

Whittlesea Municipal Storm and Flood Emergencies Sub-Plan 2023-2026

*A Sub-Plan of the Whittlesea Municipal
Emergency Management Plan*

This Whittlesea Storm and Flood Emergency Sub-Plan (WSFESP) is a sub-plan of the Whittlesea Municipal Emergency Management Plan (MEMPC) V4.1 and is to be read in conjunction with that document. Terms, acronyms, and references that appear in the MEMPC are not duplicated in this sub-plan.

Version 5.0
Full revision May 2023

Acknowledgement of Country

The Whittlesea Municipal Emergency Management Planning Committee recognises the rich Aboriginal heritage of this country and acknowledge the Wurundjeri Willum Clan and Taungurung people as the Traditional Owners of lands within the City of Whittlesea.

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1. Introduction and the sub-plan



1.1. Aim and objectives

1.1.1. Aim

The purpose of this Whittlesea Storm and Flood Emergency Sub-Plan, the sub-plan, is to detail the local arrangements for before, during and after storm and flood incidents within the municipal footprint known as the City of Whittlesea.

1.1.2. Objectives

The objectives of the sub-plan, are to:

- align with and reflect the state emergency management planning framework and associated documentation,
- identify and 'assess the storm and flood risks' which may impact the people, property and/or the environment in the municipal area,
- support the implementation of measures to 'avoid or minimise future risks' and 'reduce existing risks' giving consideration to the causes and consequences of storm and flood incidents within the municipal area,
- 'manage residual risks' with a focus on how access to better information can reduce the consequences of flood events,
- detail the multiagency approach and how policies, actions and accountabilities will be implemented to manage storm and flood incidents that impact the municipality before, during and after.

1.2. Responsibility for planning, review and maintenance of this Sub-Plan

This sub-plan must be maintained in order to remain effective. It must be endorsed by the MEMPC and assured by the REMPC and published every three years, or more frequently if required.

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

- following any new flood study
- following a change in non-structural and/or structural flood mitigation measures
- after the occurrence of a significant storm or flood event within the municipality.

1.3. Approval and endorsement

This Whittlesea Storm and Flood Emergency Sub-Plan has been prepared by the Whittlesea Municipal Emergency Management Planning Committee (MEMPC) as set out in Victoria's emergency management planning framework and following guidelines issued by the relevant Minister under the Emergency Management Act 2013 section 77.

This is a sub plan to the Whittlesea Municipal Emergency Management Plan (MEMPC). It is consistent with the State Emergency Management Plan (SEMP), the SEMP Storm Sub-Plan, the SEMP Flood Sub-Plan and the Victorian Floodplain Management Strategy. It also takes into account the outcomes of the Community Emergency Risk Assessment (CERA) process undertaken by the Whittlesea MEMPC. This sub-plan is a result of the cooperative efforts of the City of Whittlesea, VICSES and Victoria Police.

Minor and administrative amendments will be made to this sub-plan from time to time without presentation to the MEMPC. Any major structural or policy changes will be considered by the Whittlesea MEMPC before endorsement.

Endorsement

This sub-plan was accepted at the Whittlesea MEMPC during its meeting on 16 May 2023 as a sub-plan to the MEMP for a period of three (3) years. The REMPC endorsed plan on 23 October 2023

1.4. Document amendment register

This Whittlesea Storm and Flood Emergency Sub-Plan will be amended, maintained and distributed as required by the Whittlesea MEMPC with the City of Whittlesea supporting version control and administration.

Suggestions for amendments to this sub-plan should be sent to:
resilience.management@whittlesea.vic.gov.au

Amendments listed below have been included in this sub-plan and MEMPC members are advised of updates and version control.

Amendment Number	Date of Amendment	Amendment Entered By	Summary of Amendment
1.0	14 May 2013	VICSES	Initial development and adoption
1.1	April 2014	R Butler/A Tuxworth	Plan and maps reviewed and updated
2.0	Sept 2014	K Falcke/A Tuxworth	Minor amendments
3.0	May 2018	R. Butler	Review and update of Appendix A, B, C, F & G
3.1	May 2018	G. Abbott	Addition of storm appendix
4.0	January 2022	R. Butler	Application of new template. Updated parts of the body as well as Appendices A, B, C, F & G
4.0	April/May 2022	C Brockwell	Legislative and general content updates, preparation for MEMPC review
4.0	May 2022	C Brockwell	Endorsed by MEMPC for 12 Months
4.1	March 2023	M Patton	Administrative amendments
5.0	May 2023	A Mason	Full review and re-write
5.0	23 Oct 2023	M Patton	Endorsed by REMPC

This sub-plan will be made available on the City of Whittlesea and VICSES websites at www.whittlesea.vic.gov.au and www.ses.vic.gov.au

1.5. Complementary plans which support this Whittlesea Municipal Storm and Flood Emergencies Sub-Plan

- VICSES Thomastown and Lalor Local Flood Guide.
- VICSES Whittlesea Local Flood Guide.
- VICSES Central Region Emergency Response Plan.
- VICSES Central Region Storm and Flood Sub-Plans.
- VICSES SOP061.

1.6. Local considerations

The Whittlesea municipality is located approximately 20 kilometres north of Melbourne. The municipality is one of the largest local government areas in Melbourne covering an area of 487 square kilometres. About 30 percent of the municipality is urban and 70 percent is rural.

The municipality has 17 major suburbs and rural communities including Beveridge, Bundoora, Donnybrook, Doreen, Eden Park, Epping, Humevale, Kinglake West, Lalor, Mernda, Mill Park, South Morang, Thomastown, Whittlesea, Wollert, Woodstock and Yan Yean. The City of Whittlesea is bordered by the City of Hume to the west and Nillumbik Shire Council to the east, the Cities of Darebin and Banyule to the south, and Mitchell and Murrindindi Shire Councils to the north.

Whittlesea municipality has a diverse landscape character and many significant environmental features including the Plenty Gorge Parklands, the Kinglake National Park, extensive River Redgum Woodlands, grasslands, and significant waterways, such as the Plenty River, and Darebin and Merri Creeks.

Plenty Road and High Street form the major north-south transport routes through the municipality, and a series of roads, such as Mahoneys Road, Settlement Road, McDonalds Road, Findon Road, Cooper Street and Donnybrook Road cut across the municipality in an east-west direction. The Western Ring Road, which traverses the southern section of the municipality, provides an important passenger vehicle and freight link to the Hume Highway.

Whittlesea municipality is a rapidly growing and diverse community. It has one of the most culturally diverse populations in Victoria. In 2021, the Whittlesea municipality had an estimated population of 229,396¹; it is one of the fastest growing municipalities in Australia, with the population expected to reach over 300,000 by 2040². In 2021, there were 80,108 private residential dwellings in Whittlesea³ with around 2,500 new dwelling commencements per year⁴ (on average).

1. www.abs.gov.au Whittlesea 2021 Census All persons QuickStats; Australian Bureau of Statistics

2. www.forecast.id.com.au Population Summary; prepared by .id (informed decisions)

3. www.abs.gov.au 2021 Census of Population and Housing Whittlesea (LGA27070); Australian Bureau of Statistics

4. www.forecast.id.com.au Population and household Forecasts, 2016 to 2041; prepared by .id (informed decisions)

1.7. Historic floods

Significant floods (with high flood gauge levels and likely flooding consequences to property and infrastructure) have occurred within the City of Whittlesea area as detailed in the following tables. Levels and rain totals in black indicate large-scale impacts to surrounding areas were recorded, whereas grey figures indicate localised impacts if any occurred.

Event	Merri Creek at Craigieburn Nth (229627A)	Merri Creek at Somerton (229603A)		Darebin Creek at Epping (229613A)		Darebin Creek at Bundoora (229612A)		Plenty River at Mernda (229616A)	
	Creek Height	Rainfall at Gauge	Creek Height	Rainfall at Gauge	Creek Height	Rainfall at Gauge	Creek Height	Rainfall at Gauge	River Height
Normal Water Level	0.40m	-	0.65m	-	0.40m	-	0.45m	-	0.55m
Minor Flood Class	Not Classified	-	3.4m	-	Not Classified	-	Not Classified	-	Not Classified
Moderate Flood Class	Not Classified	-	3.7m	-	Not Classified	-	Not Classified	-	Not Classified
Major Flood Class	Not Classified	-	4.4m	-	Not Classified	-	Not Classified	-	Not Classified
18 th September 1960	-	-	-	-	-	-	3.66m	-	-
13 th July 1963	-	-	-	-	-	-	3.89m	-	-
9 th November 1971	4.44m	-	-	-	-	-	-	-	-
15 th May 1974	-	-	4.97m	-	-	-	4.82m	-	4.90m
18 th September 1975	-	-	3.30m	-	-	-	-	-	-
7 th April 1977	-	-	3.97m	-	-	-	-	-	-
19 th November 1978	1.81m	89mm / 22 hrs	2.88m	79mm / 18 hrs	1.50m	83mm / 21 hrs	2.60m	72mm / 19 hrs	2.55m
16 th October 1983	2.30m	81mm / 40 hrs	3.36m	64mm / 35 hrs	1.22m	83mm / 35 hrs	2.68m	68mm / 35 hrs	2.22m
30 th July 1987	2.39m	81mm / 34 hrs	3.87m	74mm / 34 hrs	2.22m	57mm / 37 hrs	3.28m	69mm / 38 hrs	3.24m
5 th April 1989	0.69m	64mm / 10 hrs	2.39m	-	1.27m	-	3.78m	27mm / 9 hrs	0.68m
11 th June 1989	2.35m	63mm / 45 hrs	3.74m	56mm / 44 hrs	2.09m	47mm / 42 hrs	3.15m	53mm / 44 hrs	3.02m
18 th July 1990	2.13m	62mm / 57 hrs	3.53m	55mm / 56 hrs	2.08m	56mm / 56 hrs	3.23m	52mm / 56 hrs	1.78m
5 th December 1992	0.54m	10mm / 1 hr	1.71m	16mm / 2 hrs	2.64m	15mm / 2 hrs	4.41m	2mm / 1 hr	0.87m
27 th December 1993	1.56m	130mm / 37 hrs	3.33m	71mm / 38 hrs	1.34m	76mm / 39 hrs	2.94m	58mm / 42 hrs	0.79m
23 rd June 1996	1.79m	50mm / 24 hrs	3.01m	56mm / 25 hrs	2.32m	53mm / 22 hrs	3.18m	57mm / 22 hrs	2.63m
24 th April 2001	-	97mm / 50 hrs	2.93m	98mm / 50 hrs	1.98m	100mm / 50 hrs	1.63m	109mm / 51 hrs	3.19m
3 rd February 2005	2.13m	179mm / 27 hrs	4.28m	140mm / 27 hrs	2.52m	134mm / 27 hrs	2.60m	116mm / 26 hrs	3.79m
28 th November 2010	1.78m	114mm / 82 hrs	2.84m	63mm / 84 hrs	1.77m	84mm / 80 hrs	1.15m	62mm / 80 hrs	3.11m
5 th February 2011	0.54m	80mm / 13 hrs	2.73m	98mm / 13 hrs	2.35m	88mm / 14 hrs	2.77m	70mm / 13 hrs	2.87m
25 th December 2011	0.46m	41mm / 3 hrs	1.92m	43mm / 3 hrs	2.16m	77mm / 4 hrs	3.17m	38mm / 4 hrs	1.10m
1 st June 2013	1.97m	103mm / 12 hrs	3.43m	102mm / 12 hrs	2.39m	107mm / 13 hrs	3.25m	31mm / 12 hrs	1.73m
31 st January 2016	0.62m	16mm / 2 hrs	0.88m	46mm / 2 hrs	2.38m	39mm / 2 hrs	1.38m	33mm / 1 hr	1.11m
29 th December 2016	1.53m	70mm / 2 hrs	2.86m	65mm / 2 hrs	2.62m	87mm / 3 hrs	3.09m	30mm / 2 hrs	0.88m
3 rd December 2017	1.06m	101mm / 73 hrs	1.57m	58mm / 41 hrs	1.82m	76mm / 43 hrs	1.24m	56mm / 41 hrs	1.35m

Table 1 – Selection of Historical Flood Events along Merri Creek, Darebin Creek and Plenty River

1.8. List of abbreviations and acronyms

In addition to the acronyms used in the MEMP and detailed in the MEMP's acronyms list, the following abbreviations and acronyms are used in this plan:

The following abbreviations and acronyms are used in the Plan			
AEP	Annual Exceedance Probability	FWS	Flood Warning System
AHD	Australian Height Datum (the height of a location above mean sea level in metres)	FZ	Floodway Zone
ARI	Average Recurrence Interval	LSIO	Land Subject to Inundation Overlay
CMA	Catchment Management Authority	PMF	Probable Maximum Flood
FO	Floodway Overlay	SBO	Special Building Overlay

1.9. Glossary

In addition to the terms used in the MEMP and detailed in the MEMP's glossary, the following terms are 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 which 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.
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 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 that is not absorbed into the ground has been taken into account.

2. Management arrangements



2.1. Planning

This sub-plan has been prepared as a sub-plan of the Whittlesea MEMP and aligns with the State's emergency management planning framework, including the SEMP and associated sub-plans and relevant strategic documents which outline the strategic approach for flood management across the state.



Image 1 – Strategic approach to flood management as detailed in the Victorian flood plain management strategy

2.1.1. State Emergency Management Plan alignment

The State Emergency Management Priorities are outlined in the SEMP.

The six C's: Command, Control, Coordination, Consequence, Communication and Community Connection are included in the SEMP.

2.1.2. Roles and responsibilities

The SEMP also defines the responsibilities of the Incident Controller (IC), Incident Control Centre (ICC), Incident Management Team (IMT) and Incident Emergency Management Team (IEMT).

The SEMP outlines (in Table 9 of the State Emergency Management Plan Roles and Responsibilities) that the Control Agency for storm and flood is VICSES. DEECA is identified as the Control Agency for dam safety, reticulated water and wastewater (sewerage) services related incidents.

There are a few agencies with specific roles that will act in support of VICSES and provide support to the community in the event of a serious storm or flood within the City of Whittlesea. These agencies will be engaged through the Incident Emergency Management Team (IEMT).

The general roles and responsibilities of supporting agencies are as detailed in the Whittlesea MEMP, VICSES Central Region Emergency Response Plan (complementary plan to the SEMP), SEMP Flood Sub-Plans and SEMP Storm Sub-Plan.

2.1.3. Whittlesea MEMPC

Arrangements for the Whittlesea MEMPC is detailed in the MEMP. The multi-agency committee regularly review the CERA for storm and flood risk and come together to review and amend this sub-plan when required. Significant work has been undertaken on this sub-plan to ensure it has relevant local content with purpose. The MEMPC fosters strong relationships across agency representatives with responsibilities for flood and storm response. This results in an uplift of readiness arrangements as implemented for the October 2022 storm event. This enhanced emergency response by maintaining proactive communication for road closure management and evacuation preparedness.

2.1.4. City of Whittlesea Storm and Flood Working Group

The City of Whittlesea has a Working Group dedicated to storm and flood. The purpose of the Working Group is to provide a forum for sharing information, problem solving on local issues, and proactive, strategic thinking to identify, assess and manage the storm and flood risks across the municipality. The main objectives of the group are to proactively assess storm and flood risks in the community, understand how they affect our municipality; and to increase agency and the community's ability to respond to and recover from flood and storm consequences.

2.1.5. Exercising the Plan

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

2.2. Preparedness and mitigation

2.2.1. Community awareness, information and education

To help inform and prepare the community, throughout the year, The City of Whittlesea will publish through various channels, scheduled information on key preparation activities that residents can undertake to help minimise the impact storms and floods. The published posts will support what is published on the City of Whittlesea website under "Resilience and Emergency Management."

In addition, if there is a storm or flood warning, timely and up-to-date information, directing residents to appropriate channels will be shared via all communication channels.

VICSES with the support of the City of Whittlesea and Melbourne Water will coordinate community information for storms and floods within the municipality, which includes, the preparation of Local Flood Guides and attendance at public events. Engagement will include raising awareness about the projected impacts of flood and storm events and what actions can be taken to prepare for and help minimise these impacts.

This sub-plan will be made available on the City of Whittlesea and the VICSES websites upon formal adoption by the MEMPC.

2.2.2. Structural flood mitigation measures

Structural flood mitigation measures existing within the City of Whittlesea are contained in Appendix A, for each riverine flooding locations: Plenty River, Merri Creek, Darebin Creek, and Central and Edgars Creek.

2.3. Readiness

2.3.1. On Receipt of a flood watch/severe weather warning

The VICSES RDO (until an IC is appointed) will undertake actions as defined within the Flood Intelligence Cards (Appendix A).

General considerations will be as follows:

- review storm and flood intelligence to assess likely flood consequences, including:
Melbourne Water rainfall and river monitoring ([Rainfall and river levels | Melbourne Water](#)),
- monitor weather and flood information – (bom.gov.au),
- assess Command and Control requirements,
- review local resources and consider the need for further resources in regard to personnel, property protection, flood rescue and air support,
- notify and brief the appropriate officers: This includes the Regional/Zone Controller (RC/ZC), and City of Whittlesea and other emergency services through the IEMT,
- assess ICC readiness (including staffing of IMT and IEMT) and open if required,
- ensure information and warnings are prepared and issued to the community where required (see Appendix E),
- monitor watercourses and undertake reconnaissance of low-lying areas,
- develop media and community information management strategy,
- ensure storm and flood mitigation works are being checked by owners,
- develop and issue incident action plan, if required,
- develop and issue situation report, if required.

2.3.2. On receipt of the first and subsequent storm and/or flood warnings

The VICSES RDO/IC will undertake actions as defined within the Flood Intelligence Cards (Appendix A).

General considerations will be as follows:

- develop an appreciation of current flood levels and predicted levels. Determine if floodwaters are rising, peaking or falling.
- review flood and storm intelligence to assess likely flood consequences. Consider:
 - what areas may be at risk of inundation,
 - what areas may be at risk of isolation,
 - what areas may be at risk of indirect affects as a consequence of power, gas, water, telephone, sewerage, health, transport or emergency service infrastructure interruption,
 - the characteristics of the populations at risk.
- determine what the “at-risk” community need to know and do as the storm and/or flood develops.

- warn the at-risk community including ensuring that an appropriate public information strategy is implemented; including details of:
 - the current situation,
 - storm and/or flood predictions,
 - what the consequences of predicted activity or levels may be,
 - public safety advice,
 - who to contact for further information,
 - who to contact for emergency assistance.
- liaise with relevant asset owners as appropriate (i.e. water and power utilities)
- implement response strategies as required based upon flood consequence assessment.
- continue to monitor the situation – (bom.gov.au/vic/flood/)
- continue to conduct reconnaissance of low-lying areas

2.3.3. Media communication

Responsibility for public information, including media briefings, rest with VICSES as the control agency. Council will assist VICSES to warn the community where practicable including activation of flood warning systems, where they exist. The IC through the Public Information Section established at the ICC will manage media communication and use VicEmergency if appropriate. If the ICC is not established, the VICSES RDO will manage all media communication. The City of Whittlesea will assist with the dissemination of public information and warnings to ensure consistent and timely messaging occurs.

2.3.4. Preliminary deployments

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

2.4. Response

2.4.1. Activation of response

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

The VICSES RDO, RAC or IC will activate agencies as required and documented in the VICSES Central Region Emergency Response Plan – Storm and Flood Sub-plans and SEMP Storm and Flood Sub-plans.

2.4.2. Escalation

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

Resourcing and event escalation arrangements are described in the SEMP.

2.4.3. Flood rescue

Victoria Police is the designated control agency for water rescue and coordinates rescues undertaken during storm and/or flood events.

In order to activate water rescue services, VICSES as a Control Agency for overall storm and/or flood response, will identify areas at risk of requiring rescue and notify the OIC of the Rescue Coordination Centre to request pre-deployment of rescue resources to those areas.

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

Rescue operations may be undertaken where voluntary evacuation is not possible, has failed or is considered too dangerous for an at-risk person or community. An assessment of available flood rescue resources (if not already done prior to the event) should be undertaken prior to the commencement of rescue operations.

Rescue is considered a high-risk strategy to both rescuers and persons requiring rescue and should not be regarded as a preferred emergency management strategy. Rescuers should always undertake a dynamic risk assessment before attempting to undertake a rescue.

2.4.4. Warnings

Warnings across Victoria are issued by VICSES as the control agency and are in alignment with the Australian Warning System – which is a national approach to information and warnings during emergencies. More information can be obtained here: [Australian Warning System](#)



Image 2: Australian Warning System icons: Storm



Image 3: Australian Warning System icons: Flood

Evacuation warning messages will be developed and issued by VICSES and may be prepared in consultation with the MERC, MEMO and MRM especially where an Emergency Relief Centre is required. They may include a warning to prepare to evacuate and a warning to evacuate immediately.

2.4.5. Evacuation

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

The decision to prepare to evacuate or to evacuate is to be made by the IC in consultation with the IEMT. If evacuation is determined as appropriate, the MEMO and MRM should be notified as soon as possible. It is the choice of individuals as to how they respond to this recommendation.

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

No triggers for evacuation within the City of Whittlesea have currently been defined.

Once the decision is made, Victoria Police is responsible for the management of the evacuation process and security of the evacuated areas. VICSES may provide advice regarding the most appropriate evacuation routes and locations for at-risk communities to evacuate to. VICSES (as the Control Agency) is also responsible for the development and communication of evacuation warnings – when activated, this will be undertaken by the ICC Public Information Section under direction of the IC.

Evacuation operations should be consistent with the Joint Standard Operating Procedure on Evacuation (JSOP3.12). Refer to details within the MEMP for further guidance on evacuations for emergencies.

Decision to evacuate

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

- properties are likely to become inundated,
- properties are likely to become isolated and occupants are not prepared 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,
- time required and available to conduct the evacuation,
- evacuation priorities and evacuation planning arrangements,
- access and egress routes available and their potential flood liability,
- current and likely future status of essential infrastructure
- resources required and available to conduct the evacuation,
- shelter options including Emergency Relief Centres,
- vulnerable people and facilities where vulnerable people may be located,
- transportation,
- registration,
- people of CALD background and transient populations,
- safety of emergency service personnel,
- different stages of an evacuation process.

Return

The IC in consultation with Victoria Police will determine when it is safe for evacuees to return to their properties and will arrange for the notification of the community.

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

Considerations for deciding whether to return include:

- current flood or storm situation,
- status of flood mitigation systems,
- size and location of the community,
- access and egress routes available and their status,
- resources required to coordinate the return,
- special needs groups,
- forecast weather,
- transportation; particularly for people without access to transport.

2.4.6. Vulnerable people in emergencies

Vulnerable people living in the community will be identified through funded agencies, community service organisations or other community networks. Such people will be assessed against the definition of a vulnerable person and may qualify for registration on the Vulnerable Persons Register (VPR).

A list of facilities where vulnerable people may be located is also kept by council. These may be funded facilities including education, health and childcare, Commonwealth regulated aged care facilities and other locally identified facilities. Further information on vulnerable people in emergencies can be obtained from the MRM.

2.4.7. Essential infrastructure and property protection

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

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

The IC will determine the priorities related to the use of sandbags, which will be consistent with the state emergency management priorities.

If VICSES sandbags are becoming limited in supply, then priority will be given to protection of essential infrastructure.

Property may be protected by:

- sandbagging to minimise entry of water into buildings,
- encouraging businesses and households to lift or move contents,

2.4.8. Disruption to services

Disruption to services other than essential infrastructure and property can occur in storm and/or flood events. This may include road closures affecting school bus routes, water treatment plants affecting potable water supplies, etc. The following services could be affected in a flooding event:

Service	Impact	Trigger Point for action	Strategy/Temporary Measures
Bus Routes: 381, 382, 384, 385, 544, 554, 555, 556, 557, 559, 564, 570, 577	Potential for route flooding in sections requiring detours	Flooding of route, road closure implementation	Route detours
Train route: South Morang Line at South Morang and Thomastown	Potential for route flooding near stations	Nil trigger identified	Bus replacement services, service delays

Table 2 – Services that may be affected in a flooding event

2.4.9. 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.

2.4.10. Aircraft management

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

Air support operations will be conducted under the control of the IC in line with Interagency Aviation Operating Policy – Victoria (IAOP) 01 – Air Operations. The IC may request aircraft support through the

State Air Desk located at the SCC. Prioritisation and allocation of aircraft will be undertaken by the State Air Desk, in consultation with the SRC.

2.4.11. Resupply

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

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

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

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

2.4.12. Impact Assessment (IA)

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

The control agency is responsible for coordinating the collection, collation and dissemination of Initial Impact Assessment (IIA) information on a whole of government basis during the emergency response.

The purpose, function and conduct of IIA are outlined in the SEMP Storm and Flood Sub-plans. All IIAs should be conducted in accordance with current State impact assessment doctrine and SOPs.

The City of Whittlesea are responsible for coordination and conduct of Secondary Impact Assessment (SIA) across the impacted community and will be triaged based on IIA intelligence. All asset owners will be responsible for asset inspections including public roads and infrastructure and make safe or rectification works as required.

The City of Whittlesea will share community SIA data to ERV via the state portal.

2.5. Relief

2.5.1. Emergency relief

The range and type of emergency relief services to be provided in response to a storm or flood event will be dependent upon the size, impact, and scale of the storm or flood. Suitable relief facilities identified for use during storms and/or floods as with the associated relief arrangements are detailed in Whittlesea MEMP and the City of Whittlesea Emergency Relief (complementary) Plan

The decision to recommend the opening of an emergency relief centre rests with the Incident Controller in accordance with the SEMP relief arrangements. The IC is responsible for ensuring that relief arrangements have been considered and implemented where required. The MRM will facilitate access to emergency relief facilities as required.

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

Animal shelter

The need for animal shelter compounds will be determined based on the location and size of the event. The Whittlesea MEMP and the City of Whittlesea Emergency Recovery (complementary) Plan provide details for animal shelter arrangements.

2.6. Recovery

2.6.1. Transition from response to recovery

VICSES as the Control Agency is responsible for ensuring an effective transition from response to recovery. This transition will be conducted in consultation with emergency management teams and the determined tier for transfer (local, regional or state). This will include the IMT and the MRM, Regional Recovery Coordinator and/or the State Recovery Coordinator. Further information about the transition can be found in the SEMP and Whittlesea MEMP.

2.6.2. After Action Review (AAR)

As the control agency, VICSES will coordinate the AAR arrangements of storm and flood operations as soon as practical following an event.

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

3. Major storm and flood risks within the Municipality



3.1. Riverine Flooding

3.1.1. Description

Riverine flooding occurs when there is heavy rainfall and the land is too saturated to absorb the water. The excess water then flows into rivers, creeks or streams. The volume of water becomes too great for the size of the channel causing the water to flow out over the banks. This then causes the water to flow into any low-lying areas adjacent.

Our riverine flooding risks include:

- Plenty River,
- Merri Creek,
- Darebin Creek,
- Central and Edgars Creek.

Typical travel times

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

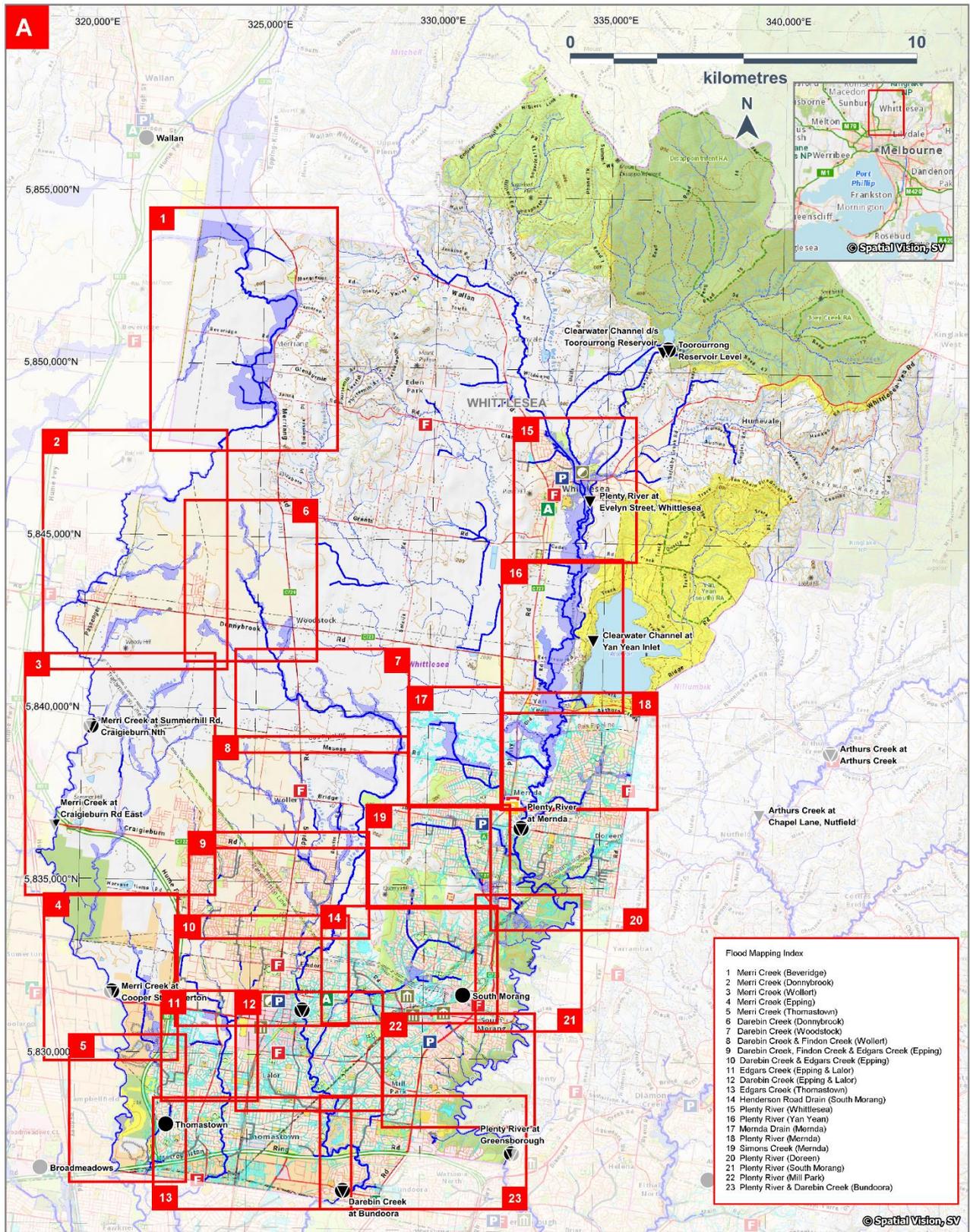
Note that flooding will start some time ahead of the time indicated by the following travel times – these are the time between the flood peaks at respective sites.

A flood peak may occur 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.

Location From (gauge)	Location To (gauge)	Typical Travel Time	Flood Class	Comments
PLENTY RIVER				
Mernda	Greensborough	Between 4 and 5 hours	Below Minor Flood Level at Lower Plenty	
		Between 3 and 4 hours	Minor Flood at Lower Plenty	
MERRI CREEK				
Craigieburn North	Somerton	Between 1 and 2 hours	Below Minor at Somerton	Somerton may peak up to 6 hours before Craigieburn North depending on the storm location and conditions.
		Between 1 min and 1 hour	Minor Flood at Somerton	Somerton may peak up to 5 hours before Craigieburn North depending on the storm location and conditions.
		Somerton likely to peak up to 4 hours before	Moderate Flood at Somerton	

		Craigieburn North		
DAREBIN CREEK				
Epping	Bundoora	Between 1 min and 1 hour.	No Flood Class	Bundoora may peak up to 5 hours before Epping depending on the storm location and conditions. If this occurs, a secondary smaller peak at Bundoora may occur up to 3 hours following Epping's peak.

Table 3 – Typical Flood Travel Times between gauges on the Plenty River and Merri and Darebin Creeks



Map Produced by VICSES October 2021.

CITY OF WHITTLESEA

Version 4: October 2021

A. Flood Index Map

Table 4: City of Whittlesea Municipal Maps (sourced Melbourne Water GIS). Flood Mapping Index, Riverine Flooding

3.1.2. Consequences

Consequences of riverine flooding include:

- human (loss of life, serious injury, displacement from home, emotional stress and physical injury from waterborne diseases),
- environmental (destruction of crops and livestock),
- social (impact on access to public and private transportation),
- built form (damage to property, neighbouring property and infrastructure such as power transmission),
- economic (business interruption).

3.1.3. Before

- River gages and warnings are available for flooding in the City of Whittlesea, and the City of Whittlesea and SES have identified properties at risk from flooding – check if your property is on this list.
- VICSES will lead the issuing of community information and warnings from a variety of sources when pre-determined triggers are met (issuing of a BOM Flood Watch or Warning); and share locally tailored information via the standard VICSES communication channels including emergency alert, phone messages, radio and television, verbal messages, community meetings and agency websites such as the VicEmergency website.
- VICSES with the support of the City of Whittlesea and Melbourne Water will coordinate community education programs for flooding within the council area (i.e. Local Flood Guides and public events). Engagement will include raising awareness about the projected impacts on the frequency and intensity of flood events and what actions can be taken to minimise these impacts.
- Local knowledge is invaluable for information regarding local waterways and previous flooding, and can also provide information regarding the potential impacts and consequences of an incident.
- The City of Whittlesea has several retarding basins, which is a structural flood mitigation measure to temporarily store water during heavy rain, reducing flood risk to the surrounding area.
- There are two types of flood warnings issued by the Bureau of Meteorology (BoM) - a flood watch, which means there is a developing weather pattern that might lead to flooding; and a flood warning, which means that flooding is expected. They will generally include predictions of the severity such as minor, moderate or major flooding. They are both distributed using the VicEmergency warning system.
- Community members can ensure they :
 - have a home emergency kit,
 - listen to emergency broadcasters and news bulletins,
 - know and support their neighbours,
 - clean up around their property and ensure outdoor items are tied down or brought inside.

3.1.4. During

- There are a number of agencies such as VicPol, DEECA, Melbourne Water and the Department of Transport and Planning with specific roles that will act in support of VICSES and provide support to the community in the event of a flood within the City of Whittlesea.
- Community information and community warnings will be issued by SES and City of Whittlesea that details incident information in a timely, relevant and tailored way to assist community members make informed decisions about their safety.
- If water rescue is required, VicPol is the designated agency, and they will coordinate rescues undertaken during a flood event.
- DTP, VicPol and the City of Whittlesea will communicate community information regarding road closures. This includes the observation and placement of warning signs and road blocks to its designated local and regional roads, bridges, walking and bike trails. VicPol may liaise with City of Whittlesea staff and DTP as to the need to erect warning signs and / or close roads and bridges under its jurisdiction. DTP is responsible for designated main roads and highways and Council is responsible for the designated local road network. DTP, VicPol and the City of Whittlesea will communicate community information regarding road closures.
- Riverine flooding is usually predicted, so residents can decide what action they will take before flooding occurs. If a flood impacts a resident, here is what they can do:
 - call VICSES for emergency assistance on 132 500 or Triple Zero (000) in life threatening situations,
 - keep monitoring weather warnings and forecasts from the Bureau of Meteorology and the VicEmergency app, and tune into emergency broadcasters,
 - do not drive through floodwater,
 - if you are indoors, stay inside – if floodwater enters, move to a higher point such as a kitchen bench or second storey. If you are outside, try to seek shelter indoors, away from floodwater. Stay away from trees, low lying areas and bodies of water,
 - if you need to evacuate, follow any instructions from emergency services, check for road closures and travel to family or friends homes that are not impacted by flood.

3.1.5. After

- An isolation risk exists for residents in Whittlesea Township – major arterial roads connecting Whittlesea Township may be cut for some time if the area is flooded.
- The City of Whittlesea will conduct secondary impact assessments to assess the impact of the flood and the level of assistance needed by affected communities.
- Matters relating to the welfare of livestock and companion animals (including feeding and rescue) are to be referred to the Department of Jobs, Precincts and Regions (DJPR); whilst matters relating to the welfare of wildlife are to be referred to DEECA and City of Whittlesea.
- Emergency relief centres may be opened after a flood emergency. The range and type of emergency relief services to be provided in response to a flood event will be dependent upon the size, impact, and scale of the flood. Agencies attending may include DFFH (providing personal hardship payments for affected persons); Red Cross, operating Register.Find.Reunite; and VCCEM providing personal support and psychological first aid.

- Council would consider offering free hard waste collection for any home that was inundated with water above flood level.
- Community members can ensure:
 - they do not re-enter their home unless it is safe to do so,
 - if they can not stay in their home, where possible, they should stay with friends and family. If they do not have a place to go, they should head to their closest relief centre,
 - follow Department of Health advice when cleaning buildings to reduce mould growth and mosquito breeding,
 - they don't drive through or enter floodwater.

3.2. Flash floods and overland flooding

3.2.1. Description

Flash flooding is caused by relatively short, intense bursts of rainfall – such as a thunderstorm. Drainage systems have insufficient time to cope with the downpour, and soil absorption and runoff can't disperse of the intense rainfall. Although flash floods tend to be localised, they can be one of the most dangerous forms of flooding because they are unpredictable and can be very destructive. As the water rises quickly in flash floods, they can be difficult to warn and prepare for.

For a list of overland flow paths and roads at risk of flooding, refer to Appendix B.

3.2.2. Consequences

Consequences of flash flooding include:

- human (loss of life, serious injury, displacement from home, emotional stress and physical injury from waterborne diseases),
- environmental (destruction of crops and livestock),
- social (impact on access to public and private transportation),
- built Form (damage to property, neighbouring property and infrastructure such as power transmission),
- economic (business interruption).

3.2.3. Before

- The City of Whittlesea undertakes studies to identify areas of flood prone land to determine risks, set future development restrictions, as well as investigate and implement options to mitigate the effect of floods on existing development.
- The Bureau of Meteorology issues Severe Thunderstorm Warnings and Severe Weather Warnings when heavy rainfall or storms are predicted. These warnings can indicate weather which has the possibility to cause flash flooding. It is important to monitor weather conditions and environmental cues, as this could be the only notice of possible flash flooding.

- SES uses the VicEmergency website, app and hotline to distribute flash flooding warnings and emergency information. During some emergencies, SES may alert communities by sounding a loud siren, or by sending SMS to mobile phones or a voice message to landlines.
- The City of Whittlesea utilises mapping to identify flash flooding prone areas in the municipality.
- For any landslide/landslip incidents, VicPol is the Control Agency, whilst VICSES is the Control Agency for any related flooding. Major landslides have the potential to cause structural and community damage within the municipality.
- The City of Whittlesea has several retarding basins, which is a structural flood mitigation measure to temporarily store water during heavy rain, reducing flood risk to the surrounding area.

3.2.4. During

- As flash flooding is caused by quick, intense bursts of rainfall, flash flooding usually develops more rapidly than overland flooding. As such, water drains away faster in a flash flood event.
- Flash floods are dangerous and can happen anywhere. There may be no official warning for flash floods. Heavy rainfall and/or quickly pooling or rushing water, could be natural signs that flash flooding is happening.
- Flash floodwater can be faster flowing and deeper than it appears. It can also contain sewerage and poisons, hidden snags, dead animals and debris. You must never drive, ride or walk through floodwater.
- If verified reports are received of flash flooding posing, or resulting in, a significant threat to life or property, VICSES Regions (or ICCs) will issue a flash flood warning product via EM-COP.
- Community members can ensure:
 - if they become trapped in their home or a building, they seek refuge in the highest part,
 - they never drive through floodwater, however, if they find themselves driving when flash flooding occurs, they should safely pull over to higher ground, away from trees.

3.2.5. After

- VicPol is responsible for the management of the evacuation process, with VICSES and other agencies assisting where practical. VICSES is responsible for the development and communication of evacuation warnings.
- Flash floods can also erode road and path surfaces leaving potholes, sinkholes and other dangers. The City of Whittlesea will conduct road inspections on flooded roads, to ensure the surface or sub-surface hasn't been affected by stormwater, is safe to drive, and is clear of debris. Other infrastructure or assets will also be inspected, such as bridges and footpaths.
- Council will conduct stormwater clear outs, emptying the stormwater and clearing the network of debris.
- Council would consider offering free hard waste collection for any home that was inundated with water above flood level.
- Emergency relief centres may be opened after a flood emergency. The range and type of emergency relief services to be provided in response to a flood event will be dependent upon the size, impact, and scale of the flood. Agencies attending may include DFFH (providing personal hardship payments for affected persons); Red Cross, operating Register.Find.Reunite; and VCCEM providing personal support and psychological first aid.

3.3. Infrastructure failure flooding

3.3.1. Description

Flooding can occur when infrastructure that carries, controls or stores water (such as dams, reservoirs, pumps or pipes) become damaged or stop working, which means the water can no longer be controlled or contained. Damage can occur because of age, lack or maintenance, climate impacts or extreme disasters. The two main reservoirs we have in the City of Whittlesea are Yan Yean Reservoir in Yan Yean and Toorourrong Reservoir in Whittlesea. Flooding resulting from failure of the following dams is likely to cause significant structural and community damage within the City of Whittlesea.

Dam failure

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

Dam Name	Location	Owner	Dam Capacity at Full Supply Level	Full Supply Level	VicMap Reference
Toorourrong Reservoir	Whittlesea	Melbourne Water	195ML (reduced from 300ML due to Silt)	227.85m AHD	Central 6364 G15
Yan Yean Reservoir	Yan Yean	Melbourne Water	30,266ML	183.19m AHD	Central 6448 E10

Table 5 – Melbourne Water Reservoirs that pose a risk to the City of Whittlesea from Dam Failure

Service Reservoirs located within the Municipality are listed below.

Service Reservoir Name	Location	Owner	Material	Reservoir Capacity	Melway Reference
Morang Steel Tank No.1	Williamsons Rd, South Morang	Melbourne Water	Steel Tank	29.10ML	183F10
Morang Steel Tank No.2	Williamsons Rd, South Morang	Melbourne Water	Steel Tank	29.10ML	183F10
Morang Steel Tank No.3	Williamsons Rd, South Morang	Melbourne Water	Steel Tank	40.90ML	183F10
Morang Steel Tank No.4	Williamsons Rd, South Morang	Melbourne Water	Steel Tank	40.90ML	183F10
Quarry Hill Steel Tank	Quarry Hills Park, Epping	Melbourne Water	Steel Tank	35.30ML	182J7
Yan Yean Treated Water	Arthurs Creek Rd, Yan Yean	Parks Victoria	Steel Tank	Unavailable	391D1

Table 6 – Melbourne Water Service Reservoirs in the City of Whittlesea

3.3.2. Consequences

- Human (loss of life, serious injury).
- Built Form (damage to property, neighbouring property and infrastructure such as power transmission).
- Environmental (destruction of crops and livestock, damage to local vegetation).

3.3.3. Before

- DEECA 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.

- Melbourne Water are responsible for implementing plans for the protection and continuity of services in the event of a threat or impact to Melbourne Water's dams.
- For any Landslip incidents, VicPol is the Control Agency and VICSES is the Control Agency for any flooding that may result.
- Dam owners should regularly inspect and maintain their dams to keep them in good order, and check they have the right licences to build and operate them. Those living in rural residential areas may also need to register their dam with the local water corporation.
- Have an emergency plan which provides the processes and procedures that will enable a dam owner to respond collaboratively with emergency management groups, local government(s) and emergency agencies to manage the consequences of an event aimed at protecting people and property.
- The SES will be notified during potential dam failure emergencies.
- Levee owners and operators are responsible for maintenance, operation and monitoring of their levees. Levee owners/operators must keep the IC informed of levee status' and be prepared to provide expert advice to the IC about the design and construction of their levees. In accordance with the State Emergency Management Priorities, the IC may assist levee owners to coordinate resources, both technical and physical, to provide advice and affect temporary repairs to, or augmentation of, levees.
- Inundation of critical sewerage assets including septic tanks and sewerage pump stations may result in water quality problems within the Municipality. Where this is likely to occur, or has occurred, the responsible agency for the critical sewerage asset (Yarra Valley Water) should advise VICSES and the Whittlesea MEMO of the security of critical sewerage assets to assist preparedness and response activities in the event of a flood; maintain or improve the security of critical sewerage assets; check and correct where possible the operation of critical sewerage assets in times of flood; and advise VICSES (or the relevant ICC, where established) in the event of inundation of critical sewerage assets. It is the responsibility of the City of Whittlesea to conduct secondary impact assessment which will identify impacts to critical sewerage assets such as septic tanks. This intelligence will be shared with relevant agencies.

3.3.4. During

- Should dam failure occur, significant downstream flooding with potentially swift flowing water and high amounts of debris can result.
- In Victoria dam safety is monitored, and warning arrangements are in place to warn downstream residents of potential dam failure threats.

3.3.5. After

- Asset managers of failed infrastructure may conduct water source reductions.
- Council would consider offering free hard waste collection for any home that was inundated with water above flood level
- Emergency relief centres may be opened after a flood emergency. The range and type of emergency relief services to be provided in response to a flood event will be dependent upon the size, impact, and scale of the flood. Agencies attending may include DFFH (providing personal hardship payments for affected persons); Red Cross, operating Register.Find.Reunite; and VCCEM providing personal support and psychological first aid.

3.4. Storm

3.4.1. Description

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

Storms can be unpredictable and occur anywhere and at any time. They can cause major damage and put your life at risk. Damage can occur when items such as tree branches, outdoor furniture, trampolines or other loose items become flying projectiles in strong winds; branches can fall on cars; flooding can occur due to blocked drains and overhanging branches can fall.

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

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

The City of Whittlesea is home to a number of sites of environmental significance that could be impacted by a storm event, such as:

- large river red gums in Bundoora Park with some bearing marks from Aboriginal use for shelters and utensils,
- 'Scarred' trees from Mount Cooper and around RMIT,
- a number of dry stone walls,
- numerous heritage sites such as Turner's Bakehouse, Ziebell's Farmhouse, Bear's Castle and the many bluestone buildings such as Epping Primary School and Epping Presbyterian Church.

3.4.2. Consequences

- Human (loss of life, serious injury, damage to homes).
- Environmental (destruction and damage to trees).
- Social (impact on access to public and private transportation).
- Built Form (damage to property, neighbouring property and infrastructure such as power transmission).

3.4.3. Before

- The City of Whittlesea utilise street sweepers to clean the gutters, reducing the number of blockages that occur and build-up of debris – meaning storm water can drain properly
- To minimise damage from trees in a storm event, the City of Whittlesea arranges for tree specialists to assess the sturdiness and health of every street tree at least once every 2 years, and also respond to requests about perceived dangerous trees.
- The SES has developed a StormSafe campaign to help ‘at risk’ communities prepare for storm events.
- VICSES with the support of the City of Whittlesea and Melbourne Water will coordinate community education programs for storm within the council area (i.e. Local Flood Guides and public events). Engagement will include raising awareness about the projected impacts on the frequency and intensity of storm events and what actions can be taken to minimise these impacts.
- The Bureau of Meteorology alerts communities to the threat of storms with two types of storm warnings: a Severe Weather Warning, when severe weather is occurring in an area or is expected to develop or move into an area; and a Severe Thunderstorm Warning, which alerts communities of the threat of more dangerous thunderstorms.
- VICSES uses EM-COP Public Publishing to distribute warnings in Victoria. The platform enables automatic publishing to the VicEmergency app, website and hotline (1800 226 226). Communities can also access this information through VICSES social media channels (Facebook and Twitter) and emergency broadcasters, such as ABC local radio. At this point there are no local flood warning system arrangements within the City of Whittlesea.
- Community members can ensure:
 - they have an emergency plan and kit prepared,
 - they monitor weather conditions and listen to emergency broadcasters and news bulletins,
 - they know and support their neighbours,
 - they secure loose items around the house and keep the yard free of clutter,
 - maintain their roof, make sure fences are secure and there are no tree branches overhanging their home.

3.4.4. During

- The BoM will issue warnings on severe weather and severe thunderstorms or other weather conditions likely to endanger life or property, and provide weather related information to media.
- During some emergencies, VICSES may alert communities by sounding a local siren, or by using the Emergency Alert (EA) platform to send an SMS to mobile phones or a voice message to landlines. The use of sirens for higher-end warnings has been pre-determined, and mapped to relevant warning templates in EM-COP.
- VicPol will coordinate rescues undertaken during storm events.
- During thunderstorm asthma events, the Department of Health will coordinate the health response to minimise the impact on individuals and communities.
- Community members can ensure:

- they continue to monitor weather conditions and listen to emergency broadcasters and news bulletins for warnings and alerts,
- stay indoors away from windows and bring pets inside,
- they avoid driving wherever possible. If they must drive, beware of fallen trees and power lines,
- if there is lightning during the storm, seek shelter, but never under a tree; and avoid using the telephone.

3.4.5. After

- Storm events may result in displacement or welfare issues for companion animals, livestock and wildlife. DEECA is responsible for wildlife welfare and DJPR is the support agency for the welfare of livestock and companion animals.
- Tree inspections - will check parks, playgrounds, sites of significance, other reserves.
- Emergency relief centres may be opened after a flood emergency. The range and type of emergency relief services to be provided in response to a flood event will be dependent upon the size, impact, and scale of the flood. Agencies attending may include DFFH (providing personal hardship payments for affected persons); Red Cross, operating Register.Find.Reunite; and VCCEM providing personal support and psychological first aid.
- Council would consider offering free hard waste collection for any home that was inundated with water above flood level.
- Storms can also erode road and path surfaces leaving potholes, sinkholes and other dangers. The City of Whittlesea will conduct road inspections on flooded roads, to ensure the surface or sub-surface hasn't been affected by stormwater, is safe to drive, and is clear of debris. Other infrastructure or assets will also be inspected, such as bridges and footpaths.
- Council will conduct stormwater clear outs, emptying the stormwater and clearing the network of debris.
- Community members can ensure:
 - they are aware of hazards like fallen trees, debris, damaged roads, bridges and powerlines,
 - they avoid driving through affected areas.

4. Appendix A



4.1. Plenty River

Overview of flooding consequences

Whittlesea, Yan Yean, Mernda, Doreen, South Morang and Mill Park are located between 20-30km north of Melbourne in a mixed urban fringe and rural town setting. Plenty River is the prominent watercourse in the area, beginning in the Kinglake National Park and flowing north to south down the east side of the Municipality, forming its eastern boundary from South Morang before leaving the City of Whittlesea and entering the City of Banyule. High Intensity, short duration rainfall events can cause flash flooding in and around Whittlesea, Yan Yean, Mernda, Doreen, South Morang and Mill Park, while prolonged rainfall may see Plenty River flood.

Ongoing new and infill development may see an increase to numbers of properties affected, particularly from flash flooding.

The area sees a mixture of flat and gradually undulating terrain leading to both moderate and slow water movement. Flooding may last for a number of days on areas of flat terrain.

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 Plenty River in City of Whittlesea

Property (Plenty River and its Stormwater Tributaries)					
Properties	66				
Residential	49				
Commercial	1	Whittlesea Showgrounds			
Industrial	0				
Public Land	2	Whittlesea Park and A.F. Walker Recreational Reserve			
Rural	14				
Community Infrastructure					
Child Care / Kindergartens	1	Whittlesea Child Care Centre			
Community Venues	1	Whittlesea Community Activity Centre			
Essential Infrastructure					
Major Roads	1	Whittlesea-Yea Road			
Bus Routes	4	381, 382, 384 & 385			
Sewerage Facilities	3	Sewer Emergency Relief Points			
Drainage Facilities	3	Retarding Basins			
Tourism / Recreation					
Recreation Facilities	3	Whittlesea Showgrounds, Whittlesea Park & A.F. Walker Rec Reserve			
Government Boundaries					
Local Gov't Areas	1	Whittlesea	CMA	1	Port Phillip & Westernport
Adjacent LGAs	1	Nillumbik	CFA District	1	District 14
SES Resp' Boundary	1	Whittlesea	FRV District	1	Northern

Table 7 – Consequence Summary of 1% AEP flood along Plenty River in the City of Whittlesea

Gauges and warnings

Warnings are available for flooding expected along the Plenty River at Lower Plenty. Flood class levels for the Lower Plenty gauge are detailed in table 8 and are used in the issuing of a flood warning for Plenty River. Other level/flood gauges within the Plenty River catchment are also contained within table 9.

Gauge	River / Creek Flood Class Level		
	Minor	Moderate	Major
Plenty River at Lower Plenty	5.0m	6.6m	7.2m

Table 8 – Gauges with established Flood Class Levels for the City of Whittlesea

At this site the Bureau of Meteorology (the Bureau) in consultation with Melbourne Water will issue flood warnings if levels reach those classified above. The warning will be placed on the Bureau's website (www.bom.gov.au). While the City of Whittlesea monitors these warnings in times of high rainfall, there are no specific guidelines to advise how these situations should be responded to.

Warning of potential flooding is available along Plenty River upstream at Whittlesea, Mernda and Greensborough within the City of Whittlesea.

Gauge	Station No.	Location	Stream Level & Flow Gauge	Rain Gauge	Melway Reference
Plenty River at Whittlesea	229617A	East bank of the river at Evelyn Street, Whittlesea	ü		246J9
Plenty River at Mernda	229616A	East bank of the river North side of Bridge Inn Road, Mernda	ü	ü	390K10
Plenty River at Greensborough	229615A	East bank of the river at the Maroondah Aqueduct, end of Lear Court, Greensborough	ü	ü	10J9
Toorourrong Reservoir	229400A	Toorourrong Reservoir, Whittlesea	ü	ü	VicMap 6364 G15

Table 9 – Gauges within the Plenty River catchment

These Gauges may provide some warning of expected flooding. See the Melbourne Water website for more information on these gauges:

<http://www.melbournewater.com.au/waterdata/rainfallandriverleveldata/Pages/Rainfall-and-river-level-new.aspx>. The Bureau of Meteorology's website also links a number of these gauges at:

http://www.bom.gov.au/cgi-bin/wrap_fwo.pl?IDV60201.html. It is advised that residents monitor the Bureau of Meteorology's website <http://www.bom.gov.au/vic/warnings/index.shtml?ref=hdr> and the VicEmergency website <https://emergency.vic.gov.au/> for any thunderstorm, flood or severe weather warnings present for their area.

Properties at flood risk

Properties listed in the table below are at risk from flooding along Plenty River in the City of Whittlesea. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Plenty River Middle - Whittlesea (Melbourne Water and Water Tech, August 2013), the Plenty River Middle – Yan Yean to Bundoora (Melbourne Water, August 1998) and the Laurimer Drain (Cardno, March 2021) flood mapping and risk assessment programs.

This Property Flood Risk Table is presented by the Victoria State Emergency Service for the purpose of disseminating emergency management information. The contents of the information have not been

independently verified by the Victoria State Emergency Service. No liability is accepted for any damage, loss or injury caused by errors or omissions in this information or for any action taken by any person in reliance upon it.

Properties at risk from Flooding along Plenty 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
1	Anita Court	Whittlesea	Plenty River	Riverine
2	Anita Court	Whittlesea	Plenty River	Riverine
3	Anita Court	Whittlesea	Plenty River	Riverine
4	Anita Court	Whittlesea	Plenty River	Riverine
5	Anita Court	Whittlesea	Plenty River	Riverine
34	Beech Street	Whittlesea	Plenty River	Riverine
35C	Beech Street	Whittlesea	Plenty River	Riverine
210	Bruces Creek Road	Whittlesea	Yarra Creek	Riverine
120	Cades Road	Yan Yean	Plenty River	Riverine
110	Dunnetts Road	Yan Yean	Plenty River	Riverine
120	Dunnetts Road	Yan Yean	Plenty River	Riverine
140	Dunnetts Road	Yan Yean	Plenty River	Riverine
155	Dunnetts Road	Yan Yean	Plenty River	Riverine
50	Forest Street	Whittlesea	Plenty River	Riverine
1	Gardenia Place	Whittlesea	Plenty River	Riverine
2	Gardenia Place	Whittlesea	Plenty River	Riverine
3	Gardenia Place	Whittlesea	Plenty River	Riverine
4	Gardenia Place	Whittlesea	Plenty River	Riverine
5	Gardenia Place	Whittlesea	Plenty River	Riverine
22	Gardenia Place	Whittlesea	Plenty River	Riverine
23	Gardenia Place	Whittlesea	Plenty River	Riverine
24	Gardenia Place	Whittlesea	Plenty River	Riverine
25	Gardenia Place	Whittlesea	Plenty River	Riverine
13	Hayes Road	Mernda	Mernda Drain	Riverine
57-61	Laurel Street	Whittlesea	Plenty River	Riverine
63	Laurel Street	Whittlesea	Plenty River	Riverine
65	Laurel Street	Whittlesea	Plenty River	Riverine
67	Laurel Street	Whittlesea	Plenty River	Riverine
69	Laurel Street	Whittlesea	Plenty River	Riverine
71A	Laurel Street	Whittlesea	Plenty River	Riverine
76	Laurel Street	Whittlesea	Plenty River	Riverine
2080	Plenty Road	Yan Yean	Plenty River	Riverine
240	Wallan Road	Whittlesea	Yarra Creek	Riverine
30	Yea Road	Whittlesea	Plenty River	Riverine
34	Yea Road	Whittlesea	Plenty River	Riverine
42	Yea Road	Whittlesea	Plenty River	Riverine
44	Yea Road	Whittlesea	Plenty River	Riverine
46	Yea Road	Whittlesea	Plenty River	Riverine

Properties at risk from Flooding along Plenty 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
48	Yea Road	Whittlesea	Plenty River	Riverine
52	Yea Road	Whittlesea	Plenty River	Riverine
54	Yea Road	Whittlesea	Plenty River	Riverine
Total				
41				

Table 10 – Properties at risk of flooding along the Plenty River catchment in the City of Whittlesea

Properties listed in the table below are at risk from flash flooding along Plenty River's stormwater Tributaries in the City of Whittlesea. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Laurimer Drain (Cardno, March 2021) and the Plenty River Tributaries (Engeny, July 2019) flood mapping and risk assessment programs. 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.

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Properties at risk from Flash Flooding along Plenty River (Over 30cm depth in Yard)						
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				
		P	525 Bridge Inn Road	Mernda	Local Drainage	Flash
	P	P	601 Bridge Inn Road	Mernda	Bridge Inn Road Drain	Flash
	P	P	607 Bridge Inn Road	Mernda	Bridge Inn Road Drain	Flash
	P	P	13 Hayes Road	Mernda	Mernda Drain	Flash
	P	P	14 Larnook Place	South Morang	Simons Creek	Flash
	P	P	16 Larnook Place	South Morang	Simons Creek	Flash
		P	576W Masons Road	Mernda	Mernda Drain	Flash
		P	578 Masons Road	Mernda	Mernda Drain	Flash
		P	582 Masons Road	Mernda	Mernda Drain	Flash
		P	1 Nisha Place	Mernda	Mernda Drain	Flash
		P	3 Nisha Place	Mernda	Mernda Drain	Flash
		P	1690 Plenty Road	Mernda	Plenty River Tributary	Flash
P	P	P	1 Pyrenees Lane	South Morang	Simons Creek	Flash
P	P	P	2 Pyrenees Lane	South Morang	Simons Creek	Flash
P	P	P	3 Pyrenees Lane	South Morang	Simons Creek	Flash
P	P	P	4 Pyrenees Lane	South Morang	Simons Creek	Flash
P	P	P	5 Pyrenees Lane	South Morang	Simons Creek	Flash
	P	P	27 River Brook Avenue	South Morang	Simons Creek	Flash

Properties at risk from Flash Flooding along Plenty River (Over 30cm depth in Yard)						
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				
	P	P	36 Schotters Road	Mernda	Local Drainage	Flash
	P	P	40 Schotters Road	Mernda	Local Drainage	Flash
	P	P	42 Schotters Road	Mernda	Local Drainage	Flash
	P	P	85 Schotters Road	Mernda	Mernda Drain	Flash
	P	P	1/87 Schotters Road	Mernda	Mernda Drain	Flash
	P	P	2/87 Schotters Road	Mernda	Mernda Drain	Flash
	P	P	89 Schotters Road	Mernda	Mernda Drain	Flash
Totals						
5	19	25				

Table 11 – Properties at risk of flash flooding along Plenty River’s stormwater Tributaries in the City of Whittlesea

Isolation

As occurred in the flood of May 1974, an isolation risk exists for Whittlesea Township. Major arterial roads connecting Whittlesea may be cut for some time when Plenty River and surrounding tributaries are flooded. 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/>.

Apart from the roads outlined below, all other essential infrastructure and services areas along the Plenty River in Whittlesea, Yan Yean, Mernda, South Morang and Mill Park 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 Whittlesea, Yan Yean, Mernda, South Morang and Mill Park. Check the VicTraffic website for more details:

<http://alerts.vicroads.vic.gov.au/>

Department of Transport & Planning Roads likely flooded in a 1% AEP event

- Whittlesea-Yea Road, Whittlesea at the Whittlesea Showgrounds

Table 12 – Department of Transport and Planning Possible Road Closures during a flooding event

Whittlesea City Council Roads likely flooded in a 1% AEP (100yr ARI) event

DOREEN		YAN YEAN	
• Shepherds Way		• Gardenia Avenue	
• Aylesbury Boulevard	• Wellington Street	• Arthurs Creek Road	• Laurel Street
• Hazel Glen Drive	SOUTH MORANG	• Cades Road	• McPhees Road
• Shetland Way	• Briar Court	• Dunnetts Road	• Showgrounds Road

• Garden Road	• Nirvana Drive	• Reservoir Road	• Wildwood Road
MERENDA	• Gardense Parade	WHITTLESEA	
• Hayes Road	• Larnook Place	• Bruces Creek Road	
• Masons Road	• River Brook Avenue	• Chandler Avenue	

Table 13 – Whittlesea City Council Possible flooded roads in the Plenty River catchment

Flood mitigation

Retarding basins

Melbourne Water Retarding Basin	On Drain/ Waterway	Spillway Crest Level	Full Supply Level	1% AEP Flood Level	Embankment Crest Height	Storage Capacity	ANCOLD Hazard Rating	Houses In Flow Path (dam breach)	Melway Reference
Development Boulevard	Plenty River	131.3m AHD	131.9m AHD	Unavailable	3.2m (131.9m AHD)	3.5ML	Very Low	Nil	10D3
Diosma Way	Plenty River	122.6m AHD	123.3m AHD	Unavailable	4m	4.0ML	Very Low	Nil	10D3
Incana Drive	Plenty River	112.3m AHD	112.9m AHD	Unavailable	3m	1.0ML	Very Low	Nil	10D4
Mernda Drain	Mernda Drain	162.8m AHD	Unavailable	Unavailable	1.0m	12.8ML	Low	4	390J8
Mernda South	Simons Creek	Unavailable	165.63m AHD	Unavailable	Unavailable	Unavailable	Very Low	Unavailable	390E9
Robin Place	Thomas St Drain	127.35m AHD	128.25m AHD	Unavailable	7.15m (128.25m AHD)	20.7ML	Very Low	Nil	10G1
University Hill	University Hill Creek	96.0m AHD	Unavailable	97.20m AHD	(97.50m AHD)	~20ML	Unclassified	Unavailable	10C8
Warbler Walk	Thomas St Drain	114.5m AHD	115.6m AHD	Unavailable	5.85m (115.6m AHD)	16.8ML	Very Low	Nil	10G1

Table 14 – Melbourne Water Retarding Basins within the Plenty River catchment in the City of Whittlesea

Levees

Melbourne	Reach	Side	Levee	Levee	Levee	Levee	Houses	Melway
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Water/City of Whittlesea Levee		Height	Length	Shape	Material	in Flow Path	Reference	
Laurimar Park Estate Levee	Fenwick Street to Yan Yean Road	North	Unknown	100m	Trapezoidal	Earth	1	391 H6

Table 15 – Melbourne Water Levees in the Plenty River Catchment in the City of Whittlesea

No formal Pumping Stations exist along the Plenty River in the City of Whittlesea.

Sewerage infrastructure

Sewerage Infrastructure of note during a severe flood event located along the Plenty River are contained within the following table.

Sewer Pumping Stations

Sewerage Pumping Station	On Drain / Waterway	Bank / Side of Waterway	Operator	Location	Melway Reference
Cades Road	Local Drainage	-	Yarra Valley Water	Along Dismantled Railway behind Retland Drive, Whittlesea	246 F12
Cades Road STP Influent	Plenty River	West	Yarra Valley Water	300m North of Cades Road, Whittlesea	246 G12
Corella Drive	Local Drainage	-	Yarra Valley Water	Plenty Road at Millenium Park Drive, Whittlesea	246 F10
Doreen	Orchard Road Drain	West	Yarra Valley Water	Plenty Park Gorge, Doreen	184 C1
Janefield	Plenty River	West	Yarra Valley Water	Kurrajong View, Mill Park	10 E5
Janefield Drive	University Hill Creek	-	Yarra Valley Water	Janefield Drive, Bundoora	10 C8
Laurel Street	Plenty River	West	Yarra Valley Water	Laurel Street, Whittlesea	246 H9
Mernda North	Plenty River	West	Yarra Valley Water	Mernda Recreation Reserve, Schotters Road, Mernda	246 F10
Mernda South	Local Drainage	-	Yarra Valley Water	Gledswood Avenue, South Morang	184 A4
Painted Hill	Laurimar Drain	-	Yarra Valley Water	Painted Hills Road, Doreen	391 E6
Plenty Gorge	Plenty River	West	Yarra Valley Water	Gorge Road, South Morang	183 J12
Queens Gardens	Plenty River	-	Yarra Valley	Queens Gardens, Bundoora	10 G9

	Tributary		Water		
Tributary Circuit	Plenty River	East	Yarra Valley Water	Tributary Circuit, Doreen	184 C3
Yea Road	Scrubby Creek	North	Yarra Valley Water	Yea Road, Whittlesea	246 K7

Table 16 – Sewer Pumping Stations within the Plenty River Catchment in the City of Whittlesea

Sewer emergency relief points

There are Sewer Emergency Relief Points within the Plenty River catchment. 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.

Operator	On Drain / Waterway	Bank / Side of Waterway	Location	Melway Reference
Yarra Valley Water	Plenty River	West	Laurel Street, Whittlesea	246 H9
Yarra Valley Water	Local Drainage		Gledswood Avenue, South Morang	184 A4
Yarra Valley Water	Plenty River	West	Mernda Recreation Reserve, Schotters Road, Mernda	390 K8
Yarra Valley Water	Local Drainage		Plenty Road at Millenium Park Drive, Whittlesea	246 F10
Yarra Valley Water	Simons Creek	South	Simons Creek Wetland, Steels Place, Mernda	183 J2
Yarra Valley Water	Plenty River	West	300m North of Cades Road, Whittlesea	246 G12
Yarra Valley Water	Scrubby Creek	North	Yea Road, Whittlesea	246 K7

Table 17 – Sewer Emergency Relief Points in the Plenty River Catchment in the City of Whittlesea

Command, control and coordination

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

Flood Impacts and Operational Considerations (Intelligence Cards)

The tables on the following pages provide a breakdown of the possible consequences of flooding along the Plenty River at various gauge heights or rain totals within the City of Whittlesea. 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:

- Plenty River at Whittlesea,
- Plenty River at Mernda,
- Plenty River at Greensborough,
- Plenty River's Stormwater Tributaries.

FLOOD INTELLIGENCE CARD – WHITTLESEA GAUGE, PLENTY RIVER

Version 4 – January 2022



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

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LOCATION	East bank of the river at Evelyn Street, Whittlesea
MELWAY REFERENCE:	246J9
STREAM:	Plenty River
GAUGE NUMBER:	229617A
GAUGE ZERO:	190.5m AHD
GAUGE TYPE	Stream Level

MINOR:	Not Established
MODERATE:	Not Established
MAJOR	Not Established
LEVEE HEIGHT:	N/A
TELEMETRIC/MANUAL	Telemetric
HIGHEST RECORDED FLOOD:	1.68m 3 rd Dec 2017 (Gauge Installed April 2013)

River Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
1.68m	3 rd December 2017 Flood Level Peak		
2.0m	1% AEP (100 year ARI flow)	<p>Properties at Flood Risk 34 Properties in Total</p> <ul style="list-style-type: none"> • 1, 2, 3, 4 & 5 Anita Court, Whittlesea • 34 & 35C Beech Street, Whittlesea • 210 Bruces Creek Road, Whittlesea • 50 Forest Street, Whittlesea • 1, 2, 3, 4, 5, 22, 23, 24 & 25 Gardenia Place, Whittlesea • 57-61, 63, 65, 67, 69, 71A & 76 Laurel Street, Whittlesea • 240 Wallan Road, Whittlesea • 30, 34, 42, 44, 46, 48, 52 & 54 Yea Road, Whittlesea <p>Community Infrastructure Likely Flooded</p> <ul style="list-style-type: none"> • Whittlesea Showgrounds, 30 Yea Road, Whittlesea • Whittlesea Park, 35C Beech Street, Whittlesea • Whittlesea Child Care Centre, 57-61 Laurel Road, Whittlesea • Whittlesea Community Activity Centre, 57-61 Laurel Road, Whittlesea <p>Essential Infrastructure Likely Impacted</p> <ul style="list-style-type: none"> • Bus Route 384 along Whittlesea-Yea Road <p>Water Over Road</p>	<p>VICSES may provide warnings via VicEmergency to the community (including Brimbank Council and appropriate agencies as required) based on the predictions provided by BoM regarding flood levels and the risk of Flash Flooding.</p> <p>The VICSES RDO, in conjunction with the Regional Agency Commander, will maintain operational awareness and form an appropriate response arrangement to suit the level of incident.</p> <p>VICSES to respond on a request-by-request basis.</p> <p>Council and DTP (as appropriate) to provide road closure signage under predetermined arrangements.</p>

River Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		<ul style="list-style-type: none"> • Bruces Creek Road, Whittlesea • Wildwood Road, Whittlesea • Kinglake View, Whittlesea • McPhees Road, Whittlesea • Chandler Avenue, Whittlesea • Whittlesea-Yea Road, Whittlesea at Whittlesea Showgrounds • Showgrounds Road, Whittlesea • Laurel Street, Whittlesea • Gardenia Avenue, Whittlesea • Cades Road, Yan Yean 	
Unavailable	28 th November 2010 Flood Level Peak	Event Summary <ul style="list-style-type: none"> • Whittlesea Showgrounds flooded • Showgrounds Road and Yea Road flooded • Cades Road, Whittlesea flooded 	

Table 18 – Breakdown of likely consequences at various Whittlesea gauge level heights along the Plenty River with operational considerations

FLOOD INTELLIGENCE CARD – MERNDA GAUGE, PLENTY RIVER

Version 4 – January 2022



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

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LOCATION:	East bank of the river North side of Bridge Inn Road, Mernda
CURRENT LEVEL:	https://www.melbournewater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/229616A
STREAM:	Plenty River
GAUGE NUMBER:	229616A
GAUGE ZERO:	153.62m AHD
GAUGE TYPE:	Stream Level & Rain

MELWAY REFERENCE:	390 K10
MINOR:	Not Established
MODERATE:	Not Established
MAJOR:	Not Established
LEVEE HEIGHT:	N/A
HIGHEST RECORDED FLOOD:	4.90m (15 th May 1974)

River Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
2.33m	20% AEP (5yr ARI) Flood Level	<ul style="list-style-type: none"> Nil expected in the City of Whittlesea 	
3.11m	28 th November 2010 Flood Level	Event Summary <ul style="list-style-type: none"> Arthurs Creek Road and Recreation Road flooded 	
3.87m	5% AEP (20yr ARI) Flood Level	Properties at Flood Risk (over 30cm depth in yard at the primary building on property) 1 Property in Total <ul style="list-style-type: none"> 13 Hayes Road, Mernda Water Over Road (over 30cm depth) <ul style="list-style-type: none"> Hayes Road, Mernda 	
4.90m	15 th May 1974 Flood Level	Event Summary <ul style="list-style-type: none"> Nil information available 	
5.11m	1% AEP (100 year ARI flow)	<ul style="list-style-type: none"> Note: It is not known at what level infrastructure contained below starts being flooded Properties at Flood Risk 7 Properties in Total <ul style="list-style-type: none"> 120 Cades Road, Yan Yean 110, 120, 140 & 155 Dunnetts Road, Yan Yean 13 Hayes Road, Mernda 2080 Plenty Road, Yan Yean Essential Infrastructure Likely Impacted <ul style="list-style-type: none"> Bus Routes 381, 382 & 385 Water Over Road <ul style="list-style-type: none"> Cades Road, Yan Yean Dunnetts Road, Yan Yean Reservoir Road, Yan Yean Arthurs Creek Road, Yan Yean Hazel Glen Drive, Mernda Hayes Road, Mernda 	<p>VICSES may provide warnings via VicEmergency to the community (including Brimbank Council and appropriate agencies as required) based on the predictions provided by BoM regarding flood levels and the risk of Flash Flooding.</p> <p>The VICSES RDO, in conjunction with the Regional Agency Commander, will maintain operational awareness and form an appropriate response arrangement to suit the level of incident.</p> <p>VICSES to respond on a request-by-request basis.</p> <p>Council and DTP (as appropriate) to provide road closure signage under predetermined arrangements.</p>

Table 19 – Breakdown of likely consequences at various Mernda gauge level heights along the Plenty River with operational considerations

FLOOD INTELLIGENCE CARD – GREENSBOROUGH GAUGE, PLENTY RIVER

Version 4 – January 2022



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

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LOCATION:	Maroondah Aqueduct Crossing, Corowa Crescent, Greensborough
CURRENT LEVEL:	https://www.melbournwater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/229615A
STREAM:	Plenty River
GAUGE NUMBER:	229615A
GAUGE ZERO:	39.97m AHD
GAUGE TYPE:	Stream Level

MELWAY REFERENCE:	10J9
MINOR:	Not Established
MODERATE:	Not Established
MAJOR:	Not Established
LEEVE HEIGHT:	N/A
HIGHEST RECORDED FLOOD:	7.77m (15th May 1974)

River Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
7.7m	1% AEP (100 year ARI flow)	<ul style="list-style-type: none"> Nil consequence expected in City of Whittlesea 	<p>VICSES may provide warnings via VicEmergency to the community (including Brimbank Council and appropriate agencies as required) based on the predictions provided by BoM regarding flood levels and the risk of Flash Flooding.</p> <p>The VICSES RDO, in conjunction with the Regional Agency Commander, will maintain operational awareness and form an appropriate response arrangement to suit the level of incident.</p> <p>VICSES to respond on a request-by-request basis.</p> <p>Council and DTP (as appropriate) to provide road closure signage under predetermined arrangements.</p>
7.77m	15 th May 1974 Flood Level	<p>Event Summary</p> <ul style="list-style-type: none"> Nil Information available 	

Table 20 – Breakdown of likely consequences at various Greensborough gauge level heights along the Plenty River with operational considerations

FLOOD INTELLIGENCE CARD – PLENTY RIVER’S STORMWATER TRIBUTARIES (FLASH FLOODING) (UNGAUGED)

Version 1 – January 2022



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

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CLOSEST RAIN GAUGE:	Plenty River at Mernda
LOCATION:	East bank of the river North side of Bridge Inn Road, Mernda
RECENT RAINFALL:	https://www.melbournewater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/229616A

MELWAY REF:	390 K10
GAUGE NUMBER:	229616A
GAUGE TYPE:	Stream Level & Rain

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; 28mm in 2 hours; 32mm in 3 hours; or 41mm in 6 hours Note: rainfall depths are a very rough method of estimating flood events and have been used due to the ungauged nature of the catchment. This should be used as a guide only.	20% AEP (5-year ARI)	Properties at Flood Risk (over 30cm depth in yard) 5 Properties in Total Simons Creek <ul style="list-style-type: none"> 1, 2, 3, 4 & 5 Pyrenees Lane, South Morang Water Over Road (over 30cm depth) <ul style="list-style-type: none"> Nil Expected 	
16mm in 10 mins; 26mm in 30 mins; 33mm in 1 hour; 41mm in 2 hours; 46mm in 3 hours; or	5% AEP (20-year ARI)	Properties at Flood Risk (over 30cm depth in yard) 19 Properties in Total Bridge Inn Road Drain <ul style="list-style-type: none"> 601 & 607 Bridge Inn Road, Mernda Local Drainage <ul style="list-style-type: none"> 36, 40 & 42 Schotters Road, Mernda 	

Design Rainfall Depths (mm) – Indication of Possible Flooding	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
<p>59mm 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>Mernda Drain</p> <ul style="list-style-type: none"> • 13 Hayes Road, Mernda • 576W Masons Road, Mernda • 85, 1/87, 2/87 & 89 Schotters Road, Mernda <p>Simons Creek</p> <ul style="list-style-type: none"> • 14 & 16 Larnook Place, South Morang • 1, 2, 3, 4 & 5 Pyrenees Lane, South Morang • 27 River Brook Avenue, South Morang <p>Water Over Road (over 30cm depth)</p> <p>Laurimar Drain</p> <ul style="list-style-type: none"> • Hazel Glen Drive, Doreen • Shetland Way, Doreen <p>Local Drainage</p> <ul style="list-style-type: none"> • Briar Court, South Morang <p>Mernda Drain</p> <ul style="list-style-type: none"> • Hayes Road, Mernda • Masons Road, Mernda <p>Simons Creek</p> <ul style="list-style-type: none"> • Gardense Parade, South Morang • Larnook Place, South Morang • River Brook Avenue, South Morang • Riverdale Boulevard, South Morang • Shepherds Way, Mernda 	
<p>24mm in 10 mins; 39mm in 30 mins; 48mm in 1 hour; 59mm in 2 hours; 67mm in 3 hours; or 84mm 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>1% AEP (100-year ARI)</p>	<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 (over 30cm depth in yard)</p> <p>25 Properties in Total</p> <p>Bridge Inn Road Drain</p> <ul style="list-style-type: none"> • 601 & 607 Bridge Inn Road, Mernda <p>Local Drainage</p> <ul style="list-style-type: none"> • 525 Bridge Inn Road • 36, 40 & 42 Schotters Road, Mernda <p>Mernda Drain</p> <ul style="list-style-type: none"> • 13 Hayes Road, Mernda • 576W, 578 & 582 Masons Road, Mernda • 1 & 3 Nisha Place, Mernda • 85, 1/87, 2/87 & 89 Schotters Road, Mernda <p>Plenty River Tributary</p> <ul style="list-style-type: none"> • 1690 Plenty Road, Mernda 	<p>VICSES may provide warnings via VicEmergency to the community (including Brimbank Council and appropriate agencies as required) based on the predictions provided by BoM regarding flood levels and the risk of Flash Flooding.</p> <p>The VICSES RDO, in conjunction with the Regional Agency Commander, will maintain operational awareness and form an appropriate response arrangement to suit the level of incident.</p> <p>VICSES to respond on a request-by-request basis.</p> <p>Council and DTP (as appropriate) to provide road closure signage under predetermined arrangements.</p>

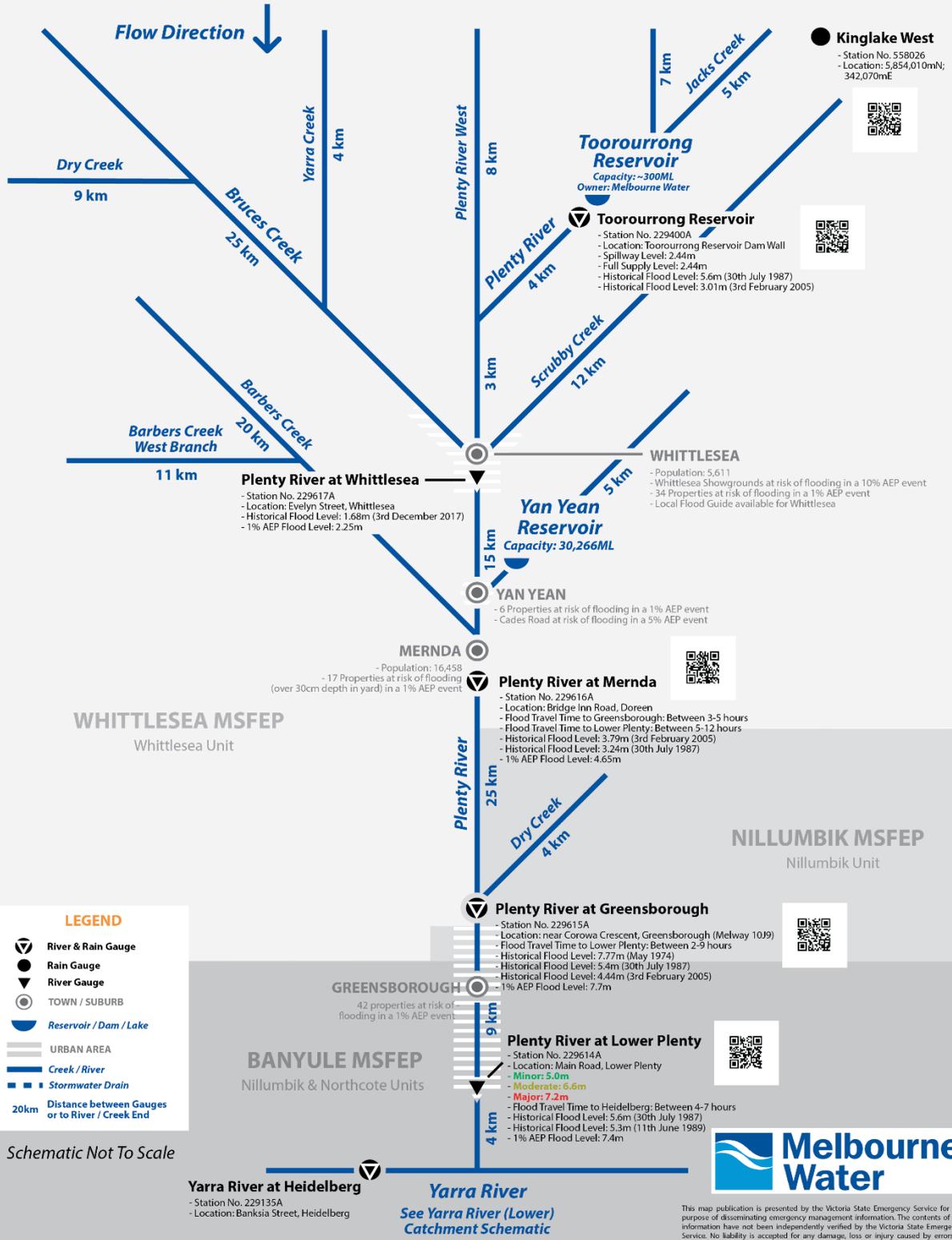
Design Rainfall Depths (mm) – Indication of Possible Flooding	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		<p>Simons Creek</p> <ul style="list-style-type: none"> • 14 & 16 Larnook Place, South Morang • 1, 2, 3, 4 & 5 Pyrenees Lane, South Morang • 27 River Brook Avenue, South Morang <p>Water Over Road (over 30cm depth)</p> <p>Laurimar Drain</p> <ul style="list-style-type: none"> • Aylesbury Boulevard, Doreen • Hazel Glen Drive, Doreen • Shetland Way, Doreen <p>Local Drainage</p> <ul style="list-style-type: none"> • Briar Court, South Morang • Nirvana Drive, South Morang <p>Mernda Drain</p> <ul style="list-style-type: none"> • Hayes Road, Mernda • Masons Road, Mernda <p>Orchard Road Drain</p> <ul style="list-style-type: none"> • Garden Road, Doreen <p>Simons Creek</p> <ul style="list-style-type: none"> • Gardense Parade, South Morang • Larnook Place, South Morang • River Brook Avenue, South Morang • Riverdale Boulevard, South Morang • Shepherds Way, Mernda • Wellington Street, Mernda 	

Table 21 – Breakdown of possible consequences at various rainfall intensities around Plenty River’s stormwater tributaries in the City of Whittlesea with operational considerations



Plenty River Catchment Schematic

Version 4 - January 2021



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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Image 4-Plenty River Catchment Schematic

4.2. Merri Creek

Overview of flooding consequences

Merri Creek flows from north to south forming the western boundary of the City of Whittlesea, sharing its banks with the city of Hume. Flowing south, the Creek exits in the City of Whittlesea at the south-west boundary of the municipality, entering the municipalities of Merri-bek and Darebin. Beveridge, Donnybrook, Wollert, Epping, Lalor and Thomastown are towns/suburbs that Merri Creek runs through or adjacent to. At present, there is little development and infrastructure at risk from flooding along Merri Creek apart from a small number of properties and roads.

The Merri Catchment through the City of Whittlesea is currently predominantly rural with some industrial properties. Potential infrastructure at risk may increase due to large housing developments in planning and construction phases within the Merri Creek Catchment.

The largest flood to affect the area was on the 15th May 1974.

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Summary of Consequences in a 1% AEP (100yr ARI) flood along Merri Creek in the City of Whittlesea

Property					
Properties	3				
Residential	0				
Commercial	0				
Industrial	1				
Public Land	0				
Rural	2				
Community Infrastructure					
Essential Infrastructure					
Major Roads	1	Merriang Road			
Sewerage Facilities	4	3 Pumping Stations and 1 Emergency Relief Point			
Tourism / Recreation					
Government Boundaries					
Local Gov't Areas	1	Whittlesea	CMA	1	Port Phillip & Westernport
Adjacent LGAs	2	Mitchell & Hume	CFA District	1	District 14
SES Resp' Boundary	1	Whittlesea	FRV District	1	Northern

Table 22 – Consequence Summary of 1% AEP flood along Merri Creek in the City of Whittlesea

Gauges and warnings

Warnings are available for flooding expected along the Merri Creek at Somerton. Flood class levels for the Somerton gauge are detailed in Table 23 and are used in the issuing of a flood warning for Merri Creek. Other level/flood gauges within the Merri Creek catchment are also contained within table 24.

Gauge	River / Creek Flood Class Level		
	Minor	Moderate	Major
Merri Creek at Somerton	3.4m	3.7m	4.4m

Table 23 – Gauges with established Flood Class Levels for the City of Whittlesea

At this site the Bureau of Meteorology (the Bureau) in consultation with Melbourne Water will issue flood warnings if levels reach those classified above. The warning will be placed on the Bureau's website (<http://www.bom.gov.au/vic/warnings/index.shtml>). While the City of Whittlesea monitors these warnings in times of high rainfall, there are no specific guidelines to advise how these situations should be responded to.

Gauges are also located at the following locations within the Merri Creek catchment.

Gauge	Station No.	Location	Stream Level & Flow Gauge	Rain Gauge	Melway Reference
Merri Creek at Craigieburn North	229627A	West side of the creek 200m south of Summerhill Rd, Craigieburn	ü	ü	387H3
Merri Creek at Craigieburn East	229257A	East side of the creek at Craigieburn Rd bridge, Wollert	ü		387E10
Merri Creek at Somerton	229603B	West side of the creek, 200m north of Cooper Street, Somerton	ü	ü	180J10
Wallan	586146	Green Hill Reserve, Northern Hwy, Wallan		ü	6363 B9

Table 24– Gauges within the Merri Creek catchment in Whittlesea

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/rainfallandrivervelleveldata/Pages/Rainfall-and-river-level-new.aspx>. The Bureau of Meteorology's website also links a number of these gauges at:

http://www.bom.gov.au/cgi-bin/wrap_fwo.pl?IDV60201.html. It is advised that residents monitor the Bureau of Meteorology's website <http://www.bom.gov.au/vic/warnings/index.shtml?ref=hdr> and the VicEmergency website <https://emergency.vic.gov.au/> for any thunderstorm, flood or severe weather warnings present for their area.

Properties at flood risk

Properties listed in the table below are at risk from flooding along Merri Creek in the City of Whittlesea. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Merri Creek Outer (Melbourne Water, March 1991) and the Merri Creek Upper (Melbourne Water, April 2009) flood mapping and risk assessment programs.

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Properties at risk from Flooding along Merri Creek in Whittlesea during a 1% AEP event				
Residential	Commercial	Industrial	Rural	Public Use
Street No. at Risk	Street	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
1685	Merriang Road	Beveridge	Merri Creek	Riverine
1815	Merriang Road	Beveridge	Merri Creek	Riverine
67	Trawalla Avenue	Thomastown	Merri Creek	Riverine
Total				
3				

Table 25 – Properties at risk of flooding along the Merri Creek catchment in the City of Whittlesea

Isolation

No major isolation risks exist for areas around Beveridge, Donnybrook, Wollert, Epping, Lalor and Thomastown. 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/>.

Apart from the roads outlined below, all other essential infrastructure and services areas around Beveridge, Donnybrook, Wollert, Epping, Lalor and Thomastown 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 Beveridge, Donnybrook, Wollert, Epping, Lalor and Thomastown. Check the VicRoads website for more details: <http://alerts.vicroads.vic.gov.au/>

Department of Transport & Planning Roads flooded in a 1% AEP event
<ul style="list-style-type: none"> Merriang Road, Beveridge near Janna Road and Beveridge Road

Table 26 – Department of Transport & Planning Possible Road Closures during a flooding event

Whittlesea City Council Roads flooded in a 1% AEP event
BEVERIDGE
<ul style="list-style-type: none"> Beveridge Road
DONNYBROOK
<ul style="list-style-type: none"> Langley Park Drive

Table 27 – Whittlesea City Council Possible Road Closures during a flooding event

Flood mitigation

No formal Retarding Basins, Pumping Stations or Levees exist around Beveridge, Donnybrook, Wollert, Epping, Lalor and Thomastown.

Sewerage infrastructure

Sewerage Infrastructure of note during a severe flood event located along sections of the Merri Creek in or adjacent to the City of Whittlesea are contained within the following tables.

Sewer pumping stations

Sewerage Pumping Station	On Drain / Waterway	Bank / Side of Waterway	Operator	Location	Melway Reference
Craigieburn FCF007	Merri Creek	West	Yarra Valley Water	Hume Highway and Aitken Creek, Craigieburn	387 D11
Dunlop Olympic	Merri Creek	West	Yarra Valley Water	O'Herns Road, Somerton	180 F6
Rushwood Drive	Merri Creek	West	Yarra Valley Water	Rushwood Drive, Craigieburn	180 E1

Table 28 – Sewer Pumping Stations within the Merri Creek Catchment in the City of Whittlesea

Sewer emergency relief points

There are Sewer Emergency Relief Points along Merri Creek that will affect sections of the waterway in Whittlesea should they be in operation. 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.

Operator	On Drain / Waterway	Bank / Side of Waterway	Location	Melway Reference
Yarra Valley Water	Merri Creek	West	Craigieburn Sewage Treatment Plant, 420 Hume Highway, Craigieburn	387 D11

Table 29 – Sewer Emergency Relief Points in the Merri Creek Catchment affecting the City of Whittlesea

Command, control and coordination

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

Flood impacts and operational considerations (Intelligence Cards)

The tables on the following pages provide a breakdown of the possible consequences of flooding along Merri Creek at various creek heights or rain totals within Whittlesea. 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 Craigieburn North,
- Merri Creek at Somerton.

FLOOD INTELLIGENCE CARD – CRAIGIEBURN NORTH GAUGE, MERRI CREEK

Version 4 – January 2022



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

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LOCATION:	West side of the creek 200m south of Summerhill Rd, Craigieburn	MELWAY REFERENCE:	387H7
CURRENT LEVEL:	https://www.melbournewater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/229627A	MINOR:	Not Established
STREAM:	Merri Creek	MODERATE:	Not Established
GAUGE NUMBER:	229627A	MAJOR:	Not Established
GAUGE ZERO:	194.073m AHD	LEVEE HEIGHT:	N/A
GAUGE TYPE:	Stream Level & Rain	HIGHEST RECORDED FLOOD:	4.90m (15 th May 1974)

Creek Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Consideration
3.00m	20% AEP (5 year ARI flow)	<ul style="list-style-type: none"> Nil in City of Whittlesea 	
3.50m	10% AEP (10 year ARI flow)	<ul style="list-style-type: none"> Nil in City of Whittlesea 	
4.00m	5% AEP (20 year ARI flow)	<ul style="list-style-type: none"> Nil in City of Whittlesea 	
4.60m	2% AEP (50 year ARI flow)	<ul style="list-style-type: none"> Nil in City of Whittlesea 	
4.90m	1% AEP (100 year ARI flow) 15 th May 1974 Flood Level	<p>Properties at Flood Risk 2 Properties in Total</p> <ul style="list-style-type: none"> 1685 & 1815 Merriang Road, Beveridge <p>Water Over Road</p> <ul style="list-style-type: none"> Beveridge Road, Beveridge near Merriang Road Merriang Road, Beveridge near Janna Road and Beveridge Road Langley Park Drive, Donnybrook 	<p>VICSES may provide warnings via VicEmergency to the community (including Brimbank Council and appropriate agencies as required) based on the predictions provided by BoM regarding flood levels and the risk of Flash Flooding.</p> <p>The VICSES RDO, in conjunction with the Regional Agency Commander, will maintain operational awareness and form an appropriate response arrangement to suit the level of incident.</p> <p>VICSES to respond on a request-by-request basis.</p> <p>Council and DTP (as appropriate) to provide road closure signage under predetermined arrangements.</p>

Table 30 – Breakdown of likely consequences at various Craigieburn North gauge level heights along Merri Creek in Whittlesea with operational considerations

FLOOD INTELLIGENCE CARD – SOMERTON GAUGE, MERRI CREEK

Version 4 – January 2022



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

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LOCATION:	West side of the creek, 200m north of Cooper Street, Somerton
CURRENT LEVEL:	https://www.melbournewater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/229603A
STREAM:	Merri Creek
GAUGE NUMBER:	229603A
GAUGE ZERO:	125.048m AHD
GAUGE TYPE:	Stream Level & Rain

MELWAY REFERENCE:	180 J9
MINOR:	3.4m
MODERATE:	3.7m
MAJOR:	4.4m
LEEVE HEIGHT:	N/A
HIGHEST RECORDED FLOOD:	4.90m (15 th May 1974)

Creek Height	Flood Class or Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
3.3m	Bank Full Level		
3.4m	MINOR FLOOD LEVEL	<ul style="list-style-type: none"> Nil in City of Whittlesea 	
3.7m	MODERATE FLOOD LEVEL	<ul style="list-style-type: none"> Nil in City of Whittlesea 	
4.4m	MAJOR FLOOD LEVEL	<ul style="list-style-type: none"> Nil in City of Whittlesea 	
5.2m	1% AEP (100yr ARI) Flood Level (Major)	<p>Properties at Flood Risk</p> <p>1 Property in Total</p> <ul style="list-style-type: none"> 67 Trawalla Avenue, Thomastown 	<p>VICSES may provide warnings via VicEmergency to the community (including Brimbank Council and appropriate agencies as required) based on the predictions provided by BoM regarding flood levels and the risk of Flash Flooding.</p> <p>The VICSES RDO, in conjunction with the Regional Agency Commander, will maintain operational awareness and form an appropriate response arrangement to suit the level of incident.</p> <p>VICSES to respond on a request-by-request basis.</p>

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

Table 31 – Breakdown of likely consequences at various Somerton gauge level heights along Merri Creek in Whittlesea with operational considerations



Merri Creek Catchment Schematic

Version 6 - February 2020

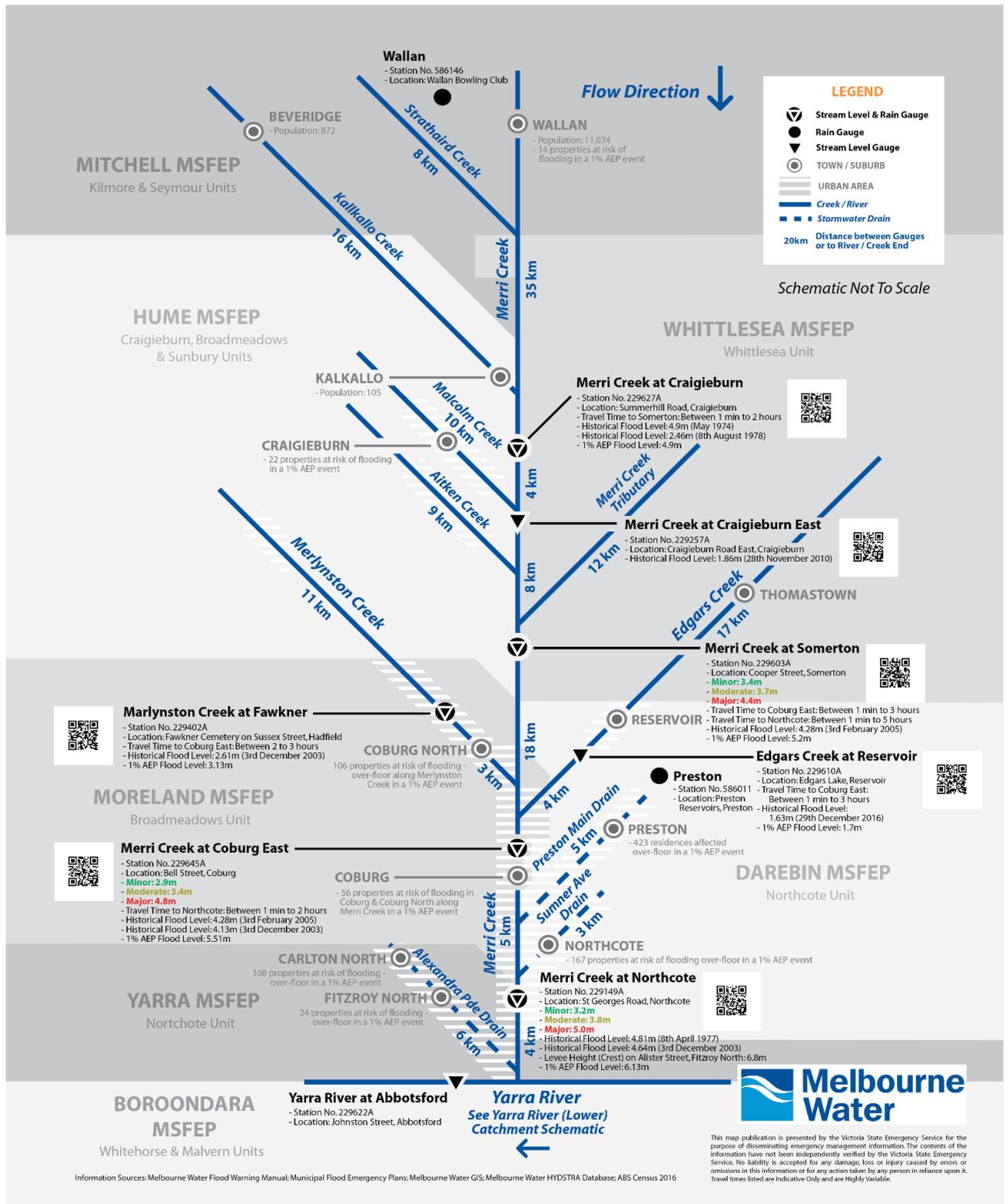


Image 5-Merri Creek Catchment Schematic

4.3. Darebin Creek

Overview of flooding consequences

Darebin Creek, which also flows north to south, beginning in the centre of the municipality in Donnybrook, it exits at the municipality's southern boundary, flowing into the Darebin municipality. A number of underground drains join up with Darebin Creek to form a key drainage system for the southern urban area of the municipality.

Wollert, Epping, South Morang, Mill Park, Lalor, Thomastown and Bundoora are located between 16km to 28km north of Melbourne in a mixture of established residential and light industrial areas and areas of new residential estates. Darebin Creek is the prominent watercourse in the area, flowing north to south with the entire middle and upper catchment located within the municipality. High intensity, short duration rainfall events can cause flash flooding in and around Epping, Mill Park, Lalor and Thomastown, while prolonged rainfall may see Darebin Creek and its tributaries flood. The area sees a mixture of flat and gradually undulating terrain leading to both moderate and slow water movement. Flooding may last for a number of days on areas of flat terrain.

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Summary of Consequences in a 1% AEP (100yr ARI) flood along Darebin Creek & Stormwater Tributaries

Property					
Properties	172				
Residential	162				
Commercial	0				
Industrial	5				
Public Land	1				
Rural	4				
Community Infrastructure					
Schools / Colleges	4	Northside Christian Centre & College; St Francis of Assisi Catholic Primary School; Lalor Primary School; & Lalor Secondary College			
Essential Infrastructure					
Major Roads	3	Childs Road, Dalton Road and the Metropolitan Ring Road			
Major Rail	1	Mernda Line between Pindari Ave & Civic Drive, South Morang			
Bus Routes	4	556, 559, 564 & 577			
Sewerage Facilities	2	1 Pumping Station and 1 Emergency Relief Point			
Drainage Facilities	2	Findon Creek & The Palisades Retarding Basins			
Tourism / Recreation					
Government Boundaries					
Local Gov't Areas	1	Whittlesea	CMA	1	Port Phillip & Westernport
Adjacent LGAs	1	Darebin	CFA District	1	District 14
SES Resp' Boundary	1	Whittlesea	FRV District	1	Northern

Table 32 – Consequence Summary of 1% AEP flood along Darebin Creek & Stormwater Tributaries in Whittlesea

Gauges and warnings

Whilst there are stream level gauges within the Darebin Creek catchment, Melbourne Water does not provide any flood warning service at this point, due to the generally short warning times available.

Gauge	Station No.	Location	Stream Level & Flow Gauge	Rain Gauge	Melway Reference
Darebin Creek at Epping	229613A	West bank of the creek, north side of Rufus Street, Epping	ü	ü	182D11
Darebin Creek at Bundoora	229612A	East bank of the creek, north side of Settlement Road, Bundoora	ü	ü	9F12

Table 33 – Hydrographic Monitoring Stations within the Darebin Creek catchment in Whittlesea

These Gauges may provide some warning of expected flooding. See the Melbourne Water website for more information on these gauges:

<http://www.melbournewater.com.au/waterdata/rainfallandriverveldata/Pages/Rainfall-and-river-level-new.aspx>. The Bureau of Meteorology's website also links a number of these gauges at:

http://www.bom.gov.au/cgi-bin/wrap_fwo.pl?IDV60201.html. It is advised that residents monitor the Bureau of Meteorology's website <http://www.bom.gov.au/vic/warnings/index.shtml?ref=hdr> and the VicEmergency website <https://emergency.vic.gov.au/> for any thunderstorm, flood or severe weather warnings present for their area.

Properties at flood risk

Properties listed in the table below are at risk from flooding along Darebin Creek in Whittlesea. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Darebin Creek Middle (Melbourne Water and SKM, August 2016) and the Darebin Creek (Bundoora) (Melbourne Water, July 2009) flood mapping and risk assessment programs.

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Properties at risk from Flooding along Darebin Creek in the City of Whittlesea during a 1% AEP event				
Residential	Commercial	Industrial	Rural	Public Use
Street No. at Risk	Street	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
1343	Donnybrook Road	Woodstock	Darebin Creek	Riverine
450	Epping Road	Wollert	Findons Creek West Branch	Riverine
481	Epping Road	Wollert	Findons Creek West Branch	Riverine
4/10	Lucy Court	Bundoora	Darebin Creek	Riverine
5/10	Lucy Court	Bundoora	Darebin Creek	Riverine
6/10	Lucy Court	Bundoora	Darebin Creek	Riverine
7/10	Lucy Court	Bundoora	Darebin Creek	Riverine
2/21	McLeans Road	Bundoora	Darebin Creek	Riverine
23A	McLeans Road	Bundoora	Darebin Creek	Riverine
2/25	McLeans Road	Bundoora	Darebin Creek	Riverine
2/27	McLeans Road	Bundoora	Darebin Creek	Riverine
31	McLeans Road	Bundoora	Darebin Creek	Riverine
1015	Merriang Road	Woodstock	Darebin Creek	Riverine
1/3	Mozart Court	Bundoora	Darebin Creek	Riverine
2/3	Mozart Court	Bundoora	Darebin Creek	Riverine
10/60	Nickson Street	Bundoora	Darebin Creek	Riverine
11/60	Nickson Street	Bundoora	Darebin Creek	Riverine
14	Samuel Court	Bundoora	Darebin Creek	Riverine
15	Samuel Court	Bundoora	Darebin Creek	Riverine
4/123	Settlement Road	Bundoora	Darebin Creek	Riverine
Total				
20				

Table 34 – Properties at risk of flooding along Darebin Creek in the City of Whittlesea

Properties listed in the table below are at risk from flash flooding along the stormwater drainage network in the Darebin Creek catchment in the City of Whittlesea. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Darebin Creek (Cardno, April 2020) 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.

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Properties at risk from Flooding along the Stormwater Drainage network in the Darebin Creek catchment						
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				
	P	P	1 Blackburn Street	Lalor	Lalor Drain	Flash
	P	P	2 Blackburn Street	Lalor	Lalor Drain	Flash
	P	P	3 Blackburn Street	Lalor	Lalor Drain	Flash
	P	P	4 Blackburn Street	Lalor	Lalor Drain	Flash
	P	P	5 Blackburn Street	Lalor	Lalor Drain	Flash
	P	P	6 Blackburn Street	Lalor	Lalor Drain	Flash
	P	P	7A Blackburn Street	Lalor	Lalor Drain	Flash
	P	P	7 Blackburn Street	Lalor	Lalor Drain	Flash
	P	P	8 Blackburn Street	Lalor	Lalor Drain	Flash
	P	P	10 Blackburn Street	Lalor	Lalor Drain	Flash
	P	P	12 Blackburn Street	Lalor	Lalor Drain	Flash
	P	P	1/14 Blackburn Street	Lalor	Lalor Drain	Flash
	P	P	2/14 Blackburn Street	Lalor	Lalor Drain	Flash
		P	6 Canberra Grove	Lalor	Lalor Drain	Flash
P	P	P	7 Canberra Grove	Lalor	Lalor Drain	Flash
	P	P	8 Canberra Grove	Lalor	Lalor Drain	Flash
	P	P	9 Canberra Grove	Lalor	Lalor Drain	Flash
	P	P	10 Canberra Grove	Lalor	Lalor Drain	Flash
	P	P	11 Canberra Grove	Lalor	Lalor Drain	Flash
	P	P	12 Canberra Grove	Lalor	Lalor Drain	Flash
		P	13 Canberra Grove	Lalor	Lalor Drain	Flash
		P	14 Canberra Grove	Lalor	Lalor Drain	Flash
		P	154 Casey Drive	Lalor	Lalor Drain	Flash
		P	2/156 Casey Drive	Lalor	Lalor Drain	Flash
		P	158 Casey Drive	Lalor	Lalor Drain	Flash
		P	160 Casey Drive	Lalor	Lalor Drain	Flash
		P	162 Casey Drive	Lalor	Lalor Drain	Flash
		P	164 Casey Drive	Lalor	Lalor Drain	Flash
		P	166 Casey Drive	Lalor	Lalor Drain	Flash
		P	168 Casey Drive	Lalor	Lalor Drain	Flash

Properties at risk from Flooding along the Stormwater Drainage network in the Darebin Creek catchment						
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				
		P	170 Casey Drive	Lalor	Lalor Drain	Flash
		P	172 Casey Drive	Lalor	Lalor Drain	Flash
	P	P	174 Casey Drive	Lalor	Lalor Drain	Flash
		P	176 Casey Drive	Lalor	Lalor Drain	Flash
	P	P	178 Casey Drive	Lalor	Lalor Drain	Flash
	P	P	180 Casey Drive	Lalor	Lalor Drain	Flash
	P	P	182 Casey Drive	Lalor	Lalor Drain	Flash
	P	P	66 Centenary Drive	Mill Park	Local Drainage	Flash
	P	P	290-312 Childs Road	Mill Park	South Morang Drain	Flash
	P	P	63 Cumberland Crescent	Thomastown	Thomastown East Drain	Flash
	P	P	212 Dalton Road	Lalor	Lalor Drain	Flash
	P	P	214 Dalton Road	Lalor	Lalor Drain	Flash
		P	1/216 Dalton Road	Lalor	Lalor Drain	Flash
		P	2/216 Dalton Road	Lalor	Lalor Drain	Flash
		P	3/216 Dalton Road	Lalor	Lalor Drain	Flash
P	P	P	4/216 Dalton Road	Lalor	Lalor Drain	Flash
	P	P	5/216 Dalton Road	Lalor	Lalor Drain	Flash
	P	P	220 Dalton Road	Lalor	Lalor Drain	Flash
		P	221 Dalton Road	Lalor	Lalor Drain	Flash
P	P	P	222 Dalton Road	Lalor	Lalor Drain	Flash
		P	223 Dalton Road	Lalor	Lalor Drain	Flash
P	P	P	224 Dalton Road	Lalor	Lalor Drain	Flash
		P	225 Dalton Road	Lalor	Lalor Drain	Flash
P	P	P	226 Dalton Road	Lalor	Lalor Drain	Flash
P	P	P	228 Dalton Road	Lalor	Lalor Drain	Flash
	P	P	230 Dalton Road	Lalor	Lalor Drain	Flash
		P	232 Dalton Road	Lalor	Lalor Drain	Flash
	P	P	136 Darebin Drive	Lalor	Lalor Drain	Flash
	P	P	118 David Street	Lalor	Lalor Drain	Flash
		P	1/1 Davisson Street	Epping	Local Drainage	Flash
		P	2/1 Davisson Street	Epping	Local Drainage	Flash
		P	3/1 Davisson Street	Epping	Local Drainage	Flash
	P	P	4/1 Davisson Street	Epping	Local Drainage	Flash
		P	6 Deakin Avenue	Lalor	Lalor Drain	Flash
	P	P	8 Deakin Avenue	Lalor	Lalor Drain	Flash
	P	P	10 Deakin Avenue	Lalor	Lalor Drain	Flash
		P	11 Deakin Avenue	Lalor	Lalor Drain	Flash
		P	11A Deakin Avenue	Lalor	Lalor Drain	Flash
		P	113 Derrick Street	Lalor	Lalor Drain	Flash
		P	115 Derrick Street	Lalor	Lalor Drain	Flash
		P	117 Derrick Street	Lalor	Lalor Drain	Flash
		P	4 East Court	Lalor	Lalor Drain	Flash
		P	5 East Court	Lalor	Lalor Drain	Flash

Properties at risk from Flooding along the Stormwater Drainage network in the Darebin Creek catchment

Properties at risk from Flooding along the Stormwater Drainage network in the Darebin Creek catchment						
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				
	P	P	7 Griffin Court	Lalor	Lalor Drain	Flash
	P	P	8 Griffin Court	Lalor	Lalor Drain	Flash
		P	9 Griffin Court	Lalor	Lalor Drain	Flash
		P	10 Griffin Court	Lalor	Lalor Drain	Flash
		P	11 Griffin Court	Lalor	Lalor Drain	Flash
	P	P	12 Griffin Court	Lalor	Lalor Drain	Flash
	P	P	13 Griffin Court	Lalor	Lalor Drain	Flash
		P	9 Henricks Court	Mill Park	South Morang Drain	Flash
	P	P	11 Henricks Court	Mill Park	South Morang Drain	Flash
		P	520 High Street	Epping	Local Drainage	Flash
		P	696 High Street	Epping	Local Drainage	Flash
		P	5 Hinkler Drive	Mill Park	South Morang Drain	Flash
		P	7 Hinkler Drive	Mill Park	South Morang Drain	Flash
		P	9 Hinkler Drive	Mill Park	South Morang Drain	Flash
		P	48 Houston Street	Epping	Local Drainage	Flash
		P	50 Houston Street	Epping	Local Drainage	Flash
		P	20 Josef Avenue	Bundoora	Local Drainage	Flash
		P	21 Josef Avenue	Bundoora	Local Drainage	Flash
		P	22 Josef Avenue	Bundoora	Local Drainage	Flash
	P	P	23 Josef Avenue	Bundoora	Local Drainage	Flash
	P	P	24 Josef Avenue	Bundoora	Local Drainage	Flash
		P	25W Josef Avenue	Bundoora	Local Drainage	Flash
		P	27 Josef Avenue	Bundoora	Local Drainage	Flash
		P	29 Josef Avenue	Bundoora	Local Drainage	Flash
		P	31 Josef Avenue	Bundoora	Local Drainage	Flash
		P	16 Kirwan Avenue	Lalor	Lalor Drain	Flash
	P	P	17 Kirwan Avenue	Lalor	Lalor Drain	Flash
	P	P	19 Kirwan Avenue	Lalor	Lalor Drain	Flash
	P	P	21 Kirwan Avenue	Lalor	Lalor Drain	Flash
	P	P	23 Kirwan Avenue	Lalor	Lalor Drain	Flash
		P	25 Kirwan Avenue	Lalor	Lalor Drain	Flash
		P	37 Konrads Crescent	Mill Park	South Morang Drain	Flash
		P	39 Konrads Crescent	Mill Park	South Morang Drain	Flash
		P	20 Lynne Street	Lalor	Lalor Drain	Flash
		P	27 Lynne Street	Lalor	Lalor Drain	Flash
		P	29 Lynne Street	Lalor	Lalor Drain	Flash
		P	36 Maxwell Street	Lalor	Lalor Drain	Flash
		P	1 Menzies Parade	Lalor	Lalor Drain	Flash
		P	3 Menzies Parade	Lalor	Lalor Drain	Flash
	P	P	5 Menzies Parade	Lalor	Lalor Drain	Flash
		P	7 Menzies Parade	Lalor	Lalor Drain	Flash
		P	9 Menzies Parade	Lalor	Lalor Drain	Flash
		P	36 Moorhead Drive	Mill Park	South Morang Drain	Flash

Properties at risk from Flooding along the Stormwater Drainage network in the Darebin Creek catchment						
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				
		P	7/1 Morang Drive	Mill Park	Local Drainage	Flash
		P	8/1 Morang Drive	Mill Park	Local Drainage	Flash
		P	9/1 Morang Drive	Mill Park	Local Drainage	Flash
		P	10/1 Morang Drive	Mill Park	Local Drainage	Flash
		P	11/1 Morang Drive	Mill Park	Local Drainage	Flash
		P	11 Morang Drive	Mill Park	Local Drainage	Flash
	P	P	42 Northgate Drive	Thomastown	Local Drainage	Flash
		P	14 Norwood Road	Mill Park	Local Drainage	Flash
		P	15 Norwood Road	Mill Park	Local Drainage	Flash
		P	16 Norwood Road	Mill Park	Local Drainage	Flash
		P	18 Norwood Road	Mill Park	Local Drainage	Flash
		P	31 Partridge Street	Lalor	Local Drainage	Flash
		P	33 Partridge Street	Lalor	Local Drainage	Flash
		P	2 Pulford Crescent	Mill Park	Local Drainage	Flash
		P	19 Railway Road	Epping	Local Drainage	Flash
	P	P	21 Railway Road	Epping	Local Drainage	Flash
	P	P	2 Richardson Street	Thomastown	Thomastown East Drain	Flash
		P	4 Richardson Street	Thomastown	Thomastown East Drain	Flash
		P	41 Rochester Drive	Thomastown	Thomastown East Drain	Flash
		P	43 Rochester Drive	Thomastown	Thomastown East Drain	Flash
	P	P	45 Rochester Drive	Thomastown	Thomastown East Drain	Flash
	P	P	47 Rochester Drive	Thomastown	Thomastown East Drain	Flash
	P	P	49 Rochester Drive	Thomastown	Thomastown East Drain	Flash
P	P	P	67 Roycroft Avenue	Mill Park	South Morang Drain	Flash
		P	69 Roycroft Avenue	Mill Park	South Morang Drain	Flash
	P	P	1 Whitehall Place	Lalor	Lalor Drain	Flash
	P	P	10 Whitehall Place	Lalor	Lalor Drain	Flash
		P	1 Woodvale Court	Mill Park	Local Drainage	Flash
		P	2 Woodvale Court	Mill Park	Local Drainage	Flash
		P	3 Woodvale Court	Mill Park	Local Drainage	Flash
		P	5 Woodvale Court	Mill Park	Local Drainage	Flash
		P	6 Woodvale Court	Mill Park	Local Drainage	Flash
		P	7 Woodvale Court	Mill Park	Local Drainage	Flash
		P	8 Woodvale Court	Mill Park	Local Drainage	Flash
		P	9 Woodvale Court	Mill Park	Local Drainage	Flash
		P	10 Woodvale Court	Mill Park	Local Drainage	Flash
Totals						
7	62	152				

Table 35 – Properties at risk of flooding along Darebin Creek’s Stormwater Tributaries in the City of Whittlesea

Isolation

No major isolation risks exist for areas around Wollert, Epping, South Morang, Mill Park, Lalor, Thomastown and Bundoora during a 1% AEP (100yr ARI) event. Some localised short-duration isolation may occur due to flash flooding.

Essential infrastructure

The Mernda Railway Line may be flooded between Pindari Avenue and Civic Drive in South Morang in a 1% AEP flash flooding event along the Hendersons Road Drain System.

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 Darebin Creek in Wollert, Epping, South Morang, Mill Park, Lalor, Thomastown and Bundoora are expected to remain predominantly dry during a 1% AEP (100yr ARI) event.

Road closures

The following roads are subject to closure during flooding around Darebin Creek in Wollert, Epping, South Morang, Mill Park, Lalor, Thomastown and Bundoora. Check the VicRoads website for more details: <http://alerts.vicroads.vic.gov.au/>

Department of Transport & Planning Roads likely flooded in a 1% AEP (100yr ARI) event

- Childs Road, Epping at Buch Avenue
- Dalton Road, Lalor at Ruth Street
- Metropolitan Ring Road, Thomastown between Dalton Road and Plenty Road

Table 36 – Department of Transport & Planning Possible Road Closures during a flooding event

Whittlesea City Council Roads likely flooded in a 1% AEP (100yr ARI) event

BUNDOORA	LALOR	MILL PARK	
			• Pivot Place
• Betula Avenue	• Anderson Street	• Alder Court	• Pleasant Close
• Bramble Crescent	• Blackburn Street	• Appletree Drive	• Prince Of Wales Avenue
• Bryson Court	• Canberra Grove	• Blamey Avenue	• Protea Court
• Josef Avenue	• Casey Drive	• Chestnut Road	• Sirius Court
• Wisteria Drive	• Curtin Avenue	• Cunningham Drive	• Sycamore Street
EPPING	• Deakin Avenue	• Cuthbert Drive	• Woodvale Court
• Athena Place	• East Court	• Emmerson Court	SOUTH MORANG
• Avon Place	• Kellerher Street	• Figree Court	• Fitzgerald Drive
• Dransfield Way	• Kirwan Avenue	• Hinkler Avenue	• The Lakes Boulevard
• Findon Road west bound at Glendale Avenue	• Luzon Court	• Hobson Crescent	• Vista Way
• Horseshoe Crescent	• Lynne Street	• Jacaranda Drive	THOMASTOWN
• Houston Street	• Manus Court	• Konrads Crescent	• Barbara Court
• Maiden Court	• Monash Street	• Lady Penrhyn Avenue	• Cumberland Crescent
• Meadow Glen Drive	• Partridge Street	• Lavender Court	• Darebin Drive
• Touhey Avenue	• Sydney Crescent	• Mill Park Drive	• Rochester Drive
• Trotting Place	• Torruk Court	• Norwood Road	• Stella Drive
	• West Court	• Pindari Avenue	

	<ul style="list-style-type: none"> • Whitehill Place 		
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Table 37 – Whittlesea City Council Possible Road Closures during a flooding event

Flood mitigation

Retarding basins

Melbourne Water Retarding Basin	On Drain/ Waterway	Spillway Crest Level	Full Supply Level	1% AEP Flood Level	Embankment Crest Height	Storage Capacity	ANCOLD Hazard Rating	Houses In Flow Path (dam breach)	Melway Reference
Findon Creek	Findon Creek West Branch	N/A	146.00m AHD	146.00m AHD	4.5m (146.00m AHD)	62ML	Very Low	Nil	182 D5
The Palisades	Hendersons Rd Drain	163.8m AHD	164.9m AHD	163.8m AHD	N/A	Unavailable	Unclassified	N/A	183 B3

Table 38 – Melbourne Water Retarding Basins within the Darebin Creek catchment in the City of Whittlesea

No formal Pumping Stations or Levees exist around Darebin Creek in Wollert, Epping, South Morang, Mill Park, Lalor, Thomastown and Bundoora.

Sewerage infrastructure

Sewerage Infrastructure of note during a severe flood event located within the Darebin Creek catchment in the City of Whittlesea is contained within the following two tables.

Sewer Pumping Stations

Sewerage Pumping Station	On Drain / Waterway	Bank / Side of Waterway	Operator	Location	Melway Reference
Maserati Drive	Darebin Creek	East	Yarra Valley Water	Maserati Drive, Epping	182 D7

Table 39 – Sewer Pumping Stations within the Darebin Creek Catchment in the City of Whittlesea

Sewer emergency relief points

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

On Drain / Waterway	Bank / Side of Waterway	Operator	Location	Melway Reference
Darebin Creek	East	Yarra Valley Water	Maserati Drive, Epping	182 D7

Table 40 – Sewer Emergency Relief Points in the Darebin Creek Catchment in the City of Whittlesea

Command, control and coordination

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

Flood impacts and operational considerations (Intelligence Cards)

The tables on the following pages provide a breakdown of the possible consequences of flooding along Darebin Creek at various creek heights or rain totals within the City of Whittlesea. 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:

- Darebin Creek at Epping,
- Darebin Creek at Bundoora,
- Darebin Creek’s Stormwater Drains.

FLOOD INTELLIGENCE CARD – EPPING GAUGE, DAREBIN CREEK

Version 4 – January 2022



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

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



LOCATION:	Rufus Street, Epping
CURRENT LEVEL:	https://www.melbournewater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/229613A
STREAM:	Darebin Creek
GAUGE NUMBER:	229613
GAUGE ZERO:	119.56m AHD
GAUGE TYPE:	Stream Level & Rain

MELWAY REFERENCE:	182 C11
MINOR:	Not Established
MODERATE:	Not Established
MAJOR:	Not Established
LEEVE HEIGHT:	N/A
HIGHEST RECORDED FLOOD:	2.52m (2 nd February 2005)

Creek Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
2.36m	20% AEP (5yr ARI) Flood Level	Water Over Road (over 30cm depth) <ul style="list-style-type: none"> Casey Drive, Lalor 	
2.86m	5% AEP (20yr ARI) Flood Level	Water Over Road (over 30cm depth) <ul style="list-style-type: none"> Casey Drive, Lalor 	
3.34m	1% AEP (100-year ARI) Flood Level	<p>Properties at Flood Risk</p> <p>4 Properties in Total</p> <p>Darebin Creek</p> <ul style="list-style-type: none"> 1343 Donnybrook Road, Woodstock 1015 Merriang Road, Woodstock <p>Findons Creek West Branch</p> <ul style="list-style-type: none"> 450 & 481 Epping Road, Wollert <p>Water Over Road</p> <p>Findons Creek West Branch</p> <ul style="list-style-type: none"> Boundary Road, Wollert Lehmanns Road, Wollert Harvest Home Road, Wollert Findon Road, Epping <p>Darebin Creek</p> <ul style="list-style-type: none"> Casey Drive, Lalor 	<p>VICSES may provide warnings via VicEmergency to the community (including Brimbank Council and appropriate agencies as required) based on the predictions provided by BoM regarding flood levels and the risk of Flash Flooding.</p> <p>The VICSES RDO, in conjunction with the Regional Agency Commander, will maintain operational awareness and form an appropriate response arrangement to suit the level of incident.</p> <p>VICSES to respond on a request-by-request basis.</p> <p>Council and DTP (as appropriate) to provide road closure signage under predetermined arrangements.</p>

Table 41 – Breakdown of likely consequences at various Epping gauge level heights along Darebin Creek with operational considerations

FLOOD INTELLIGENCE CARD – BUNDOORA GAUGE, DAREBIN CREEK

Version 4 – January 2022



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

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LOCATION:	East bank of the creek, north side of Settlement Road, Bundoora
CURRENT LEVEL:	https://www.melbournewater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/229612A
STREAM:	Darebin Creek
GAUGE NUMBER:	229612A
GAUGE ZERO:	80.21m AHD
GAUGE TYPE:	Stream Level & Rain

MELWAY REFERENCE:	9 G12
MINOR:	Not Established
MODERATE:	Not Established
MAJOR:	Not Established
LEEVE HEIGHT:	N/A
HIGHEST RECORDED FLOOD:	4.82m (15 th May 1974)

Creek Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
3.7m	Bank Full Level	<ul style="list-style-type: none"> Breakout level on the lower bank at Gauging location 	
4.20m	1% AEP (100-year ARI flow)	<p>Property Flooding 16 Properties in Total</p> <ul style="list-style-type: none"> 4/10, 5/10, 6/10 & 7/10 Lucy Court, Bundoora 2/21, 23A, 2/25, 2/27 & 31 McLeans Road, Bundoora 1/3 & 2/3 Mozart Court, Bundoora 10/60 & 11/60 Nickson Street, Bundoora 14 & 15 Samuel Court, Bundoora 4/123 Settlement Road, Bundoora <p>Community Infrastructure Likely Flooded Northside Christian Centre and College, McLeans Road</p> <p>Water Over Road (Roads in Red are DTP owned Roads)</p> <ul style="list-style-type: none"> Metropolitan Ring Road, Thomastown between Dalton Road and Plenty Road McLeans Road, Bundoora 	<p>VICSES may provide warnings via VicEmergency to the community (including Brimbank Council and appropriate agencies as required) based on the predictions provided by BoM regarding flood levels and the risk of Flash Flooding.</p> <p>The VICSES RDO, in conjunction with the Regional Agency Commander, will maintain operational awareness and form an appropriate response arrangement to suit the level of incident.</p> <p>VICSES to respond on a request-by-request basis.</p> <p>Council and DTP (as appropriate) to provide road closure signage under predetermined arrangements.</p>
4.69m		<p>Community Infrastructure Likely Flooded</p> <ul style="list-style-type: none"> Water starts flowing on footbridge on northern side of Settlement Road 	
4.82m	15 th May 1974 Flood Level	<ul style="list-style-type: none"> Nil Information Available 	

Table 42 – Breakdown of likely consequences at various Bundoora gauge level heights along Darebin Creek with operational considerations

FLOOD INTELLIGENCE CARD – DAREBIN CREEK STORMWATER TRIBUTARIES (UNGAUC)

Version 4 – January 2022



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

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CLOSEST RAIN GAUGE:	Darebin Creek at Epping
LOCATION:	West bank of the creek, north side of Rufus Street, Epping
RECENT RAINFALL:	https://www.melbournewater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/229613A

MELWAY REF:	182D11
GAUGE NUMBER	229613A
GAUGE TYPE	Rain

Design Rainfall Depths (mm) – Indication of Possible Flooding	Annual Exceedance Probability	Consequence / Impact	Operational Considerations
11mm in 10 mins; 18mm in 30 mins; 23mm in 1 hour; 28mm in 2 hours; 32mm in 3 hours; or 41mm 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 30cm depth in yard) 7 Properties in Total Lalor Drain <ul style="list-style-type: none"> 7 Canberra Grove, Lalor 4/216, 222, 224, 226 & 228 Dalton Road, Lalor South Morang Drain <ul style="list-style-type: none"> 67 Roycroft Avenue, Mill Park Water Over Road (over 30cm depth) (Roads in Red are DTP owned Roads) The Lakes Boulevard Drain <ul style="list-style-type: none"> Fitzgerald Drive, South Morang Lalor Drain <ul style="list-style-type: none"> Anderson Street, Lalor Blackburn Street, Lalor Canberra Grove, Lalor Curtin Avenue, Lalor Dalton Road, Lalor at Ruth Street Kirwan Avenue, Lalor Partridge Street, Lalor Local Drainage <ul style="list-style-type: none"> Houston Street, Epping Josef Avenue, Bundoora Monash Street, Lalor 	VICSES may provide warnings via VicEmergency to the community (including Brimbank Council and appropriate agencies as required) based on the predictions provided by BoM regarding flood levels and the risk of Flash Flooding. The VICSES RDO, in conjunction with the Regional Agency Commander, will maintain operational awareness and form an appropriate response arrangement to suit the level of incident. VICSES to respond on a request-by-request basis. Council and DTP (as appropriate) to provide road closure signage under predetermined arrangements.

Design Rainfall Depths (mm) – Indication of Possible Flooding	Annual Exceedance Probability	Consequence / Impact	Operational Considerations
		<p>South Morang Drain</p> <ul style="list-style-type: none"> Hinkler Avenue, Mill Park Konrads Crescent, Mill Park Lavender Court, Mill Park Pleasant Close, Mill Park Woodvale Court, Mill Park 	
<p>16mm in 10 mins; 26mm in 30 mins; 33mm in 1 hour; 41mm in 2 hours; 46mm in 3 hours; or 59mm 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 30cm depth in yard)</p> <p>62 Properties in Total</p> <p>Lalor Drain</p> <ul style="list-style-type: none"> 1, 2, 3, 4, 5, 6, 7A, 7, 8, 10, 12, 1/14 & 2/14 Blackburn Street, Lalor 6, 7, 8, 9, 10, 11, 12, 13 & 14 Canberra Grove, Lalor 154, 2/156, 158, 160, 162, 164, 166, 168, 170, 172, 174, 176, 178, 180 & 182 Casey Drive, Lalor 212, 214, 1/216, 2/216, 3/216, 4/216, 5/216, 220, 221, 222, 223, 224, 225, 226, 228, 230 & 232 Dalton Road, Lalor 136 Darebin Drive, Lalor 118 David Street, Lalor 8, 10 Deakin Avenue, Lalor 7, 8, 12 & 13 Griffin Court, Lalor 17, 19, 21 & 23 Kirwan Avenue, Lalor 20, 27 & 29 Lynne Street, Lalor 5 Menzies Parade, Lalor 1 & 10 Whitehall Place, Lalor <p>Local Drainage</p> <ul style="list-style-type: none"> 66 Centenary Drive, Mill Park 4/1 Davisson Street, Epping 23 & 24 Josef Avenue, Bundoora 42 Northgate Drive, Thomastown 21 Railway Road, Epping <p>South Morang Drain</p> <ul style="list-style-type: none"> 290-312 Childs Road, Mill Park 11 Henricks Court, Mill Park 67 Roycroft Avenue, Mill Park <p>Thomastown East Drain</p> <ul style="list-style-type: none"> 63 Cumberland Crescent, Thomastown 2 Richardson Street, Thomastown 45, 47 & 49 Rochester Drive, Thomastown <p>Community Infrastructure Likely Flooded</p> <p>South Morang Drain</p>	<p>VICSES may provide warnings via VicEmergency to the community (including Brimbank Council and appropriate agencies as required) based on the predictions provided by BoM regarding flood levels and the risk of Flash Flooding.</p> <p>The VICSES RDO, in conjunction with the Regional Agency Commander, will maintain operational awareness and form an appropriate response arrangement to suit the level of incident.</p> <p>VICSES to respond on a request-by-request basis.</p> <p>Council and DTP (as appropriate) to provide road closure signage under predetermined arrangements.</p>

Design Rainfall Depths (mm) – Indication of Possible Flooding	Annual Exceedance Probability	Consequence / Impact	Operational Considerations
		<ul style="list-style-type: none"> • St Francis of Assisi Catholic Primary School on Childs Road, Mill Park Lalor Drain • Lalor Primary School on Maxwell Street, Lalor flooded around sporting field • Lalor Secondary College on Dalton Road, Lalor flooded through centre of School Water Over Road (over 30cm depth) (Roads in Red are DTP owned Roads) Darebin Creek • Casey Drive, Lalor Henderson Road Drain • Athena Place, Epping • Avon Place, Epping The Lakes Boulevard Drain • Fitzgerald Drive, South Morang • Lalor Drain • Anderson Street, Lalor • Blackburn Street, Lalor • Canberra Grove, Lalor • Curtin Avenue, Lalor • Dalton Road, Lalor at Ruth Street • Deakin Avenue, Lalor • East Court, Lalor • Kellerher Street, Lalor • Kirwan Avenue, Lalor • Lynne Street, Lalor • Partridge Street, Lalor • Sydney Crescent, Lalor • West Court, Lalor • Whitehill Place, Lalor Local Drainage • Betula Avenue, Bundoora • Bryson Court, Bundoora • Childs Road, Epping at Buch Avenue • Darebin Drive, Thomastown • Emmerson Court, Mill Park • Houston Street, Epping • Josef Avenue, Bundoora • Lady Penrhyn Avenue, Mill Park • Luzon Court, Lalor • Monash Street, Lalor • Pindari Avenue, Mill Park • Tobruk Court, Lalor 	

Design Rainfall Depths (mm) – Indication of Possible Flooding	Annual Exceedance Probability	Consequence / Impact	Operational Considerations
		<ul style="list-style-type: none"> • Touhey Avenue, Epping Mill Park Drain • Mill Park Drive, Mill Park • Wisteria Drive, Bundoora South Morang Drain • Cuthbert Drive, Mill Park • Hinkler Avenue, Mill Park • Konrads Crescent, Mill Park • Lavender Court, Mill Park • Norwood Road, Mill Park • Pleasant Close, Mill Park • Protea Court, Mill Park • Woodvale Court, Mill Park Thomastown East Drain • Cumberland Crescent, Thomastown 	
<p>24mm in 10 mins; 39mm in 30 mins; 48mm in 1 hour; 59mm in 2 hours; 67mm in 3 hours; or 84mm 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>	1% AEP (100-year ARI)	<ul style="list-style-type: none"> Properties at Flood Risk 152 Properties in Total Lalor Drain • 1, 2, 3, 4, 5, 6, 7A, 7, 8, 10, 12, 1/14 & 2/14 Blackburn Street, Lalor • 7, 8, 9, 10, 11 & 12 Canberra Grove, Lalor • 174, 178, 180 & 182 Casey Drive, Lalor • 212, 214, 4/216, 5/216, 220, 222, 224, 226, 228 & 230 Dalton Road, Lalor • 136 Darebin Drive, Lalor • 118 David Street, Lalor • 6, 8, 10, 11 & 11A Deakin Avenue, Lalor • 113, 115 & 117 Derrick Street, Lalor • 4 & 5 East Court, Lalor • 7, 8, 9, 10, 11, 12 & 13 Griffin Court, Lalor • 16, 17, 19, 21, 23 & 25 Kirwan Avenue, Lalor • 20, 27 & 29 Lynne Street, Lalor • 36 Maxwell Street, Lalor • 1, 3, 5, 7 & 9 Menzies Parade, Lalor • 1 & 10 Whitehall Place, Lalor Local Drainage • 66 Centenary Drive, Mill Park • 1/1, 2/1, 3/1 & 4/1 Davisson Street, Epping • 520 & 696 High Street, Epping • 48 & 50 Houston Street, Epping • 20, 21, 22, 23, 24, 25W, 27, 29 & 31 Josef Avenue, Bundoora • 7/1, 8/1, 9/1, 10/1, 11/1 & 11 Morang Drive, Mill Park 	<p>VICSES may provide warnings via VicEmergency to the community (including Brimbank Council and appropriate agencies as required) based on the predictions provided by BoM regarding flood levels and the risk of Flash Flooding.</p> <p>The VICSES RDO, in conjunction with the Regional Agency Commander, will maintain operational awareness and form an appropriate response arrangement to suit the level of incident.</p> <p>VICSES to respond on a request-by-request basis.</p> <p>Council and DTP (as appropriate) to provide road closure signage under predetermined arrangements.</p> <p>PTV to advise on potential for rail closure. Metro Trains required to conduct track inspection following flood inundation prior to reopening of track. Potential for delayed services or need for bus replacement services.</p>

Design Rainfall Depths (mm) – Indication of Possible Flooding	Annual Exceedance Probability	Consequence / Impact	Operational Considerations
		<ul style="list-style-type: none"> • 42 Northgate Drive, Thomastown • 14, 15, 16 & 18 Norwood Road, Mill Park • 31 & 33 Partridge Street, Lalor • 2 Pulford Crescent, Mill Park • 19 & 21 Railway Road, Epping • 1, 2, 3, 5, 6, 7, 8, 9 & 10 Woodvale Court, Mill Park <p>South Morang Drain</p> <ul style="list-style-type: none"> • 290-312 Childs Road, Mill Park • 9 & 11 Henricks Court, Mill Park • 5, 7 & 9 Hinkler Drive, Mill Park • 37 & 39 Konrads Crescent, Mill Park • 36 Moorhead Drive, Mill Park • 67 & 69 Roycroft Avenue, Mill Park <p>Thomastown East Drain</p> <ul style="list-style-type: none"> • 63 Cumberland Crescent, Thomastown • 2 & 4 Richardson Street, Thomastown • 41, 43, 45, 47 & 49 Rochester Drive, Thomastown <p>Community Infrastructure Likely Flooded</p> <p>South Morang Drain</p> <ul style="list-style-type: none"> • St Francis of Assisi Catholic Primary School on Childs Road, Mill Park <p>Lalor Drain</p> <ul style="list-style-type: none"> • Lalor Primary School on Maxwell Street, Lalor flooded around sporting field • Lalor Secondary College on Dalton Road, Lalor flooded through centre of School <p>Essential Infrastructure Likely Impacted</p> <ul style="list-style-type: none"> • The Mernda Railway Line may be flooded between Pindari Avenue and Civic Drive in South Morang in a 1% AEP flash flooding event along the Hendersons Road Drain System <p>Water Over Road (over 30cm depth) Roads in Red are DTP owned Roads</p> <p>Dransfield Way Drain</p> <ul style="list-style-type: none"> • Dransfield Way, Epping • Findon Road west bound at Glendale Avenue, Epping • Horseshoe Crescent, Epping • Meadow Glen Drive, Epping • Trotting Place, Epping <p>Henderson Road Drain</p> <ul style="list-style-type: none"> • Athena Place, Epping • Avon Place, Epping • Maiden Court, Epping • Vista Way, South Morang <p>The Lakes Boulevard Drain</p>	

Design Rainfall Depths (mm) – Indication of Possible Flooding	Annual Exceedance Probability	Consequence / Impact	Operational Considerations
		<ul style="list-style-type: none"> • Fitzgerald Drive, South Morang Lalor Drain • Anderson Street, Lalor • Blackburn Street, Lalor • Canberra Grove, Lalor • Curtin Avenue, Lalor • Dalton Road, Lalor at Ruth Street • Deakin Avenue, Lalor • East Court, Lalor • Kellerher Street, Lalor • Kirwan Avenue, Lalor • Lynne Street, Lalor • Partridge Street, Lalor • Sydney Crescent, Lalor • West Court, Lalor • Whitehill Place, Lalor Local Drainage • Barbara Court, Thomastown • Betula Avenue, Bundoora • Bryson Court, Bundoora • Childs Road, Epping at Buch Avenue • Darebin Drive, Thomastown • Emmerson Court, Mill Park • Hobson Crescent, Mill Park • Houston Street, Epping • Josef Avenue, Bundoora • Lady Penrhyn Avenue, Mill Park • Luzon Court, Lalor • Manus Court, Lalor • Monash Street, Lalor • Pindari Avenue, Mill Park • Pivot Place, Mill Park • Prince Of Wales Avenue, Mill Park • Sirius Court, Mill Park • Stella Drive, Thomastown • The Lakes Boulevard, South Morang • Tobruk Court, Lalor • Touhey Avenue, Epping Mill Park Drain • Blamey Avenue, Mill Park • Bramble Crescent, Bundoora 	

Design Rainfall Depths (mm) – Indication of Possible Flooding	Annual Exceedance Probability	Consequence / Impact	Operational Considerations
		<ul style="list-style-type: none"> • Jacaranda Drive, Mill Park • Mill Park Drive, Mill Park • Wisteria Drive, Bundoora South Morang Drain • Alder Court, Mill Park • Appletree Drive, Mill Park • Chestnut Road, Mill Park • Cunningham Drive, Mill Park • Cuthbert Drive, Mill Park • Figree Court, Mill Park • Hinkler Avenue, Mill Park • Konrads Crescent, Mill Park • Lavender Court, Mill Park • Norwood Road, Mill Park • Pleasant Close, Mill Park • Protea Court, Mill Park • Sycamore Street, Mill Park • Woodvale Court, Mill Park Thomastown East Drain • Cumberland Crescent, Thomastown • Rochester Drive, Thomastown 	

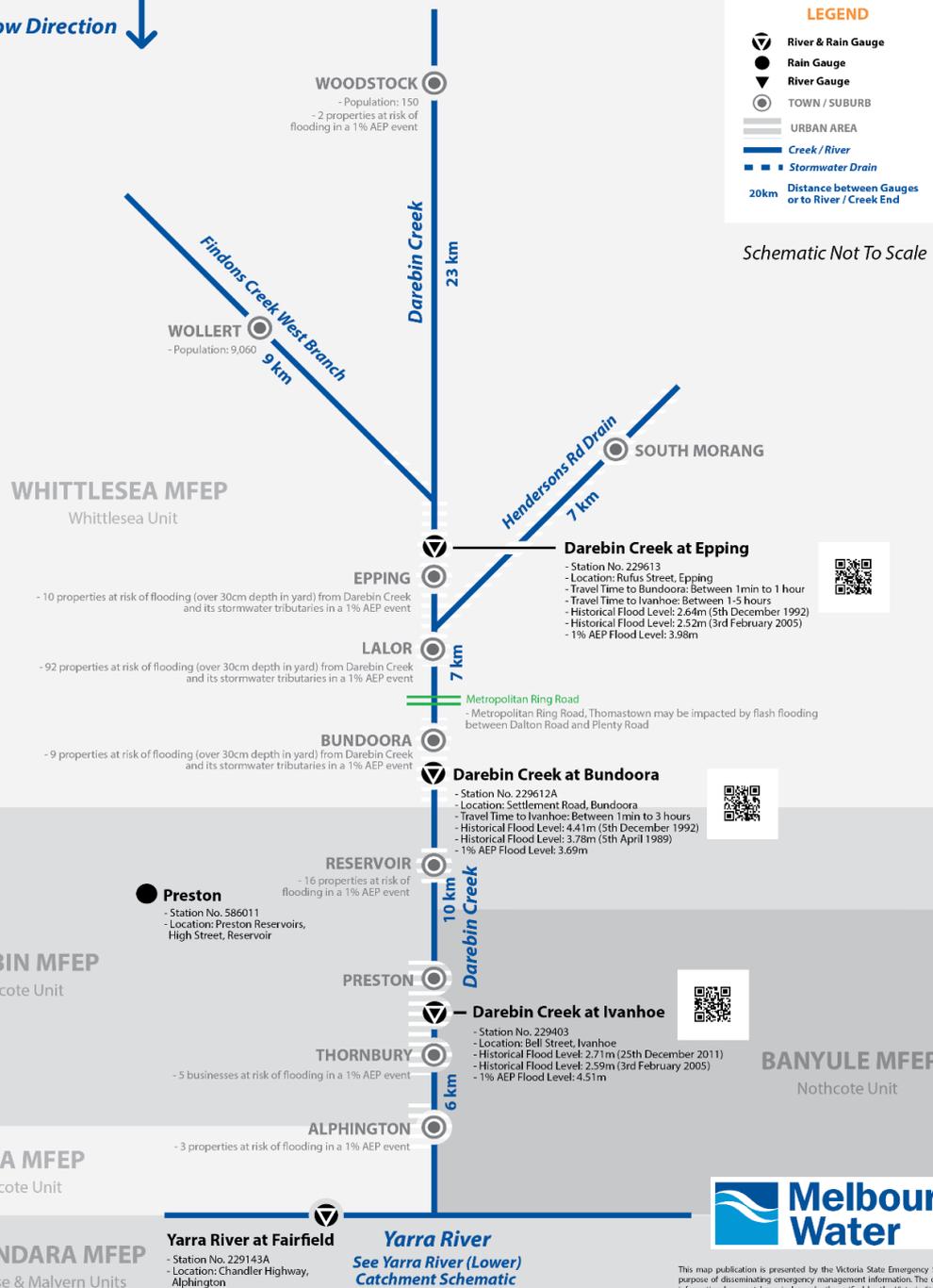
Table 43 – Breakdown of possible consequences at various rainfall intensities around Epping, Mill Park & Lalor with operational considerations



Darebin Creek Catchment Schematic

Version 5 - January 2021

Flow Direction ↓



Schematic Not To Scale

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

This map publication is presented by the Victoria State Emergency Service for the purposes 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. Travel times listed are Indicative Only and are Highly Variable.

Image 6-Darebin Creek Catchment Schematic

4.4. Central and Edgars Creek

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 Central & Edgars Creeks in Whittlesea

Property (over 30cm depth in yard)					
Properties	79				
Residential	56				
Commercial	1				
Industrial	22				
Public Land	0				
Rural	0				
Community Infrastructure					
Essential Infrastructure					
Major Roads	2	Edgars Road and Settlement Road			
Major Rail	1	Mernda Line at Thomastown			
Bus Routes	3	554, 557 & 570			
Sewerage Facilities	7	4 Pumping Stations and 3 Emergency Relief Points			
Drainage Facilities	4	Retarding Basins			
Tourism / Recreation					
Government Boundaries					
Local Gov't Areas	1	Whittlesea	CMA	1	Port Phillip & Westernport
Adjacent LGAs	1	Darebin	CFA District	1	District 14
SES Resp' Boundary	1	Whittlesea	FRV District	1	Northern

Table 44 – Consequence Summary of 1% AEP flood along Central & Edgars Creeks in City of Whittlesea

Gauges and warnings

Neither the Bureau of Meteorology nor Melbourne Water currently provides flood forecasts for the Central or Edgars Creek catchments. All flood response actions must therefore be driven by rainfall and / or river level observations. Telemetered water level / flood gauges are located at Merri Creek at Somerton and Darebin Creek at Epping.

Gauge	Station No.	Location	Stream Level & Flow Gauge	Rain Gauge	Melway Reference
Darebin Creek at Epping	229613A	West bank of the creek, north side of Rufus Street, Epping	ü	ü	182D11
Merri Creek at Somerton	229603B	West side of the creek, 200m north of Cooper Street, Somerton	ü	ü	180J10

Table 45 – Gauges within neighbouring catchments.

These Gauges may provide some warning of expected flooding. See the Melbourne Water website for more information on these gauges:

<http://www.melbournewater.com.au/waterdata/rainfallandriverleveldata/Pages/Rainfall-and-river-level-new.aspx>. The Bureau of Meteorology's website also links a number of these gauges at:

http://www.bom.gov.au/cgi-bin/wrap_fwo.pl?IDV60201.html. It is advised that residents monitor the Bureau of Meteorology's website <http://www.bom.gov.au/vic/warnings/index.shtml?ref=hdr> and the VicEmergency website <https://emergency.vic.gov.au/> for any thunderstorm, flood or severe weather warnings present for their area.

Properties at flood risk

Properties listed in the table below are at risk from flooding within the Edgars and Central Creek's catchments in the City of Whittlesea. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Edgars Creek (Cardno, March 2020) 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 Flash Flooding (over 30cm depth in yard) within the Edgars and Central Creek's Catchment						
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				
		P	7 Alchester Court	Thomastown	Local Drainage	Flash
		P	8 Alchester Court	Thomastown	Local Drainage	Flash
		P	9 Alchester Court	Thomastown	Local Drainage	Flash
	P	P	13 Alchester Court	Thomastown	Local Drainage	Flash
	P	P	5 Alfa Court	Lalor	Edgars Creek	Flash
		P	4 Campus Place	Thomastown	Local Drainage	Flash
	P	P	5 Campus Place	Thomastown	Local Drainage	Flash
	P	P	6 Campus Place	Thomastown	Local Drainage	Flash
	P	P	7 Campus Place	Thomastown	Local Drainage	Flash
		P	2/3 Charles Street	Thomastown	Thomastown Drain	Flash
		P	3/3 Charles Street	Thomastown	Thomastown Drain	Flash
		P	4/3 Charles Street	Thomastown	Thomastown Drain	Flash
		P	12 Charnfield Court	Thomastown	Keon Park Drain	Flash
		P	21 Charnfield Court	Thomastown	Keon Park Drain	Flash
		P	10 Crispian Court	Thomastown	Thomastown West Drain	Flash
		P	5 Dunstans Court	Thomastown	Keon Park Drain	Flash
	P	P	15 Dunstans Court	Thomastown	Keon Park Drain	Flash
		P	6 Hotham Court	Lalor	Local Drainage	Flash
		P	3 Howe Court	Thomastown	Thomastown West Drain	Flash
P	P	P	4 Howe Court	Thomastown	Thomastown West Drain	Flash
		P	2 Keon Parade	Thomastown	Keon Park Drain	Flash
		P	40 Keon Parade	Thomastown	Keon Park Drain	Flash
		P	2 Kosciusko Court	Lalor	Local Drainage	Flash
	P	P	3 Kosciusko Court	Lalor	Local Drainage	Flash
		P	4 Kosciusko Court	Lalor	Local Drainage	Flash
		P	5 Kosciusko Court	Lalor	Local Drainage	Flash
		P	15 Kosciusko Court	Lalor	Local Drainage	Flash
	P	P	42 Lawson Crescent	Thomastown	Local Drainage	Flash
	P	P	44 Lawson Crescent	Thomastown	Local Drainage	Flash

Properties at risk from Flash Flooding (over 30cm depth in yard) within the Edgars and Central Creek's Catchment

Properties at risk from Flash Flooding (over 30cm depth in yard) within the Edgars and Central Creek's Catchment						
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				
		P	6 Lomond Court	Lalor	Local Drainage	Flash
		P	7 Lomond Court	Lalor	Local Drainage	Flash
		P	1 Maitland Close	Thomastown	Thomastown West Drain	Flash
	P	P	12 Maitland Close	Thomastown	Thomastown West Drain	Flash
		P	101 Mount View Road	Lalor	Edgars Creek	Flash
		P	103 Mount View Road	Lalor	Edgars Creek	Flash
		P	105 Mount View Road	Lalor	Edgars Creek	Flash
		P	106 Mount View Road	Lalor	Edgars Creek	Flash
		P	108 Mount View Road	Lalor	Edgars Creek	Flash
		P	110 Mount View Road	Lalor	Edgars Creek	Flash
		P	1/112 Mount View Road	Lalor	Edgars Creek	Flash
		P	2/112 Mount View Road	Lalor	Edgars Creek	Flash
		P	40 Pandora Avenue	Thomastown	Thomastown West Drain	Flash
		P	52 Pandora Avenue	Thomastown	Thomastown West Drain	Flash
		P	54 Pandora Avenue	Thomastown	Thomastown West Drain	Flash
	P	P	61 Pandora Avenue	Thomastown	Thomastown West Drain	Flash
	P	P	63 Pandora Avenue	Thomastown	Thomastown West Drain	Flash
	P	P	65 Pandora Avenue	Thomastown	Thomastown West Drain	Flash
		P	67 Pandora Avenue	Thomastown	Thomastown West Drain	Flash
		P	71 Pandora Avenue	Thomastown	Thomastown West Drain	Flash
		P	73 Pandora Avenue	Thomastown	Thomastown West Drain	Flash
		P	1/51 Richards Street	Lalor	Edgars Creek	Flash
		P	2/51 Richards Street	Lalor	Edgars Creek	Flash
		P	8 Salamander Avenue	Thomastown	Thomastown West Drain	Flash
		P	10 Salamander Avenue	Thomastown	Thomastown West Drain	Flash
		P	12 Salamander Avenue	Thomastown	Thomastown West Drain	Flash
		P	309 Settlement Road	Thomastown	Local Drainage	Flash
		P	371 Settlement Road	Thomastown	Keon Park Drain	Flash
		P	373 Settlement Road	Thomastown	Keon Park Drain	Flash
		P	20 Temple Drive	Thomastown	Keon Park Drain	Flash
		P	31 Temple Drive	Thomastown	Keon Park Drain	Flash
	P	P	35 Temple Drive	Thomastown	Keon Park Drain	Flash
	P	P	37 Temple Drive	Thomastown	Keon Park Drain	Flash
		P	39 Temple Drive	Thomastown	Keon Park Drain	Flash
		P	40 Temple Drive	Thomastown	Keon Park Drain	Flash
		P	41 Temple Drive	Thomastown	Keon Park Drain	Flash
	P	P	43 Temple Drive	Thomastown	Keon Park Drain	Flash
		P	45 Temple Drive	Thomastown	Keon Park Drain	Flash
		P	47 Temple Drive	Thomastown	Keon Park Drain	Flash
		P	49 Temple Drive	Thomastown	Keon Park Drain	Flash
		P	49A Temple Drive	Thomastown	Keon Park Drain	Flash
		P	5 Townsend Court	Lalor	Local Drainage	Flash
		P	6 Townsend Court	Lalor	Local Drainage	Flash

Properties at risk from Flash Flooding (over 30cm depth in yard) within the Edgars and Central Creek's Catchment						
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				
		P	7 Townsend Court	Lalor	Local Drainage	Flash
		P	19 Wirraway Crescent	Thomastown	Thomastown West Drain	Flash
		P	20 Wirraway Crescent	Thomastown	Thomastown West Drain	Flash
		P	22 Wirraway Crescent	Thomastown	Thomastown West Drain	Flash
		P	23 Wirraway Crescent	Thomastown	Thomastown West Drain	Flash
		P	24 Wirraway Crescent	Thomastown	Thomastown West Drain	Flash
		P	25 Wirraway Crescent	Thomastown	Thomastown West Drain	Flash
Totals						
1	17	79				

Table 46 – Properties at risk of flooding along the Central & Edgars Creeks and Stormwater Tributaries in the City of Whittlesea

Isolation

No major isolation risks exist for areas around Thomastown, Lalor & Epping during a 1% AEP (100yr ARI) event. Some localised short-duration isolation may occur due to flash flooding.

Essential infrastructure

- The Mernda Railway Line likely impacted during a 1% AEP (100yr ARI) flood event north of Thomastown Station with overland flow across High Street and Station Street.
- Bus Routes 554, 555, 557, 559 & 570 likely impacted during a 1% AEP (100yr ARI) 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/>

Apart from the roads outlined below, all other essential infrastructure and services areas around Thomastown, Lalor and Epping 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 Thomastown, Lalor and Epping near Central and Edgars Creeks. Check the VicRoads website for more details:

<http://alerts.vicroads.vic.gov.au/>

Department of Transport & Planning Roads flooded in a 1% AEP (100yr ARI) event	
•	Edgars Road, Lalor north of Kingsway Drive
•	Settlement Road, Thomastown at Cliveden Court

Table 47– Department of Transport & Planning Possible Road Closures during a flooding event

Whittlesea City Council Roads likely flooded in a 1% AEP (100yr ARI) event			
LALOR	• Pinetree Crescent	• Burwood Court	• Pandora Avenue
• Begonia Court	• Pinnacle Court	• Central Avenue	• Patronia Street
• Buller Parade	• Robert Street	• Derwent Court	• Pleasant Road
• Cambala Avenue	• Rosemary Drive	• Dunstons Court	• Queenscliff Road
• Duncan Road	• Sarissa Street	• Emma Court	• Salamander Avenue
• Festival Grove	• Townsend Court	• Equator Road	• Sheila Court
• Gillwell Road	• Tripani Avenue	• Fir Street	• Spring Street
• Hotham Court	• Wellington Crescent	• Gladstone Street	• Temple Drive
• Kingsway Drive	THOMASTOWN	• Heyington Avenue	• The Boulevard
• Kosciusko Court	• Alchester Court	• Howe Court	• Wirraway Crescent
• Lascelles Drive	• Alexander Avenue	• Karingal Way	• Wodonga Crescent
• Moffat Drive	• Badger Court	• Lawson Crescent	• Wolseley Place
• Mount View Road	• Barden Place	• Leilani Grove	
• Parfrey Avenue	• Beech Street	• Madera Drive	

Table 48 –Whittlesea City Council Possible Road Closures during a flooding event

Flood mitigation

Retarding basins

Melbourne Water Retarding Basin	On Drain/ Waterway	Spillway Crest Level	Full Supply Level	1% AEP Flood Level	Embankment Crest Height	Storage Capacity	ANCOLD Hazard Rating	Houses In Flow Path (dam breach)	Melway Reference
Great Brome Avenue	Epping Drain	N/A	145.8m AHD	Unavailable	147.0m AHD	5.95ML	Very Low	0	182 A7
Herlitz Drive	Yale Dr Drain	146.0m AHD	146.45m AHD	Unavailable	1.26m (146.76m AHD)	0.5ML	Low	Unavailable	181 J6
Melbourne Market	Edgars Creek	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable	Unclassified	Unavailable	8 G1

Table 49 – Melbourne Water Retarding Basins within the Central & Edgars Creeks catchment in the City of Whittlesea

City of Whittlesea Retarding Basin	On Drain/ Waterway	Spillway Crest Level	Full Supply Level	1% AEP Flood Level	Embankment Crest Height	Storage Capacity	ANCOLD Hazard Rating	Houses In Flow Path (dam breach)	Melway Reference
Lipton Drive	CoW Local Drain	97.17m AHD	97.17m AHD	Unknown	1.8m	Unknown	Unclassified	Unknown	8F10

Table 50 – Whittlesea City Council Retarding Basins within the Central & Edgars Creeks catchment in the City of Whittlesea

No formal Pumping Stations or Levees exist around Thomastown, Lalor or Epping.

Sewerage infrastructure

Sewerage Infrastructure of note during a severe flood event located around Thomastown, Lalor and Epping are contained within the following two tables.

Sewer pumping stations

Sewerage Pumping Station	On Drain / Waterway	Bank / Side of Waterway	Operator	Location	Melway Reference
Cotters Road	Local Drainage	N/A	Yarra Valley Water	O'herns Road, Epping at Cotters Road	181 G7
Edgars Road	Edgars Creek	West	Yarra Valley Water	Cooper Street, Epping at Edgars Road	181 G11
Kimberley Street	Local Drainage	N/A	Yarra Valley Water	Kimberley Street, Lalor	8 E4
Mossman Crescent	Benaroon Drive Drain	N/A	Yarra Valley Water	Sarissa Street, Lalor	8 D4

Table 51 – Sewer Pumping Stations within the Edgars and Central Creek Catchments in the City of Whittlesea

Sewer emergency relief points

There are Sewer Emergency Relief Points along the Central and Edgars Creeks and their stormwater tributaries that will likely affect floodwater conditions downstream of their locations if in operation. 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.

Operator	On Drain / Waterway	Bank / Side of Waterway	Location	Melway Reference
Yarra Valley Water	Benaroon Dr Drain	East	Sarissa Street, Lalor	8 D4
Yarra Valley Water	Edgars Creek	West	Cooper Street at Edgars Road,	181 G11
Yarra Valley Water	Thomastown West Drain	North	Pandora Avenue, Thomastown	8 C10

Table 52 – Sewer Emergency Relief Points in the Central & Edgars Creeks Catchment in the City of Whittlesea

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 SEMP. During significant events, VICSES will conduct incident management using multi-agency resources.

Flood impacts and operational considerations (Intelligence Cards)

The tables on the following pages provide a breakdown of the possible consequences of flooding along Central and Edgars Creeks and their stormwater tributaries at various rain totals within the City of Whittlesea. 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:

- Edgars Creek, Central Creek and Stormwater Tributaries.

FLOOD INTELLIGENCE CARD – EDGARS CREEK, CENTRAL CREEK & STORMWATER TRIBUTARIES (UNGAUGED)

Version 2 – January 2022



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

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

CLOSEST RAIN GAUGE:	Darebin Creek at Epping
LOCATION:	West bank of the creek, north side of Rufus Street, Epping
RECENT RAINFALL:	https://www.melbournewater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/229613A

MELWAY REF:	182D11
GAUGE NUMBER:	229613A
GAUGE TYPE:	Stream Level and Rain

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; 28mm in 2 hours; 32mm in 3 hours; or 41mm in 6 hours Note: rainfall depths are a very rough method of estimating flood events and have been used due to the ungauged nature of the catchment. This should be used as a guide only.	20% AEP (5-year ARI)	Properties at Flood Risk (over 30cm depth in yard) 1 Property in Total Thomastown West Drain <ul style="list-style-type: none"> • 4 Howe Court, Thomastown Water Over Road (over 30cm depth) Central Creek <ul style="list-style-type: none"> • Moffat Drive, Lalor Thomastown West Drain <ul style="list-style-type: none"> • Pandora Avenue, Thomastown 	
16mm in 10 mins; 26mm in 30 mins;	5% AEP (20-year ARI)	Properties at Flood Risk (over 30cm depth in yard) 15 Properties in Total Edgars Creek	

Design Rainfall Depths (mm) – Indication of Possible Flooding	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
<p>33mm in 1 hour; 41mm in 2 hours; 46mm in 3 hours; or 59mm 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"> • 5 Alfa Court, Lalor • Keon Park Drain • 15 Dunstans Court, Thomastown • 35, 37, 43 Temple Drive, Thomastown • Local Drainage • 13 Alchester Court, Thomastown • 5, 6 & 7 Campus Place, Thomastown • 3 Kosciusko Court, Lalor • Thomastown West Drain • 4 Howe Court, Thomastown • 12 Maitland Close, Thomastown • 61, 63, 65 Pandora Avenue, Thomastown • Essential Infrastructure Likely Impacted • Bus Routes 570 by flooding on The Boulevard • Water Over Road (over 30cm depth) • Central Creek • Moffat Drive, Lalor • Keon Park Drain • Dunstans Court, Thomastown • Temple Drive, Thomastown • Settlement Road, Thomastown at Cliveden Court • Local Drainage • Alchester Court, Thomastown • Duncan Road, Lalor • Edgars Road, Lalor north or Kingsway Drive • Hotham Court, Lalor • Karingal Way, Thomastown • Kosciusko Court, Lalor • Lawson Crescent, Thomastown • Patronia Street, Thomastown • Pinnacle Court, Lalor • Robert Street, Lalor • Rosemary Drive, Lalor • Townsend Court, Lalor • Wellington Crescent, Lalor • Wolseley Place, Thomastown • Thomastown Drain • Beech Street, Thomastown 	

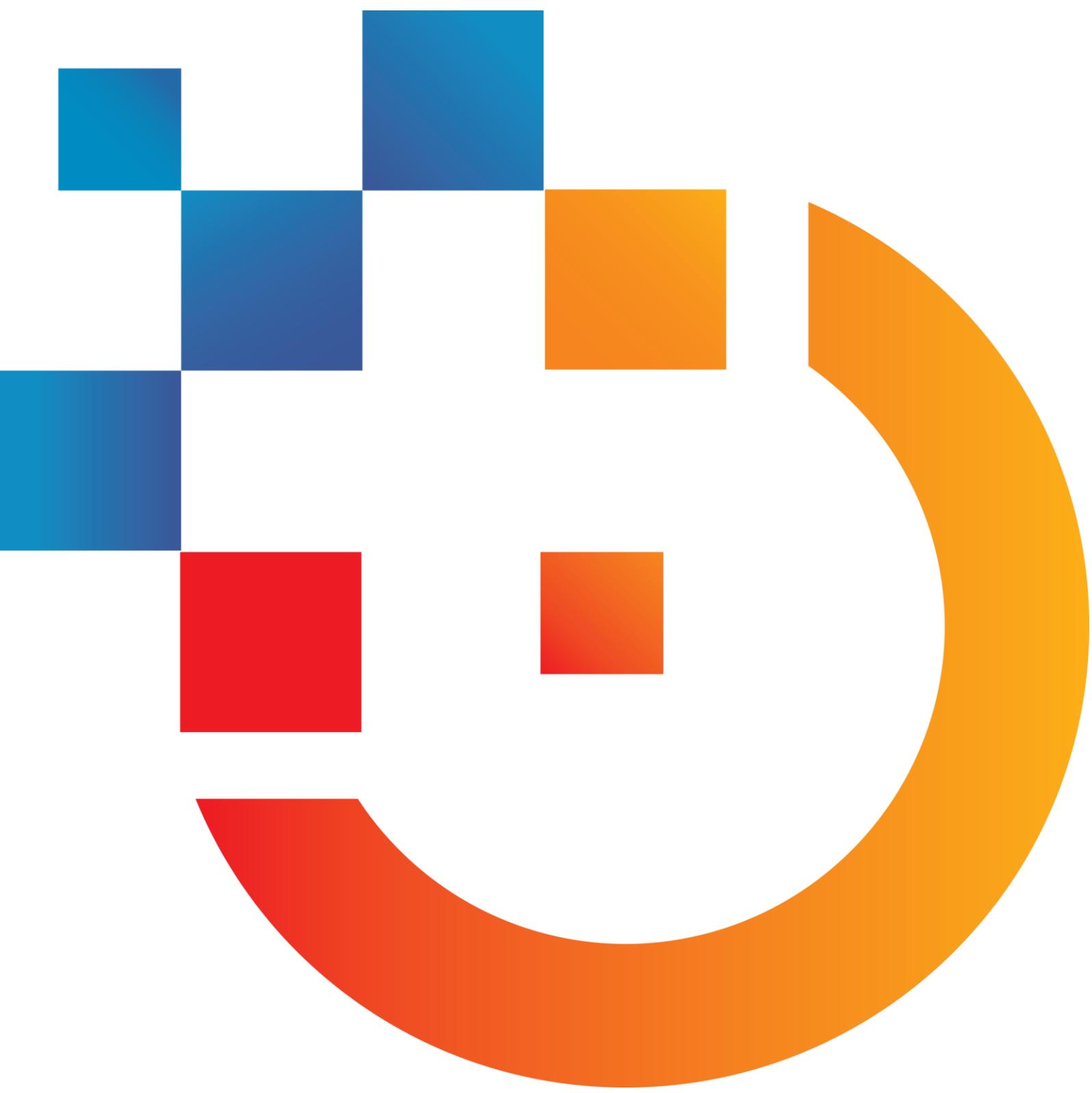
Design Rainfall Depths (mm) – Indication of Possible Flooding	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		<ul style="list-style-type: none"> Central Avenue, Thomastown Fir Street, Thomastown Pleasant Road, Thomastown The Boulevard, Thomastown Thomastown West Drain Barden Place, Thomastown Madera Drive, Thomastown Pandora Avenue, Thomastown Salamander Avenue, Thomastown Sheila Court, Thomastown Wirraway Crescent, Thomastown 	
<p>25mm in 10 mins; 40mm in 30 mins; 50mm in 1 hour; 62mm in 2 hours; 70mm in 3 hours; or 89mm 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>1% AEP (100-year ARI)</p>	<p>Properties at Flood Risk (over 30cm depth in yard)</p> <p>79 Properties in Total</p> <p>Edgars Creek</p> <ul style="list-style-type: none"> 5 Alfa Court, Lalor 101, 103, 105, 106, 108, 110, 1/112 & 2/112 Mount View Road, Lalor 1/51 & 2/51 Richards Street, Lalor <p>Keon Park Drain</p> <ul style="list-style-type: none"> 12 & 21 Charnfield Court, Thomastown 5 & 15 Dunstons Court, Thomastown 2 & 40 Keon Parade, Thomastown 371 & 373 Settlement Road, Thomastown 20, 31, 35, 37, 39, 40, 41, 43, 45, 47, 49 & 49A Temple Drive, Thomastown <p>Local Drainage</p> <ul style="list-style-type: none"> 7, 8, 9 & 13 Alchester Court, Thomastown 4, 5, 6 & 7 Campus Place, Thomastown 6 Hotham Court, Lalor 2, 3, 4, 5 & 15 Kosciusko Court, Lalor 42 & 44 Lawson Crescent, Thomastown 6 & 7 Lomond Court, Lalor 309 Settlement Road, Thomastown 5, 6 & 7 Townsend Court, Lalor <p>Thomastown Drain</p> <ul style="list-style-type: none"> 2/3, 3/3 & 4/3 Charles Street, Thomastown <p>Thomastown West Drain</p> <ul style="list-style-type: none"> 10 Crispian Court, Thomastown 3 & 4 Howe Court, Thomastown 	<p>VICSES may provide warnings via VicEmergency to the community (including Brimbank Council and appropriate agencies as required) based on the predictions provided by BoM regarding flood levels and the risk of Flash Flooding.</p> <p>The VICSES RDO, in conjunction with the Regional Agency Commander, will maintain operational awareness and form an appropriate response arrangement to suit the level of incident.</p> <p>VICSES to respond on a request-by-request basis.</p> <p>Council and DTP (as appropriate) to provide road closure signage under predetermined arrangements.</p> <p>PTV to advise on potential for rail closure. Metro Trains required to conduct track inspection following flood inundation prior to reopening of track. Potential for delayed services or need for bus replacement services.</p> <p>Whittlesea EHOs to have awareness of Sewer Emergency Relief Structures within floodwaters</p>

Design Rainfall Depths (mm) – Indication of Possible Flooding	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		<ul style="list-style-type: none"> • 1 & 12 Maitland Close, Thomastown • 40, 52, 54, 61, 63, 65, 67, 71 & 73 Pandora Avenue, Thomastown • 8, 10 & 12 Salamander Avenue, Thomastown • 19, 20, 22, 23, 24 & 25 Wirraway Crescent, Thomastown <p>Essential Infrastructure Likely Impacted</p> <ul style="list-style-type: none"> • The Mernda Railway Line likely impacted if flooding occurs along the Thomastown Drain at Station Street and High Street north of Thomastown Station. • Bus Routes 570 by flooding on The Boulevard, and 554 & 557 by flooding on Gillwell Road <p>Water Over Road (over 30cm depth) (Roads in Red are DTP owned Roads)</p> <p>Benaroon Drive Drain</p> <ul style="list-style-type: none"> • Gillwell Road, Lalor • Sarissa Street, Lalor <p>Central Creek</p> <ul style="list-style-type: none"> • Moffat Drive, Lalor • Tripani Avenue, Lalor <p>Edgars Creek</p> <ul style="list-style-type: none"> • Mount View Road, Lalor <p>Keon Park Drain</p> <ul style="list-style-type: none"> • Dunstons Court, Thomastown • Temple Drive, Thomastown • Settlement Road, Thomastown at Cliveden Court <p>Local Drainage</p> <ul style="list-style-type: none"> • Alchester Court, Thomastown • Begonia Court, Lalor • Buller Parade, Lalor • Cambala Avenue, Lalor • Duncan Road, Lalor • Edgars Road, Lalor north or Kingsway Drive • Festival Grove, Lalor • Hotham Court, Lalor • Karingal Way, Thomastown • Kingsway Drive, Lalor • Kosciusko Court, Lalor • Lascelles Drive, Lalor • Lawson Crescent, Thomastown • Parfrey Avenue, Lalor • Patronia Street, Thomastown 	

Design Rainfall Depths (mm) – Indication of Possible Flooding	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		<ul style="list-style-type: none"> • Pinetree Crescent, Lalor • Pinnacle Court, Lalor • Queenscliff Road, Thomastown • Robert Street, Lalor • Rosemary Drive, Lalor • Townsend Court, Lalor • Wellington Crescent, Lalor • Wodonga Crescent, Thomastown • Wolseley Place, Thomastown Thomastown Drain • Alexander Avenue, Thomastown • Beech Street, Thomastown • Central Avenue, Thomastown • Equator Road, Thomastown • Fir Street, Thomastown • Heyington Avenue, Thomastown • Pleasant Road, Thomastown • The Boulevard, Thomastown Thomastown West Drain • Badger Court, Thomastown • Barden Place, Thomastown • Burwood Court, Thomastown • Derwent Court, Thomastown • Emma Court, Thomastown • Howe Court, Thomastown • Leilani Grove, Thomastown • Madera Drive, Thomastown • Pandora Avenue, Thomastown • Salamander Avenue, Thomastown • Sheila Court, Thomastown • Spring Street, Thomastown • Wirraway Crescent, Thomastown 	

Table 53 – Breakdown of possible consequences at various rainfall intensities around Edgars Creek and its stormwater Tributaries in City of Whittlesea with operational considerations

5. Appendix B



5.1. Appendix B – Overland Flooding

Flow path designs and drains

A list of key flow paths designs and drains within or boarding the City of Whittlesea is detailed here:

Suburb/s	Melbourne Water Drain OR Flow Path	Suburb/s	Melbourne Water Drain OR Flow Path
Doreen	Ashley Park Drain	Mernda	Mernda Drain
Doreen	Bassetts Rd Drain, part of Simon Creek	Bundoora & Mill Park	Mill Park Drain
Lalor	Benaroon Dr Drain	Doreen	Orchard Rd Drain
Whittlesea	Black Flat Rd Drain	Mernda	Sackville Drain
Mill Park	Blossom Park Drain	Mill Park	South Morang Drain
Mernda	Bridge Inn Rd Drain	South Morang	The Great Eastern Way Drain
Bundoora	Bundoora Drain	South Morang	The Lakes Blv Drain
Mernda	Cravens Rd North Drain	Mill Park	Thomas St Drain
Epping	Dransfield Way Drain	Thomastown	Thomastown Drain
Epping	Epping Drain	Thomastown	Thomastown East Drain
Wollert	Eucalypt Drain	Thomastown	Thomastown West Drain
Mernda	Everard Rd Drain	Epping & Wollert	Vearings Rd Drain
Doreen	Furlong Dr Drain	Mill Park	Peter Hopper Lake
Whittlesea	Haleys Drain	Bundoora	Botanica Park Lake
Mill Park & South Morang	Heaths Court Drain (tributary that runs into Plenty River)	Wollert	Lehmanns Rd Drain
Epping & South Morang	Hendersons Rd Drain	Epping & Mill Park	McDonalds Rd Drain
Bundoora	Janefield Drain	Lalor	Lalor Drain
Epping & Wollert	Yale Dr Drain	Doreen	Laurimar Drain
Thomastown	Keon Park Drain	Bundoora	Kerri St Drain

Table 54 - Key flow paths designs and drains within or boarding the City of Whittlesea

Local roads at risk of flooding or water over road

The City of Whittlesea has identified the following locations at risk of water over road or potential flooding based on previous incidents. Please note: roads will be closed only as needed.

Suburb	Road	Water Source	Controls: in place OR required during incident	Section or Detail
Beveridge	Beveridge Road	Overland flow to Merri Creek	Signage	Between Merri Creek & Melbourne to Sydney train line
Bundoora	Tasman Drive	Darebin Creek	Signage	North side of Metropolitan Ring Road
Doreen	Arthurs Creek Road	Plenty River	Signage with road closure at ? depth	Between Plenty River and Old Plenty Road
Doreen	Painted Hills Drive & Shorthorn Crescent	Laurimar Creek Reserve	Signage	Painted Hills Drive Between Overland Drive and Roaming Rd
Epping	Koukoura Drive	Stormwater, flooding due to undeveloped land	Signage	Opposite No. 47
South Morang	Harmony Drive	Gross pollutant traps drains to Hendersons Creek	Signage	Between No. 15 and 36
South Morang	Hawkstowe Parade	Low lying Road, Wilton Vale wetland	Signage	Between Serendip Avenue and Conelly Way
Whittlesea	Cades Road	Overland flooding, Plenty River	Signage & Road Closure	Between Plenty River and Clearwater Channel; on corner of Cades Road & Dunnetts Road
Whittlesea	Dunnetts Road	Overland flooding, Plenty River	Signage & Road Closure	Between Cades Rd and Clearwater Channel
Whittlesea	Wallan Road			
Whittlesea	Grants Road	Overland Flooding	Signage	Drains quickly – near Plenty Road intersections Corner of Plenty Road and Grants Road
Whittlesea	Ridge Road			
Wollert	Wildwood Road	Overland Flooding Plenty River	Signage & Road Closure	Lachlan Lane after Plenty River crossing Between Plenty River and Cades Lane
Wollert	Summerhill Road	Overland Flooding, Tributaries of Findon Creek, Curly Sedge Creek	Signage	Between Bodycoats Rd and 270 Summerhill Road and Around 430 Summerhill Road
Wollert	Epping Road	Findon Creek	Signage	Vicinity of 565 Epping

Suburb	Road	Water Source	Controls: in place OR required during incident	Section or Detail
		East Branch		Road
Woodstock	Masons Road	Overland Flooding	Signage & Road Closure	Between Epping Road 75 Masons Road
Woodstock	Donnybrook Road	Overland Flooding	Signage	Between Merriang Road and Barbers Creek
Woodstock	Selkirk Road	Tributary of Barbers Creek West Branch	Signage & Road Closure	185 Selkirk Road, 265 Selkirk Road (signage)
Yan Yean	Reservoir Road	Overflowing of Plenty River	Signage & Road Closure	Between Recreation Road & Old Plenty Road
Yan Yean	Recreation Road			
Whittlesea	Yea Road	Overflow of Scrubby Creek	Signage	Outside Whittlesea Showgrounds

Table 55 – Locations within the City of Whittlesea at risk of water over road or potential flooding based on previous incidents.

**Whittlesea Municipal Storm and
Flood Emergencies Sub-Plan
2023-2026**



**Whittlesea
MEMPC**