Wyndham City

Storm and Flood Emergency Plan

A Sub-Plan of the Municipal Emergency Management Plan

For Wyndham City Council
And
VICSES Units Wyndham and Wyndham West

Draft Version 4.1
Reviewed March 2023

wyndhamcity

VICTORIA State Government

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Distribution List

Copy No.	Issue To: Position	Organisation	Date
1	Group Manager	Ambulance Victoria	
2	MERC	Victoria Police – Werribee Station	
3	Operations Manager	CFA District Office	
4	Council Office Copy	Wyndham City Council	
5	Emergency Management Coordinator	Department of Families, Fairness and Housing	
6	MEMO	Wyndham City Council	
7	Team Leader Hydrology & Flood Warnings	Melbourne Water	
8	MEMP Committee Chairperson	MEMP Committee Chairperson	
9	MEMP Committee Executive Officer	Wyndham City Council	
10	Deputy MEMO	Wyndham City Council	
11	MRM	Wyndham City Council	
12	Western Zone	FRV	
13	RERC	Victoria Police Werribee/ Wyndham North	
14		Southern Rural Water	
15	Team Leader	Department of Transport	
16	Operations Officer Emergency Management	VICSES Central Region	
17	Controller	VICSES Wyndham & Wyndham West Unit	

The plan was made available on Govdex. The organisations listed above, having access to Govdex were made aware of the posting.

Document Transmittal Form / Amendment Certificate

This Municipal Storm and Flood Emergency Plan (MSFEP) will be amended, maintained and distributed as required by VICSES in consultation with the Wyndham City MEMPC

Suggestions for amendments to this Plan should be forwarded to:

VICSES Western Region,
239 Proximity Drive
Sunshine West VIC 3020

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

Amendment Number	Date of Amendment	Amendment Entered By	Summary of Amendment
Issue date of Flood Emergency Plan Version 1.0 – 13 June 2013			
1	31/07/2015	Ross Butler, VICSES	Appendix A & B Updated
2	10/08/2015	Geb Abbott, VICSES	Parts 1 – 4, Updated with Storm Annex proposed
3	Sept 2018	Ross Butler and Jodie Griffin	Update of Appendix A, B, C, F & G, Update legislative references, acronyms, inclusion of operational information
4	May 2022	Ross Butler, VICSES	Application of new template. Updated parts of the body as well as Appendices A, B, C, F and G based on new data made available since previous version. Changes and edits to accommodate the *Emergency Management Legislation Amendment Act 2018* (EMLA Act) that amended the *Emergency Management Act 2013* (EM Act 2013).
4.1	March 2023	Ross Butler, VICSES	Update of Agency references, historical storm details and Flood Class Levels for the Cottrell Street gauge

This Plan will be maintained on the SES and Wyndham City Council websites.
https://www.ses.vic.gov.au/plan-and-stay-safe/flood-guides/wyndham-city-council and
wyndham.vic.gov.au

List of Abbreviations & Acronyms

The following abbreviations and acronyms are used in the Plan:

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

Glossary

Below are terms defined for the purpose of this plan:

Term	Definition
Annual Recurrence Interval (ARI)	The average, or expected, value of the period between exceedances of a given rainfall or flow total accumulated over a given duration.
Annual Exceedance Probability (AEP)	The probability that a given total rainfall or flow is accumulated over a given duration will be exceeded in any one year.
Flash flooding	Sudden unexpected flooding caused by local heavy rainfall or rainfall in another area. Often defined as flooding which occurs within six hours of the rain which causes flooding.
Flood mapping	The process where the extent of flooding is documented in mapping software based on flood studies and surface elevations.
Floodplain	Area of land adjacent to a creek, river, estuary, lake, dam or artificial channel, which is subject to inundation.
Hot spot	A known flood problem area which has a history of repeat flooding of a road, crossing or property, often highlighted through anecdotal information and customer complaints. It is a localised issue which will vary from council to council.
Natural drainage system	Flow paths which are largely undeveloped by human sources, these include rivers, streams, natural depressions and wetlands. All-natural systems greater than 60 ha are managed by Melbourne Water.
Overland flooding	Flooding by local runoff caused by heavier than usual rainfall. Overland flooding can be caused by local flow exceeding the capacity of an urban stormwater drainage system or by the backwater effects of mainstream flooding causing urban stormwater drainage system to overflow. For local government areas this is over the 5-year ARI in residential or over 10yr ARI in commercial/industrial. For Melbourne Water catchment areas this is for all other ARIs up to the 100yr ARI.
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 which is not absorbed into the ground has been taken into account.

Part 1. INTRODUCTION

1.1 Municipal Endorsement

This Municipal Storm and Flood Emergency Plan (MSFEP) has been prepared by the Municipal Flood Planning Committee (MFPC) and with the authority of the Municipal Emergency Management Planning Committee (MEMPC), pursuant to Section 20 of the Emergency Management Act 1986.

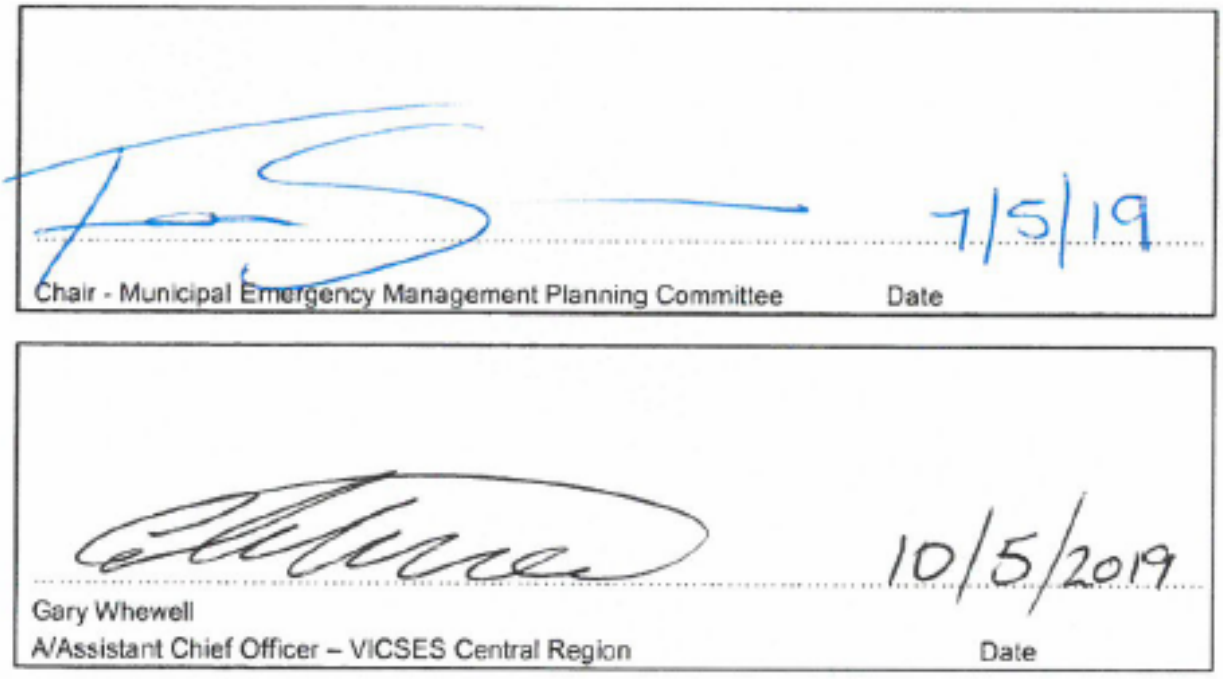
This MSFEP is a sub plan to the Wyndham City MEMP, is consistent with the Emergency Management Manual Victoria (EMMV), the Victoria Flood Management Strategy, VICSES Central Region Flood Emergency Plan, State Storm Emergency Plan and the State Flood Emergency Plan, , and takes into account the outcomes of the Community Emergency Risk Assessment (CERA) process undertaken by the MEMPC.

This Municipal Storm and Flood Emergency Plan is a result of the cooperative efforts of the Wyndham City MSFPC and its member agencies.

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

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

Endorsement



1.2 Purpose and Scope of this Storm and Flood Emergency Plan

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

As such, the scope of the Plan is to:

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

1.3 Municipal Storm and Flood Planning Committee (MSFPC)

Membership of the Wyndham City MSFPC will comprise of the following representatives from the following agencies and organisations:

- VICSES – Operations Officer (Chair)
- VICSES – Unit Controller or representative, Wyndham Unit
- Wyndham City Council representatives
- Victoria Police (ie Municipal Emergency Response Coordinator) (MERC)
- Melbourne Water as required,
- Southern Rural Water as required,
- Department of Health & Human Services (DHHS) as required,
- Country Fire Authority (Operations Officer)
- Metropolitan Fire Brigade (Commander)
- Representatives from other agencies as required.

1.4 Responsibility for Planning, Review & Maintenance of this Plan

This MSFEP must be maintained in order to remain effective.

VICSES, through the MSFEPC has responsibility for preparing, reviewing, maintaining and distributing this plan.

The plans should be reviewed:

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

Part 2. BEFORE: PREVENTION / PREPAREDNESS ARRANGEMENTS

2.1 Community Awareness for all Types of Storms and Flooding

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

VICSES with the support of Wyndham City and Melbourne Water will coordinate community education programs for storm and flooding within the municipality (i.e. Local Flood Guides and public events).

2.2 Structural Flood Mitigation Measures

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

2.3 Non-structural Flood Mitigation Measures

2.3.1 Exercising the Plan

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

2.3.2 Storm and Flood Warning

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

2.3.1 Local Knowledge

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

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

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

Part 3. DURING: RESPONSE ARRANGEMENTS

3.1 Introduction

3.1.1 Activation of Response

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

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

3.1.2 Responsibilities

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

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

3.1.3 Municipal Emergency Coordination Centre (MECC)

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

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

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

3.1.4 Escalation

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

Resourcing and event escalation arrangements are described in the SEMP.

3.2 State Emergency Management Priorities

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

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

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

3.3 The Six C's

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

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

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

3.3.1 Control

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

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

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

3.3.2 Incident Controller (IC)

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

3.3.3 Incident Control Centre (ICC)

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

Pre-determined Incident Control Centre locations are

Location	ICC Location	Facility owner
Sunshine	239 Proximity Drive, Sunshine West 3020	VICSES
Ferntree Gully	Unit 27 / 69 Acacia Road, Ferntree Gully 3156	CFA
Dandenong	45 Assembly Drive, Dandenong South 3175	CFA

3.3.4 Divisions and Sectors

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

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

Pre-determined Divisional Command locations are:

- Wyndham West Unit LHQ, 418 Ballan Road, Wyndham Vale
- Brimbank Unit LHQ, Stadium Drive, Keilor Park
- Essendon Unit LHQ, Bruce Street Essendon

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

3.3.5 Incident Management Team (IMT)

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

3.3.6 Incident Emergency Management Team (IEMT)

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

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

Refer to the SEMP for guidance on IEMTs.

3.3.7 On Receipt of a Flood Watch / Severe Weather Warning

The VICSES RDO (until an incident controller is appointed) will undertake actions as defined within the Flood Intelligence Cards (**Appendix C**).

General considerations by the Incident Controller/VICSES RDO will be as follows:

- Review storm and flood intelligence to assess likely storm and flood consequences including:
    - Melton Reservoir storage percentage is noted (Southern Rural Water Duty Officer) http://www.srw.com.au/SRW_Storage/DamChart.aspx?dam=Melton+Reservoir)
    - Melbourne Water rainfall and river monitoring (http://www.melbournewater.com.au/content/rivers_and_creeks/rainfall_and_river_level_data/subcatchment.asp?SubCatchmentID=22)
- Monitor weather and flood information – www.bom.gov.au
- Assess Command and Control requirements.
- Review local resources and consider needs for further resources regarding personnel, property protection, storm/flood rescue and air support
- Notify and brief appropriate officers. This includes RCC (if established), SCC (if established), Council (as outlined in the Wyndham Council MEMP) and other emergency services through the IEMT.
- Assess ICC readiness (including staffing of IMT and IEMT) and open if required
- Ensure flood bulletins and community information is prepared and issued to the community
- Monitor watercourses and undertake reconnaissance of low-lying areas

- Develop media and community information management strategy
- Ensure storm and flood mitigation works are being checked by owners
- Develop and issue incident action plan, if required
- Develop and issue situation report, if required

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

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

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

3.4 Community Information and Warnings

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

Community information and warnings communication methods available include:

- Emergency Alert;
- Phone messages (including SMS);
- Radio and Television;
- Two-way radio;
- Mobile and fixed public address systems;
- Sirens;
- Verbal Messages (i.e. Doorknocking);
- Agency Websites including the VicEmergency website
- VicEmergency Hotline;
- Variable Message Signs (i.e. road signs);
- Community meetings;
- Newspapers;
- Email;
- Telephone trees;
- Community Flood Wardens;
- Fax Stream;
- Newsletters;
- Letter drops; and
- Social media and/or social networking sites (i.e. Twitter and/or Facebook).

Appendix C and **E** provide further details on how community information and warnings are provided.

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

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

Other agencies such as CFA, DELWP and VICPOL may be requested to assist VICSES with the communication of community storm and/or flood warnings.

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

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

3.5 Media Communication

The IC through the Public Information Unit established at the ICC will manage Media communication. If the ICC is not established, the VICSES RDO will manage all media communication. Wyndham Council will work with the IC/VICSES RDO to assist with the

dissemination of public messaging and/or warnings to ensure that consistent and timely messaging occurs.

3.6 Impact assessment (IA)

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

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

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

3.7 Preliminary Deployments

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

3.8 Response to Flash Flooding

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

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

1. Determine if there are barriers to evacuation by considering warning time, safe routes, and resources available and ;

2. Should evacuation be the adopted strategy it must be supported by a public information capability and a rescue contingency plan;

3. Where it is likely people will become trapped by floodwaters, safety advice needs to be provided to people at risk, advising them not to attempt to flee by entering floodwater if they become trapped, and that it may be safer to seek the highest point within the building and to telephone 000 if they require rescue;

4. For buildings known to be structurally un-suitable, an earlier evacuation trigger will need to be established (return to step 1 of this cycle);and

5. If an earlier evacuation is not possible then specific preparations must be made to rescue occupants trapped in structurally unsuitable buildings either pre-emptively or as those people call for help.

6. Contact the MERC and Wyndham MEMO at the earliest opportunity to allow relief preparation to commence.

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

Response arrangements for flash flood events may be contained in **Appendix C.** Refer to the Vic Roads Website for road closures (see http://alerts.vicroads.vic.gov.au).

3.9 Evacuation

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

The decision to recommend or warn people to evacuate, or to evacuate immediately rests with the IC, and where possible the IEMT. It is the choice of individuals as to how they respond to that recommendation.

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

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

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

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

There are currently no detailed evacuation arrangements for the Wyndham municipality. Detail will be populated into **Appendix D** of this plan if determined to be required.

3.10 Flood Rescue

VicPol as the designated control agency for water rescue coordinates rescues undertaken during flood events.

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

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

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

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

3.11 Aircraft Management

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

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

Suitable airbase facilities are located at:

- Essendon
- Moorabbin

3.12 Resupply

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

When predictions/intelligence indicates 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, VICSES can assist with the transport of essential items to isolated communities and assisting with logistics functions.

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

3.13 Essential Infrastructure and Property Protection

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

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

Wyndham City keeps a limited stock of sandbags to protect assets which are the responsibility of Council. Council does not hold sandbags sufficient for the protection of private property.

The IC will determine the priorities related 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. If time permits, requests for supplementary supply should be carried out in line with the Wyndham MEMP.

Property may be protected by:

- Sandbagging to minimise entry of water into buildings
- Encouraging businesses and households to lift or move contents
- Construction of temporary levees in consultation with the Melbourne Water, Southern Rural Water, Wyndham Council and VicPol and within appropriate approved frameworks.

Refer to **Appendix C** for further specific details of essential infrastructure requiring protection.

3.14 Disruption to Services

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

3.15 Levee Management

Levee owners/operators are responsible for the maintenance, operation and monitoring of their levees. Levee owners/operators must keep the IC informed of levee status and be prepared to provide expert advice to the IC about the design and construction of their levees. In accordance with the strategic emergency management priorities, the IC may assist levee owners to coordinate resources, both technical and physical, to provide advice and affect temporary repairs to or augmentation of levees.

3.16 Road Closures

Wyndham Council, VicPol and the Department of Transport (DoT) will carry out their formal functions of road closures. This includes the observation and placement of warning signs, road blocks to its designated local and regional roads, bridges, walking and bike trails. VicPol may liaise with and advise Wyndham Council staff and DoT of the need to erect warning signs and / or closure of roads and bridges. VicRoads are responsible for designated main roads and highways and Councils are responsible for the designated local and regional road network.

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

3.17 Dam Spilling / Failure

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

Major dams with potential to cause structural and community damage within the Municipality are contained in **Appendix A**. Further information for Dams can be sourced through DELWP and Melbourne Water

3.18 Waste Water related Public Health Issues and Critical Sewerage Assets

Inundation of critical sewerage assets and sewerage pump stations may result in water quality problems. Where this is likely to or has occurred, the responsible agency for the critical sewerage asset, City West Water/Melbourne Water should undertake the following:

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

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

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

3.19 Access to Technical Specialists

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

3.20 After Action Review

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

All agencies involved in the storm/flood incident should be represented at the After-Action Review.

Part 4. AFTER: EMERGENCY RELIEF AND RECOVERY ARRANGEMENTS

4.1 General

Arrangements for emergency relief and recovery from a storm/flood incident within the City of Wyndham are detailed in the Wyndham MEMP.

4.2 Emergency Relief

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

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

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

Suitable emergency relief/recovery facilities identified for use during floods are detailed in **Appendix D** and the Wyndham MEMP. The MRM will facilitate access to emergency relief facilities as required. The MERO will facilitate access to staging areas as required.

4.3 Animal Welfare

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

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

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

4.4 Transition from Response to Recovery

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

APPENDIX A - FLOOD THREATS FOR WYNDHAM CITY

General

Wyndham is located on the western plains of Melbourne and borders Port Phillip Bay to the south. Adjoining municipalities include Melton and Brimbank to the north, Hobsons Bay to the east and Moorabool and Greater Geelong to the west. With a catchment area of approximately 1,474 km2 the Werribee River is by far the largest river that passes through the Municipality. Other significant watercourses include the Little River, Lollypop Creek, Skeleton Creek, Dry Creek, Davis Creek, Laverton Creek, Cherry Creek and Kororoit Creek. Major drains include the Werribee West Floodway, D1 Drain, Hoppers Crossing Drain, Sayers Drain, Forsyth Drain and Kayes Drain. Flooding is a common event along these waterways particularly in the lower reaches where gradients are relatively flat which makes it difficult for flows to be drained efficiently.

Terrain across the Municipality is relatively flat which makes it difficult to drain floodwaters and localised flooding is therefore a common occurrence within the municipality. The flat terrain is associated with the Werribee delta and volcanic plains.

Description of Major Waterways and Drains

The main waterways in Wyndham are the Little River (the Municipality's western boundary), Lollypop Creek, Werribee River, Skeleton Creek Laverton Creek and Kororoit Creek (part of the municipality's eastern boundary). These waterways generally flow in a south-easterly direction through the municipality towards Port Phillip Bay. Other waterways include Dry Creek and Davis Creek. With a combined length of around 800 kilometres, waterways within the municipality play an important role in the landscape.

Little River has tributaries that originate in the Brisbane Ranges and You Yangs Regional Park, the river flows to Port Phillip Bay via the Western Treatment Plant.

Werribee River, which flows through the heart of Wyndham, has an extensive catchment (approximately 1,474 km2) which extends north to the Wombat State Forest and Lerderderg Gorge State Parks, with the river flowing through the Moorabool and Melton municipalities upstream. Melton Reservoir, situated on the Werribee River, is used to harvest and manage flows for irrigation supply purposes.

Skeleton Creek, with a catchment of 122 km2, is much smaller than the Werribee River catchment but is still considered to be significant. It flows from Mt Cottrell in the north to Port Phillip Bay at Cheetham Wetlands.

Lollypop Creek originates in the undulating plains of Mambourin and Wyndham Vale and flow south into the Western Treatment Plant. Little River forms the boundary of the Wyndham municipality to the west and has tributaries that originate in the Brisbane Ranges and You Yangs Regional Park; the river flows to Port Phillip Bay via the Western Treatment Plant.

Figure A1 – Wyndham Waterways (source: Werribee River Association)

Melbourne Water Drains & Waterways	Suburb/s	Melbourne Water Drains & Waterways	Suburb/s
145W Outlet Drainage Area	Cocoroc	Kayes Drain	Laverton North
15E Outlet Drainage Area	Cocoroc	Kororoit Creek (Lower)	Laverton North
Balliang Creek	Quandong	Laverton M.D.	Laverton, Laverton North & Truganina
Belfrages Swamp Dn (WTP Subdn)	Cocoroc	Leigh St Drain	Werribee
Bellbridge Dr Drain	Hoppers Crossing	Little River (Lower)	Little River
Black Forest Rd Drain	Werribee & Wyndham Vale	Lollypop Creek	Cocoroc, Quandong, Werribee & Wyndham Vale
Brooklyn M.D.	Laverton North	Marple Cres Drain	Hoppers Crossing
Bulban Rd Drain	Werribee	Pedder St Drain	Wyndham Vale
Campbells M.D.	Laverton North & Truganina	Point Cook Creek	Point Cook & Werribee South
Cheetham Creek	Point Cook	Riverside Ave Drain	Werribee
Cherry Creek	Cocoroc, Werribee	Ryans Swamp Dn (Wtp Subdrain)	Cocoroc & Little River
Cherrys M.D.	Laverton North	Sayers Drain	Hoppers Crossing & Tarneit
Cropleys Drain	Truganina	Shaws Rd Drain	Werribee
D1 Drain	Hoppers Crossing, Point Cook, Werribee & Werribee South	Skeleton Creek	Hoppers Crossing, Laverton, Point Cook, Tarneit, Truganina & Williams Landing
Davis Creek	Tarneit	Sneydes Rd Drain	Werribee
Dohertys Drain	Laverton, Laverton North & Truganina	South Saltworks Moat	Point Cook
Dry Creek	Mount Cottrell & Tarneit	Southern Drain	Werribee
Dunes Drain	Truganina	Tarneit Creek	Tarneit
Effluent Reuse	Cocoroc	Tarneit Rd Drain	Hoppers Crossing & Tarneit
Fairbairn Rd Drain	Laverton North	Tarneit Rise Drain	Tarneit
Forsyth Drain	Truganina	Thompsons Drain	Truganina
Forsyth Rd Drain	Point Cook, Truganina & Williams Landing	Werribee River (Lower)	Cocoroc, Eynesbury, Werribee & Wyndham Vale
Hooker Rd Drain	Werribee	Werribee West Drain	Werribee & Wyndham Vale
Hoppers Crossing Drain	Hoppers Crossing & Tarneit	Westleigh Drain	Werribee
Humes M.D.	Laverton North	WTP 25W Lagoon	Cocoroc
Imms Drain	Laverton North & Truganina	WTP 55E Lagoon	Cocoroc

Table A1 – Melbourne Water Drains and Waterways within Wyndham City

Historic Storms and Floods

Significant floods (with high flood gauge levels and likely flooding consequences to property and infrastructure) to have occurred within Wyndham City are as follows in the table below. Levels and rain totals in black indicate large-scale impacts to surrounding areas were recorded, whereas grey figures indicate localised impacts if any occurred. To view the locations of a selection of these severe weather events, see mapping in **Appendix F**.

Event	Little River at Little River 232200C		Werribee River d/s of Melton Reservoir 231205D		Werribee River at Werribee Diversion Weir 231204A		Werribee River at Cottrell St Ford, Werribee 231237A		Skeleton Creek at Hoppers Crossing 231110A	
	Flow at Gauge	River Level	Flow at Gauge	River Level	Flow at Gauge	River Level	Flow at Gauge	River Level	Flow at Gauge	Creek Level
Normal Flow and Levels	4 ML/d	0.05m	3 ML/d – 200 ML/d	0.0m - 0.05m	0 ML/d – 60 ML/d	-0.4m – 0.3m	7 ML/d	0.2m	3 ML/d	1.4m
Minor	-	-	4,000 ML/d	-	-	-	-	2.7m	-	-
Moderate	-	-	35,000 ML/d	-	-	-	-	4.5m	-	-
Major	-	-	50,000 ML/d	-	-	-	-	5.4m	-	-
5th December 1966	-	-	12,595 ML/d	3.01m	-	-	-	-	-	-
23rd September 1970	-	-	28,573 ML/d	4.99m	-	-	-	-	-	-
12th November 1970	-	-	7,985 ML/d	2.23m	-	-	-	-	-	-
31st January 1971	-	-	9,446 ML/d	2.48m	-	-	-	-	-	-
7th November 1971	-	-	30,095 ML/d	5.15m	-	-	-	-	-	-
6th February 1973	-	-	22,990 ML/d	4.39m	-	-	-	-	-	-
28th August 1973	-	-	7,048 ML/d	2.05m	-	-	-	-	-	-
16th May 1974	-	-	39,381 ML/d	6.39m	-	-	-	-	-	-
27th August 1974	-	-	9,149 ML/d	2.39m	-	-	-	-	-	-
29th August 1974	-	-	7,904 ML/d	2.19m	-	-	-	-	-	-
18th September 1975	16 ML/d	0.14m	7,574 ML/d	2.13m	-	-	-	-	-	-
31st October 1975	2,321 ML/d	1.87m	8,106 ML/d	2.22m	-	-	-	-	-	-
16th October 1976	12,365 ML/d	4.33m	10,665 ML/d	2.64m	-	-	-	-	-	-
30th June 1977	2,599 ML/d	1.98m	8,887 ML/d	2.35m	-	-	-	-	-	-
3rd July 1978	10,385 ML/d	3.95m	20,062 ML/d	4.25m	-	-	-	-	-	-
7th August 1978	3,884 ML/d	2.58m	23,206 ML/d	4.69m	-	-	-	-	-	-

Event	Little River at Little River 232200C		Werribee River d/s of Melton Reservoir 231205D		Werribee River at Werribee Diversion Weir 231204A		Werribee River at Cottrell St Ford, Werribee 231237A		Skeleton Creek at Hoppers Crossing 231110A	
	Flow at Gauge	River Level	Flow at Gauge	River Level	Flow at Gauge	River Level	Flow at Gauge	River Level	Flow at Gauge	Creek Level
19th November 1978	13,988 ML/d	4.80m	38,849 ML/d	6.35m	-	-	-	-	-	-
6th October 1979	190 ML/d	0.67m	8,005 ML/d	2.20m	-	-	-	-	-	-
16th October 1983	**21,906 ML/d**	**6.06m**	**70,293 ML/d**	**8.40m**	**65,000ML/d**	**2.60m**	-	-	4,297 ML/d	2.55m
24th October 1985	977 ML/d	1.37m	30,513 ML/d	5.56m	-	-	-	-	-	1.20m
10th December 1985	4,336 ML/d	2.71m	13,393 ML/d	3.09m	-	-	-	-	3,683 ML/d	2.44m
23rd October 1986	17 ML/d	0.16m	7,027 ML/d	2.04m	-	-	-	-	-	1.18m
5th January 1987	8 ML/d	0.10m	7,229 ML/d	2.07m	-	-	-	-	1,663 ML/d	2.01m
29th July 1987	2,254 ML/d	2.00m	13,454 ML/d	3.10m	-	-	-	-	4,069 ML/d	2.51m
2nd December 1987	10,004 ML/d	4.06m	36,937 ML/d	6.19m	-	-	-	-	2,207 ML/d	2.14m
11th February 1990	3 ML/d	0.05m	12,038 ML/d	2.86m	-	-	-	-	1 ML/d	1.18m
12th October 1990	1,560 ML/d	1.56m	17,832 ML/d	3.87m	-	-	-	-	14 ML/d	1.39m
25th September 1992	170 ML/d	0.64m	17,561 ML/d	3.83m	-	-	-	-	859 ML/d	2.23m
10th October 1992	360 ML/d	0.89m	8,170 ML/d	2.24m	-	-	-	-	151 ML/d	1.76m
15th September 1993	2,944 ML/d	2.27m	46,773 ML/d	6.98m	-	-	-	-	1,939 ML/d	2.54m
20th September 1993	822 ML/d	1.27m	16,557 ML/d	3.66m	-	-	-	-	66 ML/d	1.60m
23rd October 1995	3,723 ML/d	2.53m	26,638 ML/d	5.14m	-	-	-	-	1,343 ML/d	2.39m
6th November 1995	14,112 ML/d	4.82m	61,340 ML/d	7.90m	-	-	-	-	1,240 ML/d	2.36m
1st October 1996	15 ML/d	0.14m	7,737 ML/d	2.17m	-	-	-	-	7 ML/d	1.31m
24th October 2000	3,373 ML/d	2.42m	24,053 ML/d	4.82m	18,059 ML/d	1.45m	-	-	14 ML/d	1.39m
3rd February 2005	17,061 ML/d	5.32m	13,478 ML/d	3.10m	16,738 ML/d	1.40m	-	-	**11,109 ML/d**	**3.47m**
28th November 2010	1,647 ML/d	1.71m	19,677 ML/d	3.54m	21,964 ML/d	1.57m	21,331 ML/d	4.65m	3,124 ML/d	2.75m
14th January 2011	5,704 ML/d	3.03m	36,660 ML/d	5.24m	41,466 ML/d	2.06m	**41,904 ML/d**	**5.87m**	3,058 ML/d	2.74m
5th February 2011	20,024 ML/d	5.41m	10,735 ML/d	2.43m	13,472 ML/d	1.29m	13,286 ML/d	4.05m	8,539 ML/d	3.30m
18th August 2012	948 ML/d	1.32m	7,175 ML/d	1.92m	10,364 ML/d	1.10m	9,466 ML/d	3.63m	4,224 ML/d	2.90m
15th September 2016	121 ML/d	0.55m	5,614 ML/d	1.69m	5,786 ML/d	0.87m	5,269 ML/d	2.91m	301 ML/d	2.03m
3rd October 2016	4 ML/d	0.15m	9,596 ML/d	2.27m	10,406 ML/d	1.10m	9,787 ML/d	3.67m	50 ML/d	1.70m
29th December 2016	1 ML/d	0.12m	153 ML/d	0.39m	-	0.35m	122 ML/d	0.44m	832 ML/d	2.26m

Event	Little River at Little River 232200C		Werribee River d/s of Melton Reservoir 231205D		Werribee River at Werribee Diversion Weir 231204A		Werribee River at Cottrell St Ford, Werribee 231237A		Skeleton Creek at Hoppers Crossing 231110A	
	Flow at Gauge	River Level	Flow at Gauge	River Level	Flow at Gauge	River Level	Flow at Gauge	River Level	Flow at Gauge	Creek Level
09th April 2017	1,293 ML/d	1.53m	23 ML/d	0.14m	2,099 ML/d	0.61m	1,656 ML/d	1.58m	1,768 ML/d	2.67m
11th June 2021	1 ML/d	0.13m	5,655 ML/d	1.70m	5,367 ML/d	0.84m	4,644 ML/d	2.73m	111 ML/d	1.80m
13th November 2021	68 ML/d	0.48m	7,713 ML/d	1.99m	8,947 ML/d	1.03m	7,997 ML/d	3.43m	374 ML/d	2.04m
29th September 2022	4 ML/d	0.15m	11, 861 ML/d	2.45m	11,051 ML/d	1.13m	10,839 ML/d	3.72m	10 ML/d	1.52m
8th October 2022	69 ML/d	0.49m	7,729 ML/d	1.90m	8,641 ML/d	1.02m	8,087 ML/d	3.42m	1000 ML/d	2.32m
14th October 2022	2,548 ML/d	2.08m	27,454 ML/d	4.29m	29,104 ML/d	1.76m	30,821 ML/d	5.23m	1,122 ML/d	2.36m
14th November 2022	3,165 ML/d	2.31m	9,241 ML/d	2.10m	10,856 ML/d	1.12m	10,342 ML/d	3.67m	4,008 ML/d	2.87m

Table A2 – Historical Flood Events along the Little & Werribee Rivers and Skeleton Creek

In February 1973, flows originating in the Lollypop Creek Catchment caused overtopping of the Melbourne/Geelong Railway resulting in closure for two days for repairs, closure of the Princes Freeway for several hours, and extensive flooding of rural land (MMBW, 1989).

The October 1983 floods were the result of breakouts from the Werribee River flowing into Lollypop Creek. The Melbourne/Geelong Railway line was closed for repairs, the Princes Freeway was closed due to water depths of up to 300mm at the flood peak and major damage occurred to the Main Western Sewerage Carrier (MMBW, 1989).

In February 2005, local flooding occurred across Wyndham as a result of a local intense rain event. The Werribee River was not significantly affected; however Lollypop and Skeleton Creeks and the D1 Drain were severely affected. The Melbourne-Geelong Freeway was inundated at Lollypop Creek and at Skeleton Creek. All arterial roads into and out of Wyndham were inundated. The municipality was road-isolated for several hours. Many roads within the municipality were inundated, but local traffic diversions allowed transport within the municipality. Although some property damage occurred, there was no loss of life.

Figure A2 – February 2005 Event, Lollypop Creek, Wyndham Vale

Lollypop Creek & Werribee West Drain, Wyndham Vale

Melway Reference 205 C8 (Looking Southwest)

Figure A3 – February 2005 Event, Lollypop Creek & Werribee West Drain, Wyndham Vale

In February 2011, there were severe floods throughout Victoria, including within Wyndham. There were instances of flooding into buildings as roofs and gutters failed and several homes evacuated. There was crop damage in the Werribee South market garden area. There were roads flooded for a period as the drains reached capacity. There were no instances of property flooding from rising water courses. There was no loss of life. The intensity of the rain is thought to have been greater than 100-year ARI.

Dam Spilling / Failure

Flooding resulting from failure of the following dams is likely to cause significant structural and community damage within Wyndham City. See Dam Failure in Section 3 of this plan for more information. Note that if the storage capacity is reached and water flows over the spillway, this is not to be referred to as a flow release or a storage breach or failure. To view the current storage level of any of the reservoirs in the table below, see Southern Rural Water's website www.srw.com.au

Melbourne Water Dam	Location	Owner	Dam Capacity	Full Supply Level	Melway Reference
Melton Reservoir	Exford (Mel Ref 342B6)	SRW	14,360 ML	82.56m AHD	342 H2
Merrimu Reservoir	Coimadai (Mel Ref 329A5)	SRW	32,215 ML	174.1m AHD	329 A6
Pykes Creek Reservoir	Myrniong	SRW	22,119 ML	396.57m AHD	Vicmap 6525 B1

Table A3 – Large Dams around Greater Melbourne with flooding consequence risks within Wyndham City

Service Reservoirs located within the Municipality are listed below.

Melbourne Water Service Reservoir	Location	Owner	Material	Reservoir Capacity	Melway Reference
Cowies Hill Steel Tank No.1	City West Water on Tarneit Road, Tarneit	Melbourne Water	Steel	27.6 ML	202 A3
Cowies Hill Steel Tank No.2	City West Water on Tarneit Road, Tarneit	Melbourne Water	Steel	27.6 ML	202 A3

Table A4 – Service Reservoirs within Wyndham City

APPENDIX B - TYPICAL FLOOD PEAK TRAVEL TIMES

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

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

Typical Travel Times

Location From (gauge)	Location To (gauge)	Typical Travel Time	Comments
WERRIBEE RIVER			
d/s Melton Reservoir	Werribee Diversion Weir	Between 5 to 10 hours	Minor Flood at d/s Melton Reservoir
	Cottrell Street Ford	Between 5 to 12 hours	
d/s Melton Reservoir	Werribee Diversion Weir	Between 4 to 8 hours	Moderate Flood at d/s Melton Reservoir
	Cottrell Street Ford	Between 5 to 8 hours	
LITTLE RIVER			
Balliang	Little River	Around 8 hours	

Table B1 – Typical Flood Travel Times between gauges on the Werribee and Little Rivers

Historical Travel Times

Flood Event	Location From (gauge)	Location To (gauge)	Flood Peak Travel Time	Flood Class at
WERRIBEE RIVER				**d/s Melton Reservoir**
24th October 2000	d/s Melton Reservoir	Werribee Diversion Weir	7 hours	Minor
3rd February 2005	d/s Melton Reservoir	Werribee Diversion Weir	9 hours	Minor
28th November 2010	d/s Melton Reservoir	Werribee Diversion Weir	6 hours	Minor
		Cottrell Street Ford	6 hours	
14th January 2011	d/s Melton Reservoir	Werribee Diversion Weir	4 hours	Moderate
		Cottrell Street Ford	5 hours	
5th February 2011	d/s Melton Reservoir	Werribee Diversion Weir	7 hours	Minor
		Cottrell Street Ford	7 hours	
18th August 2012	d/s Melton Reservoir	Werribee Diversion Weir	5 hours	Minor
		Cottrell Street Ford	5 hours	
15th September 2016	d/s Melton Reservoir	Werribee Diversion Weir	10 hours	Minor
		Cottrell Street Ford	12 hours	
3rd October 2016	d/s Melton Reservoir	Werribee Diversion Weir	8 hours	Moderate
		Cottrell Street Ford	8 hours	
11th June 2021	d/s Melton Reservoir	Werribee Diversion Weir	12 hours	Minor
		Cottrell Street Ford	13 hours	
13th November 2021	d/s Melton Reservoir	Werribee Diversion Weir	8 hours	Minor
		Cottrell Street Ford	9 hours	
29th September 2022	d/s Melton Reservoir	Werribee Diversion Weir	9 hours	Minor

Flood Event	Location From (gauge)	Location To (gauge)	Flood Peak Travel Time	Flood Class at
		Cottrell Street Ford	10 hours	
8th October 2022	d/s Melton Reservoir	Werribee Diversion Weir	8 hours	Minor
		Cottrell Street Ford	10 hours	
14th October 2022	d/s Melton Reservoir	Werribee Diversion Weir	6 hours	Moderate
		Cottrell Street Ford	7 hours	
14th November 2022	d/s Melton Reservoir	Werribee Diversion Weir	7 hours	Minor
		Cottrell Street Ford	8 hours	
LITTLE RIVER				**N/A**
14th January 2011	Balliang	Little River	8 hours	-
5th February 2011	Balliang	Little River	8 hours	-

Table B2 – Historical Flood Travel Times between gauges on the Werribee and Little Rivers

APPENDIX C1 – WERRIBEE RIVER, WERRIBEE WEST FLOODWAY & LOWER REACHES OF LOLLYPOP CREEK FLOOD EMERGENCY PLAN

Overview of Flood Consequences

Werribee & Wyndham Vale are located approximately 30km south west of Melbourne in an area of mixed established residential and light industrial in Werribee and new residential estates in Wyndham Vale.

The Werribee West Flood Mitigation Scheme of the 1980s included a Werribee River flood breakaway via Presidents Park along the Werribee West Floodway into Lollypop Creek and the Black Swamp. Appendix C1 scenario is about this scenario. Lollypop Creek flooding may occur from local rain but this is covered in Appendix C2.

Flooding consequences along the Werribee River & Werribee West Drain may include:

- The **Geelong – Melbourne Railway Line** flooding east of Lollypop Creek crossing in Werribee during a **Major** Flood Event (50,000ML/d) on the Melton Reservoir Tail Gauge.
- The **Princes Freeway**, Werribee flooding requiring part or full closure between Lollypop Creek and Geelong Road (Princes Hwy) exit during a Major Flood Event (50,000ML/d) at Melton Reservoir Tail Gauge.
- **Local Roads** closed including Bulban Road, Cottrell Street & Black Forest Road during various flood events.
- **Properties** along the West Side of Werribee River, around Gutra Court, Wattamolla Avenue, Riverview Drive & Mambourin Street, Werribee affected during a **Major** Flood Event (50,000ML/d) on the Melton Reservoir Tail Gauge.
- **Shops** along Watton Street in Werribee experiencing flooding to basements / low floors during a **Major** Flood Event (50,000ML/d) on the Melton Reservoir Tail Gauge.

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

Summary of Consequences in a 1% AEP (100yr ARI) flood along the Werribee River and lower Lollypop Creek

Property		
Properties	**132**	
Residential	57	
Commercial	45	
Industrial	0	
Public Land	5	
Rural	25	
Community Infrastructure		

Essential Infrastructure					
Major Roads	1	Princes Fwy between Lollypop Creek and Princes Hwy exit			
Major Rail	1	Geelong – Melbourne Railway VLine			
Bus Routes	2	166; 192			
Levees	3	Werribee River between Riverside Drive and Cottrell Street			
Drainage Facilities	1	Diversion Weir at Presidents Park			
Tourism / Recreation					
Sports Facilities	2	Werribee Golf Course; Wyndham Vale South Reserve			
Recreation Facilities	3	Presidents Park; Werribee River Trail; Werribee Zoo			
Government Boundaries					
Local Gov't Areas	1	Wyndham	CMA	1	Port Phillip & Westernport
Adjacent LGAs	1	Melton	CFA District	1	District 14
SES Unit Area	2	Wyndham & Wyndham West	FRV District	0	

Table C1.1 – Consequence Summary of 1% AEP flood along the Werribee River and lower Lollypop Creek

Gauges and Warnings

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

Gauge	River Flood Class Level		
	Minor	Moderate	Major
Werribee River downstream of Melton Reservoir	1.5m 4,000 ML/d	5.1m 35,000 ML/d	6.4m 50,000 ML/d
Werribee River at Cottrell Street Ford, Werribee	2.7m	4.5m	5.4m

Table C1.2 – Gauges with established flood class levels used for Flood Warning within the Werribee River catchment

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

The Bureau does not issue formal flood warnings for Little River, Lollypop Creek or Skeleton Creek. However, warnings for the region can be monitored on the Bureau's website above. While Wyndham Council monitors these warnings in times of high rainfall, there are no specific guidelines to advise how these situations should be responded to.

Gauge	Station No.	Location	Owner	Stream Level & Flow Gauge	Rain Gauge	Melway Ref
Lollypop Creek at Bulban Road, Werribee	231245A	East bank of the creek on the northern side of Bulban Road, Werribee	Melbourne Water	✓		204 J12
Quandong	587030	The Werribee Gun Club, 1225 Ballan Road, 800m south of Ballan Road	Melbourne Water		✓	244 E
Toolern Creek at Melton South	231231A	East bank along dirt track between Bridge Road and Strathtulloh Circuit West	Melbourne Water	✓	✓	343 A9
Werribee River at Cottrell Street Ford, Werribee	231237A	West bank of the river, 50m north of Cottrell Street, Werribee	Melbourne Water	✓		205 J7
Werribee River downstream of Melton Reservoir	231205D	East bank, 300m from Exford Road	DELWP	✓		220 J2
Werribee River at Werribee Diversion Weir, Wyndham Vale	231204A	East side of the river at Riverbend Historical Park, 100m upstream of Diversion Weir, Werribee	DELWP	✓		205 F2

Table C1.3 – Gauges within the Werribee River catchment

These Gauges may provide some warning of expected flooding. See the Melbourne Water website for more information on these gauges: http://www.melbournewater.com.au/waterdata/rainfallandriverleveldata/Pages/Rainfall-and-river-level-new.aspx. The 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.

Area Map of Flood Risk within the Werribee River catchment

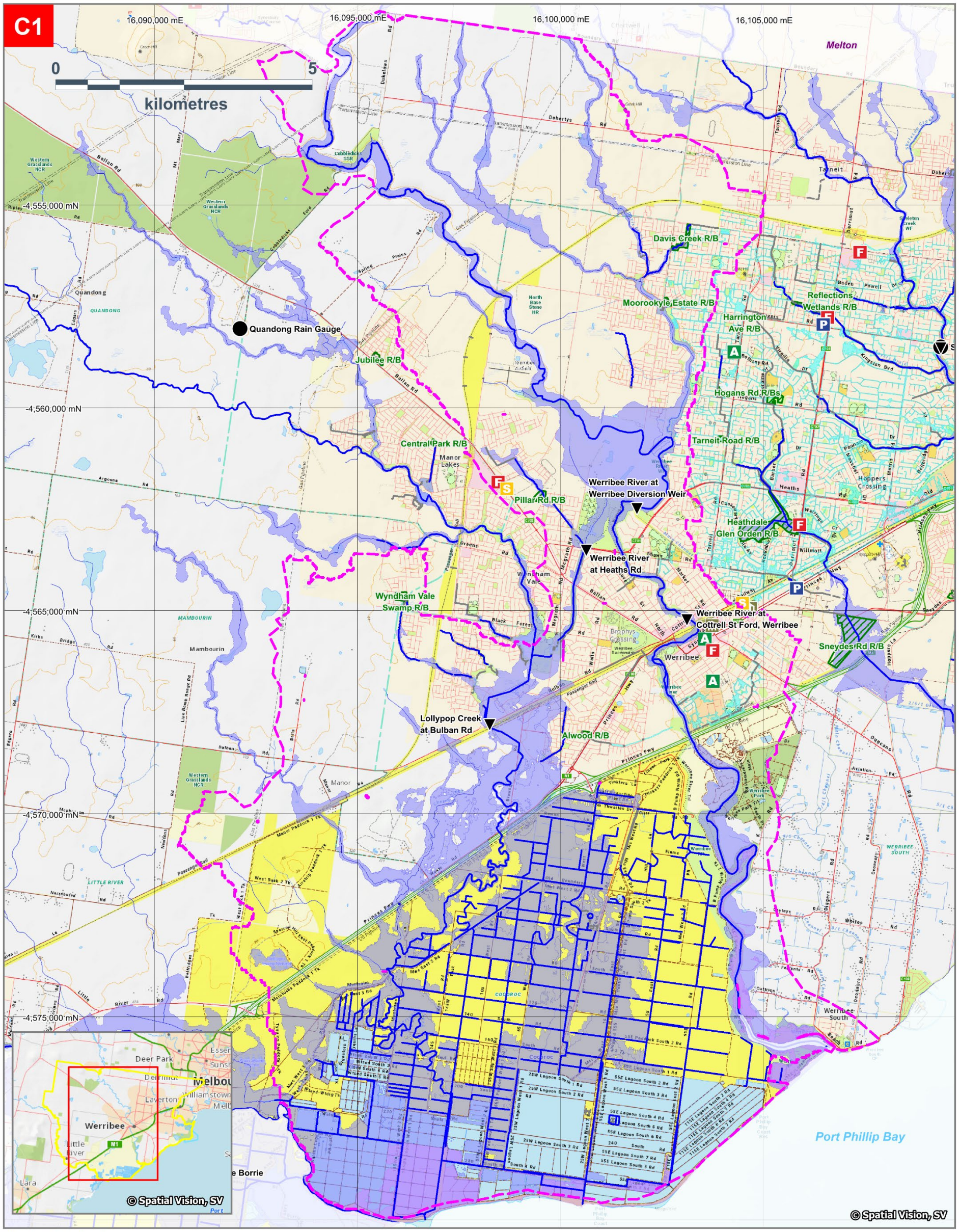


Figure C1 – Areas of flood risk along the Werribee River lower Lollypop Creek in Wyndham City and area covered by this appendix.

Properties at Flood Risk

Properties listed in the table below are at risk from flooding the Werribee River, Werribee West Drain and lower Lollypop Creek. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Werribee River (Eynesbury to Presidents Park) (Melbourne Water, January 2012), the Werribee River (Presidents Park to Werribee Township) (Melbourne Water, January 2016), the Werribee River (Township) (Melbourne Water, August 2017), the Werribee River (d/s Werribee Township) (Melbourne Water, April 2009), and the Lollypop Creek (Lower) (WTP Waterway Mapping, BMT WBM, June 2008) flood mapping and risk assessment programs.

CONFIDENTIALITY: This table contains sensitive information about the effects of flooding on private property. Specific reference to private addresses or business must be made directly to owners or other Emergency Services and NOT via broadcast or print media.

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

Properties at risk from Flooding the Werribee River, and Lower Lollypop Creek during a 1% AEP event

Residential	Commercial	Industrial	Rural	Public Use

Street No. at Risk	Street	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
5	Alaska Court	Werribee	Lollypop Creek (Lower)	Riverine
8	Alaska Court	Werribee	Lollypop Creek (Lower)	Riverine
2/160	Ballan Road	Werribee	Werribee West Drain	Riverine
162	Ballan Road	Werribee	Werribee West Drain	Riverine
208	Ballan Road	Wyndham Vale	Werribee West Drain	Riverine
9/210	Ballan Road	Wyndham Vale	Werribee West Drain	Riverine
10/210	Ballan Road	Wyndham Vale	Werribee West Drain	Riverine
11/210	Ballan Road	Wyndham Vale	Werribee West Drain	Riverine
13	Bonus Court	Werribee	Lollypop Creek (Lower)	Riverine
19	Bonus Court	Werribee	Lollypop Creek (Lower)	Riverine
25	Bonus Court	Werribee	Lollypop Creek (Lower)	Riverine
15	Browns Road	Werribee	Lollypop Creek (Lower)	Riverine
32	Browns Road	Werribee	Lollypop Creek (Lower)	Riverine
85	Browns Road	Werribee	Lollypop Creek (Lower)	Riverine
92	Browns Road	Werribee	Lollypop Creek (Lower)	Riverine
112	Browns Road	Werribee	Lollypop Creek (Lower)	Riverine
1	Buckingham Drive	Werribee	Werribee West Drain	Riverine
1/3	Buckingham Drive	Werribee	Werribee West Drain	Riverine
4	Buckingham Drive	Werribee	Werribee West Drain	Riverine
5	Buckingham Drive	Werribee	Werribee West Drain	Riverine
6	Buckingham Drive	Werribee	Werribee West Drain	Riverine
1/8	Buckingham Drive	Werribee	Werribee West Drain	Riverine
2/8	Buckingham Drive	Werribee	Werribee West Drain	Riverine
10	Buckingham Drive	Werribee	Werribee West Drain	Riverine
17	Buckingham Drive	Werribee	Werribee West Drain	Riverine
148	Bulban Road	Werribee	Lollypop Creek (Lower)	Riverine
150-168	Bulban Road	Werribee	Lollypop Creek (Lower)	Riverine

Properties at risk from Flooding the Werribee River, and Lower Lollypop Creek during a 1% AEP event				
Residential	Commercial	Industrial	Rural	Public Use

Street No. at Risk	Street	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
170-198	Bulban Road	Werribee	Lollypop Creek (Lower)	Riverine
270	Bulban Road	Werribee	Lollypop Creek (Lower)	Riverine
2	Coop Street	Werribee	Werribee River	Riverine
4	Coop Street	Werribee	Werribee River	Riverine
6	Coop Street	Werribee	Werribee River	Riverine
17	Cottrell Street	Werribee	Werribee River	Riverine
41	Cottrell Street	Werribee	Werribee River	Riverine
43	Cottrell Street	Werribee	Werribee River	Riverine
2	Davis Road	Tarneit	Werribee River	Riverine
12	Davis Road	Tarneit	Werribee River	Riverine
21	Davis Road	Tarneit	Werribee River	Riverine
22	Davis Road	Tarneit	Werribee River	Riverine
23	Davis Road	Tarneit	Werribee River	Riverine
50	Galvin Road	Werribee	Lollypop Creek (Lower)	Riverine
7	Gaudin Court	Werribee	Lollypop Creek (Lower)	Riverine
2	Gutra Court	Werribee	Werribee River	Riverine
720	Heaths Road	Wyndham Vale	Werribee River	Riverine
557	Hogans Road	Tarneit	Werribee River	Riverine
1	Kent Court	Werribee	Werribee West Drain	Riverine
2	Kent Court	Werribee	Werribee West Drain	Riverine
3	Kent Court	Werribee	Werribee West Drain	Riverine
145-169	Mcgrath Road	Werribee	Lollypop Creek (Lower)	Riverine
351	Mcgrath Road	Wyndham Vale	Werribee West Drain	Riverine
1/359	Mcgrath Road	Wyndham Vale	Werribee West Drain	Riverine
361	Mcgrath Road	Wyndham Vale	Werribee West Drain	Riverine
363	Mcgrath Road	Wyndham Vale	Werribee West Drain	Riverine
365	Mcgrath Road	Wyndham Vale	Werribee West Drain	Riverine
367	Mcgrath Road	Wyndham Vale	Werribee West Drain	Riverine
369	Mcgrath Road	Wyndham Vale	Werribee West Drain	Riverine
371	Mcgrath Road	Wyndham Vale	Werribee West Drain	Riverine
390	Mcgrath Road	Wyndham Vale	Werribee River	Riverine
480	Mcgrath Road	Wyndham Vale	Werribee River	Riverine
525-559	Mcgrath Road	Wyndham Vale	Werribee River	Riverine
560	Mcgrath Road	Wyndham Vale	Werribee River	Riverine
570	Mcgrath Road	Wyndham Vale	Werribee River	Riverine
575	Mcgrath Road	Wyndham Vale	Werribee River	Riverine
580	Mcgrath Road	Wyndham Vale	Werribee River	Riverine
590	Mcgrath Road	Wyndham Vale	Werribee River	Riverine
600	Mcgrath Road	Wyndham Vale	Werribee River	Riverine
20	Morrisons Lane	Little River	Lollypop Creek (Lower)	Riverine
3-5	Riverview Drive	Werribee	Werribee River	Riverine
7	Riverview Drive	Werribee	Werribee River	Riverine
9	Riverview Drive	Werribee	Werribee River	Riverine
11	Riverview Drive	Werribee	Werribee River	Riverine

Properties at risk from Flooding the Werribee River, and Lower Lollypop Creek during a 1% AEP event				
Residential	Commercial	Industrial	Rural	Public Use

Street No. at Risk	Street	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
17	Riverview Drive	Werribee	Werribee River	Riverine
19	Riverview Drive	Werribee	Werribee River	Riverine
21	Riverview Drive	Werribee	Werribee River	Riverine
23	Riverview Drive	Werribee	Werribee River	Riverine
12	Wattamolla Avenue	Werribee	Werribee River	Riverine
14	Wattamolla Avenue	Werribee	Werribee River	Riverine
26	Wattamolla Avenue	Werribee	Werribee River	Riverine
28	Wattamolla Avenue	Werribee	Werribee River	Riverine
1/56-58	Watton Street	Werribee	Werribee River	Riverine
2/56-58	Watton Street	Werribee	Werribee River	Riverine
3/56-58	Watton Street	Werribee	Werribee River	Riverine
60	Watton Street	Werribee	Werribee River	Riverine
62	Watton Street	Werribee	Werribee River	Riverine
64	Watton Street	Werribee	Werribee River	Riverine
66	Watton Street	Werribee	Werribee River	Riverine
68	Watton Street	Werribee	Werribee River	Riverine
1/70	Watton Street	Werribee	Werribee River	Riverine
2/70	Watton Street	Werribee	Werribee River	Riverine
3/70	Watton Street	Werribee	Werribee River	Riverine
4/70	Watton Street	Werribee	Werribee River	Riverine
5/70	Watton Street	Werribee	Werribee River	Riverine
6/70	Watton Street	Werribee	Werribee River	Riverine
7/70	Watton Street	Werribee	Werribee River	Riverine
72	Watton Street	Werribee	Werribee River	Riverine
74	Watton Street	Werribee	Werribee River	Riverine
76	Watton Street	Werribee	Werribee River	Riverine
78	Watton Street	Werribee	Werribee River	Riverine
80	Watton Street	Werribee	Werribee River	Riverine
82	Watton Street	Werribee	Werribee River	Riverine
84	Watton Street	Werribee	Werribee River	Riverine
86	Watton Street	Werribee	Werribee River	Riverine
88	Watton Street	Werribee	Werribee River	Riverine
1/90A	Watton Street	Werribee	Werribee River	Riverine
1/90	Watton Street	Werribee	Werribee River	Riverine
2/90A	Watton Street	Werribee	Werribee River	Riverine
3/90A	Watton Street	Werribee	Werribee River	Riverine
4/90A	Watton Street	Werribee	Werribee River	Riverine
5/90A	Watton Street	Werribee	Werribee River	Riverine
6/90A	Watton Street	Werribee	Werribee River	Riverine
92	Watton Street	Werribee	Werribee River	Riverine
96	Watton Street	Werribee	Werribee River	Riverine
98	Watton Street	Werribee	Werribee River	Riverine
100	Watton Street	Werribee	Werribee River	Riverine
1/102	Watton Street	Werribee	Werribee River	Riverine

Properties at risk from Flooding the Werribee River, and Lower Lollypop Creek during a 1% AEP event				
Residential	Commercial	Industrial	Rural	Public Use

Street No. at Risk	Street	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
2/102	Watton Street	Werribee	Werribee River	Riverine
3/102	Watton Street	Werribee	Werribee River	Riverine
106	Watton Street	Werribee	Werribee River	Riverine
108	Watton Street	Werribee	Werribee River	Riverine
112A	Watton Street	Werribee	Werribee River	Riverine
112B	Watton Street	Werribee	Werribee River	Riverine
114A	Watton Street	Werribee	Werribee River	Riverine
114B	Watton Street	Werribee	Werribee River	Riverine
114C	Watton Street	Werribee	Werribee River	Riverine
150	Watton Street	Werribee	Werribee River	Riverine
220	Watton Street	Werribee	Werribee River	Riverine
114	Wedge Street	Werribee	Werribee River	Riverine
290	Wests Road	Werribee	Lollypop Creek (Lower)	Riverine
310	Wests Road	Werribee	Lollypop Creek (Lower)	Riverine
375	Wests Road	Little River	Lollypop Creek (Lower)	Riverine
24	Whitehall Crescent	Werribee	Werribee West Drain	Riverine
5	Ziema Court	Werribee	Lollypop Creek (Lower)	Riverine

Total
132

Table C1.4 – Properties at risk of flooding along the Werribee River, Werribee West Drain and lower Lollypop Creek catchments in Wyndham City

Isolation

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

Essential Infrastructure

- The **Geelong – Melbourne Railway Line** may become flooded east of Lollypop Creek crossing in Werribee during a **Major** Flood Event on the Melton Reservoir Tail Gauge.

During an event, see the Public Transport Victoria's Website for details on delays or alterations to services. http://ptv.vic.gov.au/live-travel-updates/. A map of Public Transport routes within Wyndham City is available via the website at: https://www.ptv.vic.gov.au/assets/PTV-default-site/more/maps/Local-area-maps/Metropolitan/52_Wyndham_LAM_September-2021.pdf

Apart from the roads outlined below, all other essential infrastructure and services areas around Werribee River 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 the Werribee River. Check the VicRoads website for more details: http://alerts.vicroads.vic.gov.au/

Department of Transport (VicRoads) Roads likely flooded in a 1% AEP (100yr ARI) event	Flooded in Event
• Princes Freeway, Werribee between Lollypop Creeks and Geelong Road (Princes Hwy) exit	50,000 ML/d at Melton Reservoir Tail Gauge

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

Wyndham City Council Possible Road Closures	Flooded in Event
WERRIBEE	
• Alfred Road	50,000 ML/d at Melton Reservoir Tail Gauge
• Browns Road	50,000 ML/d at Melton Reservoir Tail Gauge
• Bulban Road at Lollypop Creek	50,000 ML/d at Melton Reservoir Tail Gauge
• Cottrell Street at Werribee River	4,000 ML/d at Melton Reservoir Tail Gauge
• Gutra Court	35,000 ML/d at Melton Reservoir Tail Gauge
• Mambourin Street	35,000 ML/d at Melton Reservoir Tail Gauge
• McGrath Road	50,000 ML/d at Melton Reservoir Tail Gauge
• Riversdale Drive	99,000 ML/d at Melton Reservoir Tail Gauge
• Riverview Drive	35,000 ML/d at Melton Reservoir Tail Gauge
• Wattamolla Avenue	35,000 ML/d at Melton Reservoir Tail Gauge
• Wests Road	50,000 ML/d at Melton Reservoir Tail Gauge
WYNDHAM VALE	
• Black Forest Road at Lollypop Creek	50,000 ML/d at Melton Reservoir Tail Gauge
• Cambridge Crescent	50,000 ML/d at Melton Reservoir Tail Gauge
• Cobbledicks Ford Road	2,000 ML/d at Melton Reservoir Tail Gauge

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

Flood Mitigation

Retarding Basins

A number of retarding basins have been constructed in the Werribee River catchment to help reduce flood risks as they capture the peak of a storm and release it in a controlled manner. As residential development continues, more retarding basins will be constructed to help manage peak flows. To view their locations and connecting waterway/drainage systems, see mapping in **Appendix F**.

Melbourne Water Retarding Basin	On Drain/ Waterway	Area	Storage Capacity	Spillway Crest Level	Full Supply Level	Embankment Crest Level	ANCOLD Hazard Rating	Houses In Flow Path (dam breach)	Melway Reference
Davis Creek	Davis Creek	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable	234 H1
Moorookyle Estate	Davis Creek	1.29 ha	20.5 ML	40.30m AHD	Unavailable	Unavailable	Very Low	0	234 G4
Pillar Road	Werribee West Drain	3.97 ha	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable	205 A2

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

Presidents Park, at the head of the Werribee West Floodway acts as a flood plain retarding basin, ahead of funnelling flows at Heaths Road.

Werribee River Levees and Pumping Stations

The Werribee West Flood Mitigation Scheme of the 1980s created:

- Levees along parts of the Werribee River;
- A flood breakaway to Lollypop Creek via Presidents Park along the Werribee West Floodway through to the Black Swamp; and
- Flood pump sites where local drainage is pumped into the river when the normal outlets have been covered by rising river levels.

Wyndham City Council is responsible to operate the Werribee River flood pumps. The tables below show levees and pump sites.

Werribee River Levees	Side	Material	Levee Height	Levee Length	Expected Level of Protection	ANCOLD Hazard Rating	Consequences of Failure	Melway Reference
Riversdale Drive (opp Huntington Ct) to Templeton Court (opp 12 Templeton Court)	East	Earth	Unavailable	3.1km	1 in 100yrs (with 1.0m freeboard)	High A	Approx. 568 surrounding properties would be flooded	234H12 – 205F5
Stewart Drive (behind 47 Stewart Drive) to Golden Avenue (opp 52 Golden Avenue)	East	Rock	~2m	270m	1 in 100yrs (with between 0.0 to 1.5m freeboard)	High A	Approx. 327 surrounding properties would be flooded	205F5
Golden Avenue (opp 52 Golden Avenue) to Golden Avenue (behind 4 Flax Court)	East	Earth		540m				205F5 – 205G6
Golden Avenue (behind 4 Flax Court) to Werribee River (behind 12 Flax Court)	East	Rock		80m				205G6
(behind 12 Flax Court) to Muirhead Crescent (behind 49 Richmond Crescent)	East	Earth		560m				205G6 – 205H7
Mortimer Street to Mambourin Street	West	Earth	Unavailable	323m	Unavailable	High A	Approx. 116 surrounding properties would be flooded	205 G7 – 205 H7

Table C1.8 – Werribee River Levees within Wyndham City

Wyndham City Pumping Station	Suburb	Side of River	Melway Reference
Centre Avenue (behind 18 Prouse Place)	Werribee	East	205G6
Golden Avenue (behind 4 Flax Court)	Werribee	East	205G6
Stewart Drive (via 49 Stewart Drive)	Werribee	East	205F5
Quinlan Court (opp 11 Quinlan Court)	Werribee	East	205F5
Weeden Drive (opp 27 Weeden Drive)	Werribee	West	205E4

Table C1.9 – Wyndham City Pumping Stations along Werribee River

Weirs

Weir Name	On Drain / Waterway	Owner	Location	Melway Reference
Southern Rural Water Diversion Weir	Werribee River	Southern Rural Water	Riverbend Historical Park, Werribee	205 F2

Table C1.10 – Weirs along the Werribee River in Wyndham City

Sewerage Infrastructure

Sewerage Infrastructure of note during a severe flood event located along the Werribee River & Lollypop Creek are contained within the following tables. To view their locations, see mapping in **Appendix F**.

Sewer Pumping Stations

Sewerage Pumping Station	On Drain / Waterway	Operator	Number of Pumps	Location	Melway Reference
National Equestrian Pumping Station	Local Drainage		One	National Equestrian Centre on Peter Gahan Drive, Werribee South	201 C3
Western Treatment Plant (WTP) Pumping Stations	WTP Outlet Drains		Twenty-Six	Western Treatment Plant on Farm Road, Cocoroc	244 E9 – F5
WTP Recycled Water Pumping Station	Werribee River		One	Werribee Park Golf Club on K. Road, Werribee South	201 A5

Table C1.9 – Sewer Pumping Stations within Wyndham City

Sewer Emergency Relief Points

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

On Drain / Waterway	Bank / Side of Waterway	Operator	Location	Melway Reference
Local Drainage	-	City West Water	Tower Road, Werribee	206 C9
Werribee River	East	City West Water	Werribee River Trail, north side of the Princes Freeway overpass	244 J1

Table C1.10 – Sewer Emergency Relief Points in the Werribee River Catchment in Wyndham City

Control, Command and Coordination

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

Flood Impacts and Operational Considerations (Intelligence Cards)

The tables on the following pages provide a breakdown of the possible consequences of flooding along the Werribee River and lower Lollypop Creek at various gauge heights within Wyndham City. 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:

- Werribee River d/s Melton Reservoir, Melton South
- Werribee River diversion Weir, Wyndham Vale
- Werribee River at Cottrell Street Ford, Werribee
- Lollypop Creek at Bulban Road, Werribee

FLOOD INTELLIGENCE CARD – MELTON RESERVOIR TAIL GAUGE, WERRIBEE RIVER

Version 4 – May 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:	**Downstream of Melton Reservoir at Exford Road, Melton South**
CURRENT LEVEL:	**http://www.bom.gov.au/fwo/IDV67204/IDV67204.087040.tbl.shtml**
STREAM:	**Werribee River**
GAUGE NUMBER:	**231205D**
GAUGE ZERO:	**58,014m AHD**
GAUGE TYPE:	**Stream Level**

MELWAY REFERENCE:	**220 J2**
MINOR:	**1.5m (4,000 ML/d)**
MODERATE:	**5.1m (35,000 ML/d)**
MAJOR	**6.4m (50,000 ML/d)**
LEVEE HEIGHT:	**99,000 ML/d**
HIGHEST RECORDED FLOOD:	**8,40m (70,293ML/d) on 16th October 1983**

River Height and/or River Flow	Flood Class or Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
1.5m 4,000 ML/d	**MINOR FLOOD LEVEL**	**Community Infrastructure Impacted** **Werribee River** • Werribee Zoo – Lower Savannah River crossing closed • Werribee Golf Course – Werribee Floodplain inundated **Water Over Road** **Werribee River** • Cobbledicks Ford Road, Wyndham Vale overtopped • Cottrell Street Ford, Werribee overtopped	**SRW** • Closure of Cottrell Street Ford • **Notify Council when combined flow of downstream of Melton Reservoir (231205D) and Toolern Creek reach 4,000ML/d.** **Werribee Zoo** • Move animals to higher ground **Werribee Golf Course** • Removal of portable assets from flood plain
5.1m 35,000 ML/d	**MODERATE FLOOD LEVEL**	**Water Over Road** **Werribee River** • Gutra Court, Werribee • Wattamolla Avenue, Werribee • Riverview Drive, Werribee • Mambourin Street, Werribee	**SRW** • Notify Council Roads & Parks standby **Wyndham City Council** • Portable pumping stations positioned at 5 flood control pits • Road closure of residential streets west side of Werribee River **Residents (west side of river)** • Flood protection within private properties – habitable rooms (17 Riverview Drive; 26 Wattamolla Avenue). Private protection required by previous agreements.

River Height and/or River Flow	Flood Class or Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
			• Flood protection within private properties – carports, garages (7 & 9 Riverview Drive; 12 & 14 Wattamolla Avenue; 2 Guyra Court) Private protection required by previous agreements.
6.4m 50,000 ML/d	**MAJOR FLOOD LEVEL**	• Outflow to Werribee West Floodway at Presidents Park **Properties at Flood Risk** • Properties west side of the Werribee River likely to be impacted • 45 shops along Watton Street, Werribee likely to have basements / rooms at river corridor level flooded **Essential Infrastructure Impacted** • The Geelong – Melbourne Railway Line likely flooded east of Lollypop Creek crossing in Werribee **Water Over Road** **Werribee West Drain** • Cambridge Crescent, Wyndham Vale between Nos. 71-83 • Black Forest Road, Wyndham Vale between Nos. 51-82 • McGrath Road, Werribee **Lollypop Creek (Lower)** • Bulban Road, Werribee • Browns Road, Werribee • Wests Road, Werribee • Alfred Road, Werribee • Princes Freeway, Werribee between Lollypop Creek and Geelong Road (Princes Hwy) exit	**Wyndham City Council** • Portable pumping at flood control pits in operation • Road Closures in the Werribee West Floodway **Owners of farm properties along the river and Lollypop Creek** • Removal of stock • Irrigation equipment etc **Vic Roads** • Possible Closure Princes Freeway at Lollypop Creek **Residents (west side of Werribee River)** • See 35,000 ML/d above **Shop Owners/ Occupiers in Watton St, Werribee** • Likely flooding of basements
99,000 ML/d	1% AEP (100yr ARI) Flood Level (Major)	**Properties at Flood Risk** • Residents of low-lying areas including those along Davis Road, Wollahra Rise & the end of McGrath Road should be advised to prepare to evacuate should the flood levels continue to rise • Flooding behind the levee banks could also occur if there is a malfunction in the flood control pit valves or heavy rain falling in the local catchment when valves are closed and pumping equipment cannot cope with stormwater runoff • 208 and the Petrol Station at 210 Ballan Road, Wyndham Vale may experience flooding from backflows along the Werribee West Drain **Essential Infrastructure Impacted** • Levee banks within urban area of Werribee designed to provide protection from a 1% AEP flood with 600mm freeboard **Water Over Road** • Riversdale Drive, Werribee	• All parties noted at Major Flood Level should be given as much warning as possible

Table C1.11 – Breakdown of likely consequences at various Melton Reservoir Tail gauge level heights along the Werribee River with operational considerations

FLOOD INTELLIGENCE CARD – WERRIBEE DIVERSION WEIR GAUGE, WERRIBEE RIVER

Version 4 – May 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:	**Riverbend Historical Park, off Heaths Road, Werribee**
CURRENT LEVEL:	**https://www.melbournewater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/231204A**
STREAM:	**Werribee River**
GAUGE NUMBER:	**231204A**
GAUGE ZERO:	**26.427m AHD**
GAUGE TYPE:	**Stream Level**

MELWAY REFERENCE:	**205 F2**
MINOR:	**Not Established**
MODERATE:	**Not Established**
MAJOR	**Not Established**
LEVEE HEIGHT:	**3.67m**
HIGHEST RECORDED FLOOD:	**2.06m (41,466ML/d) on 14th January 2011**

River Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
1.53m		• Breakout Level of River at Diversion Weir	
2.17m		• Water starts to flow over floodplain	
3.07m	1% AEP (100yr ARI) Flood Level	• Note: It is not known at what level property and infrastructure contained below starts being flooded **Properties at Flood Risk** **25 Properties in Total** • 351, 1/359, 361, 363, 365, 367, 369 & 371 McGrath Road, Wyndham Vale Properties below may experience flooding from backflows along the Werribee West Drain • 2/160, 162, 208 and the Petrol Station/fast food outlets at 210 Ballan Road, Wyndham Vale • 1, 1/3, 4, 5, 6, 1/8, 2/8, 10 & 17 Buckingham Drive, Werribee • 1, 2 & 3 Kent Court, Werribee • 24 Whitehall Crescent, Werribee **Community Infrastructure Likely Flooded** • Presidents Park at 390 McGrath Road, Wyndham Vale **Essential Infrastructure Likely Impacted** • Levee banks within urban area of Werribee designed to provide protection from a 1% AEP flood with 600mm freeboard	VICSES will provide warnings using EM-COP to Wyndham Council and appropriate agencies as required based on the predictions provided by BoM regarding flood levels and the risk of Flash Flooding. The VICSES RDO in conjunction with the Regional Agency Commander will maintain operational awareness and form an appropriate response arrangement to suit the level of incident VICSES to respond on a request-by-request basis.

River Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		• Bus Route 166 along McGrath Road **Water Over Road** • Black Forest Road, Werribee • Buckingham Drive, Werribee • McGrath Road, Wyndham Vale north of Heaths Road	Council and VicRoads (as appropriate) to provide road closure signage under predetermined arrangements

Table C1.12 – Breakdown of likely consequences at various Diversion Weir gauge level heights along the Werribee River with operational considerations

FLOOD INTELLIGENCE CARD – COTTRELL ST, WERRIBEE GAUGE, WERRIBEE RIVER

Version 5 – February 2023

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:	**Cottrell Street Ford, Cottrell Street, Werribee**
CURRENT LEVEL:	**https://www.melbournewater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/231237A**
STREAM:	**Werribee River**
GAUGE NUMBER:	**231237A**
GAUGE ZERO:	**12.80m AHD**
GAUGE TYPE:	**Stream Level**

MELWAY REFERENCE:	**205 J7**
MINOR:	**2.7m**
MODERATE:	**4.5m**
MAJOR	**6.0m**
LEVEE HEIGHT:	**9.05m**
HIGHEST RECORDED FLOOD:	**5.87m (41,904ML/d) on 14th January 2011**

River Height	Flood Class or Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
2.7m	**MINOR FLOOD LEVEL**	**Community Infrastructure Likely Impacted** • Werribee Zoo – Lower Savannah River crossing closed • Werribee Golf Course – Werribee Floodplain inundated	**Werribee Zoo** • Move animals to higher ground **Werribee Golf Course** Removal of portable assets from flood plain
2.74m		**Water Over Road** • Cottrell Street Ford Bridge, Werribee	**SRW** • Closure of Cottrell Street Ford • **Notify Council when combined flow of downstream of Melton Reservoir (231205D) and Toolern Creek reach 4,000ML/d.**
2.93m		**Community Infrastructure Likely Flooded** • Werribee River Trail flooded at various locations between Presidents Park and Chirnside Park	
4.5m	**MODERATE FLOOD LEVEL**	**Properties at Flood Risk** **12 Properties in Total** • 2 Gutra Court, Werribee (Carport / Garage) • 12 & 14 Wattamolla Avenue, Werribee (Carport / Garage)	**SRW** • Notify Council Roads & Parks standby **Wyndham City Council** • Portable pumping stations positioned at 5 flood control pits

River Height	Flood Class or Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		• 26 & 28 Wattamolla Avenue, Werribee • 7 & 9 Riverview Drive, Werribee (Carport / Garage) • 11, 17 & 19, 21 & 23 Riverview Drive, Werribee **Water Over Road** • Gutra Court, Werribee • Wattamolla Avenue, Werribee • Riverview Drive, Werribee • Mambourin Street, Werribee	• Road closure of residential streets west side of Werribee River **Residents (west side of river)** • Flood protection within private properties – habitable rooms (17 Riverview Drive; 26 Wattamolla Avenue). Private protection required by previous agreements. • Flood protection within private properties – carports, garages (7 & 9 Riverview Drive; 12 & 14 Wattamolla Avenue; 2 Guyra Court) Private protection required by previous agreements.
5.23m	14th October 2022 Flood Level Peak	**Event Summary** •	
5.4m	**MAJOR FLOOD LEVEL**	**Properties at Flood Risk** **48 New at Level; 60 Properties in Total** • 3-5 Riverview Drive, Werribee • Shops 1-3/56-58, 60, 62, 64, 66, 68, Shops 1-7/70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, Shops 1-6/90A, 92, 96, 98, 100, Shops 1-3/102, 106, 108, 112A, 112B, 114A, 114B & 114C Watton Street, Werribee likely to have basements / rooms at river corridor level flooded • Parkland at 150 & 220 Watton Street, Werribee	**Wyndham City Council** • Portable pumping at flood control pits in operation **Residents (west side of Werribee River)** • See 3.1m Moderate Flood Level above **Shop Owners/ Occupiers in Watton St, Werribee** • Likely flooding of basements
5.87m	14th January 2011 Flood Level Peak		
8.45m	1% AEP (100yr ARI) Flood Level (Major)	**Properties at Flood Risk** **7 New at Level; 67 Properties in Total** • 114 Wedge Street North, Werribee • 17, 41 & 43 Cottrell Street, Werribee • 2, 4 & 6 Coop Street, Werribee **Essential Infrastructure Likely Impacted** • Levee banks within urban area of Werribee designed to provide protection from a 1% AEP flood with 600mm freeboard	

Table C1.13 – Breakdown of likely consequences at various Werribee gauge level heights along the Werribee River with operational considerations

FLOOD INTELLIGENCE CARD – BULBAN ROAD, WERRIBEE GAUGE, LOLLYPOP CREEK

Version 2 – May 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 on the northern side of Bulban Road, Werribee**
CURRENT LEVEL:	**Unavailable**
STREAM:	**Lollypop Creek**
GAUGE NUMBER:	**231245A**
GAUGE ZERO:	**18.117m AHD**
GAUGE TYPE:	**Stream Level & Rain**

MELWAY REFERENCE:	**204 J12**
MINOR:	**Not Established**
MODERATE:	**Not Established**
MAJOR:	**Not Established**
LEVEE HEIGHT:	**N/A**
HIGHEST RECORDED FLOOD:	**1.93m (10th April 2015)**

Creek Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
1.76m		**Water Over Road** • Bulban Road, Werribee	
2.69m	1% AEP (100yr ARI) Flood Level	• Note: It is not known at what level infrastructure contained below starts being flooded **Properties at Flood Risk** **22 Properties in Total** • 5 & 8 Alaska Court, Werribee • 13, 19 & 25 Bonus Court, Werribee • 15, 32, 85, 92 & 112 Browns Road, Werribee • 148, 150-168, 170-198 & 270 Bulban Road, Werribee • 50 Galvin Road, Werribee • 7 Gaudin Court, Werribee • 145-169 McGrath Road, Werribee • 20 Morrisons Lane, Little River • 290, 310 & 375 Wests Road, Werribee • 5 Ziema Court, Werribee **Community Infrastructure Likely Flooded** • Wyndham Vale South Reserve at 145-169 McGrath Road, Werribee **Essential Infrastructure Likely Impacted**	VICSES will provide warnings using EM-COP to Wyndham 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 VicRoads (as appropriate) to provide road closure signage under predetermined arrangements

Creek Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		• The Geelong – Melbourne Railway Line flooded east of Lollypop Creek • Bus Route 192 along Black Forest Road **Water Over Road** • Alfred Road, Werribee • Black Forest Road, Werribee • Browns Road, Werribee • Bulban Road, Werribee • Galvin Road, Werribee • McGrath Road, Werribee • Old Boundary Road, Cocoroc • Princes Freeway, Werribee east of Lollypop Creek • Rowan Lane, Cocoroc	

Table C1.14 – Breakdown of likely consequences at various Bulban Road gauge level heights along Lollypop Creek with operational considerations

Note: For Information on Lollypop Creek upstream of Box Forest Road, Wyndham Vale see **Appendix 2**

APPENDIX C2 – LOLLYPOP CREEK (WYNDHAM VALE) FLOOD EMERGENCY PLAN

Overview of Flooding Consequences

This section refers to riverine flooding caused by local rainfall (See **Appendix C1** for Werribee River break out floodway into Lollypop Creek). Wyndham Vale is located approximately 30km south west of Melbourne in an area of established residential and new residential estates. Lollypop Creek originates in the undulating plains of Mambourin and Wyndham Vale and flows south into the Western Treatment Plant. Flood modelling by Water Technology in 2005 produced a close simulation of the flooding behaviour observed in February 2005. The flood in February 2005 was close to 100 years ARI.

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 Lollypop Creek (Upper)					
Property					
Properties	**14**				
Residential	6				
Commercial	2				
Industrial	0				
Public Land	2				
Rural	4				
Community Infrastructure					
Child Care / Kindergartens	1	Imaroo Kindergarten			
Community Venues	2	Wyndham Vale Resource & Community Centre; Scout Hall on Honor Avenue			
Places of Worship	1	Wyndham Presbyterian Church			
Essential Infrastructure					
Major Roads	1	Ballan Road			
Bus Routes	2	191 and 192			
Tourism / Recreation					
Recreation Facilities	2	Lollypop Creek Bicycle Trail; Wyndham Vale Reserve			
Government Boundaries					
Local Gov't Areas	1	Wyndham	CMA	1	Port Phillip & Westernport
Adjacent LGAs	0		CFA District	1	District 14
SES Unit Area	1	Wyndham West	FRV District	0	

Table C2.1 – Consequence Summary of 1% AEP flood along Lollypop Creek (Upper)

Gauges and Warnings

Neither the Bureau of Meteorology nor Melbourne Water currently provides flood forecasts for the Lollypop Creek catchment. All flood response actions must therefore be driven by rainfall and / or water level observations. Telemetered water level / flood gauges are located in Quandong, on Bulban Road and at the Diversion Weir.

Gauge	Station No.	Location	Owner	Stream Level & Flow Gauge	Rain Gauge	Melway Ref
Lollypop Creek at Bulban Road, Werribee	231245A	East bank of the creek on the northern side of Bulban Road, Werribee	Melbourne Water	✓		204 J12
Quandong	587030	The Werribee Gun Club, 1225 Ballan Road, 800m south of Ballan Road	Melbourne Water		✓	244 E
Werribee River at Werribee Diversion Weir, Wyndham Vale	231204A	East side of the river at Riverbend Historical Park, 100m upstream of Diversion Weir, Werribee	DELWP	✓		205 F2

Table C2.2 – Hydrographic Monitoring Stations within or close to the Lollypop Creek catchment

These Gauges may provide some warning of expected flooding. See the Melbourne Water website for more information on these gauges: http://www.melbournewater.com.au/waterdata/rainfallandriverleveldata/Pages/Rainfall-and-river-level-new.aspx. The 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.

Area Map of Flood Risk within the Lollypop Creek catchment

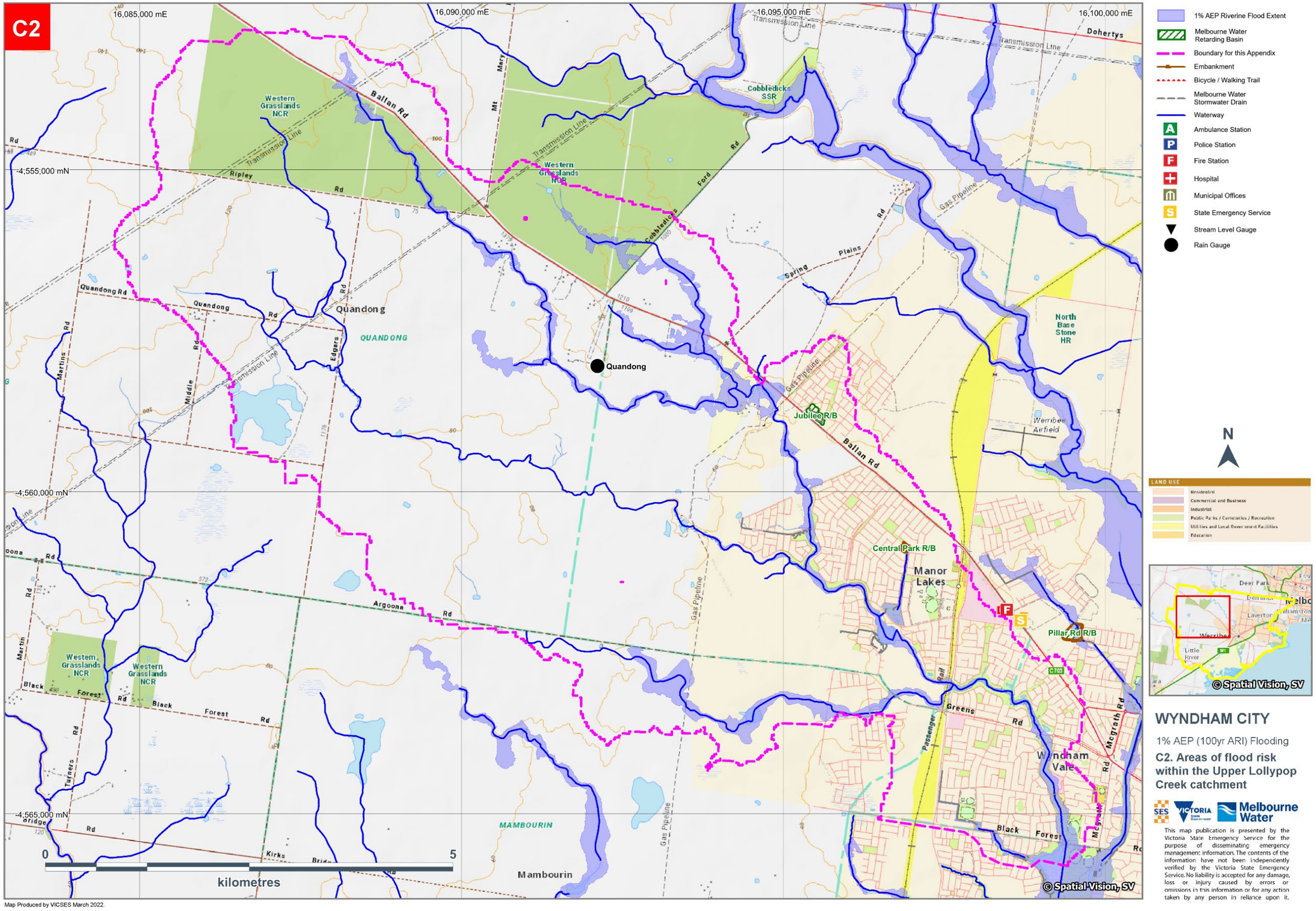

Figure C2 – Areas of flood risk around Lollypop Creek in Wyndham City and area covered by this appendix

Properties at Flood Risk

Properties listed in the table below are at risk from flooding along Lollypop Creek Upper and its tributaries throughout Manor Lakes and Wyndham Vale. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Lollypop Creek (Upper) (DPM, August 2010) and the Lollypop Creek (Middle) (GHD, April 2007) flood mapping and risk assessment programs. For properties along Lollypop Creek at risk in Werribee and Cocoroc, see **Appendix C1**.

CONFIDENTIALITY: This table contains sensitive information about the effects of flooding on private property. Specific reference to private addresses or business must be made directly to owners or other Emergency Services and NOT via broadcast or print media.

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 Lollypop Creek (Upper) during a 1% AEP event

Residential | **Commercial** | **Industrial** | **Rural** | **Public Use**

Street No. at Risk	Street	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
1005	Ballan Road	Manor Lakes	Lollypop Creek Tributary	Riverine
1021	Ballan Road	Manor Lakes	Lollypop Creek Tributary	Riverine
1	Broadway Boulevard	Wyndham Vale	Lollypop Creek	Riverine
36	Feathertop Drive	Wyndham Vale	Lollypop Creek	Riverine
85	Greens Road	Wyndham Vale	Lollypop Creek	Riverine
50	Honour Avenue	Wyndham Vale	Lollypop Creek	Riverine
1/59	Honour Avenue	Wyndham Vale	Lollypop Creek	Riverine
2/59	Honour Avenue	Wyndham Vale	Lollypop Creek	Riverine
60	Honour Avenue	Wyndham Vale	Lollypop Creek	Riverine
1/61	Honour Avenue	Wyndham Vale	Lollypop Creek	Riverine
2/61	Honour Avenue	Wyndham Vale	Lollypop Creek	Riverine
84	Honour Avenue	Wyndham Vale	Lollypop Creek	Riverine
2	Ribblesdale Avenue	Wyndham Vale	Lollypop Creek	Riverine
28	Ridge Drive	Wyndham Vale	Lollypop Creek	Riverine

Total
14

Table C2.3 – Properties at risk of flooding along the Upper Lollypop Creek catchment in Wyndham City

Isolation

No major isolation risks exist for areas around Wyndham Vale during a 1% AEP (100yr ARI) event. Residents located in the area bounded by Black Forest Road, the Regional Rail Line & Lollypop Creek in Wyndham Vale should be able to travel by Armstrong Road to the north if Greens Road and Black Forest Road were to be flooded during an event. Some localised short-duration isolation may occur due to flash flooding.

Essential Infrastructure

During an event, see the Public Transport Victoria's Website for details on delays or alterations to services. http://ptv.vic.gov.au/live-travel-updates/. A map of Public Transport routes within Wyndham City is available via the website at: https://www.ptv.vic.gov.au/assets/PTV-default-site/more/maps/Local-area-maps/Metropolitan/52_Wyndham_LAM_September-2021.pdf

Apart from the roads outlined below, all other essential infrastructure and services areas around Lollypop Creek in Wyndham Vale are expected to remain unaffected by flooding during a 1% AEP (100yr ARI) event. See **Appendix C1** for information on Lollypop Creek in Werribee & Cocoroc.

Road Closures

The following roads are subject to closure during flooding around Lollypop Creek in Wyndham Vale. Check the VicRoads website for more details: http://alerts.vicroads.vic.gov.au/. See **Appendix C1** for information on Lollypop Creek in Werribee & Cocoroc.

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

Table C2.4 – VicRoads Possible Road Closures by Lollypop Creek or its Tributaries

Wyndham City Council Roads flooded in a 1% AEP (100yr ARI) event	
WYNDHAM VALE	• Greens Road
• Black Forest Road	• Honour Avenue
• Broadway Boulevard	• Olive Way
• Feathertop Drive	• Ribblesdale Avenue

Table C2.5 – Wyndham City Possible flooded roads by flash flooding or by Lollypop Creek and its Tributaries

Flood Mitigation

Retarding Basins

A number of retarding basins have been constructed in the Lollypop Creek catchment to help reduce flood risks as they capture the peak of a storm and release it in a controlled manner. As residential development continues, more retarding basins will be constructed to help manage peak flows. To view their locations and connecting waterway/drainage systems, see mapping in **Appendix F**.

Melbourne Water Retarding Basin	On Drain/ Waterway	Area	Storage Capacity	Spillway Crest Level	Full Supply Level	Embankment Crest Level	ANCOLD Hazard Rating	Houses In Flow Path (dam breach)	Melway Reference
Central Park	Pedder Street Drain	0.87 ha	10.5 ML	44.25m AHD	Unavailable	In cut	Very Low	0	233 F11
Jubilee	Lollypop Creek Tributary	2.64 ha	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable	233 C7

Table C2.5 – Melbourne Water Retarding Basins in the Lollypop Creek Catchment

Central Park Retarding Basin, located in the northern section of Manor Lakes Estate, Wyndham Vale is part of the Pedder St Drain which connects to Lollypop Creek to the south. The retarding basin provides an outlet to excess waters from Lollypop Creek and protects the neighbouring streets of Mayesbrook Rd, Yarraman Rd, Drover Ave & Gunyong Cr.

No formal Pumping Stations or Levees exist around Lollypop Creek and its tributaries in Wyndham Vale.

Sewerage Infrastructure

There is no sewerage Infrastructure expected to be within the vicinity of floodwaters during severe flood events along Lollypop Creek in Wyndham Vale. Note that there are a number of Sewer Pumping Stations downstream of the junction with the Werribee West Drain in the Western Treatment Plan, Corcoroc.

Control, Command and Coordination

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

Flood Impacts and Operational Considerations (Intelligence Cards)

The tables on the following pages provide a breakdown of the possible consequences of flooding along Lollypop Creek Upper at various creek heights or rain totals around Manor Lakes and Wyndham Vale. 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:

- Bulban Road, Werribee

FLOOD INTELLIGENCE CARD – BULBAN RD, WERRIBEE GAUGE, LOLLYPOP CREEK

Version 4 – May 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 on the northern side of Bulban Road, Werribee**
CURRENT LEVEL:	**Unavailable**
STREAM:	**Lollypop Creek**
GAUGE NUMBER:	**231245A**
GAUGE ZERO:	**18.117m AHD**
GAUGE TYPE:	**Stream Level & Rain**

MELWAY REFERENCE:	**204 J12**
MINOR:	**Not Established**
MODERATE:	**Not Established**
MAJOR:	**Not Established**
LEVEE HEIGHT:	**N/A**
HIGHEST RECORDED FLOOD:	**1.93m (10th April 2015)**

Creek Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
2.69m	1% AEP (100yr ARI) Flood Level	• Note: It is not known at what level infrastructure contained below starts being flooded **Properties at Flood Risk** **14 Properties in Total** **Lollypop Creek Tributary** • 1005 & 1021 Ballan Road, Manor Lakes **Lollypop Creek** • 1 Broadway Boulevard, Wyndham Vale • 36 Feathertop Drive, Wyndham Vale • 85 Greens Road, Wyndham Vale • 50, 1/59, 2/59, 60, 1/61, 2/61 & 84 Honour Avenue, Wyndham Vale • 2 Ribblesdale Avenue, Wyndham Vale • 28 Ridge Drive, Wyndham Vale **Community Infrastructure Flooded** • Lollypop Creek Bicycle Trail flooded at various locations between Lollypop Drive and Black Forest Road • Eco-Living Centre Community Centre at 28 Ridge Drive, Wyndham Vale • Wyndham Vale Shopping Centre on Honour Avenue, Wyndham Vale carpark likely flooded	VICSES will provide warnings using EM-COP to Wyndham 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 VicRoads (as appropriate) to provide road closure signage under predetermined arrangements

Creek Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		• Playground at rear of Imaroo Kindergarten on Honour Avenue, Wyndham Vale • Scout Hall on Honour Avenue, Wyndham Vale • Wyndham Vale Reserve & Wyndham Vale Football Club on Honour Avenue, Wyndham Vale • Carpark of Wyndham Presbyterian Church on Black Forest Road, Wyndham Vale **Essential Infrastructure Likely Impacted** • Bus Routes 191 & 192 likely impacted with flooding along Honour Avenue and Black Forest Road flooded respectively. **Water Over Road** **Lollypop Creek** • Greens Road, Wyndham Vale at Lollypop Creek crossing • Feathertop Drive, Wyndham Vale • Broadway Boulevard, Wyndham Vale • Ribblesdale Avenue, Wyndham Vale • Honour Avenue, Wyndham Vale at Wyndham Vale Reserve • Olive Way, Wyndham Vale • Black Forest Road, Wyndham Vale **Lollypop Creek Tributary** • Ballan Road, Manor Lakes • Greens Road, Wyndham Vale west of Armstrong Road at tributary crossing	

Table C2.6 – Breakdown of likely consequences at various Bulban Road gauge level heights along Lollypop Creek Upper with operational considerations

Note: For Information on Lollypop Creek downstream of Box Forest Road, Werribee see **Appendix 1**

APPENDIX C3 – SKELETON CREEK FLOOD EMERGENCY PLAN

Overview of Flooding Consequences

Hoppers Crossing, Point Cook & Tarneit are located approximately 25km southwest of Melbourne in an area comprising of a mixture between established residential, commercial and light industrial and new residential estates. Skeleton Creek is the major drainage feature in the area. High Intensity, short duration rainfall events can cause flash flooding in and around Tarneit, Hoppers Crossing & Point Cook, while prolonged rainfall may see Skeleton Creek flood. Two tributaries; Hoppers Crossing Drain and Sayers Drain, may also flood adjacent properties. The area is relatively flat which sees slow water movement and flooding may last for several days. See mapping in **Appendix F** for more insight into flooding in the area.

This Summary table is generated from Victorian Government data. The State of Victoria does not guarantee that the publication is without flaw of any kind or is wholly appropriate for your particular purposes and therefore disclaims all liability for error, loss or damage which may arise from reliance upon it. All persons 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 Skeleton Creek					
Property					
Properties	**18**				
Residential	7				
Commercial	0				
Industrial	0				
Public Land	3				
Rural	8				
Community Infrastructure					
Schools / Colleges	1	Islamic Schools of Victoria (Al-Taqwa) Olive Branch Campus			
Child Care / Kindergartens	1	Mossfiel Kindergarten			
Community Venues	1	Wyndham Village Shopping Centre			
Essential Infrastructure					
Major Roads	3	Derrimut Road; Heaths Road; and Princes Freeway			
Sewerage Facilities	4	Emergency Relief Points			
Drainage Facilities	3	Harrington Ave R/B; Reflections Wetlands R/B; and Waldorf Avenue			
Tourism / Recreation					
Sports Facilities	0	Mossfiel Soccer and Rugby Clubs			
Recreation Facilities	1	Skeleton Creek Walking & Bicycle Trail			
Government Boundaries					
Local Gov't Areas	1	Wyndham	CMA	1	Port Phillip & Westernport
Adjacent LGAs	2	Melton; Hobsons Bay	CFA District	1	District 14
SES Unit Area	1	Wyndham	FRV District	1	Western

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

Gauges and Warnings

Neither the Bureau of Meteorology nor Melbourne Water currently provides flood forecasts for Skeleton Creek. All flood response actions must therefore be driven by rainfall and / or river level observations. Telemetered water level / flood gauges are located at Hoppers Crossing within the Skeleton Creek catchment. Flood Travel times are currently unavailable due to the existence of only one gauge.

Gauge	Station No.	Location	Owner	Stream Level & Flow Gauge	Rain Gauge	Melway Ref
Skeleton Creek at Hoppers Crossing	231110A	East side of the creek, south side of Sayers Road bridge, Truganina	Melbourne Water	✓	✓	203 A6

Table C3.2 – Gauges within the Skeleton Creek Catchment

These Gauges may provide some warning of expected flooding. See the Melbourne Water website for more information on these gauges: http://www.melbournewater.com.au/waterdata/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.

Area Map of Flood Risk within the Skeleton Creek catchment

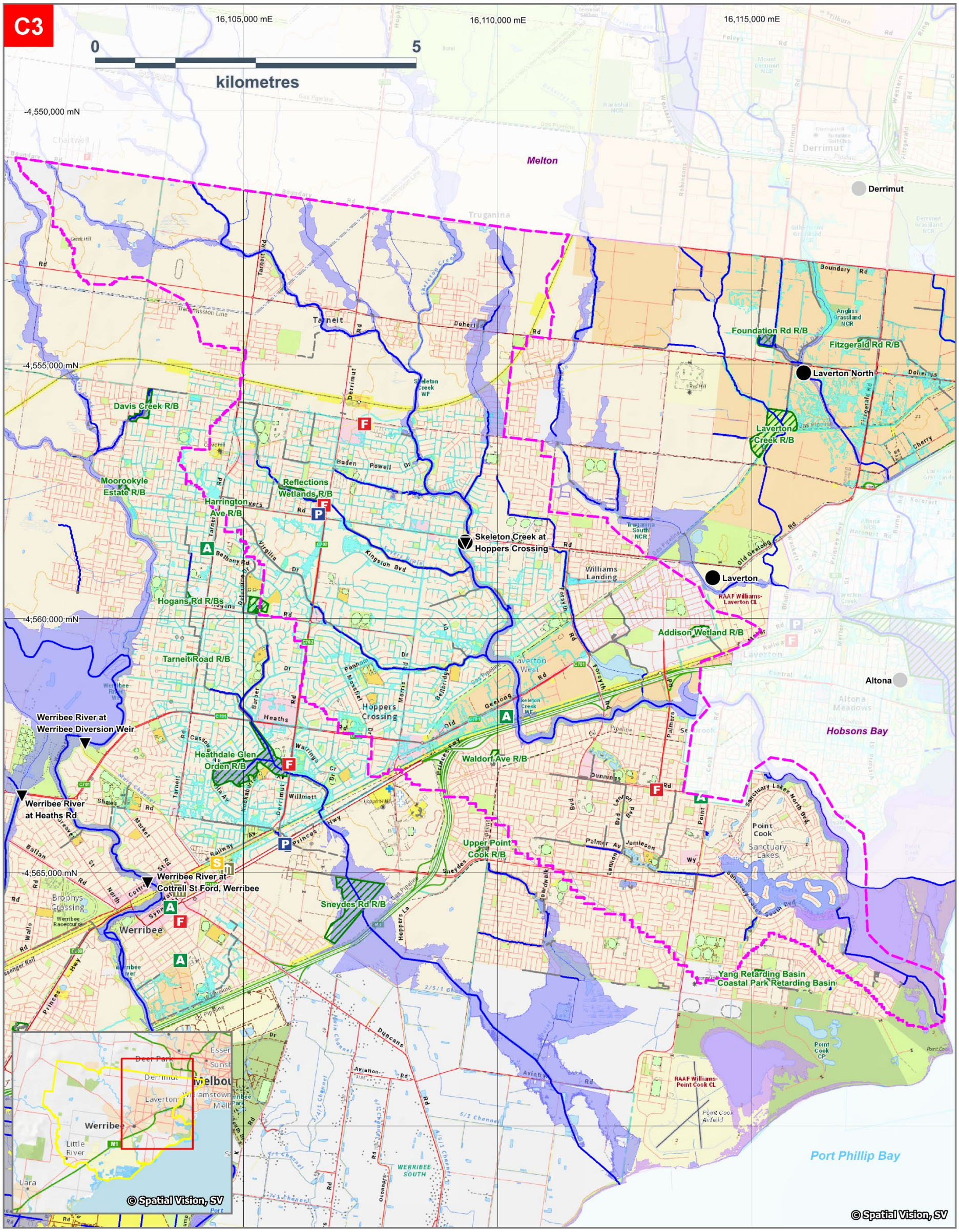

Figure C3 – Areas of flood risk around Skeleton Creek in Wyndham City and area covered by this appendix

Properties at Flood Risk

Properties listed in the table below are at risk from flooding over 30cm depth in the yard close to the primary building location during a 1% AEP event along Skeleton Creek and its tributaries south of the Regional Rail Line at Tarneit. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Skeleton Creek (GHD, February 2021) flood mapping and risk assessment program.

CONFIDENTIALITY: This table contains sensitive information about the effects of flooding on private property. Specific reference to private addresses or business must be made directly to owners or other Emergency Services and NOT via broadcast or print media.

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

Properties at risk from Flooding (over 30cm depth in yard at primary building location)							
Residential			Commercial	Industrial	Rural	Public Use	
Street No. at Risk in AEP Event			Address	Suburb	Along Melbourne Water Watercourse	Flood Risk Type	
20% AEP	5% AEP	1% AEP					
	✓	✓	16 Bayliss Avenue	Hoppers Crossing	Hoppers Crossing Drain	Flash	
	✓	✓	18 Bayliss Avenue	Hoppers Crossing	Hoppers Crossing Drain	Flash	
	✓	✓	20 Bayliss Avenue	Hoppers Crossing	Hoppers Crossing Drain	Flash	
✓	✓	✓	1/51 Morris Road	Hoppers Crossing	Local Drainage	Flash	
✓	✓	✓	2/51 Morris Road	Hoppers Crossing	Local Drainage	Flash	
✓	✓	✓	3/51 Morris Road	Hoppers Crossing	Local Drainage	Flash	
✓	✓	✓	4/51 Morris Road	Hoppers Crossing	Local Drainage	Flash	
	✓	✓	1/9A Mossfiel Drive	Hoppers Crossing	Local Drainage	Flash	
	✓	✓	2/9A Mossfiel Drive	Hoppers Crossing	Local Drainage	Flash	
	✓	✓	3/9A Mossfiel Drive	Hoppers Crossing	Local Drainage	Flash	
Totals							
4	10	10					

Table C3.3 – Properties at risk of flooding within the Skeleton Creek catchment in Wyndham City

Properties listed in the table below are at risk from flooding during a 1% AEP flood event on the Dry Creek catchment area. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Dry Creek (Melbourne Water, July 2008) flood mapping and risk assessment programs.

CONFIDENTIALITY: This table contains sensitive information about the effects of flooding on private property. Specific reference to private addresses or business must be made directly to owners or other Emergency Services and NOT via broadcast or print media.

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Properties at risk from Flooding during a 1% AEP event				
Residential	Commercial	Industrial	Rural	Public Use

Street No. at Risk	Street	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
635	Davis Road	Mount Cottrell	Dry Creek Tributary	Riverine
715	Derrimut Road	Tarneit	Dry Creek	Riverine
860	Derrimut Road	Tarneit	Dry Creek	Riverine
1030	Dohertys Road	Tarneit	Dry Creek	Riverine
65	Kenning Road	Tarneit	Dry Creek	Riverine
75	Kenning Road	Tarneit	Dry Creek	Riverine
80	Kenning Road	Tarneit	Dry Creek	Riverine
85	Kenning Road	Tarneit	Dry Creek	Riverine

Total
8

Table C3.4 – Properties at risk of flooding along Dry Creek and its tributaries in Wyndham City

Isolation

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

Essential Infrastructure

During an event, see the Public Transport Victoria's Website for details on delays or alterations to services. http://ptv.vic.gov.au/live-travel-updates/. A map of Public Transport routes within Wyndham City is available via the website at: https://www.ptv.vic.gov.au/assets/PTV-default-site/more/maps/Local-area-maps/Metropolitan/52_Wyndham_LAM_September-2021.pdf

Apart from the roads outlined below, all other essential infrastructure and services areas around Skeleton Creek and its tributaries 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 Skeleton Creek Catchment in Tarneit, Truganina, Hoppers Crossing & Point Cook. Check the VicRoads website for more details: http://alerts.vicroads.vic.gov.au/

Department of Transport (VicRoads) Roads likely flooded in a 1% AEP (100yr ARI) event
• Derrimut Road, Tarneit north of Dohertys Road
• Heaths Road east bound lanes at Hampstead Drive, Hoppers Crossing
• Princes Freeway, Hoppers Crossing at Skeleton Creek crossing

Table C3.5 – Department of Transport (VicRoads) Possible Road Closures by Skeleton Creek or its Tributaries

Wyndham City Council Roads likely flooded in a 1% AEP (100yr ARI) event			
HOPPERS CROSSING	• Enea Place	• Morris Road at Old Geelong Road	**TARNEIT**
• Banksia Crescent	• Germander Court	• O'Neill Avenue	• Boundary Road at low point between Derrimut Road and Woods Road
• Bayliss Avenue	• Golden Ash Grove	• Perkins Avenue	• Davis Road south of Kenning Road
• Bethany Road at Hogans Road	• Guinane Avenue	• Player Close	• Dohertys Road between Tarneit Road and Derrimut Road
• Burge Crescent	• Hogans Road at Elder Road	• Quarrion Court	• Giverny Drive
• Casuarina Close	• Industrial Avenue	• Raemur Court	• Kenning Road
• Clay Avenue	• Jasmine Close	• Roberts Avenue	• Malachite Drive
• Colliet Place	• Kennedy Court	• Stella Way	• Poplar Boulevard at Derrimut Road
• Crowe Street	• Kingston Boulevard	• Virgilia Drive	• Tarneit Road at Dry Creek
• Darus Court	• Matlock Street	• Wynarka Drive	
• Dunlop Road	• Miller Court		

Table C3.6 – Wyndham City Council Possible flooded roads due to flash flooding over 30cm depth

Flood Mitigation

Retarding Basins

A number of retarding basins have been constructed in the Skeleton Creek catchment to help reduce flood risks as they capture the peak of a storm and release it in a controlled manner. As residential development continues, more retarding basins will be constructed to help manage peak flows. To view their locations and connecting waterway/drainage systems, see mapping in **Appendix F**.

Melbourne Water Retarding Basin	On Drain/ Waterway	Area	Storage Capacity	Spillway Crest Level	Full Supply Level	Embankment Crest Level	ANCOLD Hazard Rating	Houses In Flow Path (dam breach)	Melway Reference
Harrington Avenue	Sayers Drain	0.32 ha	6.1 ML	nil	Unavailable	In cut	Very Low	0	202 B5
Reflections Wetlands	Sayers Drain	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable	202 E5
Waldorf Avenue	Skeleton Creek	2.38 ha	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable	207 B3

Table C3.6 – Retarding Basins in the Skeleton Creek Catchment

Harrington Avenue Retarding Basin is located on the northern side of Sayers Rd near the corner of Tarneit Rd. It is a relatively small retarding basin which protects residents in the neighbouring streets of Harrington Ave, Kinta Ln, Whyalla Gardens, Sayers Rd and Sandleford Way. The Retarding Basin is part of Sayers Drain, which connects to Skeleton Creek in Hoppers Crossing.

No formal Pumping Stations or Levees exist around Skeleton Creek and its tributaries.

Sewerage Infrastructure

Sewerage Infrastructure of note during a severe flood event located within the Skeleton Creek catchment is contained within the following table.

Sewer Emergency Relief Points

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

On Drain / Waterway	Bank / Side of Waterway	Operator	Location	Melway Reference
Local Drainage	N/A	City West Water	Guinane Avenue, Hoppers Crossing	206 G1
Local Drainage	N/A	City West Water	Industrial Avenue, Hoppers Crossing	203 E11
Local Drainage	N/A	City West Water	Point Cook Road at Fincley Road, Point Cook	208 A5
Local Drainage	N/A	City West Water	Sanctuary Lakes Boulevard, Point Cook	208 A7

Table C3.7 – Sewer Emergency Relief Points in the Skeleton Creek Catchment in Wyndham City

Control, Command and Coordination

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

Flood Impacts and Operational Considerations (Intelligence Cards)

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

- Skeleton Creek at Hoppers Crossing
- Skeleton Creek's Stormwater Tributaries in Hoppers Crossing

FLOOD INTELLIGENCE CARD – HOPPERS CROSSING GAUGE, SKELETON CREEK

Version 4 – May 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:	**Sayers Road, Truganina**
CURRENT LEVEL:	**https://www.melbournewater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/231110A**
STREAM:	**Skeleton Creek**
GAUGE NUMBER:	**231110A**
GAUGE ZERO:	**11.68m AHD**
GAUGE TYPE:	**Stream Level & Rain**

MELWAY REFERENCE:	**203 A6**
MINOR:	**Not Established**
MODERATE:	**Not Established**
MAJOR	**Not Established**
LEVEE HEIGHT:	**N/A**
HIGHEST RECORDED FLOOD:	**3.47m (11,109 ML/d) on 3rd February 2005**

Creek Height and/or Flow	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
3.47m 11,109 ML/d	3rd February 2005 Flood Level & Flow Peak 5% AEP (20yr ARI) Flood Level		
3.87m	1% AEP (100yr ARI) Flood Level	• Note: It is not known at what level property and infrastructure contained below starts being flooded **Properties at Flood Risk (Below Floor)** **15 Properties in Total** **Dry Creek Tributary** • 635 Davis Road, Mount Cottrell **Dry Creek** • 65, 75, 80 & 85 Kenning Road, Tarneit • 1030 Dohertys Road, Tarneit • 715 & 860 Derrimut Road, Tarneit **Skeleton Creek** • 13, 15, 17 & 19, 21, 23 & 25 Angela Drive, Hoppers Crossing **Community Infrastructure Likely Flooded** **Skeleton Creek Tributary**	VICSES will provide warnings using EM-COP to Wyndham Council and appropriate agencies as required based on the predictions provided by BoM regarding flood levels and the risk of Flash Flooding. The VICSES RDO in conjunction with the Regional Agency Commander will maintain operational awareness and form an appropriate response arrangement to suit the level of incident

Creek Height and/or Flow	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		• Flooding to the rear of the Islamic Schools of Victoria (Al-Taqwa) at 860 Derrimut Road, Tarneit **Skeleton Creek** • Skeleton Creek Walking & Bicycle Trail likely flooded in parts between Leakes Road, Truganina and Bayside Drive, Point Cook **Water Over Road (Roads in red are Department of Transport operated roads)** **Skeleton Creek** • Boundary Road, Truganina, between Derrimut Road and Woods Road • Princes Freeway, Hoppers Crossing at Skeleton Creek crossing **Dry Creek** • Kenning Road, Tarneit • Tarneit Road, Tarneit at Dry Creek crossing • Dohertys Road, Tarneit between Tarneit Road and Derrimut Road **Dry Creek Tributary** • Davis Road, Mount Cottrell south of Kenning Road • Derrimut Road, Tarneit north of Dohertys Road • Dohertys Road, Tarneit, east of Derrimut Road at a dip **Forsyth Drain** • Dohertys Road, Truganina, west of Woods Road	VICSES to respond on a request-by-request basis. Council and VicRoads (as appropriate) to provide road closure signage under predetermined arrangements

Table C3.7 – Breakdown of likely consequences at various Hoppers Crossing gauge level heights along Skeleton Creek with operational considerations

FLOOD INTELLIGENCE CARD – SKELETON CREEK'S STORMWATER TRIBUTARIES (UNGAUGED)

Version 4 – May 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:	**Skeleton Creek at Hoppers Crossing**
LOCATION:	**Sayers Road, Truganina**
RECENT RAINFALL:	**https://www.melbournewater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/231110A**

MELWAY REFERENCE:	**203 A6**
GAUGE NUMBER	**231110A**
GAUGE TYPE	**Stream Level & Rain**

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
10mm in 10 mins; 17mm in 30 mins; 22mm in 1 hour; 28mm in 2 hours; 31mm in 3 hours; or 40mm 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 close to the primary building location)** **4 Properties in Total** **Local Drainage** • Units 1-4/51 Morris Road, Hoppers Crossing **Water Over Road (over 30cm depth)** **(Roads in red are Department of Transport operated roads)** **Local Drainage** • Bayliss Avenue, Hoppers Crossing • Casuarina Close, Hoppers Crossing • Heaths Road east bound lanes at Hampstead Drive, Hoppers Crossing • Kennedy Court, Hoppers Crossing • Miller Court, Hoppers Crossing • Morris Road at Old Geelong Road, Hoppers Crossing • Stella Way, Hoppers Crossing	
15mm in 10 mins; 25mm in 30 mins; 32mm in 1 hour; 40mm in 2 hours;	5% AEP (20-year ARI)	**Properties at Flood Risk (over 30cm depth in yard close to the primary building location)** **10 Properties in Total** **Hoppers Crossing Drain** • 16, 18 & 20 Bayliss Avenue, Hoppers Crossing **Local Drainage**	

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
45mm in 3 hours; or 57mm 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.		• Units 1-4/51 Morris Road, Hoppers Crossing • 1/9A, 2/9A & 3/9A Mossifiel Drive, Hoppers Crossing **Water Over Road (over 30cm depth)** **(Roads in red are Department of Transport operated roads)** **Hoppers Crossing Drain** • Hogans Road at Elder Road, Hoppers Crossing • Virgilla Drive, Hoppers Crossing **Local Drainage** • Bayliss Avenue, Hoppers Crossing • Casuarina Close, Hoppers Crossing • Colliet Place, Hoppers Crossing • Darus Court, Hoppers Crossing • Dunlop Road, Hoppers Crossing • Enea Place, Hoppers Crossing • Heaths Road east bound lanes at Hampstead Drive, Hoppers Crossing • Industrial Avenue, Hoppers Crossing • Kennedy Court, Hoppers Crossing • Malachite Drive, Tarneit • Miller Court, Hoppers Crossing • Morris Road at Kingston Boulevard, Hoppers Crossing • Morris Road at Old Geelong Road, Hoppers Crossing • Perkins Avenue, Hoppers Crossing • Player Close, Hoppers Crossing • Stella Way, Hoppers Crossing • Wynarka Drive, Hoppers Crossing **Sayers Drain** • Germander Court, Hoppers Crossing **Tarneit Creek** • Poplar Boulevard at Derrimut Road, Tarneit	
22mm in 10 mins; 37mm in 30 mins; 46mm in 1 hour; 57mm in 2 hours; 65mm in 3 hours; or 81mm in 6 hours Note: rainfall depths are a very rough method of estimating flood events	1% AEP (100-year ARI)	**Properties at Flood Risk (over 30cm depth in yard close to the primary building location)** **10 Properties in Total** **Hoppers Crossing Drain** • 16, 18 & 20 Bayliss Avenue, Hoppers Crossing **Local Drainage** • Units 1-4/51 Morris Road, Hoppers Crossing • 1/9A, 2/9A & 3/9A Mossifiel Drive, Hoppers Crossing **Community Infrastructure Likely Flooded** • Mossfiel Kindergarten • Mossfiel Soccer and Rugby Clubs	VICSES will provide warnings using EM-COP to Wyndham 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

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
and have been used due to the ungagged nature of the catchment. This should be used as a guide only.		• Wyndham Village Shopping Centre **Water Over Road (Over 30cm depth) (Roads in red are Department of Transport operated roads)** **Hoppers Crossing Drain** • Hogans Road at Elder Road, Hoppers Crossing • Virgilla Drive, Hoppers Crossing **Local Drainage** • Banksia Crescent, Hoppers Crossing • Bayliss Avenue, Hoppers Crossing • Bethany Road at Hogans Road, Hoppers Crossing • Burge Crescent, Hoppers Crossing • Casuarina Close, Hoppers Crossing • Clay Avenue, Hoppers Crossing • Colliet Place, Hoppers Crossing • Crowe Street, Hoppers Crossing • Darus Court, Hoppers Crossing • Dunlop Road, Hoppers Crossing • Dyer Street, Hoppers Crossing • Enea Place, Hoppers Crossing • Giverny Drive, Tarneit • Golden Ash Grove, Hoppers Crossing • Guinane Avenue, Hoppers Crossing • Heaths Road east bound lanes at Hampstead Drive, Hoppers Crossing • Industrial Avenue, Hoppers Crossing • Kennedy Court, Hoppers Crossing • Kingston Boulevard, Hoppers Crossing • Malachite Drive, Tarneit • Matlock Street, Hoppers Crossing • Miller Court, Hoppers Crossing • Morris Road at Kingston Boulevard, Hoppers Crossing • Morris Road at Old Geelong Road, Hoppers Crossing • O'Neil Avenue, Hoppers Crossing • Perkins Avenue, Hoppers Crossing • Player Close, Hoppers Crossing • Quarrion Court, Hoppers Crossing • Raemur Court, Hoppers Crossing • Roberts Avenue, Hoppers Crossing • Stella Way, Hoppers Crossing • Wynarka Drive, Hoppers Crossing	response arrangement to suit the level of incident VICSES to respond on a request-by-request basis. Council and VicRoads (as appropriate) to provide road closure signage under predetermined arrangements

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		Sayers Drain • Jasmine Close, Hoppers Crossing • Germander Court, Hoppers Crossing **Tarneit Creek** • Poplar Boulevard at Derrimut Road, Tarneit	

Table C3.8 – Breakdown of possible consequences at various rainfall intensities around Hoppers Crossing with operational considerations

APPENDIX C4 – D1 DRAIN FLOOD EMERGENCY PLAN

Overview of Flooding Consequences

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Summary of Consequences in a 1% AEP (100yr ARI) flood along the D1 Drain					
Property					
Properties	**107**				
Residential	87				
Commercial	0				
Industrial	0				
Public Land	4				
Rural	16				
Community Infrastructure					
Care Facilities	1	Glendale Aged Care Hostel			
Community Venues	1	Encore Events Centre carpark			
Essential Infrastructure					
Major Roads	2	Heaths Road; Princes Highway			
Sewerage Facilities	2	Sewer Emergency Relief Points			
Drainage Facilities	3	Retarding Basins			
Tourism / Recreation					
Recreation Facilities	1	Heathdale Glen Orden Wetlands			
Government Boundaries					
Local Gov't Areas	1	Wyndham	CMA	1	Port Phillip & Westernport
Adjacent LGAs	0		CFA District	1	District 14
SES Unit Area	1	Wyndham	FRV District	0	

Table C4.1 – Consequence Summary of 1% AEP flood along the D1 Drain

Gauges and Warnings

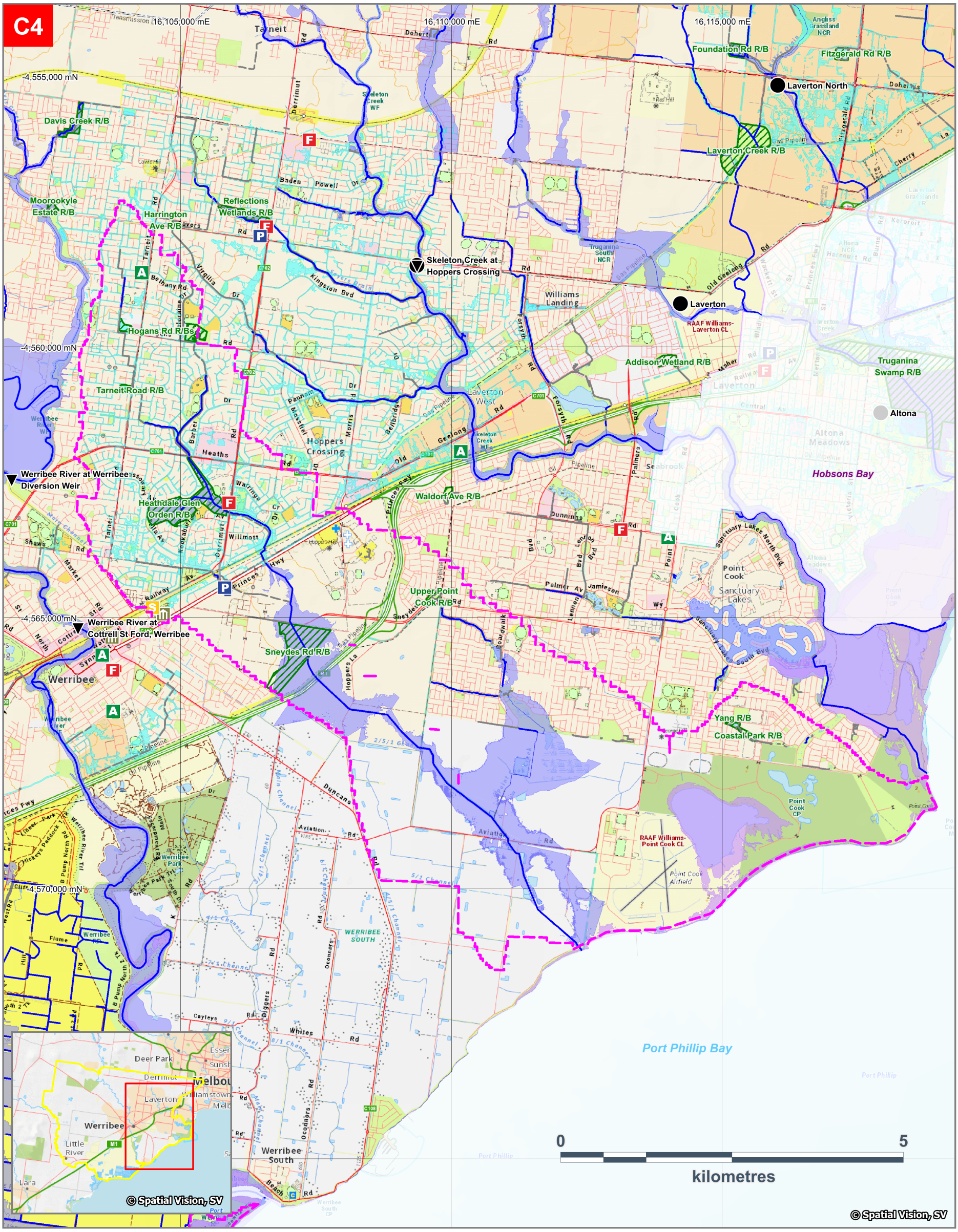
Neither the Bureau of Meteorology nor Melbourne Water currently provides flood forecasts for the D1 Drain. All flood response actions must therefore be driven by rainfall and / or river level observations. Telemetered water level / flood gauges are located at Skeleton Creek at Hoppers Crossing within the Skeleton Creek catchment.

Gauge	Station No.	Location	Owner	Stream Level & Flow Gauge	Rain Gauge	Melway Ref
Skeleton Creek at Hoppers Crossing	231110A	East side of the creek, south side of Sayers Road bridge, Truganina	Melbourne Water	✓	✓	203 A6

Table C4.2 – Gauges adjacent to the D1 Drain 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.

Area Map of Flood Risk within the D1 Drain catchment



Map Produced by VICSES May 2022.

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WYNDHAM CITY

Version 4: May 2022

C4 - Areas of Flood Risk within the D1 Drain catchment

- 1% AEP Storm Surge Extent
- 1% AEP Flash Flood Extent
- 1% AEP Riverine Flood Extent
- Melbourne Water Retarding Basin
- Melbourne Water Stormwater Drain
- Waterway
- Boundary for this Appendix
- Stream Level Gauge
- Rain Gauge
- State Emergency Service
- Municipal Office
- Police Station
- Fire Station
- Ambulance Station

LAND USE

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

SES VICTORIA State Government Melbourne Water

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Figure C4 – Areas of flood risk around the D1 Drain in Wyndham City

Properties at Flood Risk

Properties listed in the table below are at risk from flooding (over 30cm depth close to the primary building location) from the top of the D1 Drain catchment to the Princes Hwy in Werribee. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the D1 Drain (GHD, February 2021) 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 (over 30cm depth close to the primary building location)						
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				
	✓	✓	7 Albatross Avenue	Werribee	Local Drainage	Flash
		✓	9 Albatross Avenue	Werribee	Local Drainage	Flash
✓	✓	✓	1 Brolga Court	Werribee	Local Drainage	Flash
✓	✓	✓	2 Brolga Court	Werribee	Local Drainage	Flash
		✓	6 Brolga Court	Werribee	Local Drainage	Flash
	✓	✓	7 Brolga Court	Werribee	Local Drainage	Flash
	✓	✓	1A Budgie Court	Werribee	Local Drainage	Flash
		✓	2 Budgie Court	Werribee	Local Drainage	Flash
		✓	3 Budgie Court	Werribee	Local Drainage	Flash
	✓	✓	5 Budgie Court	Werribee	Local Drainage	Flash
		✓	6 Budgie Court	Werribee	Local Drainage	Flash
	✓	✓	29 Claremont Crescent	Hoppers Crossing	D1 Drain	Flash
✓	✓	✓	31 Claremont Crescent	Hoppers Crossing	D1 Drain	Flash
✓	✓	✓	33 Claremont Crescent	Hoppers Crossing	D1 Drain	Flash
✓	✓	✓	35 Claremont Crescent	Hoppers Crossing	D1 Drain	Flash
		✓	37 Claremont Crescent	Hoppers Crossing	D1 Drain	Flash
		✓	24 Cormorant Crescent	Werribee	Local Drainage	Flash
	✓	✓	26 Cormorant Crescent	Werribee	Local Drainage	Flash
✓	✓	✓	28 Cormorant Crescent	Werribee	Local Drainage	Flash
✓	✓	✓	30 Cormorant Crescent	Werribee	Local Drainage	Flash
✓	✓	✓	32 Cormorant Crescent	Werribee	Local Drainage	Flash
		✓	1/33 Cormorant Crescent	Werribee	Shaws Road Drain	Flash
	✓	✓	34 Cormorant Crescent	Werribee	Local Drainage	Flash
	✓	✓	35 Cormorant Crescent	Werribee	Shaws Road Drain	Flash
	✓	✓	36 Cormorant Crescent	Werribee	Local Drainage	Flash
	✓	✓	37 Cormorant Crescent	Werribee	Shaws Road Drain	Flash
	✓	✓	38 Cormorant Crescent	Werribee	Local Drainage	Flash
	✓	✓	39 Cormorant Crescent	Werribee	Shaws Road Drain	Flash
	✓	✓	40 Cormorant Crescent	Werribee	Local Drainage	Flash

Properties at risk from Flooding (over 30cm depth close to the primary building location)						
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				
✓	✓	✓	41 Cormorant Crescent	Werribee	Shaws Road Drain	Flash
	✓	✓	42 Cormorant Crescent	Werribee	Local Drainage	Flash
✓	✓	✓	43 Cormorant Crescent	Werribee	Shaws Road Drain	Flash
	✓	✓	44 Cormorant Crescent	Werribee	Local Drainage	Flash
✓	✓	✓	45 Cormorant Crescent	Werribee	Shaws Road Drain	Flash
	✓	✓	46 Cormorant Crescent	Werribee	Local Drainage	Flash
✓	✓	✓	47 Cormorant Crescent	Werribee	Shaws Road Drain	Flash
	✓	✓	48 Cormorant Crescent	Werribee	Local Drainage	Flash
		✓	48A Cormorant Crescent	Werribee	Local Drainage	Flash
✓	✓	✓	49 Cormorant Crescent	Werribee	Shaws Road Drain	Flash
	✓	✓	51 Cormorant Crescent	Werribee	Shaws Road Drain	Flash
	✓	✓	53 Cormorant Crescent	Werribee	Shaws Road Drain	Flash
	✓	✓	55 Cormorant Crescent	Werribee	Shaws Road Drain	Flash
	✓	✓	57 Cormorant Crescent	Werribee	Shaws Road Drain	Flash
	✓	✓	59 Cormorant Crescent	Werribee	Shaws Road Drain	Flash
	✓	✓	61 Cormorant Crescent	Werribee	Shaws Road Drain	Flash
	✓	✓	63 Cormorant Crescent	Werribee	Shaws Road Drain	Flash
		✓	65 Cormorant Crescent	Werribee	Shaws Road Drain	Flash
		✓	2 David Court	Werribee	D1 Drain	Flash
		✓	4 David Court	Werribee	D1 Drain	Flash
		✓	6 David Court	Werribee	D1 Drain	Flash
		✓	8 David Court	Werribee	D1 Drain	Flash
		✓	78A Derrimut Road	Hoppers Crossing	D1 Drain	Flash
		✓	80-82 Derrimut Road	Hoppers Crossing	D1 Drain	Flash
		✓	86 Derrimut Road	Hoppers Crossing	D1 Drain	Flash
		✓	265 Heaths Road	Werribee	D1 Drain	Flash
		✓	16 Huntingfield Drive	Hoppers Crossing	D1 Drain	Flash
		✓	17 Huntingfield Drive	Hoppers Crossing	D1 Drain	Flash
		✓	18 Huntingfield Drive	Hoppers Crossing	D1 Drain	Flash
		✓	19 Huntingfield Drive	Hoppers Crossing	D1 Drain	Flash
		✓	20 Huntingfield Drive	Hoppers Crossing	D1 Drain	Flash
		✓	21 Huntingfield Drive	Hoppers Crossing	D1 Drain	Flash
		✓	22 Huntingfield Drive	Hoppers Crossing	D1 Drain	Flash
		✓	23 Huntingfield Drive	Hoppers Crossing	D1 Drain	Flash
		✓	25 Huntingfield Drive	Hoppers Crossing	D1 Drain	Flash
		✓	27 Huntingfield Drive	Hoppers Crossing	D1 Drain	Flash
		✓	29 Huntingfield Drive	Hoppers Crossing	D1 Drain	Flash
		✓	1/31 Huntingfield Drive	Hoppers Crossing	D1 Drain	Flash
		✓	2/31 Huntingfield Drive	Hoppers Crossing	D1 Drain	Flash
		✓	3/31 Huntingfield Drive	Hoppers Crossing	D1 Drain	Flash
		✓	33 Huntingfield Drive	Hoppers Crossing	D1 Drain	Flash
		✓	35 Huntingfield Drive	Hoppers Crossing	D1 Drain	Flash
		✓	37 Huntingfield Drive	Hoppers Crossing	D1 Drain	Flash

Properties at risk from Flooding (over 30cm depth close to the primary building location)						
Residential			Commercial	Industrial	Rural	Public Use
Street No. at Risk in AEP Event			Address	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
20% AEP	5% AEP	1% AEP				
		✓	39 Huntingfield Drive	Hoppers Crossing	D1 Drain	Flash
		✓	5 Kookaburra Avenue	Werribee	Local Drainage	Flash
	✓	✓	7 Kookaburra Avenue	Werribee	Local Drainage	Flash
✓	✓	✓	9 Kookaburra Avenue	Werribee	Local Drainage	Flash
✓	✓	✓	11 Kookaburra Avenue	Werribee	Local Drainage	Flash
		✓	12 Kookaburra Avenue	Werribee	Local Drainage	Flash
✓	✓	✓	13 Kookaburra Avenue	Werribee	Local Drainage	Flash
		✓	14 Kookaburra Avenue	Werribee	Local Drainage	Flash
	✓	✓	15 Kookaburra Avenue	Werribee	Local Drainage	Flash
		✓	16 Kookaburra Avenue	Werribee	Local Drainage	Flash
	✓	✓	11 Magpie Court	Werribee	Local Drainage	Flash
		✓	46 Mckenzie Crescent	Hoppers Crossing	D1 Drain	Flash
		✓	48 Mckenzie Crescent	Hoppers Crossing	D1 Drain	Flash
	✓	✓	6 Sanderling Street	Werribee	Local Drainage	Flash
✓	✓	✓	3 Snipe Court	Werribee	Local Drainage	Flash
		✓	23 Tamarind Crescent	Werribee	Local Drainage	Flash
✓	✓	✓	25 Tamarind Crescent	Werribee	Local Drainage	Flash
✓	✓	✓	27 Tamarind Crescent	Werribee	Local Drainage	Flash
		✓	29 Tamarind Crescent	Werribee	Local Drainage	Flash
Totals						
19	47	91				

Table C4.3 – Properties at risk of flooding along the D1 Drain north of the Princes Hwy, Werribee in Wyndham City

Properties listed in the table below are at risk from flooding (where primary building footprint is within the flood extent) along the D1 Drain south of the Princes Hwy in Werribee to Port Phillip Bay. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the D1 Drain (AECOM, November 2012) flood mapping and risk assessment program.

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Properties at risk from Flooding along the D1 Drain during a 1% AEP event				
Residential	Commercial	Industrial	Rural	Public Use
Street No. at Risk	Street	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
785	Aviation Road	Werribee South	D1 Drain	Riverine
787	Aviation Road	Werribee South	D1 Drain	Riverine
800	Aviation Road	Point Cook	D1 Drain	Riverine
810	Aviation Road	Werribee South	D1 Drain	Riverine
830	Aviation Road	Werribee South	D1 Drain	Riverine
832	Aviation Road	Werribee South	D1 Drain	Riverine
40	Cunninghams Road	Werribee South	D1 Drain	Riverine

Properties at risk from Flooding along the D1 Drain during a 1% AEP event				
Residential	Commercial	Industrial	Rural	Public Use

Street No. at Risk	Street	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
51	Cunninghams Road	Werribee South	D1 Drain	Riverine
53	Cunninghams Road	Werribee South	D1 Drain	Riverine
59	Cunninghams Road	Werribee South	D1 Drain	Riverine
1	Lignum Road	Point Cook	D1 Drain	Riverine
5	Lignum Road	Point Cook	D1 Drain	Riverine
30	Rifle Range Road	Werribee South	D1 Drain	Riverine
55	Rifle Range Road	Werribee South	D1 Drain	Riverine
60	Rifle Range Road	Werribee South	D1 Drain	Riverine
65	Rifle Range Road	Werribee South	D1 Drain	Riverine

Total
16

Table C4.4 – Properties at risk of flooding along the D1 Drain south of the Princes Hwy in Wyndham City

Isolation

No major isolation risks exist for areas around Hoppers Crossing, Werribee & Point Cook due to the D1 Drain flooding during a 1% AEP (100yr ARI) event. Some localised short-duration isolation may occur due to flash flooding.

Essential Infrastructure

During an event, see the Public Transport Victoria's Website for details on delays or alterations to services. http://ptv.vic.gov.au/live-travel-updates/. A map of Public Transport routes within Wyndham City is available via the website at: https://www.ptv.vic.gov.au/assets/PTV-default-site/more/maps/Local-area-maps/Metropolitan/52_Wyndham_LAM_September-2021.pdf

Apart from the roads outlined below, all other essential infrastructure and services areas around Hoppers Crossing, Werribee & Point Cook 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 Hoppers Crossing, Werribee & Point Cook around the D1 Drain. Check the VicRoads website for more details: http://alerts.vicroads.vic.gov.au/

Department of Transport (VicRoads) Roads likely flooded in a 1% AEP (100yr ARI) event
• Princes Highway eastbound lanes, Werribee at David Court

Table C4.5 – Department of Transport (VicRoads) Possible Road Closures during a flooding event

Wyndham City Council Roads likely flooded in a 1% AEP (100yr ARI) event			
HOPPERS CROSSING	• Sierra Court	• Cobbler Street	• Pigeon Street
• Barber Drive	• Warringa Crescent	• Cormorant Crescent	• Poinciana Court
• Bethany Road	**POINT COOK**	• David Court	• Princes Highway
• Claremont Crescent	• Aviation Road	• Egan Close	• Rosella Avenue
• Dowling Avenue	• Cunninghams Road	• Grouse Court	• Rosella Avenue

• Golden Square Crescent	• Hacketts Road	• Hakea Court	• Sanderling Street
• Hampstead Drive	• Lignum Road	• Harvest Way	• Silvereye Crescent
• Huntingfield Drive	• Rifle Range Road	• Hawk Court	• Sneydes Road
• Johnson Avenue	**TARNEIT**	• Kauri Court	• Tamarind Crescent
• Kenmore Close	• Castleton Avenue	• Kookaburra Avenue	• Thornbill Drive
• Madison Drive	• Meadow Way	• Magpie Court	• Totara Court
• Mckenzie Crescent	**WERRIBEE**	• Miner Court	• Tracey Street
• Mcveigh Place	• Albatross Avenue	• Niagara Way	**WERRIBEE SOUTH**
• Paloma Court	• Brolga Court	• Osprey Street	• Hoppers Lane
• Sheedy Road	• Budgie Court	• Petrel Court	

Table C4.6 – Wyndham City Council Possible flooded roads due to flash flooding over 30cm depth

Flood Mitigation

Retarding Basins

A number of retarding basins have been constructed in the D1 Drain catchment to help reduce flood risks as they capture the peak of a storm and release it in a controlled manner. As residential development continues, more retarding basins will be constructed to help manage peak flows. To view their locations and connecting waterway/drainage systems, see mapping in **Appendix F**.

Melbourne Water Retarding Basin	On Drain/ Waterway	Area	Storage Capacity	Spillway Crest Level	Full Supply Level	Embankment Crest Level	ANCOLD Hazard Rating	Houses In Flow Path (dam breach)	Melway Reference
Heathdale Glen Orden	D1 Drain	29.77 ha	477 ML	nil	Unavailable	Unavailable	High C	67	206 C3
Hogans Road No. 1	D1 Drain	4.60 ha	37 ML	Unavailable	Unavailable	In cut	Very Low	0	202 C9
Hogans Road No.2	Tarneit Road Drain	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable	234 K9
Sneydes Road	D1 Drain	29.97 ha	720 ML	Unavailable	Unavailable	Unavailable	High C	36	206 G8
Tarneit Road	Tarneit Road Drain	1.32 ha	6.0 ML	nil	Unavailable	In cut	High C	13	234 K11
Upper Point Cook	Point Cook Creek	2.34 ha	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable	207 B6
Yang	South Saltworks Moat	1.23 ha	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable	208 C11

Table C4.6 – Melbourne Water Retarding Basins within the D1 Drain catchment in Wyndham City

No formal Pumping Stations or Levees exist along the D1 Drain.

Sewerage Infrastructure

Sewerage Infrastructure of note during a severe flood event located around the D1 Drain are contained within the following two tables.

Sewer Pumping Stations

Melbourne Water Sewerage Pumping Station	On Drain / Waterway	Number of Pumps	Location	Melway Reference
Hoppers Crossing Pumping Complex	Local Drainage	Two	Melbourne Water Hoppers Crossing Pumping Complex on Old Sneydes Road, Werribee	206 J5

Table C4.7 – Sewer Pumping Stations within the D1 Drain Catchment in Wyndham City

Sewer Emergency Relief Points

There are Sewer Emergency Relief Points along the D1 Drain and its tributaries that will affect likely affect floodwater conditions should they be activated. 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.

On Drain / Waterway	Bank / Side of Waterway	Location	Asset Owner	Melway Reference
D1 Drain	North	Claremont Crescent, Hoppers Crossing	City West Water	206 E3
Point Cook Creek	East	Featherbrook Drive, Point Cook	City West Water	207 F10

Table C4.8 – Sewer Emergency Relief Points in the D1 Drain Catchment in Wyndham City

Control, Command and Coordination

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

Flood Impacts and Operational Considerations (Intelligence Cards)

The tables on the following pages provide a breakdown of the possible consequences of flooding along the D1 Drain at various rain totals. These tables are to be used only as a guide as no two floods at a location will have identical impacts.

Intelligence Cards have been included for the following locations:

- D1 Drain

FLOOD INTELLIGENCE CARD – D1 DRAIN (UNGAUGED)

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

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

CLOSEST RAIN GAUGE:	**Skeleton Creek at Hoppers Crossing**
LOCATION:	**Sayers Road, Truganina**
RECENT RAINFALL:	**https://www.melbournewater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/231110A**

MELWAY REFERENCE:	**203 A6**
GAUGE NUMBER	**231110A**
GAUGE TYPE	**Stream Level & Rain**

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	**Annual Exceedance Probability (% AEP)**	**Consequence / Impact**	**Operational Considerations**
10mm in 10 mins; 17mm in 30 mins; 22mm in 1 hour; 28mm in 2 hours; 31mm in 3 hours; or 40mm 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 close to the primary building location)** **19 Properties in Total** **D1 Drain** • 31, 33 & 35 Claremont Crescent, Hoppers Crossing **Local Drainage** • 1 & 2 Brolga Court, Werribee • 28, 30 & 32 Cormorant Crescent, Werribee • 9, 11 & 13 Kookaburra Avenue, Werribee • 3 Snipe Court, Werribee • 25 & 27 Tamarind Crescent, Werribee **Shaws Road Drain** • 41, 43, 45, 47 & 49 Cormorant Crescent, Werribee **Community Infrastructure Likely Flooded** • Heathdale Glen Orden Wetlands at 53-57 Kookaburra Avenue, Werribee **Water Over Road (over 30cm depth)** **(Roads in red are Department of Transport operated roads)** **Local Drainage** • Barber Dr, Hoppers Crossing • Brolga Ct, Werribee • Budgie Ct, Werribee • Claremont Cr, Hoppers Crossing • Cobbler St, Werribee	

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		• Cormorant Cr, Werribee • Grouse Ct, Werribee • Hampstead Dr, Hoppers Crossing • Madison Dr, Hoppers Crossing • Magpie Ct, Werribee • Miner Ct, Werribee • Paloma Ct, Hoppers Crossing • Rosella Av, Werribee • Tamarind Cr, Werribee **Shaws Road Drain** • Albatross Av, Werribee • Kookaburra Av, Werribee • Sanderling St, Werribee	
15mm in 10 mins; 25mm in 30 mins; 32mm in 1 hour; 40mm in 2 hours; 45mm in 3 hours; or 57mm 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.	5% AEP (20-year ARI)	**Properties at Flood Risk (over 30cm depth in yard close to the primary building location)** **47 Properties in Total** **D1 Drain** • 29, 31, 33 & 35 Claremont Crescent, Hoppers Crossing **Local Drainage** • 7 Albatross Avenue, Werribee • 1, 2 & 7 Brolga Court, Werribee • 1A & 5 Budgie Court, Werribee • 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46 & 48 Cormorant Crescent, Werribee • 7, 9, 11, 13 & 15 Kookaburra Avenue, Werribee • 11 Magpie Court, Werribee • 6 Sanderling Street, Werribee • 3 Snipe Court, Werribee • 25 & 27 Tamarind Crescent, Werribee **Shaws Road Drain** • 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61 & 63 Cormorant Crescent, Werribee **Community Infrastructure Likely Flooded** • Aqua Pulse & Encore Events Centre car park at 80-82 Derrimut Road, Hoppers Crossing • Glendale Aged Care Hostel at 265 Heaths Road, Werribee • Heathdale Glen Orden Wetlands at 53-57 Kookaburra Avenue, Werribee **Water Over Road (over 30cm depth)** **(Roads in red are Department of Transport operated roads)** **D1 Drain** • Huntingfield Dr, Hoppers Crossing **Local Drainage** • Barber Dr, Hoppers Crossing • Brolga Ct, Werribee	

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		• Budgie Ct, Werribee • Claremont Cr, Hoppers Crossing • Cobbler St, Werribee • Cormorant Cr, Werribee • Grouse Ct, Werribee • Hampstead Dr, Hoppers Crossing • Harvest Way, Werribee • Hawk Ct, Werribee • Madison Dr, Hoppers Crossing • Magpie Ct, Werribee • Mckenzie Cr, Hoppers Crossing • Miner Ct, Werribee • Niagara Way, Werribee • Paloma Ct, Hoppers Crossing • Petrel Ct, Werribee • Poinciana Ct, Werribee • Rosella Av, Werribee • Tamarind Cr, Werribee • Totara Ct, Werribee • Warringa Cr, Hoppers Crossing **Shaws Road Drain** • Albatross Av, Werribee • Kookaburra Av, Werribee • Sanderling St, Werribee	
21mm in 10 mins; 34mm in 30 mins; 43mm in 1 hour; 52mm in 2 hours; 59mm in 3 hours; or 74mm in 6 hours Note: rainfall depths are a very rough method of estimating flood events and have been used due to the ungagged nature of the catchment. This should be used as a guide only.	1% AEP (100-year ARI)	**Properties at Flood Risk (over 30cm depth in yard close to the primary building location)** **107 Properties in Total** **D1 Drain** • 785, 787, 800, 810, 830 & 832 Aviation Road, Werribee South • 29, 31, 33, 35 & 37 Claremont Crescent, Hoppers Crossing • 40, 51, 53 & 59 Cunninghams Road, Werribee South • 2, 4, 6 & 8 David Court, Werribee • 78A, 80-82 & 86 Derrimut Road, Hoppers Crossing • 265 Heaths Road, Werribee • 16, 17, 18, 19, 20, 21, 22, 23, 25, 27, 29, Units 1-3/31, 33, 35, 37 & 39 Huntingfield Drive, Hoppers Crossing • 1 & 5 Lignum Road, Point Cook • 46 & 48 Mckenzie Crescent, Hoppers Crossing • 30, 55, 60 & 65 Rifle Range Road, Werribee South **Local Drainage** • 7 & 9 Albatross Avenue, Werribee	VICSES will provide warnings using EM-COP to Wyndham 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

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		• 1, 2, 6 & 7 Brolga Court, Werribee • 1A, 2, 3, 5 & 6 Budgie Court, Werribee • 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48 & 48A Cormorant Crescent, Werribee • 5, 7, 9, 11, 12, 13, 14, 15 & 16 Kookaburra Avenue, Werribee • 11 Magpie Court, Werribee • 6 Sanderling Street, Werribee • 3 Snipe Court, Werribee • 23, 25, 27 & 29 Tamarind Crescent, Werribee **Shaws Road Drain** • 1/33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63 & 65 Cormorant Crescent, Werribee **Community Infrastructure Likely Flooded** • Aqua Pulse & Encore Events Centre car park at 80-82 Derrimut Road, Hoppers Crossing • Glendale Aged Care Hostel at 265 Heaths Road, Werribee • Heathdale Glen Orden Wetlands at 53-57 Kookaburra Avenue, Werribee **Water Over Road (over 30cm depth (Roads in red are Department of Transport operated roads)** **D1 Drain** • Aviation Road, Point Cook • Bethany Rd, Hoppers Crossing • Cunninghams Road, Point Cook • David Ct, Werribee • Dowling Av, Hoppers Crossing • Hacketts Road, Point Cook • Hoppers Lane, Werribee South • Huntingfield Dr, Hoppers Crossing • Lignum Road, Point Cook • Princes Highway eastbound lanes, Werribee at David Court • Rifle Range Road, Point Cook **Local Drainage** • Barber Dr, Hoppers Crossing • Brolga Ct, Werribee • Budgie Ct, Werribee • Claremont Cr, Hoppers Crossing • Cobbler St, Werribee • Cormorant Cr, Werribee • Egan Cl, Werribee • Grouse Ct, Werribee • Hampstead Dr, Hoppers Crossing • Harvest Way, Werribee • Hawk Ct, Werribee	VICSES to respond on a request-by-request basis. Council and VicRoads (as appropriate) to provide road closure signage under predetermined arrangements

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		• Johnson Av, Hoppers Crossing • Kauri Ct, Werribee • Kenmore Cl, Hoppers Crossing • Madison Dr, Hoppers Crossing • Magpie Ct, Werribee • Mckenzie Cr, Hoppers Crossing • Mcveigh Pl, Hoppers Crossing • Miner Ct, Werribee • Niagara Way, Werribee • Osprey St, Werribee • Paloma Ct, Hoppers Crossing • Petrel Ct, Werribee • Pigeon St, Werribee • Poinciana Ct, Werribee • Rosella Av, Werribee • Sheedy Rd, Hoppers Crossing • Sierra Ct, Hoppers Crossing • Silvereye Cr, Werribee • Tamarind Cr, Werribee • Totara Ct, Werribee • Tracey St, Werribee • Warringa Cr, Hoppers Crossing **Shaws Road Drain** • Albatross Av, Werribee • Hakea Ct, Werribee • Kookaburra Av, Werribee • Sanderling St, Werribee • Thornbill Dr, Werribee **Tarneit Road Drain** • Castleton Av, Tarneit • Golden Square Cr, Hoppers Crossing • Meadow Way, Tarneit	

Table C4.9 – Breakdown of possible consequences at various rainfall intensities around the D1 Drain with operational considerations

APPENDIX C5 – LAVERTON NORTH & TRUGANINA FLOOD EMERGENCY PLAN

Overview of Flooding Consequences

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

Summary of Consequences in a 1% AEP (100yr ARI) flood around Laverton North and Truganina					
Property					
Properties	**11**				
Residential	0				
Commercial	0				
Industrial	11				
Public Land	0				
Rural	0				
Community Infrastructure					
Essential Infrastructure					
Major Roads	2	Dohertys Road and Fitzgerald Road			
Bus Routes	2	414; & 417			
Drainage Facilities	3	Retarding Basins			
Tourism / Recreation					
Government Boundaries					
Local Gov't Areas	1	Wyndham	CMA	1	Port Phillip & Westernport
Adjacent LGAs	2	Brimbank & Hobsons Bay	CFA District	0	
SES Unit Area	1	Wyndham	FRV District	1	Western

Table C5.1 – Consequence Summary of 1% AEP flood around Laverton North and Truganina

Gauges and Warnings

There is currently one gauge on Kororoit Creek that could be used to assist with public safety through the issue of flood warnings. This is at Deer Park in the City of Brimbank.

Warning Gauge	River Flood Class Level		
	Minor	Moderate	Major
Kororoit Creek at Deer Park	3.6m	4.0m	4.5m

Table C5.2 – Gauges with established flood class levels used for Flood Warning within Wyndham City

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

Gauge	Station No.	Location	Owner	Stream Level & Flow Gauge	Rain Gauge	Melway Ref
Kororoit Creek at Deer Park	231104A	North side of the creek along Millbank Drive, near Wandsworth Ave, Deer Park	Melbourne Water	✓	✓	25 C7
Kororoit Creek at Brooklyn	231107A	West bank of the creek, north side of the Federation Bicycle Trail bridge, Brooklyn	Melbourne Water	✓	✓	40 F10
Laverton North	231819	On Kayes Drain, south of Dohertys Road near Alex Fraser Drive, Laverton North	Melbourne Water		✓	39 E12
Laverton RAAF	87031	RAAF Williams Laverton Base	BoM		✓	53 A8

Table C5.2 – Gauges within the Kororoit Creek catchment monitoring flood levels for Wyndham City

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.

Area Map of Flood Risk around Laverton North and Truganina

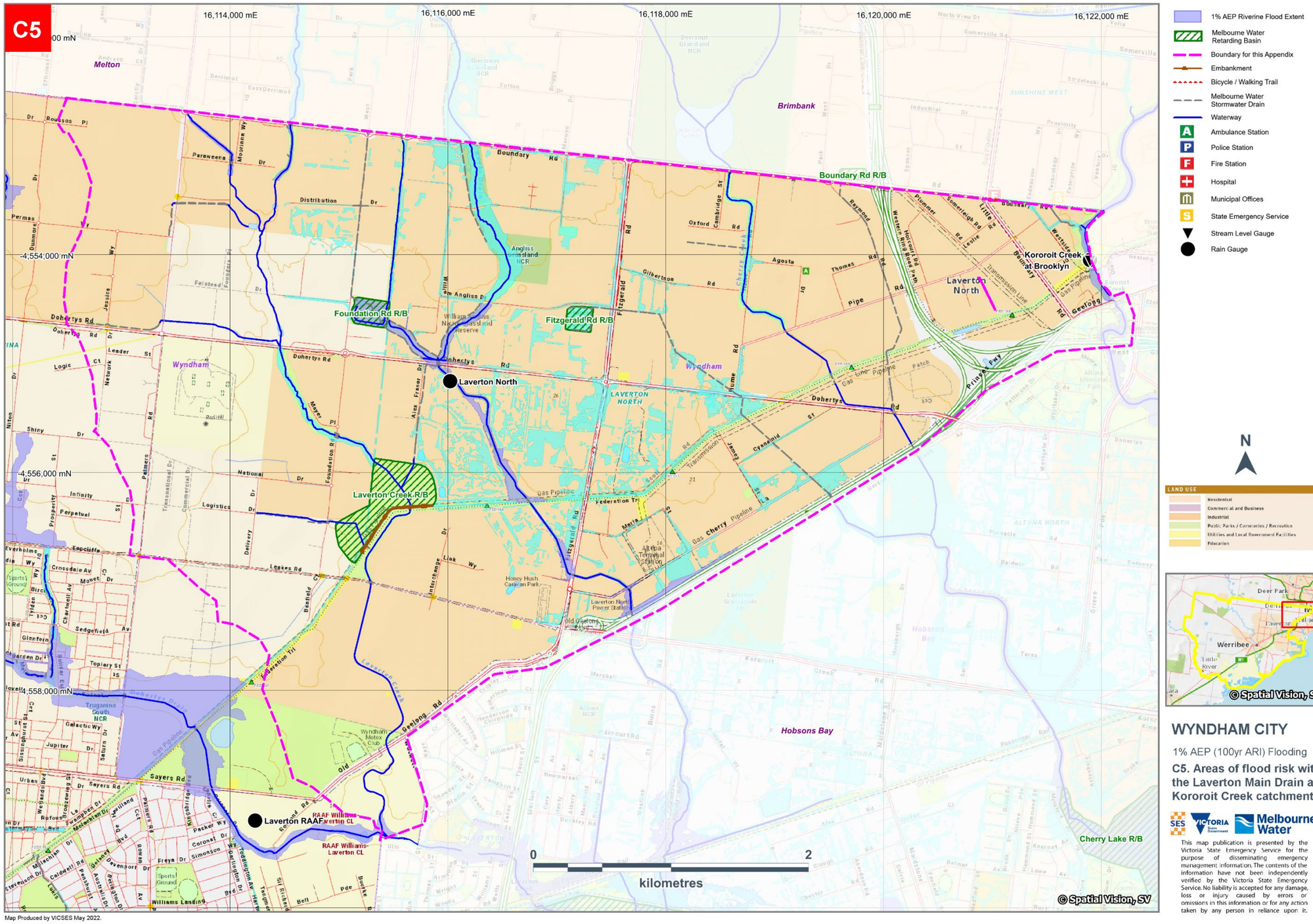

Figure C5 – Areas of flood risk around Laverton North and Truganina in the City of Wyndham; and area covered by this appendix

Properties at Flood Risk

Properties listed in the table below are at risk from flooding around Laverton North and Truganina where flooding is likely to occur over 30cm depth near the primary building location during a 1% AEP flood event. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Kororoit Creek (Lower) (Melbourne Water, May 2011), Cherrys Main Drain (Alluvium, August 2010), Kayes Drain (Engeny, August 2021) and the Humes Main Drain (Engeny, August 2017) 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 around Laverton North during a 1% AEP event				
Residential	Commercial	Industrial	Rural	Public Use

Street No. at Risk	Street	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
185-189	Boundary Road	Laverton North	Kayes Drain	Flash
1/120-124	Cherry Lane	Laverton North	Kayes Drain	Flash
127-145	Cherry Lane	Laverton North	Local Drainage	Flash
163	Cherry Lane	Laverton North	Local Drainage	Flash
63-83	Fitzgerald Road	Laverton North	Local Drainage	Flash
91-95	Fitzgerald Road	Laverton North	Local Drainage	Flash
97	Fitzgerald Road	Laverton North	Local Drainage	Flash
99	Fitzgerald Road	Laverton North	Local Drainage	Flash
101	Fitzgerald Road	Laverton North	Local Drainage	Flash
103	Fitzgerald Road	Laverton North	Local Drainage	Flash
105	Fitzgerald Road	Laverton North	Local Drainage	Flash

Total
11

Table C5.3 – Properties at risk of flooding around Laverton North and Truganina

Isolation

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

Essential Infrastructure

During an event, see the Public Transport Victoria's Website for details on delays or alterations to services. http://ptv.vic.gov.au/live-travel-updates/. A map of Public Transport routes within Wyndham is available via the website at: https://www.ptv.vic.gov.au/assets/PTV-default-site/more/maps/Local-area-maps/Metropolitan/52_Wyndham_LAM_September-2021.pdf

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

Road Closures

The following roads are subject to closure during flooding around Laverton North and Truganina. Check the VicRoads website for more details: http://alerts.vicroads.vic.gov.au/

Department of Transport (VicRoads) Roads likely flooded in a 1% AEP (100yr ARI) event
• Dohertys Road, Laverton North at Hume Road
• Fitzgerald Road, Laverton North south of Dohertys Road

Table C5.4 – Department of Transport (VicRoads) Possible Road Closures during a flooding event

Wyndham City Council Roads flooded in a 1% AEP (100yr ARI) event	
LAVERTON NORTH	• Dohertys Road at Alex Fraser Drive
• Boundary Road east of Fairbairn Road	• Progress Court
• Cherry Lane	• Silverton Close
• Cyanamid Street	

Table C5.5 – Wyndham City Council Possible flooded roads due to flash flooding

Flood Mitigation

Retarding Basins

A number of retarding basins have been constructed in the Laverton North and Truganina area to help reduce flood risks as they capture the peak of a storm and release it in a controlled manner. As residential development continues, more retarding basins will be constructed to help manage peak flows. To view their locations and connecting waterway/drainage systems, see mapping in **Appendix F**.

Melbourne Water Retarding Basin	On Drain/ Waterway	Area	Storage Capacity	Spillway Crest Level	Full Supply Level	Embankment Crest Level	ANCOLD Hazard Rating	Houses In Flow Path (dam breach)	Melway Reference
Fitzgerald Road	Humes Drain	3.48 ha	34.4 ML	Unavailable	Unavailable	Unavailable	Very Low	0	39 G11
Foundation Road	Imms Drain	4.88 ha	110 ML	24.8m AHD	Unavailable	25.4m AHD	High C	Unavailable	39 C11
Laverton Creek	Laverton Main Drain	20.67 ha	331 ML	Unavailable	Unavailable	20.15m AHD	High A	46	53 C2

Table C5.6 – Melbourne Water Retarding Basins around Laverton North

No formal Pumping Stations or Levees exist around Laverton North or Truganina.

Sewerage Infrastructure

Sewerage Infrastructure of note during a severe flood event located around Truganina and Laverton North is contained within the following table.

Sewer Emergency Relief Points

There are Sewer Emergency Relief Points along Dohertys 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
Dohertys Creek	South	City West Water	Bolivar Esplanade, Truganina	203 G5

Table C5.7 – Sewer Emergency Relief Points around Truganina and Laverton North in Wyndham City

Control, Command and Coordination

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

Flood Impacts and Operational Considerations (Intelligence Cards)

The tables on the following pages provide a breakdown of the possible consequences of flooding around Laverton North at various creek heights or rain totals within Wyndham City. These tables are to be used only as a guide as no two floods at a location will have identical impacts.

Intelligence Cards have been included for the following locations:

- Kororoit Creek at Brooklyn
- Stormwater Drains, Laverton North

FLOOD INTELLIGENCE CARD – BROOKLYN GAUGE, KORORoit CREEK

Version 2 – May 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 bank of the creek, north side of the Federation Bicycle Trail bridge, Brooklyn**
CURRENT LEVEL:	**https://www.melbournewater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/231107A**
STREAM:	**Kororoit Creek**
GAUGE NUMBER:	**231107A**
GAUGE ZERO:	**7.567m AHD**
GAUGE TYPE:	**Stream Level, Flow and Rain**

MELWAY REFERENCE:	**40 F10**
MINOR:	**Not Established**
MODERATE:	**Not Established**
MAJOR	**Not Established**
LEVEE HEIGHT:	**N/A**
HIGHEST RECORDED FLOOD:	**5.67m (7th March 1919)**

Creek Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
3.57m	20% AEP (5yr ARI) Flood Level	• Nil impacts expected in Wyndham City	
3.86m	10% AEP (10yr ARI) Flood Level	• Nil impacts expected in Wyndham City	
4.01m	February 2005 Flood Level peak		
4.33m	5% AEP (20yr ARI) Flood Level	• Nil impacts expected in Wyndham City	
4.90m	2% AEP (50yr ARI) Flood Level	• Nil impacts expected in Wyndham City	
5.33m	1% AEP (100yr ARI) Flood Level	• Nil impacts expected in Wyndham City	

Table C5.7 – Breakdown of likely consequences at various Brooklyn gauge level heights along Kororoit Creek with operational considerations

FLOOD INTELLIGENCE CARD – STORMWATER DRAINS, LAVERTON NORTH (UNGAUGED)

Version 2 – May 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:	**Laverton RAAF**
LOCATION:	**RAAF Williams Laverton Base**
RECENT RAINFALL:	**http://www.bom.gov.au/products/IDW60801/IDW60801.94449.shtml**

MELWAY REFERENCE:	**53 A8**
GAUGE NUMBER	**87031**
GAUGE TYPE	**Rain**

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
23mm in 10 mins; 37mm in 30 mins; 48mm in 1 hour; 60mm in 2 hours; 68mm in 3 hours; or 85mm in 6 hours Note: rainfall depths are a very rough method of estimating flood events and have been used due to the ungagged nature of the catchment. This should be used as a guide only.	1% AEP (100-year ARI)	• Note: It is not known at what level property and infrastructure contained below starts being flooded **Properties at Flood Risk** **11 Properties in Total** **Kayes Drain** • 185-189 Boundary Road, Laverton North • 1/120-124 Cherry Lane, Laverton North **Local Drainage** • 127-145 & 163 Cherry Lane, Laverton North • 63-83, 91-95, 97, 99, 101, 103 & 105 Fitzgerald Road, Laverton North **Water Over Road** **Fairbairn Road Drain** • Boundary Road, Laverton North east of Fairbairn Road • Progress Court, Laverton North • Silverton Close, Laverton North **Humes Main Drain** • Cherry Lane, Laverton North • Cyanamid Street, Laverton North • Dohertys Road, Laverton North at Hume Road • Fitzgerald Road, Laverton North south of Dohertys Road **Kayes Drain**	

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		• Dohertys Road at Alex Fraser Drive	

Table C5.8 – Breakdown of possible consequences at various rainfall intensities around Laverton North with operational considerations

APPENDIX C6 – LITTLE RIVER FLOOD EMERGENCY PLAN

Overview of Flooding Consequences

The Little River's highest recorded flow rate of 21,906 ML/d was seen on the 16th October 1983. There was no record of any significant impact outside the river incision.

A number of properties around the Old Melbourne Road area, Little River are likely to be located within floodwaters in a 1% AEP event. It is unknown whether flooding will be below or above floor level. The Western Treatment Plant, located on the northern bank of the lower reaches of the Little River may experience flooding during a 1% AEP event, as well as a few roads in the Old Melbourne Road area, Little River, as well as the Princes Freeway (south bound) at Little River; although it is unknown whether this flooding will cause these roads to be closed. As more intelligence becomes available, these details may change.

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Summary of Consequences in a 1% AEP (100yr ARI) flood along Little River					
Property					
Properties	**11**				
Residential	0				
Commercial	0				
Industrial	0				
Public Land	0				
Rural	11				
Community Infrastructure					
Essential Infrastructure					
Major Roads	1	Princes Freeway at Little River			
Sewerage Facilities	1	Western Treatment Plant			
Tourism / Recreation					
Recreation Facilities	2	Little River Walking Trail; Rothwell Reserve			
Government Boundaries					
Local Gov't Areas	1	Wyndham	CMA	1	Port Phillip & Westernport
Adjacent LGAs	2	Moorabool; & Greater Geelong	CFA District	1	District 14
SES Unit Area	1	Wyndham West	FRV District	0	

Table C6.1 – Consequence Summary of 1% AEP flood along Little River in Wyndham City

Gauges and Warnings

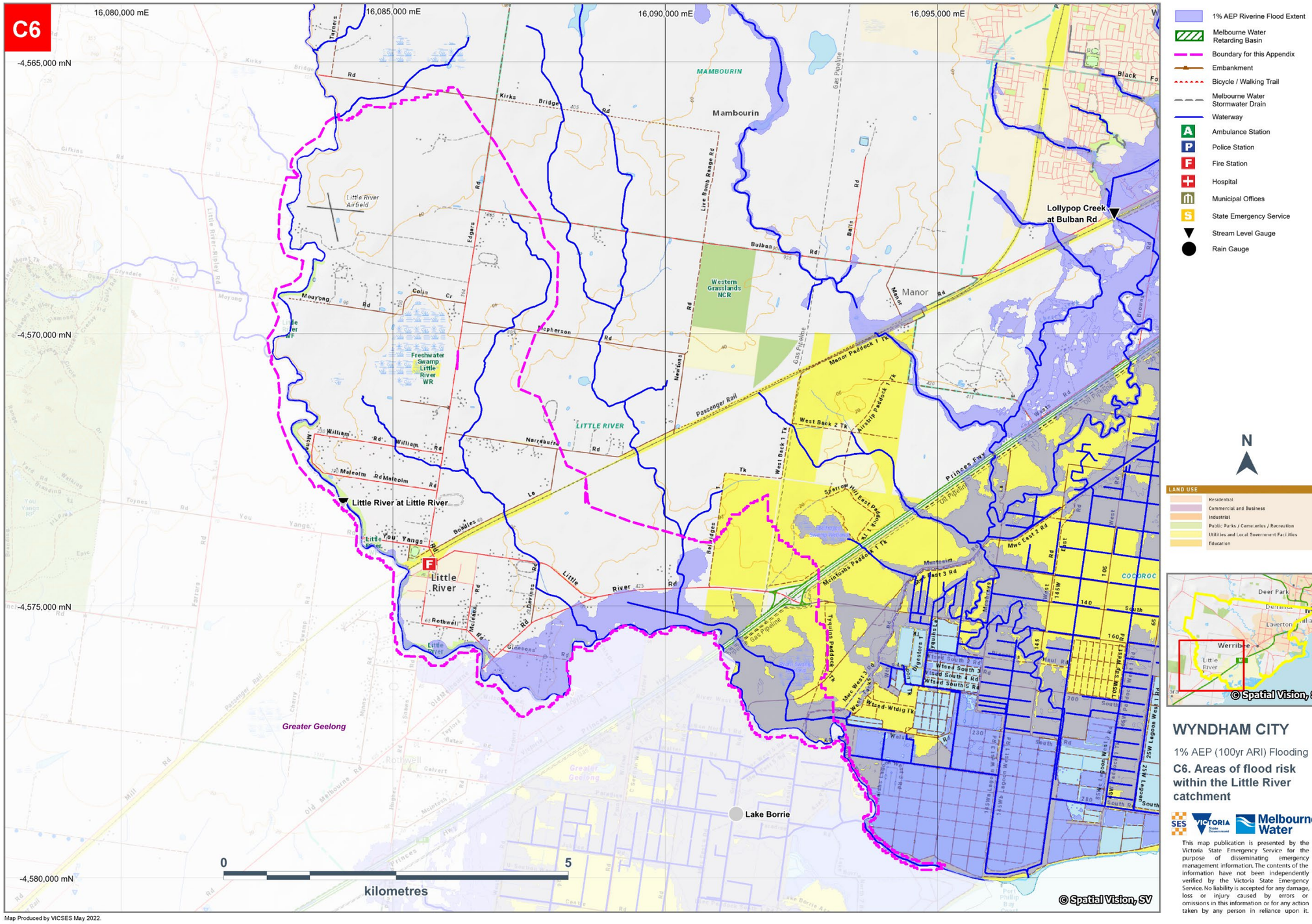
Neither the Bureau of Meteorology nor Melbourne Water currently provides flood forecasts for Little River. All flood response actions must therefore be driven by rainfall and / or river level observations. Telemetered water level / flood gauges are located at Balliang and Little River within the Little River catchment. See **Appendix B** for typical flood travel times for Little River.

Gauge	Station No.	Location	Owner	Stream Level & Flow Gauge	Rain Gauge	Melway Ref
Little River at Ripley Weir, Balliang	232242A	South side of the river, 150m west of Bacchus Marsh-Geelong Road, Balliang	Melbourne Water	✓	✓	Vicmap 6608 A14
Little River at Little River	232200C	East side of the river, 400m south of Malcolm Road, Little River	DELWP	✓		200 A3
Quandong	587030	The Werribee Gun Club, 1225 Ballan Road, 800m south of Ballan Road	Melbourne Water		✓	244 E
Lake Borrie	587023	Cnr Paradise Road and Grills Road, Point Wilson	Melbourne Water		✓	Vicmap 6689 E14

Table C6.2 – Gauges within the Little 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.

Area Map of Flood Risk within the Little River catchment



Map Produced by VICSES May 2022.

Figure C6 – Areas of flood risk along Little River in Wyndham City and area covered by this appendix.

Properties at Flood Risk

Properties listed in the table below are at risk from flooding along Little River in Wyndham City. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Little River (Middle) (Melbourne Water, January 2009) and the Little River (Lower) (BMT WBM, June 2008) flood mapping and risk assessment programs.

CONFIDENTIALITY: This table contains sensitive information about the effects of flooding on private property. Specific reference to private addresses or business must be made directly to owners or other Emergency Services and NOT via broadcast or print media.

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Properties at risk from Flooding along Little 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
18-32	Gleesons Road	Little River	Little River	Riverine
33-45	Gleesons Road	Little River	Little River	Riverine
50-64	Gleesons Road	Little River	Little River	Riverine
68-82	Gleesons Road	Little River	Little River	Riverine
86	Gleesons Road	Little River	Little River	Riverine
100-140	Gleesons Road	Little River	Little River	Riverine
2-54	Old Melbourne Road	Little River	Little River	Riverine
56-58	Old Melbourne Road	Little River	Little River	Riverine
76	Old Melbourne Road	Little River	Little River	Riverine
86	Old Melbourne Road	Little River	Little River	Riverine
220	Rothwell Road	Little River	Little River	Riverine

Total
11

Table C6.3 – Properties likely affected by Flooding in the Little River Catchment

Isolation

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

Essential Infrastructure

- The Western Treatment Plan on New Farm Road, Werribee likely flooded adjacent to Little River during a 1% AEP event.

During an event, see the Public Transport Victoria's Website for details on delays or alterations to services. http://ptv.vic.gov.au/live-travel-updates/. A map of Public Transport routes within City of Wyndham is available via the website at: https://www.ptv.vic.gov.au/assets/PTV-default-site/more/maps/Local-area-maps/Metropolitan/52_Wyndham_LAM_September-2021.pdf

Apart from the roads outlined below, all other essential infrastructure and services areas around Little River 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 Little River. Check the VicRoads website for more details: http://alerts.vicroads.vic.gov.au/

Department of Transport (VicRoads) Roads flooded in a 1% AEP (100yr ARI) event
• Princes Freeway (south-bound) at Little River

Table C6.4 – Department of Transport (VicRoads) Possible Road Closures by Little River or its Tributaries

Wyndham City Council Roads flooded in a 1% AEP (100yr ARI) event
LITTLE RIVER
• Gleesons Road
• Old Melbourne Road
• Rothwell Road

Table C6.5 – Wyndham City Possible flooded roads by Little River or its Tributaries

Flood Mitigation

No formal Retarding Basins, Pumping Stations or Levees exist along Little River in Wyndham.

Sewerage Infrastructure

Sewerage Infrastructure of note during a severe flood event located at the Western Treatment Plan in Cocoroc and Point Wilson along the lower reaches of Little River is contained within the following table.

Sewer Pumping Stations

Melbourne Water Sewerage Pumping Station	On Drain / Waterway	Number of Pumps	Location	Melway Reference
Western Treatment Plant (WTP) Pumping Stations	WTP Outlet Drains	Three	Western Treatment Plant on Farm Road, Cocoroc	244 E9 – F5

Table C6.6 – Sewer Pumping Stations in the Little River Catchment

Control, Command and Coordination

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

Flood Impacts and Operational Considerations (Intelligence Cards)

The tables on the following pages provide a breakdown of the possible consequences of flooding along Little River at various creek heights within Wyndham City. 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:

- Little River at Balliang
- Little River at Little River

FLOOD INTELLIGENCE CARD – BALLIANG GAUGE, LITTLE RIVER

Version 4 – May 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:	**At Ripley Weir, 170m west of Geelong-Bacchus Marsh Road, Balliang**
CURRENT LEVEL:	**https://www.melbournewater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/232242A**
STREAM:	**Little River**
GAUGE NUMBER:	**232242A**
GAUGE ZERO:	**Unavailable**
GAUGE TYPE:	**Stream Level & Rain**

ESMAP REFERENCE:	**Central 6608 A14**
MINOR:	**Not Established**
MODERATE:	**Not Established**
MAJOR:	**Not Established**
LEVEE HEIGHT:	**N/A**
HIGHEST RECORDED FLOOD:	**3.17m (9,459 ML/d) on 4th February 2011**

River Height and/or River Flow	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
3.17m 9,459 ML/d	4th February 2011 Flood Level & Flow Peak		
Unavailable	1% AEP (100yr ARI) Flood Level		

Table C6.7 – Breakdown of likely consequences at various Balliang gauge level heights along Wyndham City with operational considerations

FLOOD INTELLIGENCE CARD – LITTLE RIVER GAUGE, LITTLE RIVER

Version 4 – May 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:	**500m North of You Yangs Road, Little River (West Bank)**
CURRENT LEVEL:	**https://www.melbournewater.com.au/water-data-and-education/rainfall-and-river-levels#/reader/232200C**
STREAM:	**Little River**
GAUGE NUMBER:	**232200C**
GAUGE ZERO:	**24.475m AHD**
GAUGE TYPE:	**Stream Level**

MELWAY REFERENCE:	**200 A3**
MINOR:	**Not Established**
MODERATE:	**Not Established**
MAJOR:	**Not Established**
LEVEE HEIGHT:	**N/A**
HIGHEST RECORDED FLOOD:	**6.06m (21,906ML/d) on 16th October 1983**

River Height and/or River Flow	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
4.70m 13,476 ML/d	20% AEP (5yr ARI) Level & Flow		
5.32m 17,061 ML/d	3rd February 2005 Flood Level & Flow Peak 2.5% AEP (40yr ARI) Flood Level & Flow	**Event Summary** • Princes Freeway Flooded just south of Little River crossing (VicRoads Ref: 78 A9) reducing north and south bound traffic to single lanes	
5.41m 20,024 ML/d	5th February 2011 Flood Level & Flow Peak		
6.06m 21,906 ML/d	16th October 1983 Flood Level & Flow Peak		
32,054 ML/d	1% AEP (100yr ARI) Flow	**Properties at Flood Risk** **11 Properties in Total** • 220 Rothwell Road, Little River • 2-54, 56-58, 76 & 86 Old Melbourne Road, Little River • 18-32, 33-45, 50-64, 68-82, 86 & 100-140 Gleesons Road, Little River	

River Height and/or River Flow	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		Community Infrastructure Likely Flooded • Little River Walking Trail between River Street and Jolyon Court, Little River • Rothwell Reserve, Rothwell Road, Little River **Essential Infrastructure Likley Flooded** • The Western Treatment Plant on New Farm Road, Werribee likely flooded adjacent to Little River **Water Over Road** • Rothwell Road, Little River at Rothwell Reserve • Old Melbourne Road, Little River near Rothwell Road • Gleesons Road, Little River • Princes Freeway, Little River near Little River crossing	

Table C6.8 – Breakdown of likely consequences at various Little River gauge level heights along Little River with operational considerations

APPENDIX D - FLOOD EVACUATION ARRANGEMENTS

Phase 1 - Decision to Evacuate

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

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

The following should be considered when planning for evacuation:

- Anticipated flood consequences and their timing and reliability of predictions;
- Size and location of the community to be evacuated;
- Likely duration of evacuation;
- Forecast weather;
- Flood Models;
- Predicted timing of flood consequences;
- Time required to conduct the evacuation;
- Time available to conduct the evacuation;
- Evacuation priorities and evacuation planning arrangements;
- Access and egress routes available and their potential flood liability;
- Current and likely future status of essential infrastructure;
- Resources required to conduct the evacuation;
- Resources available to conduct the evacuation;
- Shelter including Emergency Relief Centres, Assembly Areas etc.;
- Vulnerable people and facilities;
- Transportation;
- Registration
- People of CALD background and transient populations;
- Safety of emergency service personnel;
- Different stages of an evacuation process.

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

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

Phase 2 – Warning

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

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

Phase 3 – Withdrawal

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

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

VicPol will control security of evacuated areas.

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

Landing zones for aircraft will be determined by the following:

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

Vulnerable People in Emergencies

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

Phase 4 – Shelter

Relief/Recovery Centres and/or assembly areas which cater for people's basic needs during floods may be established to meet the immediate needs of people affected by storms/flooding. The need for Relief Centres will be determined dependant on the location and scale of the event. Relief Centre and Assembly Area locations are listed in the MEMP sub plan- Wyndham Relief and Recovery Plan.

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

Animal Shelter

The need for animal shelter compounds will be determined dependant on location and size of event. Details of emergency relief and recovery arrangements can be found in the Wyndham Relief and Recovery Plan (sub plan to the Wyndham MEMP). .

Caravans

Most caravans in the Wyndham City area are semi-permanent. If the need arises for caravans to be evacuated, this will be dealt with by the IC/IEMT.

There are caravan parks in the following locations:

Caravan Park locations (include address)	Comments
Werribee South Caravan Park 39 Beach Road Werribee South	This is located above the 1 in 100 year flood level
B.P Caravan Park 655 O'Connor's Road Werribee South	This is located above the 1 in 100 year flood level A local newspaper, the Werribee Banner reported on 11 January 1995 that on 5 January 1995, 39mm of rain fell between 5-6pm and this caravan park was severely inundated.
Honey Hush Caravan Park 6 Leakes Road Laverton North	This is located above the 1 in 100 year flood level

Table D.1 – Caravan Parks within Wyndham City

Phase 5 – Return

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

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

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

Considerations for deciding whether to evacuate include:

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

Disruption to Services

Disruption to a range of services can occur in the event of a flood. This may include road closures affecting school bus routes, water treatment plant affecting potable water supplies etc. *This table will be populated as a more detailed analysis of the flood risk is completed*.

Service	Impact	Trigger Point for action	Strategy/Temporary Measures
Geelong- Melbourne railway line		Major flood level- 50,000ML/day	
Princes Freeway			
Western Treatment Plant		1%	

Table D.2 – Disruption to Services within Wyndham City

Essential Infrastructure and Property Protection

Essential Infrastructure and properties such as residences, businesses, roads, power supply, utilities, telecommunications etc.) may require protection.

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

Rescue

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

Resources are available from the Wyndham and Wyndham West SES units to assist with rescue operations – specific details of equipment and resources available can be obtained via the VICSES RDO.

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

APPENDIX E – STORM AND FLOOD WARNING SYSTEMS

Public Information and Warnings

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

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

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

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

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

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

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

Local Flood Warning System Arrangements

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

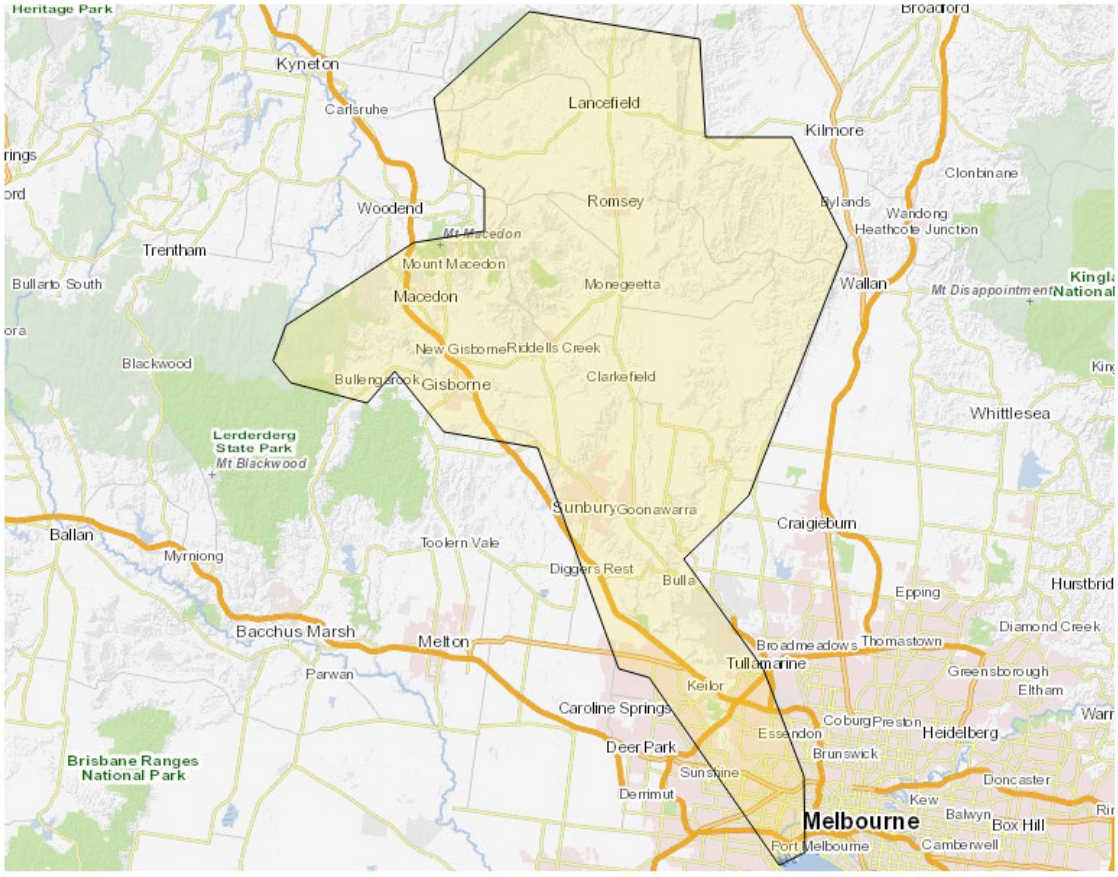
This local arrangement information can be found on the Melton Reservoir Tail Gauge Flood Intelligence Card on page <…> of this plan.

BOM Flood Warning Example

ADVICE - FLOOD

Incident Location: Maribyrnong
Incident Name: MaribyrnongFloodSept2016
Issued: Set at publish time
Next Update Expected:

Map



Message

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

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

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

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

Stay informed - monitor your local conditions and remain alert.

What you should do:

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

Impacts in your area:

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

This message was issued by State Emergency Service.

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

Flood information:

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

APPENDIX F – MAPS AND SCHEMATICS

Overview

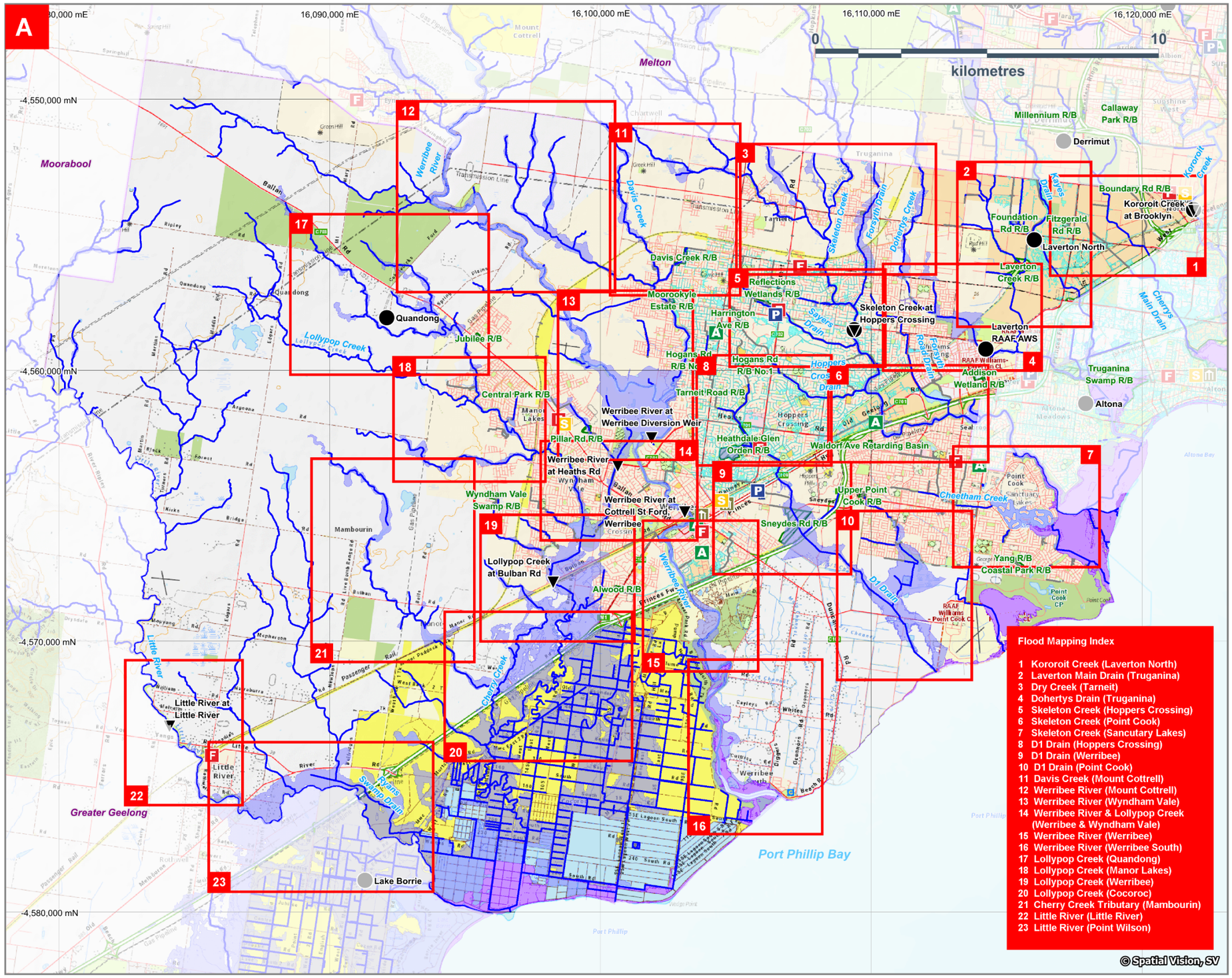
Maps considered useful to flood response are included in this Appendix. They include:

- A map outlining a series of flooding hot spot maps within Wyndham City.
- A map showing the Municipal boundary together with the open waterways and underground stormwater drainage pipe network within Wyndham City and the 1% AEP (100-year ARI) flood extents (sourced from Melbourne Water GIS).
- A set of 20 maps showing flooding hot spots within Wyndham City together with the 1% AEP (100-year ARI) flood extents (sourced from the Melbourne Water GIS).
- Schematics detailing the drainage catchments relevant for this municipality.
    - Each Schematic outlines the drainage system comprising of rivers, creeks or storm-water drains contained within one of the major catchments in the Port Phillip and Westernport Region.
    - Within each Schematic, there are details useful to flood response, such as those relating to gauges, towns, rivers, creeks, drains and reservoirs. Historical facts and figures may also be shown.
    - The schematics also detail the response boundaries for VICSES units and local government, and provide a reference link to the corresponding MSFEP.
    - Details within these Catchment Schematics reflect those contained within either other sections of this MSFEP, or refer to other plans. These details have been filtered to contain only key facts. For more information on a gauge, drainage system or town consult the corresponding MSFEP.

Note that:

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

Wyndham City Municipal Maps (sourced Melbourne Water GIS)



Flood Mapping Index

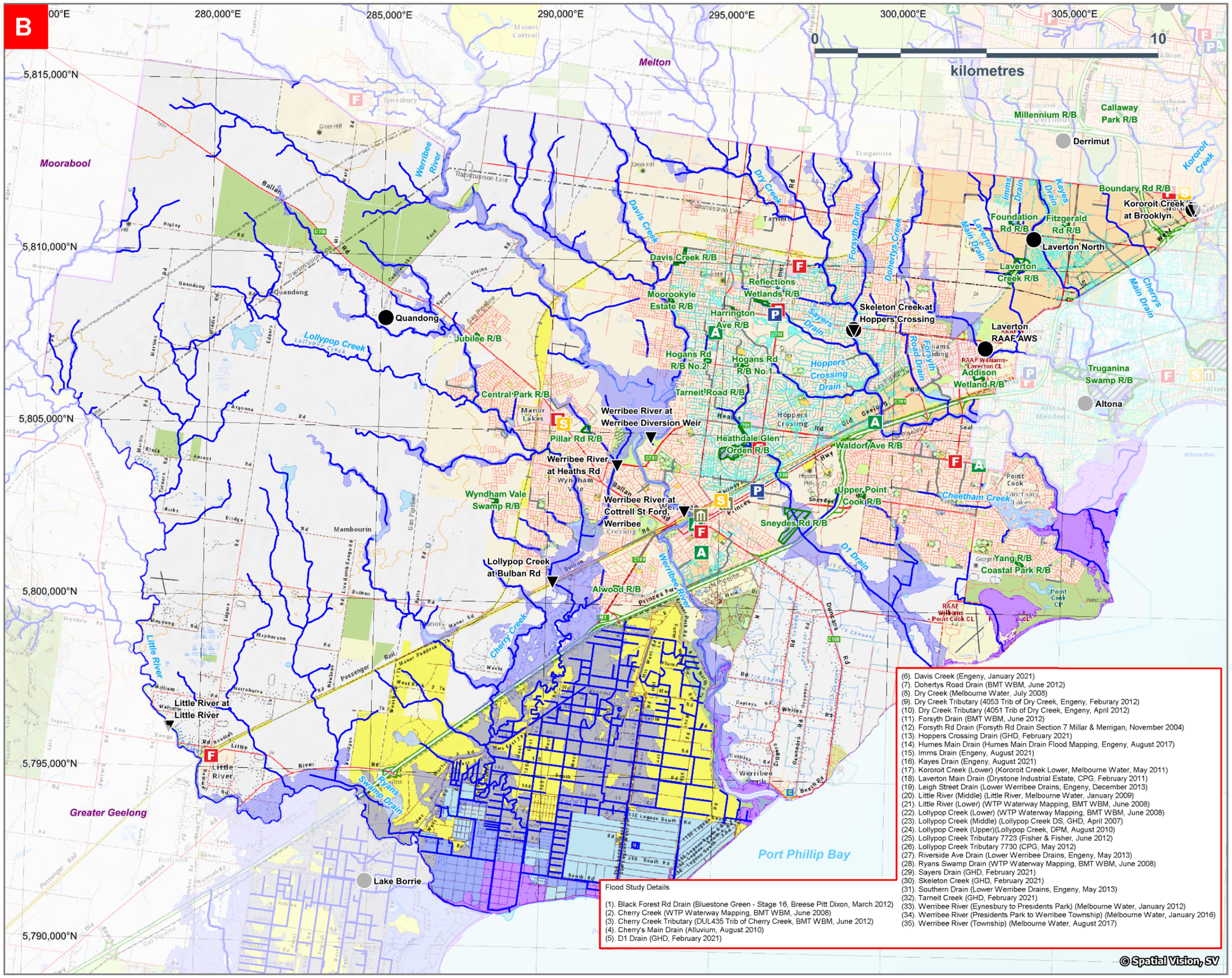
1 Kororoit Creek (Laverton North)
2 Laverton Main Drain (Truganina)
3 Dry Creek (Tarneit)
4 Dohertys Drain (Truganina)
5 Skeleton Creek (Hoppers Crossing)
6 Skeleton Creek (Point Cook)
7 Skeleton Creek (Sancutary Lakes)
8 D1 Drain (Hoppers Crossing)
9 D1 Drain (Werribee)
10 D1 Drain (Point Cook)
11 Davis Creek (Mount Cottrell)
12 Werribee River (Mount Cottrell)
13 Werribee River (Wyndham Vale)
14 Werribee River & Lollypop Creek (Werribee & Wyndham Vale)
15 Werribee River (Werribee)
16 Werribee River (Werribee South)
17 Lollypop Creek (Quandong)
18 Lollypop Creek (Manor Lakes)
19 Lollypop Creek (Werribee)
20 Lollypop Creek (Cocoroc)
21 Cherry Creek Tributary (Mambourin)
22 Little River (Little River)
23 Little River (Point Wilson)

WYNDHAM CITY

Version 4: April 2022

A. Flood Mapping Index

Map Produced by VICSES March 2022.



Flood Study Details

(1). Black Forest Rd Drain (Bluestone Green - Stage 16, Breese Pitt Dixon, March 2012)
(2). Cherry Creek (WTP Waterway Mapping, BMT WBM, June 2008)
(3). Cherry Creek Tributary (DUL435 Trib of Cherry Creek, BMT WBM, June 2012)
(4). Cherry's Main Drain (Alluvium, August 2010)
(5). D1 Drain (GHD, February 2021)
(6). Davis Creek (Engeny, January 2021)
(7). Dohertys Road Drain (BMT WBM, June 2012)
(8). Dry Creek (Melbourne Water, July 2008)
(9). Dry Creek Tributary (4053 Trib of Dry Creek, Engeny, Feburary 2012)
(10). Dry Creek Tributary (4051 Trib of Dry Creek, Engeny, April 2012)
(11). Forsyth Drain (BMT WBM, June 2012)
(12). Forsyth Rd Drain (Forsyth Rd Drain Section 7 Millar & Merrigan, November 2004)
(13). Hoppers Crossing Drain (GHD, February 2021)
(14). Humes Main Drain (Humes Main Drain Flood Mapping, Engeny, August 2017)
(15). Imms Drain (Engeny, August 2021)
(16). Kayes Drain (Engeny, August 2021)
(17). Kororoit Creek (Lower) (Kororoit Creek Lower, Melbourne Water, May 2011)
(18). Laverton Main Drain (Drystone Industrial Estate, CPG, February 2011)
(19). Leigh Street Drain (Lower Werribee Drains, Engeny, December 2013)
(20). Little River (Middle) (Little River, Melbourne Water, January 2009)
(21). Little River (Lower) (WTP Waterway Mapping, BMT WBM, June 2008)
(22). Lollypop Creek (Lower) (WTP Waterway Mapping, BMT WBM, June 2008)
(23). Lollypop Creek (Middle) (Lollypop Creek DS, GHD, April 2007)
(24). Lollypop Creek (Upper)(Lollypop Creek, DPM, August 2010)
(25). Lollypop Creek Tributary 7723 (Fisher & Fisher, June 2012)
(26). Lollypop Creek Tributary 7730 (CPG, May 2012)
(27). Riverside Ave Drain (Lower Werribee Drains, Engeny, May 2013)
(28). Ryans Swamp Drain (WTP Waterway Mapping, BMT WBM, June 2008)
(29). Sayers Drain (GHD, February 2021)
(30). Skeleton Creek (GHD, February 2021)
(31). Southern Drain (Lower Werribee Drains, Engeny, May 2013)
(32). Tarneit Creek (GHD, February 2021)
(33). Werribee River (Eynesbury to Presidents Park) (Melbourne Water, January 2012)
(34). Werribee River (Presidents Park to Werribee Township) (Melbourne Water, January 2016)
(35). Werribee River (Township) (Melbourne Water, August 2017)

Map Produced by VICSES March 2022.

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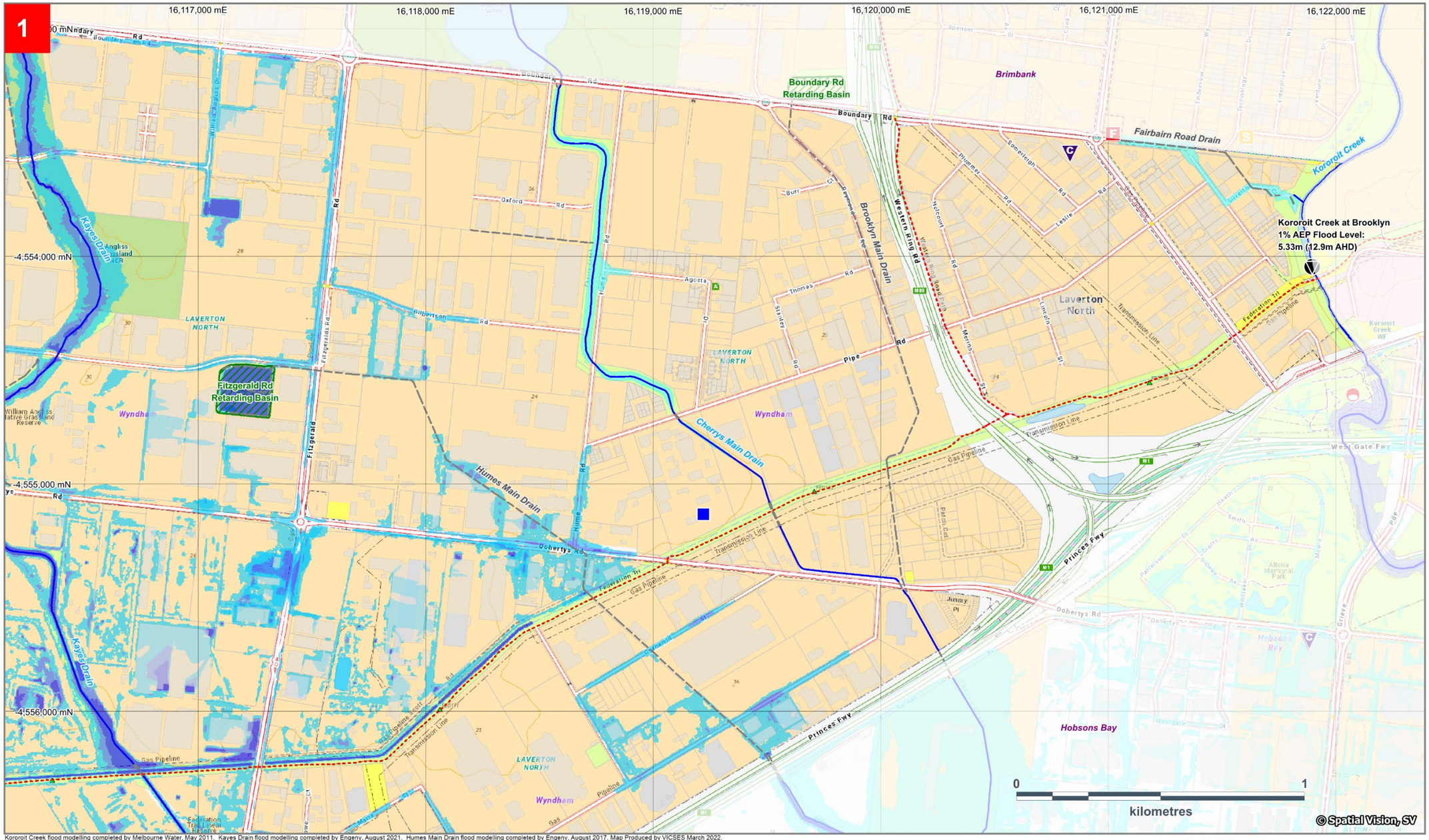
WYNDHAM CITY

Version 4: March 2022

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

Flood Extent Maps (sourced Melbourne Water GIS)



Kororoit Creek flood modelling completed by Melbourne Water, May 2011. Kayes Drain flood modelling completed by Engeny, August 2021. Humes Main Drain flood modelling completed by Engeny, August 2017. Map Produced by VICSES March 2022.

N

WYNDHAM CITY

1% AEP (100yr ARI) Flooding

1. Kororoit Creek (Laverton North)

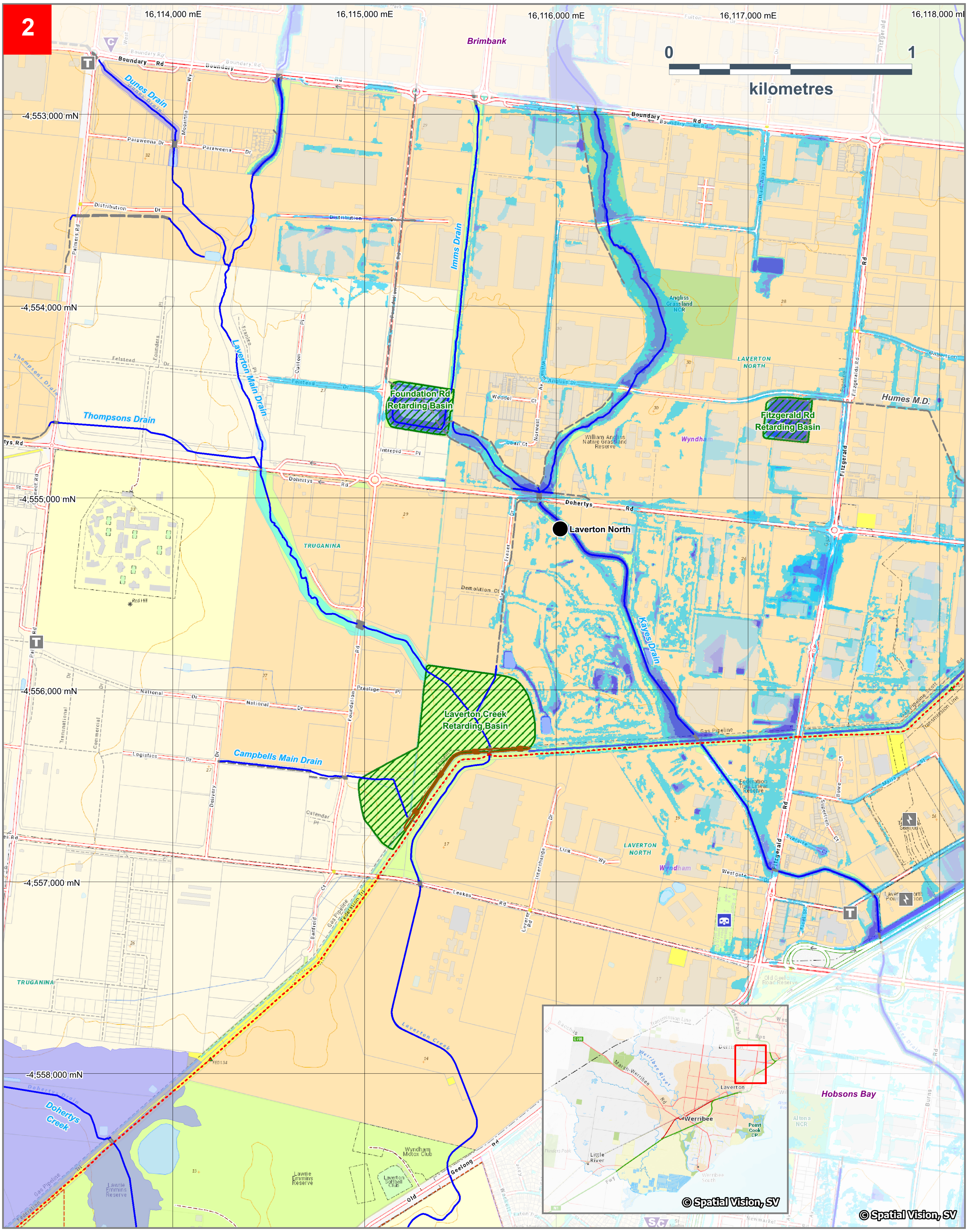
- Building
- Waterbody

1% AEP Flood Depth

- Greater than 60cm
- Between 30cm and 60cm
- Between 5cm and 30cm
- 1% AEP Flash Flood Extent (Depth Unavailable)
- 1% AEP Riverine Extent (Depth Unavailable)
- Melbourne Water Retarding Basin
- Waterway
- Melbourne Water Underground Drain
- Bicycle / Walking Trail
- Child Care / Kindergarten
- Stream Level Gauge & 1% AEP Flood Level
- Rain Gauge
- Fire Station
- Sewer Emergency Relief Point
- State Emergency Service
- Retail Water Storage

LAND USE

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


2
16,114,000 mE
16,115,000 mE
16,116,000 mE
16,117,000 mE
16,118,000 mE
0
1
kilometres
Brimbank
-4,553,000 mN
-4,554,000 mN
-4,555,000 mN
-4,556,000 mN
-4,557,000 mN
-4,558,000 mN
Dunes Drain
Boundary Rd
Paraweena Dr
Distribution Dr
Imms Drain
Laverton Main Drain
Thompsons Drain
Foundation Rd Retarding Basin
Angliss Grassland NCR
LAVERTON NORTH
Humes M.D.
Fitzgerald Rd Retarding Basin
Wyndham
William Angliss Native Grassland Reserve
Dohertys Rd
Laverton North
TRUGANINA
Kayes Drain
Laverton Creek Retarding Basin
Campbells Main Drain
Gas Pipeline
Federation Trail Linear Reserve
Leakes Rd
Westgate Dr
Laverton Creek
Dohertys Creek
Lawrie Emmins Reserve
Wyndham Motox Club
Laverton Softball Club
Old Geelong Rd
Old Geelong Road Reserve
Hobsons Bay
Altona NCR
Laverton
Werribee
Point Cook CP
Little River
Werribee South
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© Spatial Vision, SV

Flood modelling completed by AECOM, November 2012. Map produced by VICSES March 2022.

N

WYNDHAM CITY

1% AEP (100yr ARI) Flooding

2. Laverton Main Drain (Truganina)

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

1% AEP Flash Flood Depth

- Greater than 60cm
- Between 30cm and 60cm
- Between 5cm and 30cm

- Melbourne Water Retarding Basin
- Waterway
- Melbourne Water Underground Drain
- Bicycle / Walking Trail
- Child Care / Kindergarten
- School / College

- Caravan Park
- Power Terminal Station
- Telephone Exchange
- Rain Gauge

LAND USE

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

SES VICTORIA State Government Melbourne Water

3

16,106,000 mE
16,108,000 mE
16,110,000 mE
16,112,000 mE
-4,552,000 mN
-4,554,000 mN
-4,556,000 mN

0 1
kilometres

Truganina
Melton
Wyndham
Tarneit
TARNEIT
TRUGANINA

Trib Of Dry Creek
Dry Creek
Trib Of Skeleton Creek
Skeleton Creek
Forsyth Drain
Dohertys Creek
Tarneit Creek

Dohertys Rd
Derrimut Rd
Tarneit Rd
Passenger Rail
Transmission Line

Skeleton Creek WF

© Spatial Vision, SV

Flood modelling completed by Engeny, February 2012. Map Produced by VICSES March 2022.

N

WYNDHAM CITY

1% AEP (100yr ARI) Flooding

3. Dry Creek & Skeleton Creek (Tarneit)

- Building
- Waterbody

1% AEP Flood Depth

- Greater than 60cm
- Between 30cm and 60cm
- Between 5cm and 30cm
- 1% AEP Riverine Flood Extent (Depth Unavailable)

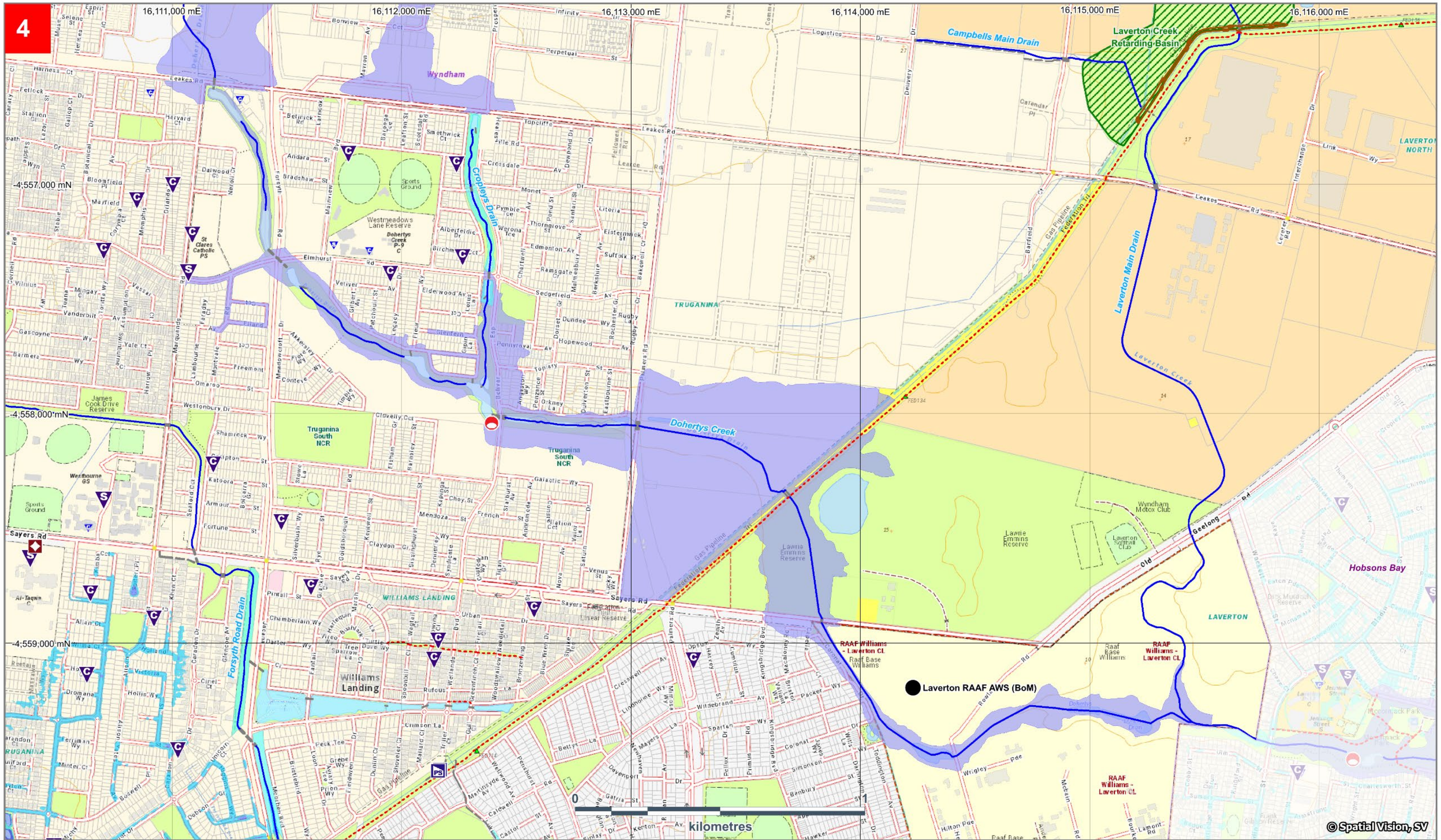
- Waterway
- Melbourne Water Underground Drain

- Child Care / Kindergarten
- Aged Care Facility / Retirement Village
- School / College
- Community Centre
- Fire Station
- Road Likely Requiring Closure

LAND USE

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

SES VICTORIA State Government Melbourne Water



Flood modelling completed by GHD, February 2021. Map Produced by VICSES March 2022.

N

WYNDHAM CITY

1% AEP (100yr ARI) Flooding

4. Dohertys Drain (Truganina)

Building

Waterbody

1% AEP Flood Depth

Greater than 60cm

Between 30cm and 60cm

Between 5cm and 30cm

1% AEP Flash Flood Extent (Depth Unavailable)

1% AEP Riverine Extent (Depth Unavailable)

Melbourne Water Retarding Basin

Waterway

Melbourne Water Underground Drain

Bicycle / Walking Trail

Embankment

Child Care / Kindergarten

School / College

Place Of Worship

Rain Gauge

Sewer Emergency Relief Point

Drainage Pumping Station

LAND USE

Residential

Commercial and Business

Industrial

Public Parks / Cemeteries / Recreation

Utilities and Local Government Facilities

Education

5

16,105,000 mE
16,106,000 mE
16,107,000 mE
16,108,000 mE
16,109,000 mE
16,110,000 mE
-4,557,000 mN
-4,558,000 mN
-4,559,000 mN

Reflections Wetlands Retarding Basin
Harrington Ave Retarding Basin
Hogans Rd Retarding Basin No.1
Skeleton Creek at Hoppers Crossing
1% AEP Flood Level: 3.69m (15.4m AHD)
Tarneit Creek
Sayers Drain
Hoppers Crossing Drain
Skeleton Creek
Forsyth Drain
Forsyth Road Drain
Marple Cres Drain
Sayers Rd
Derrimut Rd
Baden Powell Dr
Hoppers Crossing Linear Reserve
TARNEIT
HOPPERS CROSSING
TRUGANINA

0
1
kilometres

© Spatial Vision, SV

Flood modelling completed by GHD, February 2021. Map Produced by VICSES March 2022.

N

WYNDHAM CITY

1% AEP (100yr ARI) Flooding

5. Skeleton Creek (Hoppers Crossing)

1% AEP Flood Depth
- Greater than 60cm
- Between 30cm and 60cm
- Between 5cm and 30cm

- Building
- Waterbody
- Place Of Worship
- Fire Station
- Melbourne Water Retarding Basin
- Waterway
- Melbourne Water Underground Drain
- Bicycle / Walking Trail
- Embankment
- Child Care / Kindergarten
- Aged Care Facility / Retirement Village
- School / College
- Community Centre
- Police Station
- Stream Level Gauge & 1% AEP Flood Level
- Rain Gauge

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

6

16,109,000 mE
16,110,000 mE
16,111,000 mE
16,112,000 mE
16,113,000 mE
16,114,000 mE
-4,560,000 mN
-4,561,000 mN
-4,562,000 mN
-4,563,000 mN

Addison Wetland Retarding Basin
Waldorf Ave Retarding Basin
Bellbridge Dr Drain
Hoppers Crossing Drain
Skeleton Creek
Forsyth Road Drain
Wetlands
Cheetham Creek
Boardwalk Wetlands
Seabrook Reserve Wetlands
Proposed Reserve
WILLIAMS LANDING
RAAF Williams - Laverton CL
Raaf Base Williams
Williams Landing
Lynch Barkley Bridge
Nicklaus Reserve
Bellbridge Reserve
Rosslare Court Reserve
Skeleton Creek Linear Reserve
Aitken Reserve
Sports Ground
Tennis
Bellbridge PS
Truganina South PS
Seabrook PS
Emmanuel C
Sports Ground Dunnings Road Reserve
Laverton West
HOPPERS CROSSING
POINT COOK
Wyndham
Hobsons Bay
Gas Pipeline
Oil Pipeline
Passenger Rail
Princes Fwy
Forsyth Rd
Geelong Rd
Old Geelong Rd
Dunnings Rd
Palmers Rd
Kidbrooke Rd
Trihlom Av
Boardwalk Blvd
Skeleton Creek WF
Laverton
Werribee
Little River
M1
C761

0 1 kilometres

© Spatial Vision, SV

Flood modelling completed by GHD, February 2021. Map Produced by VICSES March 2022.

N

WYNDHAM CITY

1% AEP (100yr ARI) Flooding

6. Skeleton Creek (Point Cook)

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

1% AEP Flood Depth

- Greater than 60cm
- Between 30cm and 60cm
- Between 5cm and 30cm

- Melbourne Water Retarding Basin
- Waterway
- Melbourne Water Underground Drain
- Bicycle / Walking Trail
- Embankment

- Child Care / Kindergarten
- Sewer Emergency Relief Point
- School / College
- Community Centre
- Ambulance Station

LAND USE

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

SES VICTORIA State Government Melbourne Water

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7

16,114,000 mE
16,115,000 mE
16,116,000 mE
16,117,000 mE
16,118,000 mE
-4,564,000 mN
-4,565,000 mN
-4,566,000 mN
-4,567,000 mN

0 1
kilometres

Building
1% AEP Riverine Flood Extent (Depth Unavailable)
1% AEP Storm Surge Extent (Depth Unavailable)
Melbourne Water Retarding Basin
Bicycle / Walking Trail
Melbourne Water Stormwater Drain
Waterway
Child Care / Kindergarten
Education Facility
Aged Care Facility / Retirement Village
Fire Station
Community Centre
Telephone Exchange
Sewer Emergency Relief Point
Ambulance Station

N

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

WYNDHAM CITY

1% AEP (100yr ARI) Flooding

7. Skeleton Creek (Sanctuary Lakes)

SES VICTORIA Melbourne Water

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Flood modelling completed by Melbourne Water, August 2009. Map Produced by VICSES March 2022.


8
16,104,000 mE
16,105,000 mE
16,106,000 mE
16,107,000 mE
16,108,000 mE
-4,560,000 mN
-4,561,000 mN
-4,562,000 mN
-4,563,000 mN
0
1
kilometres
Hogans Rd Retarding Basin No.2
Hogans Rd Retarding Basin No.1
Tarneit Road Retarding Basin
Heathdale Glen Orden Retarding Basin
Tarneit Road Drain
D1 Drain
Hoppers Crossing Drain
HOPPERS CROSSING
Hoppers Crossing
Wyndham
Heaths Rd
Hogans Rd
Derrimut Rd
Tarneit Rd
Princes Hwy
Passenger Rail
Oil Pipeline
© Spatial Vision, SV

Flood modelling completed by GHD, February 2021. Map Produced by VICSES March 2022.

Building

1% AEP Flood Depth

- Greater than 60cm
- Between 30cm and 60cm
- Between 5cm and 30cm
- Melbourne Water Retarding Basin
- Bicycle / Walking Trail
- Melbourne Water Stormwater Drain
- Waterway
- Embankment
- Child Care / Kindergarten
- Education Facility
- Aged Care Facility / Retirement Villag
- Fire Station
- Place of Worship
- Telephone Exchange
- Sewer Emergency Relief Point
- Hospital
- Community Centre

N

LAND USE

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

WYNDHAM CITY

1% AEP (100yr ARI) Flooding

8. D1 Drain (Hoppers Crossing)

SES VICTORIA State Government Melbourne Water

9

16,105,000 mE
16,106,000 mE
16,107,000 mE
16,108,000 mE
16,109,000 mE
-4,564,000 mN
-4,565,000 mN
-4,566,000 mN
-4,567,000 mN

Willmott
Wyndham
WERRIBEE
WERRIBEE SOUTH
D1 Drain
Shaws Road Drain
Sneydes Rd Retarding Basin
Princes Hwy
Princes Fwy
Sneydes Rd
Duncans Rd
Oil Pipeline
Gas Pipeline
Werribee Public Cemetery Reserve
Conquest Park
Soldiers Reserve
Soegan Street Reserve
Loyola Reserve
Southern Drain
Victoria Uni (TAFE Division)
Victoria University
Victoria University Wyndham Sports Complex
Melbourne University
Suzanne Cory HS
St Vincents Private Hospital Werribee
Athletics
Sports Ground
Federation Trail Linear Reserve
Main Channel
2/5/1 Channel
0
1
kilometres

© Spatial Vision, SV

Building

1% AEP Flood Depth

- Greater than 60cm
- Between 30cm and 60cm
- Between 5cm and 30cm
- 1% AEP Riverine Flood Extent (Depth Unavailable)
- Melbourne Water Retarding Basin
- Bicycle / Walking Trail
- Melbourne Water Stormwater Drain
- Waterway
- Embankment
- Child Care / Kindergarten
- Education Facility
- Aged Care / Retirement Village
- State Emergency Service
- Sewer Pumping Station
- Police Station
- Sewer Emergency Relief Point
- Hospital
- Municipal Offices

N

LAND USE

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

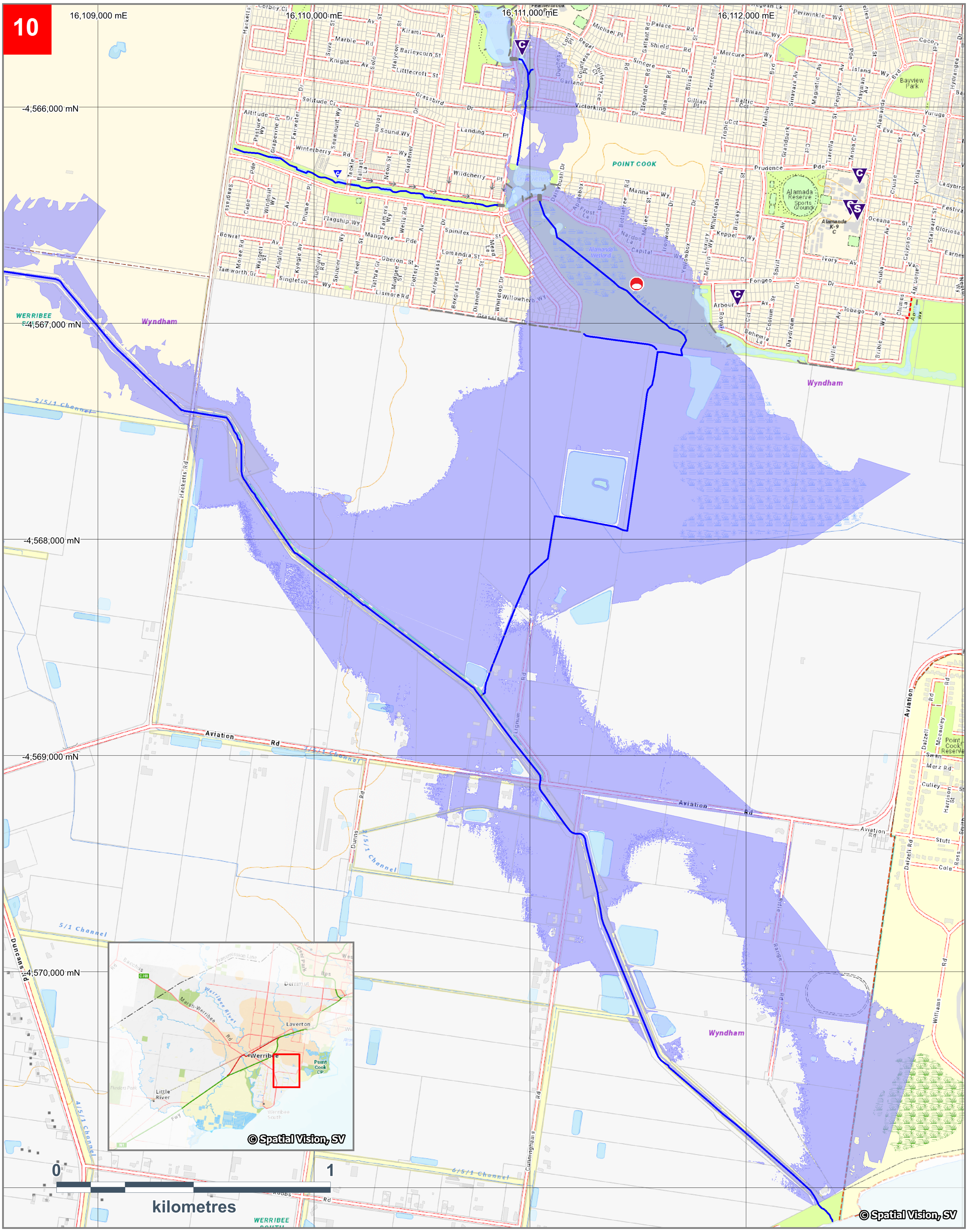
WYNDHAM CITY

1% AEP (100yr ARI) Flooding

9. D1 Drain (Werribee)

SES VICTORIA Melbourne Water

D1 Drain flood modelling (south of Princes Hwy) completed by AECOM, November 2012. D1 Drain flood modelling (North of Princes Hwy) completed by GHD, February 2021. Map Produced by VICSES March 2022.


10
16,109,000 mE
16,110,000 mE
16,111,000 mE
16,112,000 mE
-4,566,000 mN
-4,567,000 mN
-4,568,000 mN
-4,569,000 mN
-4,570,000 mN
POINT COOK
Alamanda Wetland
Point Cook Creek
Alamada Reserve Sports Ground
Alamanda K-9 C
Bayview Park
Wyndham
WERRIBEE
WERRIBEE SOUTH
Hacketts Rd
Aviation Rd
Duncans Rd
Dunns Rd
Lignum Rd
Rifle Range Rd
Cunninghams Rd
Williams Rd
Point Cook Reserve
2/5/1 Channel
5/1 Channel
4/5/1 Channel
6/5/1 Channel
Derrimut
Laverton
Werribee
Little River
Werribee South
Point Cook CP
Werribee River
Marsh-Werribee Rd
© Spatial Vision, SV
0
1
kilometres
© Spatial Vision, SV

Flood modelling completed by AECOM, November 2012. Map produced by VICSES March 2022.

N

Building
Waterbody
1% AEP Flood Extent (Depth Unavailable)

Waterway
Child Care / Kindergarten
Sewer Emergency Relief Point
School / College

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

WYNDHAM CITY

1% AEP (100yr ARI) Flooding

10. D1 Drain (Point Cook)

11

16,101,000 mE
16,102,000 mE
16,103,000 mE
16,104,000 mE
16,105,000 mE

-4;551,000 mN
-4;552,000 mN
-4;553,000 mN
-4;554,000 mN
-4;555,000 mN
-4;556,000 mN

0 1
kilometres

© Spatial Vision, SV

Flood modelling completed by AECOM, November 2012. Map produced by VICSES March 2022.

N

WYNDHAM CITY

1% AEP (100yr ARI) Flooding

11. Davis Creek (Mount Cottrell)

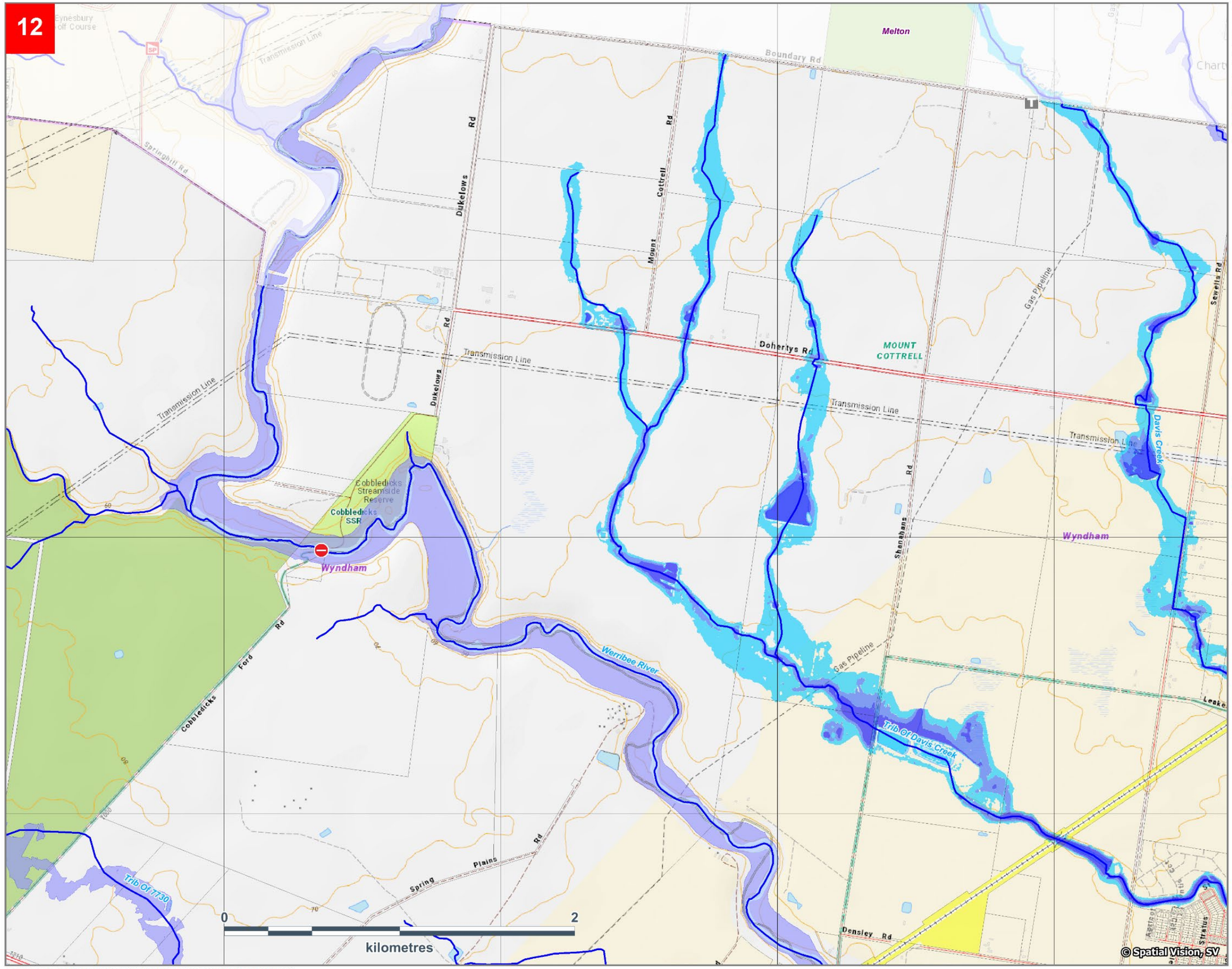
Building
Waterbody
1% AEP Flood Extent (Depth Unavailable)

1\% AEP Flood Depth
Greater than 60cm
Between 30cm and 60cm
Between 5cm and 30cm

Melbourne Water Retarding Basin
Waterway
Melbourne Water Underground Drain
Child Care / Kindergarten
School / College

Retail Water Storage
Place of Worship
Telephone Exchange

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



Flood modelling completed by Melbourne Water, January 2012. Map Produced by VICSES March 2022.

Building

1% AEP Riverine Flood Extent (Depth Unavailable)

1% AEP Flood Depth

- Greater than 60cm
- Between 30cm and 60cm
- Between 5cm and 30cm

Melbourne Water Retarding Basin

Waterway

Rain Gauge

Road Likely Requiring Closure

Sewer Pumping Station

Telephone Exchange

N

LAND USE

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

WYNDHAM CITY

1% AEP (100yr ARI) Flooding

12. Werribee River (Mount Cottrell)

SES VICTORIA Melbourne Water

13

16,099,000 mE
16,100,000 mE
16,101,000 mE
16,102,000 mE
16,103,000 mE

0 1
kilometres

-4,558,000 mN
-4,559,000 mN
-4,560,000 mN
-4,561,000 mN
-4,562,000 mN
-4,563,000 mN

Wyndham
Werribee Airfield
WYNDHAM VALE
TARNEIT
Laverton
Werribee
Point Cook CP
Little River
Derrimut
Marsh-Werribee
Werribee River
Davis Creek
Sewells Rd
Moorookyle Estate Retarding Basin
Pillar Rd Retarding Basin
Werribee West Drain
Werribee River at Werribee Diversion Weir
1% AEP Flood Level: 3.073m (29.5m AHD)
Heatherton Christian C
Bethan Catholic PS
Wootten Road Reserve
Presidents Park
Galvin Park Sports Ground
Werribee River Linear Reserve
Latham Street Reserve
Quarantine Primary Community Centre Reserve

© Spatial Vision, SV

Werribee River flood modelling completed by Melbourne Water, January 2012. Map produced by VICSES March 2022.

N

Building
Waterbody
1% AEP Flood Extent (Depth Unavailable)
Melbourne Water Retarding Basin

Waterway
Melbourne Water Underground Drain
Bicycle / Walking Trail
Embankment

School / College
Child Care / Kindergarten
Airfield
Community Centre
Stream Level Gauge & 1% AEP Flood Level

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

SES VICTORIA State Government Melbourne Water

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WYNDHAM CITY

1% AEP (100yr ARI) Flooding

13. Werribee River (Wyndham Vale)

14

16,098,000 mE
16,099,000 mE
16,100,000 mE
16,101,000 mE
16,102,000 mE
16,103,000 mE
4,563,000 mN
4,564,000 mN
4,565,000 mN
4,566,000 mN

Werribee River at Heaths Rd

Werribee River at Cottrell St Ford, Werribee
1% AEP Flood Level: 8.45m (21.25m AHD)

Wyndham Vale
Wyndham
Werribee
WERRIBEE

Greens Rd
Bolton Rd
Ballan Rd
Heaths Rd
Mcgrath Rd
Greaves St
Cottrell St
Bulban Rd
Watton St
Synnot St
Market St
Leigh St Drain
Werribee West Drain
Lollypop Creek
Black Forest Road Drain
Werribee River
Passenger Rail
Oil Pipeline

Presidents Park
Sports Ground
Galvin Park
Number 1 Oval
Number 2 Oval
Number 3 Oval
Wilson Reserve
Wyndham Central
Drainline Arm Reserve
Coventry Reserve
Werribee Street North Reserve
Number 1 Oval Wyndham Vale Reserve
Recreation Centre Reserve
Gordon Okeeffe Reserve
Wyndham Vale South Reserve
Haines Drive Reserve
Racecourse
Werribee Racecourse
Brophys Crossing
Thomas Chrinside PS
Chrinside Park
Werribee Outdoor Pool
Wyndham Park Pedestrian Bridge
Werribee Bicentennial Bridge
St Andrews
Manorvale
Manorvale Pre-School

0
1
kilometres

© Spatial Vision, SV

Lollypop Creek flood modelling completed by GHD, April 2007. Werribee River flood modelling completed by Melbourne Water, January 2016. Map Produced by VICSES March 2022.

N

WYNDHAM CITY

1% AEP (100yr ARI) Flooding

14. Werribee River, Werribee West Drain & Lollypop Creek (Werribee)

1% AEP Flash Flood Depth

- Greater than 60cm
- Between 30cm and 60cm
- Between 5cm and 30cm
- 1% AEP Riverine Extent (Depth Unavailable)
- Aged Care Facility / Retirement Village
- Road Likely Requiring Closure
- Building
- Waterway
- Melbourne Water Underground Drain
- Bicycle / Walking Trail
- Levee
- Ambulance Station
- Community Centre
- Child Care / Kindergarten
- School / College
- Fire Station
- Municipal Offices
- Place Of Worship
- Stream Level Gauge & 1% AEP Flood Level

LAND USE

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

SES VICTORIA Melbourne Water

15

16,102,000 mE
16,103,000 mE
16,104,000 mE
16,105,000 mE
-4,566,000 mN
-4,567,000 mN
-4,568,000 mN
-4,569,000 mN
-4,570,000 mN

Werribee River flood modelling completed by Melbourne Water, April 2009. Southern Drain flood modelling completed by Engeny, May 2013. Map produced by VICSES March 2022.

N

WYNDHAM CITY

1% AEP (100yr ARI) Flooding

15. Werribee River (Werribee Park)

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

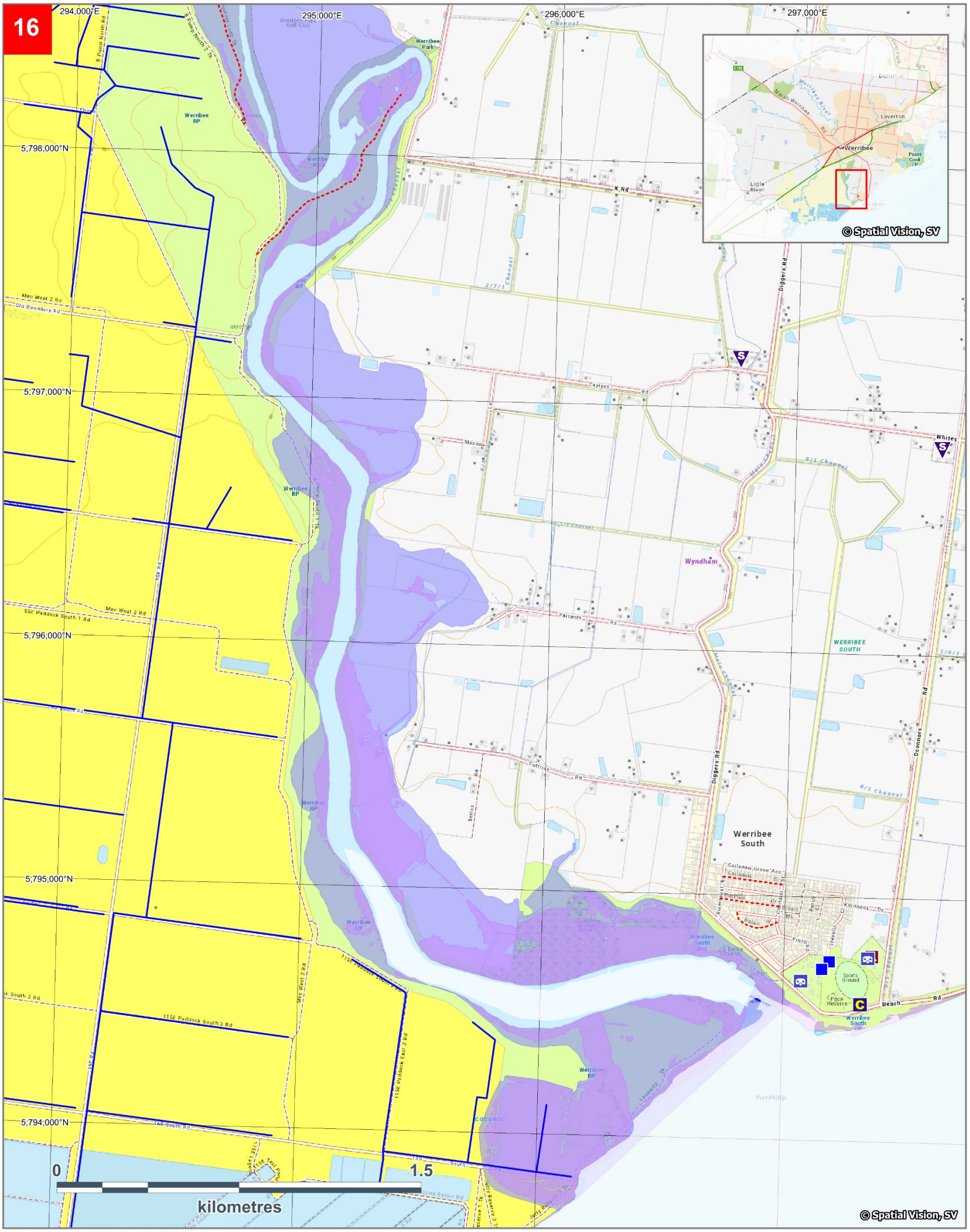
1% AEP Flash Flood Depth

- Greater than 60cm
- Between 30cm and 60cm
- Between 5cm and 30cm

- Waterway
- Melbourne Water Underground Drain
- Bicycle / Walking Trail
- Aged Care / Retirement Village
- Ambulance Station
- Fire Station
- Child Care / Kindergarten
- Sewer Emergency Relief Point
- School / College
- Power Terminal Station
- Sewer Pumping Station

LAND USE

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



Flood modelling completed by April 2009. Map produced by VICSES March 2022.

N

WYNDHAM CITY

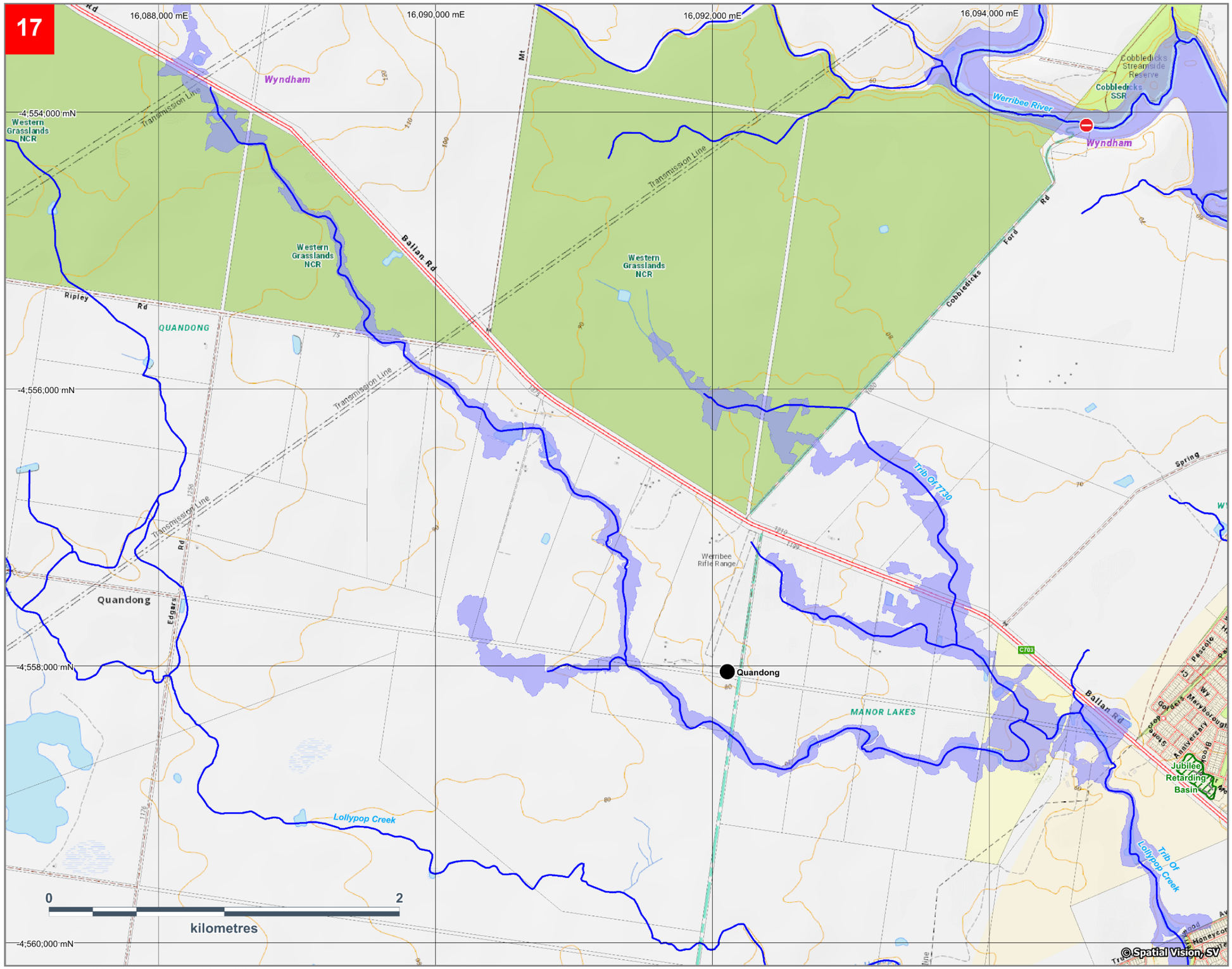
1% AEP (100yr ARI) Flooding

16. Werribee River (Werribee South)

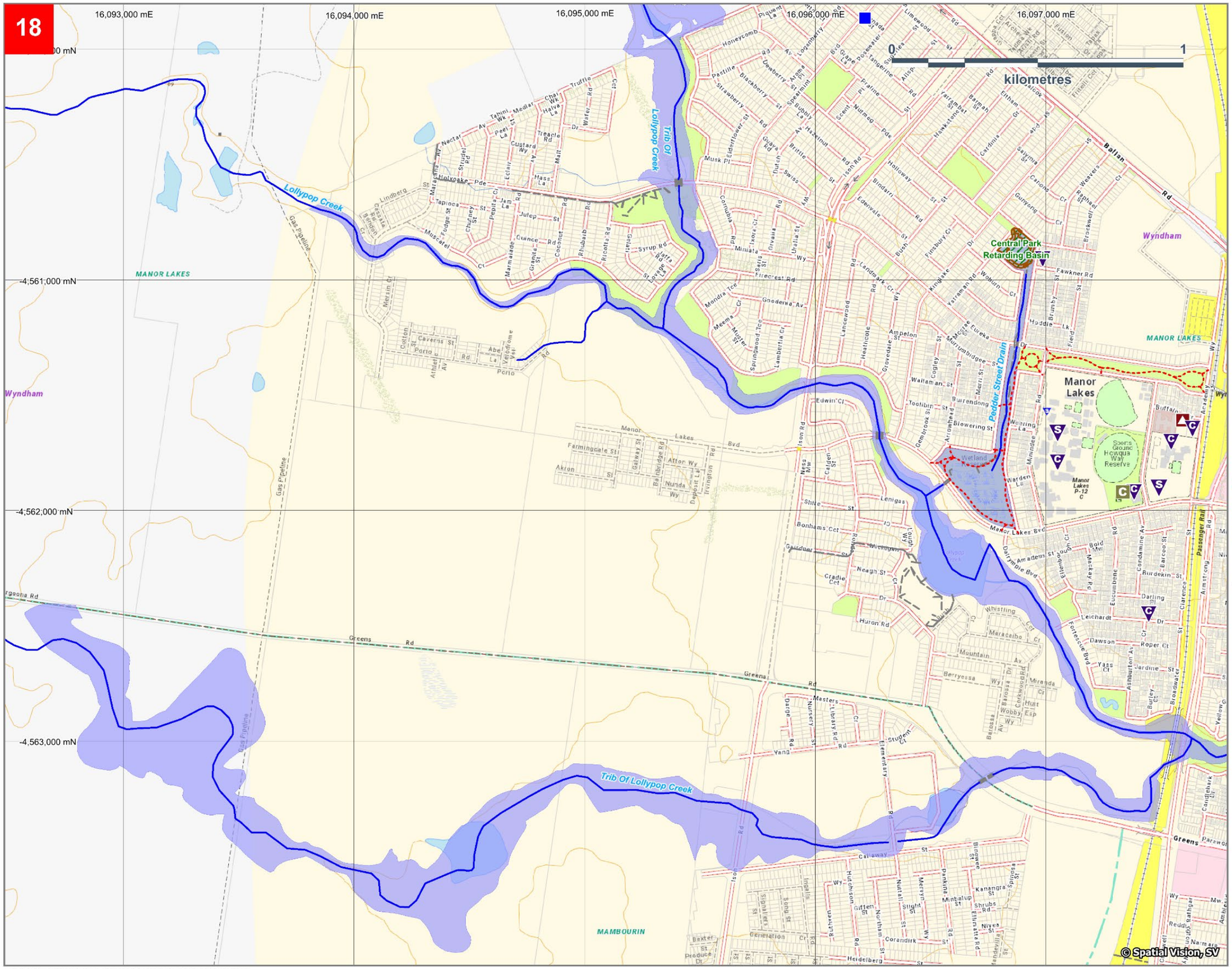
- Building
- Waterbody
- 1% AEP Flood Extent (Depth Unavailable)
- 1% AEP Storm Surge Extent
- Waterway
- School / College
- Coast Guard Flotilla
- Caravan Park
- Retail Water Storage

LAND USE

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



Flood modelling completed by CPG, May 2012. Map Produced by VICSES March 2022.



Flood modelling completed by DPM, August 2010. Map Produced by VICSES March 2022.

WYNDHAM CITY

1% AEP (100yr ARI) Flooding

18. Lollypop Creek (Manor Lakes)

19

16,096,000 mE
16,097,000 mE
16,098,000 mE
16,099,000 mE
16,100,000 mE
16,101,000 mE
-4;566,000 mN
-4;567,000 mN
-4,568,000 mN
-4;569,000 mN

Trib. Of Lollypop Creek
Lollypop Creek
Cherry Creek
Passenger Rail
Bulban Rd
Princes Hwy
Dohrn Rd
Werribee
Wyndham
Wyndham Vale South Reserve
Bulban Road Linear Reserve
Alwood Retarding Basin
Thomas Chirgwin PS
Riverwalk PS
Gas Pipeline
Oil Pipeline

Lollypop Creek at Bulban Rd
1% AEP Flood Level:
2.693m (20.81m AHD)

0
1
kilometres

© Spatial Vision, SV

Flood modelling completed by DPM, August 2010. Map Produced by VICSES March 2022.

Building
1% AEP Riverine Flood Extent (Depth Unavailable)
Melbourne Water Retarding Basin
Bicycle / Walking Trail
Melbourne Water Stormwater Drain
Waterway
Child Care / Kindergarten
Education Facility
Place Of Worship
Stream Level Gauge &1% AEP Flood Level

N

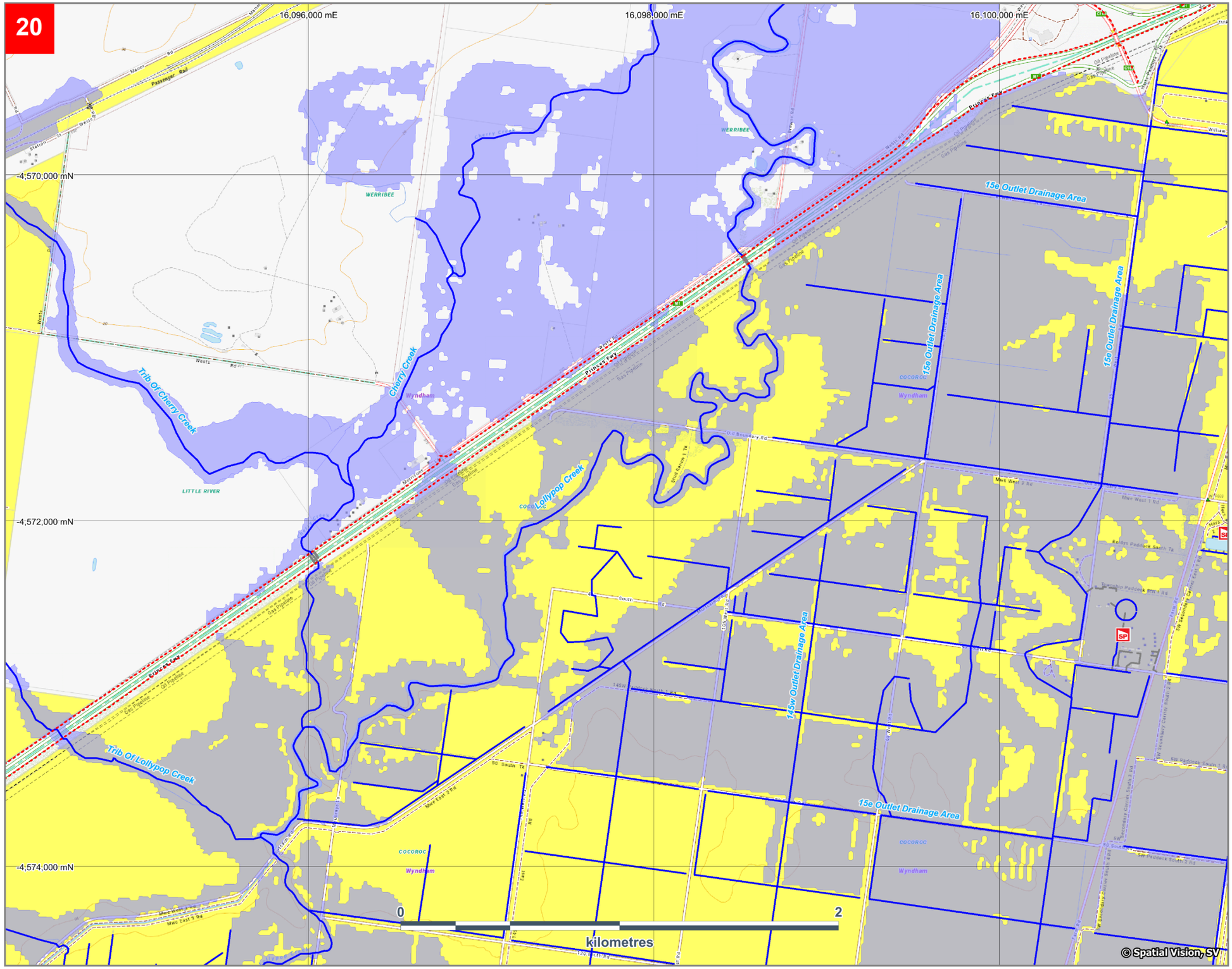
LAND USE
Residential
Commercial and Business
Industrial
Public Parks / Cemeteries / Recreation
Utilities and Local Government Facilities
Education

WYNDHAM CITY

1% AEP (100yr ARI) Flooding

19. Lollypop Creek (Werribee)

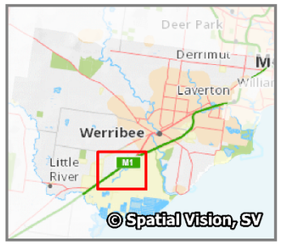
SES VICTORIA Melbourne Water



Building
1% AEP Riverine Flood Extent (Depth Unavailable)
Bicycle / Walking Trail
Waterway
Sewer Pumping Station

N

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



WYNDHAM CITY

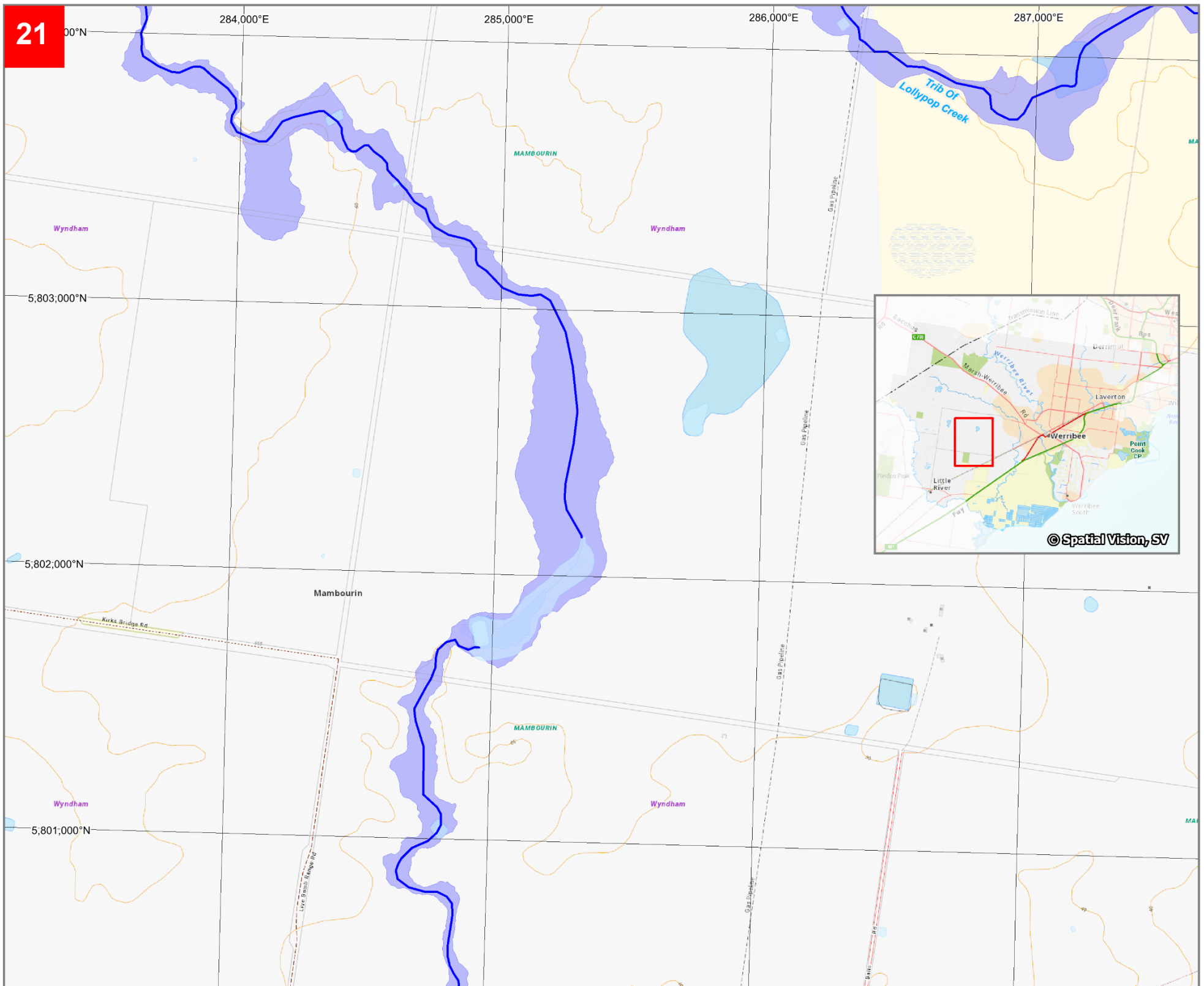
1% AEP (100yr ARI) Flooding

20. Lollypop Creek (Cocoroc)

SES VICTORIA Melbourne Water

Flood modelling completed by BMT WBM, June 2008. Map Produced by VICSES March 2022.

21



Flood modelling completed by BMT WBM, June 2008. Map produced by VICSES March 2022.

N

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

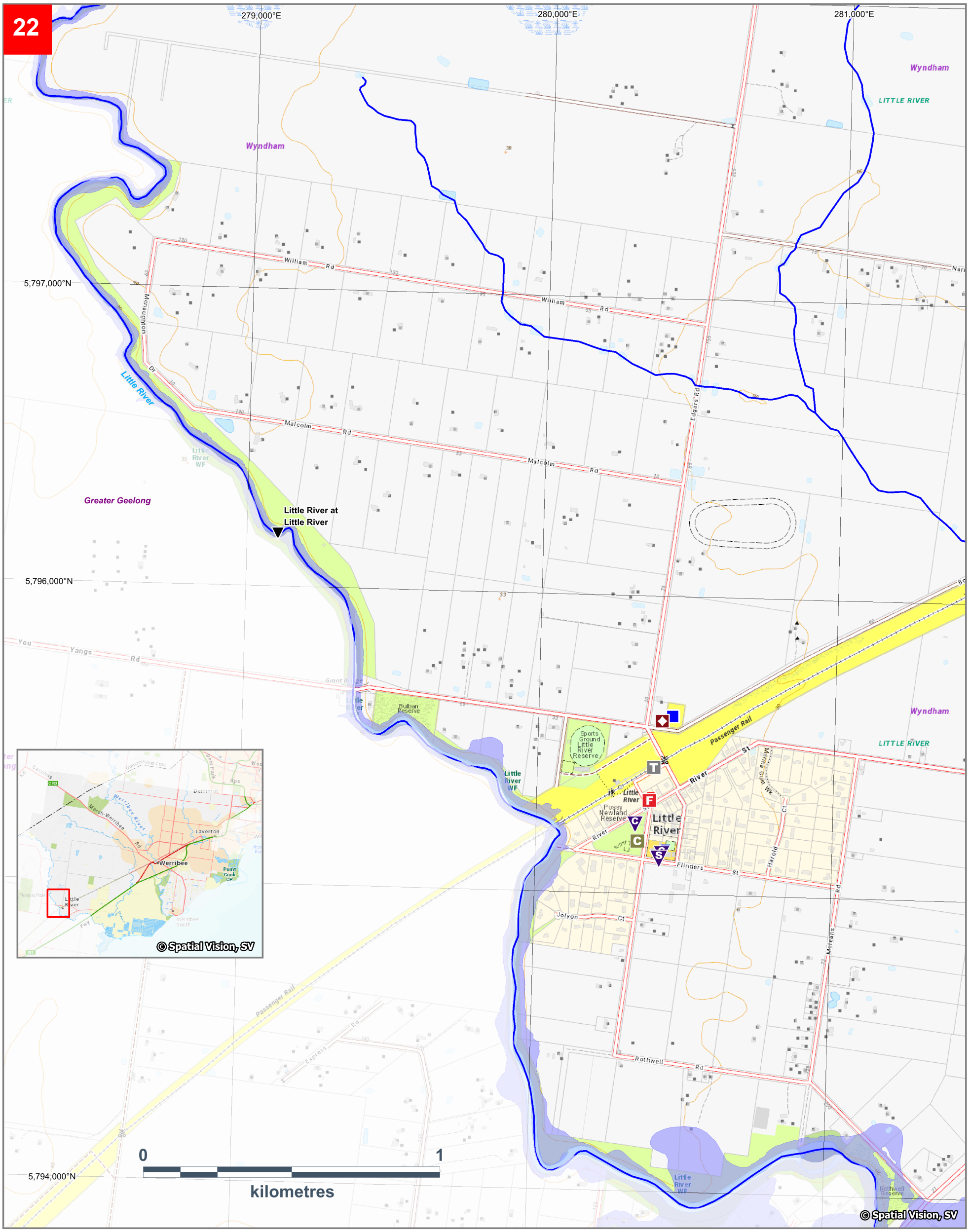
LAND USE
Residential
Commercial and Business
Industrial
Public Parks / Cemeteries / Recreation
Utilities and Local Government Facilities
Education

WYNDHAM CITY

1% AEP (100yr ARI) Flooding

21. Cherry Creek Tributary (Mambourin)

22



Flood modelling completed by Melbourne Water, January 2009. Map produced by VICSES March 2022.

N

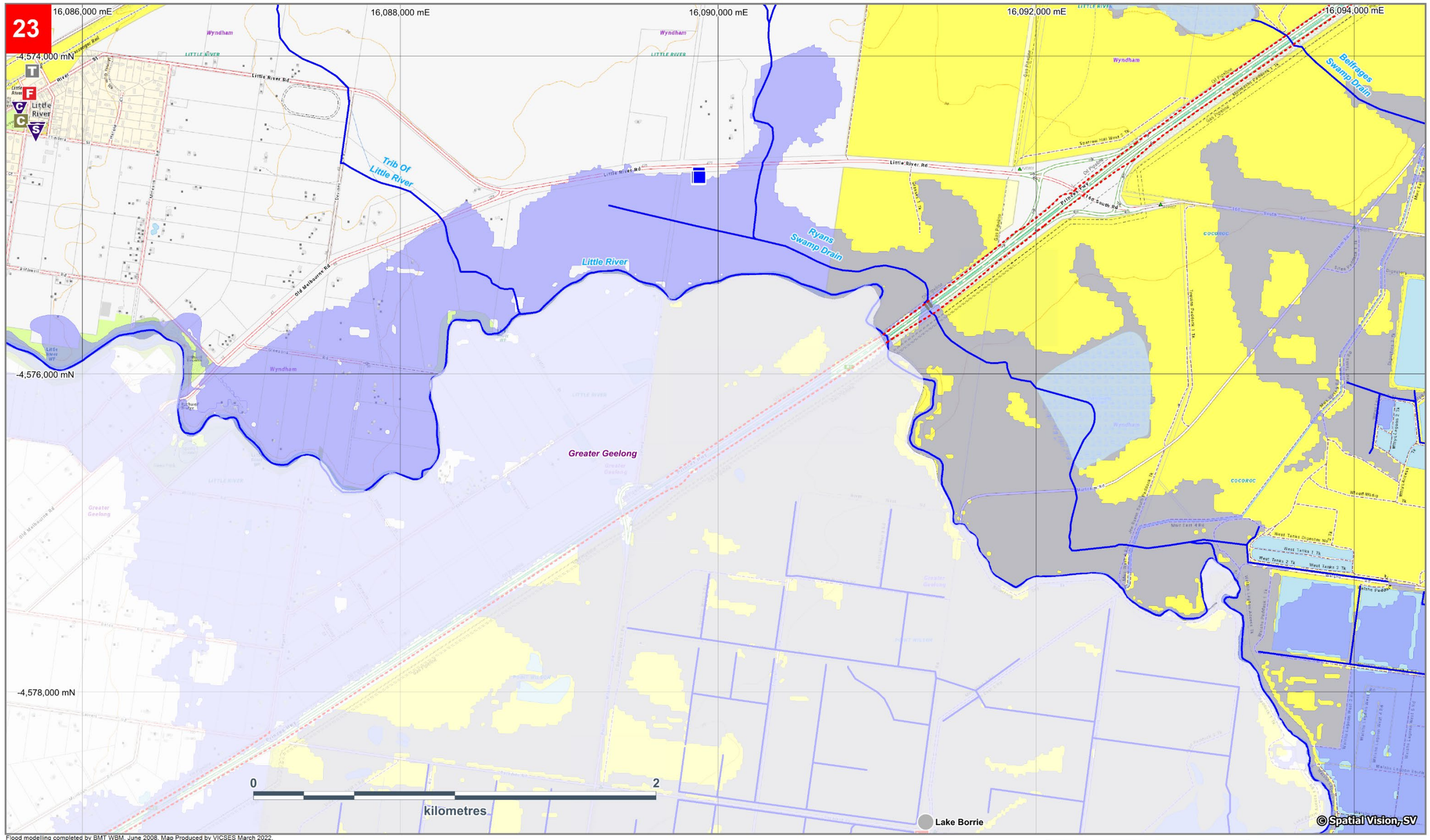
Building
Waterbody
1% AEP Flood Extent (Depth Unavailable)
Waterway
Community Centre
Place Of Worship
School / College
Child Care / Kindergarten
Fire Station
Retail Water Storage
Stream Level Gauge
Telephone Exchange

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

WYNDHAM CITY

1% AEP (100yr ARI) Flooding

22. Little River (Little River)



Flood modelling completed by BMT WBM, June 2008. Map Produced by VICSES March 2022.

N

WYNDHAM CITY

1% AEP (100yr ARI) Flooding

23. Little River (Point Wilson)

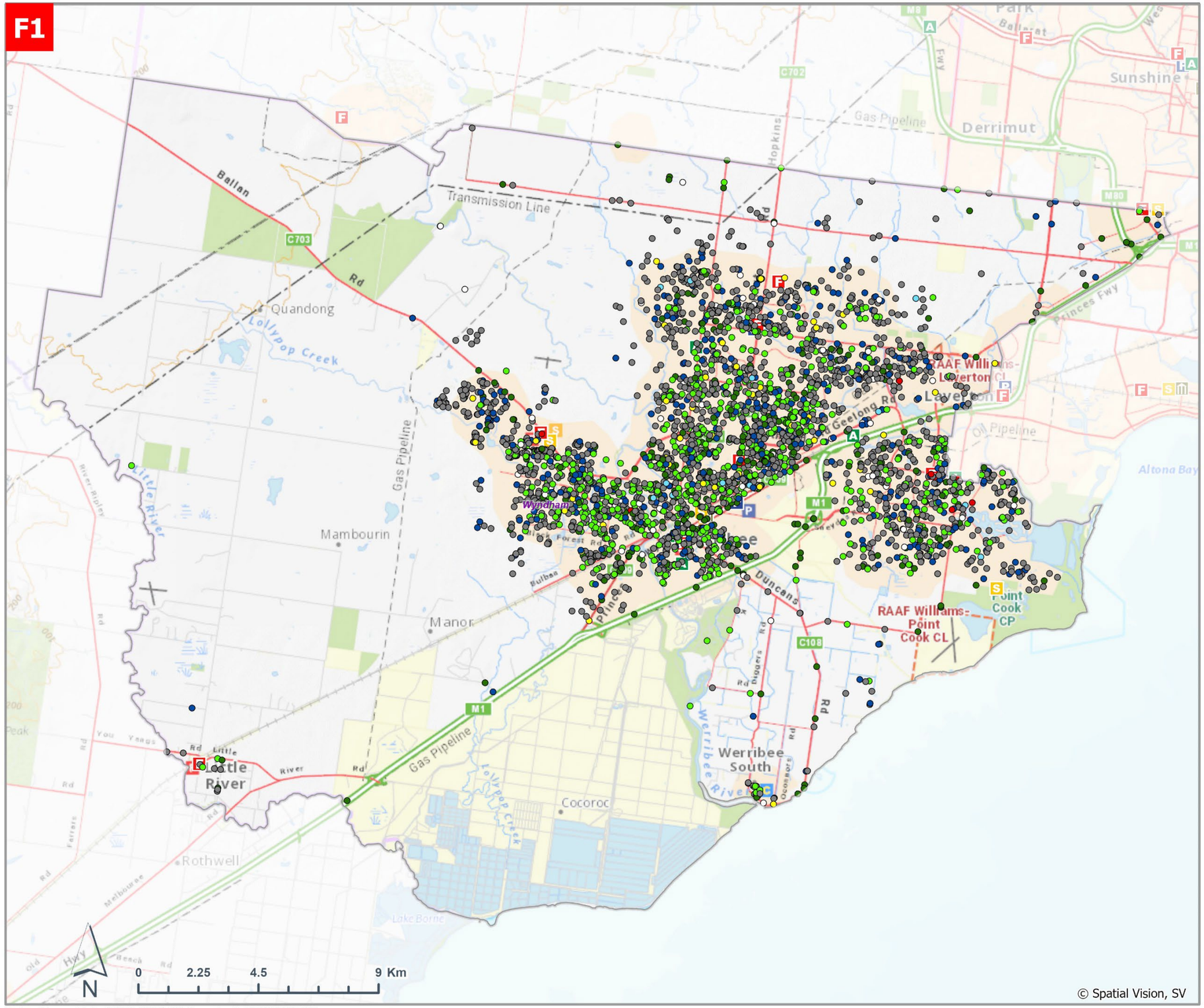
- Building
- Waterbody
- 1% AEP Riverine Flood Extent (Depth Unavailable)
- Bicycle / Walking Trail
- Waterway
- Community Centre
- Fire Station
- Rain Gauge
- Retail Water Storage
- Child Care / Kindergarten
- Telephone Exchange
- School / College

LAND USE

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

SES VICTORIA State Government Melbourne Water

Severe Weather Request for Assistance Maps



Flood modelling completed by XXXXXXX, XXXXXX 20XX. Map produced by VICSES XXXXXX 2022.

LAND USE

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

- Fire Station
- VICSES Units
- Ambulance Stations
- Police Stations
- Municipal Office
- Municipal Depot

Severe Weather RFAs (Storm or Flood)

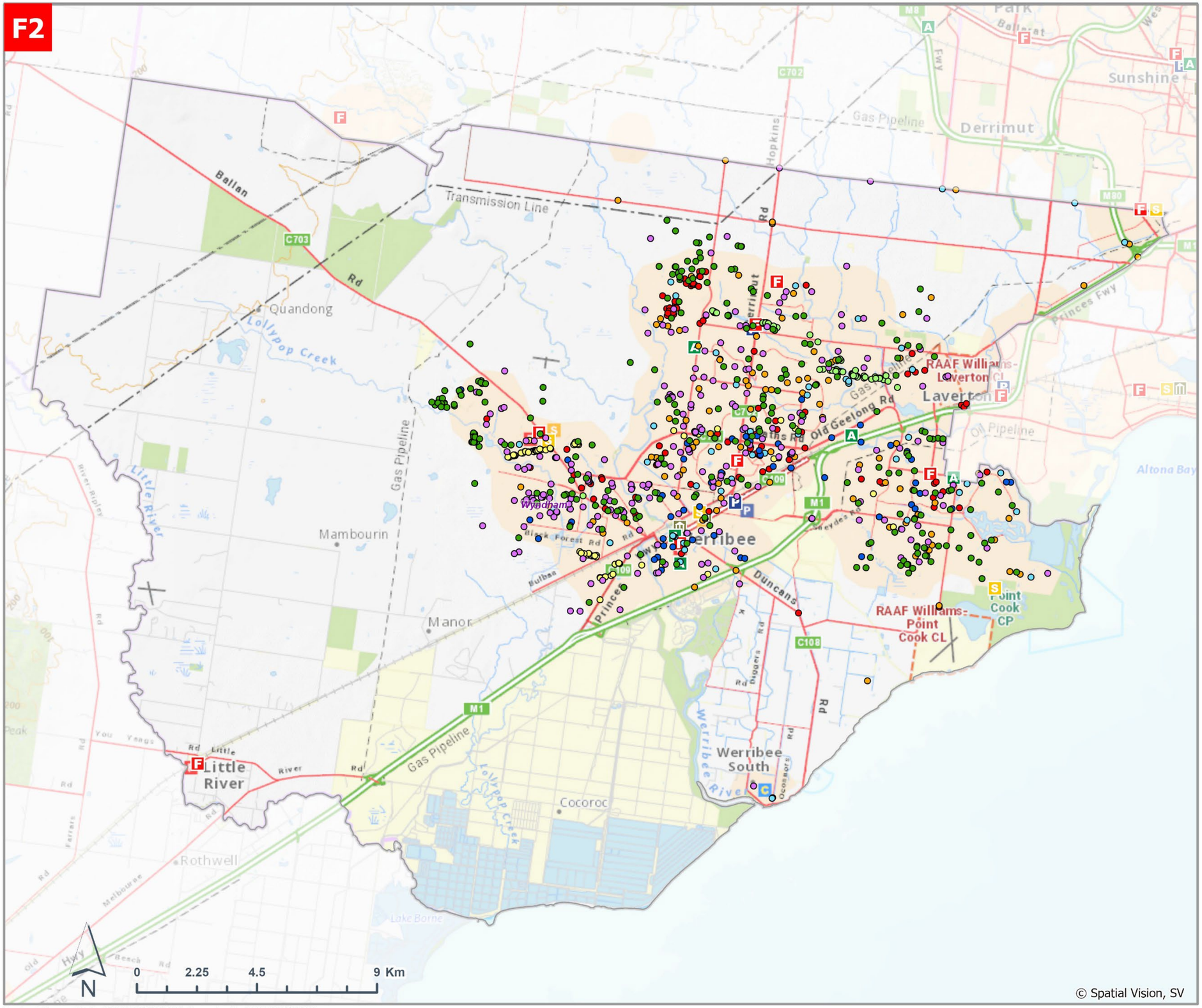
- Assist Other Agency
- Building Damage
- Flooding
- Loose Debris / Object / Fence
- Rescue
- Tree Down
- Tree Down Traffic Hazard
- Other

WYNDHAM CITY

1% AEP (100yr ARI) Flooding

F1. Severe Weather Requests for Assistance (RFA) by Job Type (July 2009 - February 2023)

F2



Flood modelling completed by XXXXXXX, XXXXXX 20XX. Map produced by VICSES XXXXXX 2022.

LAND USE

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

- Fire Station
- VICSES Units
- Ambulance Stations
- Police Stations
- Municipal Office
- Municipal Depot

Severe Weather RFAs (Storm or Flood)

Where greater than 60 RFAs received

- 4th-5th Feb 2011 (90)
- 1st-2nd Oct 2013 (108)
- 18th Mar 2016 (85)
- 21st-22nd Nov 2016 (70)
- 29th Jul 2017 (60)
- 14th Dec 2018 (62)
- 29th Oct-3rd Nov 2021 (241)
- 5th-8th Jan 2022 (265)

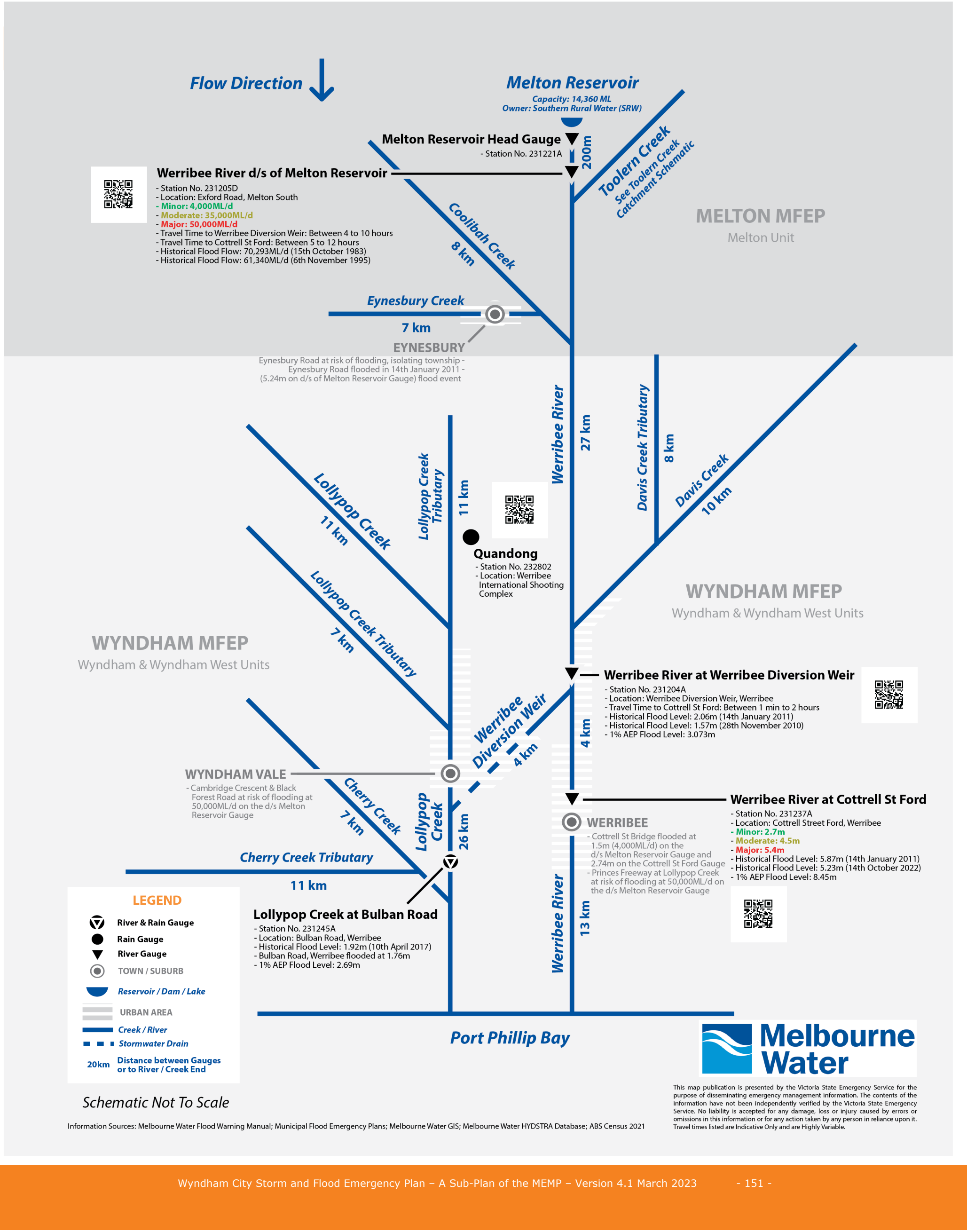
WYNDHAM CITY

1% AEP (100yr ARI) Flooding

F2. Severe Weather Requests for Assistance (RFA) by Event (July 2009 - February 2023)

Werribee River (Lower) & Lollypop Creek Catchment Schematic

Version 5 - March 2023



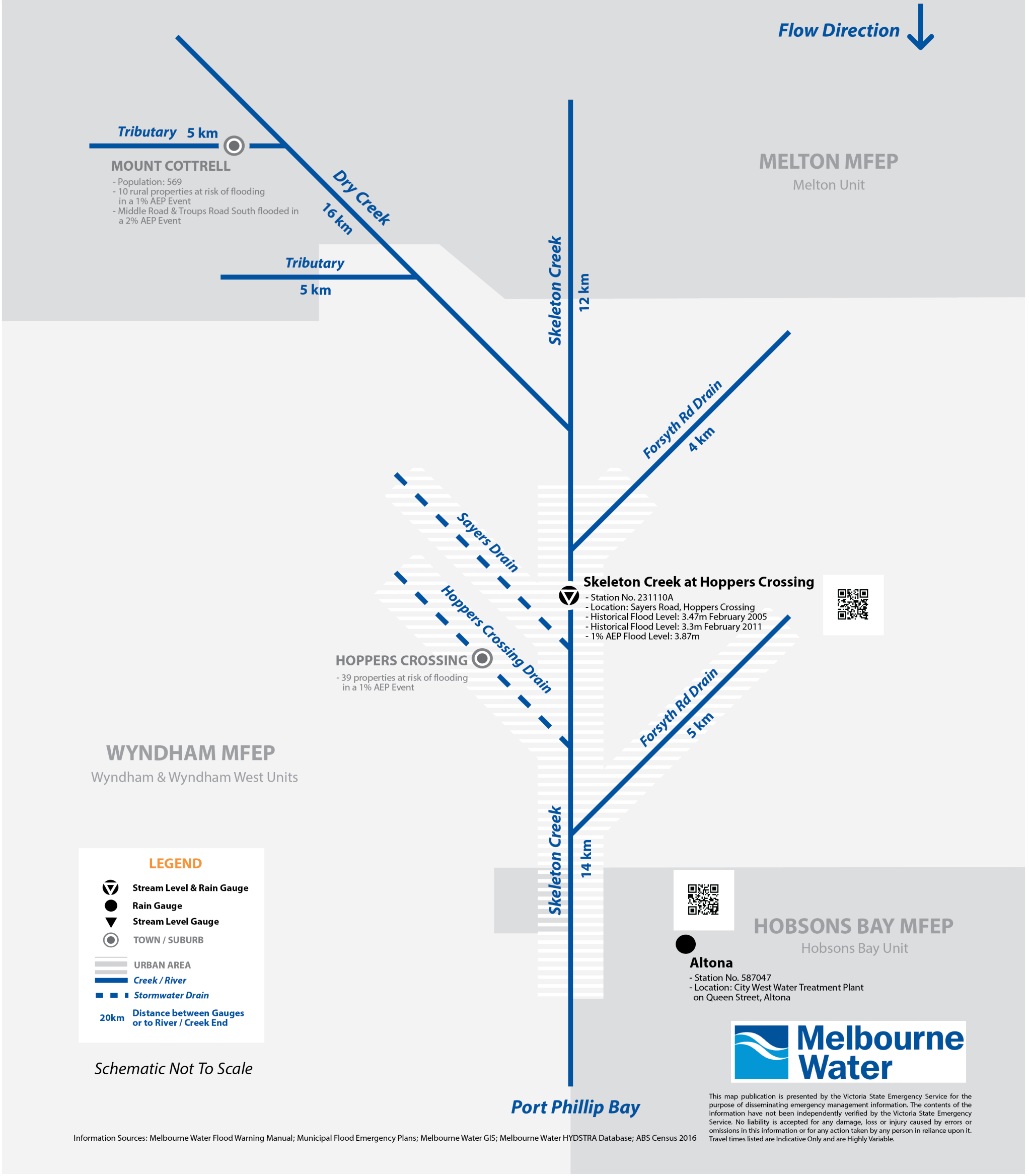
Schematic Not To Scale

Information Sources: Melbourne Water Flood Warning Manual; Municipal Flood Emergency Plans; Melbourne Water GIS; Melbourne Water HYDSTRA Database; ABS Census 2021

Melbourne Water

Skeleton Creek Catchment Schematic

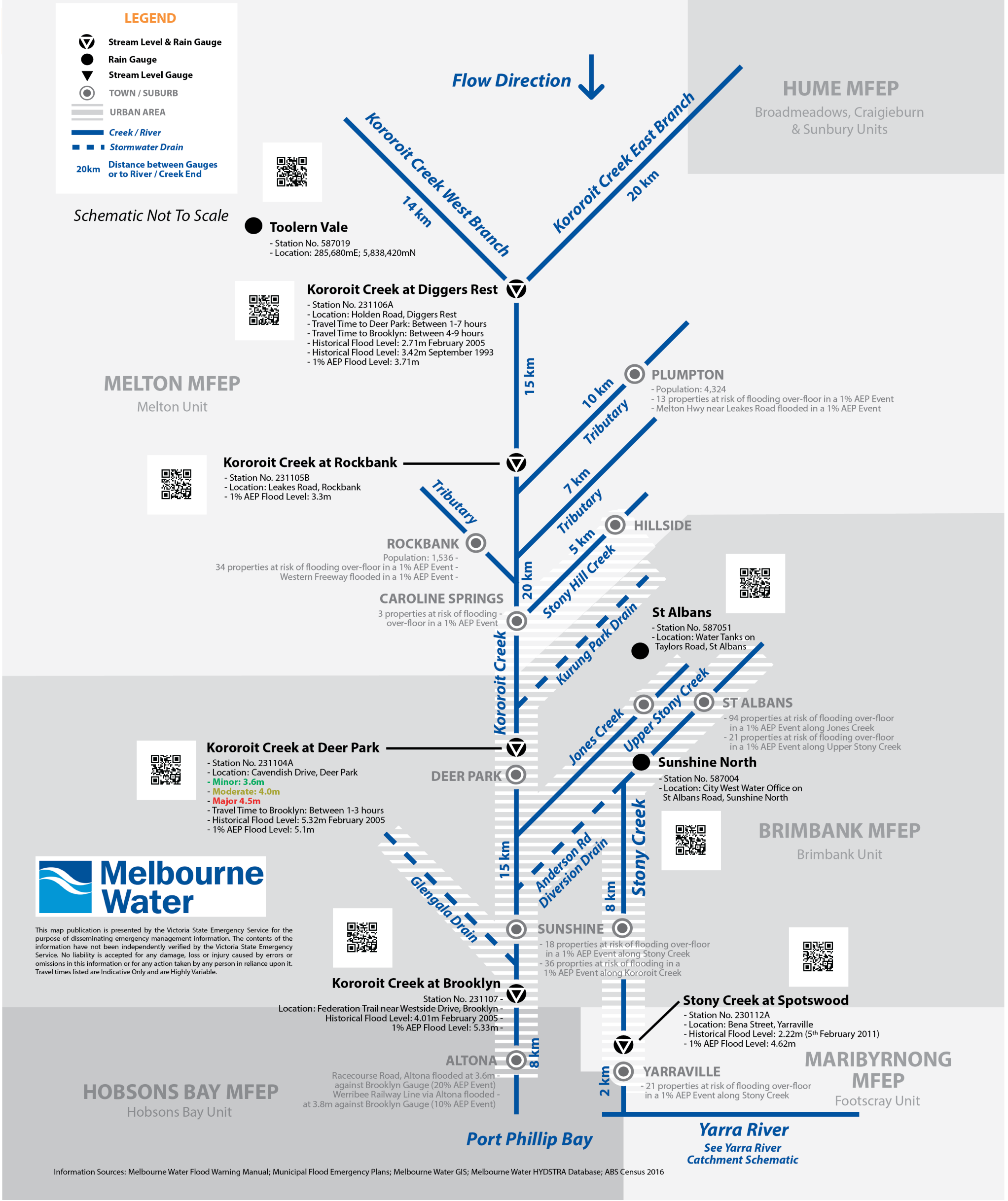
Version 6 - June 2022



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

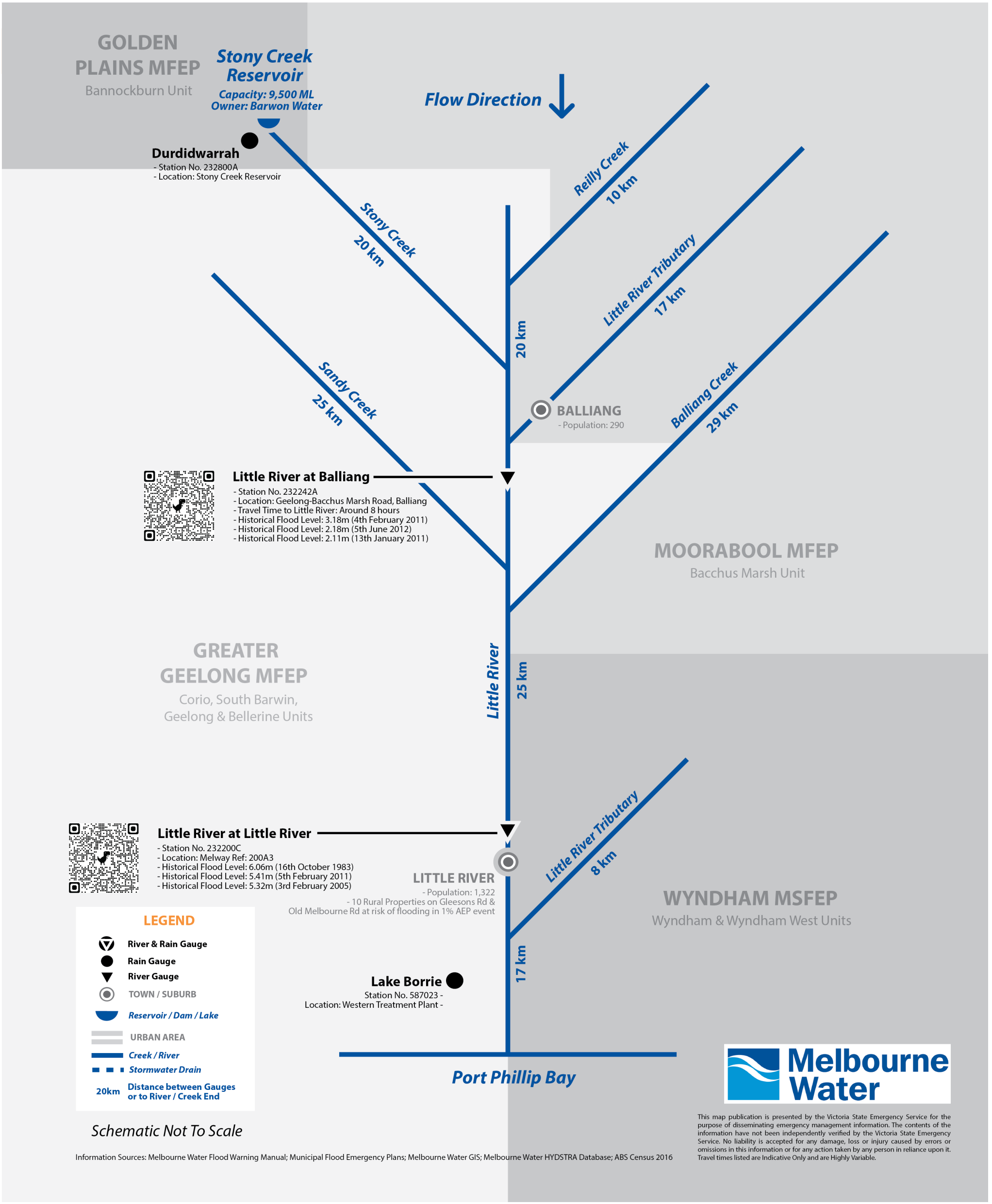
Kororoit Creek & Stony Creek Catchment Schematic

Version 5 - June 2021



Little River Catchment Schematic

Version 3 - June 2022



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

APPENDIX G – SEVERE WEATHER (STORM) EVENTS

Overview

Wyndham municipality is susceptible to severe weather events due to a combination of undulating terrain, urban boundary location and wind exposed properties. Storm events in the City of Wyndham area may include wind storms, hailstorms and thunderstorms including lightning activity. There have been occurrences of atmospheric downbursts/microburst within Wyndham and adjacent municipalities.

Severe storm activity could result in injuries and increases in road accidents. Damaging wind events could lead to trees down, with damage to the built and natural environment. Obstructions across roads could disrupt services, affect community functioning and cause significant road traffic delays. 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.

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

Large Storm Events

Typically, VICSES Wyndham and Wyndam West Units would expect to be impacted by a large storm event on average once a year (more than 40 RFAs per event) for incidents within Wyndham City, with a number of months resulting in 100+ RFAs during periods of La Nina weather patterns.

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

- February 2011 – flash flood event that caused damage to property and infrastructure from rapid water rises and drainage challenges resulting in **431** Requests for assistance to VICSES.
- October 2013 – Windstorm event that saw **444** requests received for trees down and building damage.
- March 2016 – Another windstorm event that saw **114** RFAs across the municipality predominantly for building damage.
- October 2016 – Severe weather event with fierce winds led to many RFAs for building damage and tree down related issues, which led to secondary traffic issues and road closures as a result of trees across roads.
- October / November 2021 – Severe Storm resulting in **358** RFAs for building damage and trees down as well as disruption to power and other services.
- January 2022 – Severe Weather event that saw **265** RFAs for impacts relating to both wind and rain

VICSES Requests for Assistance

The Victoria State Emergency Service records requests for assistance made by the public during severe weather events. Additional calls may have been made directly to Council during these events. Table G1 below is a breakdown of requests by suburb and damage type during the period July 2009 to March 2022 in relation to severe weather and storm events.

Suburb	VICSES Request for Assistance (July 2009 – February 2023)				
	Building Damage	Flooding	Tree Down	Tree Down Traffic Hazard	Other**
Hoppers Crossing	363	87	180	83	33
Laverton	4	3	0	1	1
Laverton North	8	5	1	14	0
Little River	7	2	3	5	0
Manor Lakes	147	24	15	14	13
Mount Cottrell	9	0	0	5	3
Point Cook	338	70	92	41	26
Tarneit	288	58	43	32	24
Truganina	126	24	23	15	5
Werribee	465	94	281	117	54
Werribee South	29	8	16	17	6
Williams Landing	49	9	2	2	4
Wyndham Vale	168	42	73	17	25

Table G1 – Breakdown of severe weather RFAs received by VICSES Wyndham and Wyndham West Units by suburb in Wyndham City

*RFAs captured are those that occurred in conjunction with storm/ severe weather activity. Single incident RFAs that have occurred in calm weather have not been included.

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

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

Date	VICSES Request for Assistance (July 2009 – February 2023)				
	Building Damage	Flooding	Tree Down	Tree Down Traffic Hazard	Other**
July 2009	1	0	1	0	0
August 2009	18	7	7	0	0
September 2009	9	3	1	1	0
October 2009	7	0	0	0	0
November 2009	25	1	2	8	0
December 2009	4	0	0	0	0
January 2010	4	1	0	0	0
February 2010	9	1	0	4	0
March 2010	18	0	0	4	0
April 2010	3	3	2	0	0
May 2010	8	0	3	0	0
June 2010	3	2	2	0	0
July 2010	3	2	1	0	0
August 2010	44	15	5	0	0
September 2010	14	3	2	8	0
October 2010	15	4	1	15	0
November 2010	9	4	3	3	0
December 2010	19	2	1	10	2
January 2011	217	9	11	190	4
February 2011	2	1	1	0	0
March 2011	9	2	1	1	0
April 2011	3	1	0	1	0
May 2011	1	0	1	0	0
June 2011	3	2	1	1	0

Date	VICSES Request for Assistance (July 2009 – February 2023)				
	Building Damage	Flooding	Tree Down	Tree Down Traffic Hazard	Other**
July 2011	5	1	1	0	0
August 2011	4	3	0	1	0
September 2011	1	0	0	0	0
October 2011	25	3	1	16	0
November 2011	10	3	2	3	0
December 2011	9	5	4	1	0
January 2012	12	18	4	1	0
February 2012	3	5	1	0	0
March 2012	8	10	4	0	0
April 2012	15	0	0	2	0
May 2012	10	2	0	0	0
June 2012	2	0	0	0	0
July 2012	3	2	2	0	0
August 2012	17	5	2	1	0
September 2012	3	0	1	0	0
October 2012	8	2	1	0	0
November 2012	15	16	9	0	0
December 2012	6	2	4	4	0
January 2013	5	1	0	2	0
February 2013	9	19	7	1	0
March 2013	2	1	1	0	0
April 3013	3	4	3	0	0
May 2013	2	0	1	0	0
June 2013	6	0	1	0	0
July 2013	23	17	8	0	0
August 2013	23	10	2	0	0
September 2013	316	91	34	3	0
October 2013	11	1	2	0	0
November 2013	1	2	3	1	0
December 2013	7	5	6	0	0
January 2014	14	6	3	0	0
February 2014	13	1	0	2	0
March 2014	2	1	0	0	0
April 2014	5	0	0	2	0
May 2014	55	19	10	1	0
June 2014	19	6	5	1	0
July 2014	0	1	1	1	0
August 2014	10	7	2	1	0
September 2014	5	2	0	1	0
October 2014	13	0	0	0	0
November 2014	12	8	5	0	0
December 2014	12	1	0	2	0
January 2015	8	1	3	0	0
February 2015	4	3	0	0	0
March 2015	3	1	0	0	0
April 2015	1	0	0	0	0
May 2015	0	0	3	0	0
June 2015	3	0	0	0	0
July 2015	0	0	1	0	0
August 2015	0	2	1	0	0
September 2015	11	2	1	0	0
October 2015	18	16	4	3	0
November 2015	12	3	2	0	0
December 2015	57	3	22	1	0
January 2016	5	1	1	0	0
February 2016	92	11	9	2	0
March 2016	2	1	2	0	0

Date	VICSES Request for Assistance (July 2009 – February 2023)				
	Building Damage	Flooding	Tree Down	Tree Down Traffic Hazard	Other**
April 2016	4	3	3	2	0
May 2016	10	2	3	0	0
June 2016	20	5	6	2	0
July 2016	3	1	1	0	0
August 2016	5	2	1	1	0
September 2016	62	28	12	1	1
October 2016	101	3	3	1	0
November 2016	22	0	3	2	0
December 2016	9	6	1	3	0
January 2017	18	2	1	5	0
February 2017	12	8	1	1	0
March 2017	25	1	3	3	0
April 2017	1	0	0	1	1
May 2017	1	0	1	1	0
June 2017	37	26	5	1	0
July 2017	6	2	1	0	0
August 2017	4	3	4	0	0
September 2017	4	3	2	0	0
October 2017	3	1	0	0	0
November 2017	28	5	6	7	2
December 2017	16	4	3	0	0
January 2018	9	9	8	0	0
February 2018	9	8	3	1	0
March 2018	5	5	2	0	0
April 2018	10	4	0	1	0
May 2018	6	1	1	1	0
June 2018	8	2	2	0	0
July 2018	2	4	3	1	0
August 2018	2	1	0	0	0
September 2018	6	0	1	0	0
October 2018	12	13	4	2	0
November 2018	59	1	2	21	1
December 2018	10	2	2	1	1
January 2019	6	1	1	0	0
February 2019	7	2	2	0	0
March 2019	0	1	1	1	0
April 2019	21	0	3	9	0
May 2019	5	1	0	1	1
June 2019	10	3	0	0	0
July 2019	6	7	3	2	0
August 2019	4	2	1	1	0
September 2019	11	0	0	1	2
October 2019	18	12	8	3	5
November 2019	5	8	5	4	4
December 2019	27	3	2	1	0
January 2020	12	13	7	2	0
February 2020	8	1	0	0	1
March 2020	8	3	4	2	0
April 2020	3	1	3	0	0
May 2020	3	1	0	4	0
June 2020	5	0	0	1	0
July 2020	12	12	2	1	4
August 2020	2	10	1	1	4
September 2020	7	7	2	3	2
October 2020	7	10	4	2	4
November 2020	28	25	8	3	6
December 2020	30	8	4	8	6

Date	VICSES Request for Assistance (July 2009 – February 2023)				
	Building Damage	Flooding	Tree Down	Tree Down Traffic Hazard	Other**
January 2021	5	1	1	2	0
February 2021	7	0	0	2	0
March 2021	6	3	1	2	0
April 2021	0	4	2	0	0
May 2021	11	0	0	0	0
June 2021	5	6	2	1	4
July 2021	5	5	2	2	0
August 2021	5	2	2	1	0
September 2021	14	6	1	4	2
October 2021	62	91	27	3	20
November 2021	68	61	6	2	18
December 2021	19	9	4	1	0
January 2022	262	21	10	74	23
February 2022	6	3	1	1	0
March 2022	7	2	3	2	0
April 2022	8	4	0	0	0
May 2022	3	1	1	0	1
June 2022	10	0	1	0	0
July 2022	3	1	0	2	1
August 2022	8	2	1	0	2
September 2022	5	2	0	1	1
October 2022	35	17	9	5	12
November 2022	27	10	15	4	8
December 2022	17	3	0	1	1
January 2023	7	4	4	3	1
February 2023	8	2	4	1	0

Table G2 – Breakdown of severe weather RFAs received by VICSES Wyndham and Wyndham West Units in Wyndham City by month

*RFAs captured are those that occurred in conjunction with storm/ severe weather activity. Single incident RFAs that have occurred in calm weather have not been included.

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

Activation Triggers

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

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

CD/19/34926

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

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

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

CD/19/34926

Readiness Level	RL 1 - Low to Moderate	RL 2 -High	RL 3(A) - Very High	RL 3 (B) - VERY HIGH	RL 4 - SEVERE	RL 5 - EXTREME
Activation Considerations	**Thunderstorm Forecast Chart (TFC), issued daily**			**Severe Weather Intelligence Briefing (SWIB), issued Tuesday & Friday**		
Storm Prediction or Warning	SWIB - no colour. No thunderstorms. No severe weather.	SWIB - no colour. TFC shows thunderstorms possible. No severe weather warning (SWW). No severe thunderstorm warning (STW).	SWIB - no colour. TFC - severe thunderstorms possible. SWW - issued for winds and/or possible heavy rainfall. STW - issued for wind and/or heavy rainfall and/or hail. Storm surge - forecast with minimal impacts.	SWIB - coloured yellow. TFC - shows severe thunderstorms likely. SWW - issued for wind* and/or heavy rainfall. STW - issued for wind* and/or heavy rainfall and/or hail. Storm surge - forecast with greater impacts.	SWIB - coloured orange for winds* and/or rainfall. TFC - shows severe thunderstorms likely; including potential for large hail, damaging winds*, and heavy rainfall leading to flash flooding. SWW - issued for damaging winds* and/or heavy rainfall. STW - issued for wind* and/or heavy rainfall and/or hail. Storm tide (normal tide) - forecast.	SWIB - coloured red for damaging to destructive winds* and/or very heavy rainfall. TFC - shows severe thunderstorms likely including potential for giant hail, damaging/destructive winds, heavy rainfall leading to flash flooding. SWW - issued for damaging or destructive winds* or heavy rainfall. STW - issued for super cells possible, heavy rain and/or very dangerous thunderstorm warning issued. Storm tide (high tide) - forecast.
Storm Behaviour	No thunderstorms. No severe weather.	Wind - gusts < 90km/h Rain - rates not conducive to flash flooding. Hail - small (<2cm).	SWIB - 50km/hr+ average winds*, gusts* reaching 90-100 km/hr for prolonged periods. TFC - possibility of thunderstorms may or may not include small hail (<3cm). SWW / STW - chance of flash flooding and damaging winds considered possible.	SWIB - 60km/hr+ average winds*, gusts* reaching over 100km/hr (101-109 km/hr) for 6 or more hour period. TFC - severe thunderstorms possible, high possibility of 3 or 4cm hail, wind gusts* over 100km/hr. SWW - heavy rainfall leading to flash flooding across districts considered possible. STW - localised flash flooding rates of >20mm per 30mins likely.	SWIB - 70km/hr+ average winds*, damaging gusts* reaching over 110km/hr (110-120 km/hr) for 3 or more hour period. TFC - severe thunderstorms likely. SWW - heavy rainfall leading to flash and/or riverine flooding across districts considered likely. STW - possibility of hail of 4-5cm, wind gusts* >110km/hr. Potential for super cell, squall or tornado. Localised flash flooding rates of >30mm per 30mins likely.	SWIB - very unstable weather conditions including 80km/hr+ average winds*, damaging (120km/hr) to destructive (>125km/hr) gusts* for 3 or more hour period certain. TFC - severe thunderstorms likely. SWW - heavy rainfall leading to flash and/or riverine flooding across districts considered very likely. STW - super cells including hail >5cm, wind gusts* >120km/hr. Localised flash flooding rates of >40mm per 30mins. Squalls or tornado likely.
	**Consideration: Add 10km/hr to average winds and/or gusts when considering Alpine district predictions and/or warnings based on time of day, time of year, altitude, and area of prediction.*					
Storm Activity	Local level Unit response Active RFAs per Unit: Rural 1 - 20 Urban/Metro 1 - 60	Local level Unit response Active RFAs per Unit: Rural 20 - 30 Urban/Metro 60 - 75	Local level Unit response with additional local agency support Active RFAs per Unit: Rural 20 - 30 Urban/Metro 60 - 75 Active RFAs per Region: Rural 60 - 100 Urban/Metro 200 - 250	Multi-unit response with increasing multi-agency response. Active RFAs per Region: Rural 100 - 250 Urban/Metro 250 - 400 ESTA - Critical Incident Response Plan (CIRP) Level 1 activated.	Multi-unit response with multi-agency support and high level of multi-agency response activity (e.g. fire alarms). Active RFAs per Region: Rural 250 - 500 Urban/Metro 400 - 1,000 ESTA - Critical Incident Response Plan (CIRP) Level 2 activated. Event creation has increased to 2-4 per minute. <15 calls waiting.	Multi-unit response and high level of multi-agency response activity with significant impacts across municipalities. Active RFAs per Region: Rural 500+ Urban/Metro 1,000+ ESTA - Critical Incident Response Plan (CIRP) Level 3 activated. Event creation has increased to 4+ per minute. 15+ calls waiting.
Readiness and Activation	**VICSES - Business As Usual - Operations**			**Multi Agency Operations under JSOP 2.03**		
State	SCC Monitoring (white)	SCC Monitoring (white)	SCC Monitoring (white) / Tier 1 (blue)	SCC Tier 1 (blue) Where 1 level 2 ICC is activated.	SCC Tier 2 (orange) Where 2+ Level 2 ICCs, or 1 Level 3 ICC is activated.	SCC Tier 3 (red) Where 3+ Level 2 ICCs, or 2+ Level 3 ICC is activated.
	SDO monitoring SAC aware	SDO monitoring SAC aware	SDO and SAC - 60 minute recall or in place. SOCC - 60 minute recall or in place.	SDO and SAC - in place. SOCC - in place.	SDO and SAC - in place. SOCC - in place. Night shift on standby, or remote SDO, SAC and SOCC to be rostered.	SDO and SAC - in place for day and night shifts. SOCC - in place for day and night shifts at multiple ESTA locations.
Region			Regional Command - 60 minute recall or in place	Rural - Regional Command in place at RCC or Regional Office, RC notified. Metro - RCC open with base RCT in place.	RCC open - RCT in place, other relevant agencies available on immediate recall.	RCC open - Full RCT in place.
	RDO monitoring RAC aware	RDO actively monitoring RAC monitoring	RAC and RDO - 60 minute recall or in place	Rural - RDO and RAC in place at RCC or Regional Office. Metro - RC, RAC and RDO in place at RCC.	RC, RAC and RDO in place at RCC. Night shift on standby, or remote RDO and RAC to be rostered.	RC, RAC and RDO in place at RCC for day and night shifts.
Incident			RAC and RDO - 60 minute recall or in place at RCC or Regional Office. Optional support form: Resource Officer Management Support Officer Warnings & Advice Officer Intelligence Officer	Rural - Base IMT on 60 minute recall. Metro - Base IMT in place	Rural - Base IMT in place, with Core IMT on 60 minute recall. Metro - Core IMT in place.	Rural - Core IMT in place, with Full IMT on 60 minute recall. Metro - Full IMT in place.
Effect	**Potential Consequences**					
People	Some minor inconvenience around local roads.		Increased number of roads being impacted. Traffic management plan should be considered.		Significant number of roads impacted. Traffic management plan is required. Some major roads closed with tree blockages or flash flooding impacts.	
Remote Communities	Inconvenience only.		Some minor isolation and loss of utilities of individual properties or remote communities is likely.		Community isolation and loss of food/supplies potential with resupply requirements dependant on time of power or access outages.	
Health	Little impact expected. Some local issues might be encountered, but managed locally within own facility plans.		Consideration for review and familiarisation with facility plans. VICPOL and DHHS to review Vulnerable persons list.		Highly likely vulnerable people impacted by power outage will require relocation. Communities without power for days needing support.	
Critical Infrastructure	Nil impact.		May require some preparatory work and discussion with owner of infrastructure.		Significant work likely to be required to protect critical infrastructure. Contingency plans put in place if lose of the infrastructure occurs.	
Public Infrastructure Essential Community Infrastructure	Limited impact.		Some disruption to access to parks and vegetated community areas and infrastructure. Some minor damage to community infrastructure.		Significant damage to community infrastructure and community facilities. Long term closure of key community facilities likely.	
Power	Possible power disruptions.		Likely short term power disruptions.		Power disruptions almost guaranteed, with potential long term outages.	
Water Utilities	Little impact expected some local issues might be encountered but managed locally.		Increased potential but still managed locally. May be minor sewerage overflow issues in isolated areas.		Highly likely that some infrastructure will be impacted, water authorities should develop or initiate their plans to address issues. Significant potential for pollutants including sewerage in water and loss of power will exasperate the impacts.	
Telecommunications	Unlikely impacts.		Minimal impact to individual premises only.		Significant impact with loss of landlines and mobile powers which will affect peoples capacity to receive warnings and information. Commercial Business impacts with loss of phone services.	
Gas	Little impact expected Some local issues might be encountered but managed locally.		Increased potential for infrastructure damage and disruption but still managed locally.		Likely that some infrastructure will be impacted, supply authorities should develop or initiate their plans to address issues.	
Road Network	Unlikely impacts.		Some minor roads may be impacted with possible disruption to critical needs supplies such as milk.		Highly likely for roads to be cut and egress and access impacted. Major roads potentially cut in some locations traffic diversions in place. Potential rescue of trapped persons in vehicles highly likely. Expected impact on rail routes. Economic impact likely with loss of power and utilities supply for lengthy period.	
Public Transport	Limited impact on public transport routes.		Impact to public transport routes may occur but likely to be minimal with diversions possible		Public transport impacts will occur with roads and rail lines cut and no alterative route available Significant disruption to people movement likely.	
Education	Unlikely impacts.		Some impact expected. Traffic management plan for school buses should be considered.		Some school and preschools may be impacted by utilities loss and damage to infrastructure. School bus routes closed for period of time	
Public Events	May be cancelled due to weather conditions only.		Some public events may need to be cancelled or rescheduled due to safety of patrons either whilst at event or travelling to/from the event.		Public events impacted likely cancellation of major events due to wind impacts and risk, and potential flooding impact on venue or ability to attend or leave event.	
Tourism	Unlikely that event(s) will be impacted but consideration must be given to any event occurring to ensure it is safe to continue.		Potential impact on tourist locations if area not safe to visit or isolated due to road closures.		May impact on high value tourist locations and facilities with long term impacts in the social and economic environment of communities.	
Agriculture Animal welfare	No impact likely with landowners managing any localised issues.		Potential impact with losses to live stock, fencing and crops including high intensive farming of produce and tree farms.		Substantial impact to crops, including high intensive produce farming (vegetables and fruit) and tree farms with short and long term impacts due to loss of crops. Economic impact to area.	
Environmental	Minimal impact.		Potential for stream erosion and loss of vegetation around watercourses. Minor tree damage.		Significant disturbance to vegetation with some areas heavily impacted.	
Cultural Heritage	Minimal impact likely.		Some disturbance along watercourses may occur, but likely to be minimal.		Potential for impact on historical structures and features.	
Relief and Recovery	Relief and recovery activity unlikely may be some local issues.		Increased potential for relief and recovery activity, but likely to be managed locally by LGA with support of DHHS.		Formal arrangements put in place for relief and recovery activity. Regional Recovery Commander appointed. Health Commander in place Demands on relief and recovery to be substantial and potentially long term.	

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