	157	29	87	43	19
Sydenham	229	32	34	19	6
Taylors Lakes	794	92	64	24	19
Tullamarine	7	4	1	7	2

Table G1 – Breakdown of severe weather RFAs received by VICSES Brimbank Unit by suburb

*Loose Debris / Objects, Rescue Persons Trapped, Rescue Structure Collapse, and Rescue Vehicle into Structure

Table G2 is a breakdown of requests for assistance by Date (Month) and damage type.

VICSES Request for Assistance (July 2009 – November 2022)					
Date	Building Damage	Flooding	Tree Down	Tree Down Traffic Hazard	Other*
July 2009	7	5	8	0	0
August 2009	26	17	8	0	0
September 2009	6	12	1	0	0
October 2009	2	0	0	1	0
November 2009	38	6	4	8	0
December 2009	4	2	2	0	0
January 2010	5	8	8	1	0
February 2010	97	26	26	32	0
March 2010	29	1	3	30	0
April 2010	1	1	3	0	0
May 2010	0	1	0	0	0
June 2010	10	5	2	0	0
July 2010	1	1	2	0	0

Date	VICSES Request for Assistance (July 2009 – November 2022)				
	Building Damage	Flooding	Tree Down	Tree Down Traffic Hazard	Other*
August 2010	6	2	6	1	0
September 2010	8	4	6	0	0
October 2010	16	2	4	9	0
November 2010	14	2	6	0	0
December 2010	12	8	4	19	0
January 2011	13	2	4	19	1
February 2011	11	5	4	6	0
March 2011	3	1	2	1	0
April 2011	4	1	0	1	0
May 2011	5	0	0	1	0
June 2011	3	1	2	0	0
July 2011	2	0	0	0	0
August 2011	6	0	0	0	0
September 2011	6	6	3	1	0
October 2011	3	1	1	2	0
November 2011	7	4	6	0	0
December 2011	1394	11	5	135	0
January 2012	147	12	6	3	0
February 2012	82	11	13	12	0
March 2012	18	2	3	3	0
April 2012	4	5	7	1	0
May 2012	11	1	1	4	0
June 2012	12	1	1	2	0
July 2012	6	1	0	0	0
August 2012	6	5	2	0	0
September 2012	7	12	4	1	0
October 2012	5	2	0	0	0
November 2012	2	2	2	0	0
December 2012	9	15	8	2	0
January 2013	6	1	2	1	0
February 2013	6	0	2	1	0
March 2013	12	20	9	0	0
April 3013	1	1	0	0	0
May 2013	2	0	1	1	0
June 2013	7	0	3	2	0
July 2013	4	7	6	0	0
August 2013	13	23	13	0	0
September 2013	16	17	8	1	0
October 2013	105	86	32	0	0
November 2013	3	2	2	0	0
December 2013	6	1	3	0	0
January 2014	13	7	4	0	0
February 2014	4	3	4	0	0
March 2014	2	1	0	0	0
April 2014	6	1	2	0	0
May 2014	0	0	2	0	0
June 2014	56	49	41	0	0
July 2014	8	2	6	0	0
August 2014	2	0	1	0	0
September 2014	15	4	5	1	0
October 2014	9	1	0	1	0
November 2014	10	2	3	1	0
December 2014	10	9	9	1	0
January 2015	8	6	5	0	0
February 2015	27	7	11	1	0
March 2015	7	12	4	0	0
April 2015	2	1	2	0	0
May 2015	2	2	0	1	0
June 2015	8	0	2	0	0
July 2015	4	0	1	0	0
August 2015	3	0	2	0	0
September 2015	3	0	0	2	0

Date	VICSES Request for Assistance (July 2009 – November 2022)				
	Building Damage	Flooding	Tree Down	Tree Down Traffic Hazard	Other*
October 2015	9	4	3	2	0
November 2015	38	10	10	14	0
December 2015	16	7	7	0	0
January 2016	26	6	4	14	0
February 2016	2	2	4	1	0
March 2016	6	4	3	0	0
April 2016	1	2	1	0	0
May 2016	3	2	0	0	0
June 2016	3	0	0	1	0
July 2016	4	5	3	2	0
August 2016	6	1	1	1	0
September 2016	3	3	1	0	0
October 2016	114	128	75	1	0
November 2016	5	5	6	0	0
December 2016	7	5	7	1	0
January 2017	5	3	2	0	0
February 2017	12	3	4	0	0
March 2017	7	3	5	0	0
April 2017	10	4	1	1	0
May 2017	2	1	0	0	0
June 2017	4	0	0	0	0
July 2017	68	26	28	0	0
August 2017	9	3	1	1	0
September 2017	7	0	3	0	0
October 2017	1	1	0	0	0
November 2017	5	2	2	1	0
December 2017	30	0	4	18	0
January 2018	11	4	2	1	0
February 2018	6	5	1	0	0
March 2018	6	6	2	0	0
April 2018	3	2	0	0	0
May 2018	6	2	1	2	0
June 2018	5	1	0	4	0
July 2018	3	2	0	0	0
August 2018	6	0	0	0	0
September 2018	1	1	4	0	0
October 2018	3	2	2	0	0
November 2018	11	4	2	9	2
December 2018	23	4	6	10	1
January 2019	7	6	2	1	1
February 2019	3	2	4	2	0
March 2019	5	5	4	3	1
April 2019	2	5	1	0	0
May 2019	1	1	2	3	0
June 2019	5	1	0	1	0
July 2019	4	5	7	0	0
August 2019	3	4	2	2	2
September 2019	2	2	2	3	2
October 2019	5	2	4	7	1
November 2019	12	17	15	2	3
December 2019	8	7	6	1	1
January 2020	53	43	13	8	10
February 2020	5	1	4	1	1
March 2020	6	4	1	1	1
April 2020	9	4	9	7	2
May 2020	3	1	2	2	2
June 2020	4	0	1	0	0
July 2020	1	1	0	0	0
August 2020	13	4	10	8	1
September 2020	9	2	19	7	3
October 2020	6	0	6	3	0
November 2020	7	3	4	6	1

Date	VICSES Request for Assistance (July 2009 – November 2022)				
	Building Damage	Flooding	Tree Down	Tree Down Traffic Hazard	Other*
December 2020	18	9	16	5	5
January 2021	17	8	8	1	0
February 2021	4	2	5	2	0
March 2021	1	0	1	1	0
April 2021	6	1	1	0	0
May 2021	8	3	0	4	1
June 2021	11	1	18	3	4
July 2021	2	1	4	0	1
August 2021	1	0	3	2	0
September 2021	7	5	8	1	2
October 2021	67	0	97	65	11
November 2021	66	4	43	12	1
December 2021	21	3	10	6	0
January 2022	27	8	2	5	2
February 2022	3	1	2	2	1
March 2022	3	3	1	0	2
April 2022	2	3	2	0	0
May 2022	4	1	1	0	1
June 2022	5	1	1	1	0
July 2022	5	1	1	1	0
August 2022	9	0	1	1	0
September 2022	3	0	0	1	0
October 2022	24	23	5	2	2
November 2022	9	6	8	5	1

Table G2 – Breakdown of severe weather RFAs received by VICSES Brimbank Unit by month

* Fence Down, Loose Debris / Objects, Rescue Persons Trapped, Sandbag Request

VICSES Severe Weather (Storm or Flood) Requests for Assistance Mapping

Figure G1 – Severe Weather Requests for Assistance (RFA)s by Job Type July 2009 – November 2022

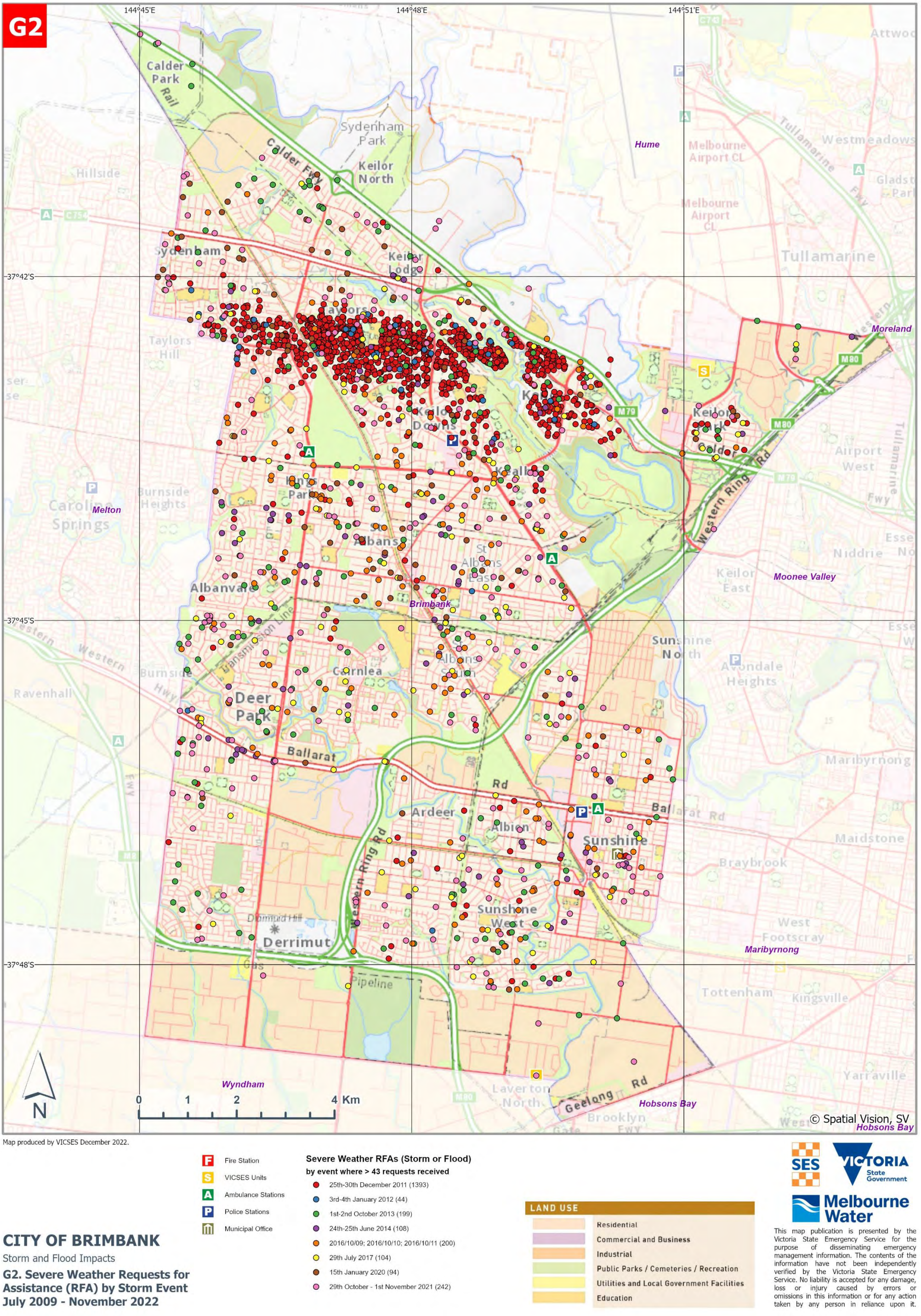


Figure G2 – Severe Weather Requests for Assistance (RFA)s for selected significant storms between July 2009 – November 2022