

City of Yarra

Storm and Flood Emergency Plan

A Sub-Plan of the Municipal Emergency Management Plan

For City of Yarra
And
VICSES Units Northcote and Malvern

Version 11.2
Reviewed September 2020

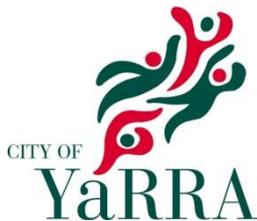


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Distribution List

Copy No.	Issue To: Position	Organisation	Date
Original	MEMP Committee Executive Officer	City of Yarra Council	
1	Council Office Copy	City of Yarra Council	
2	MERO	City of Yarra Council	
3	MRM	City of Yarra Council	
4	MERC	Victoria Police	
5	RERC	Victoria Police	
6	REMI	Victoria Police	
7	Deputy MERC	Victoria Police	
8	ROEM	VICSES Central Head Office (CHO)	
9	VICSES Controller	VICSES (Northcote Unit)	
10	VICSES Controller	VICSES (Malvern Unit)	
11	Team Leader Hydrology & Flood warnings	Melbourne Water	
12	Flood warning Manager	Bureau of Meteorology (Flood warning)	
13	Regional Emergency Management Officer	Department of Transport	
14	EM unit	Ambulance Victoria	
15	Emergency Management Officer	Dept. of Education and Training (DET)	
16	Commander	FRV	
17	ICC's	VICSES Sunshine, FRV Burnley, CFA Dandenong.	
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Document Transmittal Form / Amendment Certificate

This Municipal Flood Emergency Plan (MFEP) will be amended, maintained and distributed as required by VICSES in consultation with City of Yarra.

Suggestions for amendments to this Plan should be forwarded to VICSES Regional Office Unit 6, 3-5 Gilda Court Mulgrave Vic 3170.

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
Version 1	2/6/2011		Draft Document
Version 2	24/2/2012	M. Potter	New Template
Version 3	15/8/2012	M. Potter	Command Control updated
Final (Version 4)	1/5/2013	M. Potter	Final Version
Draft Version 5	3/10/2014	R. Butler	Updated Appendix A, B, C, F & Inclusion of G
Version 5	4/08/2015	D. Goldfinch	Minor updates to content to reflect latest legislation, ensure consistency (e.g. acronym changes)
Version 6	08/10/2015	L. Saaroni	Formatting updated and reference to the Municipal Flood Management Plan included
Version 7	01/08/2016	D. Goldfinch	Minor updates to content to reflect latest legislation, ensure consistency (e.g. acronym changes)
Version 8	09/11/2016	D. Goldfinch	Minor updates to content to reflect latest legislation, ensure consistency (e.g. acronym changes). Addition of information on flood gates (3.8) and location of dam within the City of Yarra (3.16).
Version 9	29/11/2016	L. Saaroni	Updated acronyms, State Plan/Strategy references, communications arrangements, formatting,
Version 9.2	25/01/2017	D.Goldfinch	Update 3.3.4 SES Divisional Command points
Version 10.0	11/04/2017	R. Butler	Updated Appendix A, B, C, F & G
Version 11.0	17/02/2020	R. Butler	Application of new template. Updated parts of the body as well as appendices A, B, C & F
Version 11.1	30/09/2020	R. Butler	Incorporate feedback from CoY and addition of Glass St & Peel Street flood models into Appendix C3 and C4
Version 11.2	07/09/2020	B. Langan	Version 11.2 of the City of Yarra MSFEP has been unanimously endorsed by the MEMPC.

This Plan will be maintained on the City of Yarra website as a sub plan of the MEMP.

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

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 Yarra 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 Yarra 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 Municipal Endorsement

This Municipal Flood Emergency Plan (MFEP) has been prepared by Yarra City Council and with the authority of the MEMPC pursuant to Section 20 of the Emergency Management Act 1986 (as amended).

This MFEP is a sub plan to the City of Yarra Municipal Emergency Management Plan (MEMP), is consistent with the Emergency Management Manual Victoria (EMMV) and the Victoria Flood Management Strategy (2016), and takes into account the outcomes of the Community Emergency Risk Assessment (CERA) process undertaken by the Municipal Emergency Management Planning Committee (MEMPC).

The Municipal Flood Emergency Plan is consistent with the Regional Flood Emergency Plan and the State Flood Emergency Plan.

This Municipal Flood Emergency Plan is a result of the cooperative efforts of the City of Yarra Emergency Management Planning Committee (MEMPC) and its member agencies.

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

1.2 The Municipality

A detailed profile of the municipality including climate, demography, assets and other general matters is provided in the MEMP Part 4. An outline of the flood threat is provided in Appendix A of this Plan.

1.3 Purpose and Scope of this Flood Emergency Plan

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

As such, the scope of the Plan is to:

- Identify the Flood Risk to City of Yarra;
- Support the implementation of measures to minimise the causes and impacts of flood incidents within City of Yarra;
- Detail response and recovery arrangements including preparedness, Incident Management and Command and Control;
- Identify linkages with local, regional and state emergency and wider planning arrangements with specific emphasis on those relevant to flooding.

1.4 Responsibility for Planning, Review & Maintenance of this Plan

This Municipal Flood Emergency Plan must be maintained in order to remain effective.

VICSES through the Flood Planning Committee has responsibility for preparing, reviewing, maintaining and distributing this plan.

A working group of the MEMPC will meet once every three years or following any new study/flood/changes in risk, in order to review the MFEP.

The plan should be reviewed:

- Following any new flood study;
- Following any significant change in non-structural and/or structural flood mitigation measures;
- After the occurrence of a significant flood event within the Municipality to review and where necessary amend arrangements and information contained in this Plan.
- Or if none of the above occur, every 3 years.

1.5 Endorsement of the Plan

The MFEP will be circulated to the MEMPC for endorsement with the recommendation to include the MFEP as a sub-plan of the MEMPlan.

Part 2. BEFORE: PREVENTION / PREPAREDNESS ARRANGEMENTS

2.1 Community Awareness for all Types of Flooding

This plan will be made publicly available via the Yarra City Council website. The plan and its contents will be promoted to the community through local media, the FloodSafe program, social media (VICSES and the Municipality) upon formal adoption by the City of Yarra.

VICSES with the support of City of Yarra will coordinate community education programs for flooding within the council area e.g. FloodSafe / StormSafe.

A Community Engagement Plan to promote and support this plan will be developed in conjunction with VICSES local units who will lead the delivery of the program with support from the Yarra City Council and the VICSES Central Region.

2.2 Structural Flood Mitigation Measures

There are no formal retarding basins, pumping stations or levees built within the City of Yarra.

A number of reserves and parklands along waterways in the Municipality may hold a large amount of stormwater during an event. These include:

Reserve / Park	On Drain / Waterway	Location	Melway Reference
Alphington Park Wetlands	Yarra River	View Street, Alphington	45 C1
Alphington Park	Yarra River	View Street, Alphington	31 C12
Latrobe Golf Course	Yarra River	Farm Road, Alphington	45 D1
T.H. Westfield Reserve	Merri Creek	Yarra Bend Park, Fairfield	30 H12
Kevin Bartlett Sporting and Recreation Complex	Yarra River	FR Smith Drive, Burnley	59 B1

Table 2.1 – Reserves / Parks within the City of Yarra along waterways

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.

2.3.2 Flood Warning

Arrangements for flood warning are contained within the State Flood Emergency Plan (see <http://www.ses.vic.gov.au/prepare/em-planning/state-plans>), and on the BoM website <http://www.bom.gov.au>.

Specific details of local flood warning system arrangements are provided in appendix E.

2.3.3 Local Knowledge

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

Part 3. DURING: RESPONSE ARRANGEMENTS

3.1 Introduction

3.1.1 Activation of Response

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

The RDO / VICSES Incident Controller will activate agencies as required as documented in the State Emergency Response Plan – Storm and/or Flood.

3.1.2 Responsibilities

There are a number of agencies with specific roles that will act in support of VICSES and provide support to the community in the event of a serious flood within City of Yarra. These agencies will be engaged through the EMT.

The general roles and responsibilities of supporting agencies are as agreed within the City of Yarra MEMP, EMMV (Part 7 'Emergency Management Agency Roles'), State Flood Emergency Plan and the VICSES Central Region Flood Emergency Plan (see <http://www.ses.vic.gov.au/prepare/em-planning/regional-plans>).

3.1.3 Municipal Emergency Coordination Centre (MECC)

Liaison with the MECC will be through the established Division/Sector Command and through Municipal involvement in the Incident EMT, in particular the Municipal Emergency Response Coordinator (MERC). The VICSES RDO / IC will liaise with the MECC directly if no Division/Sector Command is established.

The function, location, establishment and operation of the MECC will be as detailed in the City of Yarra MEMP.

3.1.4 Escalation

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

Resourcing and event escalation arrangements are described in the EMMV ('State Emergency Response Plan' – section 3.12).

3.2 The Six C's

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

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

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

3.2.1 Control

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

Part 7.1 of the EMMV prepared under the *Emergency Management Act 1986 (as amended)*, identifies VICSES as the Control Agency for flood. It identifies DELWP as the Control Agency responsible for “*dam safety, water and sewerage asset related incidents*” and other emergencies

All flood response activities within City of Yarra including those arising from a dam failure or retarding basin / levee bank failure incident will therefore be under the control of the appointed Incident Controller, or his / her delegated representative.

3.2.2 Incident Controller (IC)

An Incident Controller (IC) will be appointed by the VICSES (as the Control Agency) to command and control available resources in response to a flood event on the advice of the Bureau of Meteorology (or other reliable source) that a flood event will occur or is occurring. The Incident Controller responsibilities are as defined in Part 3 of the EMMV

3.2.3 Incident Control Centre (ICC)

As required, the Incident Controller will establish an Incident Control Centre (ICC) from which to initiate incident response command and control functions. The decision as to if and when the ICC should be activated, rests with the Control Agency (i.e. VICSES).

Pre-determined Incident Control Centre locations are

- Sunshine ICC
- Burnley ICC
- Dandenong ICC

3.2.4 Divisions and Sectors

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

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

Northcote Unit: Darebin Enterprise Centre, 2 Wingrove St Alphington 3071

Currently the following locations have been identified as possible Divisional Command Points for events within the City of Yarra, Municipality.

Broadmeadows SES LHQ

Essendon SES LHQ

Brimbank SES LHQ

Note: Another project is running concurrently that seeks to identify suitable locations in to the future for Division Command locations & Sector Command location points, which may see this location change.

3.2.5 Incident Management Team (IMT)

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

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

3.2.6 Emergency Management Team (EMT)

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

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

Refer to 3 of the EMMV for guidance on EMTs.

3.2.7 On Receipt of a Flood Watch / Severe Weather Warning

Incident Controller or VICSES RDO (until an incident controller is appointed) will undertake actions as defined in Part 3 of the EMMV. General considerations by the Incident Controller/VICSES RDO will be as follows:

- Review flood intelligence to assess likely flood consequences
- Monitor weather and flood information – www.bom.gov.au and or through the Melbourne Water website
http://www.melbournewater.com.au/content/rivers_and_creeks/rainfall_and_river_level_data/rainfall_and_river_level_data.asp.
- Assess Command and Control requirements.
- Review local resources and consider needs for further resources regarding personnel, property protection, flood rescue and air support

- Notify and brief appropriate officers. This includes Regional Control Centre (RCC) (if established), State Control Centre (SCC) (if established), Council, other emergency services through the EMT.
- Assess ICC readiness (including staffing of IMT and EMT) and open if required
- Ensure flood bulletins and community information are prepared and issued to the community
- Monitor watercourses and undertake reconnaissance of low-lying areas
- Develop media and community information management strategy
- Ensure flood mitigation works are being checked by owners
- Develop and issue incident action plan, if required
- Develop and issue situation report, if required

3.2.8 On Receipt of the First and Subsequent Flood Warnings

Incident Controller/VICSES RDO (until an incident controller is appointed) will undertake actions as defined in Part 3 of the EMMV). General considerations by the Incident Controller/VICSES RDO will be as follows:

- Develop an appreciation of current flood levels and predicted levels. Are floodwaters, rising, peaking or falling?
- Review flood intelligence to assess likely flood consequences. Consider:
 - What areas may be at risk of inundation
 - What areas may be at risk of isolation
 - What areas may be at risk of indirect affects as a consequence of power, gas, water, telephone, sewerage, health, transport or emergency service infrastructure interruption
 - The characteristics of the populations at risk
- Determine what the at-risk community need to know and do as the flood develops.
- Warn the at-risk community including ensuring that an appropriate warning and community information strategy is implemented including details of:
 - The current flood situation
 - Flood predictions
 - What the consequences of predicted levels may be
 - Public safety advice
 - Who to contact for further information
 - Who to contact for emergency assistance
- Liaise with relevant asset owners as appropriate (i.e. water and power utilities)
- Implement response strategies as required based upon flood consequence assessment.
- Continue to monitor the flood situation – www.bom.gov.au/vic/flood/ and or through the Melbourne Water website <http://www.melbournewater.com.au/waterdata/rainfallandrivervelleveldata/Pages/Rainfall-and-river-level-new.aspx> .
- Continue to conduct reconnaissance of low-lying areas

Depending on the intelligence provided in the VICSES notification to Council, Council may:

- Assess resourcing levels and provide advice to VICSES
- Place staff and plant equipment on standby
- Close relevant pathways
- Distribute flood watch/warnings to internal staff and the community as directed by VICSES

3.3 Impact assessment

An impact assessment can be conducted in accordance with part 3 of the EMMV to assess and record the extent and nature of damage caused by flooding. This information may then be used to provide the basis for further needs assessment and recovery planning by DHHS and recovery agencies.

The purpose, function and conduct of IAs are outlined in the State Flood Emergency Plan. All assessments should be conducted in accordance with Part 3 of the EMMV.

3.4 Preliminary Deployments

When flooding is expected to be severe enough to cut access to towns, suburbs and/or communities, the Incident Controller will consult with relevant agencies to ensure that resources are in place if required to provide emergency response. These resources might include emergency service personnel, food items and non-food items such as medical supplies, shelter, assembly areas, relief centres etc.

3.5 Response to Flash Flooding

Emergency management response to flash flooding should be consistent with the guideline for the emergency management of flash flooding contained within the State Flood Emergency Plan.

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

1. Determine if there are barriers to evacuation by considering warning time, safe routes, resources available etc.;
2. If evacuation is possible, then evacuation should be the adopted strategy and it must be supported by a public information capability and a rescue contingency plan;
3. Where it is likely people will become trapped by floodwaters due to limited evacuation options safety advice needs to be provided to people at risk advising them not to attempt to flee by entering floodwater if they become trapped, and that it may be safer to seek the highest point within the building and to telephone 000 if they require rescue. This advice needs to be provided even when evacuation may be possible, due to the likelihood that not all community members will evacuate.
4. For buildings known to be structurally un-suitable an earlier evacuation trigger will need to be established (return to step 1 of this cycle).
5. If an earlier evacuation is not possible then specific preparations must be made to rescue occupants trapped in structurally unsuitable buildings either pre-emptively or as those people call for help.
6. Leading up to extreme weather events, Council's contractor ensures that the flood gates at the following locations are closed.
 - a. Dights falls to Turner Street (Main Yarra Trail);

- b. under Heidelberg Rd bridge (Merri Creek Trail);
- c. under St Georges Rd bridge (Merri Creek Trail);
- d. bridge crossings (2 No.) into Darebin (below George Knott Reserve) (Merri Creek Trail);
- e. under Queens Parade/ High Street Bridge (Merri Creek Trail); and
- f. Clarke Street – Gipps Street (Main Yarra Trail)

The flood gates are reopened after flood waters have subsided.

During a flash flood it will often be difficult, due the rapid development of flooding, to establish evacuation (relief) centres ahead of actually triggering the evacuation as is normal practice but this is insufficient justification for not adopting evacuation.

Refer to appendix C for response arrangements for flash flood events.

3.6 Evacuation

The decision to recommend or warn people to prepare to evacuate or to evacuate immediately rests with the Incident Controller.

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

VicPol and/or Australian Red Cross may take on the responsibility of registering people affected by a flood emergency including those who have been evacuated.

Refer to Evacuation Guidelines, which can be found in the EMMV, Part 8 – Appendixes and Glossary, Appendix 9. for guidance of evacuations for flood emergencies.

Refer to Appendix C of this Plan for detailed evacuation arrangements for City of Yarra.

Refer to Department of Transport (VicRoads) Website for road closures <http://alerts.vicroads.vic.gov.au>

3.7 Flood Rescue

VicPol as the designated Control Agency for water rescue, co-ordinates rescues undertaken during flood events.

VICSES may conduct flood rescues. Appropriately trained and equipped VICSES units or other agencies that have appropriate training and equipment will support and 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.

Rescue manager appointed by Vic Police to co-ordinate Swift water Rescues with support from SES units.

3.8 Aircraft Management

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

Air support operations will be conducted under the control of the Incident Controller.

The Incident Controller may request aircraft support through the State Air Desk located at the State Control Centre will establish priorities.

Suitable airbase facilities are located at:

- Essendon Airport
- Moorabbin Airport

3.9 Resupply

Communities, neighbourhoods or households can become isolated during floods as a consequence of road closures or damage to roads, bridges and causeways. Under such circumstances, the need may arise to resupply isolated communities/properties with essential items.

When predictions/intelligence indicates that communities, neighbourhoods and/or households may become isolated, VICSES will advise businesses and/or households that they should stock up on essential items.

After the impact, VICSES can support isolated communities through assisting with the transport of essential items to isolated communities and assisting with logistics functions.

Resupply operations are to be included as part of the emergency relief arrangements with VICSES working with the relief agencies to service communities that are isolated.

3.10 Essential Community Infrastructure and Property Protection

Essential Community Infrastructure and Property (e.g. residences, businesses, roads, power supply etc.) may be affected in the event of a flood.

City of Yarra does not maintain a small stock of sandbags. However supplies are available through the VICSES Regional Headquarters. The Incident Controller will determine the priorities related the use of sandbags, which will be consistent with the strategic priorities.

If VICSES sandbags are becoming limited in supply, then priority will be given to protection of essential community infrastructure. Other high priorities may include for example the protection of historical buildings.

Property may be protected by:

- Sandbagging to minimise entry of water into buildings
- Encouraging businesses and households to lift or move contents
- Construction of temporary levees in consultation with the CMA, LGA and VICPOL and within appropriate approval frameworks.

The Incident Controller will ensure that owners of essential community infrastructure are kept advised of the flood situation. Essential community infrastructure providers must keep the Incident Controller informed of their status and ongoing ability to provide services.

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

Note: VICSES are currently investigating options to implement a MOU with a couple of suppliers of sand across the region. For further information please contact Central Region Office.

3.11 Disruption to Services

Disruption to services other than essential community infrastructure and property can occur in flood events. Refer to Appendix C for further specific details of disruption to services and Appendix D for location of sandbag collection point (s).

3.12 Road Closures

Yarra City Council and Department of Transport (VicRoads) will carry out their formal functions of road closures including observation and placement of warning signs, road blocks etc. to its designated local and regional roads, bridges, walking and bike trails. Yarra City Council staff may also liaise with and advise DoT as to the need or advisability of erecting warning signs and / or of closing roads and bridges under its jurisdiction. DoT are responsible for designated main roads and highways and Council is responsible for the designated local and regional road network.

DoT and the City of Yarra will communicate community information regarding road closures.

3.13 Dam Spilling/Failure

DELWP is the Control Agency for dam safety incidents (e.g. breach, failure or potential breach / failure of a dam), however VICSES is the Control Agency for any flooding that may result.

Under the water Act 1989, dam owners are responsible for dam safety and accountable for the damage their dams may cause if they fail. Dam Safety Emergency Plan prepared by the DELWP sets out the procedures the dam owner is obliged to take in the case of a major event or incident occurring at the dam with the identified priority of:

- Saving life
- Saving property
- Dam structure damage control.

There is only one dam within the City of Yarra - located at the La Trobe Golf Course, Farm Road, Alphington.

Major dams outside the municipality with potential to cause structural and community damage within the City of Yarra are contained in **Appendix A**. Refer to DELWP Dam Safety Plan within the Yarra MEMP. Melbourne Water also have Dam Safety Emergency Plans for their operated Dams.

3.14 Waste Water related Public Health Issues and Critical Sewerage Assets

Overflows of stormwater through the sewerage network and Melbourne Water emergency relief structures may result in water quality problems within the municipality. Where this is likely to occur or has occurred the responsible agency for the critical sewerage asset should undertake the following:

- Advise VICSES of the security of critical sewerage assets to assist preparedness and response activities in the event of flood;
- Maintain or improve the security of critical sewerage assets;
- Check and correct where possible the operation of critical sewerage assets in times of flood;
- Advise the ICC in the event of inundation of critical sewerage assets.

It is the responsibility of the City of Yarra to liaise with the Environmental Protection Agency and Melbourne Water on any water quality issues relating to flooding. Council's Health Protection unit will report to the MERO/MRM and the ICC on any identified water quality issues arising from the flood events.

Critical Storm water Assets in the City of Yarra are:

- Pit Lids

Flash flooding often causes pit lids covers to be dislodged from sewer and stormwater system manholes. Man holes give access to sewer and stormwater pipes and are often located in roadways and public spaces. The uncovered opening presents a significant hazard for motorists and pedestrians – in terms of driving, walking and causes contamination of storm/flood water. Pit lids need to be replaced (some may be difficult to find) as soon as possible after the flash flood.

3.15 Access to Technical Specialists

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

3.16 After Action Review

VICSES will coordinate the after action review arrangements of flood operations as soon as practical following an event.

All agencies involved in the flood incident should be represented at the after action review.

Part 4. AFTER: EMERGENCY RELIEF AND RECOVERY ARRANGEMENTS

4.1 General

Arrangements for relief and recovery following a flood incident within City of Yarra are detailed in the City of Yarra MEMP.

APPENDIX A - FLOOD THREATS FOR CITY OF YARRA

General

The Municipality of Yarra is located 3km north-east of the Melbourne CBD and covers a total land area of 19.5km². A culturally and socially diverse municipality, Yarra has a population of approximately 91,300, containing 43,939 households.

The city includes the suburbs of Abbotsford, Burnley, Clifton Hill, Collingwood, Cremorne, Fitzroy, North Carlton, North Fitzroy, Princes Hill and Richmond and parts of Alphington and Fairfield. Yarra is bounded by the Yarra River to the east and south, Merri Creek and Heidelberg Road to the north and Melbourne City Council (Punt Road, Nicholson Street and Princes Park) to the west. Housing density in Yarra has increased significantly over the latter half of the 20th century, resulting in the municipality being over 80% residential (Yarra Municipal FEP 2012). There are no green-field sites for further residential development – rather, development had come from the retrofitting of factories and rezoning of industrial land to residential. The city has over 230 hectares of open space, including sporting and recreation areas, parkland, gardens, reserves and golf courses.

The drainage network contains some major historic brick drains and relies heavily on overland flow paths when floods exceed the pipe network capacity (Yarra FMP). The C.o. Yarra Road Management Plan (2009) suggests that only 30% of the drainage network can cope with a 5-year ARI flood.

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.

Flooding on the Merri Creek tends to rise and fall quickly.

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.

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. 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.

This tidal influence can be expected to affect the Yarra River upstream to Dights Falls in Kew.

Description of Major Waterways and Drains

There are two main waterways flowing through the City of Yarra

- The Yarra River is a major waterway and forms the eastern and southern boundary of the Municipality. All stormwater from the City of Yarra is discharged to the river, either directly or via Darebin or Merri Creeks.

The Yarra River rises upstream of the Upper Yarra Reservoir flowing through the Yarra Ranges Shire and enters the city of Yarra downstream of the confluence of Darebin Creek. The Yarra flows along the eastern and southerly border of the Municipality and leaves it at the Punt Road Bridge, where it enters the City of Melbourne. The most flood-prone land within the Municipality is adjacent to the Yarra River in Alphington, Burnley and Cremorne.

See **Appendix F** for a schematic of the Yarra River.

- Merri Creek originates near Wallen and flows through or forms boundaries of the Shire of Mitchell and Cities of Whittlesea, Hume, Moreland and Darebin before reaching the City of Yarra at St Georges Road in Fitzroy North, flowing south and entering the city at Heidelberg Road, Clifton Hill. The Yarra flows through Clifton Hill and Fairfield before discharging to the Yarra River south of the Eastern Freeway at Fairfield.

See **Appendix F** for a schematic of Merri Creek

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

Melbourne Water Drains & Waterways	Description
Yarra River	The Yarra River is a major waterway and forms the eastern and southern boundary of the Municipality. All stormwater from the City of Yarra is discharged to the river, either directly or via Darebin or Merri Creeks. The most flood-prone land along the Yarra within the Municipality is adjacent to the river in Alphington, Burnley and Cremorne.
Merri Creek	Merri Creek originates near Wallan. It enters the municipality through Fitzroy North and flows through Clifton Hill and enters the Yarra River in Fairfield.
Darebin Creek	The creek rises near Donnybrook and enters the City of Yarra at Alphington. It enters the Yarra River at Alphington.
Alexandra Parade Drain (North)	The drain initially runs in an easterly direction under Pigdon Street in Carlton North. It then turns south at Amess Street, east at Richardson Street and continues in a southerly direction under Canning Street. It turns east at the intersection of Canning and Princes Streets in Carlton to become the Alexandra Parade Drain (East).
Alexandra Parade Drain (East)	The drain runs under Alexandra Parade in an easterly direction from Princes Street in Carlton and is the continuation of the Alexandra Parade Drain (North). It enters Merri Creek just downstream of the Eastern Freeway in Fairfield.
Fairfield Main Drain	The drain runs in a southerly direction from Heidelberg Road in Alphington under Yarraford Avenue into the Yarra River.
Lygon Street Main Drain	The drain runs in a southerly direction under Lygon Street in Carlton North and joins the Alexandra Parade Main Drain (North) at Pigdon Street.
Lygon Street Main Drain Park Street Diversion	The drain runs southwards under Lygon Street before turning in an easterly direction under Park Street, entering Merri Creek in Fitzroy North downstream of the Epping line railway bridge.
North Fitzroy Drain	The drain runs in a southerly direction under Fergie Street in Fitzroy North from Scotchmer Street, under Edinburgh Gardens, Jameson Street and George Street where it joins the Alexandra Parade Drain (East) at Alexandra Parade.
Palmer Street Main Drain	The drain runs in a westerly direction under Kent Street in Richmond from Newlands Street. It then turns in a southerly direction at Church Street, then runs from the intersection of Highett Street in a south easterly direction to Palmer Street, to enter the Yarra River just upstream of Hawthorn Bridge.

Melbourne Water Drains & Waterways	Description
	The Palmer Street Main Drain also runs in a northerly direction from Church Street junction, under Church Street and enters the Yarra River at the end of Church Street in Abbotsford.
Richmond Quarry Drain	Commencing at Swan Street between Lord and Edinburgh Streets in Richmond, the drain runs in a southerly direction and enters the Yarra River just upstream of Herring Island.

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

Historic Floods

Historically, the Yarra municipality was significantly impacted by flooding from the Yarra River. In the Great Flood of 1891, for example, the Yarra River rose 14 metres above its normal level in some areas. It flooded many riverside suburbs including Richmond and Cremorne causing extensive damage. There was also extensive flooding along the Yarra River in 1934. Since the 1891 flood, extensive remedial work has been carried out on the lower Yarra River, including widening and redirecting its course to Port Phillip Bay. As a result, the impact of riverine flooding on the community has now been substantially reduced.

The last notable flood event within the Yarra municipality was in December 2018 when large areas across the municipality were affected. The storm caused significant basement flooding with some evacuations of residential and commercial property with Glass and Newry Streets as well as Highett Street and Swan Street particularly impacted. It also affected public areas and infrastructure.

Significant floods to have occurred within the City of Yarra are as follows in the table below. Levels and rain totals in black indicate large-scale impacts to surrounding areas were recorded, whereas grey figures indicate localised impacts if any occurred. To view the locations of these floods, see maps in **Appendix F**.

Event	Yarra River at Alphington (229143B)		Yarra River at Abbotsford (229622A)	Yarra River at Hawthorn (229687A)	Yarra River at Burnley (229621A)		Merri Creek at Northcote (229149A)		Darebin Creek at Ivanhoe (229403A)
	Rainfall at Gauge	River Level	Tide Level	Tide Level	Rainfall at Gauge	Tide Level	Rainfall at Gauge	Creek Level	Creek Level
Normal Water Level		0.5m	0.5m to 1.0m	0.3m to 0.8m		0.1m to 0.7m		0.2m	0.2m
Minor Flood Class		3.0m	2.7m	-		-		3.2m	-
Moderate Flood Class		6.0m	6.7m	-		-		3.8m	-
Major Flood Class		8.7m	8.9m	-		-		5.0m	-
13 th July 1891	-	12.38m	12.60m	-	-	7.38m	-	-	-
20 th October 1901	-	9.14m	9.53m	-	-	3.98m	-	-	-
14 th June 1911	-	7.48m	-	-	-	-	-	-	-
23 rd September 1916	-	8.58m	9.37m	-	-	3.96m	-	4.51m	-
23 rd October 1920	-	6.02m	-	-	-	-	-	-	-
11 th October 1923	-	9.76m	-	-	-	-	-	-	-
1 st December 1934	-	13.05m	12.55m	-	-	5.55m	-	4.85m	3.06m
18 th October 1937	-	8.17m	7.98m	-	-	2.70m	-	2.76m	-
13 th July 1952	-	9.45m	9.75m	-	-	-	-	4.48m	2.99m

Event	Yarra River at Alphington (229143B)		Yarra River at Abbotsford (229622A)	Yarra River at Hawthorn (229687A)	Yarra River at Burnley (229621A)		Merri Creek at Northcote (229149A)		Darebin Creek at Ivanhoe (229403A)
	Rainfall at Gauge	River Level	Tide Level	Tide Level	Rainfall at Gauge	Tide Level	Rainfall at Gauge	Creek Level	Creek Level
Normal Water Level		0.5m	0.5m to 1.0m	0.3m to 0.8m		0.1m to 0.7m		0.2m	0.2m
Minor Flood Class		3.0m	2.7m	-		-		3.2m	-
Moderate Flood Class		6.0m	6.7m	-		-		3.8m	-
Major Flood Class		8.7m	8.9m	-		-		5.0m	-
22 nd September 1952	-	9.40m	9.23m	-	-	-	-	-	-
10 th November 1954	-	-	-	-	-	-	-	4.25m	-
9 th November 1971	-	8.44m	-	-	-	3.12m	-	3.51m	-
14 th May 1974	-	8.87m	-	-	-	3.25m	-	4.74m	2.84m
26 th October 1975	-	5.44m	-	-	-	-	-	3.36m	-
16 th October 1976	-	3.46m	-	-	-	-	-	1.86m	-
8 th April 1977	-	4.58m	-	-	-	-	-	4.46m	-
19 th June 1977	-	4.67m	-	-	24mm / 66hrs	1.45m	-	3.39m	-
1 st July 1977	-	4.94m	-	-	-	-	-	2.76m	-
10 th August 1978	-	3.69m	4.23m	-	36mm / 30hrs	1.40m	-	2.55m	-
20 th November 1978	-	4.28m	5.19m	-	60mm / 27hrs	1.91m	-	3.31m	-
6 th October 1979	-	2.28m	2.75m	-	44mm / 29hrs	1.29m	-	2.24m	-
16 th October 1983	-	3.17m	-	-	67mm / 33hrs	1.55m	86mm / 34hrs	3.18m	-
19 th September 1984	69mm/ 50hrs	5.33m	-	-	58mm / 52hrs	2.20m	-	2.38m	-
30 th July 1987	47mm/ 35hrs	5.15m	6.02m	3.14m	50mm / 34hrs	1.92m	59mm / 33hrs	3.91m	-
22 nd November 1988	-	-	4.11m	2.99m	-	1.38m	-	2.97m	-
11 th June 1989	40mm/ 20hrs	5.39m	5.94m	3.09m	39mm / 45hrs	1.87m	32mm / 23hrs	3.98m	-
18 th July 1990	42mm/ 7hrs	3.42m	4.47m	2.39m	63mm / 63hrs	1.60m	46mm / 7hrs	3.27m	-
12 th October 1990	45mm/ 28hrs	3.25m	3.87m	2.04m	45mm / 33hrs	1.40m	-	2.53m	-
19 th September 1991	60mm/ 8days	3.91m	3.35m	1.99m	-	1.58m	-	1.13m	-
26 th September 1992	33mm/ 3days	4.00m	3.99m	2.02m	16mm / 94hrs	1.18m	-	2.22m	-
11 th October 1992	61mm/ 6days	4.95m	5.13m	2.67m	55mm / 6days	1.63m	-	2.11m	-

Event	Yarra River at Alphington (229143B)		Yarra River at Abbotsford (229622A)	Yarra River at Hawthorn (229687A)	Yarra River at Burnley (229621A)		Merri Creek at Northcote (229149A)		Darebin Creek at Ivanhoe (229403A)
	Rainfall at Gauge	River Level	Tide Level	Tide Level	Rainfall at Gauge	Tide Level	Rainfall at Gauge	Creek Level	Creek Level
Normal Water Level		0.5m	0.5m to 1.0m	0.3m to 0.8m		0.1m to 0.7m		0.2m	0.2m
Minor Flood Class		3.0m	2.7m	-		-		3.2m	-
Moderate Flood Class		6.0m	6.7m	-		-		3.8m	-
Major Flood Class		8.7m	8.9m	-		-		5.0m	-
19 th September 1993	97mm/ 14days	3.68m	3.59m	1.96m	-	1.28m	-	2.71m	-
27 th December 1993	87mm/ 40hrs	3.40m	4.83m	2.72m	79mm / 49hrs	1.68m	125mm / 38hrs	2.95m	-
8 th March 1995	46mm/ 5hrs	1.63m	3.03m	2.12m	54mm / 7hrs	1.43m	-	3.02m	-
19 th April 1996	84mm/ 8days	3.34m	3.42m	-	39mm / 4days	1.28m	-	1.38m	-
25 th June 1996	48mm/ 26hrs	3.94m	4.32m	-	28mm / 25hrs	1.60m	-	2.74m	-
1 st August 1996	36mm/ 36hrs	4.90m	4.92m	2.58m	35mm / 37hrs	1.73m	-	2.36m	-
27 th December 1999	62mm/ 26hrs	2.95m	3.93m	2.09m	108mm / 41hrs	1.43m	121mm / 54hrs	2.87m	-
26 th October 2000	73mm/ 51hrs	3.33m	3.85m	1.85m	51mm / 47hrs	1.39m	82mm / 48hrs	2.88m	1.32m
3 rd December 2003	98mm/ 2hrs	3.62m	5.38m	3.43m	41mm / 8hrs	1.99m	108mm / 8hrs	4.13m	2.14m
13 th November 2004	125mm/ 10days	5.01m	5.52m	2.82m	87mm / 6days	1.83m	69mm / 8 days	2.37m	1.72m
3 rd February 2005	124mm/ 29hrs	5.70m	6.50m	4.46m	138mm / 37hrs	2.94m	135mm / 28hrs	4.28m	2.59m
1 st November 2010	67mm/ 33hrs	3.42m	3.25m	1.49m	65mm / 19hrs	0.92m	63mm / 83hrs	2.01m	1.41m
5 th February 2011	85mm/ 15hrs	4.55m	4.53m	2.35m	122mm / 33hrs	1.27m	71mm / 27hrs	3.08m	2.19m
12 th April 2011	61mm/ 12hrs	3.30m	3.71m	1.99m	80mm / 65hrs	1.29m	82mm / 66hrs	2.75m	1.58m
27 th November 2011	24mm/ 8hrs	3.82m	3.46m	1.72m	52mm / 23hrs	1.01m	47mm / 22hrs	2.07m	1.36m
26 th December 2011	43mm/ 5hrs	3.63m	4.19m	1.96m	40mm / 16hrs	0.94m	42mm / 5hrs	3.33m	2.71m
1 st June 2013	77mm/ 17hrs	3.98m	5.25m	2.84m	54mm / 14hrs	1.69m	74mm / 14hrs	3.85m	3.21m
29 th December 2016	40mm / 10hrs	3.08m	3.95m	1.88m	27mm / 10hrs	1.03m	40mm / 10hrs	3.89m	2.57m
3 rd December 2017	-	2.67m	3.19m	1.87m	54mm / 23hrs	1.17m	80mm / 26hrs	2.54m	1.36m
6 th November 2018	-	1.94m	2.90m	1.96m	40mm / 2hrs	1.24m	43mm / 2hrs	2.90m	1.38m
14 th December 2018	30mm / 1hr	1.45m	1.77m	1.08m	32mm / 10min	0.78m	25mm / 1hr	1.75m	1.29m

Table A7 – Selection of Historical Flood Events along the Yarra River, Merri Creek & Darebin Creek

Dam Failure

Flooding resulting from failure of the following dams is likely to cause significant structural and community damage within the City of Yarra. 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.

Melbourne Water Dam	Location	Owner	Dam Capacity	Full Supply Level	Melway Reference
Sugarloaf Reservoir	Christmas Hills	Melbourne Water	99,222 ML	178.00m AHD (48m on gauge)	273 B6
Upper Yarra Reservoir	Reefton	Melbourne Water	200,501 ML	366.53m AHD	X912 U2
Yan Yean Reservoir	Yan Yean	Melbourne Water	31,085 ML	183.19m AHD	391 D1

Table A8 – Melbourne Water Reservoirs that pose a risk to the City of Yarra from Dam Failure

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 (eg. 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.

Where negative values are shown in the table below this indicates that a flood peak may be expected at the gauge downstream before a separate flood peak is experienced at the upstream gauge. This phenomenon may be due to the location of the thunderstorm passing through the catchment between the two gauges, or because of the urban environment found downstream causing floodwaters to enter the waterway quicker than those in a more rural setting upstream. Lastly this may be because of the existence of a retarding basin between the two gauges.

Typical Travel Times

Location From (gauge)	Location To (gauge)	Typical Travel Time		Comments
Yarra River				
Fitzsimons La, Templestowe	Chandler Hwy, Fairfield	Between 2 and 18 hours	Minor Flood at Fairfield	Inflows from Diamond Creek & Plenty River may impact on travel time.
	Johnston St, Abbotsford	Between 2 and 19 hours	Minor Flood at Fairfield	Inflows from Diamond Creek & Plenty River may impact on travel time. As well as tides flowing up the Yarra
Banksia St, Heidelberg	Chandler Hwy, Fairfield	Between 1 min and 8 hours	Minor Flood at Fairfield	Inflows from Darebin Creek may impact on travel time.
	Johnston St, Abbotsford	Between 1 min and 9 hours	Minor Flood at Fairfield	Inflows from Darebin Creek may impact on travel time. As well as tides flowing up the Yarra
Merri Creek				
Cooper St, Somerton	Northcote	Between 1 min to 4 hours	Minor Flood at Northcote	Inflows from Merlynston and Edgars Creeks may impact on travel time.
Bell St, Coburg		Between 1 min to 2 hours		
Cooper St, Somerton	Northcote	Between 1 hour to 4 hours	Moderate Flood at Northcote	Inflows from Merlynston and Edgars Creeks may impact on travel time.
Bell St, Coburg		Between 1 min to 2 hours		

Table B1 – Typical Flood Travel Times between gauges on the Yarra River and Merri Creek

Historical Travel Times

Flood Event	Location From (gauge)	Location To (gauge)	Flood Peak Travel Time	Flood Class at
Yarra River				Fairfield
10 th August 1978	Templestowe	Fairfield	6 hours	Minor
		Abbotsford	Less than 1 hour	
	Heidelberg	Fairfield	Fairfield peaked 3 hours before Heidelberg	
		Abbotsford	Abbotsford peaked 9 hours before Heidelberg	
20 th November 1978	Templestowe	Fairfield	17 hours	Minor
		Abbotsford	11 hours	
	Heidelberg	Fairfield	5 hours	
		Abbotsford	Abbotsford peaked 1 hour before Heidelberg	
30 th July 1987	Templestowe	Fairfield	11 hours	Minor
		Abbotsford	13 hours	
	Heidelberg	Fairfield	3 hours	
		Abbotsford	5 hours	
19 th September 1991	Templestowe	Fairfield	10 hours	Minor
		Abbotsford	12 hours	
	Heidelberg	Fairfield	3 hours	
		Abbotsford	5 hours	
26 th September 1992	Templestowe	Fairfield	11 hours	Minor
		Abbotsford	16 hours	
	Heidelberg	Fairfield	3 hours	
		Abbotsford	8 hours	
11 th October 1992	Templestowe	Fairfield	8 hours	Minor
		Abbotsford	8 hours	
	Heidelberg	Fairfield	6 hours	
		Abbotsford	6 hours	
19 th September 1993	Templestowe	Fairfield	31 hours	Minor
		Abbotsford	27 hours	
	Heidelberg	Fairfield	22 hours	
		Abbotsford	18 hours	
25 th June 1996	Templestowe	Fairfield	16 hours	Minor
		Abbotsford	16 hours	
	Heidelberg	Fairfield	8 hours	
		Abbotsford	8 hours	
1 st August 1996	Templestowe	Fairfield	18 hours	Minor
		Abbotsford	16 hours	
	Heidelberg	Fairfield	6 hours	
		Abbotsford	4 hours	
26 th October 2000	Templestowe	Fairfield	8 hours	Minor
		Abbotsford	5 hours	
	Heidelberg	Fairfield	2 hours	
		Abbotsford	Abbotsford peaked 1 hour before Heidelberg	

Flood Event	Location From (gauge)	Location To (gauge)	Flood Peak Travel Time	Flood Class at
3 rd December 2003	Templestowe	Fairfield	Fairfield peaked 2 hours before Templestowe	Minor
		Abbotsford	Abbotsford peaked 2 hours before Templestowe	
	Heidelberg	Fairfield	Fairfield peaked 1 hour before Heidelberg	
		Abbotsford	Abbotsford peaked 1 hour before Heidelberg	
13 th November 2004	Templestowe	Fairfield	10 hours	Minor
		Abbotsford	13 hours	
	Heidelberg	Fairfield	6 hours	
		Abbotsford	9 hours	
3 rd February 2005	Templestowe	Fairfield	8 hours	Minor
	Heidelberg	Fairfield	4 hours	
1 st November 2010	Templestowe	Fairfield	22 hours	Minor
		Abbotsford	19 hours	
	Heidelberg	Fairfield	10 hours	
		Abbotsford	7 hours	
5 th February 2011	Templestowe	Fairfield	12 hours	Minor
		Abbotsford	13 hours	
	Heidelberg	Fairfield	7 hours	
		Abbotsford	8 hours	
12 th April 2011	Templestowe	Fairfield	6 hours	Minor
		Abbotsford	5 hours	
	Heidelberg	Fairfield	1 hour	
		Abbotsford	Less than 1 hour	
27 th November 2011	Templestowe	Fairfield	12 hours	Minor
		Abbotsford	13 hours	
	Heidelberg	Fairfield	5 hours	
		Abbotsford	6 hours	
26 th December 2011	Templestowe	Fairfield	2 hours	Minor
		Abbotsford	2 hours	
	Heidelberg	Fairfield	Fairfield peaked 2 hours before Heidelberg	
		Abbotsford	Abbotsford peaked 2 hours before Heidelberg	
1 st June 2013	Templestowe	Fairfield	2 hours	Minor
		Abbotsford	2 hours	
	Heidelberg	Fairfield	Less than 1 hour	
		Abbotsford	Less than 1 hour	
29 th December 2016	Templestowe	Fairfield	6 hours	Minor
		Abbotsford	6 hours	
	Heidelberg	Fairfield	2 hours	
		Abbotsford	2 hours	

Flood Event	Location From (gauge)	Location To (gauge)	Flood Peak Travel Time	Flood Class at
Merri Creek				Northcote
19 th November 1978	Somerton	Northcote	Less than 1 hour	Minor
30 th July 1987	Somerton	Northcote	4 hours	Moderate
	Coburg		2 hours	
11 th June 1989	Somerton	Northcote	2 hours	Moderate
	Coburg		1 hour	
18 th July 1990	Somerton	Northcote	3 hours	Minor
	Coburg		1 hour	
3 rd December 2003	Somerton	Northcote	1 hour	Moderate
	Coburg		Less than 1 hour	
3 rd February 2005	Somerton	Northcote	Less than 1 hour	Moderate
	Coburg		Less than 1 hour	
26 th December 2011	Coburg	Northcote	1 hour	Minor
1 st June 2013	Coburg	Northcote	Less than 1 hour	Moderate
29 th December 2016	Coburg	Northcote	1 hour	Moderate

Table B2 – Historical Flood Travel Times between gauges on the Yarra River and Merri Creek

APPENDIX C1 – YARRA RIVER FLOOD EMERGENCY PLAN

Overview of Flooding Consequences

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 the Yarra River in the City of Yarra					
Property					
Properties	155				
Residential	127				
Commercial	10				
Industrial	8				
Public Land	10				
Rural	0				
Community Infrastructure					
Essential Infrastructure					
Major Roads	2	Punt Road north of Citylink Underpass; and Yarra Boulevard between Swan Street and Grange Road			
Bus Routes	3	246, 605 and 969 along Punt Road			
Drainage Facilities	1	Alphington Park Wetland	Sewerage Facilities	7	Emergency Relief Points
Tourism / Recreation					
Features of Interest	2	Abbotsford Convent grounds; Collingwood Children's Farm			
Recreation Facilities	5	Alphington Park; Burnley Gardens; Dight Falls Loop Trail; Fairfield Park; Main Yarra River Circuit Trail			
Sports Facilities	3	Fairfield Boathouse; Kevin Bartlett Sporting & Recreation complex; Latrobe Golf Course;			
Government Boundaries					
Local Gov't Areas	1	Yarra	CMA	1	Port Phillip & Westernport
Adjacent LGAs	4	Banyule; Boroondara; Melbourne (City of); and Stonnington			
SES Unit Area	2	Malvern and Northcote	FRV District	1	Central

Table C1.1 – Consequence Summary of 1% AEP flood along the Yarra River in the City of Yarra

The Yarra River is a major waterway, rising upstream of the Upper Yarra Reservoir and flowing through the Yarra Ranges Shire, entering the city of Yarra just downstream of the confluence of Darebin Creek. The Yarra forms the eastern and southern boundaries of the Municipality, flowing through Alphington, Fairfield, Abbotsford, Richmond, Burnley and Cremorne, before exiting the municipality at the Hoddle Bridge in Cremorne.

All stormwater from the municipality is discharged into the Yarra River, either directly or via Merri or Darebin Creeks. The most flood-prone land along the Yarra within the Municipality is adjacent to the Yarra River in Alphington, Burnley and Cremorne.

Riverine flooding affects a broad area and often results from prolonged rain events such as the three day long rain event of February 2005.

Alphington and Abbotsford form the north-eastern districts of Yarra. High intensity, short duration rainfall events can cause flash flooding in Alphington, while prolonged rainfall events can cause the Yarra River to flood, affecting the southern portion of Alphington and the eastern boundary of Abbotsford as formed by the Yarra River. Darebin Creek, which flows into the Yarra River at Alphington, may flood parts of the suburb during high intensity rainfall events, affecting a number of properties, roads and recreational and educational facilities. (Yarra Municipal FEP 2012)

Burnley, Richmond and Cremorne form the southern district of Yarra. High intensity, short duration rainfall events can cause flash flooding in Richmond, affecting roads and properties, while prolonged rainfall events may cause the Yarra River to flood, affecting areas of Burnley & Cremorne in the immediate vicinity of the Yarra River. Gardiners Creek, which flows into the Yarra River from the south at Burnley, may contribute to flooding parts of the suburb during high intensity rainfall events, affecting a number of educational and recreational facilities. A number of properties and roads in Cremorne may also be similarly affected. (Yarra Municipal FEP 2012)

The area adjacent to the Yarra River is comprised of parkland/reserves, residential, industrial and public use zones. Key infrastructure at risk in the catchment includes the Terminal Station in Richmond and major roads including Citylink/ Monash Freeway and Punt Road. The Yarra Trail and Capital City Trail pedestrian and cycling trails run parallel to the Yarra River and are affected by floodwater in riverine flooding events.

Gauges and Warnings

Warnings are available for flooding expected along the Yarra River at Alphington and Abbotsford. For other stream (river) level gauges within the Municipality, Melbourne Water does not provide any flood warning service at this point.

Melbourne Water Gauges	Station No.	Location	Stream Level & Flow Gauge	Rain Gauge	Melway Reference
Yarra River at Banksia Street, Heidelberg	229135A	East bank of the River on the north side of the bridge	✓	✓	32 D5
Yarra River at Rudder Grange, Alphington	229143B	Rudder Grange, end of Alphington Street, Alphington	✓	✓	31 A12
Yarra River at Johnston Street Abbotsford	229622A	West side of the river at Johnston St bridge, Abbotsford	✓		44 G4
Yarra River at Hawthorn	229687A	North side of Channel at Glenferrie Road bridge under the Monash Fwy, Hawthorn	✓ *		45 A11
Yarra River at Burnley	229621A	North side of River and Freeway at SP AusNet Richmond Terminal Station, Richmond	✓ *	✓	58 G1

Table C1.2 – Gauges within the lower Yarra River catchment

* Gauge may be influenced by tidal currents up the Yarra River to Dights Falls, Abbotsford.

These Gauges may provide some warning of expected flooding. See the Melbourne Water website for more information on these gauges: <http://www.melbournewater.com.au/waterdata/rainfallandriverleveldata/Pages/Rainfall-and-river-level-new.aspx>. It is advised that residents monitor the Bureau of Meteorology's website http://www.bom.gov.au/cgi-bin/wrap_fwo.pl?IDV60201.html and the VicEmergency website <https://emergency.vic.gov.au/> for any thunderstorm, flood or severe weather warnings present for their area.

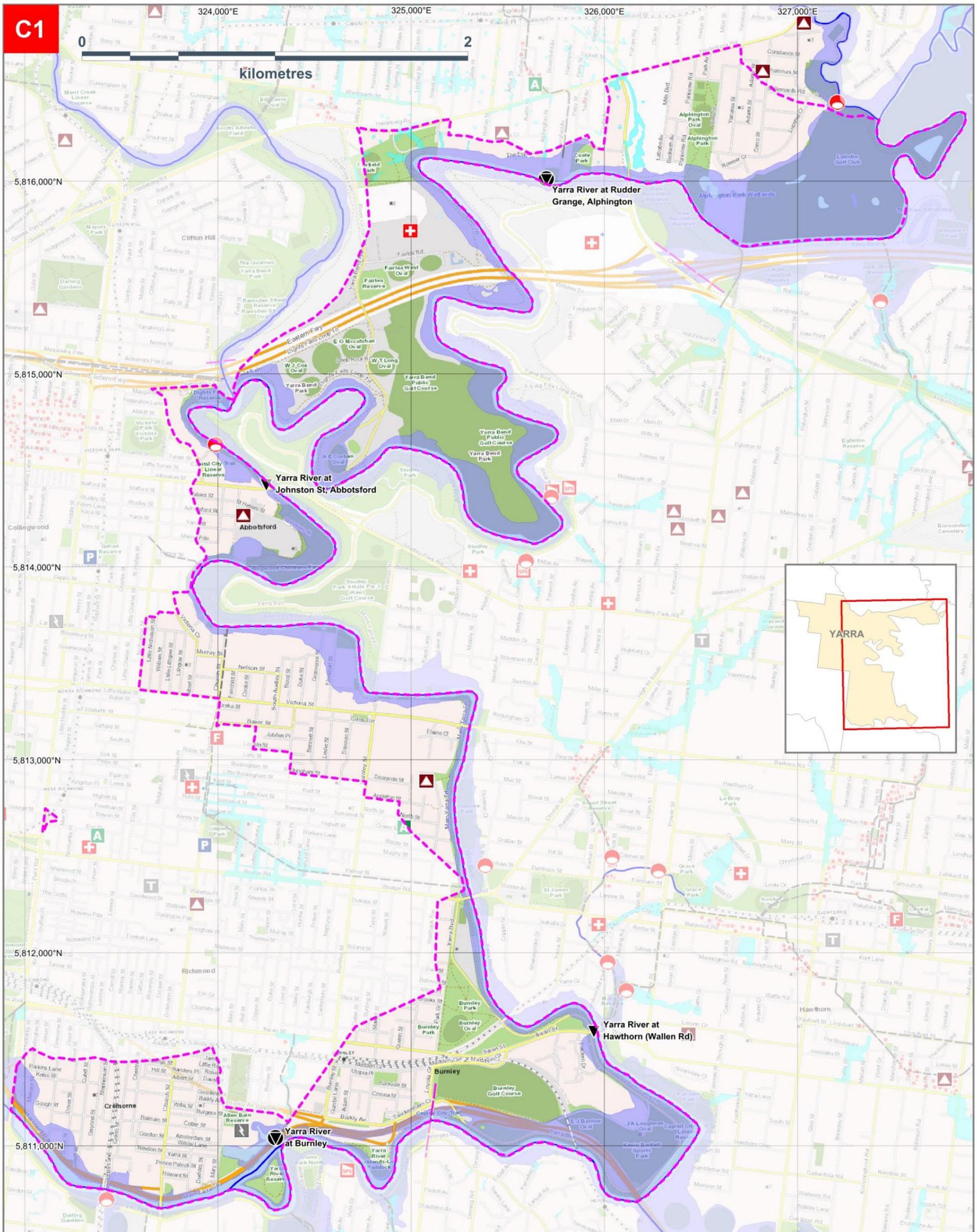
There are currently four Melbourne Water flood warning gauges on the Yarra River that could be used to assist with public safety. These are at Templestowe, Heidelberg, Alphington and Abbotsford. Those gauges with flood class levels established are outlined in the table below. Gauges at Hawthorn and Burnley do not have established flood class levels as they may be affected by tidal variations.

Gauge	River / Creek Flood Class Level		
	Minor	Moderate	Major
Yarra River at Fitzsimons La, Templestowe	3.5m	6.0m	8.0m
Yarra River at Banksia St, Heidelberg	6.0m	8.3m	9.2m
Yarra River at Rudder Grange, Alphington	3.0m	6.0m	8.7m
Yarra River at Johnston St, Abbotsford	2.7m	6.7m	8.9m

Table C1.3 – Gauges with established Flood Class Levels along the lower Yarra River

At these sites on the Yarra River and Merri 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 (<http://www.bom.gov.au/vic/warnings/index.shtml>). While the City of Yarra monitors these warnings in times of high rainfall, there are no specific guidelines to advise how these situations should be responded to.

Areas of Flood Risk



Map Produced by VICSES January 2020.



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

- | | | |
|----------------------------------|---------------------------------|-------------------|
| Building | Aged Care Facility | Ambulance Station |
| Waterbody | 1% AEP Over-Floor Flooding Risk | Fire Station |
| 1% AEP Flash Flood Extent | Sewer Emergency Relief Point | Hospital |
| 1% AEP Riverine Flood Extent | Telephone Exchange | Police Station |
| Melbourne Water Stormwater Drain | Power Terminal Station | Rain Gauge |
| Flood Model Extent | Sewer Pumping Station | |
| Waterway | Stream Level Gauge | |

Basemap: Vicmap and Corporate Geospatial Library information which is Copyright © State of Victoria, Department of Environment, Land, Water and Planning 2020.



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Figure C1 – Areas of flood risk around Yarra River in the City of Yarra and area covered by this Appendix

Properties at Flood Risk

Properties listed in the table below are at risk from flooding along the Yarra River during a 1% AEP riverine flood event. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Yarra River (S.P. Goh & Associates, June 2016) flood mapping and risk assessment program. Note that any multi-lot properties situated above ground floor likely impacted by isolation only with flooding on ground floor impacting access to common areas and/or carpark and storage facilities. Information on above ground-floor properties is not available in this list.

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 the Yarra River during a 1% AEP event				
Residential	Commercial	Industrial	Rural	Public Use
Street No. at Risk	Street	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
2	Alphington Street	Alphington	Yarra River	Riverine
3	Alphington Street	Alphington	Yarra River	Riverine
4	Alphington Street	Alphington	Yarra River	Riverine
5	Alphington Street	Alphington	Yarra River	Riverine
6	Alphington Street	Alphington	Yarra River	Riverine
7	Alphington Street	Alphington	Yarra River	Riverine
Parks Vic Depot	Barkly Avenue	Richmond	Yarra River	Riverine
20	Bent Street	Cremorne	Yarra River	Riverine
22	Bent Street	Cremorne	Yarra River	Riverine
24	Bent Street	Cremorne	Yarra River	Riverine
36-80	Church Street	Abbotsford	Yarra River	Riverine
167-169	Cremorne Street	Cremorne	Yarra River	Riverine
1/162	Cubitt Street	Cremorne	Yarra River	Riverine
2/164	Cubitt Street	Cremorne	Yarra River	Riverine
3/166	Cubitt Street	Cremorne	Yarra River	Riverine
170	Cubitt Street	Cremorne	Yarra River	Riverine
181	Cubitt Street	Cremorne	Yarra River	Riverine
182	Cubitt Street	Cremorne	Yarra River	Riverine
183	Cubitt Street	Cremorne	Yarra River	Riverine
184	Cubitt Street	Cremorne	Yarra River	Riverine
185	Cubitt Street	Cremorne	Yarra River	Riverine
186	Cubitt Street	Cremorne	Yarra River	Riverine
187	Cubitt Street	Cremorne	Yarra River	Riverine
188	Cubitt Street	Cremorne	Yarra River	Riverine
189	Cubitt Street	Cremorne	Yarra River	Riverine
190	Cubitt Street	Cremorne	Yarra River	Riverine
191	Cubitt Street	Cremorne	Yarra River	Riverine
192	Cubitt Street	Cremorne	Yarra River	Riverine
193	Cubitt Street	Cremorne	Yarra River	Riverine
194	Cubitt Street	Cremorne	Yarra River	Riverine
195	Cubitt Street	Cremorne	Yarra River	Riverine
196	Cubitt Street	Cremorne	Yarra River	Riverine

Properties at risk from Flooding along the Yarra River during a 1% AEP event				
Residential	Commercial	Industrial	Rural	Public Use
Street No. at Risk	Street	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
171	Dover Street	Cremorne	Yarra River	Riverine
173	Dover Street	Cremorne	Yarra River	Riverine
175	Dover Street	Cremorne	Yarra River	Riverine
181	Dover Street	Cremorne	Yarra River	Riverine
183	Dover Street	Cremorne	Yarra River	Riverine
185	Dover Street	Cremorne	Yarra River	Riverine
187	Dover Street	Cremorne	Yarra River	Riverine
189	Dover Street	Cremorne	Yarra River	Riverine
191	Dover Street	Cremorne	Yarra River	Riverine
193	Dover Street	Cremorne	Yarra River	Riverine
195	Dover Street	Cremorne	Yarra River	Riverine
197	Dover Street	Cremorne	Yarra River	Riverine
199	Dover Street	Cremorne	Yarra River	Riverine
1/201	Dover Street	Cremorne	Yarra River	Riverine
2/201	Dover Street	Cremorne	Yarra River	Riverine
3/201	Dover Street	Cremorne	Yarra River	Riverine
4/201	Dover Street	Cremorne	Yarra River	Riverine
La Trobe Golf Club	Farm Road	Alphington	Yarra River	Riverine
6	Farm Road	Alphington	Yarra River	Riverine
8	Flockhart Street	Abbotsford	Yarra River	Riverine
24-28	Flockhart Street	Abbotsford	Yarra River	Riverine
30-40	Flockhart Street	Abbotsford	Yarra River	Riverine
33	Flockhart Street	Abbotsford	Yarra River	Riverine
1	Gough Place	Cremorne	Yarra River	Riverine
2	Gough Street	Cremorne	Yarra River	Riverine
3	Gough Place	Cremorne	Yarra River	Riverine
5	Gough Place	Cremorne	Yarra River	Riverine
7	Gough Place	Cremorne	Yarra River	Riverine
9	Gough Place	Cremorne	Yarra River	Riverine
11	Gough Place	Cremorne	Yarra River	Riverine
13	Gough Place	Cremorne	Yarra River	Riverine
15	Gough Place	Cremorne	Yarra River	Riverine
30-36	Grosvenor Street	Abbotsford	Yarra River	Riverine
38	Grosvenor Street	Abbotsford	Yarra River	Riverine
45	Grosvenor Street	Abbotsford	Yarra River	Riverine
17-21	Harcourt Parade	Cremorne	Yarra River	Riverine
280-350	Heidelberg Road	Fairfield	Yarra River	Riverine
452-484	Johnston Street	Abbotsford	Yarra River	Riverine
452A	Johnston Street	Abbotsford	Yarra River	Riverine
2	Kelso Street	Cremorne	Yarra River	Riverine
2A	Kelso Street	Cremorne	Yarra River	Riverine
3	Kelso Street	Cremorne	Yarra River	Riverine
4	Kelso Street	Cremorne	Yarra River	Riverine
5	Kelso Street	Cremorne	Yarra River	Riverine

Properties at risk from Flooding along the Yarra River during a 1% AEP event

Residential	Commercial	Industrial	Rural	Public Use
Street No. at Risk	Street	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
6	Kelso Street	Cremorne	Yarra River	Riverine
7	Kelso Street	Cremorne	Yarra River	Riverine
7A	Kelso Street	Cremorne	Yarra River	Riverine
8	Kelso Street	Cremorne	Yarra River	Riverine
9	Kelso Street	Cremorne	Yarra River	Riverine
10	Kelso Street	Cremorne	Yarra River	Riverine
12	Kelso Street	Cremorne	Yarra River	Riverine
24	Mayfield Street	Abbotsford	Yarra River	Riverine
1	Melrose Street	Cremorne	Yarra River	Riverine
2	Melrose Street	Cremorne	Yarra River	Riverine
3	Melrose Street	Cremorne	Yarra River	Riverine
4	Melrose Street	Cremorne	Yarra River	Riverine
5	Melrose Street	Cremorne	Yarra River	Riverine
6	Melrose Street	Cremorne	Yarra River	Riverine
6A	Melrose Street	Cremorne	Yarra River	Riverine
7	Melrose Street	Cremorne	Yarra River	Riverine
8	Melrose Street	Cremorne	Yarra River	Riverine
9	Melrose Street	Cremorne	Yarra River	Riverine
10B	Melrose Street	Cremorne	Yarra River	Riverine
10A	Melrose Street	Cremorne	Yarra River	Riverine
11	Melrose Street	Cremorne	Yarra River	Riverine
12	Melrose Street	Cremorne	Yarra River	Riverine
12A	Melrose Street	Cremorne	Yarra River	Riverine
13	Melrose Street	Cremorne	Yarra River	Riverine
14	Melrose Street	Cremorne	Yarra River	Riverine
15	Melrose Street	Cremorne	Yarra River	Riverine
16	Melrose Street	Cremorne	Yarra River	Riverine
1	Panther Place	Fairfield	Yarra River	Riverine
2	Panther Place	Fairfield	Yarra River	Riverine
3	Panther Place	Fairfield	Yarra River	Riverine
39B	Park Crescent	Fairfield	Yarra River	Riverine
429	Punt Road	Cremorne	Yarra River	Riverine
431	Punt Road	Cremorne	Yarra River	Riverine
433	Punt Road	Cremorne	Yarra River	Riverine
435	Punt Road	Cremorne	Yarra River	Riverine
437	Punt Road	Cremorne	Yarra River	Riverine
439	Punt Road	Cremorne	Yarra River	Riverine
441	Punt Road	Cremorne	Yarra River	Riverine
443	Punt Road	Cremorne	Yarra River	Riverine
445	Punt Road	Cremorne	Yarra River	Riverine
447	Punt Road	Cremorne	Yarra River	Riverine
449	Punt Road	Cremorne	Yarra River	Riverine
5	Riverbrae Court	Alphington	Yarra River	Riverine
6	Riverbrae Court	Alphington	Yarra River	Riverine

Properties at risk from Flooding along the Yarra River during a 1% AEP event				
Residential	Commercial	Industrial	Rural	Public Use
Street No. at Risk	Street	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
7	Riverbrae Court	Alphington	Yarra River	Riverine
8	Riverbrae Court	Alphington	Yarra River	Riverine
1/20	Shamrock Street	Abbotsford	Yarra River	Riverine
2/20	Shamrock Street	Abbotsford	Yarra River	Riverine
3/20	Shamrock Street	Abbotsford	Yarra River	Riverine
4/20	Shamrock Street	Abbotsford	Yarra River	Riverine
40	Shamrock Street	Abbotsford	Yarra River	Riverine
4	St Heliers Street	Abbotsford	Yarra River	Riverine
6-14	St Heliers Street	Abbotsford	Yarra River	Riverine
16	St Heliers Street	Abbotsford	Yarra River	Riverine
18	St Heliers Street	Abbotsford	Yarra River	Riverine
24	St Heliers Street	Abbotsford	Yarra River	Riverine
3	The Esplanade	Fairfield	Yarra River	Riverine
5	The Esplanade	Fairfield	Yarra River	Riverine
7-9	The Esplanade	Fairfield	Yarra River	Riverine
11	The Esplanade	Fairfield	Yarra River	Riverine
13	The Esplanade	Fairfield	Yarra River	Riverine
14	The Esplanade	Fairfield	Yarra River	Riverine
651-653	Victoria Street	Abbotsford	Yarra River	Riverine
655-657	Victoria Street	Abbotsford	Yarra River	Riverine
659	Victoria Street	Abbotsford	Yarra River	Riverine
661-663	Victoria Street	Abbotsford	Yarra River	Riverine
675	Victoria Street	Abbotsford	Yarra River	Riverine
1	View Street	Alphington	Yarra River	Riverine
733	Yarra Boulevard	Burnley	Yarra River	Riverine
3	Yarraford Avenue	Alphington	Yarra River	Riverine
7	Yarraford Avenue	Alphington	Yarra River	Riverine
8	Yarraford Avenue	Alphington	Yarra River	Riverine
9	Yarraford Avenue	Alphington	Yarra River	Riverine
11	Yarraford Avenue	Alphington	Yarra River	Riverine
12	Yarraford Avenue	Alphington	Yarra River	Riverine
13	Yarraford Avenue	Alphington	Yarra River	Riverine
14	Yarraford Avenue	Alphington	Yarra River	Riverine
16	Yarraford Avenue	Alphington	Yarra River	Riverine
18	Yarraford Avenue	Alphington	Yarra River	Riverine
Total				
155				

Table C1.4 – Properties at risk of flooding along the Yarra River in the City of Yarra during a 1% AEP riverine flood event.

Isolation

No major isolation risks exist for areas around Yarra during a 1% AEP (100yr ARI) event. The six main River crossings in the area being Chandler Hwy & The Eastern Freeway in Fairfield, Johnston Street in Abbotsford, and Bridge Road, Swan Street, Grange Road & Church Street in Richmond are expected to

remain passable in a 1% AEP event. Some localised short-duration isolation may occur due to flash flooding.

Essential Infrastructure

During an event, see the Public Transport Victoria’s Website for details on delays or alterations to services. <http://ptv.vic.gov.au/live-travel-updates/>. A map of Public Transport routes within the City of Yarra is available via the website at: https://www.ptv.vic.gov.au/assets/default-site/more/maps/Local-area-maps/Metropolitan/d3c974aa39/Melbourne_LAM-v2.pdf

All other essential infrastructure and services areas around Alphington, Fairfield, Abbotsford, Richmond, Burnley and Cremorne are expected to remain unaffected by flooding during a 1% AEP (100yr ARI) event.

Road Closures

The following roads are subject to closure during flooding around Yarra River. Check the Department of Transport (VicRoads) website for more details: <https://traffic.vicroads.vic.gov.au/>

VicRoads Roads flooded in a 1% AEP (100yr ARI) event	
• Punt Road, Cremorne north of Citylink Underpass	
• Yarra Boulevard, Burnley between Swan Street Road and Grange Road	

Table C1.5 – Department of Transport (VicRoads) Possible Road Closures during a flooding event

Yarra City Council Roads flooded in a 1% AEP (100yr ARI) event			
ABBOTSFORD	ALPHINGTON	BURNLEY	
• Flockhart Street	• Alphington Street	• F.R. Smith Drive	• Gough Place
• Grosvenor Street	• Old Heidelberg Road	CREMORNE	• Gough Street
• Shamrock Street	• View Street	• Bent Street	• Kelso Street
	• Yarraford Avenue	• Dover Street	FAIRFIELD
			• Yarra Bend Road

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

Flood Mitigation

A number of reserves and parklands along Yarra River may hold a large amount of stormwater during an event. These include:

Reserve / Park	On Drain / Waterway	Location	Melway Reference
Kevin Bartlett Sporting and Recreation Reserve	Yarra River	F.R. Smith Drive, Burnley	59 A1-B1
Alphington Park Wetlands	Yarra River	View Street, Alphington	45 C1
Alphington Park	Yarra River	View Street, Alphington	31 C12
Latrobe Golf Course	Yarra River	Farm Road Alphington	31 D12
T.H. Westfield Reserve	Merri Creek	Yarra Bend Park, Fairfield	30 H12

Table C1.7 – Parks and Reserves along the Yarra River in the City of Yarra

No formal Retarding Basins, Pumping Stations or Levees exist around the Yarra River in Alphington, Fairfield, Abbotsford, Richmond, Burnley and Cremorne.

Sewerage Infrastructure

Sewerage Infrastructure of note during a severe flood event located around the Yarra River in Alphington, Fairfield, Abbotsford, Richmond, Burnley and Cremorne are contained within the following table.

Sewer Emergency Relief Points

There are also Sewer Emergency Relief Points noted in the adjacent Municipalities of Stonnington and Boroondara that will affect the City of Yarra. Contact the Melbourne Water 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. To view their locations, view mapping in **Appendix F**.

On Drain / Waterway	Bank / Side of Waterway	Location	Melway Reference
Yarra River	South (Boroondara)	Along Main Yarra Trail, near Pedestrian Bridge 100m west of Burke Road, Kew East	31 K11
Yarra River	South (Boroondara)	Off Main Yarra Trail, 400m west of Burke Road, Kew East	31 J11
Darebin Creek	West	Near La Trobe Golf Club Clubhouse, Farm Road, Alphington	31 E12
Yarra River	North	La Trobe Golf Club, Alphington	45 D1
Yarra River	East (Boroondara)	Denham Street, Hawthorn	2H H6
Gardiners Creek	South (Stonnington)	Along Gardiners Creek Trail bordering St Kevins College and the Kooyong Lawn Tennis Club, Toorak	59 B3
Yarra River	South (Stonnington)	Alexandra Avenue at the Railway Bridge, South Yarra	2L H2

Table C1.8 – Sewer Emergency Relief Points in the Yarra Catchment in the City of Yarra.

Command, Control and Coordination

VICSES will assume overall control of the response to flood incidents. Other agencies will be requested to support operations as detailed in this Plan. Control and coordination of a flood incident shall be carried out at the lowest effective level and in accordance with the State Emergency Response Plan (EMMV Part 3). During significant events, VICSES will conduct incident management using multi-agency resources.

Flood Impacts & Operational Considerations (Intelligence Cards)

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

- Yarra River at Rudder Grange, Alphington
- Yarra River at Abbotsford
- Yarra River at Hawthorn
- Yarra River at Burnley

FLOOD INTELLIGENCE CARD – RUDDER GRANGE, ALPHINGTON GAUGE, YARRA RIVER

Version 4 – January 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.

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LOCATION	Rudder Grange, end of Alphington Street, Alphington
MELWAY REFERENCE:	31 A12
STREAM:	Yarra River
GAUGE NUMBER:	229143A
GAUGE ZERO:	4.750m AHD
GAUGE TYPE	Stream Level & Rain

MINOR:	3.0m
MODERATE:	6.0m
MAJOR	8.7m
LEVEE HEIGHT:	N/A
TELEMETRIC/MANUAL	Telemetric
HIGHEST RECORDED FLOOD:	13.05m (1 st December 1934)

River Height	Flood Class or Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
3.0m	MINOR FLOOD LEVEL		
3.62m	December 2003 Flood Level Peak	Event Summary <ul style="list-style-type: none"> 98mm of rain over 2 hours created flash flooding conditions (>100yr ARI intensity) 	
6.0m	MODERATE FLOOD LEVEL	Community Infrastructure Flooded <ul style="list-style-type: none"> Main Yarra River Circuit and Dights Falls Loop Trails in Alphington and Fairfield at various locations 	
8.7m	MAJOR FLOOD LEVEL	Properties at Flood Risk 1 Properties in Total <ul style="list-style-type: none"> 2 Alphington Street, Alphington 	
12.9m	1% AEP (100yr ARI) Flood Level (Major)	<ul style="list-style-type: none"> Note: It is not known at what level many of the property and infrastructure contained below starts being flooded Properties at Flood Risk 33 New at Level; 34 Properties in Total <ul style="list-style-type: none"> 6 & LaTrobe Golf Club Farm Road, Alphington 5, 6, 7 & 8 Riverbrae Court, Alphington 1 View Street, Alphington 7, 8, 9, 11, 12, 13, 14, 16 & 18 Yarraford Avenue, Alphington 3, 4, 5, 6 & 7 Alphington Street, Alphington 	

River Height	Flood Class or Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		<ul style="list-style-type: none"> • 3 Yarraford Avenue, Alphington • 3, 5, 7-9, 11, 13 & 14 The Esplanade, Fairfield • 39B Park Crescent, Fairfield • 1, 2 & 3 Panther Place, Fairfield • 280-350 Heidelberg Road, Fairfield <p>Community Infrastructure Flooded</p> <ul style="list-style-type: none"> • Alphington Park, View Street, Alphington • Alphington Park Wetlands, View Street, Alphington • Latrobe Golf Course (course and clubhouse), Farm Road, Alphington • Fairfield Boathouse, Fairfield Park Drive, Fairfield • Parts of Fairfield Park on Fairfield Park Drive, Fairfield <p>Essential Infrastructure Impacted</p> <ul style="list-style-type: none"> • Sewer Emergency Relief Points are located at La Trobe Golf Club, Alphington <p>Water Over Road (Over 300mm Depth)</p> <ul style="list-style-type: none"> • Old Heidelberg Road, Alphington • View Street, Alphington • Yarraford Avenue, Alphington • Alphington Street, Alphington • Yarra Bend Road, Fairfield 	
13.05m	1 st December 1934 Flood Level Peak		

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

FLOOD INTELLIGENCE CARD – ABBOTSFORD GAUGE, YARRA RIVER

Version 4 – January 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.

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LOCATION	West side of the river at Johnston St bridge, Abbotsford
MELWAY REFERENCE:	44 G4
STREAM:	Yarra River
GAUGE NUMBER:	229622A
GAUGE ZERO:	0m AHD
GAUGE TYPE	River Level

MINOR:	2.7m
MODERATE:	6.7m
MAJOR	8.9m
LEVEE HEIGHT:	N/A
TELEMETRIC/MANUAL	Telemetric
HIGHEST RECORDED FLOOD:	12.1m (December 1934)

River Height	Flood Class or Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
2.4m		Community Infrastructure likely flooded <ul style="list-style-type: none"> Main Yarra River Trail near Johnston Street Bridge, Abbotsford 	
2.7m	MINOR FLOOD LEVEL		
4.53m	4-5 February 2011 Flood Level Peak	Event Summary <ul style="list-style-type: none"> Flood warning issued Minor damage to banks of the Yarra River 	
5.5m	12-14 November 2004 Flood Level Peak	Event Summary <ul style="list-style-type: none"> Moderate flood levels reached at Heidelberg Incident room established at Brooklyn in anticipation of reaching major flood levels Flooding of large areas along the Lower and Upper Yarra River, particularly downstream of Heidelberg affecting parklands, golf courses and low lying property. 	
6.7m	MODERATE FLOOD LEVEL		
8.9m	MAJOR FLOOD LEVEL		

River Height	Flood Class or Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
11.3m approx.	1891 Flood Level Peak	<p>Event Summary</p> <ul style="list-style-type: none"> • Largest recorded flood in metropolitan Melbourne at time • 200 houses around Richmond and Collingwood destroyed • 3000 people left homeless • Flood level peak at 37ft, 1 in. above summer level 	
12.1m	1% AEP (100yr ARI) Flood Level (Major)	<ul style="list-style-type: none"> • Note: It is not known at what level property and infrastructure contained below starts being flooded <p>Properties at Flood Risk 27 Properties in Total</p> <ul style="list-style-type: none"> • 452-484 & 452A Johnstone Street, Abbotsford • 4, 6-14, 16, 18 & 24 St Heliers Street, Abbotsford • 24 Mayfield Street, Abbotsford • 36-80 Church Street, Abbotsford • 30-36, 38 & 45 Grosvenor Street, Abbotsford • 8, 24-28, 30-40 & 33 Flockhart Street, Abbotsford • Units 1-4/20 & 40 Shamrock Street, Abbotsford • 651-653, 655-657, 659, 661-663 & 675 Victoria Street, Abbotsford • 733 Yarra Boulevard, Burnley <p>Community Infrastructure at Flood Risk</p> <ul style="list-style-type: none"> • Abbotsford Convent grounds, St Heliers Street, Abbotsford • Collingwood Children's Farm, St Heliers Street, Abbotsford • Kevin Bartlett Sporting and Recreation Complex, F.R. Smith Drive, Burnley • Burnley Gardens (near F.R. Smith Drive), Yarra Boulevard, Burnley <p>Water Over Road (above 300mm depth)</p> <ul style="list-style-type: none"> • Flockhart Street, Abbotsford • Grosvenor Street, Abbotsford • Shamrock Street, Abbotsford • Yarra Boulevard, Burnley • F.R. Smith Drive, Burnley 	
12.1m	4 th December 1934 Flood Level Peak	<p>Event Summary</p> <ul style="list-style-type: none"> • 18 people dead • 6000 people left homeless • Extensive damage to Abbotsford Convent, Merri Creek, Collingwood and Clifton Hill quarries • Boatsheds, rowing club sheds and swimming sheds destroyed • Flood peak at Johnston Bridge, Abbotsford measured at 2'7" higher than 1891 Flood Level Peak, 39ft., 7 in. above summer level 	

Table C1.10 – Breakdown of likely consequences at various Abbotsford gauge level heights along the Yarra River in the City of Yarra with operational considerations

FLOOD INTELLIGENCE CARD – HAWTHORN GAUGE, YARRA RIVER

Version 1 – January 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.

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LOCATION	North side of Channel at Glenferrie Road bridge under the Monash Fwy, Hawthorn
MELWAY REFERENCE:	45 A11
STREAM:	Yarra River
GAUGE NUMBER:	229687A
GAUGE ZERO:	0.00m AHD
GAUGE TYPE	Stream Level (Tidal Influence)

MINOR:	Not Established
MODERATE:	Not Established
MAJOR	Not Established
LEVEE HEIGHT:	N/A
TELEMETRIC/MANUAL	Telemetric
HIGHEST RECORDED FLOOD:	4.46m (3 rd February 2005)

River Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
8.9m	1% AEP (100yr ARI) Flood Level	<ul style="list-style-type: none"> Note: It is not known at what level infrastructure contained below starts being flooded <p>Properties at Flood Risk</p> <p>1 Properties in Total</p> <ul style="list-style-type: none"> St Kevin's Boatshed at 733 Yarra Boulevard, Burnley <p>Tourism / Recreation Likely Impacted</p> <ul style="list-style-type: none"> Kevin Bartlett Sporting and Recreation Complex, F.R. Smith Drive, Burnley Burnley Gardens(near F.R. Smith Drive), Yarra Boulevard, Burnley <p>Water Over Road (over 30cm depth)</p> <ul style="list-style-type: none"> Yarra Boulevard, Burnley F.R. Smith Drive, Burnley 	

Table C1.11 – Breakdown of likely consequences at various Hawthorn gauge level heights along the Yarra River with operational considerations

FLOOD INTELLIGENCE CARD – BURNLEY GAUGE, YARRA RIVER

Version 4 – January 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.

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LOCATION	North side of River and Freeway at SP AusNet Richmond Terminal Station, Richmond
MELWAY REFERENCE:	44 G12
STREAM:	Yarra River
GAUGE NUMBER:	229621A
GAUGE ZERO:	0.00m AHD
GAUGE TYPE	Tide Level & Rain

MINOR:	Not Established
MODERATE:	Not Established
MAJOR	Not Established
LEEVE HEIGHT:	N/A
TELEMETRIC/MANUAL	Telemetric
HIGHEST RECORDED FLOOD:	7.38m (13 th July 1891)

River Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
2.9m	10% AEP (10yr ARI) Flood Level		
3.6m	5% AEP (20yr ARI) Flood Level		
4.9m	2% AEP (50yr ARI) Flood Level		
5.5m	1% AEP (100yr ARI) Flood Level	<ul style="list-style-type: none"> Note: It is not known at what level infrastructure contained below starts being flooded Properties at Flood Risk 94 Properties in Total Parks Victoria Burnley Depot Offices on Barkley Avenue, Richmond 1/162, 2/164, 3/166, 170, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195 & 196 Cubitt Street, Cremorne 171, 173, 175, 181, 183, 185, 187, 189, 191, 193, 195, 197, 199 & Units 1-4/201 Dover Street, Cremorne 20, 22 & 24 Bent Street, Cremorne 167-169 Cremorne Street, Cremorne 17-21 Harcourt Parade, Cremorne 2 Gough Street, Cremorne 	

River Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		<ul style="list-style-type: none"> • 1, 3, 5, 7, 9, 11, 13 & 15 Gough Place, Cremorne • 1, 2, 3, 4, 5, 6, 6A, 7, 8, 9, 10A, 10B, 11, 12, 12A, 13, 14, 15 & 16 Melrose Street, Cremorne • 2, 2A, 3, 4, 5, 6, 7, 7A, 8, 9, 10 & 12 Kelso Street, Cremorne • 429, 431, 433, 435, 437, 439, 441, 443, 445, 447 & 449 Punt Road, Cremorne <p>Essential Infrastructure Likely Impacted</p> <ul style="list-style-type: none"> • Bus Routes 246, 605 and 969 along Punt Road, Cremorne <p>Water Over Road</p> <ul style="list-style-type: none"> • Bent Street, Cremorne • Dover Street, Cremorne • Gough Place, Cremorne • Gough Street, Cremorne • Kelso Street, Cremorne • Punt Road, Cremorne 	

Table C1.12 – Breakdown of likely consequences at various Burnley gauge level heights along the Yarra River in the City of Yarra with operational considerations

APPENDIX C2 – MERRI CREEK FLOOD EMERGENCY PLAN

Overview of Flooding Consequences

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 Merri Creek in the City of Yarra					
Property					
Properties	0				
Residential	0				
Commercial	0				
Industrial	0				
Public Land	0				
Rural	0				
Community Infrastructure					
Essential Infrastructure					
Tourism / Recreation					
Recreation Facilities	2	Merri Creek Trail; T.H. Westfield Reserve			
Government Boundaries					
Local Gov't Areas	1	Yarra	CMA	1	Port Phillip & Westernport
Adjacent LGAs	2	Darebin and Moreland	CFA District	0	
SES Unit Area	1	Northcote	FRV District	1	Central

Table C2.1 – Consequence Summary of 1% AEP flood along Merri Creek in the City of Yarra

Merri Creek rises in Melbourne's outer north between Craigieburn and Kalkallo and flows south along the boundaries of the Cities of Hume, Whittlesea and Darebin, receiving several creeks, tributaries and drains before entering the City of Yarra north of St Georges Road, Northcote. Merri Creek then forms part of the northern boundary of the municipality, flowing through Fitzroy North and Clifton Hill before heading south from Heidelberg Road, through Clifton Hill and discharging into the Yarra River upstream of Dight's Falls at Yarra Bend Park, Fairfield.

High Intensity, short duration rainfall events can cause flash flooding in and around this region, while prolonged rainfall events may cause Merri Creek to flood affecting surrounding parkland area and residences in the north eastern areas of Fitzroy North.

Gauges and Warnings

Warnings are available for flooding expected along Merri Creek at Northcote. For other hydrographic/telemetry (river gauges) within the Municipality, Melbourne Water does not provide any flood warning service at this point, due to the generally short warning times available.

Melbourne Water Gauges	Station No.	Location	Stream Level & Flow Gauge	Rain Gauge	Melway Reference
Merri Creek at Cooper Street, Somerton	229603A	West side of the creek, 200m north of Cooper Street, Somerton	✓	✓	180 J9
Merri Creek at Bell Street, Coburg	229645A	West side of the Creek at the Bell St Bridge, Coburg	✓	✓	30 A1
Merri Creek at St Georges Road, Northcote	229149A	East side of the creek in Green Reserve at end of Union St, Northcote	✓	✓	30 D10

Table C2.2 – Gauges within the Merri Creek catchment

These Gauges may provide some warning of expected flooding. See the Melbourne Water website for more information on these gauges: <http://www.melbournewater.com.au/waterdata/rainfallandriverveldata/Pages/Rainfall-and-river-level-new.aspx>. It is advised that residents monitor the Bureau of Meteorology's website http://www.bom.gov.au/cgi-bin/wrap_fwo.pl?IDV60201.html and the VicEmergency website <https://emergency.vic.gov.au/> for any thunderstorm, flood or severe weather warnings present for their area.

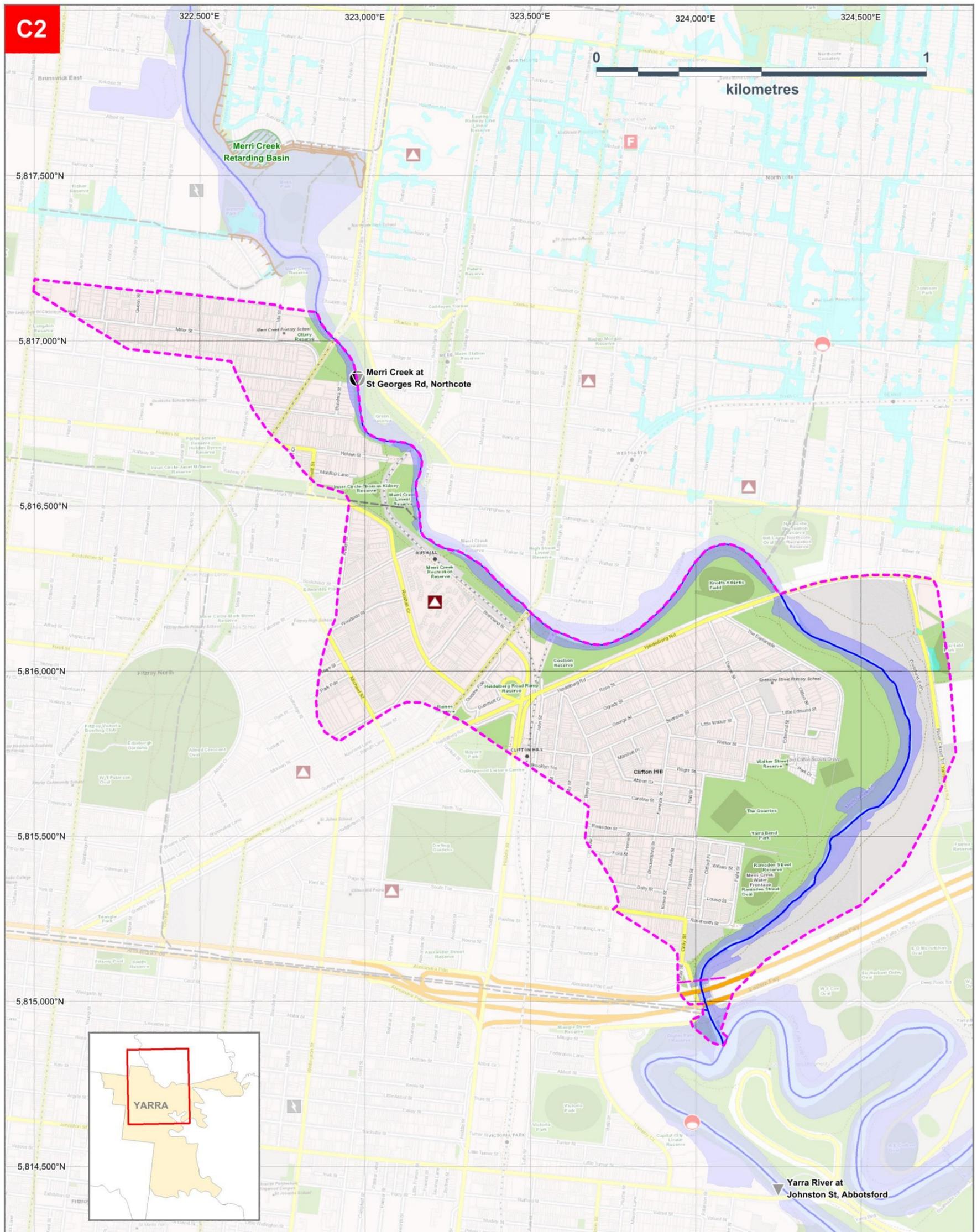
There are currently three Melbourne Water flood warning gauges on the Merri Creek that could be used to assist with public safety. These are at Somerton, Coburg and Northcote. Those gauges with flood class levels established are outlined in the table below.

Hydrographic Monitoring Station	River / Creek Flood Class Level		
	Minor	Moderate	Major
Merri Creek at Somerton	3.4m	3.7m	4.4m
Merri Creek at Bell Street, Coburg	2.9m	3.4m	4.8m
Merri Creek at St Georges Road, Northcote	3.2m	3.8m	5.0m

Table C2.3 – Hydrographic Monitoring Stations with established Flood Class Levels for the City of Yarra

At these sites on the Yarra River and Merri 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 (<http://www.bom.gov.au/vic/warnings/index.shtml>). While the City of Yarra monitors these warnings in times of high rainfall, there are no specific guidelines to advise how these situations should be responded to.

Areas of Flood Risk



Map Produced by VICSES January 2020.



CITY OF YARRA
 1% AEP (100yr ARI)
 Flooding
**C2. Areas of flood risk
 along Merri Creek**

- | | | |
|----------------------------------|------------------------------|---------------------------------|
| Building | Waterway | 1% AEP Over-Floor Flooding Risk |
| Waterbody | Aged Care Facility | Fire Station |
| 1% AEP Flash Flood Extent | Sewer Emergency Relief Point | Rain Gauge |
| 1% AEP Riverine Flood Extent | Telephone Exchange | |
| Melbourne Water Retarding Basin | Power Terminal Station | |
| Melbourne Water Stormwater Drain | Sewer Pumping Station | |
| Flood Model Extent | Stream Level Gauge | |

Basemap: Vicmap and Corporate Geospatial Library Information which is Copyright © State of Victoria, Department of Environment, Land, Water and Planning 2020.



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Figure C2 – Areas of flood risk around Merri Creek in the City of Yarra and area covered by this Appendix

Properties at Flood Risk

Currently, there are no properties at risk. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Merri Creek (Melbourne Water) flood mapping program. Note that any multi-lot properties situated above ground floor likely impacted by isolation only with flooding on ground floor impacting access to common areas and/or carpark and storage facilities. Information on above ground-floor properties is not available in this list.

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 Merri Creek during a 1% AEP event				
Residential	Commercial	Industrial	Rural	Public Use
Street No. at Risk	Street	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
Total				
0				

Table C2.4 – Properties at risk of flooding along Merri Creek in the City of Yarra

Isolation

No major isolation risks exist for areas around Merri 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. <http://ptv.vic.gov.au/live-travel-updates/>. A map of Public Transport routes within the City of Yarra is available via the website at: https://www.ptv.vic.gov.au/assets/default-site/more/maps/Local-area-maps/Metropolitan/d3c974aa39/Melbourne_LAM-v2.pdf

All essential infrastructure, roads and services areas around Merri Creek are expected to remain unaffected by flooding during a 1% AEP (100yr ARI) event.

Road Closures

The following roads are subject to closure during flooding around Merri Creek. Check the Department of Transport (VicRoads) website for more details: <https://traffic.vicroads.vic.gov.au/>

Department of Transport (VicRoads) Roads flooded in a 1% AEP (100yr ARI) event
<ul style="list-style-type: none"> Nil impacted in City of Yarra

Table C2.5 – VicRoads Possible Road Closures during a flooding event

Yarra City Council Roads flooded in a 1% AEP (100yr ARI) event
<ul style="list-style-type: none"> Nil impacted in City of Yarra

Table C2.6 – Yarra City Council Possible Road Closures during a flooding event

Flood Mitigation

A number of reserves and parklands along Merri Creek may hold a large amount of stormwater during an event. These include:

Reserve / Park	On Drain / Waterway	Location	Melway Reference
Merri Creek Labyrinth	Merri Creek	Near Park Drive, Clifton Hill	44 G1
T.H. Westfield Reserve	Merri Creek	Yarra Bend Park, Fairfield	30 G12-H12
Yarra Bend Park	Merri Creek & Yarra River	Heidelberg Road to Yarra River, Fairfield	30 H12-44 G3
Wetlands	Merri Creek	Between The Esplanade and Merri Creek, Clifton Hill	44 H11

Table C2.7 – Parks and Reserves along the Merri Creek in the City of Yarra

No formal Retarding Basins, Pumping Stations or Levees exist around Merri Creek in Yarra.

Command, Control and Coordination

VICSES will assume overall control of the response to flood incidents. Other agencies will be requested to support operations as detailed in this Plan. Control and coordination of a flood incident shall be carried out at the lowest effective level and in accordance with the State Emergency Response Plan (EMMV Part 3). During significant events, VICSES will conduct incident management using multi-agency resources.

Flood Impacts & Operational Considerations (Intelligence Cards)

The tables on the following pages provide a breakdown of the possible consequences of flooding along Merri Creek at various creek heights within the City of Yarra. 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:

- Merri Creek at Northcote

FLOOD INTELLIGENCE CARD – NORTHCOTE GAUGE, MERRI CREEK

Version 3 – January 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.

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LOCATION	East side of the creek in Green Reserve at end of Union St, Northcote
MELWAY REFERENCE:	30 D10
STREAM:	Merri Creek
GAUGE NUMBER:	229149A
GAUGE ZERO:	23.97m AHD
GAUGE TYPE	Creek Level & Rain

MINOR:	3.2m
MODERATE:	3.8m
MAJOR	5.0m
LEVEE HEIGHT:	N/A
TELEMETRIC/MANUAL	Telemetric
HIGHEST RECORDED FLOOD:	4.81m (7 th April 1977)

Creek Height	Flood Class or Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
3.2m	MINOR FLOOD LEVEL		
3.8m	MODERATE FLOOD LEVEL		
4.35m	February 2005 Flood Level Peak	Event Summary <ul style="list-style-type: none"> Moderate Flood Levels reached at Northcote gauge Creek overtopped banks St Georges Rd, Northcote at 2am Footbridges flooded along Merri Creek Trail Water levels receded below minor flood levels within the day 	
4.64m	December 2003 Flood Level Peak	Event Summary <ul style="list-style-type: none"> Moderate Flood Levels reached at Northcote gauge Creek overtopped banks near St Georges Rd, Northcote gauge Approximately 50yr ARI flows caused damage to creek bed Loss of a footbridge and surrounding bank damage 	
5.0m	MAJOR FLOOD LEVEL		

Creek Height	Flood Class or Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
6.13m	1% AEP (100yr ARI) Flood Level (Major)	Community Infrastructure Flooded <ul style="list-style-type: none"> • T.H. Westfield Reserve, Yarra Bend Park, Fairfield • Merri Creek Trail/ Capital City Trail, Fitzroy North and Clifton Hill • Merri Creek Trail footbridge near Roseneath Street, western approach flooded • Merri Creek Trail footbridge south of Eastern Freeway flooded • Merri Creek Trail footbridge east of High Street, Northcote flooded 	

Table C2.8 – Breakdown of likely consequences at various Northcote gauge level heights along Merri Creek with operational considerations

APPENDIX C3 – CARLTON NORTH, FITZROY NORTH and NORTHERN COLLINGWOOD AND FITZROY FLOOD EMERGENCY PLAN

Overview of Flooding Consequences

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) flash flood around Carlton North, Fitzroy North and Northern Collingwood and Fitzroy

Property					
Properties	640				
Residential	532				
Commercial	107				
Industrial	0				
Public Land	1				
Rural	0				
Community Infrastructure					
Child Care / Kindergartens	3	Gold Street Child Care Centre; Cold Street Children's Centre; and North Carlton Children's Centre			
Essential Infrastructure					
Major Roads	5	Alexandra Parade; Eastern Freeway; Hoddle Street; Nicholson Street; and Queens Parade			
Tram Routes	3	11; 86; and 112			
Bus Routes	2	504; 546			
Tourism / Recreation					
Recreation Facilities	1	Main Yarra Trail			
Government Boundaries					
Local Gov't Areas	1	Yarra	CMA	1	Port Phillip & Westernport
Adjacent LGAs	1	Moreland	CFA District	0	
SES Unit Area	1	Northcote	FRV District	1	Central

Table C3.1 – Consequence Summary of 1% AEP flash flooding around Carlton North, Fitzroy North and Northern Collingwood and Fitzroy

Carlton North & Fitzroy North, along with the northern sections of Fitzroy and Collingwood form the northern districts of the City of Yarra.

Drains in the area include Alexandra Parade Main and Relief Drains, Lygon Street Main Drain and the associated Park Street Diversion and North Fitzroy Main Drain. Lygon Street Main Drain Park Street Diversion carries flows east and discharges into the Merri Creek north of Rushall Railway Station in Fitzroy North. Lygon Street Main Drain and North Fitzroy Main Drain flow south to meet Alexandra Parade Main Drain, and Alexandra Parade Main Drain and Relief Drain flow east to discharge into Merri Creek in Abbotsford prior to the junction with the Yarra River.

The area is comprised of mixed residential, commercial and public green zones. The Drainage System is generally designed to give 10% AEP (10yr ARI) protection across Yarra. Events greater than 10% AEP may see overflows across residential roads and properties.

High intensity, short duration rainfall events can cause flash flooding in these suburbs, while prolonged rainfall events may cause Merri Creek to flood, affecting the north-eastern areas of Fitzroy North immediately adjacent to it. In high intensity rainfall events, Merri Creek may flood, affecting parkland along the creek (Yarra Municipal FEP 2012).

Gauges and Warnings

Whilst there are hydrographic/telemetry stations (river gauges) within the municipality, Melbourne Water does not provide any flood warning service at this point, due to the generally short warning times available.

Melbourne Water Gauges	Station No.	Location	Stream Level & Flow Gauge	Rain Gauge	Melway Reference
Merri Creek at St Georges Road, Northcote	229149A	East side of the creek in Green Reserve at end of Union St, Northcote	✓	✓	30 D10

Table C3.1 – Hydrographic Monitoring Stations close to Carlton North & Fitzroy North

These Gauges may provide some warning of expected flooding. See the Melbourne Water website for more information on these gauges: <http://www.melbournewater.com.au/waterdata/rainfallandriverleveldata/Pages/Rainfall-and-river-level-new.aspx>. It is advised that residents monitor the Bureau of Meteorology's website http://www.bom.gov.au/cgi-bin/wrap_fwo.pl?IDV60201.html and the VicEmergency website <https://emergency.vic.gov.au/> for any thunderstorm, flood or severe weather warnings present for their area.

Areas of Flood Risk around Carlton North, Fitzroy North and the northern sections of Collingwood and Fitzroy

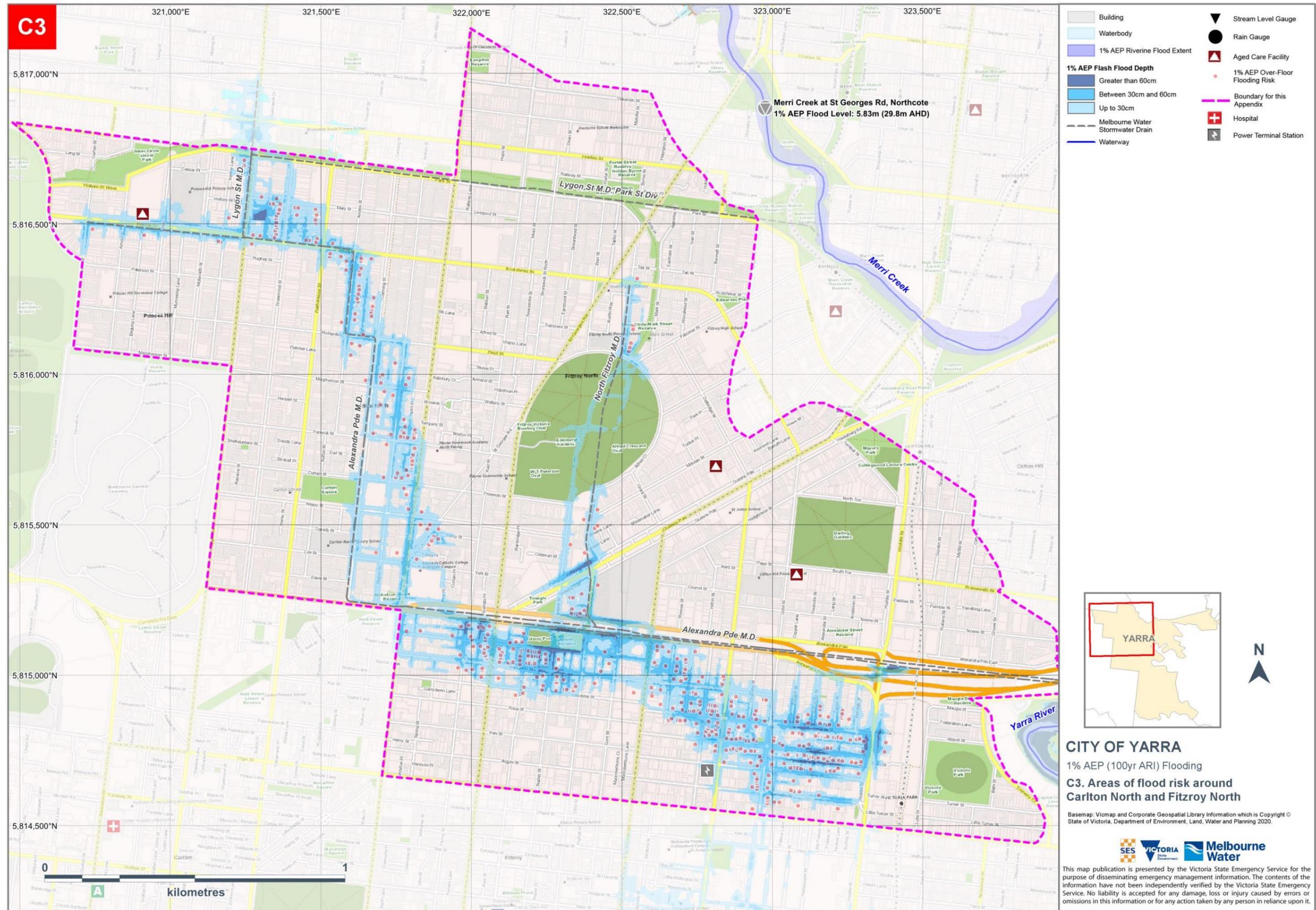


Figure C3 – Areas of flood risk around Carlton North, Fitzroy North and the northern sections of Collingwood and Fitzroy in the City of Yarra

Properties at Flood Risk

Properties listed in the table below are at risk from flash flooding around Carlton North, Fitzroy North, and the northern sections of Fitzroy and Collingwood. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Alexandra Parade Main Drain (GHD, November 2013) flood mapping and risk assessment program. Note that any multi-lot properties situated above ground floor likely impacted by isolation only with flooding confined to the ground floor impacting access to common areas and/or carpark and storage facilities. ★ indicates multi-lot properties with above-ground properties.

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 flash flooding around Carlton North, Fitzroy North, Fitzroy and Collingwood						
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 Alexander Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	4 Alexander Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	8 Alexander Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	10 Alexander Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	1 Alexandra Parade	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	5/9 Alexandra Parade	Collingwood	Alexandra Pde Main Drain	Flash
		✓	25 Alexandra Parade	Collingwood	Alexandra Pde Main Drain	Flash
		✓	64 Alexandra Parade	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	66 Alexandra Parade	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	68 Alexandra Parade	Fitzroy	Alexandra Pde Main Drain	Flash
	✓	✓	72 Alexandra Parade	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	84 Alexandra Parade	Fitzroy	Alexandra Pde Main Drain	Flash
	✓	✓	88 Alexandra Parade	Fitzroy	Alexandra Pde Main Drain	Flash
	✓	✓	90 Alexandra Parade	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	120-122 Alexandra Parade	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	157A Alexandra Parade	Fitzroy North	North Fitzroy Main Drain	Flash
		✓	159 Alexandra Parade	Fitzroy North	North Fitzroy Main Drain	Flash
	✓	✓	161 Alexandra Parade	Fitzroy North	North Fitzroy Main Drain	Flash
		✓	163 Alexandra Parade	Fitzroy North	North Fitzroy Main Drain	Flash
		✓	165 Alexandra Parade	Fitzroy North	North Fitzroy Main Drain	Flash
	✓	✓	167 Alexandra Parade	Fitzroy North	North Fitzroy Main Drain	Flash
	✓	✓	169 Alexandra Parade	Fitzroy North	North Fitzroy Main Drain	Flash
	✓	✓	171 Alexandra Parade	Fitzroy North	North Fitzroy Main Drain	Flash
	✓	✓	173 Alexandra Parade	Fitzroy North	North Fitzroy Main Drain	Flash
	✓	✓	175-177 Alexandra Parade	Fitzroy North	North Fitzroy Main Drain	Flash
		✓	200-220 Alexandra Parade	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	13 Alfred Crescent	Fitzroy North	North Fitzroy Main Drain	Flash
		✓	96 Amess Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	131 Amess Street	Carlton North	Alexandra Pde Main Drain	Flash

Properties at risk from flash flooding around Carlton North, Fitzroy North, Fitzroy and Collingwood

Properties at risk from flash flooding around Carlton North, Fitzroy North, Fitzroy and Collingwood						
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				
		✓	136 Amess Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	144 Amess Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	154 Amess Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	156 Amess Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	158 Amess Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	160 Amess Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	162 Amess Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	164 Amess Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	168 Amess Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	170 Amess Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	172 Amess Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	174 Amess Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	176 Amess Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	178 Amess Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	180 Amess Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	192 Amess Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	194 Amess Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	196 Amess Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	197 Amess Street	Carlton North	Alexandra Pde Main Drain	Flash
	✓	✓	202 Amess Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	203 Amess Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	205 Amess Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	210 Amess Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	212 Amess Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	214 Amess Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	2A Ballarat Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	2B Ballarat Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	2C Ballarat Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	2D Ballarat Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	1 Bendigo Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	1 Blanche Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	2 Blanche Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	3A Blanche Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	5 Blanche Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	7 Blanche Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	9 Blanche Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	9A Blanche Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	15 Blanche Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	17 Blanche Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	401 Brunswick Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	404 Brunswick Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	409 Brunswick Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	409A Brunswick Street	Fitzroy	Alexandra Pde Main Drain	Flash

Properties at risk from flash flooding around Carlton North, Fitzroy North, Fitzroy and Collingwood

Properties at risk from flash flooding around Carlton North, Fitzroy North, Fitzroy and Collingwood						
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				
	✓	✓	411 Brunswick Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	412 Brunswick Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	414 Brunswick Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	415 Brunswick Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	416-418 Brunswick Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	417 Brunswick Street	Fitzroy	Alexandra Pde Main Drain	Flash
	✓	✓	419 Brunswick Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	420 Brunswick Street	Fitzroy	Alexandra Pde Main Drain	Flash
	✓	✓	421 Brunswick Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	422 Brunswick Street	Fitzroy	Alexandra Pde Main Drain	Flash
	✓	✓	423A Brunswick Street	Fitzroy	Alexandra Pde Main Drain	Flash
	✓	✓	423B Brunswick Street	Fitzroy	Alexandra Pde Main Drain	Flash
	✓	✓	424-428 Brunswick Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	425 Brunswick Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	427 Brunswick Street	Fitzroy	Alexandra Pde Main Drain	Flash
	✓	✓	429-431 Brunswick Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	433 Brunswick Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	435-437 Brunswick Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	439 Brunswick Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	441 Brunswick Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	451 Brunswick Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	451B Brunswick Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	451C Brunswick Street	Fitzroy	Alexandra Pde Main Drain	Flash
	✓	✓	40 Budd Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	42 Budd Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	46 Budd Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	48 Budd Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	50 Budd Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	52 Budd Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	54 Budd Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	58 Budd Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	1/60 Budd Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	2/60 Budd Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	3/60 Budd Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	4/60 Budd Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	5/60 Budd Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	6/60 Budd Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	61 Budd Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	62 Budd Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	63 Budd Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	65 Budd Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	67 Budd Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	420 Canning Street	Carlton North	Alexandra Pde Main Drain	Flash

Properties at risk from flash flooding around Carlton North, Fitzroy North, Fitzroy and Collingwood

Properties at risk from flash flooding around Carlton North, Fitzroy North, Fitzroy and Collingwood						
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				
		✓	434 Canning Street	Carlton North	Alexandra Pde Main Drain	Flash
	✓	✓	435 Canning Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	436 Canning Street	Carlton North	Alexandra Pde Main Drain	Flash
	✓	✓	454 Canning Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	462 Canning Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	464 Canning Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	466 Canning Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	481 Canning Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	481A Canning Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	513 Canning Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	517 Canning Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	521 Canning Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	523 Canning Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	529 Canning Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	539 Canning Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓★	7-11 Cecil Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	55 Cecil Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	57 Cecil Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	76 Cecil Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	79 Cecil Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	81 Cecil Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	88 Cecil Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	101 Cecil Street	Fitzroy	Alexandra Pde Main Drain	Flash
	✓	✓	104 Cecil Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	107 Cecil Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓★	113 Cecil Street	Fitzroy	Alexandra Pde Main Drain	Flash
	✓	✓	124 Cecil Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	126 Cecil Street	Fitzroy	Alexandra Pde Main Drain	Flash
	✓	✓	128 Cecil Street	Fitzroy	Alexandra Pde Main Drain	Flash
	✓	✓	130 Cecil Street	Fitzroy	Alexandra Pde Main Drain	Flash
	✓	✓	1/132 Cecil Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	2/132 Cecil Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	3/132 Cecil Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	4/132 Cecil Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	10 Charlotte Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	14 Charlotte Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	7 Curtain Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	18 Curtain Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	957 Drummond Street	Carlton North	Lygon Street Main Drain	Flash
		✓	963 Drummond Street	Carlton North	Lygon Street Main Drain	Flash
		✓	967 Drummond Street	Carlton North	Lygon Street Main Drain	Flash
	✓	✓	973 Drummond Street	Carlton North	Lygon Street Main Drain	Flash
	✓	✓	975 Drummond Street	Carlton North	Lygon Street Main Drain	Flash

Properties at risk from flash flooding around Carlton North, Fitzroy North, Fitzroy and Collingwood

Properties at risk from flash flooding around Carlton North, Fitzroy North, Fitzroy and Collingwood						
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				
	✓	✓	977 Drummond Street	Carlton North	Lygon Street Main Drain	Flash
	✓	✓	979 Drummond Street	Carlton North	Lygon Street Main Drain	Flash
	✓	✓	981 Drummond Street	Carlton North	Lygon Street Main Drain	Flash
		✓	985 Drummond Street	Carlton North	Lygon Street Main Drain	Flash
		✓	989 Drummond Street	Carlton North	Lygon Street Main Drain	Flash
	✓	✓	993 Drummond Street	Carlton North	Lygon Street Main Drain	Flash
		✓	994 Drummond Street	Carlton North	Lygon Street Main Drain	Flash
		✓	1/999 Drummond Street	Carlton North	Lygon Street Main Drain	Flash
		✓	2/999 Drummond Street	Carlton North	Lygon Street Main Drain	Flash
		✓	3/999 Drummond Street	Carlton North	Lygon Street Main Drain	Flash
		✓	4/999 Drummond Street	Carlton North	Lygon Street Main Drain	Flash
		✓	5/999 Drummond Street	Carlton North	Lygon Street Main Drain	Flash
		✓	6/999 Drummond Street	Carlton North	Lygon Street Main Drain	Flash
		✓	7/999 Drummond Street	Carlton North	Lygon Street Main Drain	Flash
		✓	1002 Drummond Street	Carlton North	Lygon Street Main Drain	Flash
		✓★	1011 Drummond Street	Carlton North	Lygon Street Main Drain	Flash
		✓	64 Easey Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	83A Easey Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓★	92 Easey Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	97 Easey Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓★	100-108 Easey Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	112 Easey Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	114 Easey Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	115 Easey Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	120 Easey Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	122 Easey Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	124 Easey Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	124A Easey Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	126 Easey Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	128 Easey Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	138 Easey Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	154 Easey Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	156 Easey Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	158 Easey Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓★	160-166 Easey Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	168 Easey Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	4 Emma Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	10 Emma Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	12 Emma Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	14 Emma Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	16 Emma Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	18 Emma Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	26 Emma Street	Collingwood	Alexandra Pde Main Drain	Flash

Properties at risk from flash flooding around Carlton North, Fitzroy North, Fitzroy and Collingwood

Properties at risk from flash flooding around Carlton North, Fitzroy North, Fitzroy and Collingwood						
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				
		✓	35-53 Emma Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	12 Fenwick Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	16 Fenwick Street	Carlton North	Alexandra Pde Main Drain	Flash
	✓	✓	20 Fenwick Street	Carlton North	Alexandra Pde Main Drain	Flash
✓	✓	✓	26 Fenwick Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	28 Fenwick Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	46 Fenwick Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	48 Fenwick Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	2 Fergie Street	Fitzroy North	North Fitzroy Main Drain	Flash
		✓	2A Fergie Street	Fitzroy North	North Fitzroy Main Drain	Flash
		✓	6 Fergie Street	Fitzroy North	North Fitzroy Main Drain	Flash
		✓	24 Fergie Street	Fitzroy North	North Fitzroy Main Drain	Flash
		✓	28 Fergie Street	Fitzroy North	North Fitzroy Main Drain	Flash
		✓	2 Forest Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	3 Forest Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	4 Forest Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	6 Forest Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓★	8 Forest Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓★	126 Garton Street	Princes Hill	Alexandra Pde Main Drain	Flash
		✓	4/475 George Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	479 George Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	481 George Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	483 George Street	Fitzroy	Alexandra Pde Main Drain	Flash
	✓	✓	537-541 George Street	Fitzroy North	North Fitzroy Main Drain	Flash
		✓	4-6 Gold Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	8 Gold Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	10 Gold Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	1/11-17 Gold Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	2/11-17 Gold Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	3/11-17 Gold Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	4/11-17 Gold Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	12A Gold Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	19 Gold Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	21 Gold Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓★	22-24 Gold Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	23 Gold Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	25 Gold Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	30 Gold Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	33-35 Gold Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	34 Gold Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	36 Gold Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	38 Gold Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	39 Gold Street	Collingwood	Alexandra Pde Main Drain	Flash

Properties at risk from flash flooding around Carlton North, Fitzroy North, Fitzroy and Collingwood

Properties at risk from flash flooding around Carlton North, Fitzroy North, Fitzroy and Collingwood						
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				
		✓	40 Gold Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	41 Gold Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	43 Gold Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	48 Gold Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	50 Gold Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	52 Gold Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	54 Gold Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	60 Gold Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	62 Gold Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	63 Gold Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	481 Gore Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	292 Hoddle Street	Abbotsford	Alexandra Pde Main Drain	Flash
		✓	294 Hoddle Street	Abbotsford	Alexandra Pde Main Drain	Flash
		✓*	375 Hoddle Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	2 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	6 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	11 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	16 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	18 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	20 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	21 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	22 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	23 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	25 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	26 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	27 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	28 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	29 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	31 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	32 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	33-37 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	34 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	34A Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	34B Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	36 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	36A Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	36B Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	36C Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	38 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	40 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	42 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	44 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	45-47 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash

Properties at risk from flash flooding around Carlton North, Fitzroy North, Fitzroy and Collingwood

Properties at risk from flash flooding around Carlton North, Fitzroy North, Fitzroy and Collingwood						
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				
		✓	48-50 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	52 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	54 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	56 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	59 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	61 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	62 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	64 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	65A Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	68 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	69 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	74 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	78 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	82 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	84 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	86 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	88 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	89 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	90 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	91 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	99 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	101 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	113 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	117 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	119 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	121 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	123 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	125 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	127 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	129 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	133 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	135 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	137 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	137A Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	139 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓★	147-149 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	151 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	155 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	1/159 Hotham Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	9 Jamieson Street	Fitzroy North	North Fitzroy Main Drain	Flash
	✓	✓	32 Jamieson Street	Fitzroy North	North Fitzroy Main Drain	Flash
	✓	✓	33 Jamieson Street	Fitzroy North	North Fitzroy Main Drain	Flash
	✓	✓	34 Jamieson Street	Fitzroy North	North Fitzroy Main Drain	Flash

Properties at risk from flash flooding around Carlton North, Fitzroy North, Fitzroy and Collingwood

Properties at risk from flash flooding around Carlton North, Fitzroy North, Fitzroy and Collingwood						
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				
		✓	55 Jamieson Street	Fitzroy North	North Fitzroy Main Drain	Flash
		✓	56 Jamieson Street	Fitzroy North	North Fitzroy Main Drain	Flash
		✓	57 Jamieson Street	Fitzroy North	North Fitzroy Main Drain	Flash
		✓	58 Jamieson Street	Fitzroy North	North Fitzroy Main Drain	Flash
		✓	59 Jamieson Street	Fitzroy North	North Fitzroy Main Drain	Flash
		✓	60 Jamieson Street	Fitzroy North	North Fitzroy Main Drain	Flash
		✓★	61 Jamieson Street	Fitzroy North	North Fitzroy Main Drain	Flash
		✓	62 Jamieson Street	Fitzroy North	North Fitzroy Main Drain	Flash
		✓	63 Jamieson Street	Fitzroy North	North Fitzroy Main Drain	Flash
		✓	64 Jamieson Street	Fitzroy North	North Fitzroy Main Drain	Flash
		✓	65 Jamieson Street	Fitzroy North	North Fitzroy Main Drain	Flash
		✓	116-120 Johnston Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	44 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	50 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	52 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	54 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	55 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	58 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	60 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	64-68 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	65-69 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	66 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	70 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	71 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	72 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	73 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	74 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	75 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	76 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	77 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	78 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	79 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	80 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	81 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	82 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	85 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	86A Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	88 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	93 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	97 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	102 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	104 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	105 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash

Properties at risk from flash flooding around Carlton North, Fitzroy North, Fitzroy and Collingwood

Properties at risk from flash flooding around Carlton North, Fitzroy North, Fitzroy and Collingwood						
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				
		✓	107 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	108 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	109 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	110 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	112 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	117 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	121 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	123 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	125 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	127 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	129 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	131 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	133 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	134 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	135 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	136 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	137 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	138 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	139 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	140 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	145 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	147 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	149 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	151 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	153 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	155 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	157 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	159 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	161 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	163 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	167 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	170 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	172 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	174 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	175 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	176 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	177 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	178 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	179A Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	179B Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	180 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	182 Keele Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	68 Keeley Lane	Princes Hill	Alexandra Pde Main Drain	Flash

Properties at risk from flash flooding around Carlton North, Fitzroy North, Fitzroy and Collingwood

Properties at risk from flash flooding around Carlton North, Fitzroy North, Fitzroy and Collingwood						
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				
		✓	18-20 Lee Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	110 Leicester Street	Fitzroy	Alexandra Pde Main Drain	Flash
	✓	✓	112 Leicester Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	151 Leicester Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	153 Leicester Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	697 Lygon Street	Princes Hill	Lygon Street Main Drain	Flash
	✓	✓	701 Lygon Street	Princes Hill	Lygon Street Main Drain	Flash
		✓	1016 Lygon Street	Carlton North	Lygon Street Main Drain	Flash
		✓	1018 Lygon Street	Carlton North	Lygon Street Main Drain	Flash
	✓	✓	1020 Lygon Street	Carlton North	Lygon Street Main Drain	Flash
	✓*	✓*	1072 Lygon Street	Carlton North	Lygon Street Main Drain	Flash
		✓	24 Macpherson Street	Carlton North	Alexandra Pde Main Drain	Flash
	✓	✓	31-33 Macpherson Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	35 Macpherson Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	2/31 Mary Street	Carlton North	Lygon Street Main Drain	Flash
	✓	✓	1 Mater Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	12A-12 Mater Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	13 Mater Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	14 Mater Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	15 Mater Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	16 Mater Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	17 Mater Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	18 Mater Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	19 Mater Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	20 Mater Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	21 Mater Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	22 Mater Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓*	30 Mater Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	61 Mater Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	63 Mater Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	4 Mckean Street	Fitzroy North	North Fitzroy Main Drain	Flash
		✓	19 Mckean Street	Fitzroy North	North Fitzroy Main Drain	Flash
		✓	403 Napier Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	406 Napier Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	411 Napier Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	418 Napier Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	420 Napier Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	422 Napier Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	423 Napier Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	424 Napier Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	426 Napier Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	428 Napier Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	433 Napier Street	Fitzroy	Alexandra Pde Main Drain	Flash

Properties at risk from flash flooding around Carlton North, Fitzroy North, Fitzroy and Collingwood

Properties at risk from flash flooding around Carlton North, Fitzroy North, Fitzroy and Collingwood						
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				
		✓	436 Napier Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	437 Napier Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	441 Napier Street	Fitzroy	Alexandra Pde Main Drain	Flash
	✓	✓★	443 Napier Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	514 Napier Street	Fitzroy North	North Fitzroy Main Drain	Flash
		✓★	540 Napier Street	Fitzroy North	North Fitzroy Main Drain	Flash
		✓	16 Newry Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	361-363 Nicholson Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	365 Nicholson Street	Carlton North	Alexandra Pde Main Drain	Flash
✓	✓	✓	366 Nicholson Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	367-369 Nicholson Street	Carlton North	Alexandra Pde Main Drain	Flash
✓	✓	✓	368-370 Nicholson Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	410 Nicholson Street	Fitzroy North	Alexandra Pde Main Drain	Flash
		✓	412 Nicholson Street	Fitzroy North	Alexandra Pde Main Drain	Flash
		✓	413-415 Nicholson Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	414 Nicholson Street	Fitzroy North	Alexandra Pde Main Drain	Flash
		✓★	427-437 Nicholson Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	443-445 Nicholson Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	457 Nicholson Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	461 Nicholson Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	465 Nicholson Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	467 Nicholson Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	471 Nicholson Street	Carlton North	Alexandra Pde Main Drain	Flash
	✓	✓	475 Nicholson Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	477-479 Nicholson Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	1/477-481 Nicholson Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	2/477-481 Nicholson Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	481 Nicholson Street	Carlton North	Alexandra Pde Main Drain	Flash
	✓	✓	487-489 Nicholson Street	Carlton North	Alexandra Pde Main Drain	Flash
✓★	✓★	✓★	491-497 Nicholson Street	Carlton North	Alexandra Pde Main Drain	Flash
✓	✓	✓	499-501 Nicholson Street	Carlton North	Alexandra Pde Main Drain	Flash
✓	✓	✓	503 Nicholson Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	505 Nicholson Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	2 Percy Street	Fitzroy North	Alexandra Pde Main Drain	Flash
		✓	75 Pigdon Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	77 Pigdon Street	Carlton North	Alexandra Pde Main Drain	Flash
	✓	✓	91 Pigdon Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	93 Pigdon Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	95 Pigdon Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	97 Pigdon Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	99 Pigdon Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	101 Pigdon Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	103 Pigdon Street	Carlton North	Alexandra Pde Main Drain	Flash

Properties at risk from flash flooding around Carlton North, Fitzroy North, Fitzroy and Collingwood

Properties at risk from flash flooding around Carlton North, Fitzroy North, Fitzroy and Collingwood						
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				
		✓	105 Pigdon Street	Carlton North	Alexandra Pde Main Drain	Flash
	✓	✓	140 Pigdon Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	142 Pigdon Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	144 Pigdon Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	1/198 Pigdon Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	2/198 Pigdon Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	1/200 Pigdon Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	2/200 Pigdon Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	3/200 Pigdon Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	211 Pigdon Street	Princes Hill	Alexandra Pde Main Drain	Flash
	✓	✓	213 Pigdon Street	Princes Hill	Alexandra Pde Main Drain	Flash
		✓	297 Pigdon Street	Princes Hill	Alexandra Pde Main Drain	Flash
		✓	71 Queens Parade	Fitzroy North	North Fitzroy Main Drain	Flash
		✓	79 Queens Parade	Fitzroy North	North Fitzroy Main Drain	Flash
		✓	81-89 Queens Parade	Fitzroy North	North Fitzroy Main Drain	Flash
	✓★	✓★	88 Queens Parade	Fitzroy North	North Fitzroy Main Drain	Flash
		✓	111 Queens Parade	Fitzroy North	North Fitzroy Main Drain	Flash
		✓	632 Rathdowne Street	Carlton North	Lygon Street Main Drain	Flash
		✓	634 Rathdowne Street	Carlton North	Lygon Street Main Drain	Flash
		✓	644-646 Rathdowne Street	Carlton North	Lygon Street Main Drain	Flash
		✓	941 Rathdowne Street	Carlton North	Lygon Street Main Drain	Flash
	✓	✓	949 Rathdowne Street	Carlton North	Lygon Street Main Drain	Flash
		✓	967 Rathdowne Street	Carlton North	Lygon Street Main Drain	Flash
		✓	969 Rathdowne Street	Carlton North	Lygon Street Main Drain	Flash
		✓	971 Rathdowne Street	Carlton North	Lygon Street Main Drain	Flash
		✓	977 Rathdowne Street	Carlton North	Lygon Street Main Drain	Flash
		✓	979 Rathdowne Street	Carlton North	Lygon Street Main Drain	Flash
		✓★	981-985 Rathdowne Street	Carlton North	Lygon Street Main Drain	Flash
	✓	✓	82 Richardson Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	93 Sackville Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	99-101 Sackville Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	104 Sackville Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	106 Sackville Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	2/108 Sackville Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	3/108 Sackville Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	4/108 Sackville Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	115 Sackville Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	130-132 Sackville Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	151 Sackville Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	163 Scotchmer Street	Fitzroy North	Alexandra Pde Main Drain	Flash
		✓	423 Smith Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	425 Smith Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	428-430 Smith Street	Collingwood	Alexandra Pde Main Drain	Flash

Properties at risk from flash flooding around Carlton North, Fitzroy North, Fitzroy and Collingwood

Properties at risk from flash flooding around Carlton North, Fitzroy North, Fitzroy and Collingwood						
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				
		✓	1/432 Smith Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	2/432 Smith Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	434 Smith Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	438 Smith Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	440 Smith Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	462 Smith Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	464 Smith Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	472-478 Smith Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	484 Smith Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	2-4 St Georges Road	Fitzroy North	Alexandra Pde Main Drain	Flash
		✓	18 St Georges Road	Fitzroy North	Alexandra Pde Main Drain	Flash
	✓	✓	21 St Georges Road	Fitzroy North	Alexandra Pde Main Drain	Flash
		✓	22 St Georges Road	Fitzroy North	Alexandra Pde Main Drain	Flash
		✓	24 St Georges Road	Fitzroy North	Alexandra Pde Main Drain	Flash
		✓	26 St Georges Road	Fitzroy North	Alexandra Pde Main Drain	Flash
		✓	27 St Georges Road	Fitzroy North	Alexandra Pde Main Drain	Flash
		✓	28 St Georges Road	Fitzroy North	Alexandra Pde Main Drain	Flash
		✓	30 St Georges Road	Fitzroy North	Alexandra Pde Main Drain	Flash
		✓	32 St Georges Road	Fitzroy North	Alexandra Pde Main Drain	Flash
		✓	328 Station Street	Carlton North	Alexandra Pde Main Drain	Flash
	✓	✓	329 Station Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	330 Station Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	332 Station Street	Carlton North	Alexandra Pde Main Drain	Flash
	✓	✓	334 Station Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	336 Station Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	371 Station Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	382 Station Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	384 Station Street	Carlton North	Alexandra Pde Main Drain	Flash
	✓	✓	386 Station Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	392 Station Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	400-402 Station Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	421 Station Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	423 Station Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	425 Station Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	427 Station Street	Carlton North	Alexandra Pde Main Drain	Flash
	✓	✓	446 Station Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	463 Station Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	465 Station Street	Carlton North	Alexandra Pde Main Drain	Flash
		✓	263 Wellington Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	267 Wellington Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	273-277 Wellington Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	279 Wellington Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	281 Wellington Street	Collingwood	Alexandra Pde Main Drain	Flash

Properties at risk from flash flooding around Carlton North, Fitzroy North, Fitzroy and Collingwood

Properties at risk from flash flooding around Carlton North, Fitzroy North, Fitzroy and Collingwood						
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				
	✓	✓	283-285 Wellington Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	287 Wellington Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	289 Wellington Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	2/297 Wellington Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	4/297 Wellington Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	315 Wellington Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	317 Wellington Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	319 Wellington Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	321 Wellington Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	322-324 Wellington Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	323 Wellington Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	326 Wellington Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	327 Wellington Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	328 Wellington Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	329 Wellington Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓	✓	330 Wellington Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓★	332-336 Wellington Street	Collingwood	Alexandra Pde Main Drain	Flash
	✓★	✓★	350 Wellington Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	354 Wellington Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	356 Wellington Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	358 Wellington Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	360 Wellington Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	362 Wellington Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	364-368 Wellington Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	64 Westgarth Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	69 Westgarth Street	Fitzroy	Alexandra Pde Main Drain	Flash
✓	✓	✓	70-76 Westgarth Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	82 Westgarth Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	1/93 Westgarth Street	Fitzroy	Alexandra Pde Main Drain	Flash
	✓	✓	95 Westgarth Street	Fitzroy	Alexandra Pde Main Drain	Flash
	✓★	✓★	97 Westgarth Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	99 Westgarth Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	121 Westgarth Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	123 Westgarth Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	127 Westgarth Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	129 Westgarth Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	132 Westgarth Street	Fitzroy	Alexandra Pde Main Drain	Flash
	✓	✓	140 Westgarth Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	146 Westgarth Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	151 Westgarth Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	333 Young Street	Fitzroy	Alexandra Pde Main Drain	Flash
	✓	✓	334 Young Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	335 Young Street	Fitzroy	Alexandra Pde Main Drain	Flash

Properties at risk from flash flooding around Carlton North, Fitzroy North, Fitzroy and Collingwood						
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				
		✓	337 Young Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	339 Young Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	341 Young Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	343 Young Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	344 Young Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	345 Young Street	Fitzroy	Alexandra Pde Main Drain	Flash
	✓	✓	346 Young Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	347 Young Street	Fitzroy	Alexandra Pde Main Drain	Flash
	✓	✓	348 Young Street	Fitzroy	Alexandra Pde Main Drain	Flash
		✓	1 Alexander Street	Collingwood	Alexandra Pde Main Drain	Flash
		✓	4 Alexander Street	Collingwood	Alexandra Pde Main Drain	Flash
Totals						
7	121	640				

Table C3.3 – Properties at risk of flash flooding around Carlton North, Fitzroy North, and northern Fitzroy and Collingwood in the City of Yarra

Isolation

No major isolation risks exist for areas around Carlton North, Collingwood, Fitzroy North and Princes Hill during a 1% AEP (100yr ARI) event. Some localised short-duration isolation may occur due to flash flooding.

Essential Infrastructure

During an event, see the Public Transport Victoria's Website for details on delays or alterations to services. <http://ptv.vic.gov.au/live-travel-updates/>. A map of Public Transport routes within the City of Yarra is available via the website at: https://www.ptv.vic.gov.au/assets/default-site/more/maps/Local-area-maps/Metropolitan/d3c974aa39/Melbourne_LAM-v2.pdf

Tramlines on Route 86 on Smith Street and Routes 11 and 112 on Brunswick Street between Westgarth Street and Eastern Highway are subject to flooding above 300mm depth in a 1% AEP (100yr ARI) rainfall event.

During an event, see the Public Transport Victoria's Website for details on delays or alterations to services. <http://ptv.vic.gov.au/live-travel-updates/>

Apart from the roads outlined below, all other essential infrastructure and services areas around Carlton North, Fitzroy north and Princes Hill are expected to remain unaffected by flooding during a 1% AEP (100yr ARI) event.

Road Closures

The following roads are subject to closure during flooding around Carlton North, Collingwood, Fitzroy North and Princes Hill. Check the Department of Transport (VicRoads) website for more details: <https://traffic.vicroads.vic.gov.au/>

Department of Transport (VicRoads) Roads flooded in a 1% AEP (100yr ARI) event
• Eastern Freeway, Clifton Hill at Hoddle Street underpass
• Alexandra Parade, Fitzroy between Fitzroy Street and Smith Street
• Hoddle Street, Collingwood, between Little Abbott Street and Hotham Street
• Nicholson Street, Carlton North, northbound between Princes Street and Church Street
• Queens Parade, Fitzroy North, eastbound between Alexandra Avenue and George Street

Table C3.4 – Department of Transport (VicRoads) Possible Road Closures during a flooding event

Yarra City Council Roads flooded in a 1% AEP (100yr ARI) event			
CARLTON NORTH	COLLINGWOOD		
• Amess Street	• Blanche Street	• Mater Street	• Westgarth Street
• Canning Street	• Budd Street	• Wellington Street	• Young Street
• Fenwick Street	• Charlotte Street	FITZROY	FITZROY NORTH
• MacPherson Street	• Easey Street	• Brunswick Street	• Fergie Street
• Mary Street	• Emma Street	• Cecil Street	• George Street
• Richardson Street	• Gold Street	• Fitzroy Street	• Jamiesons Street
• Station Street	• Hoddle Street (Slip)	• George Street	PRINCES HILL
• Taplin Place	• Hotham Street	• Gore Street	• Garton Street
	• Keele Street	• Napier Street	• Pigdon Street
	• Little Abbott Street	• Smith Street	• Wilson Street

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

Flood Mitigation

No formal Retarding Basins, Pumping Stations or Levees currently exist around Carlton North, Collingwood, Fitzroy North and Princes Hill in Yarra.

Command, Control and Coordination

VICSES will assume overall control of the response to flood incidents. Other agencies will be requested to support operations as detailed in this Plan. Control and coordination of a flood incident shall be carried out at the lowest effective level and in accordance with the State Emergency Response Plan (EMMV Part 3). During significant events, VICSES will conduct incident management using multi-agency resources.

Flood Impacts & Operational Considerations (Intelligence Cards)

The tables on the following pages provide a breakdown of the possible consequences of flash flooding along the stormwater drains around Carlton North, Fitzroy North, Fitzroy and Collingwood at various rain totals within the City of Yarra. 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:

- Carlton North, Fitzroy North, Fitzroy and Collingwood Stormwater Drains

FLOOD INTELLIGENCE CARD – Carlton North, Fitzroy North, Fitzroy & Collingwood Stormwater Drains (UNGAUGED)

Version 4 – January 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.

CLOSEST RAIN GAUGE	Merri Creek at Northcote
LOCATION	East side of the creek in Green Reserve at end of Union St, Northcote
MELWAY REF:	30 D10

GAUGE NUMBER	229149A
GAUGE TYPE	Stream Level & Rain
TELEMETRIC/MANUAL	Telemetric

Design Rainfall Depths (mm) – Indication of Possible Flooding	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
11mm in 10 mins; 19mm in 30 mins; 25mm in 1 hour; 32mm in 2 hours; 46mm in 6 hours; or 59mm 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 (Above Floor Level) 7 Properties in Total Alexandra Parade Main Drain <ul style="list-style-type: none"> • 26 Fenwick Street, Carlton North • 366, 368-370, Ground-floor Units of 491-497, 499-501 & 503 Nicholson Street, Carlton North • 70-76 Westgarth Street, Fitzroy Water Over Road (Moderate to High Flood Hazard Rating) Alexandra Parade Main Drain <ul style="list-style-type: none"> • Nicholson Street, Carlton North Alexandra Parade Relief Drain <ul style="list-style-type: none"> • Cecil Street, Fitzroy 	
13mm in 10 mins; 22mm in 30 mins; 29mm in 1 hour; 36mm in 2 hours; 53mm in 6 hours; or	10% AEP (10 year ARI)	Properties at Flood Risk (Above Floor Level) 17 Properties in Total Fitzroy North Main Drain <ul style="list-style-type: none"> • 1020 Lygon Street, Carlton North Alexandra Parade Main Drain <ul style="list-style-type: none"> • 429-431 Brunswick Street, Fitzroy 	

Design Rainfall Depths (mm) – Indication of Possible Flooding	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
<p>66mm in 12 hours</p> <p>Note: rainfall depths are a very rough method of estimating flood events and have been used due to the ungagged nature of the catchment. This should be used as a guide only.</p>		<ul style="list-style-type: none"> • 104 Cecil Street, Fitzroy • 20, 26 Fenwick Street, Carlton North • 366, 368-370, 487-489, Ground-floor Units of 491-497, 499-501 & 503 Nicholson Street, Carlton North • 91 & 213 Pigdon Street, Carlton North • 82 Richardson Street, Carlton North • 334 Station Street, Carlton North • 70-76 Westgarth Street, Fitzroy <p>Fitzroy North Main Drain</p> <ul style="list-style-type: none"> • 537-541 George Street, Fitzroy North <p>Water Over Road (Moderate to High Flood Hazard Rating)</p> <p>Alexandra Parade Main Drain</p> <ul style="list-style-type: none"> • Nicholson Street, Carlton North • Pigdon Street, Princes Hill <p>Alexandra Parade Relief Drain</p> <ul style="list-style-type: none"> • Cecil Street, Fitzroy 	
<p>16mm in 10 mins; 26mm in 30 mins; 34mm in 1 hour; 43mm in 2 hours; 61mm in 6 hours; or 77mm in 12 hours</p> <p>Note: rainfall depths are a very rough method of estimating flood events and have been used due to the ungagged nature of the catchment. This should be used as a guide only.</p>	<p>5% AEP (20 year ARI)</p>	<p>Properties at Flood Risk (Above Floor Level)</p> <p>121 Properties in Total</p> <p>Lygon Street Main Drain</p> <ul style="list-style-type: none"> • 973, 975, 977, 979, 981 & 993 Drummond Street, Carlton North • 701, 1020 & Ground-floor Units of 1072 Lygon Street, Carlton North • 949 Rathdowne Street, Carlton North <p>Alexandra Parade Main Drain</p> <ul style="list-style-type: none"> • 1, 5-9, 72, 88 & 90 Alexandra Parade, Fitzroy • 202 Amess Street, Carlton North • 5 & 7 Blanche Street, Collingwood • 401, 411, 419, 421, 423A, 423B & 429-431 Brunswick Street, Fitzroy • 40, 42, 46, 48, 50, 52 & 54 Budd Street, Collingwood • 435 & 454 Canning Street, Carlton North • 104, 124, 128, 130 & 1/132 Cecil Street • 10, 12, 14, 16, 18 & 26 Emma Street, Collingwood • 20 & 26 Fenwick Street, Carlton North • 41 Gold Street, Collingwood • 33-37, 34, 34A, 34B, 36, 36A, 36B, 36C & 45-47 Hotham Street, Collingwood • 44, 54, 58, 64-68, 66, 78, 80 & 97 Keele Street, Collingwood • 112 Leicester Street, Fitzroy • 31-33 MacPherson Street, Carlton North • 1, 12-12A & 15 Mater Street, Collingwood • Ground-floor Units of 443 Napier Street 	

Design Rainfall Depths (mm) – Indication of Possible Flooding	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		<ul style="list-style-type: none"> • 366, 368-370, 475, 487-489, Ground-floor Units of 491-497, 499-501 & 503 Nicholson Street, Carlton North • 91, 140 & 213 Pigdon Street, Carlton North • 82 Richardson Street, Carlton North • 464 & 484 Smith Street, Collingwood • 21 St Georges Road, Fitzroy North • 329, 334, 386 & 446 Station Street, Carlton North • 267, 273-277, 279, 281, 283-285, 287, 289, 315, 322-324, 326, 328, 330 & Ground-floor Units of 350 Wellington Street, Collingwood • 70-76, 95, Ground-floor Units of 97 & 140 Westgarth Street, Fitzroy • 334, 346 & 348 Young Street, Fitzroy <p>North Fitzroy Main Drain</p> <ul style="list-style-type: none"> • 161, 167, 169, 171, 173 & 175-177 Alexandra Parade, Fitzroy North • 537-541 George Street, Fitzroy North • 32, 33 & 34 Jamieson Street, Fitzroy North • Ground-floor Units of 88 Queens Parade <p>Water Over Road (Moderate to High Flood Hazard Rating)</p> <p>Alexandra Parade Main Drain</p> <ul style="list-style-type: none"> • Nicholson Street, Carlton North • Pigdon Street, Princes Hill • Station Street, Carlton North <p>Alexandra Parade Relief Drain</p> <ul style="list-style-type: none"> • Cecil Street, Fitzroy • Fitzroy Street, Fitzroy <p>North Fitzroy Main Drain</p> <ul style="list-style-type: none"> • George Street, Fitzroy North 	
<p>19mm in 10 mins; 32mm in 30 mins; 42mm in 1 hour; 52mm in 2 hours; 73mm in 6 hours; or 91mm in 12 hours</p> <p>Note: rainfall depths are a very rough method of estimating flood events and have been used due to the untagged nature of the catchment. This</p>	<p>2% AEP (50 year ARI)</p>	<p>Properties at Flood Risk (Above Floor Level)</p> <p>329 Properties in Total</p> <p>Lygon Street Main Drain</p> <ul style="list-style-type: none"> • 963, 967, 973, 975, 977, 979, 981, 985, 989, 993, Units 1-7/999 & Ground-floor Units of 1011 Drummond Street, Carlton North • 701, 1020 & Ground-floor Units of 1072 Lygon Street, Carlton North • 644-646, 941, 949, 967, 969, 971 & Ground-floor Units of 981-985 Rathdowne Street, Carlton North <p>Alexandra Parade Main Drain</p> <ul style="list-style-type: none"> • 1 & 5-9 Alexandra Parade, Collingwood • 66, 68, 72, 84, 88, 90 & 200-220 Alexandra Parade, Fitzroy • 136, 144, 154, 158, 160, 168, 170, 197, 202, 205 & 212 Amess Street, Carlton North • 2A, 2B & 2D Ballarat Street, Collingwood • 1, 2, 3A, 5, 7, 9, 9A & 17 Blanche Street, Collingwood 	

Design Rainfall Depths (mm) – Indication of Possible Flooding	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
should be used as a guide only.		<ul style="list-style-type: none"> • 401, 411, 412, 416-418, 417, 419, 420, 421, 422, 423A, 423B, 424-428, 429-431, 435-437, 451, 451B & 451C Brunswick Street, Fitzroy • 40, 42, 46, 48, 50, 52, 54, 61, 63 & 65 Budd Street, Collingwood • 435, 436, 454, 462, 464 & 466 Canning Street, Carlton North • Ground-floor Units of 7-11, 55, 76, 88, 104, 107, 124, 126, 128, 130 & Units 1-4/132 Cecil Street, Fitzroy • 14 Charlotte Street, Collingwood • 18 Curtain Street, Carlton North • 83A, Ground-floor Units of 100-108, 138 & Ground-floor Units of 160-166 Easey Street, Collingwood • 10, 12, 14, 16, 18 & 26 Emma Street, Collingwood • 12, 20, 26, 46 & 48 Fenwick Street, Carlton North • 483 George Street, Fitzroy • 4-6, 8, 4/11-17, 21, 23, 25, 30, 34, 36, 41, 43, 48, 50, 52, 54, 62 & 63 Gold Street, Collingwood • 292, 11, 20, 22, 27, 28, 31, 33-37, 34, 34A, 34B, 36, 36A, 36B, 36C, 45-47, 62, 64, 68, 69, 78, 82, 84, 101, 137, 137A & Ground-floor Units of 147-149 Hotham Street, Collingwood • 44, 54, 58, 60, 64-68, 65-69, 66, 73, 74, 75, 77, 78, 80, 82, 85, 88, 97, 102, 104, 105, 107, 108, 121, 123, 125, 127, 129, 131, 135, 149, 151, 153, 155, 157, 159, 161 & 177 Keele Street, Collingwood • 68 Keeley Lane, Princes Hill • 18-20 Lee Street, Carlton North • 112 Leicester Street, Fitzroy • 31-33 MacPherson Street, Carlton North • 1, 12-12A, 14, 15, 16, 17, 18, 19, 20, 21 & Ground-floor Units of 30 Mater Street, Collingwood • 406, 420, 423, 441 & Ground-floor Units of 443 Napier Street, Fitzroy • 366, 368-370, 413-415, 475, 477-479, Units 1-2/477-481, 481, 487-489, Ground-floor Units of 491-497, 499-501 & 503 Nicholson Street, Carlton North • 91, 93, 95, 97, 99, 101, 103, 105, 140, 142, 144, Units 1-2/198, Units 1-3/200 & 213 Pigdon Street, Princes Hill • 82 Richardson Street, Carlton North • 93, 99-101 & 115 Sackville Street, Collingwood • 464 & 484 Smith Street, Collingwood • 2-4, 18, 21, 22, 27, 28 & 30 St Georges Road, Fitzroy North • 329, 330, 332, 334, 384, 386, 392, 423, 425 & 446 Station Street, Carlton North • 267, 273-277, 279, 281, 283-285, 287, 289, 315, 322-324, 326, 327, 328, 330, Ground-floor Units of 350, 354, 356, 358, 360 & 362 Wellington Street, Collingwood • 70-76, 82, 1/93, 95, Ground-floor Units of 97, 121 & 140 Westgarth Street, Fitzroy • 334, 341, 344, 345, 346 & 348 Young Street 	

Design Rainfall Depths (mm) – Indication of Possible Flooding	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		<p>North Fitzroy Main Drain</p> <ul style="list-style-type: none"> • 157A, 161, 163, 165, 167, 169, 171, 173 & 175-177 Alexandra Parade, Fitzroy North • 2 & 2A Fergie Street, Fitzroy North • 537-541 George Street, Fitzroy North • 32, 33 & 34 Jamieson Street, Fitzroy North • 79, 81-89, Ground-floor Units of 88 & 111 Queens Parade, Fitzroy North <p>Community Infrastructure Likely Flooded</p> <p>Alexandra Parade Relief Drain</p> <ul style="list-style-type: none"> • Gold Street Child Care Centre, Gold Street, Collingwood, road approaches flooded • Gold Street Children’s Centre, Keele Street, Collingwood, flooded • Main Yarra Trail, walking track near Dights Falls flooded <p>Alexandra Parade Main Drain</p> <ul style="list-style-type: none"> • North Carlton Children’s Centre, Canning Street, Carlton North, road approach flooded <p>Essential Infrastructure Likely Impacted</p> <p>Alexandra Parade Relief Drain</p> <ul style="list-style-type: none"> • Tramlines on Route 86 on Smith Street between Westgarth Street and Eastern Highway <p>Water Over Road (Moderate to High Flood Hazard Rating)</p> <p>Alexandra Parade Main Drain</p> <ul style="list-style-type: none"> • Amess Street, Carlton North • Fenwick Street, Carlton North • Nicholson Street, Carlton North • Pigdon Street, Princes Hill • Richardson Street, Carlton North • Station Street, Carlton North <p>Alexandra Parade Relief Drain</p> <ul style="list-style-type: none"> • Blanche Street, Collingwood • Budd Street, Collingwood • Cecil Street, Fitzroy • Eastern Highway, Fitzroy • Emma Street, Collingwood • Fitzroy Street, Fitzroy • Gold Street, Collingwood • Hotham Street, Collingwood • Keele Street, Collingwood • Little Abbott Street, Collingwood • Westgarth Street, Fitzroy <p>North Fitzroy Main Drain</p> <ul style="list-style-type: none"> • George Street, Fitzroy North 	

Design Rainfall Depths (mm) – Indication of Possible Flooding	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		<ul style="list-style-type: none"> Jamieson Street, Fitzroy North Queens Parade, Fitzroy North 	
<p>22mm in 10 mins; 37mm in 30 mins; 48mm in 1 hour; 60mm in 2 hours; 83mm in 6 hours; or 102mm in 12 hours</p> <p>Note: rainfall depths are a very rough method of estimating flood events and have been used due to the ungagged nature of the catchment. This should be used as a guide only.</p>	1% AEP (100-year ARI)	<p>Properties at Flood Risk (Above Floor Level)</p> <p>640 Properties in Total</p> <p>Lygon Street Main Drain</p> <ul style="list-style-type: none"> 957, 963, 967, 973, 975, 977, 979, 981, 985, 989, 993, 994, Units 1-7/999, 1002 & Ground-floor Units of 1011 Drummond Street, Carlton North 697, 701, 1016, 1018, 1020 & Ground-floor Units of 1072 Lygon Street, Carlton North 2/31 Mary Street, Carlton North 632, 634, 644-646, 941, 949, 967, 969, 971, 977, 979 & Ground-floor Units of 981-985 Rathdowne Street, Carlton North <p>Alexandra Parade Main Drain</p> <ul style="list-style-type: none"> 1, 4, 8 & 10 Alexander Street, Collingwood 1, 5-9 & 25 Alexandra Parade, Collingwood 64, 66, 68, 72, 84, 88, 90, 120-122 & 200-220 Alexandra Parade, Fitzroy 96, 131, 136, 144, 154, 156, 158, 160, 162, 164, 168, 170, 172, 174, 176, 178, 180, 192, 194, 196, 197, 202, 203, 205, 210, 212 & 214 Amess Street, Carlton North 2A, 2B, 2C & 2D Ballarat Street, Collingwood 1 Bendigo Street, Collingwood 1, 2, 3A, 5, 7, 9, 9A, 15 & 17 Blanche Street, Collingwood 401, 404, 409, 409A, 411, 412, 414, 415, 416-418, 417, 419, 420, 421, 422, 423A, 423B, 424-428, 425, 427, 429-431, 433, 435-437, 439, 441, 451, 451B & 451C Brunswick Street, Fitzroy 40, 42, 46, 48, 50, 52, 54, 58, Units 1-6/60, 61, 62, 63, 65 & 67 Budd Street, Collingwood 420, 434, 435, 436, 454, 462, 464, 466, 481, 481A, 513, 517, 521, 523, 529 & 539 Canning Street, Carlton North Ground-floor Units of 7-11, 55, 57, 76, 79, 81, 88, 101, 104, 107, Ground-floor Units of 113, 124, 126, 128, 130 & Units 1-4/132 Cecil Street, Fitzroy 10 & 14 Charlotte Street, Collingwood 7 & 18 Curtain Street, Carlton North 64, 83A, Ground-floor Units of 92, 97, Ground-floor Units of 100-108, 112, 114, 115, 120, 122, 124, 124A, 126, 128, 138, 154, 156, 158, Ground-floor Units of 160-166 & 168 Easey Street, Collingwood 4, 10, 12, 14, 16, 18, 26 & 35-53 Emma Street, Collingwood 12, 16, 20, 26, 28, 46 & 48 Fenwick Street, Carlton North 2, 3, 4, 6 & Ground-floor Units of 8 Forest Street, Collingwood Ground-floor Units of 126 Garton Street, Princes Hill 4/475, 479, 481 & 483 George Street, Fitzroy 	

Design Rainfall Depths (mm) – Indication of Possible Flooding	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		<ul style="list-style-type: none"> • 4-6, 8, 10, Units 1-4/11-17, 12A, 19, 21, Ground-floor Units of 22-24, 23, 25, 30, 33-35, 34, 36, 38, 39, 40, 41, 43, 48, 50, 52, 54, 60, 62 & 63 Gold Street, Collingwood • 481 Gore Street, Fitzroy • 292, 294, Ground-floor Units of 375, 2, 6, 11, 16, 18, 20, 21, 22, 23, 25, 26, 27, 28, 29, 31, 32, 33-37, 34, 34A, 34B, 36, 36A, 36B, 36C, 38, 40, 42, 44, 45-47, 48-50, 52, 54, 56, 59, 61, 62, 64, 65A, 68, 69, 74, 78, 82, 84, 86, 88, 89, 90, 91, 99, 101, 113, 117, 119, 121, 123, 125, 127, 129, 133, 135, 137, 137A, 139, Ground-floor Units of 147-149, 151, 155 & 1/159 Hotham Street, Collingwood • 116-120 Johnston Street, Collingwood • 44, 50, 52, 54, 55, 58, 60, 64-68, 65-69, 66, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 85, 86A, 88, 93, 97, 102, 104, 105, 107, 108, 109, 110, 112, 117, 121, 123, 125, 127, 129, 131, 133, 134, 135, 136, 137, 138, 139, 140, 145, 147, 149, 151, 153, 155, 157, 159, 161, 163, 167, 170, 172, 174, 175, 176, 177, 178, 179A, 179B, 180 & 182 Keele Street, Collingwood • 68 Keeley Lane, Princes Hill • 18-20 Lee Street, Carlton North • 110, 112, 151 & 153 Leicester Street, Fitzroy • 24, 31-33 & 35 MacPherson Street, Carlton North • 1, 12-12A, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, Ground-floor Units of 30, 61 & 63 Mater Street, Collingwood • 403, 406, 411, 418, 420, 422, 423, 424, 426, 428, 433, 436, 437, 441 & Ground-floor Units of 443 Napier Street, Fitzroy • 16 Newry Street, Carlton North • 361-363, 365, 366, 367-369, 368-370, 410, 412, 413-415, 414, Ground-floor Units of 427-437, 443-445, 457, 461, 465, 467, 471, 475, 477-479, Units 1-2/477-481, 481, 487-489, Ground-floor Units of 491-497, 499-501, 503 & 505 Nicholson Street, Carlton North • 2 Percy Street, Fitzroy North • 75, 77, 91, 93, 95, 97, 99, 101, 103, 105, 140, 142, 144, Units 1-2/198, Units 1-3/200, 211, 213 & 297 Pigdon Street, Princes Hill • 82 Richardson Street, Carlton North • 93, 99-101, 104, 106, Units 2-4/108, 115, 130-132 & 151 Sackville Street, Collingwood • 163 Scotchmer Street, Fitzroy North • 423, 425, 428-430, Units 1-2/432, 434, 438, 440, 462, 464, 472-478 & 484 Smith Street, Collingwood • 2-4, 18, 21, 22, 24, 26, 27, 28, 30 & 32 St Georges Road, Fitzroy North • 328, 329 330, 332, 334, 336, 371, 382, 384, 386, 392, 400-402, 421, 423, 425, 427, 446, 463 & 465 Station Street, Carlton North • 263, 267, 273-277, 279, 281, 283-285, 287, 289, 2/297, 4/297, 315, 317, 319, 321, 322-324, 323, 326, 327, 328, 329, 330, Ground-floor Units of 332-336, Ground-floor Units of 350, 354, 356, 358, 360, 362 & 364-368 Wellington Street, Collingwood 	

Design Rainfall Depths (mm) – Indication of Possible Flooding	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		<ul style="list-style-type: none"> • 64, 69, 70-76, 82, 1/93, 95, Ground-floor Units of 97, 99, 121, 123, 127, 129, 132, 140, 146 & 151 Westgarth Street, Fitzroy • 333, 334, 335, 337, 339, 341, 343, 344, 345, 346, 347 & 348 Young Street <p>North Fitzroy Main Drain</p> <ul style="list-style-type: none"> • 157A, 159, 161, 163, 165, 167, 169, 171, 173 & 175-177 Alexandra Parade, Fitzroy North • 13 Alfred Crescent, Fitzroy North • 2, 2A, 6, 24 & 28 Fergie Street, Fitzroy North • 537-541 George Street, Fitzroy North • 9, 32, 33, 34, 55, 56, 57, 58, 59, 60, Ground-floor Units of 61, 62, 63, 64 & 65 Jamieson Street, Fitzroy North • 4 & 19 McKean Street, Fitzroy North • 514 & Ground-floor Units of 540 Napier Street, Fitzroy North • 71, 79, 81-89, Ground-floor Units of 88 & 111 Queens Parade, Fitzroy North <p>Community Infrastructure Likely Flooded</p> <p>Alexandra Parade Relief Drain</p> <ul style="list-style-type: none"> • Gold Street Child Care Centre, Gold Street, Collingwood, road approaches flooded • Gold Street Children’s Centre, Keele Street, Collingwood, flooded • Main Yarra Trail, footbridge and track near Dights Falls flooded <p>Alexandra Parade Main Drain</p> <ul style="list-style-type: none"> • North Carlton Children’s Centre, Canning Street, Carlton North, road approach flooded <p>Essential Infrastructure Likely Impacted</p> <p>Alexandra Parade Relief Drain</p> <ul style="list-style-type: none"> • Tramlines on Route 86 on Smith Street between Westgarth Street and Eastern Highway • Tramlines on Routes 11 and 112 on Brunswick Street between Westgarth Street and Eastern Highway <p>Water Over Road (Moderate to High Flood Hazard Rating)</p> <p>Alexandra Parade Main Drain</p> <ul style="list-style-type: none"> • Amess Street, Carlton North • Canning Street, Carlton North • Fenwick Street, Carlton North • MacPherson Street, Carlton North • Mary Street, Carlton North • Nicholson Street, Carlton North • Pigdon Street, Princes Hill • Richardson Street, Carlton North • Station Street, Carlton North • Taplin Place, Carlton North 	

Design Rainfall Depths (mm) – Indication of Possible Flooding	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		<p>Alexandra Parade Relief Drain</p> <ul style="list-style-type: none"> • Blanche Street, Collingwood • Budd Street, Collingwood • Cecil Street, Fitzroy • Eastern Highway, Fitzroy • Emma Street, Collingwood • Fitzroy Street, Fitzroy • George Street, Fitzroy • Gold Street, Collingwood • Hotham Street, Collingwood • Keele Street, Collingwood • Little Abbott Street, Collingwood • Mater Street, Collingwood • Wellington Street, Collingwood • Westgarth Street, Fitzroy <p>North Fitzroy Main Drain</p> <ul style="list-style-type: none"> • Fergie Street, Fitzroy North • George Street, Fitzroy North • Jamieson Street, Fitzroy North • Queens Parade, Fitzroy North 	

Table C3.6 – Breakdown of possible consequences at various rainfall intensities around Carlton North, Fitzroy North, Fitzroy and Collingwood with operational considerations

APPENDIX C4 – RICHMOND, BURNLEY and SOUTHERN COLLINGWOOD FLASH FLOOD EMERGENCY PLAN

Overview of Flooding Consequences

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) flash flood around Richmond, Burnley and Cremorne					
Property					
Properties	235				
Residential	171				
Commercial	64				
Industrial	0				
Public Land	0				
Rural	0				
Community Infrastructure					
Schools / Colleges	1	Richmond West Primary School			
Community Centre	1	Centre for Culture, Ethnicity & Health			
Essential Infrastructure					
Major Roads	3	Swan Street at Railway Underpass; Swan Street between Lord St and Edinburgh St and also east of Stawell Street; and Yarra Boulevard, Richmond at Melbourne Girls College			
Tram Routes	1	70 on Swan Street			
Tourism / Recreation					
Government Boundaries					
Local Gov't Areas	1	Yarra	CMA	1	Port Phillip & Westernport
Adjacent LGAs	0		CFA District	0	
SES Unit Area	1	Malvern	FRV District	1	Central

Table C4.1 – Consequence Summary of 1% AEP flash flood around Richmond, Burnley and southern Collingwood

High intensity, short duration rainfall events can cause flash flooding in Richmond, Burnley and Collingwood, affecting roads and properties, while prolonged rainfall events may cause the Yarra River to flood, affecting areas of Burnley in the immediate vicinity of the Yarra River (Yarra Municipal FEP 2012).

Drains in the area include Richmond Quarry Main Drain, flowing south from Swan Street to the Yarra River at Richmond Terminal Station, and Palmer Street Main Drain, which flows north along Church Street to the Yarra River and also southeast from Church Street, discharging into the Yarra River north of the Hawthorn Bridge.

High Intensity, short duration rainfall events can cause flash flooding in and around this region. The Drainage System is generally designed to give 10% AEP (10yr ARI) protection across Yarra. Events greater than 10% AEP may see overflows across residential roads and properties. Glass Street in

Richmond and Peel Street in Collingwood have been impacted in historical flood events and show an elevated flood risk in recent flood modelling (Glass Street flood modelling, Engeny October 2019)

Warning Times

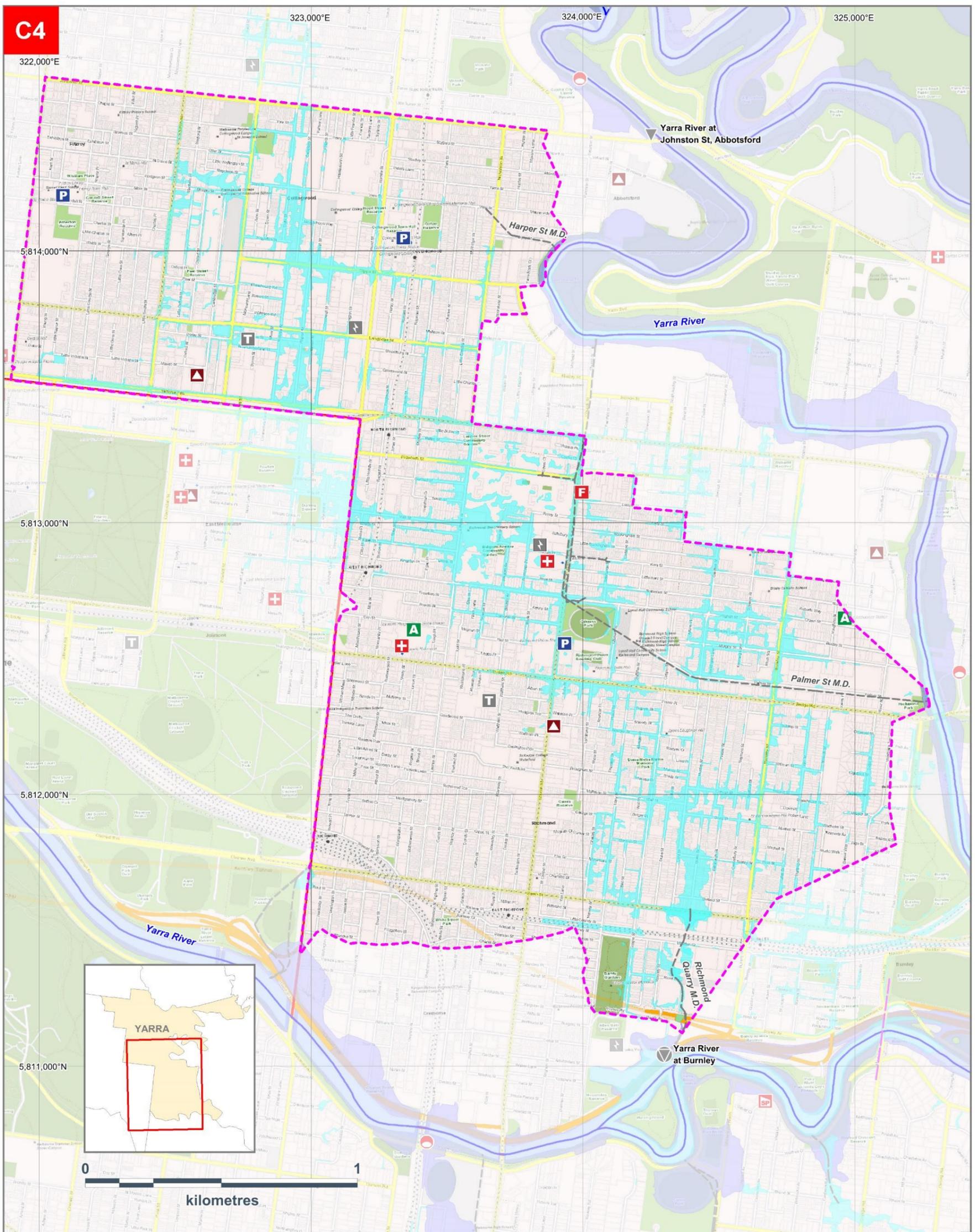
Warnings are available for flooding expected along the Yarra River at Burnley and Cremorne. For other hydrographic/telemetry (river gauges) within the Municipality, Melbourne Water does not provide any flood warning service at this point, due to the generally short warning times available.

Melbourne Water Gauges	Station No.	Location	Stream Level & Flow Gauge	Rain Gauge	Melway Reference
Yarra River at Hawthorn	229687A	North side of Channel at Glenferrie Road bridge under the Monash Fwy, Hawthorn	✓		45 A11
Yarra River at Burnley	229621A	North side of River and Freeway at SP AusNet Richmond Terminal Station, Richmond	✓	✓	58 G1

Table C4.2 – Gauges around Richmond, Burnley and Collingwood

These Gauges may provide some warning of expected flooding. See the Melbourne Water website for more information on these gauges: <http://www.melbournewater.com.au/waterdata/rainfallandriverleveldata/Pages/Rainfall-and-river-level-new.aspx>. It is advised that residents monitor the Bureau of Meteorology's website http://www.bom.gov.au/cgi-bin/wrap_fwo.pl?IDV60201.html and the VicEmergency website <https://emergency.vic.gov.au/> for any thunderstorm, flood or severe weather warnings present for their area.

Areas of Flood Risk around Richmond, Burnley and southern Collingwood



Map Produced by VICSES September 2020.



CITY OF YARRA

1% AEP (100yr ARI)
Flooding

C4. Areas of flood risk around Richmond, Collingwood and Fitzroy

- | | | |
|----------------------------------|---------------------------------|-------------------|
| Building | Aged Care Facility | Ambulance Station |
| Waterbody | 1% AEP Over-Floor Flooding Risk | Fire Station |
| 1% AEP Flash Flood Extent | Sewer Emergency Relief Point | Hospital |
| 1% AEP Riverine Flood Extent | Telephone Exchange | Police Station |
| Melbourne Water Stormwater Drain | Power Terminal Station | Rain Gauge |
| Flood Model Extent | Sewer Pumping Station | |
| Waterway | Stream Level Gauge | |

Basemap: Vicmap and Corporate Geospatial Library Information which is Copyright © State of Victoria, Department of Environment, Land, Water and Planning 2020.



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Figure C4 – Areas of flash flood risk around Richmond and southern Collingwood in the City of Yarra

Properties at Flood Risk

Properties listed in the table below are at risk from flash flooding around Richmond, Burnley and the southern parts of Collingwood. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Glass Street and Peel Street Catchment Analysis (Engeny, October 2019) and Richmond Quarry Main Drain (Melbourne Water) flood mapping and risk assessment programs as well as recent recorded flooding events. Note that any multi-lot properties situated above ground floor likely impacted by isolation only with flooding on ground floor impacting access to common areas and/or carpark and storage facilities. Information on above ground-floor properties is not available in this list.

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 Flash Flooding over 300mm depth around Richmond and Collingwood						
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 Beissel Street	Richmond	Glass Street Catchment	Flash
	✓	✓	3/48 Bell Street	Richmond	Glass Street Catchment	Flash
	✓	✓	4 Brown Street	Collingwood	Peel Street Catchment	Flash
	✓	✓	6 Brown Street	Collingwood	Peel Street Catchment	Flash
	✓	✓	8 Brown Street	Collingwood	Peel Street Catchment	Flash
	✓	✓	10 Brown Street	Collingwood	Peel Street Catchment	Flash
	✓	✓	12 Brown Street	Collingwood	Peel Street Catchment	Flash
	✓	✓	14 Brown Street	Collingwood	Peel Street Catchment	Flash
	✓	✓	16 Brown Street	Collingwood	Peel Street Catchment	Flash
	✓	✓	1 Campbell Street	Collingwood	Peel Street Catchment	Flash
	✓	✓	3 Campbell Street	Collingwood	Peel Street Catchment	Flash
✓	✓	✓	5-11 Campbell Street	Collingwood	Peel Street Catchment	Flash
	✓	✓	13 Campbell Street	Collingwood	Peel Street Catchment	Flash
	✓	✓	15 Campbell Street	Collingwood	Peel Street Catchment	Flash
✓	✓	✓	17 Campbell Street	Collingwood	Peel Street Catchment	Flash
✓	✓	✓	19 Campbell Street	Collingwood	Peel Street Catchment	Flash
✓	✓	✓	21 Campbell Street	Collingwood	Peel Street Catchment	Flash
		✓	23 Campbell Street	Collingwood	Peel Street Catchment	Flash
		✓	25 Campbell Street	Collingwood	Peel Street Catchment	Flash
		✓	27 Campbell Street	Collingwood	Peel Street Catchment	Flash
		✓	29 Campbell Street	Collingwood	Peel Street Catchment	Flash
		✓	31 Campbell Street	Collingwood	Peel Street Catchment	Flash
		✓	33 Campbell Street	Collingwood	Peel Street Catchment	Flash
		✓	35 Campbell Street	Collingwood	Peel Street Catchment	Flash
		✓	37 Campbell Street	Collingwood	Peel Street Catchment	Flash
		✓	39 Campbell Street	Collingwood	Peel Street Catchment	Flash
		✓	41 Campbell Street	Collingwood	Peel Street Catchment	Flash

Properties at risk from Flash Flooding over 300mm depth around Richmond and Collingwood

Properties at risk from Flash Flooding over 300mm depth around Richmond and Collingwood						
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				
		✓	43 Campbell Street	Collingwood	Peel Street Catchment	Flash
		✓	45 Campbell Street	Collingwood	Peel Street Catchment	Flash
		✓	47 Campbell Street	Collingwood	Peel Street Catchment	Flash
		✓	49 Campbell Street	Collingwood	Peel Street Catchment	Flash
		✓	51 Campbell Street	Collingwood	Peel Street Catchment	Flash
		✓	53 Campbell Street	Collingwood	Peel Street Catchment	Flash
		✓	55 Campbell Street	Collingwood	Peel Street Catchment	Flash
		✓	57 Campbell Street	Collingwood	Peel Street Catchment	Flash
		✓	59 Campbell Street	Collingwood	Peel Street Catchment	Flash
		✓	61 Campbell Street	Collingwood	Peel Street Catchment	Flash
	✓	✓	65 Charles Street	Richmond	Glass Street Catchment	Flash
		✓	67 Charles Street	Richmond	Glass Street Catchment	Flash
✓	✓	✓	71 Charles Street	Richmond	Glass Street Catchment	Flash
✓	✓	✓	73 Charles Street	Richmond	Glass Street Catchment	Flash
✓	✓	✓	109-111 Church Street	Richmond	Glass Street Catchment	Flash
✓	✓	✓	115-117 Church Street	Richmond	Glass Street Catchment	Flash
✓	✓	✓	27 Corsair Street	Richmond	Glass Street Catchment	Flash
✓	✓	✓	29 Corsair Street	Richmond	Glass Street Catchment	Flash
	✓	✓	51 Cromwell Street	Collingwood	Peel Street Catchment	Flash
	✓	✓	53 Cromwell Street	Collingwood	Peel Street Catchment	Flash
	✓	✓	55 Cromwell Street	Collingwood	Peel Street Catchment	Flash
	✓	✓	57 Cromwell Street	Collingwood	Peel Street Catchment	Flash
	✓	✓	59 Cromwell Street	Collingwood	Peel Street Catchment	Flash
		✓	1 Dight Street	Collingwood	Peel Street Catchment	Flash
✓	✓	✓	2 Dight Street	Collingwood	Peel Street Catchment	Flash
✓	✓	✓	4 Dight Street	Collingwood	Peel Street Catchment	Flash
✓	✓	✓	6 Dight Street	Collingwood	Peel Street Catchment	Flash
✓	✓	✓	8-10 Dight Street	Collingwood	Peel Street Catchment	Flash
✓	✓	✓	12 Dight Street	Collingwood	Peel Street Catchment	Flash
✓	✓	✓	14 Dight Street	Collingwood	Peel Street Catchment	Flash
✓	✓	✓	16 Dight Street	Collingwood	Peel Street Catchment	Flash
✓	✓	✓	18-20 Dight Street	Collingwood	Peel Street Catchment	Flash
✓	✓	✓	22 Dight Street	Collingwood	Peel Street Catchment	Flash
✓	✓	✓	24 Dight Street	Collingwood	Peel Street Catchment	Flash
✓	✓	✓	26 Dight Street	Collingwood	Peel Street Catchment	Flash
✓	✓	✓	28 Dight Street	Collingwood	Peel Street Catchment	Flash
✓	✓	✓	30 Dight Street	Collingwood	Peel Street Catchment	Flash
✓	✓	✓	32 Dight Street	Collingwood	Peel Street Catchment	Flash
✓	✓	✓	34 Dight Street	Collingwood	Peel Street Catchment	Flash
✓	✓	✓	36 Dight Street	Collingwood	Peel Street Catchment	Flash
✓	✓	✓	38 Dight Street	Collingwood	Peel Street Catchment	Flash
✓	✓	✓	40A Dight Street	Collingwood	Peel Street Catchment	Flash

Properties at risk from Flash Flooding over 300mm depth around Richmond and Collingwood

Properties at risk from Flash Flooding over 300mm depth around Richmond and Collingwood						
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				
✓	✓	✓	40 Dight Street	Collingwood	Peel Street Catchment	Flash
✓	✓	✓	42 Dight Street	Collingwood	Peel Street Catchment	Flash
✓	✓	✓	50 Dight Street	Collingwood	Peel Street Catchment	Flash
✓	✓	✓	52A Dight Street	Collingwood	Peel Street Catchment	Flash
✓	✓	✓	52 Dight Street	Collingwood	Peel Street Catchment	Flash
✓	✓	✓	54B Dight Street	Collingwood	Peel Street Catchment	Flash
✓	✓	✓	54A Dight Street	Collingwood	Peel Street Catchment	Flash
✓	✓	✓	54 Dight Street	Collingwood	Peel Street Catchment	Flash
		✓	54 Edinburgh Street	Richmond	Glass Street Catchment	Flash
		✓	54A Edinburgh Street	Richmond	Glass Street Catchment	Flash
		✓	56 Edinburgh Street	Richmond	Glass Street Catchment	Flash
		✓	58 Edinburgh Street	Richmond	Glass Street Catchment	Flash
		✓	60 Edinburgh Street	Richmond	Glass Street Catchment	Flash
		✓	62 Edinburgh Street	Richmond	Glass Street Catchment	Flash
		✓	64 Edinburgh Street	Richmond	Glass Street Catchment	Flash
		✓	66 Edinburgh Street	Richmond	Glass Street Catchment	Flash
	✓	✓	70 Edinburgh Street	Richmond	Glass Street Catchment	Flash
		✓	10 Francis Street	Richmond	Glass Street Catchment	Flash
		✓	12 Francis Street	Richmond	Glass Street Catchment	Flash
		✓	14 Francis Street	Richmond	Glass Street Catchment	Flash
✓	✓	✓	48-50 Gipps Street	Collingwood	Peel Street Catchment	Flash
	✓	✓	52 Gipps Street	Collingwood	Peel Street Catchment	Flash
		✓	58A Gipps Street	Collingwood	Peel Street Catchment	Flash
	✓	✓	58 Gipps Street	Collingwood	Peel Street Catchment	Flash
		✓	60-66 Gipps Street	Collingwood	Peel Street Catchment	Flash
		✓	63-67 Gipps Street	Collingwood	Peel Street Catchment	Flash
		✓	70-76 Gipps Street	Collingwood	Peel Street Catchment	Flash
		✓	78 Gipps Street	Collingwood	Peel Street Catchment	Flash
	✓	✓	24 Glass Street	Richmond	Glass Street Catchment	Flash
	✓	✓	31 Glass Street	Richmond	Glass Street Catchment	Flash
	✓	✓	1/32 Glass Street	Richmond	Glass Street Catchment	Flash
	✓	✓	2/32 Glass Street	Richmond	Glass Street Catchment	Flash
	✓	✓	33 Glass Street	Richmond	Glass Street Catchment	Flash
	✓	✓	34 Glass Street	Richmond	Glass Street Catchment	Flash
	✓	✓	35 Glass Street	Richmond	Glass Street Catchment	Flash
	✓	✓	36 Glass Street	Richmond	Glass Street Catchment	Flash
	✓	✓	37 Glass Street	Richmond	Glass Street Catchment	Flash
	✓	✓	38 Glass Street	Richmond	Glass Street Catchment	Flash
	✓	✓	39 Glass Street	Richmond	Glass Street Catchment	Flash
	✓	✓	40 Glass Street	Richmond	Glass Street Catchment	Flash
	✓	✓	41 Glass Street	Richmond	Glass Street Catchment	Flash

Properties at risk from Flash Flooding over 300mm depth around Richmond and Collingwood

Properties at risk from Flash Flooding over 300mm depth around Richmond and Collingwood						
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				
	✓	✓	42 Glass Street	Richmond	Glass Street Catchment	Flash
	✓	✓	43 Glass Street	Richmond	Glass Street Catchment	Flash
	✓	✓	43A Glass Street	Richmond	Glass Street Catchment	Flash
✓	✓	✓	44 Glass Street	Richmond	Glass Street Catchment	Flash
	✓	✓	45 Glass Street	Richmond	Glass Street Catchment	Flash
✓	✓	✓	46 Glass Street	Richmond	Glass Street Catchment	Flash
	✓	✓	47 Glass Street	Richmond	Glass Street Catchment	Flash
✓	✓	✓	48 Glass Street	Richmond	Glass Street Catchment	Flash
	✓	✓	49 Glass Street	Richmond	Glass Street Catchment	Flash
✓	✓	✓	50 Glass Street	Richmond	Glass Street Catchment	Flash
	✓	✓	51 Glass Street	Richmond	Glass Street Catchment	Flash
✓	✓	✓	52 Glass Street	Richmond	Glass Street Catchment	Flash
	✓	✓	53 Glass Street	Richmond	Glass Street Catchment	Flash
✓	✓	✓	60 Glass Street	Richmond	Glass Street Catchment	Flash
✓	✓	✓	62 Glass Street	Richmond	Glass Street Catchment	Flash
✓	✓	✓	1/63 Glass Street	Richmond	Glass Street Catchment	Flash
✓	✓	✓	2/63 Glass Street	Richmond	Glass Street Catchment	Flash
✓	✓	✓	3/63 Glass Street	Richmond	Glass Street Catchment	Flash
✓	✓	✓	4/63 Glass Street	Richmond	Glass Street Catchment	Flash
✓	✓	✓	101/63 Glass Street	Richmond	Glass Street Catchment	Flash
✓	✓	✓	102/63 Glass Street	Richmond	Glass Street Catchment	Flash
✓	✓	✓	103/63 Glass Street	Richmond	Glass Street Catchment	Flash
✓	✓	✓	104/63 Glass Street	Richmond	Glass Street Catchment	Flash
✓	✓	✓	105/63 Glass Street	Richmond	Glass Street Catchment	Flash
✓	✓	✓	106/63 Glass Street	Richmond	Glass Street Catchment	Flash
✓	✓	✓	107/63 Glass Street	Richmond	Glass Street Catchment	Flash
✓	✓	✓	201/63 Glass Street	Richmond	Glass Street Catchment	Flash
✓	✓	✓	202/63 Glass Street	Richmond	Glass Street Catchment	Flash
✓	✓	✓	203/63 Glass Street	Richmond	Glass Street Catchment	Flash
✓	✓	✓	204/63 Glass Street	Richmond	Glass Street Catchment	Flash
✓	✓	✓	205/63 Glass Street	Richmond	Glass Street Catchment	Flash
✓	✓	✓	206/63 Glass Street	Richmond	Glass Street Catchment	Flash
✓	✓	✓	301/63 Glass Street	Richmond	Glass Street Catchment	Flash
✓	✓	✓	302/63 Glass Street	Richmond	Glass Street Catchment	Flash
✓	✓	✓	64 Glass Street	Richmond	Glass Street Catchment	Flash
		✓	89 Hoddle Street	Richmond	Glass Street Catchment	Flash
		✓	95 Hoddle Street	Richmond	Glass Street Catchment	Flash
		✓	14 Lennox Street	Richmond	Glass Street Catchment	Flash
	✓	✓	23 Lennox Street	Richmond	Glass Street Catchment	Flash
		✓	25 Lennox Street	Richmond	Glass Street Catchment	Flash
		✓	30-32 Lennox Street	Richmond	Glass Street Catchment	Flash
	✓	✓	42 Lennox Street	Richmond	Glass Street Catchment	Flash

Properties at risk from Flash Flooding over 300mm depth around Richmond and Collingwood

Properties at risk from Flash Flooding over 300mm depth around Richmond and Collingwood						
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				
		✓	44 Lennox Street	Richmond	Glass Street Catchment	Flash
	✓	✓	88 Lennox Street	Richmond	Glass Street Catchment	Flash
	✓	✓	90 Lennox Street	Richmond	Glass Street Catchment	Flash
	✓	✓	84A Lord Street	Richmond	Glass Street Catchment	Flash
		✓	84B Lord Street	Richmond	Glass Street Catchment	Flash
		✓	84 Lord Street	Richmond	Glass Street Catchment	Flash
		✓	86 Lord Street	Richmond	Glass Street Catchment	Flash
		✓	88 Lord Street	Richmond	Glass Street Catchment	Flash
		✓	90 Lord Street	Richmond	Glass Street Catchment	Flash
		✓	106 Lord Street	Richmond	Glass Street Catchment	Flash
		✓	108 Lord Street	Richmond	Glass Street Catchment	Flash
		✓	110 Lord Street	Richmond	Glass Street Catchment	Flash
		✓	112 Lord Street	Richmond	Glass Street Catchment	Flash
		✓	114 Lord Street	Richmond	Glass Street Catchment	Flash
		✓	116 Lord Street	Richmond	Glass Street Catchment	Flash
		✓	118 Lord Street	Richmond	Glass Street Catchment	Flash
		✓	120 Lord Street	Richmond	Glass Street Catchment	Flash
		✓	122 Lord Street	Richmond	Glass Street Catchment	Flash
		✓	124 Lord Street	Richmond	Glass Street Catchment	Flash
		✓	126 Lord Street	Richmond	Glass Street Catchment	Flash
		✓	128 Lord Street	Richmond	Glass Street Catchment	Flash
		✓	131 Lord Street	Richmond	Glass Street Catchment	Flash
		✓	137 Lord Street	Richmond	Glass Street Catchment	Flash
	✓	✓	147 Lord Street	Richmond	Glass Street Catchment	Flash
✓	✓	✓	155 Lord Street	Richmond	Glass Street Catchment	Flash
✓	✓	✓	157 Lord Street	Richmond	Glass Street Catchment	Flash
✓	✓	✓	159 Lord Street	Richmond	Glass Street Catchment	Flash
	✓	✓	3/195 Mary Street	Richmond	Glass Street Catchment	Flash
		✓	1 Newry Street	Richmond	Glass Street Catchment	Flash
		✓	2 Newry Street	Richmond	Glass Street Catchment	Flash
		✓	3 Newry Street	Richmond	Glass Street Catchment	Flash
		✓	4 Newry Street	Richmond	Glass Street Catchment	Flash
		✓	5 Newry Street	Richmond	Glass Street Catchment	Flash
		✓	5A Newry Street	Richmond	Glass Street Catchment	Flash
	✓	✓	6 Newry Street	Richmond	Glass Street Catchment	Flash
		✓	1/7 Newry Street	Richmond	Glass Street Catchment	Flash
		✓	2/7 Newry Street	Richmond	Glass Street Catchment	Flash
		✓	3/7 Newry Street	Richmond	Glass Street Catchment	Flash
		✓	101/7 Newry Street	Richmond	Glass Street Catchment	Flash
		✓	102/7 Newry Street	Richmond	Glass Street Catchment	Flash
		✓	103/7 Newry Street	Richmond	Glass Street Catchment	Flash

Properties at risk from Flash Flooding over 300mm depth around Richmond and Collingwood

Properties at risk from Flash Flooding over 300mm depth around Richmond and Collingwood						
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				
		✓	104/7 Newry Street	Richmond	Glass Street Catchment	Flash
		✓	105/7 Newry Street	Richmond	Glass Street Catchment	Flash
		✓	106/7 Newry Street	Richmond	Glass Street Catchment	Flash
		✓	107/7 Newry Street	Richmond	Glass Street Catchment	Flash
		✓	108/7 Newry Street	Richmond	Glass Street Catchment	Flash
	✓	✓	12 Newry Street	Richmond	Glass Street Catchment	Flash
		✓	14 Newry Street	Richmond	Glass Street Catchment	Flash
		✓	16 Newry Street	Richmond	Glass Street Catchment	Flash
		✓	12-22 Rupert Street	Collingwood	Peel Street Catchment	Flash
		✓	1/122 Rupert Street	Collingwood	Peel Street Catchment	Flash
		✓	2/122 Rupert Street	Collingwood	Peel Street Catchment	Flash
		✓	3/122 Rupert Street	Collingwood	Peel Street Catchment	Flash
		✓	41 Smith Street	Richmond	Glass Street Catchment	Flash
		✓	43 Smith Street	Richmond	Glass Street Catchment	Flash
		✓	130-132 Stawell Street	Richmond	Glass Street Catchment	Flash
		✓	134-136 Stawell Street	Richmond	Glass Street Catchment	Flash
		✓	323 Swan Street	Richmond	Glass Street Catchment	Flash
		✓	325 Swan Street	Richmond	Glass Street Catchment	Flash
		✓	327 Swan Street	Richmond	Glass Street Catchment	Flash
		✓	329 Swan Street	Richmond	Glass Street Catchment	Flash
	✓	✓	331-333 Swan Street	Richmond	Glass Street Catchment	Flash
	✓	✓	335 Swan Street	Richmond	Glass Street Catchment	Flash
	✓	✓	337 Swan Street	Richmond	Glass Street Catchment	Flash
✓	✓	✓	341 Swan Street	Richmond	Glass Street Catchment	Flash
✓	✓	✓	345 Swan Street	Richmond	Glass Street Catchment	Flash
		✓	349 Swan Street	Richmond	Glass Street Catchment	Flash
		✓	357 Swan Street	Richmond	Glass Street Catchment	Flash
		✓	370-374 Swan Street	Richmond	Glass Street Catchment	Flash
		✓	382-384 Swan Street	Richmond	Glass Street Catchment	Flash
		✓	382-414 Swan Street	Richmond	Glass Street Catchment	Flash
		✓	388-390 Swan Street	Richmond	Glass Street Catchment	Flash
✓	✓	✓	29 Vere Street	Collingwood	Peel Street Catchment	Flash
✓	✓	✓	37 Vere Street	Collingwood	Peel Street Catchment	Flash
✓	✓	✓	39 Vere Street	Collingwood	Peel Street Catchment	Flash
✓	✓	✓	41 Vere Street	Collingwood	Peel Street Catchment	Flash
	✓	✓	43-45 Vere Street	Collingwood	Peel Street Catchment	Flash
	✓	✓	157 Victoria Parade	Collingwood	Peel Street Catchment	Flash
		✓	26 Workers Lane	Richmond	Glass Street Catchment	Flash
		✓	2 York Street	Richmond	Glass Street Catchment	Flash
		✓	4 York Street	Richmond	Glass Street Catchment	Flash
		✓	13-15 York Street	Richmond	Glass Street Catchment	Flash

Properties at risk from Flash Flooding over 300mm depth around Richmond and Collingwood						
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				
		✓	39 York Street	Richmond	Glass Street Catchment	Flash
Totals						
74	129	235				

Table C4.3 – Properties at risk of flash flooding around Richmond, Burnley and southern Collingwood in the City of Yarra

Isolation

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

Essential Infrastructure

The Lilydale, Alamein and Belgrave Railway lines at Swan Street underpass in Burnley may become flooded during a 5% AEP flood event.

During an event, see the Public Transport Victoria's Website for details on delays or alterations to services. <http://ptv.vic.gov.au/live-travel-updates/>. A map of Public Transport routes within the City of Yarra is available via the website at: https://www.ptv.vic.gov.au/assets/default-site/more/maps/Local-area-maps/Metropolitan/d3c974aa39/Melbourne_LAM-v2.pdf

In addition to the roads outlined below, Melbourne Clinic Private Hospital on Church Street, Richmond and Route 48 and 75 tramlines on Bridge Road, Richmond may be subject to flooding in an extreme rainfall event

All other essential infrastructure and services areas around Burnley and Richmond are expected to remain unaffected by flooding during a 1% AEP (100yr ARI) event.

Road Closures

The following roads are subject to closure during flooding around Burnley, Richmond and the southern parts of Collingwood. Check the Department of Transport (VicRoads) website for more details: <https://traffic.vicroads.vic.gov.au/>

Department of Transport (VicRoads) Roads likely flooded in a 1% AEP (100yr ARI) event
<ul style="list-style-type: none"> Swan Street, Richmond at Railway Underpass near Cremorne Street
<ul style="list-style-type: none"> Swan Street, Richmond between Lord Street and Edinburgh Street and east of Stawell Street
<ul style="list-style-type: none"> Yarra Boulevard, Richmond at Melbourne Girls College

Table C4.4 – Department of Transport (VicRoads) roads likely flooded over 300mm depth during a 1% AEP flood event

Yarra City Council Roads likely flooded in a 1% AEP (100yr ARI) event		
COLLINGWOOD	RICHMOND	
<ul style="list-style-type: none"> Campbell Street 	<ul style="list-style-type: none"> Belgium Avenue 	<ul style="list-style-type: none"> Lord Street
<ul style="list-style-type: none"> Dight Street 	<ul style="list-style-type: none"> Bromham Place 	<ul style="list-style-type: none"> Newry Street
<ul style="list-style-type: none"> Gipps Street (at Hoddle Street) 	<ul style="list-style-type: none"> Cole Street 	<ul style="list-style-type: none"> Reissel Street
		<ul style="list-style-type: none"> Tudor Street

• Rupert Street	• Glass Street	• York Street
• Singleton Street	• Hollick Street	
• Vere Street	• Lennox Street (between Highett St and Elizabeth St)	

Table C4.5 – Yarra City Council roads likely flooded over 300mm depth during a 1% AEP flood event

Flood Mitigation

No formal Retarding Basins, Pumping Stations or Levees exist around Burnley and Richmond.

Sewerage Infrastructure

There is no sewerage Infrastructure expected to impact or be impacted by floodwaters during severe flash flood events around Richmond, Burnley and Cremorne.

Command, Control and Coordination

VICSES will assume overall control of the response to flood incidents. Other agencies will be requested to support operations as detailed in this Plan. Control and coordination of a flood incident shall be carried out at the lowest effective level and in accordance with the State Emergency Response Plan (EMMV Part 3). During significant events, VICSES will conduct incident management using multi-agency resources.

Flood Impacts & Operational Considerations (Intelligence Cards)

The tables on the following pages provide a breakdown of the possible consequences of flash flooding around Richmond, Burnley and Cremorne at various rain totals within the City of Yarra. This table is to be used only as a guide as no two floods at a location will have identical impacts.

Intelligence Cards have been included for the following locations:

- Richmond, Burnley and Cremorne Stormwater Drains

FLOOD INTELLIGENCE CARD – RICHMOND AND SOUTHERN COLLINGWOOD STORMWATER DRAINS (UNGAUGED)

Version 4 – September 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.

CLOSEST RAIN GAUGE	Yarra River at Burnley
LOCATION	Burnley Harbour, Parks Victoria Burnley Depot
MELWAY REF:	44 G12

GAUGE NUMBER	229621A
GAUGE TYPE	Rain
TELEMETRIC/MANUAL	Telemetric

Design Rainfall Depths (mm) – Indication of Possible Flooding	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
11mm in 10 mins; 18mm in 30 mins; 23mm in 1 hour; 30mm in 2 hours; 33mm in 3 hours; or 42mm in 6 hours Note: rainfall depths are a very rough method of estimating flood events and have been used due to the ungagged nature of the catchment. This should be used as a guide only.	20% AEP (5-year ARI)	Properties at Flood Risk (over 300mm depth) 74 Properties in Total <ul style="list-style-type: none"> 5-11, 17, 19 & 21 Campbell Street, Collingwood 71 & 73 Charles Street, Richmond 109-111 & 115-117 Church Street, Richmond 27 & 29 Corsair Street, Richmond 2, 4, 6, 8-10, 12, 14, 16, 18-20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 40A, 42, 50, 52, 52A, 54, 54A & 54B Dight Street, Collingwood 48-50 Gipps Street, Collingwood 44, 46, 48, 50, 52, 60, 62, 63 & 64 Glass Street, Richmond 155, 157 & 159 Lord Street, Richmond 341 & 345 Swan Street, Richmond 29, 37, 39 & 41 Vere Street, Collingwood 157 Victoria Parade, Collingwood Water Over Road (over 300mm depth) <ul style="list-style-type: none"> Glass Street, Richmond Vere Street, Collingwood 	
40mm in 2 hours	6 th November 2018 Flash Flood Event (~5% AEP Event)	Event Summary <ul style="list-style-type: none"> Properties on Highett Street near Burnley Street flooded 	

Design Rainfall Depths (mm) – Indication of Possible Flooding	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
<p>16mm in 10 mins; 27mm in 30 mins; 34mm in 1 hour; 41mm in 2 hours; 46mm in 3 hours; or 58mm in 6 hours</p> <p>Note: rainfall depths are a very rough method of estimating flood events and have been used due to the ungagged nature of the catchment. This should be used as a guide only.</p>	<p>5% AEP (20-year ARI)</p>	<p>Properties at Flood Risk (over 300mm depth) 129 Properties in Total</p> <ul style="list-style-type: none"> • 3/48 Bell Street, Richmond • 4, 6, 8, 10, 12, 14 & 16 Brown Street, Collingwood • 1, 3, 5-11, 13, 15, 17, 19 & 21 Campbell Street, Collingwood • 65, 71 & 73 Charles Street, Richmond • 109-111 & 115-117 Church Street, Richmond • 27 & 29 Corsair Street, Richmond • 51, 53, 55, 57 & 59 Cromwell Street, Collingwood • 2, 4, 6, 8-10, 12, 14, 16, 18-20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 40A, 42, 50, 52, 52A, 54, 54A & 54B Dight Street, Collingwood • 70 Edinburgh Street, Richmond • 48-50, 52 & 58 Gipps Street, Collingwood • 24, 31, 1/32, 2/32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 43A, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 60, 62, 63 & 64 Glass Street, Richmond • 23, 42, 88 & 90 Lennox Street, Richmond • 84A, 147, 155, 157 & 159 Lord Street, Richmond • 3/195 Mary Street, Richmond • 6 & 12 Newry Street, Richmond • 331-333, 335, 337, 341 & 345 Swan Street, Richmond • 29, 37, 39, 41 & 43-45 Vere Street, Collingwood • 157 Victoria Parade, Collingwood <p>Community Infrastructure Likely Flooded</p> <ul style="list-style-type: none"> • Richmond West Primary School at 25 Lennox Street, Richmond • Centre for Culture, Ethnicity & Health at 23 Lennox Street, Richmond <p>Essential Infrastructure Likely Impacted</p> <ul style="list-style-type: none"> • The Lilydale, Alamein and Belgrave Railway Lines at Swan Street underpass in Burnley • Tramline on Swan Street, Richmond, Route 70 at Railway underpass <p>Water Over Road (over 300mm depth)</p> <ul style="list-style-type: none"> • Belgium Avenue, Richmond • Campbell Street, Collingwood • Glass Street, Richmond • Lennox Street, Richmond (at Egan Street) • Reissel Street, Richmond • Rupert Street, Collingwood • Singleton Street, Collingwood • Swan Street, Richmond between Lord Street and Edinburgh Street • Vere Street, Collingwood 	
<p>24mm in 10 mins;</p>	<p>1% AEP (100-year ARI)</p>	<p>Properties at Flood Risk (over 300mm depth) 235 Properties in Total</p>	

Design Rainfall Depths (mm) – Indication of Possible Flooding	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
<p>39mm in 30 mins; 48mm in 1 hour; 58mm in 2 hours; 65mm in 3 hours; or 79mm in 6 hours</p> <p>Note: rainfall depths are a very rough method of estimating flood events and have been used due to the ungagged nature of the catchment. This should be used as a guide only.</p>		<ul style="list-style-type: none"> • 2 Beissel Street, Richmond • 3/48 Bell Street, Richmond • 4, 6, 8, 10, 12, 14 & 16 Brown Street, Collingwood • 1, 3, 5-11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59 & 61 Campbell Street, Collingwood • 65, 67, 71 & 73 Charles Street, Richmond • 109-111 & 115-117 Church Street, Richmond • 27 & 29 Corsair Street, Richmond • 51, 53, 55, 57 & 59 Cromwell Street, Collingwood • 1, 2, 4, 6, 8-10, 12, 14, 16, 18-20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 40A, 42, 50, 52, 52A, 54, 54A & 54B Dight Street, Collingwood • 54, 54A, 56, 58, 60, 62, 64, 66 & 70 Edinburgh Street, Richmond • 10, 12 & 14 Francis Street, Richmond • 48-50, 52, 58A, 58, 60-66, 63-67, 70-76 & 78 Gipps Street, Collingwood • 24, 31, 1/32, 2/32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 43A, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 60, 62, 63 & 64 Glass Street, Richmond • 89 & 95 Hoddle Street, Richmond • 14, 23, 25, 30-32, 42, 44, 88 & 90 Lennox Street, Richmond • 84A, 84B, 84, 86, 88, 90, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 131, 137, 147, 155, 157 & 159 Lord Street, Richmond • 3/195 Mary Street, Richmond • 1, 2, 3, 4, 5, 5A, 6, 7, 12, 14 & 16 Newry Street, Richmond • 12-22, 1/122, 2/122 & 3/122 Rupert Street, Collingwood • 41 & 43 Smith Street, Richmond • 130-132 & 134-136 Stawell Street, Richmond • 323, 325, 327, 329, 331-333, 335, 337, 341, 345, 349, 357, 370-374, 382-414 & 388-390 Swan Street, Richmond • 29, 37, 39, 41 & 43-45 Vere Street, Collingwood • 157 Victoria Parade, Collingwood • 26 Workers Lane, Richmond • 2, 4, 13-15 & 39 York Street, Richmond <p>Community Infrastructure Likely Flooded</p> <ul style="list-style-type: none"> • Richmond West Primary School at 25 Lennox Street, Richmond • Centre for Culture, Ethnicity & Health at 23 Lennox Street, Richmond <p>Essential Infrastructure Flooded</p> <ul style="list-style-type: none"> • The Lilydale, Alamein and Belgrave Railway Lines at Swan Street underpass in Burnley • Tramline on Swan Street, Richmond, Route 70 at Railway underpass <p>Water Over Road (over 300mm depth)</p> <ul style="list-style-type: none"> • Belgium Avenue, Richmond • Bromham Place, Richmond • Campbell Street, Collingwood 	

Design Rainfall Depths (mm) – Indication of Possible Flooding	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		<ul style="list-style-type: none"> • Cole Street, Richmond • Dight Street, Collingwood • Gipps Street, Collingwood at Hoddle Street • Glass Street, Richmond • Hollick Street, Richmond • Lennox Street, Richmond (between Highett Street and Elizabeth Street) • Lord Street, Richmond • Newry Street, Richmond • Reissel Street, Richmond • Rupert Street, Collingwood • Singleton Street, Collingwood • Swan Street, Richmond between Railway Underpass near Cremorne Street and Punt Road • Swan Street, Richmond between Lord Street and Edinburgh Street and East of Stawell Street • Tudor Street, Richmond • Vere Street, Collingwood • Yarra Boulevard, Richmond at Melbourne Girls College • York Street, Richmond 	
32mm in 10 mins	14 th December 2018 Flash Flood Event (<1% AEP Event)	<p>Event Summary</p> <ul style="list-style-type: none"> • Properties on Highett Street near Burnley Street flooded • Properties on Glass Street and Newry Street severely impacted • Swan Street and Punt Road intersection flooded • Hoddle Street at York Street flooded • Railway line at East Richmond station flooded • Widespread flooding across Richmond, Burnley and Collingwood 	

Table C4.6 – Breakdown of possible consequences at various rainfall intensities around Richmond, Burnley and the southern part of Collingwood with operational considerations

APPENDIX D - FLOOD EVACUATION ARRANGEMENTS

Phase 1 - Decision to Evacuate

The Incident Controller (in consultation with Victoria Police) 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 in consultation with the VICPOL Council DHHS and other key agencies and expert advice (Melbourne Water and Flood Intelligence specialists).

Phase 2 – Warning

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

Evacuation warning messages will be developed and issued by VICSES in consultation with the MERO, MERC, DHHS and other key agencies and expert advice (Melbourne Water and Flood Intelligence specialists).

Phase 3 – Withdrawal

Withdrawal will be controlled by VICPOL. VICSES will provide advice regarding most appropriate evacuation routes and locations for at-risk communities to evacuate to, etc.

VICSES, AV and Local Government will provide resources where available to support VICPOL/DOT with route control and may assist VICPOL in arranging evacuation transportation.

VICPOL will control security of evacuated areas.

Evacuees will be encouraged to move using their own transport where possible. Transport for those without vehicles or other means will be arranged in consultation with the MERO.

Vulnerable groups within Yarra are identified in MEMP part 4. These should be considered during the withdrawal phase.

Phase 4 – Shelter

Relief Centres and/or assembly areas which cater for people's basic needs for floods may be established to meet the immediate needs of people affected by flooding. The flood relief centres and/or Assembly Areas are listed in the Municipal Emergency Management Plan.

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

Animal Shelter

Council encourages pet owners to use the National Equine Database (NED) which provides a free service to connect pet owners with material aid and shelter for their animals during an emergency.

Animal shelter compounds may be established for domestic pets and companion animals of evacuees and efforts will be made to accommodate animals that are brought to relief centres.

Caravans

There are no established Caravan Parks located in the City of Yarra.

Phase 5 – Return

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

The Incident Controller in consultation with VICPOL will determine when it is safe for evacuees to return to their properties and will arrange for the notification of the community.

VICPOL will manage the return of evacuated people with the assistance of other agencies as required.

Considerations for deciding whether to evacuate include:

- Current flood situation;
- Status of flood mitigation systems;
- Size and location of the community;
- Access and egress routes available and their status;
- Resources required to coordinate the return;
- At risk 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.

Essential Community Infrastructure and Property Protection

Essential Community Infrastructure and properties (e.g. residences, businesses, roads, power supply etc.) that require protection are listed in MEMP part 4.

Rescue

The following resources are available within the City of Yarra to assist with rescue operations:

No resources identified

Known high-risk areas/communities where rescues might be required include:

No area or communities identified other than flash floods over roadways.

APPENDIX E - FLOOD WARNING SYSTEMS

Flood Warning

Flood Warning products and Flood Class Levels can be found on the BoM website. Flood Warning Products include Severe Thunderstorm Warnings, Severe Weather Warnings, Flood Watches and Flood Warnings.

Flood Bulletins

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

The relevant VICSES Region Headquarters or the established ICC will normally be responsible for drafting, authorizing and issuing issue Flood Bulletins, using the One Source, One Message system.

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

Flood Bulletins should follow the following structure

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

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

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

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

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

Local Flood Warning System Arrangements

Yarra City Council has developed a checklist for MEROs and MRMs and EMLOs following the receipt of emergency warnings to ensure activation of required processes, such as closing pathways, assessing resource availability etc.

APPENDIX F – MAPS AND SCHEMATICS

Overview

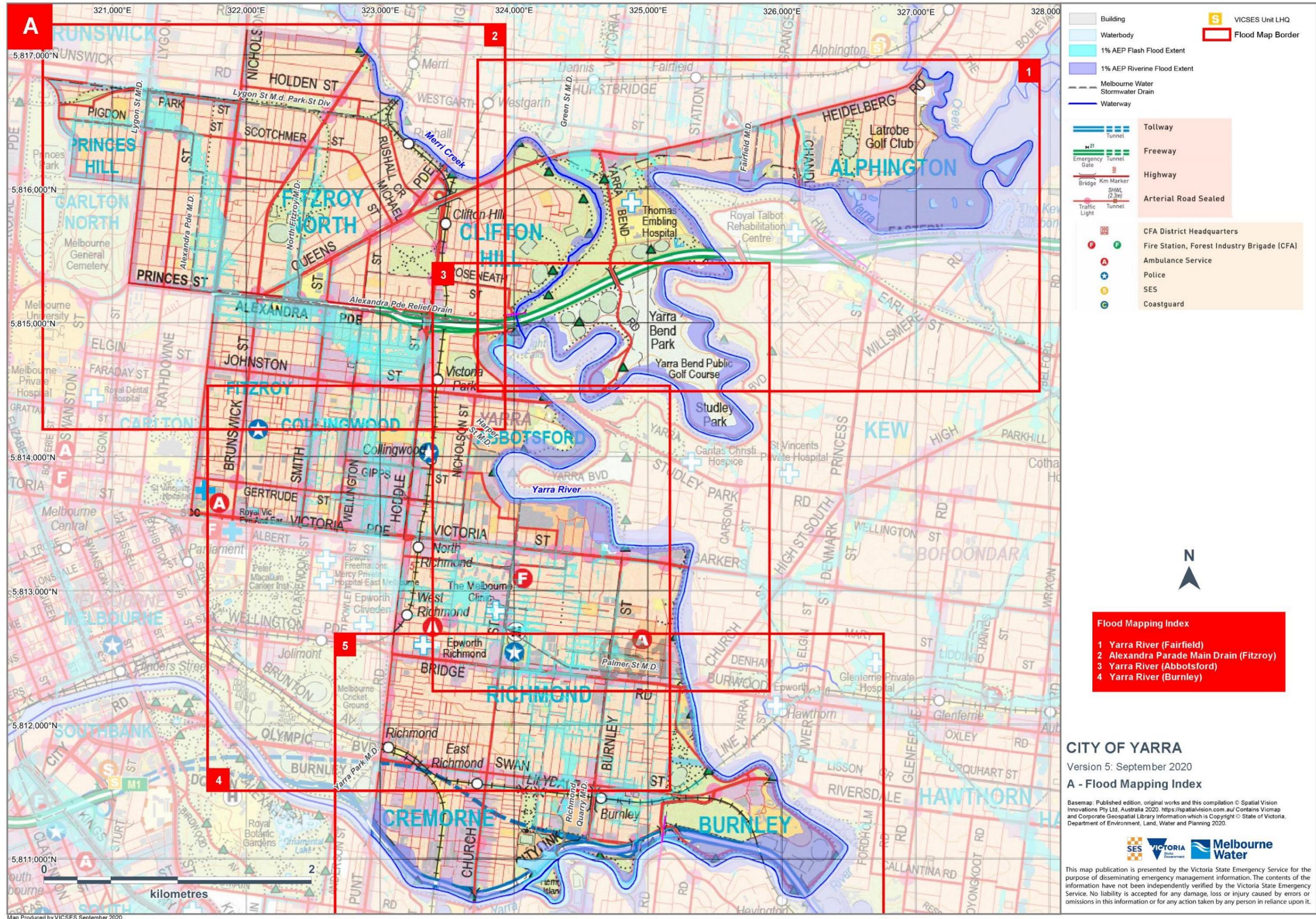
Maps considered useful to flood response are included in this Appendix. They include:

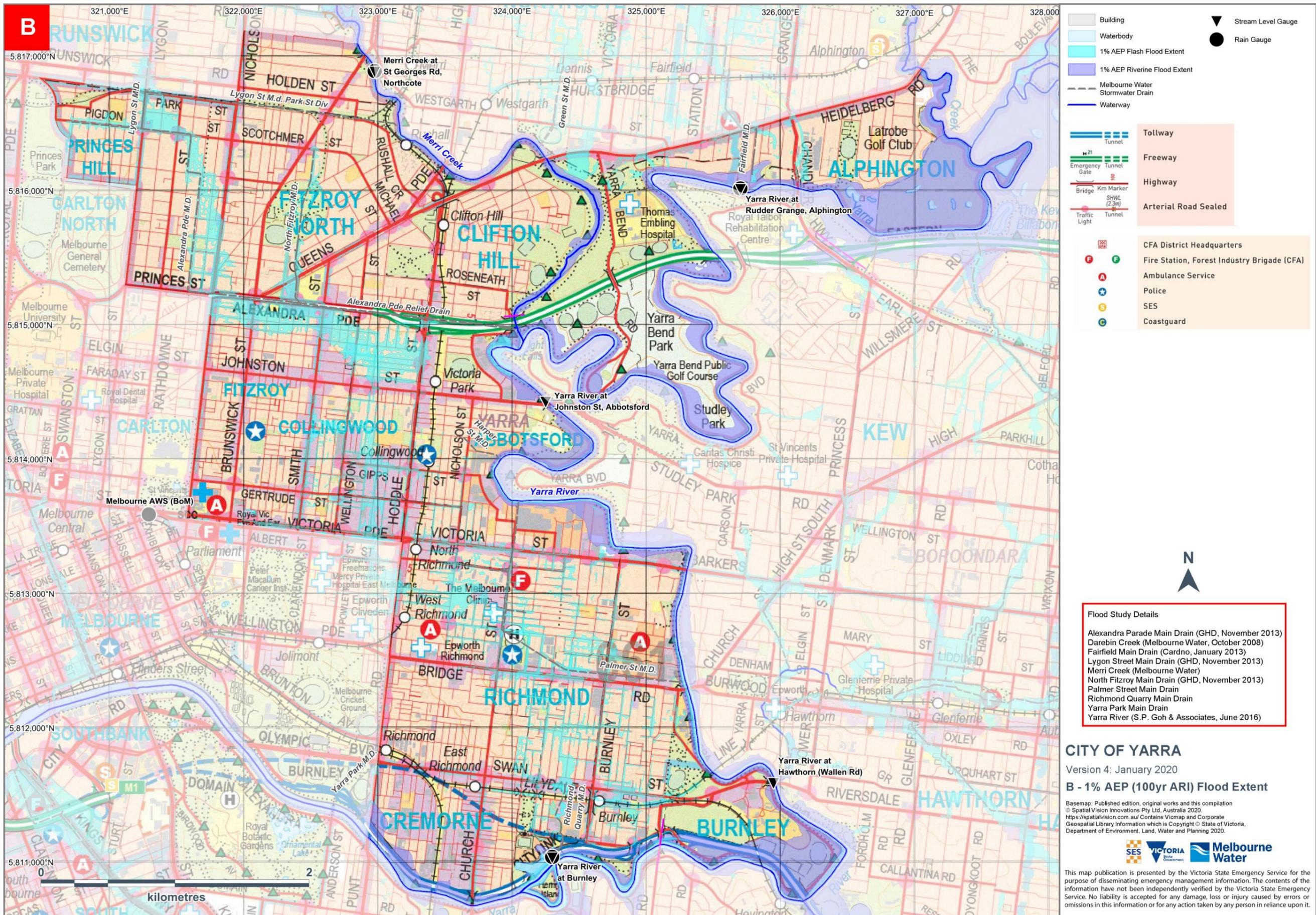
- A map outlining a series of flooding hot spot maps within the City of Yarra.
- A map showing the Municipal boundary together with the open waterways and underground stormwater drainage pipe network within the City of Yarra and the 1% AEP (100-year ARI) flood extents (sourced from Melbourne Water GIS).
- A set of 4 maps showing flooding hot spots within the City of Yarra 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 City of Yarra 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 website <https://mapshare.vic.gov.au/vicplan/>. Maps showing 1 in 100-year ARI (1% AEP) flood extents and floodways (together with volume, height and water quality data) are shown at DELWP's mapshare website <http://mapshare.maps.vic.gov.au/MapShareVic/index.html?viewer=MapShareVic.PublicSite&ocale=en-AU>
- 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 Yarra Municipal Maps (sourced Melbourne Water GIS and CoY Flood Modelling)





Flood Study Details

- Alexandra Parade Main Drain (GHD, November 2013)
- Darebin Creek (Melbourne Water, October 2008)
- Fairfield Main Drain (Cardno, January 2013)
- Lygon Street Main Drain (GHD, November 2013)
- Merri Creek (Melbourne Water)
- North Fitzroy Main Drain (GHD, November 2013)
- Palmer Street Main Drain
- Richmond Quarry Main Drain
- Yarra Park Main Drain
- Yarra River (S.P. Goh & Associates, June 2016)

CITY OF YARRA
 Version 4: January 2020
B - 1% AEP (100yr ARI) Flood Extent

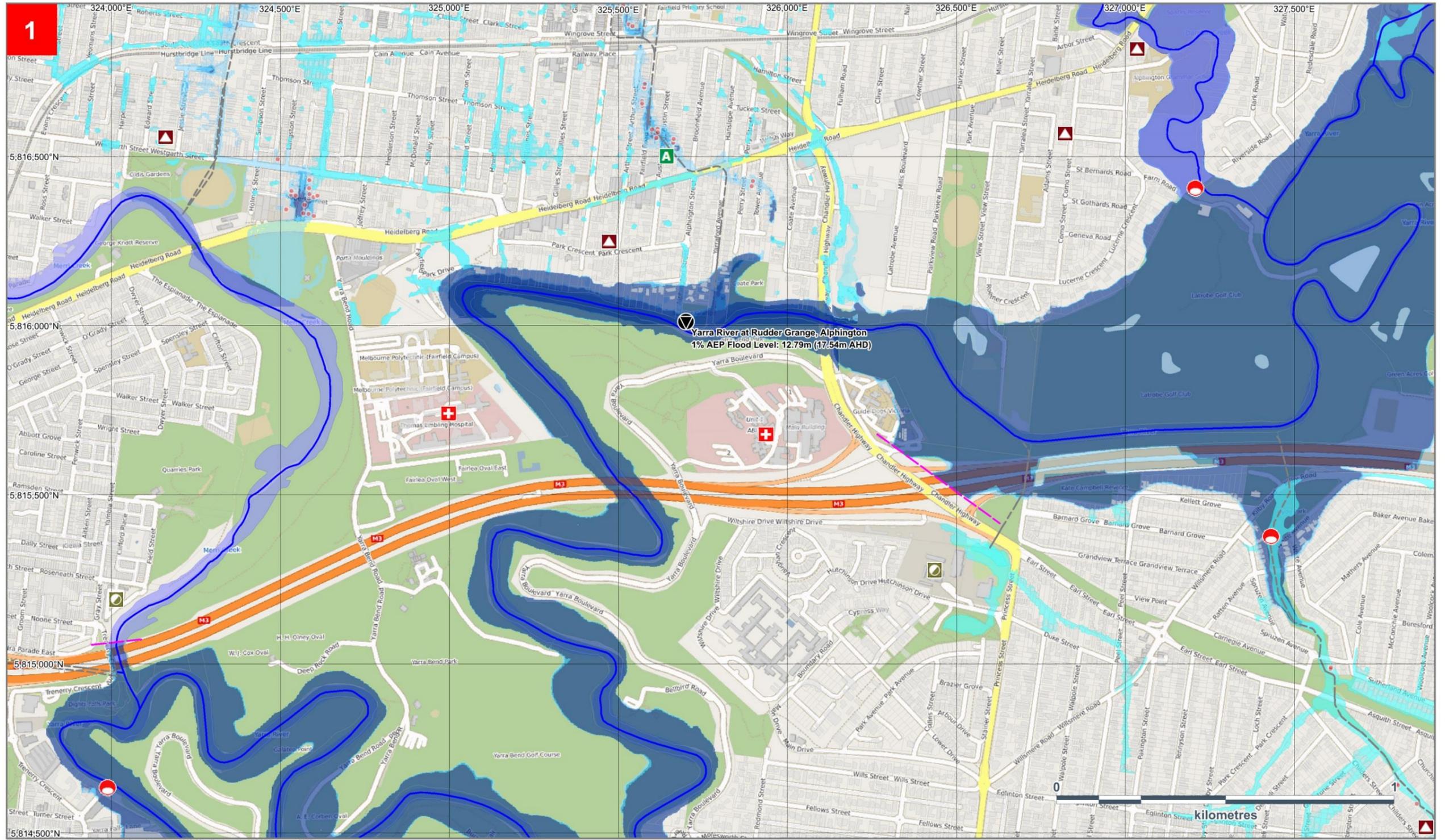
Basemap: Published edition, original works and this compilation
 © Spatial Vision Innovations Pty Ltd, Australia 2020.
<https://spatialvision.com.au/> Contains Vicmap and Corporate Geospatial Library Information which is Copyright © State of Victoria, Department of Environment, Land, Water and Planning 2020.



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Map Produced by VICSES September 2020.

Flood Extent Maps (sourced Melbourne Water GIS)



Flood modelling completed by S.P. Goh & Associates, June 2016. Map Produced by VICSES January 2020.

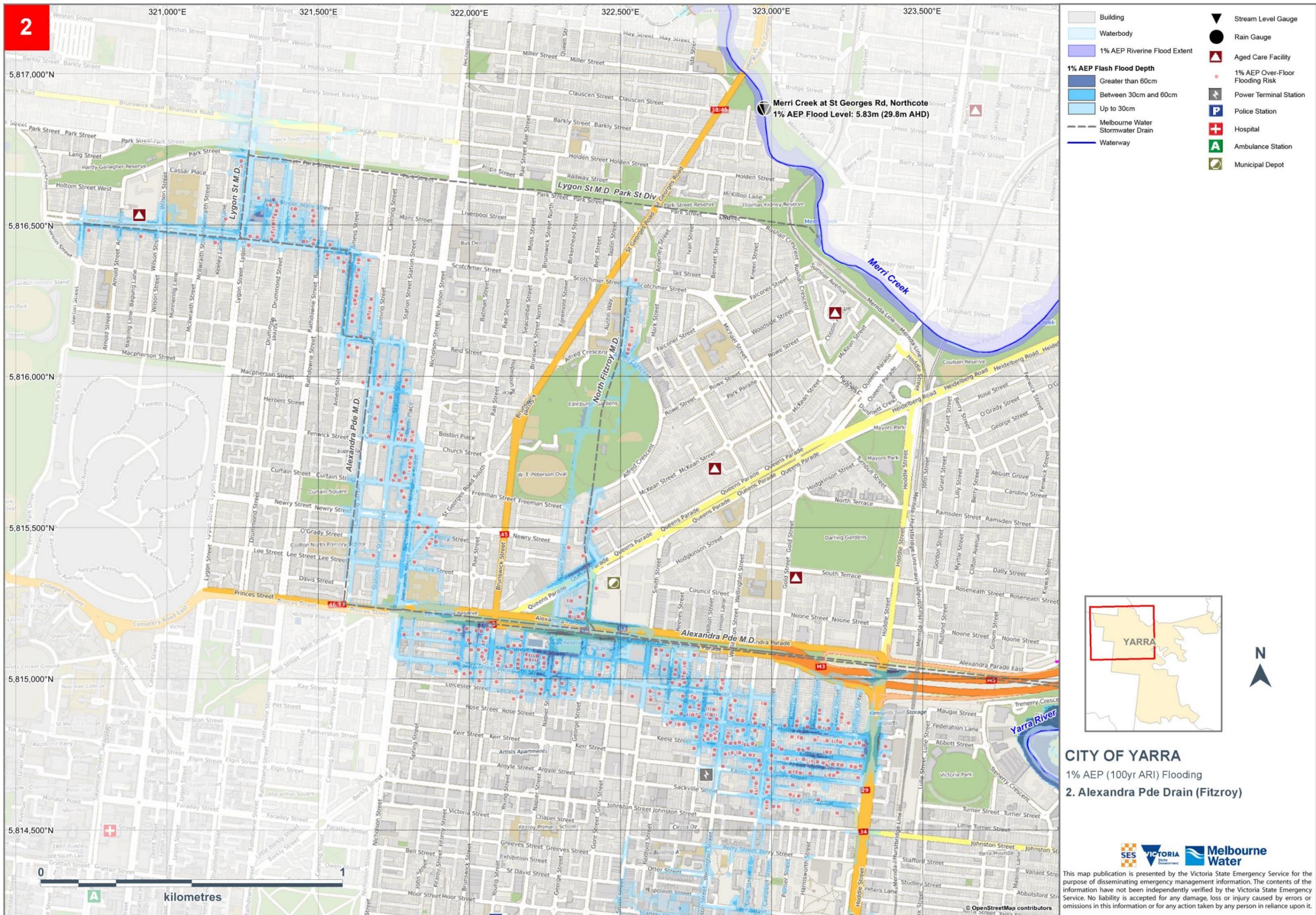
CITY OF YARRA
 1% AEP (100yr ARI) Flooding
1. Yarra River (Fairfield)

- | | | |
|--|---------------------------------|--------------------|
| Building | Aged Care Facility | Flood Model Extent |
| Waterbody | 1% AEP Over-Floor Flooding Risk | Ambulance Station |
| 1% AEP Flash Flood Extent (Depth Unavailable) | Telephone Exchange | Hospital |
| 1% AEP Riverine Flood Extent (Depth Unavailable) | Stream Level Gauge | Municipal Depot |
| 1% AEP Flood Depth Greater than 60cm | Rain Gauge | |
| 1% AEP Flood Depth Between 30cm and 60cm | Power Terminal Station | |
| 1% AEP Flood Depth Up to 30cm | Sewer Emergency Relief Point | |
| Melbourne Water Stormwater Drain | Waterway | |

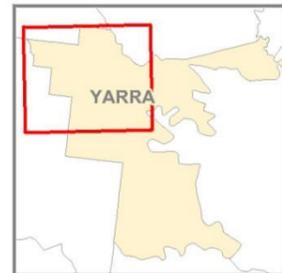


SES VICTORIA **Melbourne Water**

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- Building
- Waterbody
- 1% AEP Riverine Flood Extent
- 1% AEP Flash Flood Depth
- Greater than 60cm
- Between 30cm and 60cm
- Up to 30cm
- Melbourne Water Stormwater Drain
- Waterway
- Stream Level Gauge
- Rain Gauge
- Aged Care Facility
- 1% AEP Over-Floor Flooding Risk
- Power Terminal Station
- Police Station
- Hospital
- Ambulance Station
- Municipal Depot

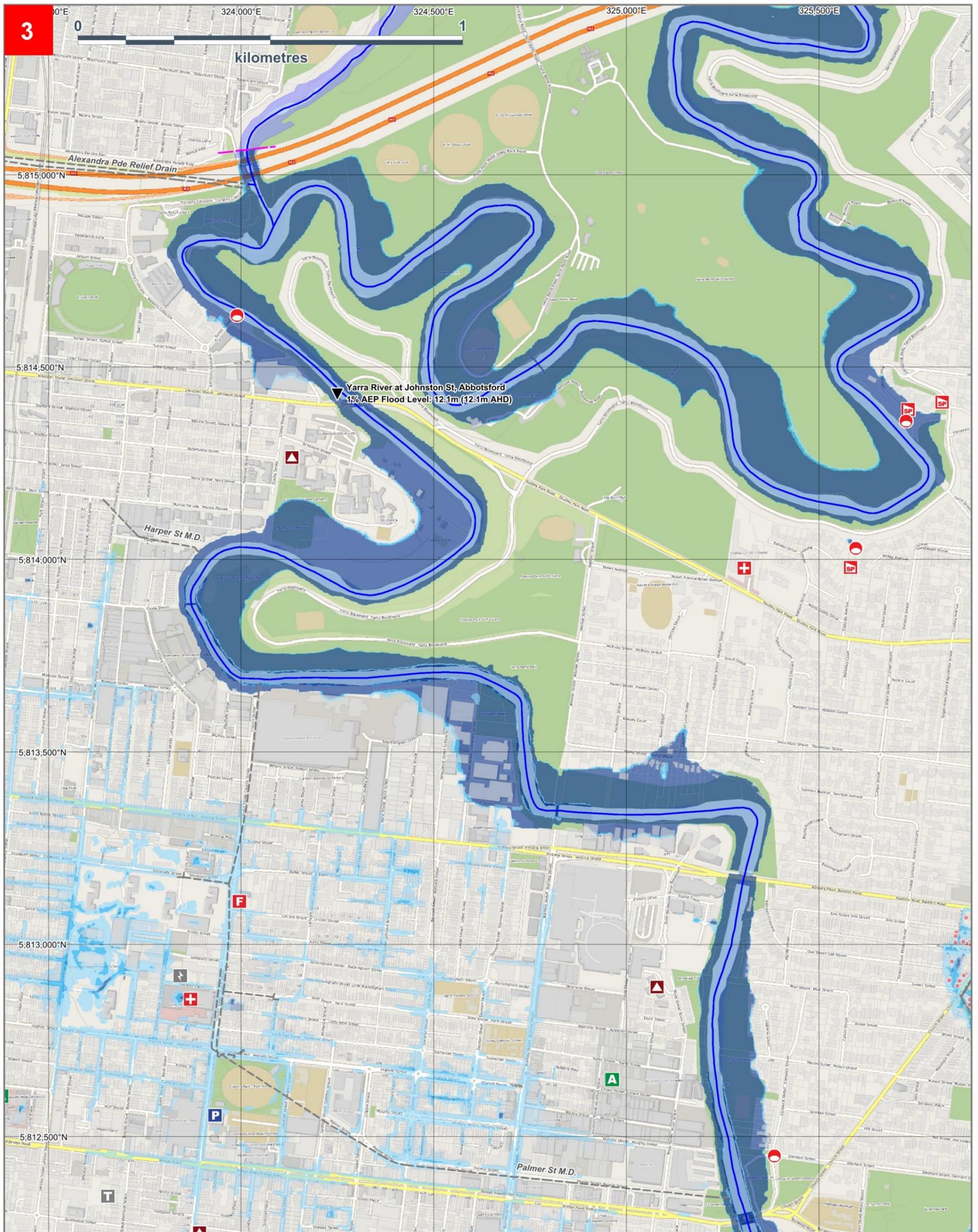


CITY OF YARRA
 1% AEP (100yr ARI) Flooding
 2. Alexandra Pde Drain (Fitzroy)



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Alexandra Pde Main Drain flood mapping completed by GHD, November 2013. Glass St Main Drain flood modeling completed by Engy, October 2019. Map Produced by VICSES September 2020.



Yarra River flood modelling completed by S.P. Goh & Associates, June 2016. Glass St Main Drain flood modelling completed by Engny, October 2019. Map Produced by VICSES September 2020.

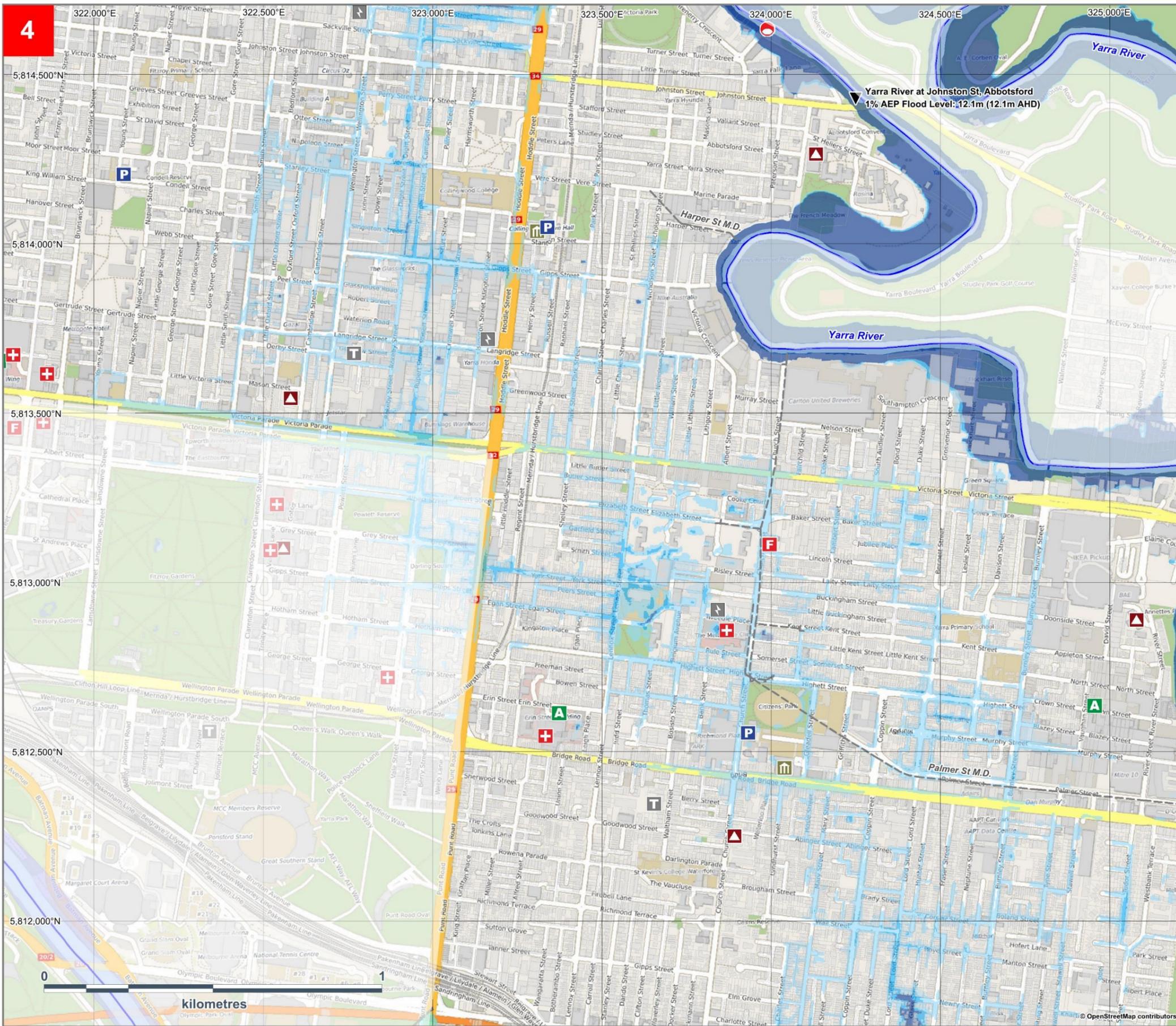
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CITY OF YARRA
 1% AEP (100yr ARI)
 Flooding
3. Yarra River (Abbotsford)

Building	Waterway	1% AEP Over-Floor Flooding Risk
Waterbody	Aged Care Facility	Ambulance Station
1% AEP Flash Flood Extent (Depth Unavailable)	Sewer Emergency Relief Point	Fire Station
1% AEP Flood Depth	Telephone Exchange	Hospital
Greater than 60cm	Power Terminal Station	Police Station
Between 30cm and 60cm	Sewer Pumping Station	
Up to 30cm	Stream Level Gauge & 1% AEP Flood Level	
Melbourne Water Stormwater Drain	Flood Model Extent	



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- Building
- Waterbody
- 1% AEP Riverine Flood Extent
- 1% AEP Flash Flood Depth Greater than 60cm
- 1% AEP Flash Flood Depth Between 30cm and 60cm
- 1% AEP Flash Flood Depth Up to 30cm
- Melbourne Water Stormwater Drain
- Waterway
- Sewer Emergency Relief Points
- Telephone Exchange
- Stream Level Gauge
- Rain Gauge
- Aged Care Facility
- 1% AEP Over-Floor Flooding Risk
- Power Terminal Station
- Police Station
- Hospital
- Ambulance Station
- Fire Station
- Municipal Offices

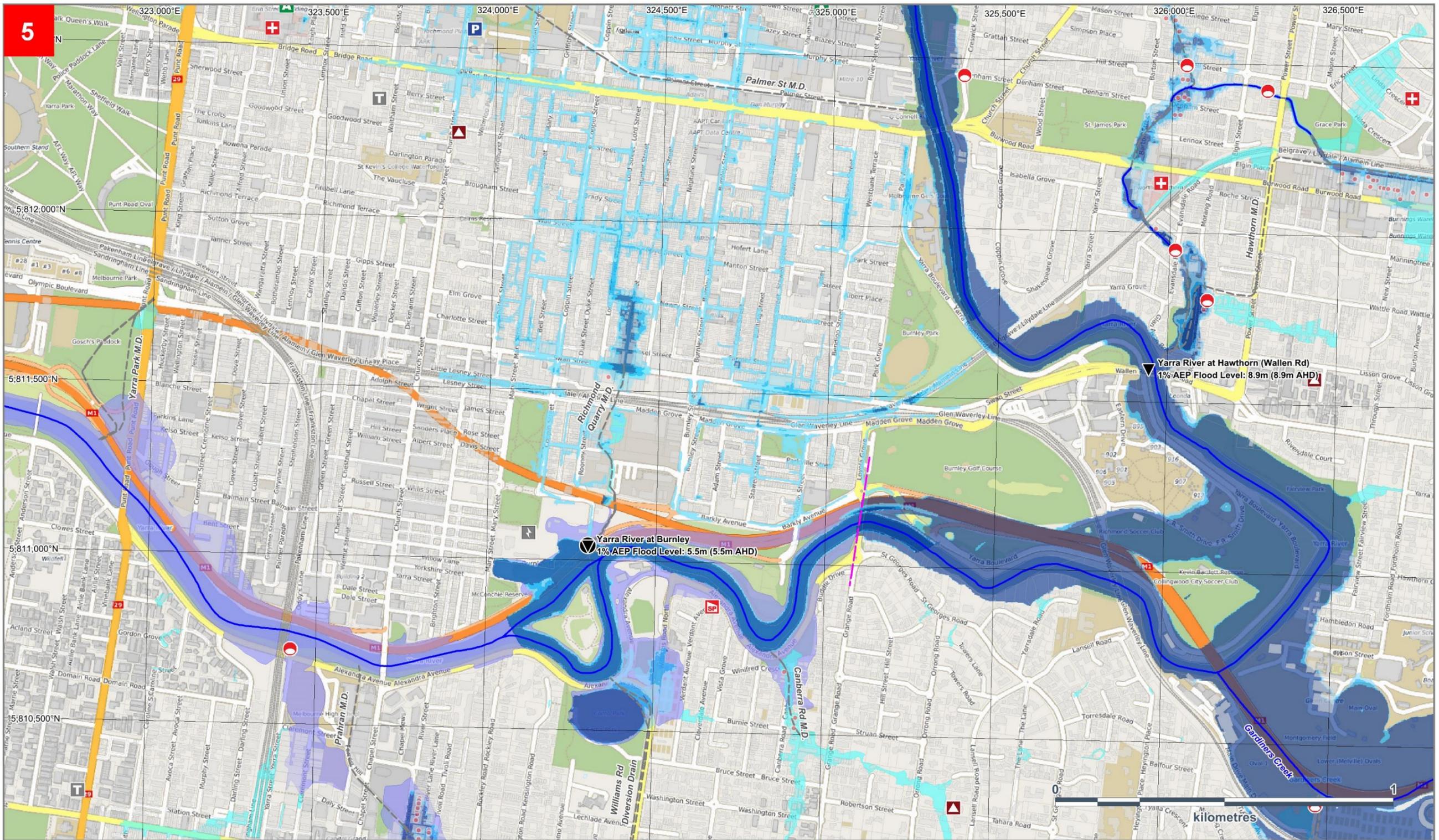


CITY OF YARRA
 1% AEP (100yr ARI) Flooding
4. Peel Street, Collingwood & Palmer Street Main Drain (Richmond)



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Glass St Main Drain flood modelling completed by Engeny, October 2019. Map Produced by VICSES September 2020.



Yarra River flood modelling completed by S.P. Goh & Associates, June 2016. Glass St Main Drain flood modelling completed by Engeny, October 2019. Map Produced by VICSES September 2020.

CITY OF YARRA
 1% AEP (100yr ARI) Flooding
 5. Yarra River (Burnley) and Glass Street (Richmond)

- | | | |
|--|---------------------------------|-----------------------|
| Building | Aged Care Facility | Ambulance Station |
| Waterbody | 1% AEP Over-Floor Flooding Risk | Fire Station |
| 1% AEP Flash Flood Extent (Depth Unavailable) | Telephone Exchange | Hospital |
| 1% AEP Riverine Flood Extent (Depth Unavailable) | Stream Level Gauge | Police Station |
| 1% AEP Flood Depth Greater than 60cm | Rain Gauge | Sewer Pumping Station |
| 1% AEP Flood Depth Between 30cm and 60cm | Power Terminal Station | |
| 1% AEP Flood Depth Up to 30cm | Sewer Emergency Relief Point | |
| Melbourne Water Stormwater Drain | Waterway | |
| | Flood Model Extent | |



Basemap: © OpenStreetMap contributors

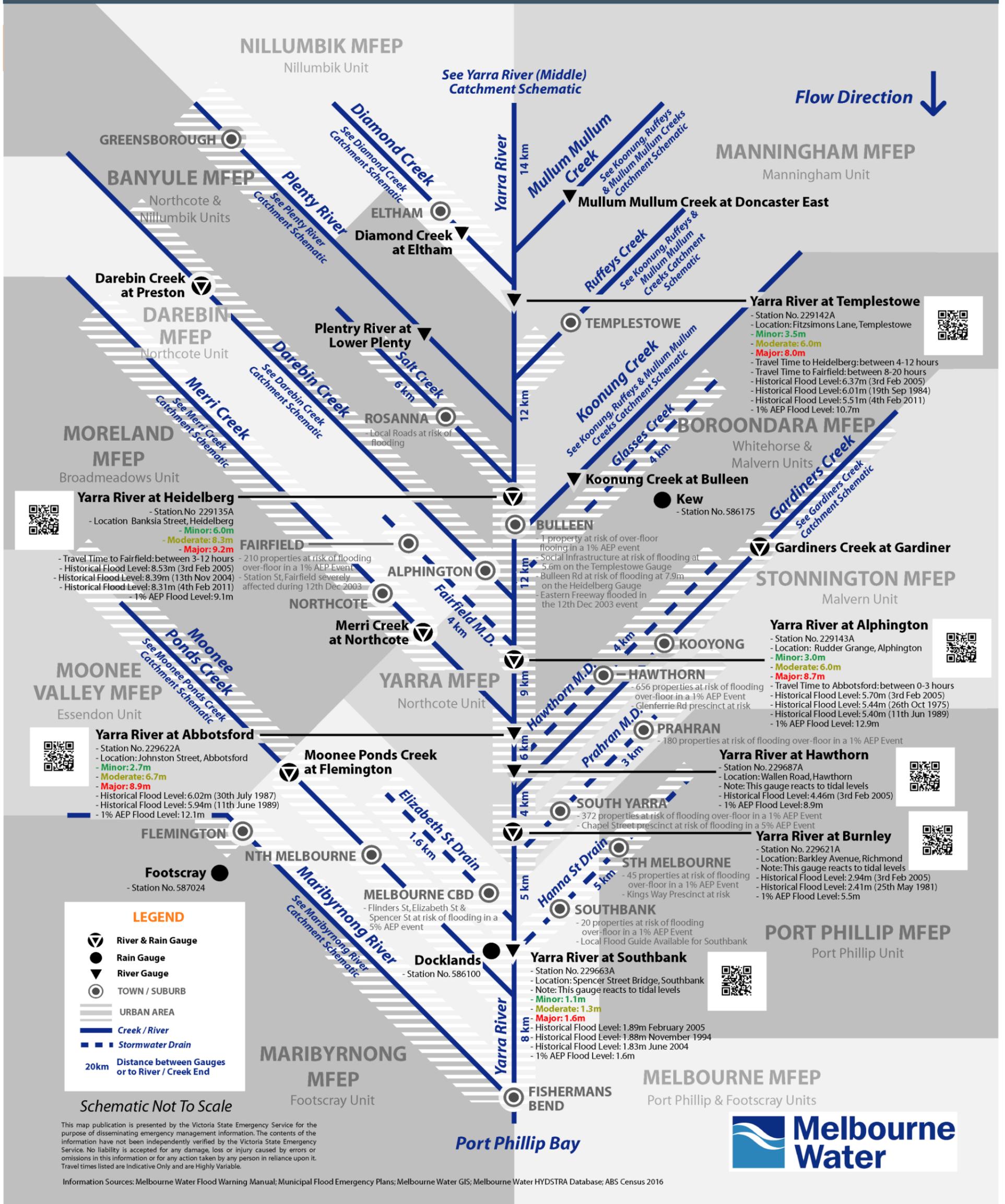
SES VICTORIA **Melbourne Water**

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Yarra River (Lower) Catchment Schematic

Version 5 - February 2020



NILLUMBİK MFEP
Nillumbik Unit

See Yarra River (Middle) Catchment Schematic

MANNINGHAM MFEP
Manningham Unit

GREENSBOROUGH

BANYULE MFEP
Northcote & Nillumbik Units

Darebin Creek at Preston

DAREBIN MFEP
Northcote Unit

MORELAND MFEP
Broadmeadows Unit

Yarra River at Heidelberg

- Station No. 229135A
- Location Banksia Street, Heidelberg
- Minor: 6.0m
- Moderate: 8.3m
- Major: 9.2m
- Travel Time to Fairfield: between 3-12 hours
- Historical Flood Level: 8.53m (3rd Feb 2005)
- Historical Flood Level: 8.39m (13th Nov 2004)
- Historical Flood Level: 8.31m (4th Feb 2011)
- 1% AEP Flood Level: 9.1m

FAIRFIELD
- 210 properties at risk of flooding over-floor in a 1% AEP Event
- Station St, Fairfield severely affected during 12th Dec 2003

NORTHCOTE

Merri Creek at Northcote

MOONEE VALLEY MFEP
Essendon Unit

Yarra River at Abbotsford

- Station No. 229622A
- Location: Johnston Street, Abbotsford
- Minor: 2.7m
- Moderate: 6.7m
- Major: 8.9m
- Historical Flood Level: 6.02m (30th July 1987)
- Historical Flood Level: 5.94m (11th June 1989)
- 1% AEP Flood Level: 12.1m

FLEMINGTON

Footscray
- Station No. 587024

NTH MELBOURNE

MELBOURNE CBD
- Flinders St, Elizabeth St & Spencer St at risk of flooding in a 5% AEP event

MARIBYRNONG MFEP
Footscray Unit

FISHERMANS BEND

Port Phillip Bay

Yarra River
14 km

Yarra River
12 km

Yarra River
12 km

Yarra River
9 km

Yarra River
6 km

Yarra River
4 km

Yarra River
8 km

Diamond Creek
See Diamond Creek Catchment Schematic

Diamond Creek at Eltham

Plenty River at Lower Plenty
Salt Creek
6 km

FAIRFIELD M.D.
4 km

ALPHINGTON

MOONEE PONDS CREEK at Flemington
Elizabeth St Drain
1.6 km

MARIBYRNONG RIVER
See Maribyrnong River Catchment Schematic

Docklands
- Station No. 586100

MULLUM MULLUM CREEK
See Koonung, Ruffeys & Mullum Mullum Creeks Catchment Schematic

Mullum Mullum Creek at Doncaster East

ROSSANNA
- Local Roads at risk of flooding

BULLEEN
1 property at risk of over-floor flooding in a 1% AEP event
Social Infrastructure at risk of flooding at 5.6m on the Templestowe Gauge
Bulleen Rd at risk of flooding at 7.9m on the Heidelberg Gauge
Eastern Freeway flooded in the 12th Dec 2003 event

ALPHINGTON M.D.
4 km

HAWTHORN
- 656 properties at risk of flooding over-floor in a 1% AEP Event
- Glenferrie Rd precinct at risk

SOUTH YARRA
- 372 properties at risk of flooding over-floor in a 1% AEP Event
- Chapel Street precinct at risk of flooding in a 5% AEP Event

SOUTHBANK
- 20 properties at risk of flooding over-floor in a 1% AEP Event
- Local Flood Guide Available for Southbank

Yarra River at Southbank
- Station No. 229663A
- Location: Spencer Street Bridge, Southbank
- Note: This gauge reacts to tidal levels
- Minor: 1.1m
- Moderate: 1.3m
- Major: 1.6m
- Historical Flood Level: 1.89m February 2005
- Historical Flood Level: 1.88m November 1994
- Historical Flood Level: 1.83m June 2004
- 1% AEP Flood Level: 1.6m

RUFFEYS CREEK
See Koonung, Ruffeys & Mullum Mullum Creeks Catchment Schematic

Yarra River at Templestowe

TEMPLESTOWE
- Station No. 229142A
- Location: Fitzsimons Lane, Templestowe
- Minor: 3.5m
- Moderate: 6.0m
- Major: 8.0m
- Travel Time to Heidelberg: between 4-12 hours
- Travel Time to Fairfield: between 8-20 hours
- Historical Flood Level: 6.37m (3rd Feb 2005)
- Historical Flood Level: 6.01m (19th Sep 1984)
- Historical Flood Level: 5.51m (4th Feb 2011)
- 1% AEP Flood Level: 10.7m

KOOYONG

PRAHAN M.D.
3 km

PRAHRAN
- 180 properties at risk of flooding over-floor in a 1% AEP Event

HANNA ST DRAIN
5 km

SOUTH MELBOURNE
- 45 properties at risk of flooding over-floor in a 1% AEP Event
- Kings Way Precinct at risk

MELBOURNE MFEP
Port Phillip & Footscray Units

GARDINERS CREEK
See Gardiners Creek Catchment Schematic

Koonung Creek at Bulleen

GARDINERS CREEK
See Gardiners Creek Catchment Schematic

STONNINGTON MFEP
Malvern Unit

Yarra River at Alphington
- Station No. 229143A
- Location: Rudder Grange, Alphington
- Minor: 3.0m
- Moderate: 6.0m
- Major: 8.7m
- Travel Time to Abbotsford: between 0-3 hours
- Historical Flood Level: 5.70m (3rd Feb 2005)
- Historical Flood Level: 5.44m (26th Oct 1975)
- Historical Flood Level: 5.40m (11th Jun 1989)
- 1% AEP Flood Level: 12.9m

HAWTHORN M.D.
4 km

Yarra River at Hawthorn
- Station No. 229687A
- Location: Wallen Road, Hawthorn
- Note: This gauge reacts to tidal levels
- Historical Flood Level: 4.46m (3rd Feb 2005)
- 1% AEP Flood Level: 8.9m

Yarra River at Burnley
- Station No. 229621A
- Location: Barkley Avenue, Richmond
- Note: This gauge reacts to tidal levels
- Historical Flood Level: 2.94m (3rd Feb 2005)
- Historical Flood Level: 2.41m (25th May 1981)
- 1% AEP Flood Level: 5.5m

PORT PHILLIP MFEP
Port Phillip Unit

Yarra River at Heidelberg

Yarra River at Templestowe

Yarra River at Bulleen

Yarra River at Alphington

Yarra River at Hawthorn

Yarra River at Burnley

Yarra River at Southbank

Yarra River at Southbank

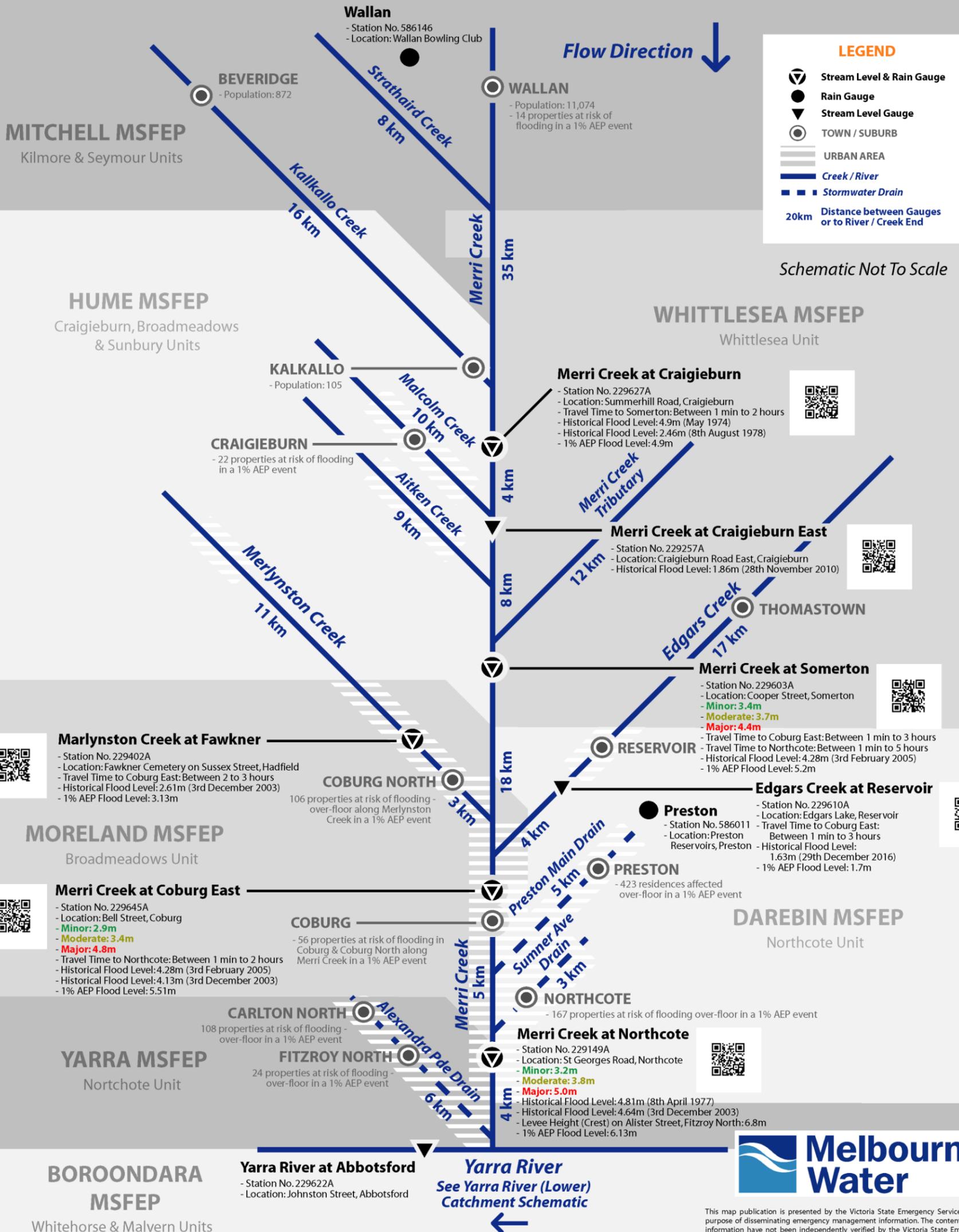
MELBOURNE MFEP





Merri Creek Catchment Schematic

Version 6 - February 2020



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



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Darebin Creek Catchment Schematic

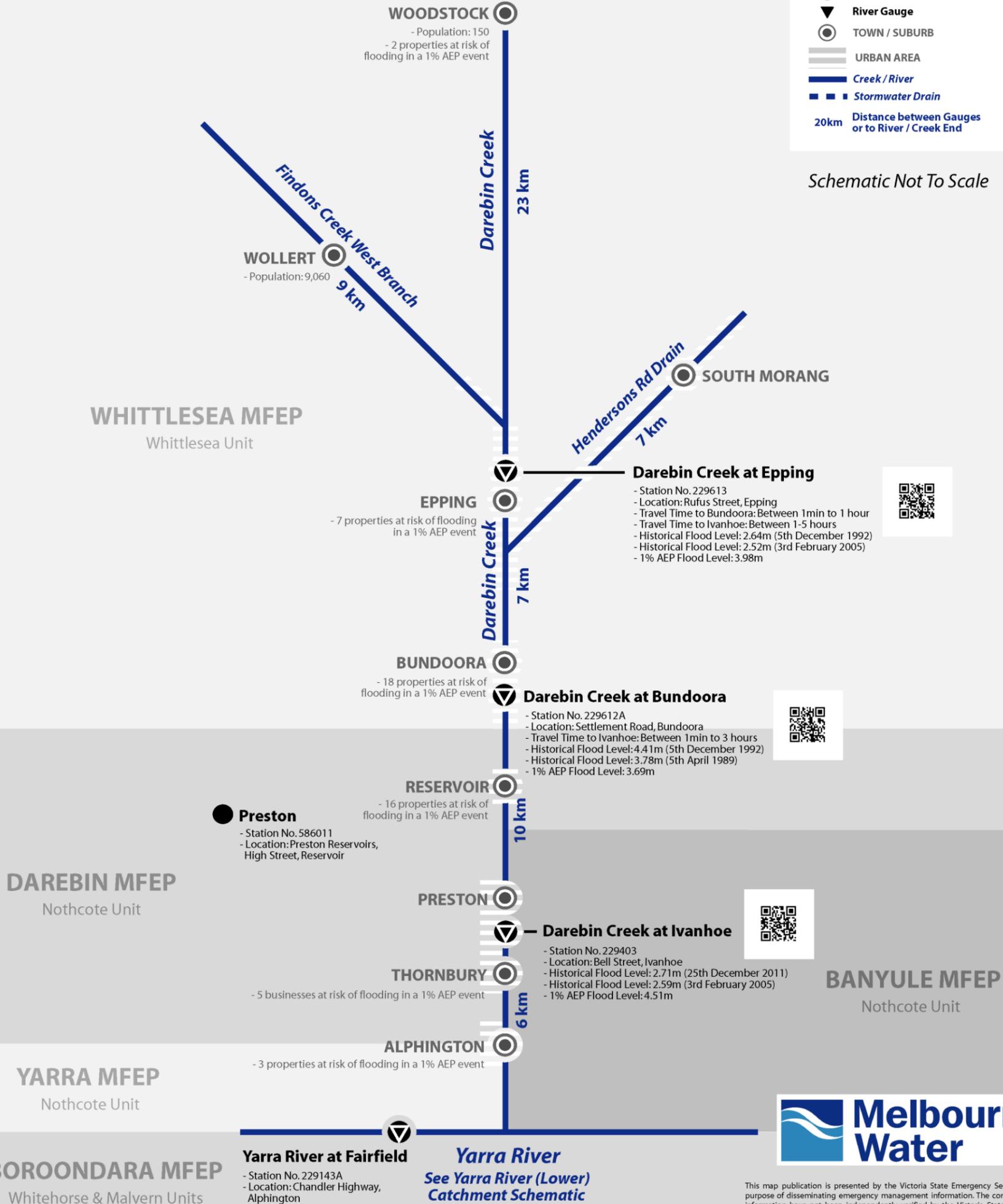
Version 4 - February 2020

Flow Direction ↓

LEGEND

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

Schematic Not To Scale



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

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