Nillumbik

Storm and Flood Emergency Plan

A Sub-Plan of the Nillumbik Municipal Emergency Management Plan

Version 8.2, August 2023

VICTORIA State Government

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Distribution List

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Original	MEMPC Executive Officer	Nillumbik Shire Council	
1	RECS office	Nillumbik Shire Council Office Copy	
2	MEMPC Chairperson	MEMPC Chairperson	
3	MEMO	Nillumbik Shire Council	
4	Deputy MEMO	Nillumbik Shire Council	
5	MRM	Nillumbik Shire Council	
6	MERC	Eltham Police Station	
8	Commander Community Resilience North West Metro Region	FRV North West Metro Region	
9	Operation Officer	CFA Eltham	
10	Operations Manager	CFA District 14	
11	Controller	VICSES Nillumbik Unit	
12	Operations Officer – Emergency Management	VICSES (North West Metro)	
13	Team Leader Hydrology and Flood Warden	Melbourne Water	
14	District Manager	DEECA	
15	Flood Warning Manager	Bureau of Meteorology	
16	REMI	North West Metro	
17	Group Manager	Ambulance Victoria (MICA 5)	
18	Team Leader	DTP Sunshine EM Section	
19	Emergency Management Coordinator & Critical Incident Response Management	DFFH Eastern Region	
20	Duty Manager	Yarra Valley Water	
21	Duty Manager	Power supplier Ausnet Services	
22	Operations Manager	CFA	
24	Commander, Community Safety and Engagement	FRV – Eastern District	
25	ICC's - Woori Yallock, Ferntree Gully, Mulgrave, Sunshine	SES & CFA	
26	Regional Recovery Manager for North West Metro.	Emergency Recovery Victoria	
27	Senior Regional Recovery Officer	Emergency Recovery Victoria	

Document Transmittal Form / Amendment Certificate

This Municipal Storm and Flood Emergency Plan (Plan) will be amended, maintained and distributed as required by VICSES in consultation with the Nillumbik Municipal Emergency Management Committee

Suggestions for amendments to this Plan should be forwarded to VICSES North West Metro Office Victoria State Emergency Service , 239 Proximity Drive, Sunshine West, Victoria 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
Version 01	12/04/12	Diana Ferguson	Population of template
Version 02	14/06/2012	Diana Ferguson	Population of template
Version 03	24/07/2012	Diana Ferguson	Update MSFEP with VICSES and Council comments
Version 04	14/08/2012	Diana Ferguson	Updated MSFEP with generic changes
Version 05	22/08/2012	Diana Ferguson	Update MSFEP with VICSES and Council comments
Version 06	30/03/2015	Ross Butler	Update of Appendices A, B, C & F and addition of appendices G & H
Version 06	May 2015	Diana Ferguson & Subcommittee	Update MSFEP including Storm information with VICSES and Council comments
Version 06	July 2015	Ross Butler & Diana Ferguson	Minor changes including Update the mapping and name changes plan.
Version 06	August 2015	Subcommittee & Diana Ferguson	Minor changes to plan.
Version 07	January 2019	Ross Butler	Update of Appendices A, B, C, F, G & H
Version 07	February/ March 2019	Subcommittee & Diana Ferguson	Review and update template
Version 08	January 2023	Ross Butler	Application of new template. Update of parts of the body as well as Appendix A, B, C, F & G. Changes and edits to accommodate the *Emergency Management Legislation Amendment Act 2018* (EMLA Act) that amended the *Emergency Management Act 2013* (EM Act 2013).
Version 08.1	February 2023	Ross Butler	Inclusion of impacts in Appendix C1 based on development of Andrew Pocket Park Project
Version 08.2	March, 2023, June 2023	Marisha Patton Kim Halse Jess Crimmins	Administrative changes

This Plan will be maintained on the Nillumbik Shire Council and VICSES websites.

www.nillumbik.vic.gov.au and www.ses.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
DJSIR	Department of Jobs, Skills, Industry and Regions	SBO	Special Building Overlay
DoI	Department of Infrastructure	SCC	State Control Centre
DTP	Department of Transport and Planning	SEMP	State Emergency Management Plan
EMLO	Emergency Management Liaison Officer	SEWS	Standard Emergency Warning Signal
EMV	Emergency Management Victoria	SHERP	State Health Emergency Response Plan
EO	Executive Officer	SOP	Standard Operating Procedure
FO	Floodway Overlay	VicPol	Victoria Police
FRV	Fire Rescue Victoria	VICSES	Victoria State Emergency Service
FWS	Flood Warning System		
FZ	Floodway Zone		
IC	Incident Controller		
ICC	Incident Control Centre		

Glossary

Below are terms defined for the purpose of this plan:

Term	Definition
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 Nillumbik Council
Overland flooding	Flooding by local runoff caused by heavier than usual rainfall. Overland flooding can be caused by local flow exceeding the capacity of an urban stormwater drainage system or by the backwater effects of mainstream flooding causing urban stormwater drainage system to overflow. For local government areas this is over the 5-year ARI in residential or over 10yr ARI in commercial/industrial. For Melbourne Water catchment areas this is for all other ARIs up to the 100yr ARI. Note that not all overland flows cause flooding under the definition in the Knox City Service Plan Appendices.
Floodplain	Area of land adjacent to a creek, river, estuary, lake, dam or artificial channel, which is subject to inundation.
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.
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.
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.
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.
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
Flood mapping	The process where the extent of flooding is documented in mapping software based on flood studies and surface elevations

Part 1. INTRODUCTION

1.1 Approval and Endorsement

The Plan has been prepared by a subcommittee of the Nillumbik Municipal Emergency Management Committee (MEMPC) and with the authority of the MEMPC pursuant to Section 77 of the Emergency Management Act 2013 (as amended).

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

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

This Plan is a result of the cooperative efforts of the Nillumbik Flood Planning Committee (MFPC) and its member agencies.

A Statement of Assurance has been undertaken and is the process whereby the Agency, VICSES along with the MEMPC has undertaken to bring the Plan into alignment and compliancy.

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

This Plan was endorsed by the Nillumbik MEMPC as a sub plan of the MEMP, 30 August 2023

1.2 Purpose and Scope of this Storm and Flood Emergency Plan

The purpose of this Plan is to detail arrangements agreed for the planning, preparedness/prevention, response and recovery from flood incidents within the Nillumbik municipal district.

As such, the scope of the Plan is to:

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

1.3 Municipal Storm and Flood Planning Committee (MSFPC)

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

- VICSES (i.e. Unit Controller & Operations Officer – Emergency Management) (Chair),
- Nillumbik Shire Council
- Victoria Police (i.e. Municipal Emergency Response Co-ordinator) (MERC),
- Catchment Management Authority,
- Department of Families, Fairness and Housing (DFFH) as required,
- Department of Energy, Environment and Climate Action (DEECA) as required,
- Water Authorities as required,
- Bureau of Meteorology as required,
- Fire Rescue Victoria (FRV); or Country Fire Authority (CFA) if relevant.
- Local community representatives and
- Parks Victoria

1.4 Responsibility for Planning, Review and Maintenance of this Plan

This Plan must be maintained in order to remain effective.

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

The MSFPC will meet at least once per year or as required.

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

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

Part 2. BEFORE: PREVENTION / PREPAREDNESS ARRANGEMENTS

2.1 Community Awareness for all Types of Storm and Flooding

Details of this Plan will be released to the community through local media, the VICSES Plan and stay safe programs, websites (VICSES and the Municipality) upon formal adoption by Nillumbik MEMPC.

VICSES with the support of Melbourne Water and Nillumbik will coordinate community education programs for storm and flooding within the council area (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).

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

2.3.3 Local Knowledge

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

There are no official Community Flood Observers within Nillumbik, 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 North West Metro Regional 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 the Nillumbik. 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 Nillumbik MEMP, the SEMP (Roles and Responsibilities), State Flood and Storm Emergency Plans and VICSES North West Metro Regional Storm and Flood Emergency Plans (ses.vic.gov.au/em-sector/vicses-emergency-plans).

3.1.3 Council Emergency Operations Centre (CEOC)

Where activated, the function, location, establishment and operation of the CEOC will be as detailed in the Nillumbik MEMP.

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

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

3.1.4 Escalation

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

Resourcing and event escalation arrangements are described in the SEMP.

3.2 Strategic Control Priorities

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

1. **Protection and preservation of life is paramount** - this includes:

    a. Safety of emergency services personnel, and;

    b. Safety of community members including vulnerable community members and visitors/tourist located within the incident area.

2. **Issuing of community information and community warnings** detailing incident information that is timely, relevant and tailored to assist community members make informed decisions about their safety.;

3. **Protection of critical infrastructure and community assets** that supports 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 values** 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 Controller and relevant stakeholders based on sound incident predictions and risk assessments.

3.3 The Six C's

Arrangements in this Plan 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 Energy, Environment and Climate Action (DEECA) as the Control Agency responsible for dam safety, water and sewerage asset related incidents and other emergencies.

All storm and flood response activities within Nillumbik, 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 their delegated representative.

3.3.2 Incident Controller (IC)

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

3.3.3 Incident Control Centre (ICC)

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

Pre-determined Incident Control Centres are located at:

- Sunshine ICC
- Dandenong ICC
- Ferntree Gully ICC

3.3.4 Divisions and Sectors

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

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

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 Nillumbik Shire 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

Incident Controller or 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;
- Monitor weather and flood information (see 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, other emergency services through the EMT;
- Assess ICC readiness (including staffing of IMT and EMT) and open if required;
- Ensure flood bulletins and community information are prepared and issued to the community;
- Monitor watercourses and undertake reconnaissance of low-lying areas;
- Develop media and community information management strategy;
- Ensure 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

VICSES Regional Duty Officer RDO/ will undertake actions as defined within the flood intelligence cards (appendix C).

General considerations by the VICSES Regional Duty Officer RDO/IC will be as follows:

- Develop an appreciation of current flood levels and predicted levels. Are floodwaters, rising, peaking or falling?
- Review flood intelligence to assess likely flood consequences. Consider:
    - What areas may be at risk of inundation;
    - What areas maybe at risk of isolation;
    - What areas maybe at risk of indirect affects as a consequence of power, gas, water, telephone, sewerage, health, transport or emergency service infrastructure interruption; and
    - The characteristics of the populations at risk;
- Determine what the at-risk community need to know and do as the storm and/or flood develops.
- Warn the at-risk community by ensuring that an appropriate warning and community information strategy is implemented. This includes:
    - The current storm and/or flood situation;
    - Storm and/or Flood predictions;
    - What the consequences of predicted activity and or levels may be;
    - Public safety advice;
    - Who to contact for further information; and

    - 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 (see 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 are contained in the VICSES North West Metro Regional Storm and Flood Emergency Plans and State Flood 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;
- VICSES Flood Storm Information Line;
- 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).

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

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

Responsibility for public information, including media briefings, rest with VICSES as the control agency. Council will assist VICSES to warn individuals within the community where practicable including activation of flood warning systems, where they exist. Other agencies such as CFA, DEECA and VICPOL may also be requested to assist VICSES with the communication of community storm and/or flood warnings. Other agencies such as CFA, DEECA 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 landslip is likely or flooding necessitating evacuation of communities is predicted, the IC may consider the use of the Emergency Alert System and SEWS.

DFFH and 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. Nillumbik Council will work with the 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 Nillumbik 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, emergency relief centres etc. in line with the Nillumbik 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 North West Metropolitan Regional Storm and Flood Emergency Plans and State Flood Emergency Plan.

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

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

2. If evacuation is possible, then evacuation should be the adopted strategy and it must be supported by a public information capability and a rescue contingency plan, Contact MERC who liaises with MEMO and MRM about activating ERC (see MEMP);

3. Where it's 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; this advice needs to be provided even when evacuation may be possible, due the likelihood that not all community members will evacuate

4. For buildings known to be structurally 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 MERC and 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 VicTraffic website for road closures https://traffic.vicroads.vic.gov.au/

3.9 Evacuation

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

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

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

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

VicPol (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 Nillumbik MEMP Section 5 Evacuation. If evacuation is determined as appropriate, Nillumbik MEMO and MRM should be notified as soon as possible.

Refer to **Appendix D** of this Plan for detailed evacuation arrangements for Nillumbik.

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

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

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

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

3.11 Aircraft Management

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

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

Suitable airbase facilities are located at:

- Essendon
- Moorabbin

3.12 Resupply

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

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

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3.13 Essential Infrastructure and Property Protection

Essential Infrastructure and Property (e.g. roads, utility, 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.

The IC will determine the priorities related to the use of sandbags, which will be consistent with the strategic priorities and the VICSES Sandbag policy.

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

Property may be protected by:

- Sandbagging to minimise entry of water into buildings.

- Encouraging businesses and households to lift or move contents; and
- Construction of temporary levees in consultation with Melbourne Water, Nillumbik Shire Council and VICPOL and within appropriate approval frameworks.

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

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** for specific details of likely disruption to services and proposed arrangements to respond to service disruptions in the municipality of Nillumbik.

3.15 Road Closures

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

See attached link for designated roads.

https://www.nillumbik.vic.gov.au/Residents/Roads-drains-and-paths

DTP, VicPol and Nillumbik Shire Council will communicate community information regarding road closures as outlined in the Nillumbik MEMP.

3.16 Dam Failure and Landslide

3.16.1 Dam Failure

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

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 DEECA and/or Melbourne Water.

3.16.2 Landslide

VicPol is the Control Agency for Landslide incidents; VICSES is the Control Agency for any flooding that may result.

Major Landslide with potential to cause structural and community damage within Nillumbik are contained in **Appendix A**.

3.17 Waste Water related Public Health Issues and Critical Sewerage Assets

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

- Advise VICSES and the Nillumbik MEMO 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; and
- Advise the ICC in the event of inundation of critical sewerage assets.

It is the responsibility of the Council's Environmental Health Officer to inspect and report to the MERO and the ICC on any water quality issues relating to flooding, on Council and/or privately owned land.

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

3.1 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.

3.2 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 recovery from a storm or flood incident within Nillumbik are detailed in the Nillumbik MEMP (section 6) and Relief and Recovery Complimentary Plan.

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 Nillumbik 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 MEMP for further information.

Nillumbik has identified facilities suitable for relief activities. Emergency Relief Centres are identified and referenced in the MEMP for potential use during storm/floods events

4.3 Animal Welfare

Matters relating to the welfare of livestock (including feeding and rescue), are to be referred to DEECA.

Matters relating to companion animals will be shared between Nillumbik Shire 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 DEECA and Nillumbik Shire Council.

Refer to **Appendix D** for animal shelter compound locations.

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 Nillumbik MEMP.

Where the Nillumbik CEOC has been activated, Council will lead municipal recovery activity as outlined in the MEMP.

APPENDIX A - FLOOD THREATS FOR NILLUMBIK

General

Nillumbik is located less than 25 kilometres north-east of Melbourne,and has the Yarra River as its southern boundary. The Shire extends 29 kilometres to Kinglake National Park in the north, stretches approximately 20 kilometres from the Plenty River and Yan Yean Road in the west, to Christmas Hills and the Yarra escarpment in the east. Nillumbik covers an area of 432 square kilometres and has an estimated population of 62,895 who live in communities which range from typical urban settings to remote bush properties[1].

Major townships within Nillumbik; are Eltham, Diamond Creek & Hurstbridge of which all are located along Diamond Creek (See Map B in **Appendix F**). Hurstbridge is the location of the convergence of the Arthurs and Diamond Creeks.

The Sugarloaf Reservoir, in Christmas Hills is a major source of fresh water for the population of Melbourne and has a capacity of 93,411 Mega litres. The reservoir has an outflow which feeds into the Yarra River upstream of Warrandyte.

Description of Major Waterways & Drains

Major rivers, creeks and drains are described below and contained in the following table. See the Schematic of Diamond Creek, The Yarra River & Plenty River in **Appendix F** for more information.

Arthurs Creek

The Arthurs Creek begins in the Kinglake National Park and flows through rural landscapes where it meets up with Diamond Creek at Hurstbridge.

Diamond Creek

The Diamond Creek begins on the Kinglake Plateau and flows through St Andrews, Hurstbridge, Diamond Creek and Eltham, before entering the Yarra River at Eltham Lower Park.

Plenty River

Beginning at Mt Disappointment, the Plenty River flows through Mernda and Whittlesea and the urban areas of Greensborough before entering the Yarra River at Lower Plenty.

Watery Gully Creek

The Water Gully Creek begins in Watery Gully and continues through Wattle Glen were it flows into Diamond Creek

Watsons Creek

The Watsons Creek begins in Kinglake National Park and passes through rural land in Christmas Hills and Kangaroo Ground, before entering the Yarra River at the Bend of Islands Conservation Zone.

[1] ABS 2021 Census

Melbourne Water Drains & Waterways	Suburb/s	Melbourne Water Drains & Waterways	Suburb/s
Allendale Rd Drain	Eltham North	Kings Gully Rd Creek	Kangaroo Ground & Watsons Creek
Arthurs Creek	Arthurs Creek, Hurstbridge, Kinglake, Nutfield & Strathewen	Long Gully	Panton Hill
Bailey Gully	Wattle Glen	Manuka Rd Gully	Hurstbridge
Black Calf Creek	Kinglake & St Andrews	Middle Hut Rd Gully	Doreen
Broad Gully	Hurstbridge	Nicholas Land Gully	Kangaroo Ground
Broad Gully Drain	Kinglake & St Andrews	Orme Rd Gully	Diamond Creek, Wattle Glen
Broad Gully Rd Drain	Diamond Creek	Parkway Drain	Diamond Creek
Chads Creek	Kinglake & Strathewen	Pidgen Bank Gully	Kangaroo Ground & North Warrandyte
Chapel Lane Gully	Nutfield	Pinchgut Creek	Kinglake
Cherry Tree Gully	Hurstbridge	Plenty River	Greensborough, Plenty & Yarrambat
Deep Creek	Arthurs Creek	Red Shirt Gully Drain	Cottles Bridge & Panton Hill
Diamond Creek	Eltham, Eltham North, Wattle Glen, Cottles Bridge, Hurstbridge, Kinglake & St Andrews	Research Creek	Eltham & Research
Doctors Gully Rd Drain	Doreen	Rifle Range Creek	Kinglake & Strathewen
Doctors Gully South Branch	Doreen	Running Creek	Arthurs Creek & Kinglake West
Dry Creek	Kinglake	Sawpit Creek	Diamond Creek
Dry Creek	Plenty	Scrubby Creek	Diamond Creek
Edinburgh St Drain	Diamond Creek	Smiths Gully	Smiths Gully
Elmo Rd Drain	Eltham	St Helena East Drain	Greensborough
Eltham Park Drain	Eltham	Steavenson Creek	Bend of Islands & Christmas Hills
Five Mile Creek	Christmas Hills	Stewart Gully South Branch	Arthurs Creek, Doreen & Nutfield
Fryers Gully Drain	Kangaroo Ground	Stony Creek	North Warrandyte
Greens Rd Gully	Arthurs Creek	Strathewen Reserve Tributary	Kinglake & Strathewen
Grove St Drain	Eltham	Sugarloaf Creek	Christmas Hills
Haleys Gully Rd Drain	Hurstbridge	Watery Gully Creek	Kangaroo Ground & Wattle Glen
Happy Valley Creek	Smiths Gully	Watsons Creek	Christmas Hills, Kangaroo Ground, Kinglake & Watsons Creek
Hildebrand Rd Tributary	Cottles Bridge	Wild Dog Creek	Kinglake
Ingrams Rd Drain	Research	Yarra River	Bend Of Islands, Christmas Hills, Eltham, Kangaroo Ground & North Warrandyte
Jehosaphat Creek	Kinglake	Yow Yow Creek	St Andrews
Kangaroo Creek	Arthurs Creek & Kinglake West	Zig Zag Rd Drain	Eltham

Table A1 – Melbourne Water Drains and Waterways within or bordering Nillumbik

Historic Storms and Floods

Significant floods (with high flood gauge levels and likely flooding consequences to property and infrastructure) to have occurred within Nillumbik 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	Plenty River at Greensb'ugh (229615A)	Arthurs Creek at Arthurs Creek (229620A)		Arthurs Creek at Nutfield (229272A)	Diamond Creek at Hurstbridge (229619B)		Diamond Creek at Eltham (229618A)	Watsons Creek at Kangaroo Ground (229608A)	Yarra River at Warrandyte (229200B)
	River Level	Rainfall at Gauge	Creek Level	Creek Level	Rainfall at Gauge	Creek Level	Creek Level	Creek Level	River Level
Normal Water Level	0.1m		1.20m	0.2m		0.2m	0.5m	0.5m	0.7m
Minor Flood Class	-		-			5.5m	6.0m	-	3.0m
Moderate Flood Class	-		-			6.4m	7.0m	-	4.5m
Major Flood Class	-		-			7.0m	7.5m	-	6.5m
9th November 1971	-	-	-	-	-	-	-	-	**6.78m**
15th May 1974	**7.77m**	-	4.32m	-	-	-	-	-	3.77m
31st July 1977	-	-	-	-	-	-	-	-	3.52m
18th September 1984	1.73m	54mm / 48hrs	3.67m	-	-	-	6.12m	4.42m	4.39m
22nd December 1985	1.92m	40mm / 8hrs	3.49m	-	-	-	6.08m	4.36m	1.96m
29th July 1987	5.40m	64mm / 28hrs	3.74m	-	-	-	5.96m	4.12m	3.13m
11th June 1989	4.84m	83mm / 43hrs	4.24m	-	-	-	**7.20m**	-	3.11m
18th September 1991	0.86m	37mm / 43hrs	3.07m	-	-	-	4.16m	3.55m	3.33m
10th October 1992	1.78m	23mm / 5hrs	3.42m	-	-	-	5.64m	4.27m	3.55m
30th July 1996	2.30m	27mm / 27hrs	3.34m	-	-	-	4.24m	1.39m	4.29m
13th November 2004	2.70m	62mm / 35hrs	2.13m	4.36m	-	-	5.81m	4.44m	3.42m
3rd February 2005	4.44m	134mm / 25hrs	-	**5.64m**	-	-	6.97m	4.74m	2.73m
30th October 2010	2.43m	58mm / 17hrs	3.98m	4.65m	53mm / 17hrs	5.32m	5.49m	3.60m	2.17m
14th January 2011	1.66m	56mm / 27hrs	3.87m	4.34m	75mm / 27hrs	4.15m	3.95m	2.22m	1.60m
5th February 2011	3.82m	73mm / 16hrs	4.21m	5.27m	98mm / 16hrs	**6.03m**	6.12m	**4.92m**	3.60m
26th November 2011	3.60m	78mm / 22hrs	4.04m	4.71m	58mm / 22hrs	5.01m	5.07m	3.32m	1.99m

Event	Plenty River at Greensb'ugh (229615A)	Arthurs Creek at Arthurs Creek (229620A)		Arthurs Creek at Nutfield (229272A)	Diamond Creek at Hurstbridge (229619B)		Diamond Creek at Eltham (229618A)	Watsons Creek at Kangaroo Ground (229608A)	Yarra River at Warrandyte (229200B)
	River Level	Rainfall at Gauge	Creek Level	Creek Level	Rainfall at Gauge	Creek Level	Creek Level	Creek Level	River Level
Normal Water Level	0.1m		1.20m	0.2m		0.2m	0.5m	0.5m	0.7m
Minor Flood Class	-		-			5.5m	6.0m	-	3.0m
Moderate Flood Class	-		-			6.4m	7.0m	-	4.5m
Major Flood Class	-		-			7.0m	7.5m	-	6.5m
25th December 2011	2.45m	53mm / 20hrs	2.58m	2.42m	67mm / 19hrs	4.16m	5.48m	3.39m	1.87m
29th December 2016	2.65m	18mm / 2hrs	1.30m	0.22m	24mm / 2hrs	0.31m	3.46m	0.39m	0.80m
3rd December 2017	0.92m	75mm / 41hrs	4.60m	3.76m	85mm / 48hrs	4.15m	3.79m	3.01m	1.71m
10th June 2021	1.16m	32mm / 11hrs	3.70m	3.66m	29mm / 12hrs	3.60m	2.98m	0.56m	3.18m
14th October 2022	4.89m	28mm / 5hrs	**5.37m**	4.97m	29mm / 6hrs	6.00m	6.23m	4.18m	2.87m
27th October 2022	2.02m	23mm / 7hrs	3.85m	4.05m	19mm / 6hrs	4.90m	5.07m	4.55m	4.19m

Table A2 – Selection of Historical Flood Events along the major waterways within Nillumbik

Significant flooding within the Nillumbik occurred on Christmas Day 2011. The rainfall intensity of these storms where recorded at a less than 1% AEP event (greater than 100 year ARI) at three rainfall gauging locations (Warrandyte, Hurstbridge & Greensborough) and a 1.5% ARI event at Arthurs Creek[2]

[2] Melbourne Water (2013): Nillumbik Flood Management Plan

Dam Failure

Flooding resulting from failure of the following dams is likely to cause significant structural and community damage within Nillumbik. See Dam Failure in **Section 3.16** 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.

Dam	Location	Owner	Dam Capacity	Full Supply Level	Melway Reference
Running Creek Reservoir	Arthurs Creek	Melbourne Water	255ML	205.33m AHD	X909 N11
Sugarloaf Reservoir	Christmas Hills	Melbourne Water	93,411ML	178.00m AHD	273 E6
Upper Yarra Reservoir	Reefton	Melbourne Water	200,051ML	366.53m AHD	X912 U2
Yan Yean Reservoir	Yan Yean	Melbourne Water	31,280ML	183.19m AHD	391 E1
	Arthurs Creek	Private	300ML		394 B1
	St Andrews	Private	100ML		394 G7

Table A3 – Melbourne Water Reservoirs that pose a risk to the Nillumbik from Dam Failure

Service Reservoirs located within Nillumbik are listed below.

Melbourne Water Service Reservoir	Location	Owner	Material	Reservoir Capacity	Melway Reference
Clearwater Reservoir	Winneke Treatment Plant, Christmas Hills	Melbourne Water	Below Ground, Concrete	212ML	273 B8
Plenty Steel Tank	Plenty Gorge Park, Goldsworthy Lane, Plenty	Melbourne Water	Steel Tank	30.60ML	10 J5

Table A4 – Melbourne Water Service Reservoirs with Nillumbik

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 food peaks at respective sites.

Typical Travel Times

Location From (gauge)	Location To (gauge)	Typical Travel Time	Flood Class	Comments
DIAMOND CREEK				
Arthurs Creek	Hurstbridge	Between 2 to 4 hours	Below Minor Flood Level at Eltham	
	Eltham	Between 4 to 10 hours		
Hurstbridge		Between 4 to 7 hours		
Arthurs Creek	Hurstbridge	Between 1 to 4 hours	Minor Flood at Eltham	
	Eltham	Between 5 to 8 hours		
Hurstbridge		Between 3 to 6 hours		
PLENTY RIVER				
Mernda	Greensborough	Between 4 to 5 hours	Below Minor Flood at Lower Plenty	
		Between 3 to 4 hours	Minor Flood at Lower Plenty	
YARRA RIVER				
Coldstream	Warrandyte	Between 29 to 62 hours	Minor Flood Event at Templestowe	Inflows from Olinda, Stringybark and Brushy Creeks may impact on travel times.
Yarra Glen	Warrandyte	Between 20 to 30 hours		
Warrandyte	Templestowe	Between 3 to 9 hours		Inflows from Anderson and Mullum Mullum Creeks may impact on travel times.

Table B1 – Typical Flood Travel Times between gauges on the Diamond Creek, Plenty River and Yarra River catchments

Historical Travel Times

Flood Event	Location From (gauge)	Location To (gauge)	Flood Peak Travel Time	Flood Class at
DIAMOND CREEK				**ELTHAM**
18th September 1984	Arthurs Creek	Eltham	5 hours	Minor
22nd December 1985	Arthurs Creek	Eltham	7 hours	Minor
29th July 1987	Arthurs Creek	Eltham	7 hours	Below Minor
1st January 1988	Arthurs Creek	Eltham	7 hours	Below Minor
11th June 1989	Arthurs Creek	Eltham	6 hours	Moderate
18th September 1991	Arthurs Creek	Eltham	9 hours	Below Minor
10th October 1992	Arthurs Creek	Eltham	6 hours	Below Minor
30th July 1996	Arthurs Creek	Eltham	4 hours	Below Minor
6th November 2004	Arthurs Creek	Eltham	10 hours	Below Minor
3rd February 2005	Unavailable due to gauge failure at Arthurs Creek			Minor
30th October 2010	Arthurs Creek	Eltham	17 hours	Below Minor
	Hurstbridge		4 hours	
28th November 2010	Arthurs Creek	Eltham	8 hours	Below Minor
	Hurstbridge		6 hours	
14th January 2011	Arthurs Creek	Eltham	9 hours	Below Minor
	Hurstbridge		5 hours	
5th February 2011	Arthurs Creek	Eltham	8 hours	Minor
	Hurstbridge		6 hours	
26th November 2011	Arthurs Creek	Eltham	10 hours	Below Minor
	Hurstbridge		6 hours	
3rd December 2017	Arthurs Creek	Eltham	8 hours	Below Minor
	Hurstbridge		5 hours	
14th October 2022	Arthurs Creek	Eltham	6 hours	Minor
	Hurstbridge		4 hours	
PLENTY RIVER				**LOWER PLENTY**
29th July 1987	Mernda	Greensborough	3 hours	Minor
11th June 1989	Mernda	Greensborough	4 hours	Minor
24th April 2001	Mernda	Greensborough	5 hours	Below Minor
3rd February 2005	Mernda	Greensborough	4 hours	Below Minor
28th November 2010	Mernda	Greensborough	4 hours	Below Minor
26th November 2011	Mernda	Greensborough	4 hours	Below Minor
26th December 2011	Mernda	Greensborough	Greensborough Peaked 1 hour before Mernda	Below Minor

Flood Event	Location From (gauge)	Location To (gauge)	Flood Peak Travel Time	Flood Class at
YARRA RIVER				**TEMPLESTOWE**
18th September 1984	Coldstream	Warrandyte	55 hours	Moderate
		Templestowe	55 hours	
	Warrandyte		Less than 1 hour	
29th July 1987	Warrandyte	Templestowe	4 hours	Minor
11th June 1989	Warrandyte	Templestowe	6 hours	Minor
18th September 1991	Coldstream	Warrandyte	62 hours	Minor
	Coldstream	Templestowe	65 hours	
	Warrandyte		3 hours	
10th October 1992	Coldstream	Warrandyte	29 hours	Minor
	Yarra Glen		20 hours	
		Templestowe	24 hours	
	Warrandyte		4 hours	
30th July 1996	Coldstream	Warrandyte	33 hours	Minor
	Yarra Glen		23 hours	
		Templestowe	32 hours	
	Warrandyte		9 hours	
13th November 2004	Warrandyte	Templestowe	5 hours	Minor
3rd February 2005	Warrandyte	Templestowe	4 hours	Moderate
5th February 2011	Coldstream	Warrandyte	48 hours	Minor
	Yarra Glen		30 hours	
		Templestowe	33 hours	
	Warrandyte		3 hours	
27th-30th October 2022	Coldstream	Warrandyte	23 hours	Minor
	Yarra Glen		20 hours	
		Templestowe	26 hours	
	Warrandyte		6 hours	

Table B2 – Historical Flood Travel Times between gauges on the Diamond Creek, Plenty River and Yarra River catchments

APPENDIX C1 – DIAMOND CREEK & ARTHURS CREEK FLOOD EMERGENCY PLAN

Overview of Flooding Consequences

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

Summary of Consequences in a 1% AEP (100yr ARI) flood along Diamond Creek and Arthurs Creek					
Property					
Properties	**198**				
Residential	100				
Commercial	3				
Industrial	61				
Public Land	17				
Rural	17				
Community Infrastructure					
Care Facilities	1	Eltham Retirement Centre			
Child Care / Kindergartens	1	Hurstbridge Preschool			
Community Venues	2	Eltham Leisure Centre Car Park; Handfield Street Scout Hall			
Essential Infrastructure					
Major Roads	4	Heidelberg - Kinglake Road; Hurstbridge-Arthurs Creek Road; Main Hurstbridge Road; & Main Road			
Major Rail	1	Hurstbridge Railway Line			
Bus Routes	6	381; 513; 578; 579; 580; & 902			
Sewerage Facilities	3	2 Pumping Stations and 1 Emergency Relief Point			
Tourism / Recreation					
Sports Facilities	5	Andrew Park Pocket Park Basketball Court; Eltham Bowling Club; Nillumbik Park Football Oval & Skate Park; Pitt St Rugby Field; & Rotary Centennial Netball Park			
Recreation Facilities	10	Campbell Street Reserve; Diamond Creek Reserve; Diamond Creek Trail; Diamond Valley Miniature Railway; Eltham Central Park Oval; Eltham District Horse & Pony Club; Eltham North Adventure Playground; Hurstbridge Pony Club; Susan Street Oval; & Wattle Glen War Memorial Reserve			
Government Boundaries					
Local Gov't Areas	1	Nillumbik	CMA	1	Port Phillip & Westernport
Adjacent LGAs	1	Banyule	CFA District	1	District 14
SES Unit Area	1	Nillumbik	FRV District	0	

Table C1.1 – Consequence Summary of 1% AEP flood along Diamond Creek and Arthurs Creek

Diamond Creek & Arthurs Creek run through the middle of Nillumbik in a south-south westerly direction through the suburbs/towns of Strathewen, Arthurs Creek, Nutfield, St Andrews, Cottles Bridge, Hurstbridge, Wattle Glen, Diamond Creek, Eltham North & Eltham. Arthurs Creek begins in Kinglake in the Shire of Murrindindi before entering the Nillumbik at Strathewen. Arthurs Creek joins Diamond Creek at Hurstbridge. Diamond Creek joins the Yarra River at Eltham.

The upper Arthurs Creek and Diamond Creek catchments are predominantly forested with residential settlements along the creeks around town centres. The lower catchment from Diamond Creek to Eltham becomes more urbanised with a number of road and pedestrian bridges at risk along with a number residential properties and businesses in the vicinity of Diamond Creek.

Recent flood events to affect Arthurs and Diamond Creeks have been in February 2005, February 2011 and the 14th October 2022 with flooding consequences including inundated roads, pedestrian bridges, residential properties, businesses and social infrastructure.

If Arthurs Creek or Diamond Creek is in flood, it may be difficult to get from one side of the municipality to the other with major crossings such as Bridge Street and Brougham Street in Eltham at risk of closure as well as Main Hurstbridge Road / Chute Street in Diamond Creek; Hurstbridge-Arthurs Creek Road in Hurstbridge; and Arthurs Creek Road in Arthurs Creek.

Gauges and Warnings

Warnings are available for flooding expected along Diamond Creek at Hurstbridge and Eltham. Flood class levels for the Hurstbridge and Eltham gauges are detailed in table C1.2 and are used in the issuing of a flood warning Diamond Creek. Other level / flood gauges within the Diamond Creek catchment are also contained within table C1.3.

Flood Warning Site	Flood Class Level		
	Minor	Moderate	Major
Diamond Creek at Hurstbridge	5.5m	6.4m	7.0m
Diamond Creek at Eltham	6.0m	7.0m	7.5m

Table C1.2 – Gauges with established Flood Class Levels for the Diamond Creek catchment

At these sites on Diamond Creek, the Bureau of Meteorology (the BoM) in consultation with Melbourne Water will issue flood warnings if levels reach those classified above. This warning will be placed on the Bureau's website (http://www.bom.gov.au/vic/warnings/index.shtml), the VicEmergency website https:/emergency.vic.gov.au/ and the VicEmergency App. While the Nillumbik 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	Stream Level & Flow Gauge	Rain Gauge	Melway Reference
Arthurs Creek at Arthurs Creek	229620A	East bank of the creek, north side of bridge at Arthurs Creek Road, Arthurs Creek	✓	✓	393 C5
Arthurs Creek at Nutfield	229272A	East bank of the creek, north side of bridge at Chapel Lane, Nutfield	✓		392 G9
Diamond Creek at Hurstbridge	229619B	East bank of creek at Fergusons Paddock 100m north of Hurstbridge – Arthurs Creek Road, Hurstbridge	✓	✓	185 J8
Diamond Creek at Eltham	229618A	East bank of creek, north side of bridge at Bridge Street, Eltham	✓		21 J6
Kinglake	586205	Frank Thompson Reserve, Kinglake Central		✓	380 C6

Table C1.2 – Hydrographic Monitoring Stations within the Diamond 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.

Areas of Flood Risk within the Diamond Creek catchment

Map produced by VICSES January 2023.

SHIRE OF NILLUMBIK

1% AEP (100yr ARI) Flooding

C1. Areas of flood risk along Diamond Creek & Arthurs Creek

- 1% AEP Flash Flood Extent
- 1% AEP Riverine Flood Extent
- Boundary for this Appendix
- Embankment
- Levee
- MW Stormwater Drain
- MW Waterway
- MW Retarding Basin
- Waterbody
- Stream Level & Rain Gauge
- Stream Level Gauge
- Rain Gauge
- Fire Station
- VICSES Units
- Ambulance Stations
- Police Stations
- Municipal Office
- Municipal Depot

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 C1 – Areas of flood risk within the Diamond Creek catchment in Nillumbik

Properties at Flood Risk

Properties listed in the table below are at risk from flooding along Diamond Creek. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Diamond Creek (Upper) (Melbourne Water, September 2016) and the Diamond Creek (Lower) (Melbourne Water, August 2002) flood mapping and risk assessment programs.

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

Properties at risk from Flooding along Diamond Creek

Residential			Commercial	Industrial	Rural	Public Use
Street No. at Risk in Flood Class Event			Address	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
Minor	Moderate	Major				
	✓	✓	11 Antoinette Boulevard	Eltham	Diamond Creek	Riverine
		✓	19 Antoinette Boulevard	Eltham	Diamond Creek	Riverine
	✓	✓	21 Antoinette Boulevard	Eltham	Diamond Creek	Riverine
✓	✓	✓	29 Antoinette Boulevard	Eltham	Diamond Creek	Riverine
✓	✓	✓	31 Antoinette Boulevard	Eltham	Diamond Creek	Riverine
	✓	✓	33 Antoinette Boulevard	Eltham	Diamond Creek	Riverine
	✓	✓	35 Antoinette Boulevard	Eltham	Diamond Creek	Riverine
		✓	39 Antoinette Boulevard	Eltham	Diamond Creek	Riverine
		✓	41 Antoinette Boulevard	Eltham	Diamond Creek	Riverine
		✓	43 Antoinette Boulevard	Eltham	Diamond Creek	Riverine
		✓	12 Arthurs Creek Road	Hurstbridge	Diamond Creek	Riverine
		✓	13 Arthurs Creek Road	Hurstbridge	Diamond Creek	Riverine
		✓	70 Arthurs Creek Road	Hurstbridge	Diamond Creek	Riverine
	✓	✓	2-6 Banoon Road	Eltham	Diamond Creek	Riverine
		✓	40 Brougham Street	Eltham	Diamond Creek	Riverine
		✓	41 Brougham Street	Eltham	Diamond Creek	Riverine
		✓	43 Brougham Street	Eltham	Diamond Creek	Riverine
		✓	16 Campbell Street	Diamond Creek	Diamond Creek	Riverine
		✓	18 Campbell Street	Diamond Creek	Diamond Creek	Riverine
		✓	27 Campbell Street	Diamond Creek	Diamond Creek	Riverine
✓	✓	✓	28 Campbell Street	Diamond Creek	Diamond Creek	Riverine
		✓	29 Campbell Street	Diamond Creek	Diamond Creek	Riverine
		✓	34-36 Campbell Street	Diamond Creek	Diamond Creek	Riverine
		✓	8-32 Cedar Avenue	Eltham North	Diamond Creek	Riverine
		✓	52 Chute Street	Diamond Creek	Diamond Creek	Riverine
		✓	59 Chute Street	Diamond Creek	Diamond Creek	Riverine
	✓	✓	4/1 Coolabah Drive	Eltham	Diamond Creek	Riverine
✓	✓	✓	5/1 Coolabah Drive	Eltham	Diamond Creek	Riverine
✓	✓	✓	6/1 Coolabah Drive	Eltham	Diamond Creek	Riverine
✓	✓	✓	7/1 Coolabah Drive	Eltham	Diamond Creek	Riverine
		✓	55 Dalton Street	Eltham	Diamond Creek	Riverine
		✓	1 Diamond Street	Diamond Creek	Diamond Creek	Riverine

Properties at risk from Flooding along Diamond Creek						
Residential			Commercial	Industrial	Rural	Public Use
Street No. at Risk in Flood Class Event			Address	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
Minor	Moderate	Major				
	✓	✓	2 Diamond Street	Diamond Creek	Diamond Creek	Riverine
		✓	3 Diamond Street	Diamond Creek	Diamond Creek	Riverine
		✓	5 Diamond Street	Diamond Creek	Diamond Creek	Riverine
	✓	✓	19 Diamond Street	Eltham	Diamond Creek	Riverine
		✓	25 Diamond Street	Eltham	Diamond Creek	Riverine
	✓	✓	43 Diamond Street	Eltham	Diamond Creek	Riverine
		✓	60 Diamond Street	Eltham	Diamond Creek	Riverine
		✓	2 Edinburgh Street	Diamond Creek	Diamond Creek	Riverine
		✓	6 Edinburgh Street	Diamond Creek	Diamond Creek	Riverine
		✓	14 Edinburgh Street	Diamond Creek	Diamond Creek	Riverine
		✓	17 Edinburgh Street	Diamond Creek	Diamond Creek	Riverine
		✓	19 Edinburgh Street	Diamond Creek	Diamond Creek	Riverine
		✓	21 Edinburgh Street	Diamond Creek	Diamond Creek	Riverine
		✓	23 Edinburgh Street	Diamond Creek	Diamond Creek	Riverine
✓	✓	✓	1 Elizabeth Street	Diamond Creek	Diamond Creek	Riverine
		✓	2 Elizabeth Street	Diamond Creek	Diamond Creek	Riverine
		✓	52 Ely Street	Eltham	Diamond Creek	Riverine
	✓	✓	54 Ely Street	Eltham	Diamond Creek	Riverine
		✓	7 Falkiner Street	Eltham	Diamond Creek	Riverine
		✓	1 Gastons Road	Eltham	Diamond Creek	Riverine
	✓	✓	32 Gastons Road	Eltham	Diamond Creek	Riverine
		✓	50 Graysharps Road	Hurstbridge	Diamond Creek	Riverine
		✓	7 Gum Glade	Eltham North	Diamond Creek	Riverine
	✓	✓	14 Handfield Street	Eltham	Diamond Creek	Riverine
		✓	11 Haven Lane	Diamond Creek	Diamond Creek	Riverine
		✓	13 Haven Lane	Diamond Creek	Diamond Creek	Riverine
		✓	15 Haven Lane	Diamond Creek	Diamond Creek	Riverine
		✓	17 Haven Lane	Diamond Creek	Diamond Creek	Riverine
		✓	19 Haven Lane	Diamond Creek	Diamond Creek	Riverine
		✓	21 Haven Lane	Diamond Creek	Diamond Creek	Riverine
		✓	23 Haven Lane	Diamond Creek	Diamond Creek	Riverine
		✓	25 Haven Lane	Diamond Creek	Diamond Creek	Riverine
		✓	27 Haven Lane	Diamond Creek	Diamond Creek	Riverine
		✓	29 Haven Lane	Diamond Creek	Diamond Creek	Riverine
		✓	31 Haven Lane	Diamond Creek	Diamond Creek	Riverine
		✓	33 Haven Lane	Diamond Creek	Diamond Creek	Riverine
		✓	35 Haven Lane	Diamond Creek	Diamond Creek	Riverine
		✓	37 Haven Lane	Diamond Creek	Diamond Creek	Riverine
		✓	634 Heidelberg-Kinglake Road	Hurstbridge	Diamond Creek	Riverine
		✓	635 Heidelberg-Kinglake Road	Hurstbridge	Diamond Creek	Riverine
		✓	636 Heidelberg-Kinglake Road	Hurstbridge	Diamond Creek	Riverine
		✓	640 Heidelberg-Kinglake Road	Hurstbridge	Diamond Creek	Riverine
		✓	641 Heidelberg-Kinglake Road	Hurstbridge	Diamond Creek	Riverine

Properties at risk from Flooding along Diamond Creek						
Residential			Commercial	Industrial	Rural	Public Use
Street No. at Risk in Flood Class Event			Address	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
Minor	Moderate	Major				
		✓	643 Heidelberg-Kinglake Road	Hurstbridge	Diamond Creek	Riverine
		✓	645 Heidelberg-Kinglake Road	Hurstbridge	Diamond Creek	Riverine
		✓	1041 Heidelberg-Kinglake Road	Hurstbridge	Diamond Creek	Riverine
		✓	1065A Heidelberg-Kinglake Road	Hurstbridge	Diamond Creek	Riverine
		✓	1 Hohnes Road	Eltham	Diamond Creek	Riverine
		✓	9 Hyde Street	Diamond Creek	Diamond Creek	Riverine
	✓	✓	11 Hyde Street	Diamond Creek	Diamond Creek	Riverine
		✓	2 Jessicas Lane	Eltham North	Diamond Creek	Riverine
		✓	18 Knowle Grove	Hurstbridge	Diamond Creek	Riverine
		✓	8/545-547 Main Road	Eltham	Diamond Creek	Riverine
		✓	9/545-547 Main Road	Eltham	Diamond Creek	Riverine
		✓	10/545-547 Main Road	Eltham	Diamond Creek	Riverine
		✓	559 Main Road	Eltham	Diamond Creek	Riverine
		✓	561 Main Road	Eltham	Diamond Creek	Riverine
		✓	575 Main Road	Eltham	Diamond Creek	Riverine
		✓	701 Main Road	Eltham	Diamond Creek	Riverine
✓	✓	✓	28 Main Hurstbridge Road	Diamond Creek	Diamond Creek	Riverine
		✓	1 Mary Place	Hurstbridge	Diamond Creek	Riverine
		✓	3 Mary Place	Hurstbridge	Diamond Creek	Riverine
✓	✓	✓	1 Moola Place	Eltham	Diamond Creek	Riverine
	✓	✓	2 Moola Place	Eltham	Diamond Creek	Riverine
	✓	✓	3 Moola Place	Eltham	Diamond Creek	Riverine
	✓	✓	4 Moola Place	Eltham	Diamond Creek	Riverine
	✓	✓	5 Moola Place	Eltham	Diamond Creek	Riverine
		✓	7 Moola Place	Eltham	Diamond Creek	Riverine
		✓	18 Panther Place	Eltham	Diamond Creek	Riverine
		✓	15 Peel Street	Eltham	Diamond Creek	Riverine
		✓	19 Peel Street	Eltham	Diamond Creek	Riverine
		✓	1/20 Peel Street	Eltham	Diamond Creek	Riverine
		✓	2/20 Peel Street	Eltham	Diamond Creek	Riverine
		✓	5/20 Peel Street	Eltham	Diamond Creek	Riverine
		✓	6/20 Peel Street	Eltham	Diamond Creek	Riverine
		✓	22 Peel Street	Eltham	Diamond Creek	Riverine
		✓	1/23 Peel Street	Eltham	Diamond Creek	Riverine
		✓	2/23 Peel Street	Eltham	Diamond Creek	Riverine
		✓	3/23 Peel Street	Eltham	Diamond Creek	Riverine
		✓	4/23 Peel Street	Eltham	Diamond Creek	Riverine
		✓	5/23 Peel Street	Eltham	Diamond Creek	Riverine
		✓	6/23 Peel Street	Eltham	Diamond Creek	Riverine
		✓	24 Peel Street	Eltham	Diamond Creek	Riverine
		✓	26 Peel Street	Eltham	Diamond Creek	Riverine
		✓	28 Peel Street	Eltham	Diamond Creek	Riverine
		✓	2/30 Peel Street	Eltham	Diamond Creek	Riverine

Properties at risk from Flooding along Diamond Creek						
Residential			Commercial	Industrial	Rural	Public Use
Street No. at Risk in Flood Class Event			Address	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
Minor	Moderate	Major				
		✓	1/31 Peel Street	Eltham	Diamond Creek	Riverine
		✓	2/31 Peel Street	Eltham	Diamond Creek	Riverine
		✓	3/31 Peel Street	Eltham	Diamond Creek	Riverine
		✓	4/31 Peel Street	Eltham	Diamond Creek	Riverine
		✓	1/32 Peel Street	Eltham	Diamond Creek	Riverine
		✓	2/32 Peel Street	Eltham	Diamond Creek	Riverine
		✓	34 Peel Street	Eltham	Diamond Creek	Riverine
	✓	✓	75 Railway Parade	Eltham	Diamond Creek	Riverine
		✓	1/77 Railway Parade	Eltham	Diamond Creek	Riverine
	✓	✓	2/77 Railway Parade	Eltham	Diamond Creek	Riverine
	✓	✓	3/77 Railway Parade	Eltham	Diamond Creek	Riverine
		✓	79 Railway Parade	Eltham	Diamond Creek	Riverine
		✓	81 Railway Parade	Eltham	Diamond Creek	Riverine
		✓	93 Railway Parade	Eltham	Diamond Creek	Riverine
		✓	99 Railway Parade	Eltham	Diamond Creek	Riverine
	✓	✓	38 River Gum Close	Diamond Creek	Diamond Creek	Riverine
	✓	✓	40 River Gum Close	Diamond Creek	Diamond Creek	Riverine
	✓	✓	42 River Gum Close	Diamond Creek	Diamond Creek	Riverine
	✓	✓	44 River Gum Close	Diamond Creek	Diamond Creek	Riverine
		✓	3/10 Souter Street	Eltham	Diamond Creek	Riverine
		✓	4/10 Souter Street	Eltham	Diamond Creek	Riverine
		✓	3/14 Souter Street	Eltham	Diamond Creek	Riverine
		✓	4/14 Souter Street	Eltham	Diamond Creek	Riverine
		✓	6/14 Souter Street	Eltham	Diamond Creek	Riverine
		✓	5A/14 Souter Street	Eltham	Diamond Creek	Riverine
		✓	5B/14 Souter Street	Eltham	Diamond Creek	Riverine
		✓	18 Souter Street	Eltham	Diamond Creek	Riverine
		✓	25 Souter Street	Eltham	Diamond Creek	Riverine
		✓	27 Souter Street	Eltham	Diamond Creek	Riverine
		✓	20 Stanhope Street	Eltham	Diamond Creek	Riverine
		✓	24 Stanhope Street	Eltham	Diamond Creek	Riverine
✓	✓	✓	20-50 Susan Street	Eltham	Diamond Creek	Riverine
		✓	21 Susan Street	Eltham	Diamond Creek	Riverine
		✓	2/23 Susan Street	Eltham	Diamond Creek	Riverine
		✓	1/23 Susan Street	Eltham	Diamond Creek	Riverine
		✓	3/23 Susan Street	Eltham	Diamond Creek	Riverine
		✓	4/23 Susan Street	Eltham	Diamond Creek	Riverine
		✓	5/23 Susan Street	Eltham	Diamond Creek	Riverine
		✓	6/23 Susan Street	Eltham	Diamond Creek	Riverine
		✓	7/23 Susan Street	Eltham	Diamond Creek	Riverine
		✓	8/23 Susan Street	Eltham	Diamond Creek	Riverine
		✓	9/23 Susan Street	Eltham	Diamond Creek	Riverine
		✓	10/23 Susan Street	Eltham	Diamond Creek	Riverine

Properties at risk from Flooding along Diamond Creek							
Residential			Commercial	Industrial	Rural	Public Use	
Street No. at Risk in Flood Class Event			Address	Suburb	Along Melbourne Water Watercourse	Flood Risk Type	
Minor	Moderate	Major					
		✓	11/23 Susan Street	Eltham	Diamond Creek	Riverine	
		✓	12/23 Susan Street	Eltham	Diamond Creek	Riverine	
		✓	13/23 Susan Street	Eltham	Diamond Creek	Riverine	
		✓	14/23 Susan Street	Eltham	Diamond Creek	Riverine	
		✓	15/23 Susan Street	Eltham	Diamond Creek	Riverine	
		✓	16/23 Susan Street	Eltham	Diamond Creek	Riverine	
		✓	17/23 Susan Street	Eltham	Diamond Creek	Riverine	
		✓	18/23 Susan Street	Eltham	Diamond Creek	Riverine	
		✓	19/23 Susan Street	Eltham	Diamond Creek	Riverine	
		✓	29 Susan Street	Eltham	Diamond Creek	Riverine	
		✓	31 Susan Street	Eltham	Diamond Creek	Riverine	
		✓	33 Susan Street	Eltham	Diamond Creek	Riverine	
		✓	35 Susan Street	Eltham	Diamond Creek	Riverine	
		✓	2/39 Susan Street	Eltham	Diamond Creek	Riverine	
		✓	3/39 Susan Street	Eltham	Diamond Creek	Riverine	
		✓	4/39 Susan Street	Eltham	Diamond Creek	Riverine	
		✓	5/39 Susan Street	Eltham	Diamond Creek	Riverine	
		✓	6/39 Susan Street	Eltham	Diamond Creek	Riverine	
		✓	7/39 Susan Street	Eltham	Diamond Creek	Riverine	
		✓	8/39 Susan Street	Eltham	Diamond Creek	Riverine	
		✓	13/39 Susan Street	Eltham	Diamond Creek	Riverine	
		✓	14/39 Susan Street	Eltham	Diamond Creek	Riverine	
		✓	47 Susan Street	Eltham	Diamond Creek	Riverine	
		✓	49 Susan Street	Eltham	Diamond Creek	Riverine	
		✓	48 Swan Street	Eltham	Diamond Creek	Riverine	
		✓	6 Valley Court	Diamond Creek	Diamond Creek	Riverine	
	✓	✓	23 Watkins Street	Diamond Creek	Diamond Creek	Riverine	
	✓	✓	44-52 Wattletree Road	Eltham North	Diamond Creek	Riverine	
		✓	137 Wilson Road	Wattle Glen	Diamond Creek	Riverine	
		✓	144 Wilson Road	Wattle Glen	Diamond Creek	Riverine	
		✓	145 Wilson Road	Wattle Glen	Diamond Creek	Riverine	
Totals							
10	36	192					

Table C1.3 – Properties at risk of flooding along Diamond Creek in Nillumbik

Properties listed in the table below are at risk from flooding along Arthurs Creek 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 Arthurs Creek (Melbourne Water, December 2016) flood mapping and risk assessment program.

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Properties at risk from Flooding along Arthurs 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
100	Arthurs Creek Road	Hurstbridge	Arthurs Creek	Riverine
861	Arthurs Creek Road	Arthurs Creek	Arthurs Creek	Riverine
865	Arthurs Creek Road	Arthurs Creek	Arthurs Creek	Riverine
205	Hurstbridge-Arthurs Creek Road	Hurstbridge	Arthurs Creek	Riverine
385	Hurstbridge-Arthurs Creek Road	Nutfield	Arthurs Creek	Riverine
825	Hurstbridge-Arthurs Creek Road	Arthurs Creek	Arthurs Creek	Riverine
835	Hurstbridge-Arthurs Creek Road	Arthurs Creek	Arthurs Creek	Riverine

Total
7

Table C1.4 – Properties at risk of flooding along Arthurs Creek in Nillumbik

Properties listed in the table below are at risk from flooding along Diamond Creek's stormwater tributaries. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Broad Gully Road Drain (CMPS&F Pty Ltd, March 2002), the Cherry Tree Creek (Melbourne Water, December 2016), the Grove Street Drain (CMPS&F Pty Ltd, October 1998), the Karingal Yallock (AECOM, July 2011) and the Research Creek (CMPS&F Pty Ltd, March 1997) flood mapping and risk assessment programs.

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

Street No. at Risk	Street	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
16	Amaroo Court	Diamond Creek	Broad Gully Road Drain	Flash
144	Bible Street	Eltham	Grove Street Drain	Flash
2/150	Bible Street	Eltham	Grove Street Drain	Flash
152	Bible Street	Eltham	Grove Street Drain	Flash
154	Bible Street	Eltham	Grove Street Drain	Flash
1/155	Bible Street	Eltham	Grove Street Drain	Flash
2/155	Bible Street	Eltham	Grove Street Drain	Flash
3/155	Bible Street	Eltham	Grove Street Drain	Flash
4/155	Bible Street	Eltham	Grove Street Drain	Flash
5	Bridge Street	Eltham	Karingal Yallock	Flash
9	Bridge Street	Eltham	Karingal Yallock	Flash

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

Street No. at Risk	Street	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
10	Bridge Street	Eltham	Karingal Yallock	Flash
11	Bridge Street	Eltham	Karingal Yallock	Flash
12	Bridge Street	Eltham	Karingal Yallock	Flash
16	Bridge Street	Eltham	Karingal Yallock	Flash
1/22	Bridge Street	Eltham	Karingal Yallock	Flash
2/22	Bridge Street	Eltham	Karingal Yallock	Flash
8/22	Bridge Street	Eltham	Karingal Yallock	Flash
9/22	Bridge Street	Eltham	Karingal Yallock	Flash
10/22	Bridge Street	Eltham	Karingal Yallock	Flash
11/22	Bridge Street	Eltham	Karingal Yallock	Flash
12/22	Bridge Street	Eltham	Karingal Yallock	Flash
13/22	Bridge Street	Eltham	Karingal Yallock	Flash
14/22	Bridge Street	Eltham	Karingal Yallock	Flash
15/22	Bridge Street	Eltham	Karingal Yallock	Flash
3	Brisbane Street	Eltham	Karingal Yallock	Flash
6/4	Brisbane Street	Eltham	Karingal Yallock	Flash
88	Broad Gully Road	Diamond Creek	Broad Gully Road Drain	Flash
5	Cecil Street	Eltham	Grove Street Drain	Flash
2/7	Cecil Street	Eltham	Grove Street Drain	Flash
3/7	Cecil Street	Eltham	Grove Street Drain	Flash
3/15	Cecil Street	Eltham	Grove Street Drain	Flash
1	Cherry Tree Road	Hurstbridge	Cherry Tree Gully	Flash
5	Cherry Tree Road	Hurstbridge	Cherry Tree Gully	Flash
7	Cherry Tree Road	Hurstbridge	Cherry Tree Gully	Flash
9	Cherry Tree Road	Hurstbridge	Cherry Tree Gully	Flash
11	Cherry Tree Road	Hurstbridge	Cherry Tree Gully	Flash
13	Cherry Tree Road	Hurstbridge	Cherry Tree Gully	Flash
15	Cherry Tree Road	Hurstbridge	Cherry Tree Gully	Flash
17	Cherry Tree Road	Hurstbridge	Cherry Tree Gully	Flash
19	Cherry Tree Road	Hurstbridge	Cherry Tree Gully	Flash
21	Cherry Tree Road	Hurstbridge	Cherry Tree Gully	Flash
23	Cherry Tree Road	Hurstbridge	Cherry Tree Gully	Flash
25	Cherry Tree Road	Hurstbridge	Cherry Tree Gully	Flash
27	Cherry Tree Road	Hurstbridge	Cherry Tree Gully	Flash
1/29	Cherry Tree Road	Hurstbridge	Cherry Tree Gully	Flash
6	Elsa Court	Eltham	Grove Street Drain	Flash
8	Elsa Court	Eltham	Grove Street Drain	Flash
10	Elsa Court	Eltham	Grove Street Drain	Flash
12	Elsa Court	Eltham	Grove Street Drain	Flash
14	Elsa Court	Eltham	Grove Street Drain	Flash
16	Elsa Court	Eltham	Grove Street Drain	Flash
18	Elsa Court	Eltham	Grove Street Drain	Flash
20	Elsa Court	Eltham	Grove Street Drain	Flash
22	Elsa Court	Eltham	Grove Street Drain	Flash

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

Street No. at Risk	Street	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
3	Everleigh Drive	Diamond Creek	Broad Gully Road Drain	Flash
5	Everleigh Drive	Diamond Creek	Broad Gully Road Drain	Flash
7	Everleigh Drive	Diamond Creek	Broad Gully Road Drain	Flash
1	Grove Street	Eltham	Grove Street Drain	Flash
2	Grove Street	Eltham	Grove Street Drain	Flash
3	Grove Street	Eltham	Grove Street Drain	Flash
5	Grove Street	Eltham	Grove Street Drain	Flash
7	Grove Street	Eltham	Grove Street Drain	Flash
1/9-11	Grove Street	Eltham	Grove Street Drain	Flash
2/9-11	Grove Street	Eltham	Grove Street Drain	Flash
3/9-11	Grove Street	Eltham	Grove Street Drain	Flash
4/9-11	Grove Street	Eltham	Grove Street Drain	Flash
1/13	Grove Street	Eltham	Grove Street Drain	Flash
1/15	Grove Street	Eltham	Grove Street Drain	Flash
17	Grove Street	Eltham	Grove Street Drain	Flash
3/21	Grove Street	Eltham	Grove Street Drain	Flash
4/21	Grove Street	Eltham	Grove Street Drain	Flash
5/21	Grove Street	Eltham	Grove Street Drain	Flash
6/21	Grove Street	Eltham	Grove Street Drain	Flash
7/21	Grove Street	Eltham	Grove Street Drain	Flash
33	Grove Street	Eltham	Grove Street Drain	Flash
33A	Grove Street	Eltham	Grove Street Drain	Flash
35	Grove Street	Eltham	Grove Street Drain	Flash
37	Grove Street	Eltham	Grove Street Drain	Flash
39	Grove Street	Eltham	Grove Street Drain	Flash
40	Grove Street	Eltham	Grove Street Drain	Flash
41	Grove Street	Eltham	Grove Street Drain	Flash
43	Grove Street	Eltham	Grove Street Drain	Flash
45	Grove Street	Eltham	Grove Street Drain	Flash
47	Grove Street	Eltham	Grove Street Drain	Flash
49	Grove Street	Eltham	Grove Street Drain	Flash
51	Grove Street	Eltham	Grove Street Drain	Flash
53	Grove Street	Eltham	Grove Street Drain	Flash
55	Grove Street	Eltham	Grove Street Drain	Flash
1078	Main Road	Eltham	Grove Street Drain	Flash
1092	Main Road	Eltham	Grove Street Drain	Flash
1215	Main Road	Eltham	Research Creek	Flash
1299	Main Road	Eltham	Research Creek	Flash
1301	Main Road	Eltham	Research Creek	Flash
1303	Main Road	Eltham	Research Creek	Flash
1305	Main Road	Eltham	Research Creek	Flash
1/1333	Main Road	Eltham	Research Creek	Flash
2/1333	Main Road	Eltham	Research Creek	Flash
7/1333	Main Road	Eltham	Research Creek	Flash

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

Street No. at Risk	Street	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
1/1342	Main Road	Eltham	Research Creek	Flash
1350	Main Road	Eltham	Research Creek	Flash
1419	Main Road	Eltham	Research Creek	Flash
1431	Main Road	Eltham	Research Creek	Flash
1445	Main Road	Eltham	Research Creek	Flash
4	Meruka Drive	Eltham	Karingal Yallock	Flash
6	Meruka Drive	Eltham	Karingal Yallock	Flash
8	Meruka Drive	Eltham	Karingal Yallock	Flash
10	Meruka Drive	Eltham	Karingal Yallock	Flash

Total
108

Table C1.5 – Properties at risk of flooding along Diamond Creek's stormwater drains in Nillumbik

Isolation

No major isolation risks exist for areas along Arthurs Creek and Diamond Creek during a 1% AEP (100yr ARI) event. Although it may be difficult to get from one side of the municipality to the other when either creek is flooded. Some localised short-duration isolation may occur due to flash flooding, including properties along Haldane Road, Eltham; and Haleys Gully Road, Hurstbridge.

Essential Infrastructure

The following list highlights the Essential Infrastructure along Arthurs Creek and Diamond Creek that are expected to be at risk of flooding during a 1% AEP (100yr ARI) event.

- The **Hurstbridge Railway Line** at multiple locations between Eltham and Hurstbridge:
  - Challenger Street Reserve, Diamond Creek
  - At Diamond Valley College and at Wattle Glen Station
  - Edendale Farm, Eltham
  - Near Diamond Street, Eltham

During an event, see the Public Transport Victoria's Website for details on delays or alterations to services. http://ptv.vic.gov.au/live-travel-updates/. A map of Public Transport routes within the Nillumbik is available via the website at: https://www.ptv.vic.gov.au/assets/default-site/more/maps/metropolitan-local-area-maps/41_Nillumbik_LAM_July-2022-NN-v2.pdf

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

Road Closures

The following roads are subject to closure during flooding along Diamond Creek. Check the VicRoads website for more details: https://traffic.vicroads.vic.gov.au/

Department of Transport and Planning Roads flooded in a 1% AEP (100yr ARI) event
Arthurs Creek
• Heidelberg - Kinglake Road, St Andrews at Mittons Bridge Road
• Hurstbridge - Arthurs Creek Road, Hurstbridge near Haleys Gully Road and at Diamond Creek Crossing
Diamond Creek
• Heidelberg - Kinglake Road, Hurstbridge between Silvan Road and Yates Road
• Main Hurstbridge Road, Diamond Creek at Nillumbik Park and Diamond Creek Reserve
• Main Road, Eltham at Eltham Primary School
• Main Road, Eltham at Falkner Street
Grove Street Drain
• Main Road, Eltham at Diamond Street
Karingal Yallock Drain
• Bridge Street, Eltham between Bolton Street and Silver Street
Research Creek
• Main Road, Eltham between Bayfield Drive and Reynolds Road

Table C1.6 – DTP Possible Road Closures during a flooding event

Nillumbik Council Roads flooded in a 1% AEP (100yr ARI) event			
ARTHURS CREEK	**ELTHAM**	**ELTHAM NORTH**	**STRATHEWEN**
• Arthurs Creek Road	• Bell Street	• Allendale Road	• Beale Road
• Eagles Nest Road	• Brisbane Street	• The Parade	• O'Deas Road
• Greens Road	• Brougham Street	• Serafini Court	• Rankins Road
COTTLES BRIDGE	• Coolabah Drive	**HURSTBRIDGE**	**WATTLE GLEN**
• Watts Lane	• Diamond Street	• Mary Place	• Wilson Road
DIAMOND CREEK	• Falkner Street	**NUTFIELD**	
• Amaroo Court	• Gastons Road	• Chapel Lane	
• Diamond Street	• Grove Street	• Doctors Gully Road	
• Edinburgh Street	• Moola Place	**ST ANDREWS**	
• Elizabeth Street	• Panther Place	• Mullers Road	
• Everleigh Drive	• Peel Street	• School Road	
• Reserve Circuit	• Railway Parade		
• Watkins Street	• Souter Street		
	• Susan Street		

Table C1.7 – Possible Road Closures during a flooding event

Flood Mitigation

Retarding Basins

Melbourne Water Retarding Basin	On Drain/ Waterway	Area	Storage Capacity	Spillway Crest Level	Full Supply Level	Embankment Crest Level	ANCOLD Hazard Rating	Houses In Flow Path (dam breach)	Melway Reference
Briar Hill	Eltham West Drain	16,000m^2	58.3ML	51.2m AHD	51.9m AHD	52.4m AHD	Low	0	21 E2
Ryans Road	Edinburgh Street Drain	5,781m^2	17.2ML	55.3m AHD	Unavailable	55.85m AHD	Low	15	11 J7

Table C1.8 – Melbourne Water Retarding Basins within the Diamond Creek catchment in the Nillumbik

No formal Pumping Stations or Levees exist along Diamond Creek.

Sewerage Infrastructure

Sewerage Infrastructure of note during a severe flood event located within the Diamond Creek catchment are contained within the following two tables.

Sewer Pumping Stations

Sewerage Pumping Station	On Drain / Waterway	Bank / Side of Waterway	Location	Melway Reference
Yarra Valley Water Pumping Station	Local Drainage	-	Ingrams Road, Research	12 F11
Yarra Valley Water Pumping Station	Local Drainage	-	Woodhill Close, Research	22 H4
Yarra Valley Water Pumping Station	Local Drainage	-	Margaret Street, Research	12 E11
Yarra Valley Water Pumping Station	Local Drainage	-	Eucalyptus Road, Eltham	22 C7
Yarra Valley Water Pumping Station	Orme Road Gully	North	James Cook Drive, Diamond Creek	12 B8
Yarra Valley Water Pumping Station	Diamond Creek	East	Hurstbridge Memorial Park, Hurstbridge	185 H8
Yarra Valley Water Pumping Station	Manuka Road Gully	South	Tulong Street, Hurstbridge	263 C7
Yarra Valley Water Pumping Station	Diamond Creek	East	Ferguson's Paddock, Hurstbridge	185 J7

Table C1.9 – Sewer Pumping Stations within the Diamond Creek Catchment in the Nillumbik

Sewer Emergency Relief Points

There are Sewer Emergency Relief Points within the Diamond Creek catchment that will likely affect floodwater conditions should they be activated. Contact the Yarra Valley 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	Owner	Location	Melway Reference
Local Drainage	-	Yarra Valley Water	Eucalyptus Road, Eltham	22 C7
Orme Road Gully	North	Yarra Valley Water	James Cook Drive, Diamond Creek	12 B8
Diamond Creek	East	Yarra Valley Water	Ferguson's Paddock, Hurstbridge	185 J7

Table C1.10 – Sewer Emergency Relief Points in the Diamond Creek Catchment in the Nillumbik

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 & Operational Considerations (Intelligence Cards)

The tables on the following pages provide a breakdown of the possible consequences of flooding along Arthurs Creek and Diamond Creek at various creek heights or rain totals within Nillumbik. 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:

- Arthurs Creek at Arthurs Creek
- Arthurs Creek at Nutfield
- Diamond Creek at Hurstbridge
- Diamond Creek at Eltham
- Diamond Creek Stormwater Tributaries

FLOOD INTELLIGENCE CARD – ARTHURS CREEK GAUGE, ARTHURS CREEK

Version 4 – January 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:	**East bank of the creek, north side of bridge at Arthurs Creek Road, Arthurs Creek**
CURRENT LEVEL:	**https://www.melbournewater.com.au/water-and-environment/water-management/rainfall-and-river-levels#/reader/229620A**
STREAM:	**Arthurs Creek**
GAUGE NUMBER:	**229620A**
GAUGE ZERO:	**106.02m AHD**
GAUGE TYPE:	**Stream Level & Rain**

MELWAY REFERENCE:	**393 C5**
MINOR:	**Not Established**
MODERATE:	**Not Established**
MAJOR	**Not Established**
LEVEE HEIGHT:	**N/A**
HIGHEST RECORDED FLOOD:	**5.37m (14th October 2022)**

Creek Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
4.21m	5th February 2011 Flood Level Peak		
4.54m	1% AEP (100yr ARI) Flood Level	• Note: It is not known at what level infrastructure contained below starts being flooded **Properties at Flood Risk** **4 Properties in Total** • 861 & 865 Arthurs Creek Road, Arthurs Creek • 825 & 835 Hurstbridge-Arthurs Creek Road, Arthurs Creek **Water Over Road** • Beale Road, Strathewen • Odeas Road, Strathewen • Rankins Road, Strathewen at Chads Creek tributary crossing • Eagles Nest Road, Arthurs Creek • Arthurs Creek Road, Arthurs Creek near Nankervis Road • Greens Road, Arthurs Creek	
4.60m	3rd December 2017 Flood Level Peak		
5.37m	14th October 2022 Flood Level Peak		

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

FLOOD INTELLIGENCE CARD – NUTFIELD GAUGE, ARTHURS CREEK

Version 4 – January 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:	**East bank of the creek, north side of bridge at Chapel Lane, Nutfield**
CURRENT LEVEL:	**https://www.melbournewater.com.au/water-and-environment/water-management/rainfall-and-river-levels#/reader/229272A**
STREAM:	**Arthurs Creek**
GAUGE NUMBER:	**229272A**
GAUGE ZERO:	**87.96m AHD**
GAUGE TYPE:	**Stream Level**

MELWAY REFERENCE:	**392 G9**
MINOR:	**Not Established**
MODERATE:	**Not Established**
MAJOR:	**Not Established**
LEVEE HEIGHT:	**N/A**
HIGHEST RECORDED FLOOD:	**5.64m (3rd February 2005)**

Creek Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
4.97m	14th October 2022 Flood Level Peak		
5.00m		**Water Over Road** • Approximate level of Chapel Lane, Nutfield	
5.27m	5th February 2011 Flood Level Peak		
5.51m	1% AEP (100yr ARI) Flood Level	• Note: It is not known at what level infrastructure contained below starts being flooded **Properties at Flood Risk** **3 Properties in Total** • 100 Arthurs Creek Road, Hurstbridge • 205 Hurstbridge-Arthurs Creek Road, Hurstbridge • 385 Hurstbridge-Arthurs Creek Road, Nutfield **Water Over Road** • Doctors Gully Road, Nutfield	
5.64m	3rd February 2005 Flood Level Peak	**Event Summary** • Arthurs Creek flooded with a Police Helicopter having to rescue a man and a woman trapped by floodwaters at Arthurs Creek.	

Table C1.12 – Breakdown of likely consequences at various Nutfield gauge level heights along Arthurs Creek with operational considerations

FLOOD INTELLIGENCE CARD – HURSTBRIDGE GAUGE, DIAMOND CREEK

Version 4 – January 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:	**East bank of creek at Fergusons Paddock 100m north of Hurstbridge – Arthurs Creek Road, Hurstbridge**
CURRENT LEVEL:	**https://www.melbournewater.com.au/water-and-environment/water-management/rainfall-and-river-levels#/reader/229619B**
STREAM:	**Diamond Creek**
GAUGE NUMBER:	**229619B**
GAUGE ZERO:	**64.99m AHD**
GAUGE TYPE:	**Water Level & Rain**

MINOR:	**5.5m**
MODERATE:	**6.4m**
MAJOR	**7.0m**
LEVEE HEIGHT:	**N/A**
MELWAY REFERENCE:	**185 J8**
HIGHEST RECORDED FLOOD:	**8.01m (1st December 1934)**

Creek Height	Flood Class or Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
5.0m		• Water starts to flow overbank at the gauging location	
5.5m	**Minor Flood Level**	**Properties at Flood Risk** **3 Property in Total** • 28 Campbell Street, Diamond Creek • 1 Elizabeth Street, Diamond Creek • 28 Main Hurstbridge Road, Diamond Creek **Community Infrastructure Flooded** • Nillumbik Park Football Oval & Skate Park on Elizabeth Street, Diamond Creek starts flooding • Diamond Creek Trail at various locations in Diamond Creek, Wattle Glen & Hurstbridge • Campbell Street Reserve, Diamond Creek **Water Over Road** • Wilson Road, Wattle Glen • Watkins Street, Diamond Creek • Allendale Road, Eltham North Single Lane Bridge over Diamond Creek	
6.03m	5th February 2011 Flood Level Peak	**Event Summary** • Hurstbridge Main Road, Diamond Creek Inundated requiring closure	

Creek Height	Flood Class or Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		• Nillumbik Park Football Oval & Diamond Creek Reserve Inundated by approx. 0.5m • Elizabeth Street, Diamond Creek Inundated • Hurstbridge Railway Line at Wattle Glen Inundated	
6.4m	**Moderate Flood Level**	**Properties at Flood Risk** **7 New at Level; 10 Properties in Total** • 2 Diamond Street, Diamond Creek • 11 Hyde Street, Diamond Creek • 38, 40, 42 & 44 River Gum Close, Diamond Creek • 23 Watkins Street, Diamond Creek **Community Infrastructure Affected** • Diamond Creek Trail at various locations in Diamond Creek, Wattle Glen & Hurstbridge • Diamond Creek Reserve, Main Hurstbridge Road, Diamond Creek • Rotary Centennial Netball Park on Diamond Street, Diamond Creek **Essential Infrastructure Flooded** • Hurstbridge Railway Line at Challenger Street Reserve, Diamond Creek • Hurstbridge Railway Line at Diamond Valley Collge and at Wattle Glen Station **Water Over Road** • Elizabeth Street, Diamond Creek • Main Hurstbridge Road, Diamond Creek at Nillumbik Park and Diamond Creek Reserve • Reserve Circuit, Diamond Creek	
7.0m	**Major Flood Level**	**Properties at Flood Risk** **53 New at Level; 63 Properties in Total** • 12, 13 & 70 Arthurs Creek Road, Hurstbridge • 16, 18, 27, 29 & 34-36 Campbell Street, Diamond Creek • 52 & 59 Chute Street, Diamond Creek • 1, 3 & 5 Diamond Street Diamond Creek • 2, 6, 14, 17, 19, 21 & 23 Edinburgh Street, Diamond Creek • 2 Elizabeth Street, Diamond Creek • 50 Graysharps Road, Hurstbridge • 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35 & 37 Haven Lane, Diamond Creek • 634, 635, 636, 640, 641, 643, 645, 1041 & 1065A Heidelberg-Kinglake Road, Hurstbridge • 9 Hyde Street, Diamond Creek • 18 Knowle Grove, Hurstbridge • 1 & 3 Mary Place, Hurstbridge • 6 Valley Court, Diamond Creek • 137, 144 & 145 Wilson Road, Wattle Glen **Community Infrastructure Affected** • Diamond Creek Trail at various locations in Diamond Creek, Wattle Glen & Hurstbridge • Hurstbridge Pony Club, Heidelberg-King Lake Road, Hurstbridge • Hurstbridge Preschool on Graysharps Road, Hurstbridge • Wattle Glen War Memorial Reserve on Wilson Road, Wattle Glen	

Creek Height	Flood Class or Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		Essential Infrastructure Affected • Hurstbridge Railway Line at various locations between Diamond Creek and Hurstbridge Stations **Water Over Road** • Diamond Street, Diamond Creek • Mullers Road, St Andrews • Heidelberg-Kinglake Road, St Andrews at Mittons Bridge Road • School Road, St Andrews • Watts Lane, Cottles Bridge • Hurstbridge – Arthurs Creek Road, Hurstbridge near Haleys Gully Road and at Diamond Creek Crossing • Heidelberg/Kinglake Road, Hurstbridge between Silvan Road and Yates Road • Mary Place, Hurstbridge • Amaroo Court, Diamond Creek • Edinburgh Street, Diamond Creek	
8.01m	1% AEP (100yr ARI) Flood Level (Major)		

Table C1.13 – Breakdown of likely consequences at various Hurstbridge gauge level heights along Diamond Creek with operational considerations

FLOOD INTELLIGENCE CARD – ELTHAM GAUGE, DIAMOND CREEK

Version 4 – January 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:	**East bank of creek, north side of bridge at Bridge Street, Eltham**
CURRENT LEVEL:	**https://www.melbournewater.com.au/water-and-environment/water-management/rainfall-and-river-levels#/reader/229618A**
STREAM:	**Diamond Creek**
GAUGE NUMBER:	**229618A**
GAUGE ZERO:	**20.94m AHD**
GAUGE TYPE:	**Stream Level**

MINOR:	**6.0m**
MODERATE:	**7.0m**
MAJOR:	**7.5m**
LEVEE HEIGHT:	**N/A**
MELWAY REFERENCE:	**21 J6**
HIGHEST RECORDED FLOOD:	**7.71m (March 1970)**

Creek Height	Flood Class or Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
5.48m	25th December 2011 Flood Level Peak (Below Minor)	**Event Summary** • Flash Flooding event causing major damage to properties in Eltham along overland flow paths including Grove Street & Valonia Drive • Rescues to persons trapped in cars on Main Road, Eltham between Parsons & Kalbar Roads	
6.0m	**Minor Flood Level**	**Properties at Flood Risk** **7 Properties in Total** • 29 & 31 Antoinette Boulevard, Eltham • Units 5-7/1 Coolabah Drive, Eltham • 1 Moola Place, Eltham • 20-50 Susan Street, Eltham **Community Infrastructure Likely Flooded** • Diamond Creek Trail at various locations in Eltham and Eltham North • Access to Edendale Farm Community Environment Centre via Gastons Road, Eltham • Brougham Street Pedestrian Bridge • Pitt Street Pedestrian Bridge, Eltham • Bell Street Pedestrian Bridge, Eltham • Eltham Leisure Centre Car Park on Brougham Street, Eltham **Water Over Road**	

Creek Height	Flood Class or Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		• Allendale Road, Eltham North Single Lane Bridge over Diamond Creek • Moola Place, Eltham • Coolabah Drive, Eltham • Serafini Court, Eltham North • Brougham Street, Eltham • Gastons Road, Eltham	
6.12m	5th February 2011 Flood Level Peak (Minor)	**Event Summary** • Allendale Road & Orion Court affected, Eltham North • Property flooding on Diamond Street, Eltham • Brougham Street Pedestrian Bridge inundated and damaged	
6.23m	14th October 2022 Flood Level Peak (Minor)		

6.97m	3rd February 2005 Flood Level Peak (Minor)	**Event Summary**
		• Received approximately 140mm of rain over 24 hours
		• Diamond Creek flooded with a man required rescuing from a tree amid floodwaters at Wattle Glen.
		• Brougham Street inundated requiring closure
		• Brougham Street Pedestrian Bridge inundated and damaged
		• Eltham Leisure Centre Car Park on Brougham Street closed due to inundation
		• Community Infrastructure Buildings Evacuated:
		  ○ Rotary Centennial Netball Park on Diamond Street, Diamond Creek
		  ○ Eltham North Community Centre on Cedar Avenue, Eltham North
		  ○ Wattletree Preschool on Wattletree Road, Eltham North
		  ○ Nillumbik Community Health Centre on Main Road, Eltham
		  ○ Eltham Preschool on Main Road, Eltham
		  ○ Eltham Child Care Cooperative on Panther Place, Eltham
		  ○ Hohnes Road Playhouse on Hohnes Road, Eltham	

7.0m	**Moderate Flood Level**	**Properties at Flood Risk** **19 New at Level; 26 Properties in Total** • 11, 21, 33 & 35 Antoinette Boulevard, Eltham • 2-6 Banoon Road, Eltham • 4/1 Coolabah Drive, Eltham • 19 & 43 Diamond Street, Eltham • 54 Ely Street, Eltham • 32 Gastons Road, Eltham • 14 Handfield Street, Eltham • 2, 3, 4 & 5 Moola Place, Eltham • 75, 2/77 & 3/77 Railway Parade, Eltham • 44-52 Wattletree Road, Eltham North **Community Infrastructure Likely Flooded** • Rotary Centennial Netball Park on Diamond Street, Diamond Creek	

Creek Height	Flood Class or Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		• Diamond Creek Trail at various locations in Eltham and Eltham North • Eltham North Adventure Playground, Eltham North Reserve • Eltham Retirement Centre on Diamond Street, Eltham • Sports Grounds at the Catholic Ladies' College on Diamond Street, Eltham • Scout Hall on Handfield Street, Eltham • Susan Street Oval and Pitt Street Rugby Field, Eltham **Essential Infrastructure Likely Flooded** • Hurstbridge Railway Line at Challenger Street Reserve, Diamond Creek **Water Over Road** • Main Road, Eltham at Falkner Street • The Parade, Eltham North	
7.5m	**Major Flood Level**	**Properties at Flood Risk** **103 New at Level; 129 Properties in Total** • 19, 39, 41 & 43 Antoinette Boulevard, Eltham • 40, 41 & 43 Brougham Street, Eltham • 8-32 Cedar Avenue, Eltham North • 55 Dalton Street, Eltham • 25 & 60 Diamond Street, Eltham • 52 Ely Street, Eltham • 7 Falkiner Street, Eltham • 1 Gastons Road, Eltham • 7 Gum Glade, Eltham North • 1 Hohnes Road, Eltham • 2 Jessicas Lane, Eltham North • Units 8-10/545-547, 559, 561, 575 & 701 Main Road, Eltham • 7 Moola Place, Eltham • 18 Panther Place, Eltham • 15, 19, 1/20, 2/20, 5/20, 6/20, 22, Factories 1-6/23, 24, 26, 28, 2/30, Factories 1-4/31, 1/32, 2/32 & 34 Peel Street, Eltham • 1/77, 79, 81, 93 & 99 Railway Parade, Eltham • 3/10, 4/10, 3/14, 4/14, 6/14, 5A/14, 5B/14, 18, 25 & 27 Souter Street, Eltham • 20 & 24 Stanhope Street, Eltham • 21, Factories 1-19/23, 29, 31, 33, 35, Factories 2-8/39, 13/39, 14/39, 47 & 49 Susan Street, Eltham • 48 Swan Street, Eltham **Community Infrastructure Likely Flooded** • Andrew Park Pocket Park Basketball Courts, 60 Diamond Street, Eltham • Diamond Creek Trail at various locations in Eltham and Eltham North • Eltham Retirement Centre on Diamond Street, Eltham further affected • Eltham Central Park Oval, Eltham • Eltham Bowling Club on Susan Street, Eltham • Diamond Valley Miniature Railway on Main Road, Eltham	

Creek Height	Flood Class or Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		• Eltham District Horse & Pony Club at Eltham Lower Park, Eltham **Essential Infrastructure Flooded** • Hurstbridge Railway Line at multiple locations; Eltham North Reserve; Edendale Farm & near Diamond Street, Eltham crossing **Water Over Road** • Railway Parade, Eltham • Diamond Street, Eltham single lane bridge over Diamond Creek • Panther Place, Eltham • Susan Street, Eltham • Peel Street, Eltham • Main Road, Eltham at Eltham Primary School • Bell Street, Eltham • Falkner Street, Eltham • Souter Street, Eltham	
8.5m	1% AEP (100 year ARI) Flood Level (Major)		

Table C1.14 – Breakdown of likely consequences at various Eltham gauge level heights along Diamond Creek with operational considerations

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

Version 4 – January 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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CLOSEST RAIN GAUGE:	**Plenty River at Greensborough**
LOCATION:	**Off Corowa Crescent, Greensborough near Lear Court**
RECENT RAINFALL:	**https://www.melbournewater.com.au/water-and-environment/water-management/rainfall-and-river-levels#/reader/229615A**

GAUGE NUMBER:	**229615A**
GAUGE TYPE:	**Stream Level & Rain**
MELWAY REFERENCE:	**10 J9**

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
24mm in 10 mins; 38mm in 30 mins; 46mm in 1 hour; 56mm in 2 hours; 63mm in 3 hours; or 79mm 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** **108 Properties in Total** **Broad Gully Road Drain, Diamond Creek** • 16 Amaroo Court, Diamond Creek • 88 Broad Gully Road, Diamond Creek • 3, 5 & 7 Everleigh Drive, Diamond Creek **Cherry Tree Gully, Hurstbridge** • 1, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27 & 1/29 Cherry Tree Road, Hurstbridge **Grove Street Drain, Eltham** • 144, 2/150, 152, 154 & Units1-4/155 Bible Street, Eltham • 5, 2/7, 3/7 & 3/15 Cecil Street, Eltham • 6, 8 , 10, 12, 14, 16, 18, 20 & 22 Elsa Court, Eltham • 1, 2, 3, 5, 7, Units 1-4/9-11, 1/13, 1/15, 17, Units 3-7/21, 33, 33A, 35, 37, 39, 40, 41, 43, 45, 47, 49, 51, 53 & 55 Grove Street, Eltham • 1078 & 1092 Main Road, Eltham **Karingal Yallock, Eltham** • 5, 9, 10, 11, 12, 16, 1/22, 2/22 & Factories 8-15/22 Bridge Street, Eltham • 3 & 6/4 Brisbane Street, Eltham • 4, 6, 8, & 10 Meruka Drive, Eltham **Research Creek, Eltham** • 1215, 1299, 1301, 1303, 1305, 1/1333, 2/1333, 7/1333, 1/1342, 1350, 1419, 1431 & 1445 Main Road, Eltham	

Design Rainfall Depths (mm) – *Indication of Possible Flooding*	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
		Community Infrastructure Likely Flooded • Diamond Creek Trail between Bridge Street and Brougham Street, Eltham **Water Over Road** **Broad Gully Road Drain, Diamond Creek** • Amaroo Court, Diamond Creek • Everleigh Drive, Diamond Creek **Grove Street Drain, Eltham** • Grove Street, Eltham • Main Road, Eltham **Karingal Yallock, Eltham** • Bridge Street, Eltham between Bolton Street and Silver Street • Brisbane Street, Eltham • Peel Street, Eltham **Research Creek** • Main Road, Eltham between Bayfield Drive and Reynolds Road	

Table C1.15 – Breakdown of possible consequences at various rainfall intensities around Diamond Creek's Stormwater Tributaries with operational considerations

APPENDIX C2 – PLENTY RIVER FLOOD EMERGENCY PLAN

Overview of Flooding Consequences

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

Summary of Consequences in a 1% AEP (100yr ARI) flood along Plenty River					
Property					
Properties	**0**				
Residential	0				
Commercial	0				
Industrial	0				
Public Land	0				
Rural	0				
Community Infrastructure					
	0				
Essential Infrastructure					
	0				
Tourism / Recreation					
Recreation Facilities	1	Plenty River walking trail			
Government Boundaries					
Local Gov't Areas	1	Nillumbik	CMA	1	Port Phillip & Westernport
Adjacent LGAs	2	Whittlesea; & Banyule	CFA District	1	District 14
SES Unit Area	1	Nillumbik	FRV District	0	

Table C2.1 – Consequence Summary of 1% AEP flood along Plenty River in the Nillumbik

Plenty River begins in the City of Whittlesea flowing in a southerly direction before forming a limited part of the western border of Nillumbik from Yarrambat to Greensborough. A large green belt surrounds the river at these locations, resulting in minimal consequences to infrastructure in the Municipalty. The river continues south through the middle of the City of Banyule where it then joins the Yarra River at its southern border.

A number of Retarding Basins operated by Melbourne Water are located on Plenty River tributaries in the City of Whittlesea which may affect water levels along Plenty River in Nillumbik.

Gauges and Warnings

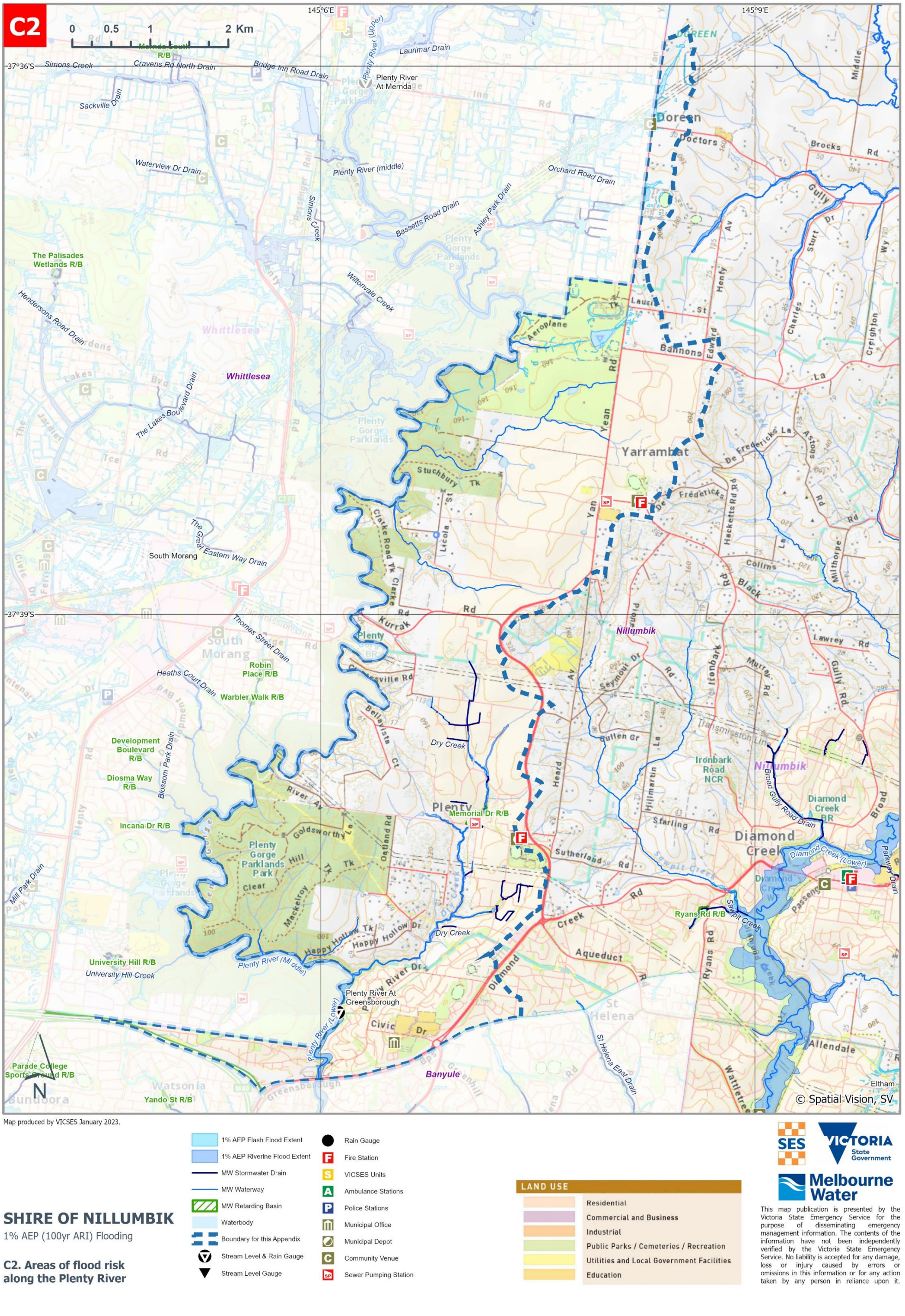
Whilst there is a hydrographic/telemetry station (water level gauge) within the municiplaity at Greensborough, Melbourne Water does not provide any flood warning service at this point, due to the limited risk to infrastructure along the stretch of River in the municipality.

Gauge	Station No.	Location	Stream Level & Flow Gauge	Rain Gauge	Melway Reference
Plenty River at Mernda	229616A	East bank of the river North side of Bridge Inn Road, Mernda	✓	✓	390 K10
Plenty River at Greensborough	299615A	East bank of the river at the Maroondah Aqueduct, end of Lear Court, Greensborough	✓	✓	10 J9

Table C2.2 – Gauges within the Plenty River catchment

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

Areas of Flood Risk within the Plenty River catchment



Map produced by VICSES January 2023.

1% AEP Flash Flood Extent
1% AEP Riverine Flood Extent
MW Stormwater Drain
MW Waterway
MW Retarding Basin
Waterbody
Boundary for this Appendix
Stream Level & Rain Gauge
Stream Level Gauge
Rain Gauge
Fire Station
VICSES Units
Ambulance Stations
Police Stations
Municipal Office
Municipal Depot
Community Venue
Sewer Pumping Station

SHIRE OF NILLUMBIK

1% AEP (100yr ARI) Flooding

C2. Areas of flood risk along the Plenty River

LAND USE

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

SES VICTORIA State Government Melbourne Water

Figure C2 – Areas of flood risk along Plenty River in Nillumbik

Properties at Flood Risk

The available information suggests that there is no risk to property along the stretch of Plenty River in Nillumbik. The properties that adjoin the River in the Shire are all set-back considerably from the river bank.

Isolation

No major isolation risks exist for areas along Plenty River in Nillumbik during a 1% AEP (100yr ARI) event. Bridge Inn Road in Mernda; Kurrak Road in Yarrambat; & the Greensborough Bypass are all expected to remain open during a 1% AEP event. Some localised short-duration isolation may occur due to flash flooding.

Essential Infrastructure

All essential infrastructure and services areas along Plenty River in the municipality of Nillumbik are expected to remain unaffected by flooding during a 1% AEP (100yr ARI) event.

Road Closures

No roads are expected to be subject to closure during flooding along Plenty River in the municipality of Nillumbik during a 1% AEP (100yr ARI) event. Check the VicRoads website for more details: https://traffic.vicroads.vic.gov.au/

Flood Mitigation

One formal Retarding Basin is located within the Plenty River catchment in Nillumbik, Memorial Drive on Dry Creek. There are also a number of Melbourne Water Retarding Basins located in the City of Whittlesea. These are included in the table below. There are no Pumping Stations or Levees along Plenty River in Nillumbik or in adjacent the City of Whittlesea.

Retarding Basins

Melbourne Water Retarding Basin	On Drain/ Waterway	Area	Storage Capacity	Spillway Crest Level	Full Supply Level	Embankment Crest Level	ANCOLD Hazard Rating	Houses In Flow Path (dam breach)	Melway Reference
Development Boulevard	Plenty River	3,698m^2	3.5ML	131.3m AHD	131.9m AHD	3.2m (131.9m AHD)	Very Low	Nil	10D3
Diosma Way	Plenty River	2,698m^2	4.0ML	122.6m AHD	123.3m AHD	4m	Very Low	Nil	10D3
Incana Drive	Plenty River	1,351m^2	1.0ML	112.3m AHD	112.9m AHD	3m	Very Low	Nil	10D4
Mernda Drain	Mernda Drain	26,570m^2	12.8ML	162.8m AHD	Unavailable	1.0m	Low	4	390J8
Memorial Drive	Dry Creek	9,846m^2	9ML	Glory Hole Weir	Unavailable	97.35m AHD	Very Low	Nil	11 C4
Robin Place	Thomas St Drain	4,065m^2	20.7ML	127.35m AHD	128.25m AHD	7.15m (128.25m AHD)	Very Low	Nil	10G1
University Hill	University Hill Creek	19,618m^2	~20ML	96.0m AHD	Unavailable	(97.50m AHD)	Unclassified	Unavailable	10C8
Warbler Walk	Thomas St Drain	4,266m^2	16.8ML	114.5m AHD	115.6m AHD	5.85m (115.6m AHD)	Very Low	Nil	10G1

Table C2.3 – Melbourne Water Retarding Basins within the Plenty River catchment in the City of Whittlesea

Sewerage Infrastructure

Sewerage Infrastructure of note during a severe flood event located around Plenty River is contained within the following two tables.

Sewer Pumping Stations

Sewerage Pumping Station	On Drain / Waterway	Bank / Side of Waterway	Location	Melway Reference
Yarra Valley Water Pumping Station	Local Drainage	-	Thornbill Drive, Yarrambat	184 B12
Yarra Valley Water Pumping Station	Local Drainage	-	Iron Bark Road, Yarrambat	184 F8
Yarra Valley Water Pumping Station	Dry Creek	East	Memorial Drive, Plenty	11 C4
Yarra Valley Water Pumping Station	Plenty River	West	Kurrajong View, Mill Park	10 E5
Yarra Valley Water Pumping Station	Plenty River	West	Queens Gardens, Bundoora	10 G9
Yarra Valley Water Pumping Station	University Hill Creek	North	Zara Close, Bundoora	10 C8
Yarra Valley Water Pumping Station	Plenty River	West	Gledswood Avenue, South Morang	184 A4
Yarra Valley Water Pumping Station	Orchard Rd Drain	West	Elation Boulevard, Doreen	184 C1
Yarra Valley Water Pumping Station	Wiltonvale Creek	East	Kalatha Street, South Morang	183 K3
Yarra Valley Water Pumping Station	Plenty River	East	Tributary Circuit, Doreen	184 C3
Yarra Valley Water Pumping Station	Plenty River	West	Gorge Road, South Morang	183 J12
Yarra Valley Water Pumping Station	Plenty River	West	Mernda Recreation Reserve, Heals Road, Mernda	390 K9

Table C2.4 – Sewer Pumping Stations within the Plenty River Catchment in Nillumbik and City of Whittlesea

Sewer Emergency Relief Points

There are Sewer Emergency Relief Points within the Plenty River catchment that will 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	Owner	Location	Melway Reference
Local Drainage	-	Yarra Valley Water	Iron Bark Road, Yarrambat	184 F8
Dry Creek	East	Yarra Valley Water	Memorial Drive, Plenty	11 C4
Plenty River	West	Yarra Valley Water	Gledswood Avenue, South Morang	184 A4
Plenty River	West	Yarra Valley Water	Mernda Recreation Reserve, Heals Road, Mernda	390 K9
Plenty River	West	Yarra Valley Water	Plenty Gorge Park, Hathfelde Boulevard, Mernda	183 K2

Table C2.5 – Sewer Emergency Relief Points in the Plenty River Catchment in Nillumbik and City of Whittlesea

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 & Operational Considerations (Intelligence Cards)

The tables on the following pages provide a breakdown of the possible consequences of flooding along Plenty River at various river heights within Nillumbik. These tables are to be used only as a guide as no two floods at a location will have identical impacts.

Intelligence Cards have been included for the following locations:

- Plenty River at Mernda
- Plenty River at Greensborough

FLOOD INTELLIGENCE CARD – MERNDA GAUGE, PLENTY RIVER

Version 4 – January 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.

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

LOCATION:	**East bank of the river North side of Bridge Inn Road, Mernda**
CURRENT LEVEL:	**https://www.melbournewater.com.au/water-and-environment/water-management/rainfall-and-river-levels#/reader/229616A**
STREAM:	**Plenty River**
GAUGE NUMBER:	**229616A**
GAUGE ZERO:	**154.352m AHD**
GAUGE TYPE:	**Stream Level & Rain**

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

River Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
3.11m	28th November 2010 Flood Level Peak		
4.65m	1% AEP (100yr ARI) Flood Level	• Nil in Nillumbik Shire	
4.90m	15th May 1974 Flood Level Peak		

Table C2.6 – Breakdown of likely consequences at various Mernda gauge level heights along Plenty River with operational considerations

FLOOD INTELLIGENCE CARD – GREENSBOROUGH GAUGE, PLENTY RIVER

Version 4 – January 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:	**East bank of the river at the Maroondah Aqueduct, end of Lear Court, Greensborough**
CURRENT LEVEL:	**https://www.melbournewater.com.au/water-and-environment/water-management/rainfall-and-river-levels#/reader/229615A**
STREAM:	**Plenty River**
GAUGE NUMBER:	**229615A**
GAUGE ZERO:	**39.97m AHD**
GAUGE TYPE:	**Stream Level & Rain**

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

River Height	Annual Exceedance Probability (% AEP)	Consequence / Impact	Operational Considerations
7.7m	1% AEP (100yr ARI) Flood Level	**Community Infrastructure Likely Flooded** • Plenty River Walking Trail between Punkerri Circuit and the Greensborough Bypass	
7.77m	15th Mary 1974 Flood Level Peak		

Table C2.7 – Breakdown of likely consequences at various Greensborough gauge level heights along Plenty River with operational considerations

APPENDIX C3 – YARRA RIVER FLOOD EMERGENCY PLAN

Overview of Flooding Consequences

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Summary of Consequences in a 1% AEP (100yr ARI) flood along the Yarra River in Nillumbik					
Property					
Properties	**21**				
Residential	0				
Commercial	1	Heritage Golf & Country Club			
Industrial	0				
Public Land	0				
Rural	20				
Community Infrastructure					
Essential Infrastructure					
Sewerage Facilities	23	17 Pumping Stations; & 6 Emergency Relief Points			
Tourism / Recreation					
Sports Facilities	1	Heritage Golf & Country Club			
Recreation Facilities	5	Bicycle Trail between Menzies Rd & Koornong Cres; Main Yarra Trail Bridge; Norman Reserve; Sweeneys Flat; & Walking Trail between Sweeney Flats & Griffith Park			
Government Boundaries					
Local Gov't Areas	1	Nillumbik	CMA	1	Port Phillip & Westernport
Adjacent LGAs	2	Yarra Ranges; & Manningham	CFA District	1	District 14
SES Unit Area	1	Nillumbik	FRV District	0	

Table C3.1 – Consequence Summary of 1% AEP flood along the Yarra River in Nillumbik

The Yarra River and its adjoining suburbs of Christmas Hills, Bend of Islands, Kangaroo Ground, North Warrandyte & Eltham are located between 10-30km North East of Melbourne moving from a semi-rural environment around Christmas Islands to North Warrandyte to a more urban landscape through Eltham. The Yarra River being the prominent water course in the area flows from the east through the Municipalities of Yarra Ranges, Manningham, Nillumbik & Banyule. High Intensity, short duration rainfall events can cause flash flooding in and around the tributaries and residential drainage network that feed into the Yarra River, while prolonged rainfall may see the Yarra River flood. Floodwaters are likely to be fast moving as they make their way from the hilly residential areas surrounding the Yarra then slow as they reach the flatter parklands along the banks of the Yarra around Bulleen. Riverine flooding from the Yarra may last for up to 48 hours. See mapping in Appendix F for more insight into flooding in the area.

Gauges and Warnings

Warnings are available for flooding expected along the Yarra River at Warrandyte and Templestowe. Flood class levels for the Warrandyte and Templestowe gauges are detailed in table C3.2 and are used in the issuing of a flood warning for the Yarra River from Coldstream to Warrandyte and from Warrandyte to Abbotsford. Other level / flood gauges within the Yarra River catchment are also contained within table C3.3.

Flood Warning Site	Flood Class Level		
	Minor	Moderate	Major
Yarra River at Warrandyte	3.0m	4.5m	6.5m
Yarra River at Templestowe	3.5m	6.0m	8.0m

Table 3.2 – Flood Warning Sites with established Flood Class Levels for Nillumbik

At these sites on the Yarra River, the Bureau of Meteorology (the BoM) in consultation with Melbourne Water will issue flood warnings if levels reach those classified above. This warning will be placed on the Bureau's website (http://www.bom.gov.au/vic/warnings/index.shtml), the VicEmergency website https:/emergency.vic.gov.au/ and the VicEmergency App. While the Nillumbik 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	Stream Level & Flow Gauge	Rain Gauge	Melway Reference
Yarra River at Yarra Glen	229206A	West bank of the river at River View Cottages B&B	✓		275 A2
Yarra River at Christmas Hills	229270A	300m south of Melb Water Yarra Gorge Pumping Stations, Skyline Rd, Christmas Hills	✓	✓	273 H12
Yarra River at Warrandyte	229200B	South bank of river at end of Police Street, Warrandyte	✓	✓	23 D12
Yarra River at Templestowe	229142A	Northern bank of River, 80m east of Fitzsimons Lane, Eltham	✓		21 G12
Smiths Gully	229853A	Roby Roy Road, Smiths Gully		✓	264 K7
Watsons Creek at Kangaroo Ground South	229608A	South bank of the creek at the Oxley Bridge, Henley Road, Bend Of Islands	✓	✓	24 F1

Table C3.3 – Gauges within the Yarra River catchment for Nillumbik

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.

Areas of Flood Risk along the Yarra River in Nillumbik

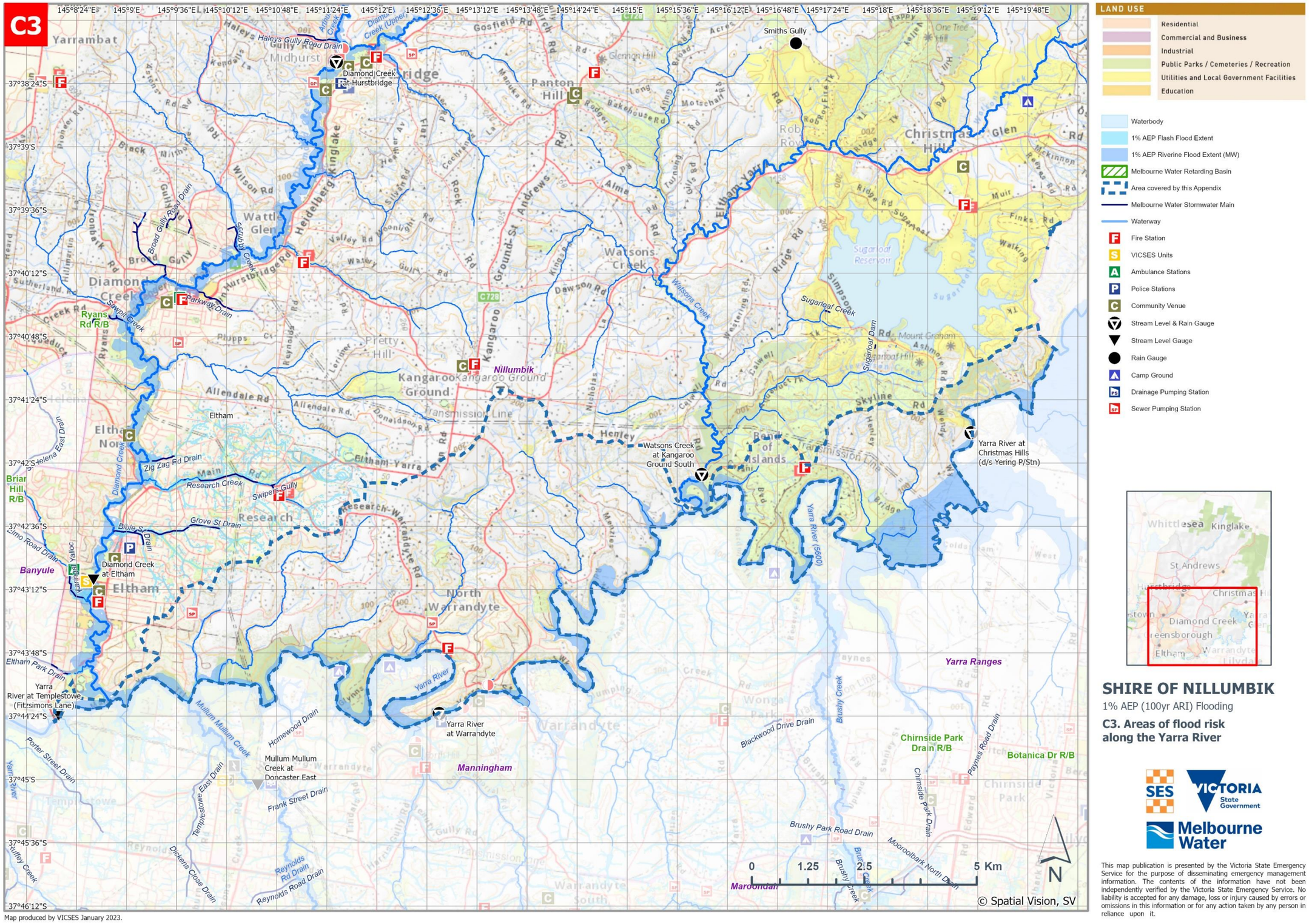

Figure C3 – Areas of flood risk along the Yarra River in Nillumbik and area covered by this appendix

Properties at Flood Risk

Properties listed in the table below are at risk from flooding along the Yarra River in Nillumbik. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Yarra River (Lower) (Melbourne Water and S.P. Goh, November 2010) flood mapping and risk assessment program.

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

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

Residential	Commercial	Industrial	Rural	Public Use

Street No. at Risk	Street	Suburb	Along Melbourne Water Watercourse	Flood Risk Type
2-6	Banoon Road	Eltham	Yarra River	Riverine
1/97	Bradleys Lane	North Warrandyte	Yarra River	Riverine
101	Bradleys Lane	North Warrandyte	Yarra River	Riverine
103	Bradleys Lane	North Warrandyte	Yarra River	Riverine
106	Bradleys Lane	North Warrandyte	Yarra River	Riverine
107	Bradleys Lane	North Warrandyte	Yarra River	Riverine
108	Bradleys Lane	North Warrandyte	Yarra River	Riverine
110	Bradleys Lane	North Warrandyte	Yarra River	Riverine
111	Bradleys Lane	North Warrandyte	Yarra River	Riverine
112-116	Bradleys Lane	North Warrandyte	Yarra River	Riverine
113	Bradleys Lane	North Warrandyte	Yarra River	Riverine
115	Bradleys Lane	North Warrandyte	Yarra River	Riverine
275	Catani Boulevard	Bend Of Islands	Yarra River	Riverine
24	Hamilton Road	North Warrandyte	Yarra River	Riverine
402	Henley Road	Bend Of Islands	Yarra River	Riverine
150	Henley Bridge Road	Christmas Hills	Yarra River	Riverine
41	Koornong Crescent	North Warrandyte	Yarra River	Riverine
180	Laughing Waters Road	Eltham	Yarra River	Riverine
58	Oxley Road	Kangaroo Ground	Yarra River	Riverine
76	The Boulevard	North Warrandyte	Yarra River	Riverine
6	Wild Cherry Drive	Eltham	Yarra River	Riverine

Total
21

Table C3.4 – Properties at risk of flooding along the Yarra River in Nillumbik

Isolation

No major isolation risks exist for areas along the Yarra River in the Nillumbik during a 1% AEP (100yr ARI) event. Kangaroo Ground – Warrandyte Road in North Warrandyte & Fitzsimons Lane, Eltham are expected to remain open during a 1% AEP event.

Some localised isolation on **Oxley Road** in the Bend of Islands; on **Koornong Crescent** in North Warrandyte; and **Yarra River Court** in North Warrandyte is possible. Localised short-duration isolation may also occur due to flash flooding.

Essential Infrastructure

All essential infrastructure and services areas along the Yarra River in Nillumbik 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 along the Yarra River in Nillumbik. Check the VicRoads website for more details https://traffic.vicroads.vic.gov.au/

Department of Transport and Planning (DTP) Roads flooded in a 1% AEP (100yr ARI) event
• Nil

Table C3.5 – DTP Possible Road Closures during a flooding event

Nillumbik Council Roads flooded in a 1% AEP (100yr ARI) event		
BEND OF ISLANDS	**KANGAROO GROUND**	• Koornong Crescent
• Oxley Road	• Menzies Road	• Yarra River Court
CHRISTMAS HILLS	**NORTH WARRANDYTE**	
• Henley Bridge Road	• Albert Road	
• Wendy Way	• Bradleys Lane	

Table C3.6 – Nillumbik Possible Road Closures during a flooding event

Flood Mitigation

No formal Retarding Basins, Pumping Stations or Levees exist along the Yarra River in the Nillumbik.

Sewerage Infrastructure

Sewerage Infrastructure of note during a severe flood event located near the Yarra River is contained within the following two tables.

Sewer Pumping Stations

Sewerage Pumping Station	On Drain / Waterway	Bank / Side of Waterway	Location	Melway Reference
Yarra Valley Water Pumping Station	Local Drainage	-	Research-Warrandyte Road, North Warrandyte	23 E9
Yarra Valley Water Pumping Station	Yarra River	North	Cooks Crescent, North Warrandyte	23 B9
Yarra Valley Water Pumping Station	Yarra River	North	Lomatia Court, North Warrandyte	23 E11
Yarra Valley Water Pumping Station	Stony Creek	West	Professors Lane, North Warrandyte	23 D8
Yarra Valley Water Pumping Station	Yarra River Tributary	West	2-6 Tills Drive, Warrandyte	23 H12
Yarra Valley Water Pumping Station	Yarra River	South	23-31 Tills Drive, Warrandyte	23 H11
Yarra Valley Water Pumping Station	Yarra River	South	33-35 Tills Drive, Warrandyte	23 H11
Yarra Valley Water Pumping Station	Yarra River	South	76-80 Tills Drive, Warrandyte	23 H10
Yarra Valley Water Pumping Station	Yarra River	South	77-89 Tills Drive, Warrandyte	23 H10
Yarra Valley Water Pumping Station	Yarra River	South	82-84 Tills Drive, Warrandyte	23 H10
Yarra Valley Water Pumping Station	Yarra River	South	86-90 Tills Drive, Warrandyte	23 H10
Yarra Valley Water Pumping Station	Yarra River	South	231 Yarra Street, Warrandyte	23 H11
Yarra Valley Water Pumping Station	Yarra River Tributary	West	339 Ringwood-Warrandyte Road, Warrandyte	23 H12
Yarra Valley Water Pumping Station	Yarra River Tributary	West	343 Ringwood-Warrandyte Road, Warrandyte	23 H12
Yarra Valley Water Pumping Station	Yarra River Tributary	West	Russell Road, Warrandyte	23 H12
Yarra Valley Water Pumping Station	Andersons Creek	West	Warrandyte Reserve, Warrandyte	35 C1
Yarra Valley Water Pumping Station	Homewood Drain	East	Alexander Reserve, Warrandyte	22 H12

Table C3.7 – Sewer Pumping Stations within the Yarra River Catchment in Nillumbik and City of Manningham

Sewer Emergency Relief Points

There are Sewer Emergency Relief Points along the Yarra River and tributaries that will 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	Owner	Location	Melway Reference
Stony Creek	West	Yarra Valley Water	Professors Lane, North Warrandyte	23 D8
Yarra River	North	Yarra Valley Water	Research-Warrandyte Road, North Warrandyte	23 F10
Yarra River Tributary	West	Yarra Valley Water	Yarra Street, Warrandyte	23 H12
Yarra River	South	Yarra Valley Water	97-99 Yarra Street, Warrandyte	23 E11
Andersons Creek	West	Yarra Valley Water	12-28 Taroona Avenue, Warrandyte	35 C1
Homewood Drain	East	Yarra Valley Water	Alexander Reserve, Warrandyte	22 H12

Table C3.8 – Sewer Emergency Relief Points in the Yarra River Catchment in Nillumbik and City of Manningham

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 & Operational Considerations (Intelligence Cards)

The tables on the following pages provide a breakdown of the possible consequences of flooding along the Yarra River at various river heights within Nillumbik. These tables are to be used only as a guide as no two floods at a location will have identical impacts.

Intelligence Cards have been included for the following locations:

- Yarra River at Christmas Hills
- Yarra River at Warrandyte
- Yarra River at Templestowe

FLOOD INTELLIGENCE CARD – CHRISTMAS HILLS GAUGE, YARRA RIVER

Version 4 – January 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.

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:	**300m south of Melb Water Yarra Gorge Pumping Stations, Skyline Rd, Christmas Hills**
CURRENT LEVEL:	https://www.melbournewater.com.au/water-and-environment/water-management/rainfall-and-river-levels#/reader/229270A
STREAM:	**Yarra River**
GAUGE NUMBER:	**229270A**
GAUGE ZERO:	**58.56m AHD**
GAUGE TYPE:	**Stream Level & Rain**

MINOR:	**N/A**
MODERATE:	**N/A**
MAJOR	**N/A**
LEVEE HEIGHT:	**N/A**
MELWAY REFERENCE:	**273 H12**
HIGHEST RECORDED FLOOD:	**4.17m (1st August 1996)**

River Height	Flood Class or Annual Exceedance Probability	Consequence / Impact	Action
7.84m	1% AEP (100yr ARI) Flood Level	**Property Flooding** **4 Properties in Total** • 275 Catani Boulevard, Bend of Islands • Heritage Golf Course at 150 Henley Bridge Road, Christmas Hills with private access bridge likely impassable • 402 Henley Road, Bend Of Islands • 58 Oxley Road, Bend of Islands with another 4 properties Isolated if Oxley Road is flooded **Community Infrastructure Likely Flooded** • Heritage Golf & Country Club on Heritage Avenue, Christmas Hills **Water Over Road** • Henley Bridge Road, Christmas Hills • Oxley Road, Kangaroo Ground • Wendy Way bridge, Christmas Hills (private river crossing)	

Table C3.9 – Breakdown of likely consequences at various Christmas Hills gauge level heights along the Yarra River with operational considerations

FLOOD INTELLIGENCE CARD – WARRANDTYE GAUGE, YARRA RIVER

Version 4 – January 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:	**South bank of river at end of Police Street, Warrandyte**
CURRENT LEVEL:	https://www.melbournewater.com.au/water-and-environment/water-management/rainfall-and-river-levels#/reader/229200B
STREAM:	**Yarra River**
GAUGE NUMBER:	**229200B**
GAUGE ZERO:	**24.03m AHD**
GAUGE TYPE:	**Stream Level & Rain**

MINOR:	**3.0m**
MODERATE:	**4.5m**
MAJOR	**6.5m**
LEVEE HEIGHT:	**N/A**
MELWAY REFERENCE:	**23 D12**
HIGHEST RECORDED FLOOD:	**10.82m (1st December 1934)**

River Height	Flood Class or Annual Exceedance Probability	Consequence / Impact	Action
3.0m	**MINOR FLOOD LEVEL**		
3.60m	5th February 2011 Flood Level Peak		
4.19m	27th October 2022 Flood Level Peak		
4.5m	**MODERATE FLOOD LEVEL**		
6.5m	**MAJOR FLOOD LEVEL**		
6.78m	9th November 1971 Flood Level Peak		
7.23m		**Property Flooding** **1 Property in Total** • 106 Bradleys Lane, North Warrandyte	
8.72m		**Property Flooding** **1 New at Level; 2 Properties in Total**	

River Height	Flood Class or Annual Exceedance Probability	Consequence / Impact	Action
		• 112-116 Bradleys Lane, North Warrandyte	
8.87m	2% AEP (50yr ARI) Flood Level (Major)		
9.18m		**Property Flooding** **1 New at Level; 3 Properties in Total** • 113 Bradleys Lane, North Warrandyte	
9.82m	1% AEP (100yr ARI) Flood Level (Major)	**Property Flooding** **11 New at Level; 14 Properties in Total** • 1/97, 101, 103, 107, 108, 110, 111 & 115 Bradleys Lane, North Warrandyte • 24 Hamilton Road, North Warrandyte • 41 Koornong Crescent, North Warrandyte with another 11 likely isolated • 76 The Boulevard, North Warrandyte **Community Infrastructure Likely Flooded** • Bicycle Trail between Menzies Road and Koornong Crescent, North Warrandyte • Norman Reserve on Bradleys Lane, North Warrandyte **Water Over Road** • Albert Road, North Warrandyte • Bradleys Lane, North Warrandyte near Norman Reserve • Koornong Crescent, North Warrandyte • Menzies Road, Kangaroo Ground at Pigeon Bank Road • Yarra River Court, North Warrandyte	

Table C3.10 – Breakdown of likely consequences at various Warrandyte gauge level heights along the Yarra River with operational considerations

FLOOD INTELLIGENCE CARD – TEMPLESTOWE GAUGE, YARRA RIVER

Version 4 – January 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.

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:	**Fitzsimons Lane, Templestowe**
CURRENT LEVEL:	https://www.melbournewater.com.au/water-and-environment/water-management/rainfall-and-river-levels#/reader/229142A
STREAM:	**Yarra River**
GAUGE NUMBER:	**229142A**
GAUGE ZERO:	**13.070m AHD**
GAUGE TYPE:	**Water Level**

MINOR:	**3.5m**
MODERATE:	**6.0m**
MAJOR:	**8.0m**
LEVEE HEIGHT:	**N/A**
MELWAY REFERENCE:	**21 G12**
HIGHEST RECORDED FLOOD:	**10.93m (1st December 1934)**

River Height	Flood Class or Annual Exceedance Probability	Consequence / Impact	Action
3.5m	**MINOR FLOOD LEVEL**		
5.53m	5th February 2011 Flood Level Peak		
6.0m	**MODERATE FLOOD LEVEL**	**Community Infrastructure Flooded** • Walking Trail between Sweeney Flats and Griffith Park, Eltham • Sweeneys Flats on Sweeneys Lane, Eltham • Main Yarra Trail Bridge off Homestead Road, Eltham	
6.37m	3rd February 2005 Flood Level Peak		
8.0m	**MAJOR FLOOD LEVEL**		
10.28m	1% AEP Flood Level (100yr ARI)	**Property Flooding** **3 Properties in Total** • 2-6 Banoon Road, Eltham • 180 Laughing Waters Road, Eltham • 6 Wild Cherry Drive, Eltham	

Table C3.11 – Breakdown of likely consequences at various Templestowe gauge level heights along the Yarra 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 Centers, Assembly Areas etc.;
- People and facilities at risk;
- Transportation;
- Registration
- People of CALD background and transient populations;
- Safety of emergency service personnel;
- Different stages of an evacuation process.

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

Phase 2 – Warning

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

Evacuation warning messages will be developed and issued by VICSES in consultation with the MEMO, MERC, DFFH, DH 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/DTP 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.

Phase 4 – Shelter

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

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

Animal Shelter

The need for Animal shelter compounds will be determined dependent on location and size of event. Refer to MEMP for further information

Caravans

There are no Caravan parks.

Phase 5 – Return

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

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

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

Considerations for deciding whether to evacuate include:

- Current flood situation;
- Status of flood mitigation systems;
- Size and location of the community;

- Access and egress routes available and their status;
- Resources required to coordinate the return;
- 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.

Essential Community Infrastructure and Property Protection

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

Rescue

The following resources are available within Nillumbik to assist with rescue operations:

- Aircraft available through state aircraft unit.
- Boats available through VICSES RDO.
- VICPOL resources available via RERC.

Known high-risk areas/communities (i.e. low-lying islands) where rescues might be required include:

- There are no identified communities at risk. The risk base is individual properties in low lying areas.

APPENDIX E – STORM & 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 are no local flood warning systems or arrangements in place.

Flood Warning Example

EXAMPLE

Moderate Flood Warning for the Yarra River at Yarra Glen

Effective Date: 04/07/12 11:08 AM
Expiry Date: 05/07/12 11:00 AM

Current Situation

The Yarra River catchment has received rainfall averaging about 2mm in both of the Upper Yarra and Lower Yarra Regions since 09:00AM yesterday (Tuesday 3 July 2012).

The level of the Yarra River at Yarra Glen is currently at 4.51 metres and rising. It it expected to peak around the moderate flood level in the early hours of tomorrow morning.

Minor flooding is expected to affect low-lying areas adjacent to the river; in particular bicycle / pedestrian paths and parklands.

Moderate flooding, in addition to the above, is also expected to cause substantial inundation to rural areas.

In the interests of community safety the SES suggests following precautions:
Don't walk, ride or drive through floodwater,
Don't allow children to play in floodwater,
Stay away from waterways and stormwater drains, and
Keep well clear of fallen power lines

Current Emergency Information is available at http://www.ses.vic.gov.au For emergency assistance contact the SES on 132 500. Current Road and Traffic Information is available at the VicRoads website: http://www.vicroads.vic.gov.au/trafficalerts

Weather Forecast:

For the latest weather forecast see http://www.bom.gov.au/vic/forecasts

Flood Warnings, Flood Watches, River Height and Rainfall information are available on the Bureau of Meteorology web site at http://www.bom.gov.au/vic/flood/. Flood Warnings and Flood Watches for Victorian Catchments are available on: Telephone Weather Service No. 1300 659217. River height and additional rainfall data for Greater Melbourne catchments is available from Melbourne Water at http://www.melbournewater.com.au

Potential Impact In Your Area

The potential local impact of this flooding in your area may include:

- Main roads may be closed and low bridges may be underwater
- Floodwater may cover low lying areas
- Floodwater may surround some properties or enter homes
- Some homes and businesses may be cut-off by floodwater

What You Should Do

- **Act quickly - conditions can change rapidly**
- Farmers should move machinery and livestock to higher ground if it is still safe to do so
- Tune in to your emergency broadcasters: ABC Local Radio, commercial radio and designated community radio stations, or SKY NEWS Television
- If you are likely to become isolated, make sure you have enough food, drinking water, medications and pet food
- If possible, make sure your family and neighbours are aware of the situation
- Floodwaters are dangerous - never drive, walk or ride through floodwaters
- Floodwaters are toxic - never play or swim in floodwaters

Emergency Contacts

- For flood or storm emergency assistance from the SES call 132 500
- For life threatening emergencies call 000

Additional Information

Road Closures:	www.vicroads.vic.gov.au	phone 131 170
Weather Warnings and River Heights:	www.bom.gov.au	phone 1300 659 217
SES Information:	www.ses.vic.gov.au	phone 1300 842 737

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Victoria State Emergency Service

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APPENDIX F – MAPS AND SCHEMATICS

Overview

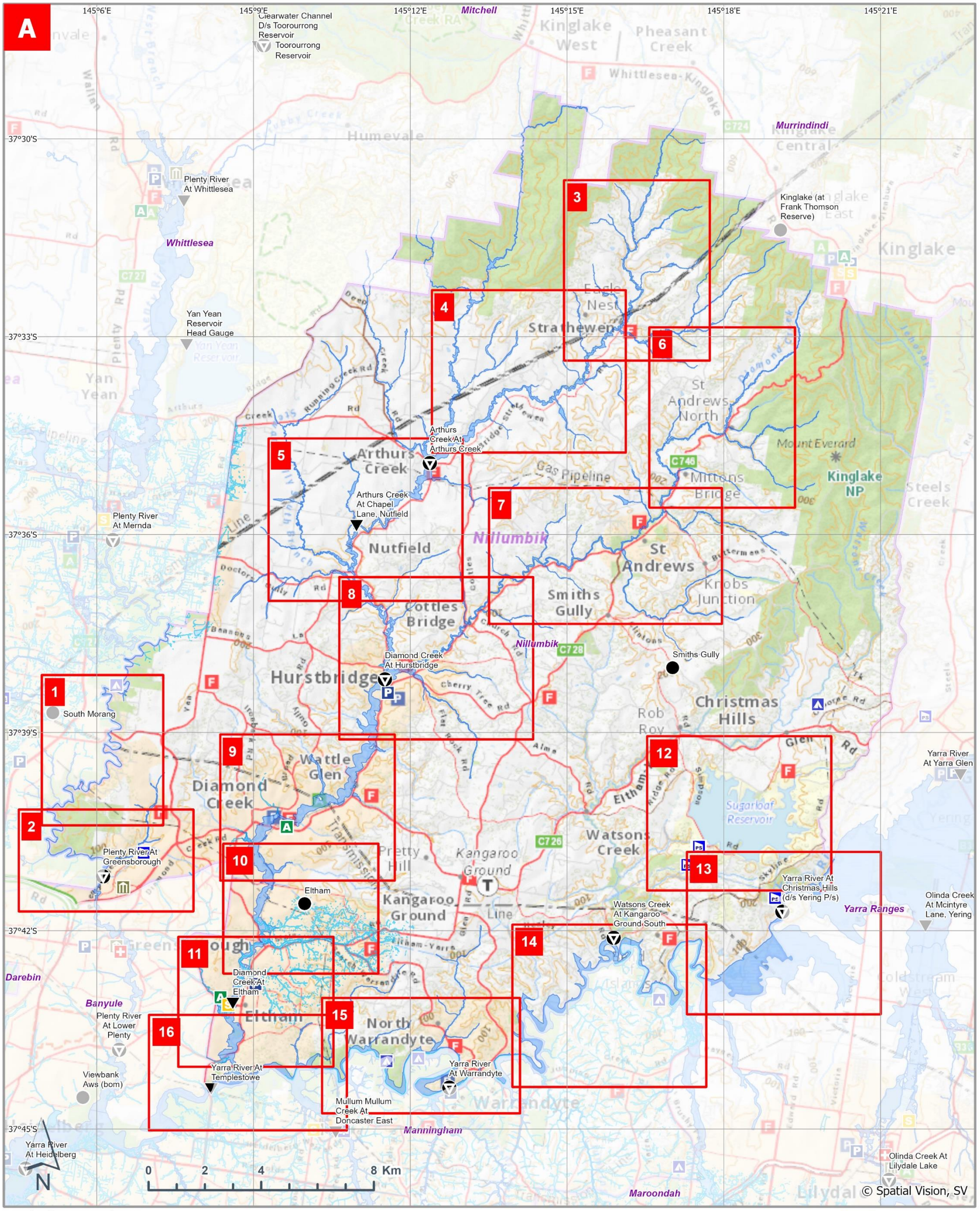
Maps considered useful to flood response are included in this Appendix. They include:

- A map outlining a series of flooding hot spot maps within the municipality of Nillumbik.
- A map showing the Shire boundary together with the open waterways and underground stormwater drainage pipe network within the municipality of Nillumbik and the 1% AEP (100-year ARI) flood extents (sourced from Melbourne Water GIS).
- A set of 16 maps showing flooding hot spots within the municiplaity f Nillumbik together with the 1% AEP (100-year ARI) flood extents (sourced from the Melbourne Water GIS).
- Schematics detailing the drainage catchments relevant for this municipality.
    - Each Schematic outlines the drainage system comprising of rivers, creeks or storm-water drains contained within one of the major catchments in the Port Phillip & Westernport Region.
    - Within each Schematic, there are details useful to flood response such as those relating to gauges, towns, rivers, creeks, drains and reservoirs. Historical facts and figures may also be shown.
    - The schematics also detail the response boundaries for SES Units and local government, and provide a reference link to the corresponding Municipal Flood Emergency Plan.
    - Details within these Catchment Schematics reflect those contained within either other sections of this Municipal Flood Emergency Plan or refer to other Municipal Flood Emergency Plans. These details have been filtered to contain only key facts. For more information on a gauge, drainage system or town consult the corresponding Flood Emergency Plan

Note that:

- The mapping/data provided in this Appendix has been developed from Melbourne Water and other sources and taken from historical records and flood modelling. It may not include more recent data or local anecdotal information. It is planned that the mapping/data be updated as further studies or modelling is completed and other Information obtained.
- Maps showing the Special Building Overlay and Land Subject to Inundation Overlay are included in the Nillumbik Planning Scheme can be used as a guide to areas that may flood during an event. The maps can be found in hard copy form at the Council's main office or online at the Department of Environment, Land, Water & Planning website https://mapshare.vic.gov.au/vicplan/.
- Maps showing 1 in 100-year ARI (1% AEP) flood extents and floodways (together with volume, height and water quality data) are shown at DEECA's mapshare website http://mapshare.maps.vic.gov.au/MapShareVic/index.html?viewer=MapShareVic.PublicSite&locale=en-AU
- Not all waterways or drains are included in the schematics, only those that are likely to contribute to flooding further on along the drainage system. Note also the flow direction; the schematics either flow from the top of the page to the bottom, or vice versa.

Nillumbik Municipal Maps (sourced Melbourne Water GIS)



Map produced by VICSES September 2022.

SHIRE OF NILLUMBIK

1% AEP (100yr ARI) Flooding

A. Municipal Flood Index Map

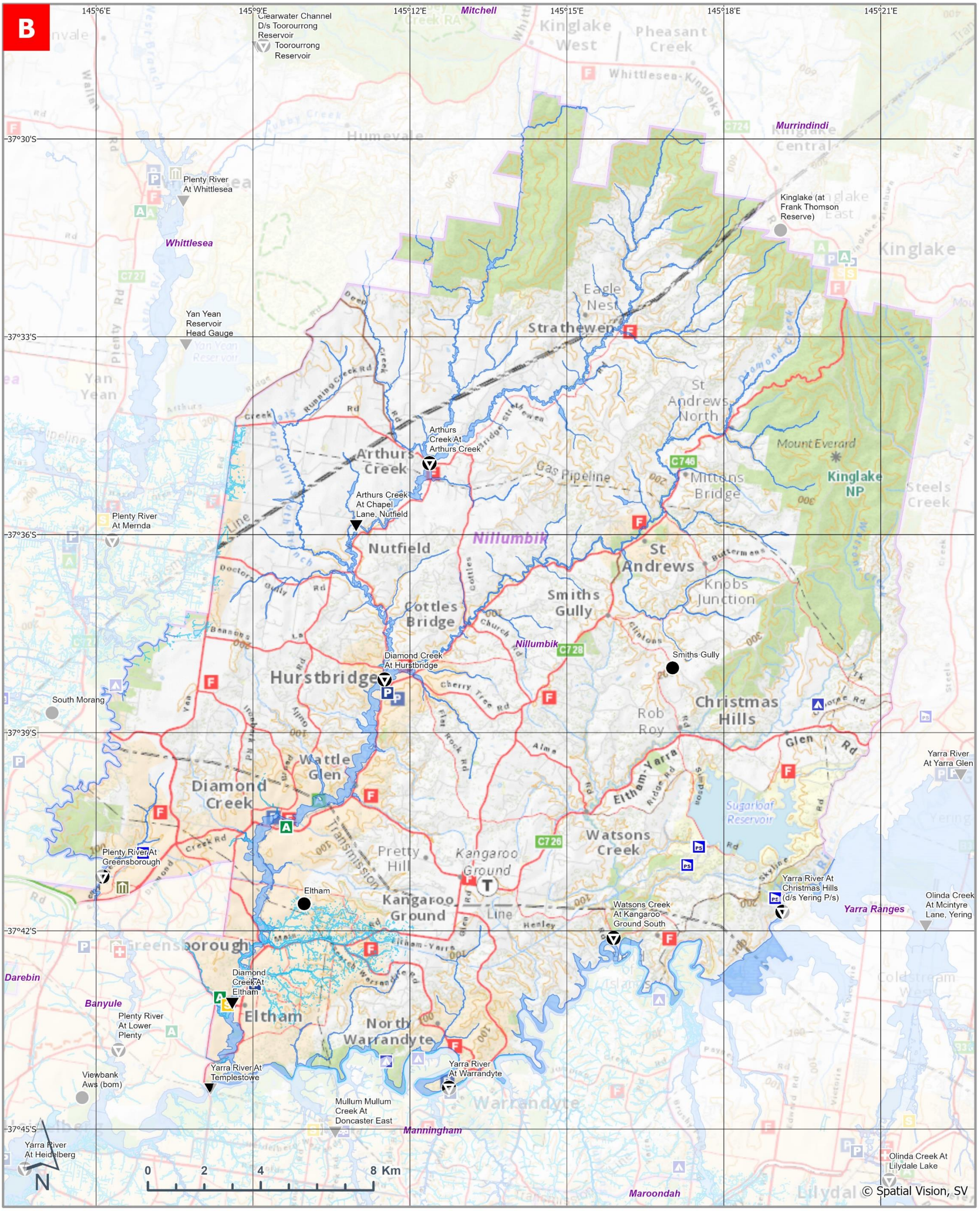
- Stream Level & Rain Gauge
- Stream Level Gauge
- Rain Gauge
- Hospitals
- Fire Station
- VICSES Units
- Ambulance Stations
- Police Stations
- Municipal Office
- Municipal Depot
- Caravan Park
- Camp Ground
- WS Pumping Station
- Waterway
- Melbourne Water Retarding Basin
- 1% AEP Flash Flood Extent
- 1% AEP Riverine Flood Extent
- Nillumbik_Extent_Indicators

LAND USE

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

SES VICTORIA State Government

Melbourne Water



Map produced by VICSES September 2022.

SHIRE OF NILLUMBIK

1% AEP (100yr ARI) Flooding

B. Municipal Flood Map (1% AEP (100yr ARI) Extent)

- Stream Level & Rain Gauge
- Stream Level Gauge
- Rain Gauge
- Hospitals
- Fire Station
- VICSES Units
- Ambulance Stations
- Police Stations
- Municipal Office
- Municipal Depot
- Caravan Park
- Camp Ground
- WS Pumping Station
- Waterway
- Melbourne Water Retarding Basin
- 1% AEP Flash Flood Extent
- 1% AEP Riverine Flood Extent

LAND USE

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

SES VICTORIA State Government

Melbourne Water

Flood Extent Maps (sourced Melbourne Water GIS)

Plenty River flood modelling completed by Melbourne Water. Map produced by VICSES September 2022.

- Building
- Waterbody
- 1% AEP Riverine Flood Extent
- Waterway
- Melbourne Water Stormwater Drain
- Embankment
- Levee
- Bicycle / Walking Trail
- Education Centre
- Stream Level & Rain Gauge
- Stream Level Gauge
- Rain Gauge
- Fire Station
- Aged Care Facility
- Child Care Centre
- Community Venue
- Telephone Exchange
- Sewer PS MW

LAND USE

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

SHIRE OF NILLUMBIK

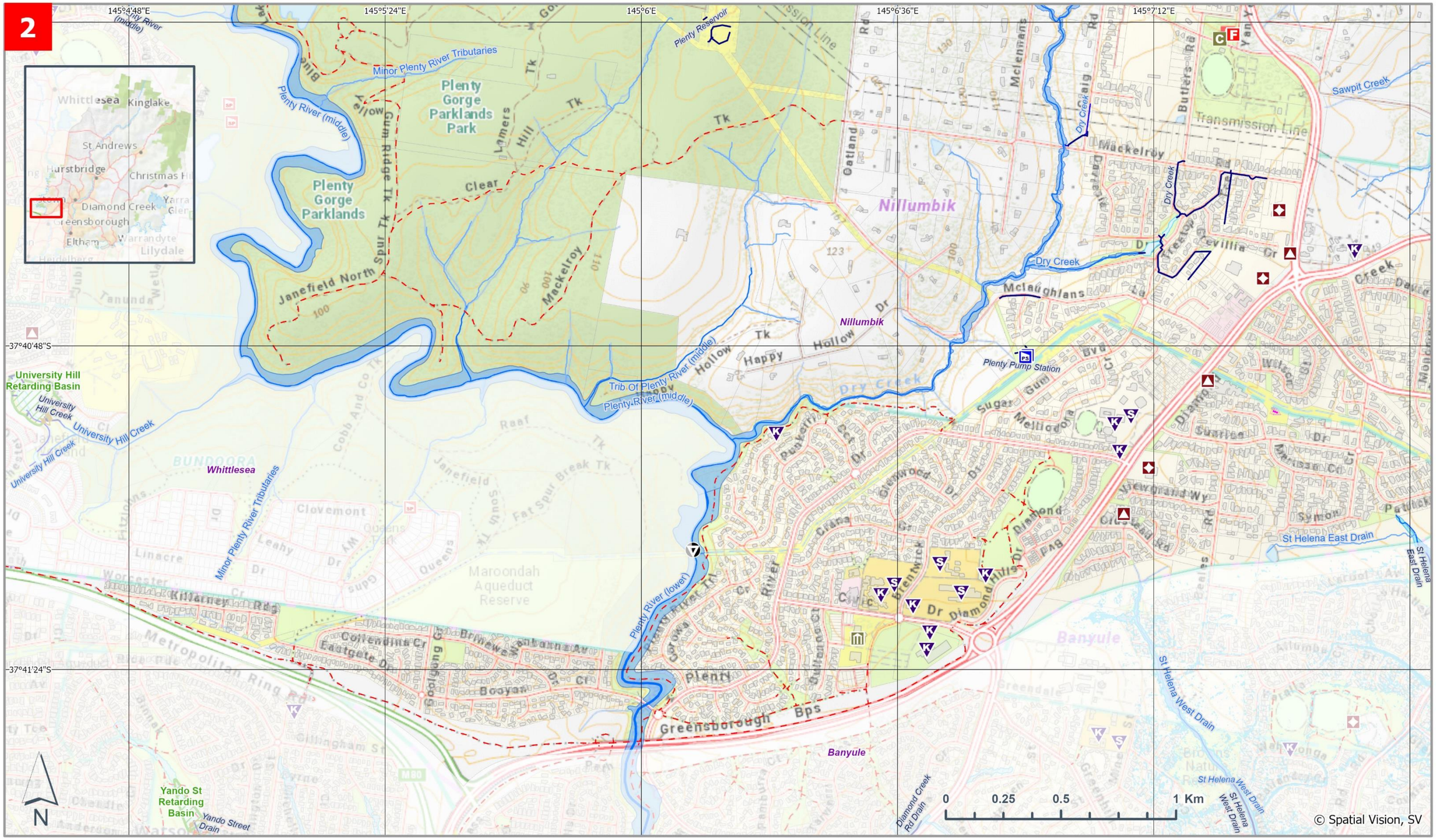
1% AEP (100yr ARI) Flooding

1. Plenty River (Plenty)

SES VICTORIA State Government

Melbourne Water

2



Flood modelling completed by Melbourne Water. Map produced by VICSES September 2022.

SHIRE OF NILLUMBIK

1% AEP (100yr ARI) Flooding

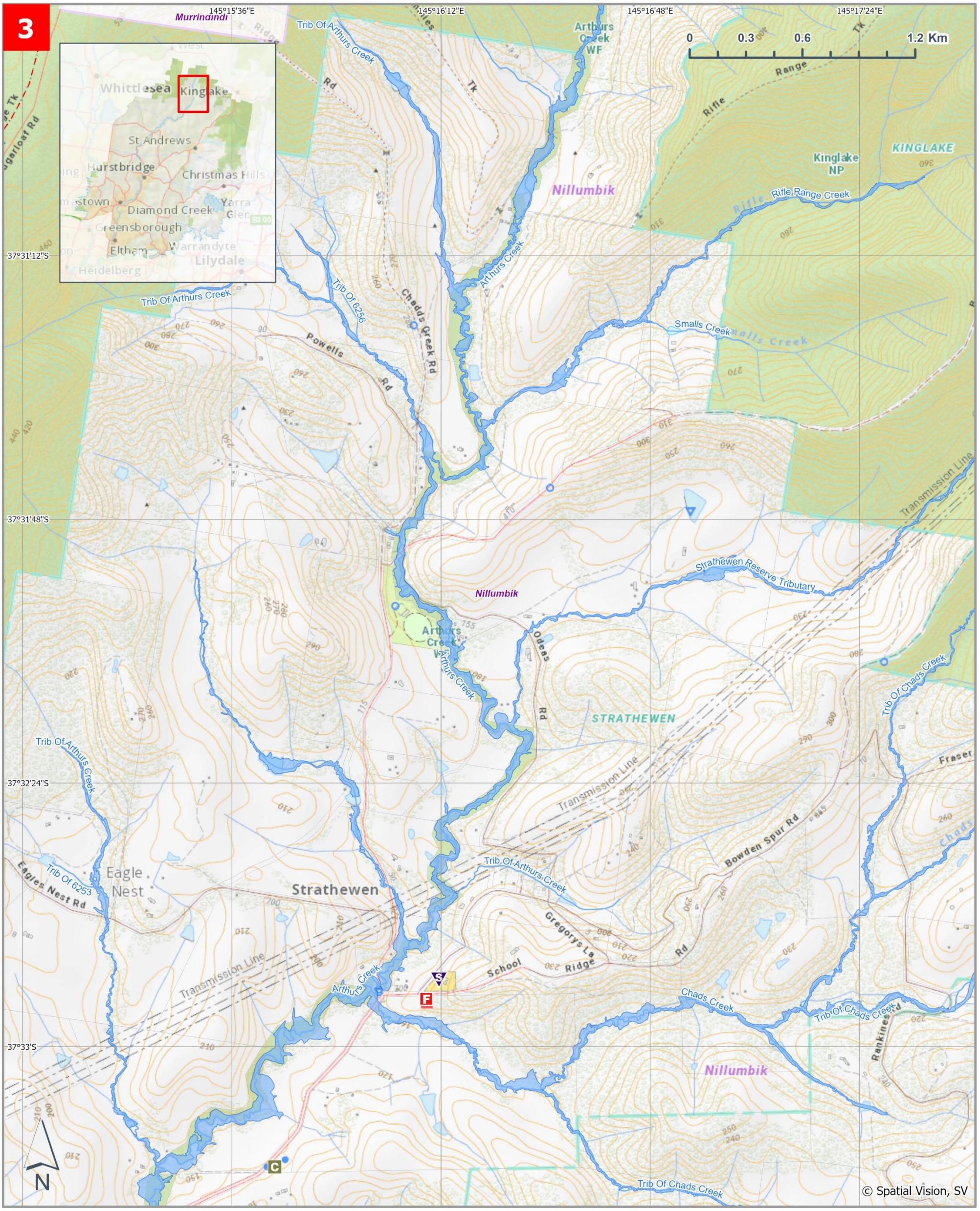
2. Plenty River (Greensborough)

- Building
- Waterbody
- 1% AEP Flash Flood Extent (MW)
- 1% AEP Riverine Flood Extent (MW)
- Melbourne Water Retarding Basin
- Waterway
- Melbourne Water Stormwater Drain
- Bicycle / Walking Trail
- Education Centre
- Child Care Centre
- Fire Station
- Community Venue
- Aged Care Facility
- Place Of Worship
- Stream Level & Rain Gauge
- Stream Level Gauge
- Rain Gauge
- Drainage Pumping Station
- Sewerage Pumping Station

LAND USE

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

SES Melbourne Water VICTORIA State Government



Arthurs Creek flood modelling completed by Melbourne Water, December 2016. Map produced by VICSES September 2022.

- Building
- Waterbody
- 1% AEP Riverine Flood Extent
- Waterway
- Education Centre
- Fire Station
- Community Venue

LAND USE

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

SHIRE OF NILLUMBIK

1% AEP (100yr ARI) Flooding

3. Arthurs Creek (Strathewen)

SES VICTORIA State Government

Melbourne Water

4

145°12'36"E 145°13'12"E 145°13'48"E 145°14'24"E 145°15'E 145°15'36"E

37°33'S

37°33'36"S

37°34'12"S

Trib Of Running Creek
Trangaroo Creek
Running Creek WP
Running Creek
Kinglake NP
Matheis Rd
Trib Of 6224
Nillumbik
Nillumbik
Running Creek WP
Minchins Rd
Transmission Line
Eagles Nest Rd
Trib Of 6253
Eagle Nest
Strathewen
Trib Of Arthurs Creek
Transmission Line
Transmission Line
Chads Creek
C
ARTHURS CREEK
Trib Of Arthurs Creek
Arthurs Creek
Cottles Bridge-Strathewen Rd
Arthurs Creek
Hewitts Rd
Running Creek East
Arthurs Creek WP
Trib Of 6278
Trib Of 6282

0 0.35 0.7 1.4 Km

N

© Spatial Vision, SV

Flood modelling completed by Melbourne Water, December 2016. Map produced by VICSES September 2022.

LAND USE

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

- Building
- Waterbody
- 1% AEP Riverine Flood Extent (MW)
- Waterway
- C Community Venue

SHIRE OF NILLUMBIK

1% AEP (100yr ARI) Flooding

4. Arthurs Creek & Running Creek (Arthurs Creek)

SES VICTORIA State Government

Melbourne Water

Flood modelling completed by Melbourne Water, December 2016. Map produced by VICSES September 2022.

LAND USE

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

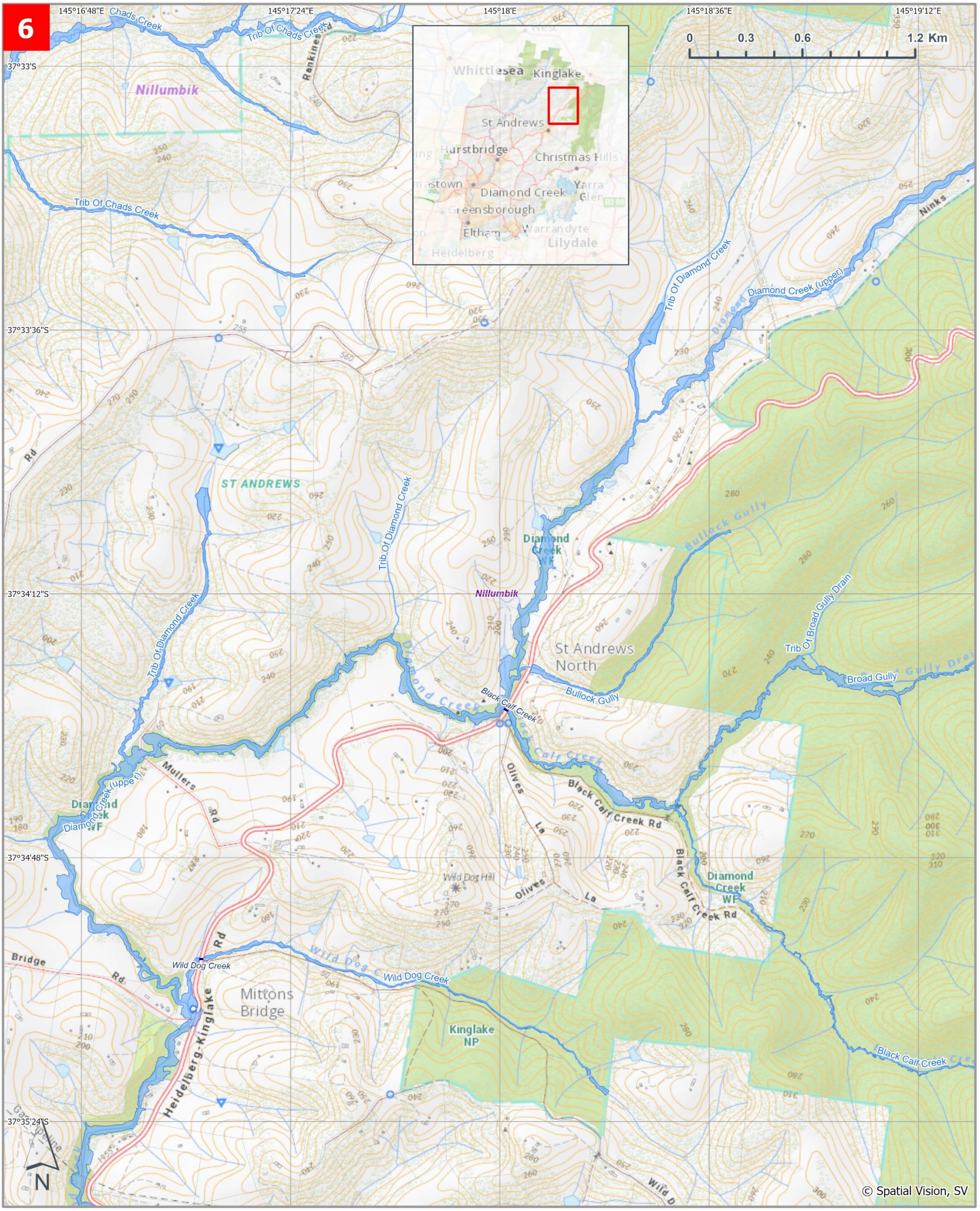
- Building
- Waterbody
- 1% AEP Riverine Flood Extent (MW)
- Waterway
- Fire Station
- Education Centre
- Community Venue
- Place Of Worship
- Telephone Exchange
- Stream Level & Rain Gauge
- Stream Level Gauge
- Rain Gauge

SHIRE OF NILLUMBIK

1% AEP (100yr ARI) Flooding

5. Arthurs Creek (Nutfield)

SES VICTORIA State Government Melbourne Water



Arthurs Creek flood modelling completed by Melbourne Water, September 2016. Map produced by VICSES September 2022.

- Building
- Waterbody
- 1% AEP Riverine Flood Extent
- Waterway

LAND USE

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

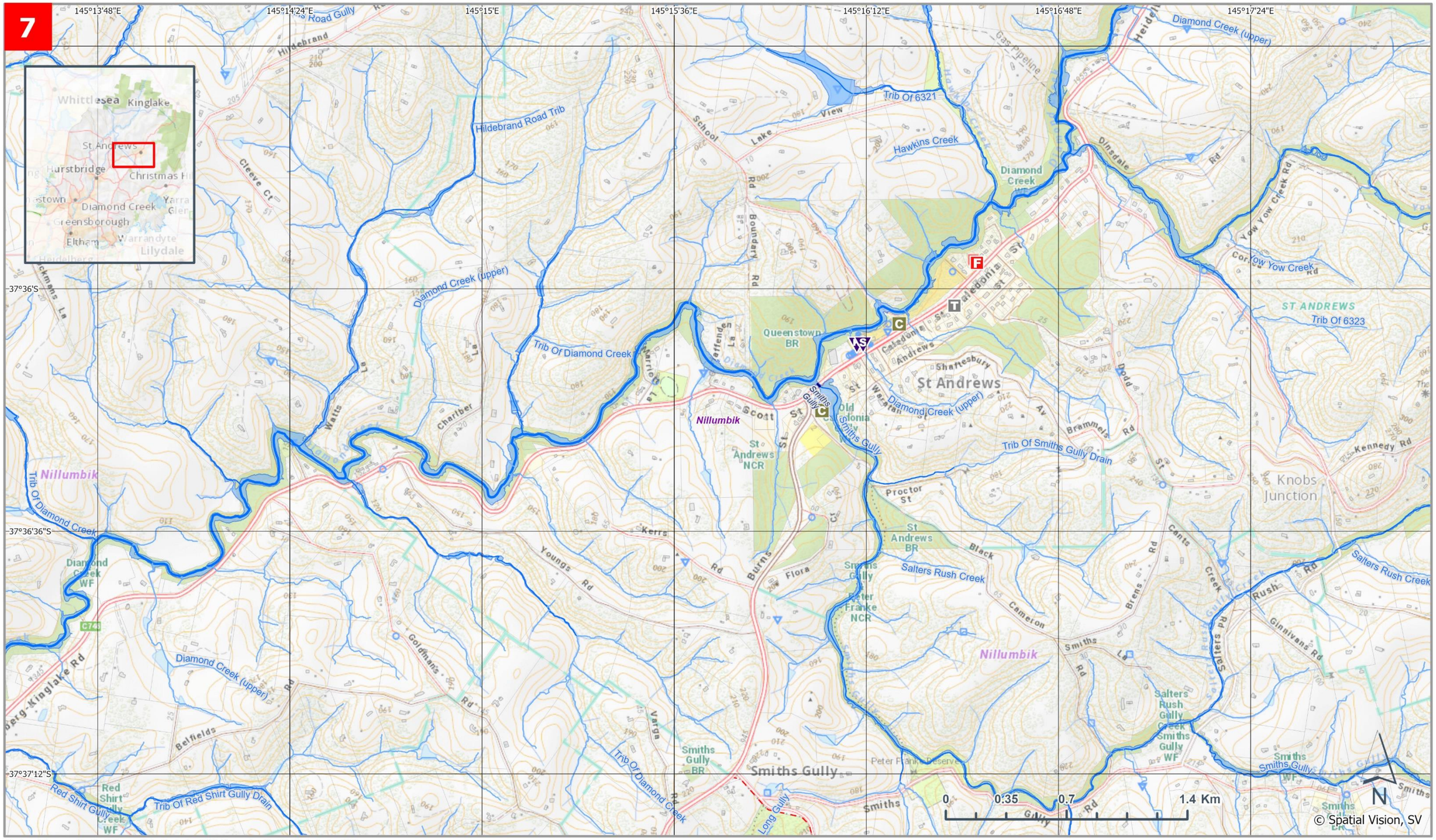
SHIRE OF NILLUMBIK

1% AEP (100yr ARI) Flooding

6. Diamond Creek (St Andrews)

SES · VICTORIA State Government · Melbourne Water

7



Flood modelling completed by Melbourne Water, September 2016. Map produced by VICSES September 2022.

- Building
- Waterbody
- 1% AEP Riverine Flood Extent (MW)
- Waterway
- Bicycle / Walking Trail
- Education Centre
- Child Care Centre
- Fire Station
- Community Venue
- Telephone Exchange

LAND USE

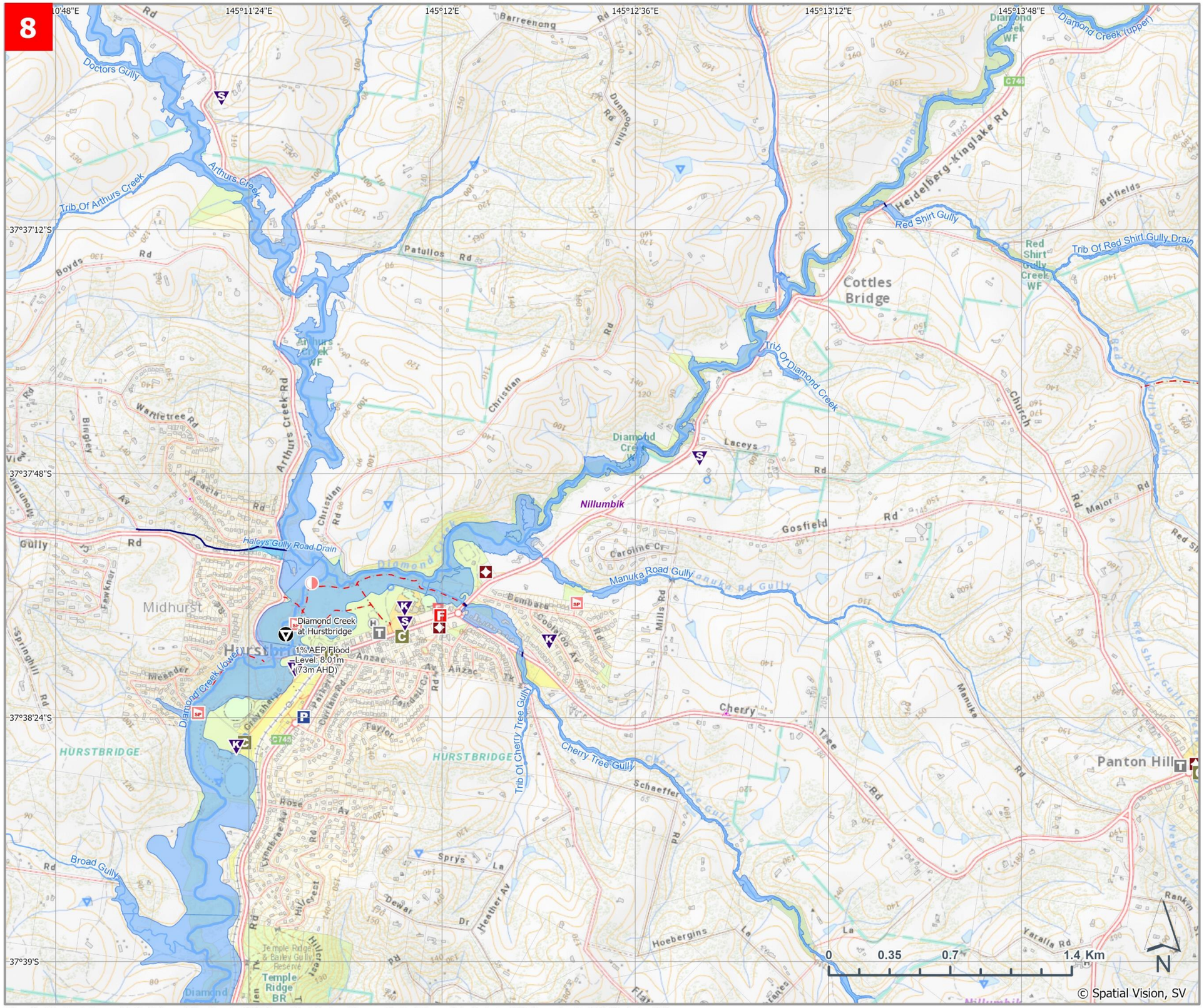
- Residential
- Commercial and Business
- Industrial
- Public Parks / Cemeteries / Recreation
- Utilities and Local Government Facilities
- Education

SHIRE OF NILLUMBIK

1% AEP (100yr ARI) Flooding

7. Diamond Creek (St Andrews)

8



Arthurs Creek flood modelling completed by Melbourne Water, December 2016. Diamond Creek flood modelling completed by Melbourne Water, September 2016. Map produced by VICSES September 2022.

LAND USE

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

- Building
- Waterbody
- 1% AEP Flash Flood Extent (MW)
- 1% AEP Riverine Flood Extent (MW)
- Waterway
- Melbourne Water Stormwater Drain
- Bicycle / Walking Trail
- Fire Station
- Police Stations
- Education Centre
- Child Care Centre
- Community Venue
- Place Of Worship
- Telephone Exchange
- Stream Level & Rain Gauge
- Stream Level Gauge
- Rain Gauge
- Sewer Pumping Station
- Sewer Emergency Relief Point

SHIRE OF NILLUMBIK

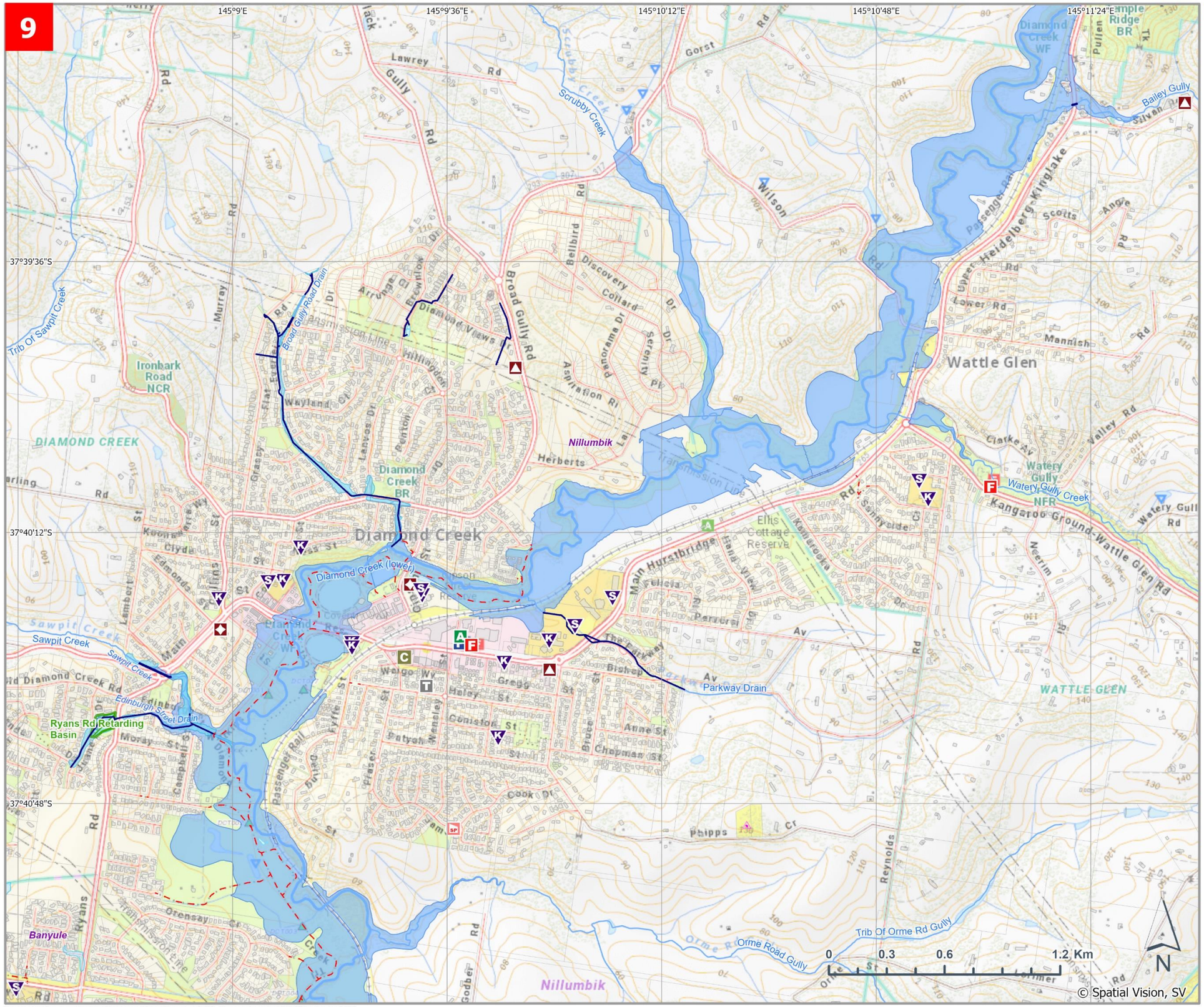
1% AEP (100yr ARI) Flooding

8. Arthurs Creek and Diamond Creek (Hurstbridge)

SES VICTORIA State Government

Melbourne Water

9



Flood modelling completed by Melbourne Water, December 2016. Map produced by VICSES September 2022.

LAND USE

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

- Building
- Waterbody
- 1% AEP Flash Flood Extent (MW)
- 1% AEP Riverine Flood Extent (MW)
- Melbourne Water Retarding Basin
- Waterway
- Melbourne Water Stormwater Drain
- Bicycle / Walking Trails
- Fire Station
- Ambulance Stations
- Police Stations
- Education Centre
- Child Care Centre
- Community Venue
- Aged Care Facility
- Place Of Worship
- Telephone Exchange

SHIRE OF NILLUMBIK

1% AEP (100yr ARI) Flooding

9. Diamond Creek (Diamond Creek and Wattle Glen)

SES VICTORIA State Government

Melbourne Water

10

145°9'E 145°9'36"E 145°10'12"E 145°10'48"E

37°40'48"S

37°41'24"S

37°42'S

37°42'36"S

Diamond Creek (lower)

Allendale Road Drain

Zig Zag Rd Drain

Research Creek

Orme Rd Gully

Orme Road Gully

Swipers Gully

Grove St Drain

Bible St Drain

Trib Of Orme Rd

Nillumbik

Eltham

Eltham North

Banyule

Diamond Creek WF

Nillumbik BR

ELTHAM

ELTHAM NORTH

Research

Phipps Cr

Cook Dr

Fraser St

Godber Rd

Orme St

Lorimer

Allendale Rd

Huntingfield Ct

Hawkhurst Ct

Wombat Dr

Margaret St

Diamond St

Ingrams Rd

Cassells Rd

Reynolds Rd

Orchard Av

Progress Rd

Sherbrooke St

Banks Rd

Glen Gully Rd

Stanley Av

Livingstone Rd

Shelbury Av

Frank St

Thompson Rd

Brinkkotter Rd

Raglen Rd

Strike Rd

Swipers Gully

Research Creek

Diamond Creek (lower)

Zig Zag Rd North

Parsons Rd

Piper Ct

Kalbar Cl

Tyrone Cl

Storey Dr

Main Rd

Park West Rd

Relene St

Sheffield Rd

Renshaw Rd

Andrews Rd

Dellwood Ct

Valonie Dr

Transmission Line

Whittlesea Kinglake St Andrews Hurstbridge Christmas Hills Diamond Creek Greensborough Eltham Warrandyte Lilydale

0 0.28 0.55 1.1 Km

N

© Spatial Vision, SVy

LAND USE

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

- Building
- Waterbody
- 1% AEP Riverine Flood Extent (MW)
- Waterway
- Melbourne Water Stormwater Drain
- Bicycle / Walking Trails
- Fire Station
- Education Centre
- Child Care Centre
- Community Venue
- Aged Care Facility
- Place Of Worship
- Telephone Exchange
- Stream Level & Rain Gauge
- Stream Level Gauge
- Rain Gauge
- Sewer Pumping Station

Flood Depth

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

SHIRE OF NILLUMBIK

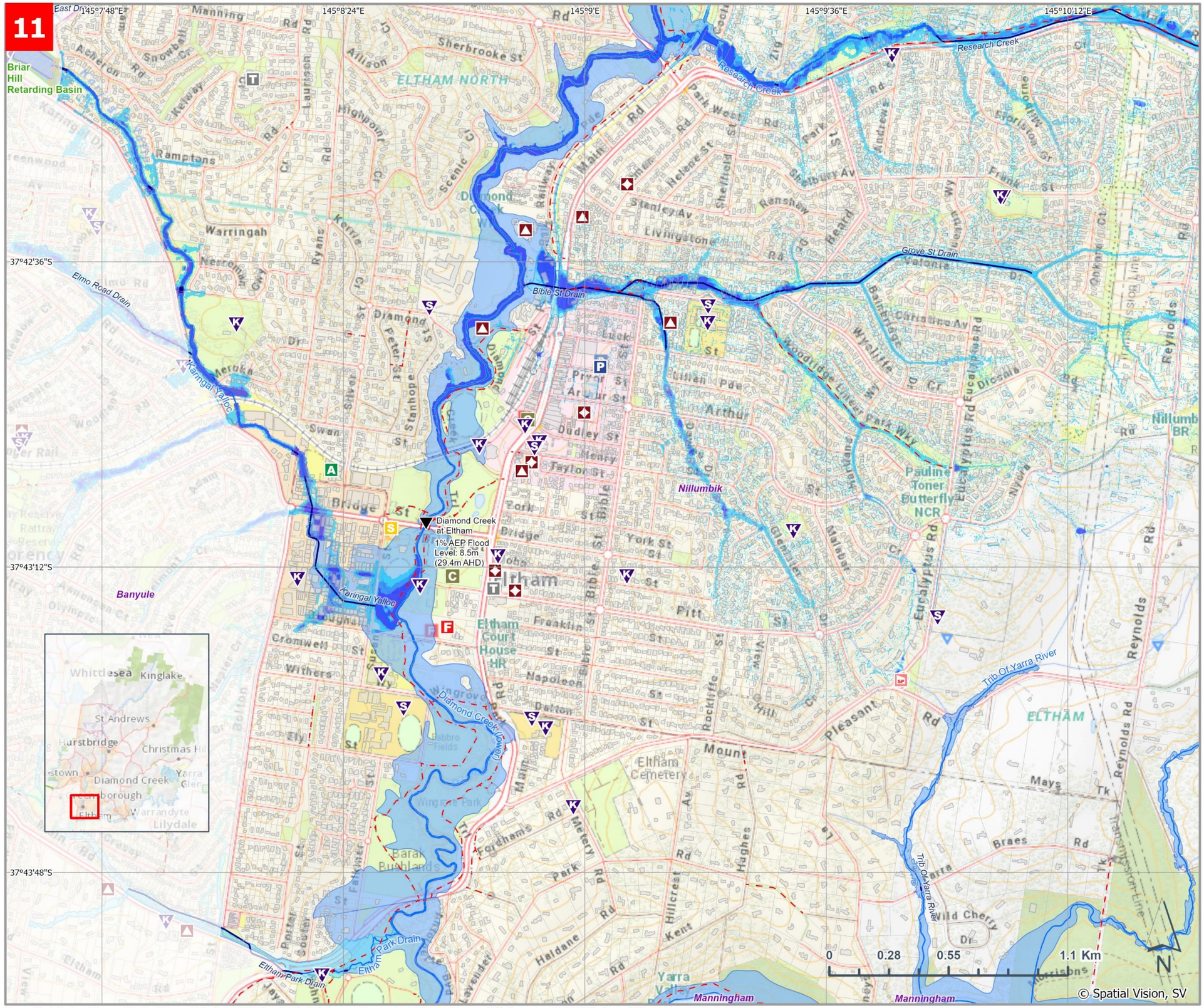
1% AEP (100yr ARI) Flooding

10. Diamond Creek (Eltham North)

SES VICTORIA State Government

Melbourne Water

Diamond Creek flood modelling completed by Melbourne Water, August 2002. Grove St Main Drain flood modelling completed by Engeny, November 2020. Map produced by VICSES September 2022.



Diamond Creek flood modelling completed by Melbourne Water, August 2002. Grove St Main Drain flood modelling completed by Engeny, November 2020. Map produced by VICSES September 2022.

LAND USE

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

- Building
- Waterbody
- 1% AEP Riverine Flood Extent (MW)
- Waterway
- Melbourne Water Stormwater Drain
- Bicycle / Walking Trail
- Fire Station
- VICSES Units
- Ambulance Stations
- Police Stations
- Education Centre
- Child Care Centre
- Community Venue
- Aged Care Facility
- Place Of Worship
- Telephone Exchange
- Stream Level & Rain Gauge
- Stream Level Gauge
- Rain Gauge
- Sewer Pumping Station

Flood Depth

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

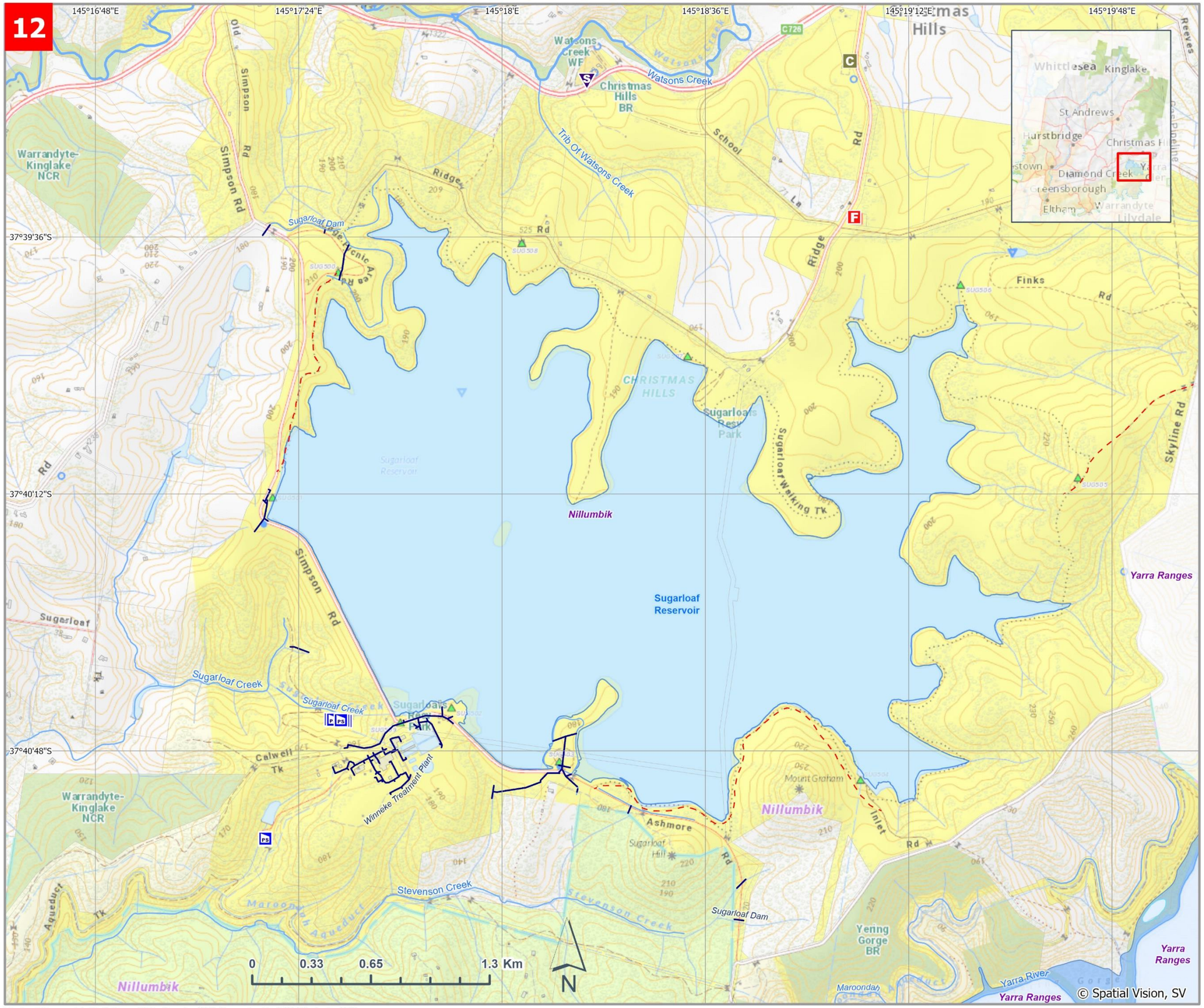
SHIRE OF NILLUMBIK

1% AEP (100yr ARI) Flooding

11. Diamond Creek (Eltham)

SES VICTORIA State Government Melbourne Water

12



LAND USE

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

- Building
- Waterbody
- 1% AEP Riverine Flood Extent (MW)
- Waterway
- Melbourne Water Stormwater Drain
- Bicycle / Walking Trails
- Fire Station
- Education Centre
- Community Venue
- Water Pumping Station

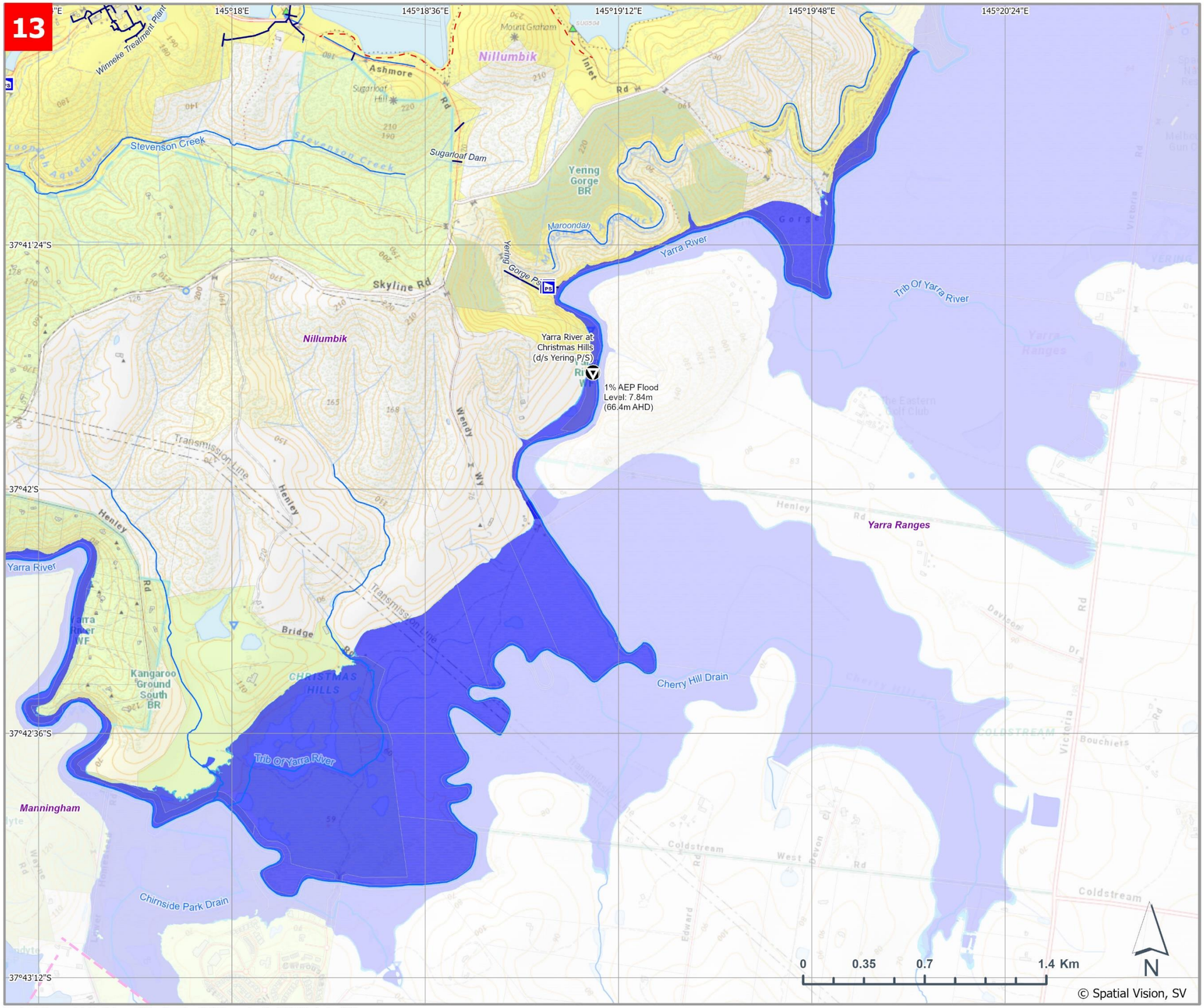
Flood modelling completed by Melbourne Water, November 2010. Map produced by VICSES September 2022.

SHIRE OF NILLUMBIK

1% AEP (100yr ARI) Flooding

12. Sugarloaf Reservoir (Christmas Hills)

13



LAND USE

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

- Building
- Waterway
- Bicycle / Walking Trails
- Stream Level & Rain Gauge
- Stream Level Gauge
- Rain Gauge
- Water Pumping Station

Flood Depth

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

SHIRE OF NILLUMBIK

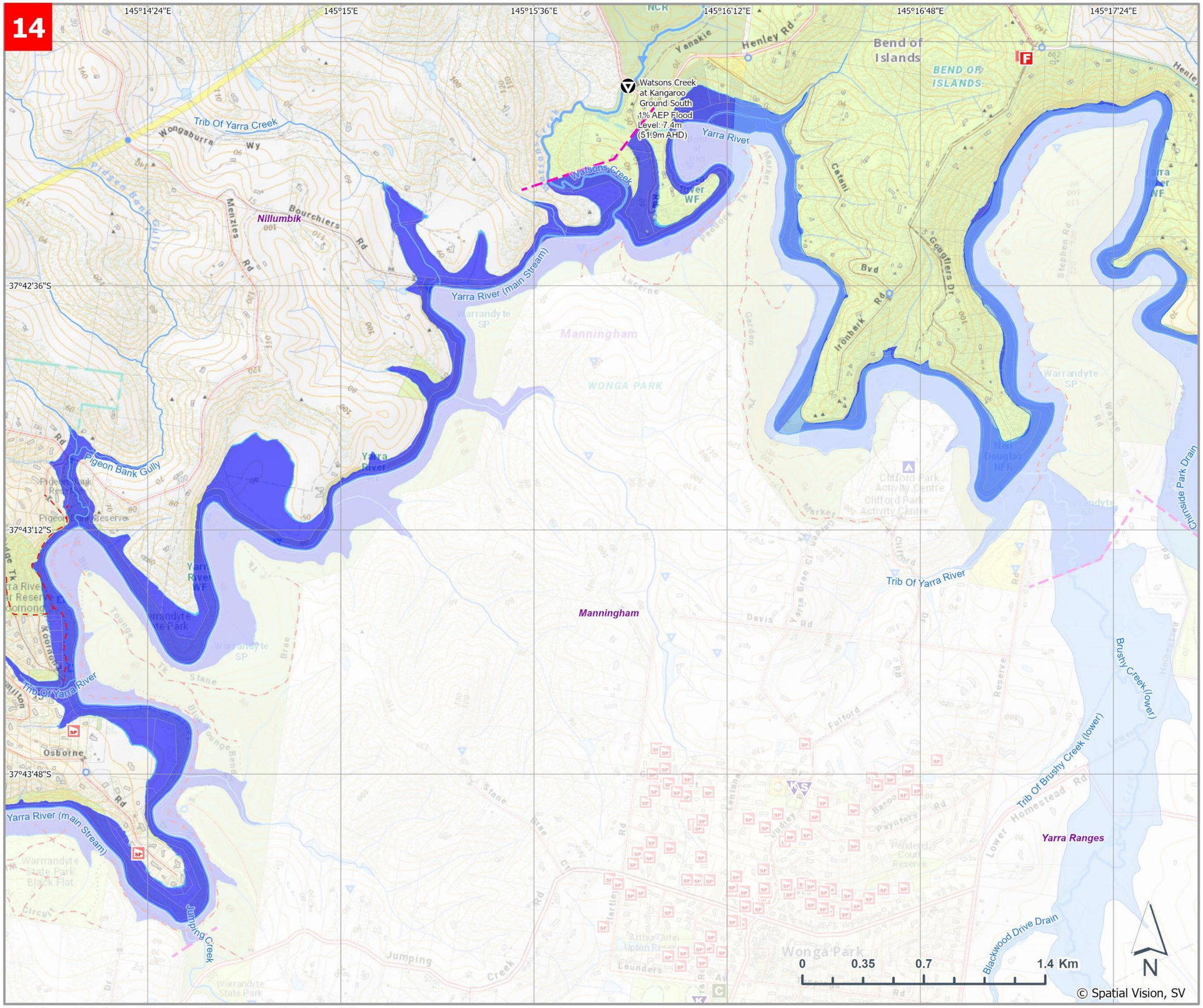
1% AEP (100yr ARI) Flooding

13. Yarra River (Christmas Hills)

SES VICTORIA State Government Melbourne Water

Flood modelling completed by Melbourne Water, November 2010. Map produced by VICSES September 2022.

14



LAND USE

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

- Building
- Waterbody
- Waterway
- Bicycle / Walking Trails
- Flood Model Extent
- Fire Station
- Community Venue
- Stream Level & Rain Gauge
- Stream Level Gauge
- Rain Gauge
- Camp Ground
- Sewer Pumping Station

Flood Depth

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

SHIRE OF NILLUMBIK

1% AEP (100yr ARI) Flooding

14. Yarra River (Kangaroo Ground)

SES VICTORIA State Government Melbourne Water

Flood modelling completed by Melbourne Water, November 2010. Map produced by VICSES September 2022.

15

145°10'48"E 145°11'24"E 145°12'E 145°12'36"E 145°13'12"E 145°13'48"E

37°43'12"S

37°43'48"S

37°44'24"S

Nillumbik

North Warrandyte

Warrandyte

Manningham

Sloan Hill

Professors Hill Reserve

Yarra Valley Parklands

Trib Of Yarra River

Trib Of Stony Creek

Stony Creek

Yarra River (main Stream)

Minor Yarra River Tributaries

Homewood Drain

Anderson Creek

Yarra River at Warrandyte

1% AEP Flood Level: 9.82m (33.85m AHD)

0 0.3 0.6 1.2 Km

N

Flood modelling completed by Melbourne Water, November 2010. Map produced by VICSES September 2022.

- Building
- Waterbody
- 1% AEP Riverine Flood Extent (MW)
- 1% AEP Flood Extent (Council)
- Waterway
- Bicycle / Walking Trail

- Education Centre
- Child Care Centre
- Fire Station

- Community Venue
- Place Of Worship
- Stream Level & Rain Gauge
- Stream Level Gauge
- Rain Gauge

- Camp Ground
- Sewerage Pumping Station
- Sewer Emergency Relief Point

Flood Depth

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

LAND USE

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

SHIRE OF NILLUMBIK

1% AEP (100yr ARI) Flooding

15. Yarra River (North Warrandyte)

SES Melbourne Water VICTORIA State Government

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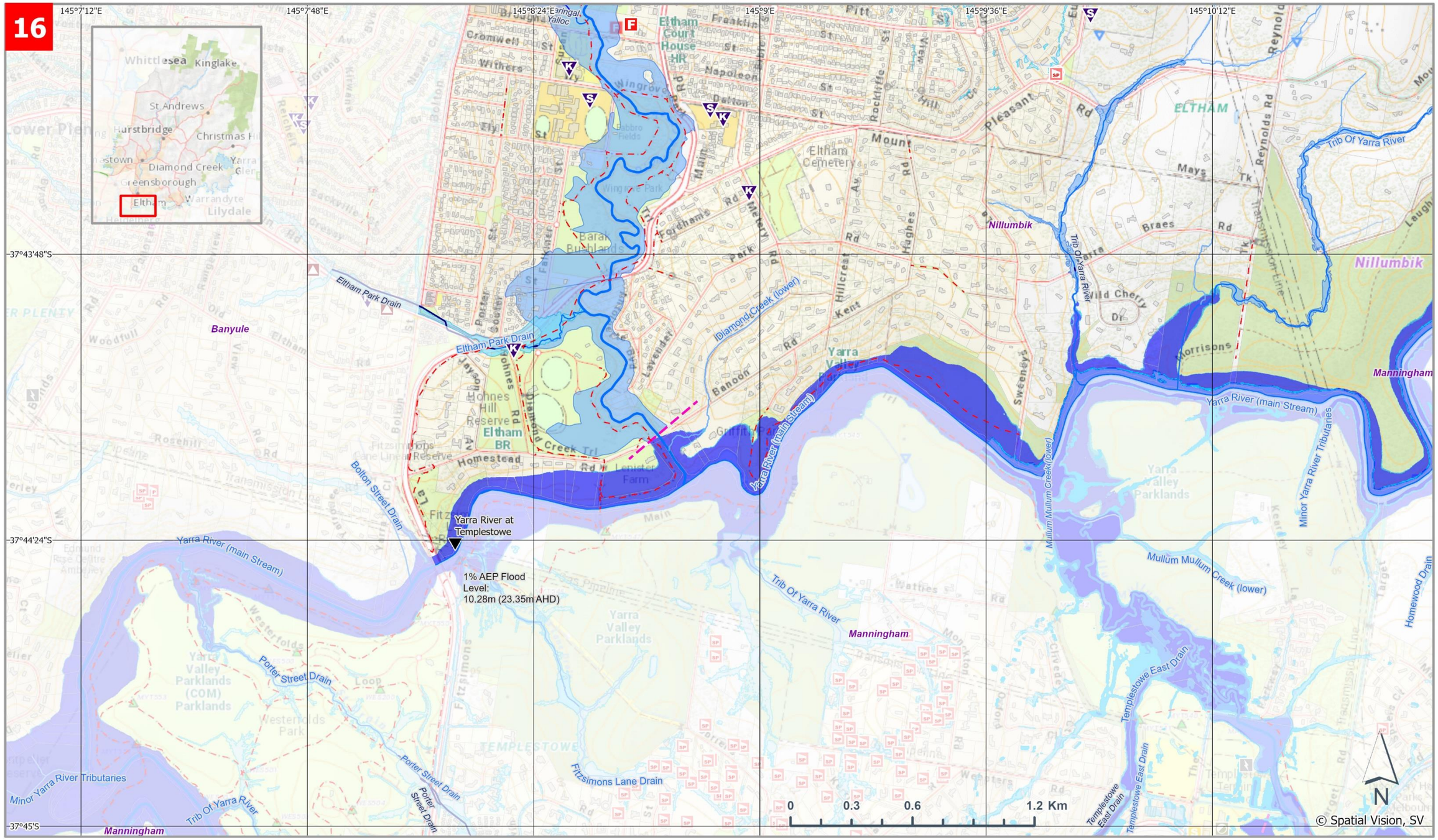
16



Flood modelling completed by Melbourne Water, November 2010. Map produced by VICSES September 2022.

SHIRE OF NILLUMBIK

1% AEP (100yr ARI) Flooding

16. Yarra River (Eltham)

- Building
- Waterbody
- 1% AEP Riverine Flood Extent (MW)
- 1% AEP Flood Extent (Council)
- Waterway
- Melbourne Water Stormwater Drain
- Bicycle / Walking Trail
- Flood Model Extent

- Education Centre
- Child Care Centre
- Fire Station
- Municipal Office
- Municipal Depot
- Community Venue
- Power Facility
- Stream Level & Rain Gauge
- Stream Level Gauge
- Rain Gauge
- Sewerage Pumping Station

Flood Depth

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

LAND USE

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

SES Melbourne Water VICTORIA State Government

VICSES Requests for Assistance (Severe Weather) Mapping

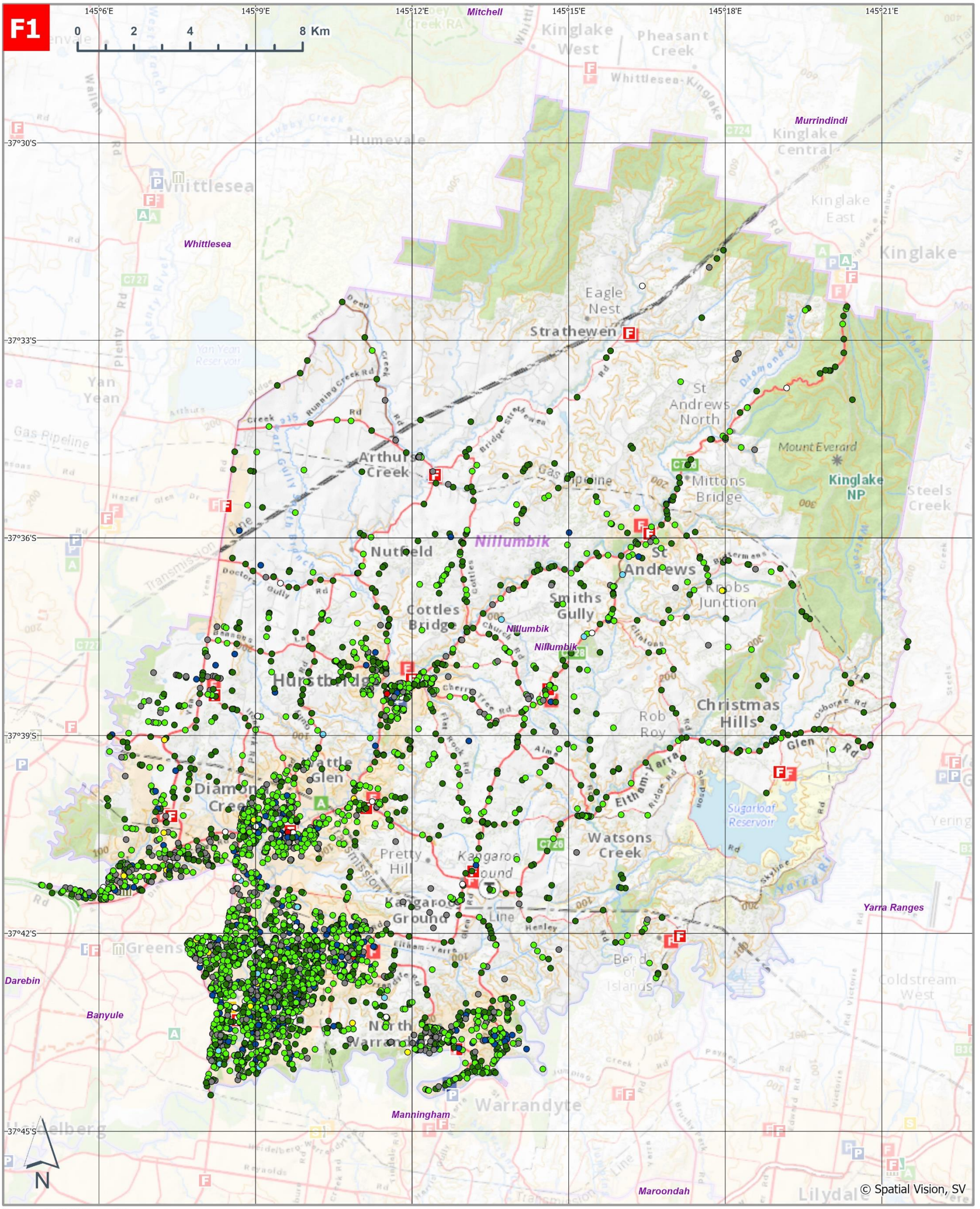
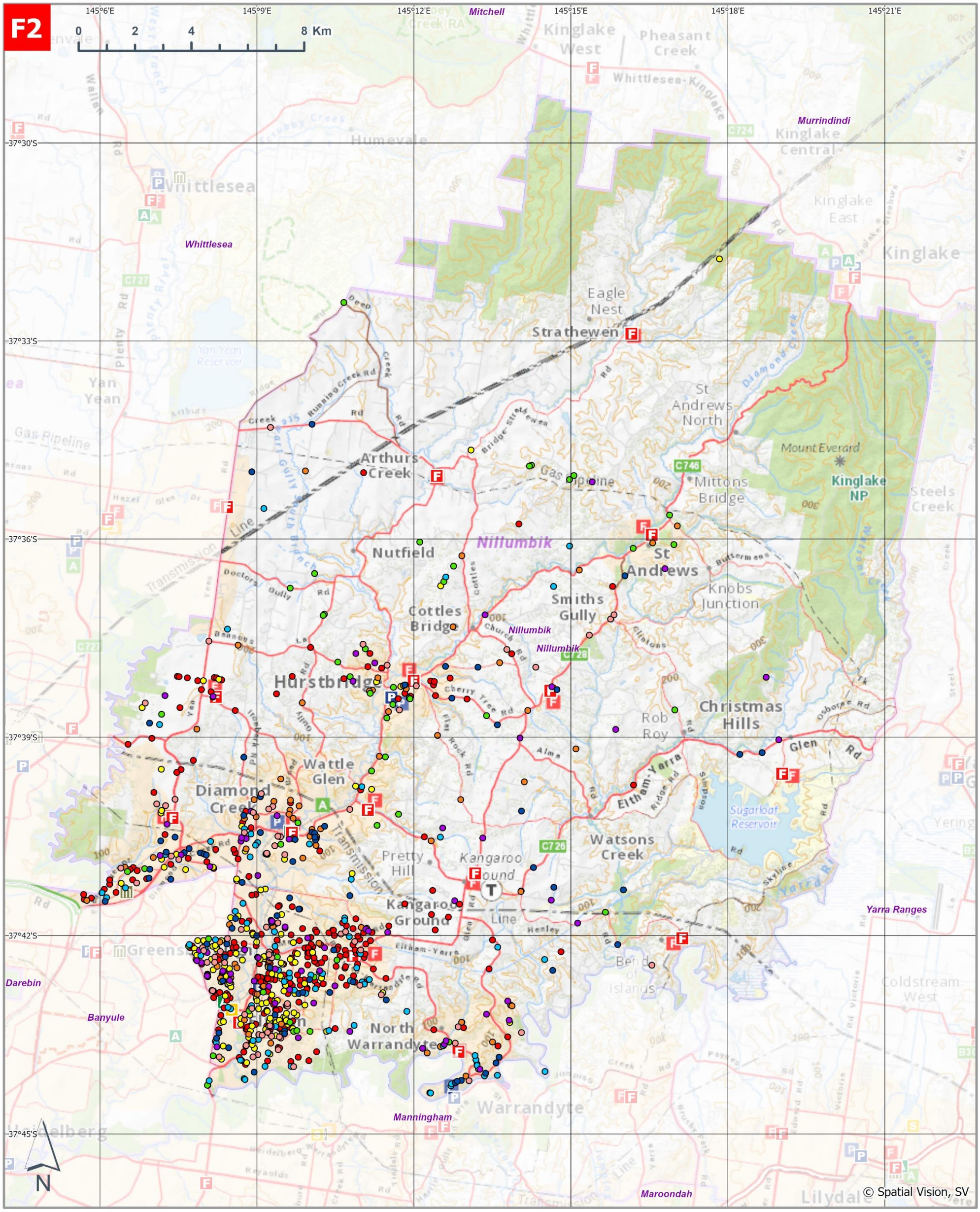


Figure F1 – Breakdown of severe weather RFAs received by VICSES Nillumbik Unit by request type



Map produced by VICSES January 2023.

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

Severe Weather RFAs (Storm or Flood)
Where greater than 60 RFAs received

- 25th-26th Dec 2011 (303)
- 5th-7th Sept 2012 (170)
- 24th Jun 2014 (80)
- 21st Nov 2019 (61)
- 27th-29th Aug 2020 (100)
- 15th-16th Nov 2020 (86)
- 9th-10th Jun 2021 (74)
- 29th-31st Oct 2021 (81)

LAND USE

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

SHIRE OF NILLUMBIK

F2. Severe Weather Requests for Assistance (RFA) by Event (July 2009 - Nov 2022)

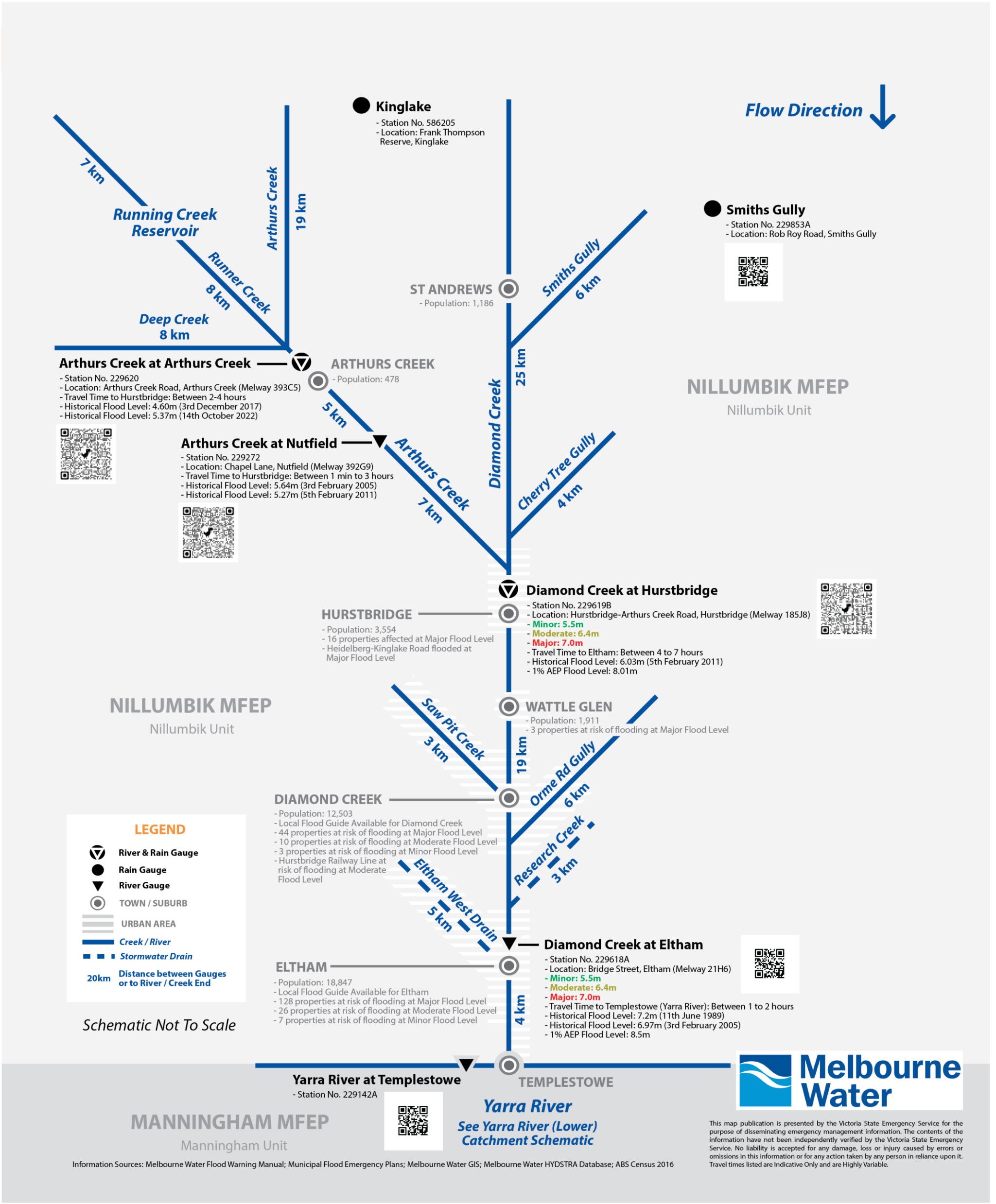
SES VICTORIA State Government

Melbourne Water

Figure F2 – Breakdown of severe weather RFAs received by VICSES Nillumbik Unit by date (Where over 60 RFAs Received per Event)

Diamond Creek Catchment Schematic

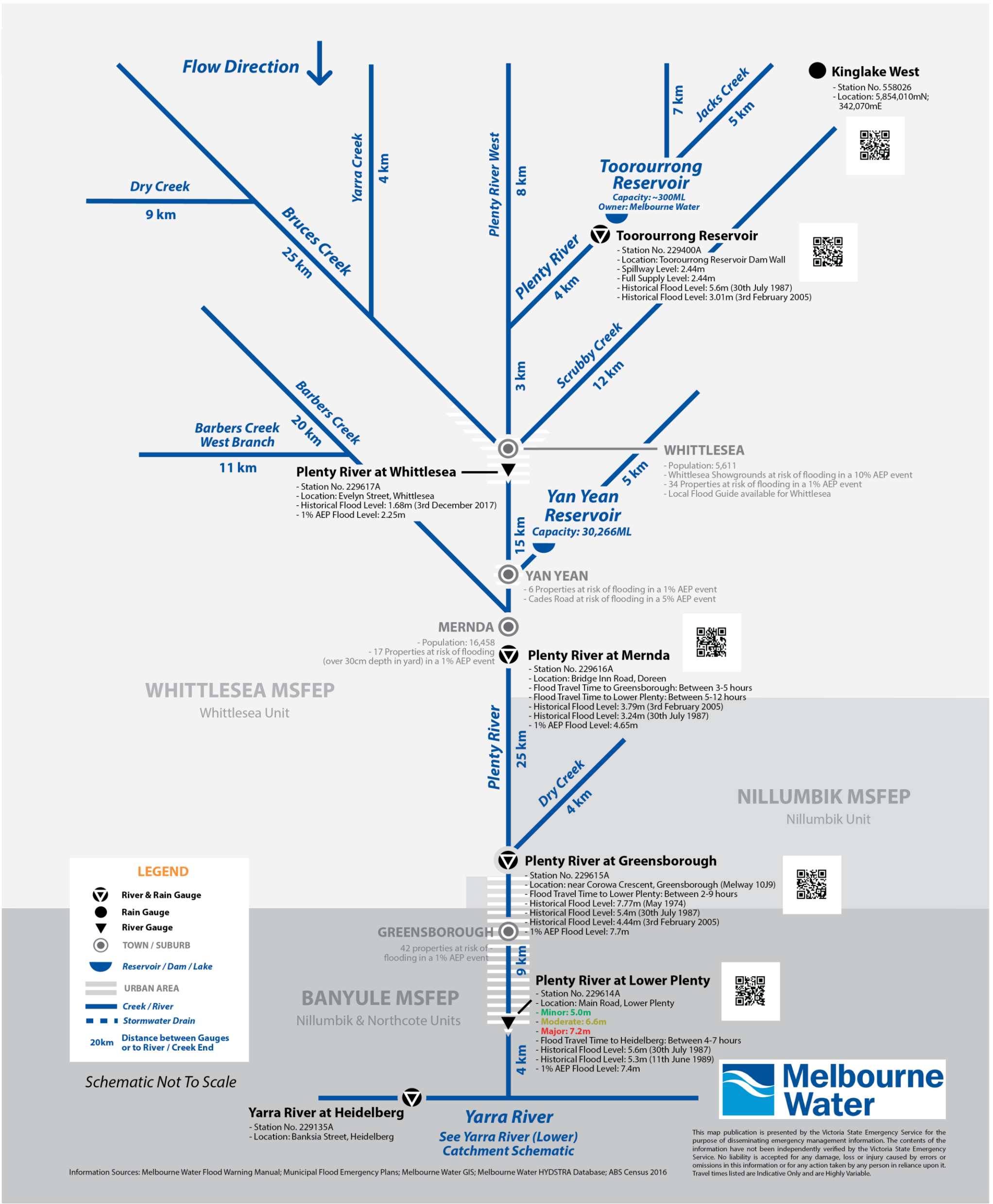
Version 4 - January 2023



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

Plenty River Catchment Schematic

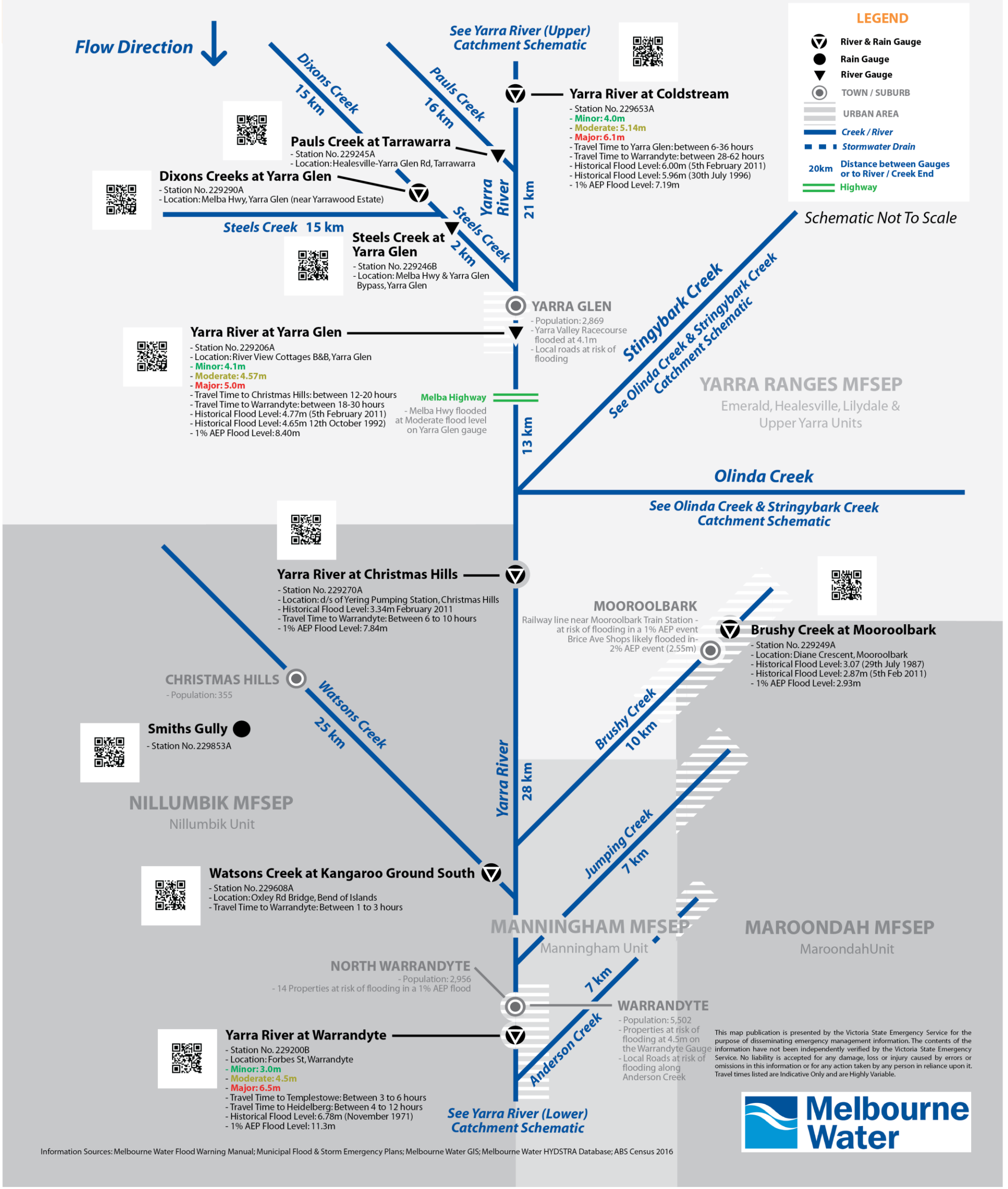
Version 4 - January 2021



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

Yarra River (Middle) Catchment Schematic

Version 6 - September 2020



APPENDIX G – SEVERE WEATHER (STORM) EVENTS

Overview

The Nillumbik Shire is susceptible to Severe Weather Events because of a combination of its hilly terrain and the high number of mature trees located within the municipality. This appendix details areas of risk from severe weather events by requests for assistance to the Victoria State Emergency Service (VICSES).

VICSES Requests for Assistance

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

Suburb	VICSES Request for Assistance (July 2009 – November 2022)				
	Building Damage	Flooding	Tree Down	Tree Down Traffic Hazard	Other *
Arthurs Creek	6	1	9	29	0
Bend Of Islands	3	0	6	6	0
Christmas Hills	1	0	14	70	0
Cottles Bridge	6	1	37	62	1
Diamond Creek	93	38	279	124	17
Doreen	2	2	9	30	1
Eltham	305	200	756	373	51
Eltham North	67	18	185	52	8
Greensborough	39	15	76	50	7
Hurstbridge	38	16	119	112	2
Kangaroo Ground	19	3	31	81	2
Kinglake	0	3	2	12	0
North Warrandyte	70	26	169	128	8
Nutfield	0	1	6	11	0
Panton Hill	11	1	37	62	2
Plenty	10	8	30	38	2
Research	41	20	90	56	4
Smiths Gully	3	1	14	32	0
St Andrews	9	4	46	62	2
Strathewen	1	0	1	6	4
Watsons Creek	1	0	9	18	0
Wattle Glen	6	2	48	43	2
Yarrambat	22	8	31	65	1

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

* Agency Liaison, Assist Agency, Fence Down, Landslide, Loose Debris, SES Incident Other

Table G2 is a breakdown of requests for assistance by Date (Month) and damage type for severe weather events. High figures during December 2011 are the result of the Hailstorm that moved across the state from the west.

Date	VICSES Request for Assistance (July 2009 – November 2022)				
	Building Damage	Flooding	Tree Down	Tree Down Traffic Hazard	Other*
July 2009	0	0	3	1	0
August 2009	21	0	65	31	0
September 2009	10	0	5	6	0
October 2009	0	0	2	4	0
November 2009	**37**	**11**	**56**	**15**	**0**
December 2009	2	0	5	1	0
January 2010	2	0	8	7	0
February 2010	3	0	3	5	0
March 2010	9	12	6	6	0
April 2010	1	0	0	1	0
May 2010	0	0	1	0	0
June 2010	6	1	14	13	0
July 2010	1	0	4	4	0
August 2010	3	0	37	26	0
September 2010	1	0	14	5	0
October 2010	1	2	17	27	0
November 2010	0	2	17	19	0
December 2010	7	2	21	15	0
January 2011	7	11	20	28	0
February 2011	**8**	**33**	**21**	**24**	**1**
March 2011	1	0	5	3	0
April 2011	3	2	8	6	0
May 2011	0	0	9	9	0
June 2011	3	0	12	15	0
July 2011	1	0	3	2	0
August 2011	1	1	0	0	0
September 2011	8	1	10	10	0
October 2011	1	0	2	6	0
November 2011	2	1	21	11	0
December 2011	**171**	**147**	**26**	**23**	**5**
January 2012	15	0	18	25	0
February 2012	13	2	29	13	0
March 2012	1	1	11	9	0
April 2012	1	0	7	8	0
May 2012	2	0	4	5	0
June 2012	1	0	4	1	0
July 2012	0	0	3	5	0
August 2012	1	0	3	13	0
September 2012	**55**	**0**	**100**	**32**	**0**
October 2012	1	0	0	0	0
November 2012	0	1	3	3	0
December 2012	4	0	8	9	0
January 2013	1	0	8	5	0
February 2013	6	1	10	6	0
March 2013	5	0	11	5	0
May 2013	0	0	1	3	0
June 2013	5	11	3	3	0
July 2013	2	0	9	11	0
August 2013	9	0	24	16	0
September 2013	**21**	**0**	**40**	**22**	**0**
October 2013	7	0	12	10	0
November 2013	2	0	3	0	0
December 2013	5	0	2	7	0
January 2014	3	0	16	8	0
February 2014	3	0	8	10	0
March 2014	2	0	2	3	0
April 2014	0	0	4	6	0
May 2014	0	1	2	7	0
June 2014	**19**	**0**	**47**	**31**	**0**
July 2014	4	0	14	19	0
August 2014	2	0	8	1	0
September 2014	9	3	18	15	0
October 2014	9	3	18	15	0
November 2014	0	0	3	2	0

Date	VICSES Request for Assistance (July 2009 – November 2022)				
	Building Damage	Flooding	Tree Down	Tree Down Traffic Hazard	Other*
December 2014	0	0	6	4	0
January 2015	2	0	14	5	0
February 2015	0	0	6	6	0
March 2015	2	0	2	4	0
April 2015	5	0	11	3	0
May 2015	0	0	0	0	0
June 2015	2	0	0	2	0
July 2015	3	0	5	9	0
August 2015	0	0	2	6	0
September 2015	1	0	1	1	0
October 2015	3	0	4	2	0
November 2015	10	0	17	6	0
December 2015	1	0	10	9	0
January 2016	7	1	20	8	0
February 2016	2	0	3	4	0
March 2016	3	0	12	8	0
April 2016	1	0	3	2	0
May 2016	5	0	30	15	0
June 2016	3	0	11	9	0
July 2016	5	0	12	13	0
August 2016	2	0	3	11	0
September 2016	2	1	7	7	0
October 2016	**19**	**0**	**65**	**71**	**0**
November 2016	3	0	8	9	0
December 2016	**17**	**17**	**9**	**12**	**0**
January 2017	4	0	5	6	0
February 2017	5	2	7	13	0
March 2017	3	0	10	8	0
April 2017	8	1	6	12	0
May 2017	3	0	3	1	0
June 2017	0	0	2	2	0
July 2017	1	0	3	3	0
August 2017	4	0	5	2	0
September 2017	0	0	7	12	0
October 2017	0	0	6	5	0
November 2017	4	6	8	8	0
December 2017	**13**	**16**	**16**	**19**	**0**
January 2018	0	0	13	9	0
February 2018	2	0	18	11	0
March 2018	2	0	14	8	1
April 2018	6	2	12	13	0
May 2018	4	0	5	7	0
June 2018	3	5	4	7	0
July 2018	4	0	7	5	0
August 2018	3	0	6	6	0
September 2018	0	0	5	0	0
October 2018	0	0	2	6	0
November 2018	3	4	7	9	0
December 2018	3	5	2	11	1
January 2019	4	0	10	7	1
February 2019	0	1	5	4	0
March 2019	1	0	5	7	0
April 2019	1	0	1	1	0
May 2019	2	3	3	8	0
June 2019	0	0	3	5	2
July 2019	6	0	8	16	0
August 2019	1	0	8	8	0
September 2019	0	0	4	8	0
October 2019	3	0	12	8	0
November 2019	9	1	43	38	0
December 2019	2	1	17	8	2
January 2020	37	9	29	20	4
February 2020	4	2	24	12	0
March 2020	2	1	8	14	0

Date	VICSES Request for Assistance (July 2009 – November 2022)				
	Building Damage	Flooding	Tree Down	Tree Down Traffic Hazard	Other*
April 2020	4	3	48	32	4
May 2020	0	1	16	12	1
June 2020	0	1	4	10	0
July 2020	1	0	3	8	1
August 2020	7	1	83	31	5
September 2020	2	0	23	13	0
October 2020	1	1	18	6	2
November 2020	12	0	66	33	11
December 2020	6	0	26	12	3
January 2021	3	2	5	8	3
February 2021	1	0	11	5	0
March 2021	1	0	4	4	0
April 2021	0	1	5	5	0
May 2021	0	2	3	2	0
June 2021	8	1	59	30	2
July 2021	3	0	8	8	2
August 2021	1	0	2	1	1
September 2021	2	1	13	9	0
October 2021	6	0	82	22	5
November 2021	5	0	32	11	2
December 2021	3	0	75	14	3
January 2022	5	5	11	14	0
February 2022	0	2	3	3	0
March 2022	3	2	6	5	0
April 2022	3	0	2	4	0
May 2022	2	0	0	1	0
June 2022	0	0	2	4	0
July 2022	2	0	2	3	0
August 2022	2	1	10	9	0
September 2022	0	0	2	3	0
October 2022	9	13	44	44	2
November 2022	8	1	37	34	7

Table G2 – Breakdown of severe weather RFAs received by VICSES Nillumbik Unit by date

* Agency Liaison, Assist Agency, Fence Down, Landslide, Loose Debris, SES Incident Other