Glenelg Flood & Storm Sub-Plan

A Sub-Plan of the Municipal Emergency Management Plan for Glenelg Shire.

Version 6. November 2025

Acknowledgment of Traditional Owners

The Glenelg Shire **Municipal Emergency Management Planning Committee (MEMPC)** respectfully acknowledges the Traditional Owners of the land and waters of Gunditjmara, Jardwadjali and Boandik people. We pay our respects to Elders past, present and emerging, and are committed to working with Aboriginal and Torres Strait Islander communities to achieve a shared vision of safer and more resilient communities.

Authority

This Flood and Storm Sub-plan has been prepared in accordance with and complies with the requirements of the ***Emergency Management (EM) Act 2013*** including having regard to the guidelines issued under section 77, *Guidelines for Preparing State, Regional and Municipal Emergency Management Plans* and was endorsed by the **Barwon South West (BSW) Regional Emergency Management Planning Committee (REMPC)** as a sub-plan to the **State Emergency Management Plan (SEMP)** and approved by the **Emergency Management Commissioner (EMC).**

Authorised and published by

Authorised and published by the Victorian Government Melbourne April 2026.

If you would like to receive this publication in an accessible format please email: *emergencyplanning@emv.vic.gov.au.*

This document is also available in PDF format at emv.vic.gov.au

Document information

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Any printed hard copies of this Flood and Storm Sub-plan are considered 'uncontrolled documents' and may not reflect the most current or updated version.

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Distribution of Glenelg Municipal Flood & Storm Sub-plan (MFSSP)

Once endorsed and signed the, **Glenelg Municipal Flood and Storm Sub-plan (MFSSP)** should be distributed to all MFSSP committee members, MEMPC Chair, Glenelg Shire Council, MEMO (Municipal Emergency Management Officer), Deputy MEMO, Representatives from; BoM, Glenelg Hopkins Catchment Management Authority (GHCMA), DEECA, Parks Victoria, Ambulance Victoria, Department of Transport and Planning, DFFH, relevant utilities, MERC (VicPol - Municipal Emergency Response Coordinator), RERC (VicPol Regional Emergency Response Coordinator), Police station(s), VICSES Units, VICSES Regional office, CFA brigades, CFA regional office.

Document Transmittal Form / Amendment Certificate

This Municipal Flood and Storm Sub-plan (MFSSP) will be amended, maintained and distributed as required or every 3 years facilitated by VICSES in consultation with the Glenelg MEMPC.

Suggestions for amendments to this Plan should be forwarded to VICSES Regional Office via ust.southwest@ses.vic.gov.au.

This Plan will be published on the VICSES website at www.ses.vic.gov.au/get-ready/your-local-flood-information located with the associated local flood guide, Glenelg Shire website https://www.glenelg.vic.gov.au/Our-Council/Emergency-Information.

Abbreviations & Acronyms

A Range of existing resources relating to floods, including documents and websites, provide various acronym lists and attachments. Definitions and acronyms can be found in State Emergency Management Plan (SEMP).

For this plan the first use of an acronym is fully described, bolded and then the acronym is enclosed in brackets for that point on the only the acronym is used.

For example: **Municipal Emergency Management Plan (MEMP)**

Introduction

Approval and Endorsement

The Glenelg Shire MEMPC is the owner of this Municipal Flood and Storm Sub-plan (MFSSP), pursuant to Part 6A of the *Emergency Management Act 2013* (as amended). If the certificate of assurance is signed and dated, then the Barwon South West REMPC has approved this plan.

In accordance with its roles and responsibilities set out in the State Emergency Management Plan (SEMP), the **Victoria State Emergency Service (VICSES)** has prepared this plan in collaboration with the **Glenelg Municipal Flood (& Storm) sub-committee (MFSC)**.

This MFSSP is a sub plan to the Glenelg Shire **Municipal Emergency Management Plan (MEMP)**. It is consistent with the SEMP and the Victorian Floodplain Management Strategy (2016).

The plan is also consistent with and subordinate to:

- SEMP Flood Sub-Plan, SEMP Storm sub-plan
- The Barwon South West Region Emergency Management Plan
- The Barwon South West Region Flood Sub-Plan, Regional Storm sub-plan

This MEMPC prepared this plan in alignment with the Guidelines for Preparing State, Regional and Municipal Emergency Management Plans, including formal consultation and statement of assurance.

It also considers the outcomes of the Community Emergency Risk Assessment (CERA) process undertaken by the Glenelg Shire Municipal Emergency Management Planning Committee (MEMPC).

The Glenelg MFSSP is a result of the cooperative efforts of the MFPC and its member agencies.

Engagement with communities through the update of this Sub-plan has primarily taken place through the Municipal Flood Planning Committee, along with input from community representatives serving on the Municipal Emergency Management Planning Committee.

This Plan requires the approval of the Barwon South West Regional Emergency Management Planning Committee.

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

Purpose and scope of this flood/storm emergency plan.

The purpose of this MFSSP is to detail the arrangements for managing a flood &/or storm emergency before, during and after it occurs or potentially occurs within the Glenelg Shire.

As such, the scope of the Plan is to:

- identify the local flood and storm risk.
- support the implementation of mitigation and planning measures to minimise the causes and impacts of flooding.
- detail emergency management arrangements.
- identify linkages with local, regional, and state emergency planning arrangements with a specific emphasis on those relevant to flood & storm.

Audience.

The audience of this Sub-plan is local government and agencies within the emergency management sector in Glenelg Shire, including business and community groups who hold a significant role in the management of the flood and storm emergencies. Although the wider community is not the primary audience, community members may find the contents of this plan informative.

How to read this plan

This is a sub-plan and therefore should be read in conjunction with the:

- SEMP, SEMP flood Sub-plan and SEMP Storm Sub-plan
- Barwon South West REMP
- Glenelg Shire MEMP

Linkages and hyperlinks

This plan refers to a range of existing resources relating to floods/storms, including documents and websites. This plan does not seek to duplicate the information contained in these resources and instead provides links to where the reader can obtain further information.

For more operational or sensitive information, a log-in may be required, such as for documents saved on the Emergency Management Common Operating Picture (EM-COP), including Joint Standard Operating Procedures (JSOPs).

Documents or resources that are referred to frequently throughout this plan (such as the SEMP) may not hyperlinked in each instance.

All hyperlinks were accurate at time of publication and currency of the linked content remains the responsibility of the host agency.

Requirements of EMP guidelines

Emergency Management Victoria has published guidelines for preparing emergency management plans including municipal plans. In accordance with *Emergency Management Act 2013 Section 3.1* (Requirements) this plan has been:

- prepared collaboratively, efficiently, and effectively *(section 60AA(1))*,

- is consistent with other existing in force EMPs and where possible not duplicate or conflict with those plans *(section 60AC(1))*,
- has adopted an integrated, coordinated, and comprehensive approach to emergency management *(sections 60AD, 60ADA and 60ADB)*,
- contain arrangements for mitigation, response, and recovery plus roles and responsibilities *(section 60AE)*,
- Has been assured, approved, and published every three years, or more frequently if required *(sections 60AG, 60AH, and 60AI).*

Municipal Flood (& Storm) sub-committee (MFSC)

Membership of the Glenelg Shire Flood (& Storm) sub-committee (MFSC) comprises of the following representatives from the following agencies and organisations:

- Chairperson - VICSES Operations Officer - Emergency Management
- Glenelg Shire (Municipal Emergency Management Officer),
- Victoria Police MERC (Municipal Emergency Response Coordinator),
- Glenelg Hopkins Catchment Management Authority,
- Department of Transport & Planning (DTP),
- Department of Families, Fairness and Housing (as required),
- Country Fire Authority (CFA) &/or Fire Rescue Victoria (FRV) (as required),
- Department of Energy, Environment and Climate Action (as required),
- Water Authorities (as required).

Responsibility for planning, review & maintenance of this plan

To remain effective and to place the community at centre of its planning, the MEMPC must ensure it maintains the MFSSP.

VICSES through the MFSC has responsibility for facilitating the preparation, review, maintenance, and distribution of this plan.

The MFSC will meet at least once per year.

The MEMPC will ensure that the MFSC review the plan following:

- a new flood study,
- a significant change in flood mitigation measures,
- after the occurrence of a significant flood event within the municipality,
- three years elapsing after the last review.

Before: Prevention & Preparedness Arrangements.

Community Awareness for all types of Flood and Storm.

Upon formal adoption by the MEMPC the community will have access to the details of this MFSSP via:

- The Victora State Emergency Service (VICSES) website
- The Glenelg Shire Council website,
- any Be Flood Ready or Storms - Plan and stay safe engagement initiatives and websites (VICSES and Glenelg Shire)

VICSES with the support of Glenelg Shire and Glenelg Hopkins Catchment Management Authority will coordinate targeted community flood engagement programs within the council area.

Refer to Appendix H (Local Flood Guide and Be Flood Ready Information).

Structural flood mitigation measures

Structural flood mitigation measures are any physical construction to reduce or avoid possible impacts of flood hazards, or the application of engineering techniques or technology to achieve flood hazard resistance and resilience in structures or systems.

There are no formal structural flood mitigation measures within Glenelg Shire, however when storage levels are low in Rocklands Reservoir it may provide flood mitigation, potentially reducing the flood magnitude in downstream towns of Harrow and Casterton. However, when Rocklands Reservoir spills, this can increase the severity of flooding in Harrow and Casterton. Refer to Appendix A – Dam spilling or failure for more detailed information.

The following is a summary of structural flood mitigation measures that exist within the Council area:

- levee – Wattle Hill Creek, immediately upstream of Fawthrop Lagoon. Overtopped at 10% AEP event.
- sea rock wall – Dutton Way, Bolwarra from Henty Bay Caravan Park to Great South West Walk.

Refer to Appendix C – Flood emergency Plans for detailed information of structural flood mitigation measures.

Non-structural flood mitigation measures

Non-structural flood mitigation measures are measures not involving physical construction which use knowledge, practice, or agreement to reduce disaster risks and impacts, through policies and laws, public awareness raising, training and education. The following are a summary of non-structural flood mitigation measures in the municipality.

Planning controls

Within Glenelg Shire there are provisions for planning controls under two overlays. The planning controls ensure that risks associated with the use and development of floodplain land are recognised and responded to appropriately via the planning permit application process.

A Land Subject to Inundation Overlay (LSIO) which identifies flood prone land in a riverine or coastal area affected by the 1 in 100 (1 per cent Annual Exceedance Probability) year flood or any other area determined by the floodplain management authority.

Clause 44.03 Floodway Overlay, with Schedule 1, applies for waterways, major flood paths, drainage depressions and high hazard areas which have the greatest risk and frequency of being affected by flooding.

Glenelg Shire Local Floodplain Development Plan 2022 has been prepared under the Glenelg Planning Scheme.

The plan establishes minimum design & development criteria for use, buildings and works, and subdivision in the following areas:

- Urban and rural areas of Portland affected by the Urban Floodway Zone (UFZ),
- Floodway Overlay (FO1) and Land Subject to Inundation Overlay (LSIO1).
- Urban and rural areas of Casterton affected by the FO1 and LSIO1.
- Rural areas of Narrawong and the Surrey River and estuary affected by the FO1 and LSIO1.
- Urban and rural areas of Heywood, Drumborg, Condah, Breakaway Creek, Tyrendarra, and Homerton affected by the FO1 and LSIO1.

The locations of these areas are shown under zoning and overlay maps forming part of the Glenelg Planning Scheme.

Exercising the plan

The MEMPC is responsible for organising exercises to test this plan, which should be conducted once within the plan's 3 year lifecycle.

Flood intelligence

Flood intelligence supports decision making and planning for flooding by providing reliable and accurate information relating to:

- the expected level, depth, and velocity of floodwater and its consequences,
- determination of actions to be undertaken in response to the identified consequences.

DEECA maintains the FloodZoom flood intelligence platform. Inquiries regarding FloodZoom access should be directed to accounts@floodzoom.vic.gov.au.

Flood warning

The SEMP Flood Sub Plan (www.ses.vic.gov.au/em-sector/vicses-emergency-plans) and on the Bureau of Meteorology (BoM) website www.bom.gov.au, detail the arrangements for BoM issued Flood Watch and Flood Warning products.

Details on Warnings issued by VICSES through VicEmergency and VICSES channels are outlined in Appendix E.

Local knowledge

Local knowledge is a critical element of planning. The community and other organisations can provide valuable local information about hazards, incidents and how they may evolve. This information is commonly

referred to as local knowledge. This plan aims to ensure that planners and responders capture appropriate local knowledge before, during and after incidents.

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

As an incident escalates from local control to a larger incident management structure, it is essential that local knowledge capability is retained within the overall structure. This should include how local subject matter experts are embedded in to divisional and sector command structures.

Refer to Appendix H – Local Flood Information for details of the local knowledge arrangements for the municipality.

During: Response & Relief Arrangements.

Activation of Response

VICSES may be notified of storm and flood incidents through several sources, but the most common source is calls received via 132 500 or if the emergency is life threatening, Triple Zero (000). Other sources are via other emergency management agencies and local government. In most cases, these events are of a small scale (a level 1 incident), which local VICSES units manage without significant outside support.

In the case of more significant level 2 (regional level) or level 3 (an incident that has high complexity and may have statewide implications) flood and storm response arrangements may be activated by the VICSES Barwon South West Regional Duty Officer (RDO) or Regional Agency Commander (RAC).

The VICSES Incident Controller (IC)/RDO/RAC will activate agencies as required as documented in the SEMP Flood sub-plan or SEMP Storm sub-plan.

Responsibilities

There are several agencies with specific roles that will act in support of VICSES and provide support to the community in the event of a serious flood or storm within the Glenelg Shire. These agencies will be engaged through the IEMT.

The general roles and responsibilities of supporting agencies are as agreed within the:

- Glenelg Shire MEMP,
- SEMP role statement,
- SEMP Flood sub-plan,
- Regional Flood Emergency Plan.

For flood and storm events, agreed roles of supporting agencies can be found in Barwon South West Flood Emergency Plan.

Appendix I list the roles and capabilities of other agencies when assisting VICSES to respond to storm events.

Municipal Emergency Coordination Centre or equivalent

If established, liaison with the emergency coordination centre will be through the established Division/Sector Command and through Municipal involvement in the IEMT, the Municipal Emergency Response Coordinator (MERC). The VICSES RDO or ICC will liaise with the centre directly if they have not established division or sector command arrangements.

The function, location, establishment and operation of an emergency coordination centre if relevant will be as detailed in the Glenelg Shire MEMP.

Escalation

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

Resourcing and event escalation arrangements are described in the SEMP.

State Emergency Management Priorities

The State Emergency Management Priorities shall form the basis of incident action planning processes.

Command, control, coordination, consequences, communication, and community

Arrangements in this MFSSP must be consistent with the 6 C's detailed in SEMP, the State and Regional Flood Emergency Sub-Plans and the MEMP. For further information, refer to the Emergency management phases in the SEMP and a one page summary on the 6 C's.

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 floods and storms.

The Role Statement within the SEMP identifies VICSES in its response functions as the Control Agency for flood and storm. It identifies DEECA as the Control Agency responsible for dam safety as well as reticulated water and wastewater (sewerage) service.

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

Incident Controller (IC)

On the advice of the Bureau of Meteorology (BoM) or other reliable source, that a flood or storm event will occur or is occurring, VICSES as the control agency will appoint an Incident Controller (IC). The IC is typically from VICSES but may be from another agency when resources are constrained. The IC will lead and manage incident-tier response control including:

- controlling the operational elements of the response
- providing operational leadership during the incident at a static location or a dynamic incident, including the tactical resolution.

The IC responsibilities are as defined in the SEMP. While providing support to the IC, support agencies retain command of their own people.

Incident Control Centre (ICC)

As required, the IC will establish an Incident Control Centre (ICC). The ICC is where they manage the incident response command and control functions from. The IC will make the decision to activate the ICC and when it should commence operations. The ICC may be activated in advance based on the severity of warnings and in accordance with VICSES readiness arrangements:

VICSES readiness and activation levels - flood

VICSES readiness and activation levels – severe weather

Pre-determined ICC locations are available in the BSW Regional Flood Emergency Plan and (JSOP 02.03).

Incident Level	Location	ICC Location	Facility owner	Key contact

L3	Glenelg River catchment Portland Coast catchment	CFA District 5 Service Centre. Cnr Walsh Road & Princes Hwy. Warrnambool, 3280.	CFA	CFA District 5 Duty Officer
L3	Glenelg River catchment Portland Coast catchment	DEECA Office 12 Murray Street, Heywood, 3304.	DEECA	FSW DDO

Divisions and Sectors

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

The location of Divisions and Sectors are chosen based on their suitability for maintaining operations during a flood and may differ from those used in other types of emergencies. The IC may establish Divisions and Sectors at the following locations to assist with the management of flooding within the Municipality:

Division	Sector
Hamilton	Heywood
	Dartmoor
	Portland

Maintenance of local knowledge and subject matter expertise in Divisions and Sectors

The plan recognises that personnel operating division and sector command points will often be from an agency that is not VICSES (the control agency) and may lack local knowledge associated with the nature of storms or flooding, and what resources are best deployed to certain types of requests for assistance.

To account for this, Incident Management Teams must ensure that mechanisms for incorporating local knowledge into the Incident Management structure are considered as part of developing strategies and tactics for managing the response within communities. The details are included in VICSES Policy 10.02 Local Knowledge.

Dependent on the nature and complexity associated with the incident, the Division Commander may appoint a Local Information Officer.

During operations, depending on nature of the incident, the LIO position should be incorporated within the incident management structure at locations such as Sector, Division Command, or an Intelligence Cell at the ICC to ensure the availability of local knowledge.

The role of an LIO during operations is to:

- To maintain communication with local Community Observers within the relevant area to understand the current situation,
- Work with Division and/or Sector Commanders on strategies and tactics for their footprint (area of operations),
- Be the conduit for information flow to and from their level (Division/Sector) to the level above.

As part of Municipal Flood Emergency Planning, VICSES will consider identifying trusted local sources to be identified as Community Observers. They are not required to be registered members of VICSES, but they will be maintained on an Observer register as part of relevant local emergency management plans.

This may include relevant members from local communities including:

- Leaders within CFA (e.g.: Captains or Group Officers)
- Local Police members
- Local Government officials
- Key Community Leaders
- Established Catchment Management Authorities and local Government observer networks.

Incident Management Team (IMT)

The Incident Controller will form an Incident Management Team (IMT) to support the IC in managing the incident-tier operational response to the emergency. This includes the functional areas of planning, intelligence, public information, operations, investigation, logistics and finance functions. Where possible, the IMT will be joint-agency, pre-planned and include personnel with relevant local knowledge.

For more detail, refer to the SEMP on IMTs and Incident Management Systems (IMSs).

Incident Emergency Management Team (IEMT)

The IC will establish a multi-agency Incident Emergency Management Team (IEMT) to support the IC in managing the effects and consequences of the flood or storm emergency.

The IEMT consists of key personnel (with appropriate authority) from stakeholder agencies and relevant organisations who need to be informed of strategic issues related to incident control. They can provide the IC with high level strategic guidance and policy advice for consideration in developing incident management strategies.

Organisations, including Glenelg Shire Council, required within the IEMT 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.

Local EMLO arrangements within an IEMT are provided for in section 4.8 of Glenelg Shire MEMP.

For more detail refer to the SEMP for guidance on IEMTs.

On Receipt of a Flood Watch / Severe Weather Warning

SES SOP008 Severe Weather Notification and Activation Process and SES SOP009 Flood Notification and Activation Process outline in detail the actions that VICSES will undertake upon receipt of a Severe Weather Warning or Flood Watch/Flood Warning.

The following are links to the current VICSES readiness:

VICSES readiness and activation levels - flood

VICSES readiness and activation levels – severe weather

Additionally, the VICSES Regional Duty Officer (until an incident controller is appointed) or IC will undertake actions as defined within the flood intelligence cards (Appendix C). General considerations by the VICSES RDO or IC will be as follows:

Review flood intelligence to assess likely flood consequences.

Monitor weather and flood information using the range of intelligence tools including– www.bom.gov.au and Rainfall and river levels.

Assess Command and Control requirements.

Review local resources and consider needs for further resources regarding personnel, property protection, flood rescue and air support. Keeping in mind geographic extent of warning area and the potential for resource constraints if there may be wide-ranging effects across the region or state.

Notify and brief appropriate officers. This includes Regional Control Centre (RCC) (if established), State Control Centre (SCC) (if established), Council, other emergency services through the EMT.

Assess ICC readiness (including staffing of IMT and IEMT) and open if required.

Ensure flood warnings and community information is prepared and issued to the community where required.

Flood (Riverine and flash) Warnings are managed by the RDO/RAC.

Severe Weather / Thunderstorm warnings are managed by SDO/SAC.

Develop media and public information management strategy.

Monitor watercourses and undertake reconnaissance of low-lying areas (consider field observers).

Ensure flood mitigation works are being checked by owners.

Develop and issue incident action plan, if required.

Develop and issue situation report, if required.

On Receipt of the First and Subsequent Flood Warnings

VICSES RDO (until an incident controller is appointed) or IC will undertake actions as defined within the flood intelligence cards **(Appendix C).** The VICSES RDO or IC will have general regard for the following considerations:

- Develop an appreciation of current flood levels and predicted levels. Are floodwaters rising, steady, peaking or falling?
- Review flood intelligence to assess likely flood consequences.
- Consider What areas may be at risk of:
- inundation
- isolation
- indirect affects to supply/distribution of
    - power
    - gas
    - water
    - telephone
    - internet
    - sewerage
    - health services
    - transport
    - emergency service infrastructure interruption.

Consider the characteristics of the populations at risk.

Determine what the ‘at-risk’ community need to know and do, as the flood develops.

Warn the ‘at-risk’ community including ensuring that an appropriate warning and community information strategy is implemented including details of:

- the current flood situation,
- flood predictions,
- what the consequences of predicted levels may be,
- public safety advice,
- who to contact for further information,

- who to contact for emergency assistance.

Liaise with relevant asset owners as appropriate (such as water, power utilities, telecommunications)

Implement response strategies as required based upon flood consequence assessment.

Continue to monitor the flood situation – www.bom.gov.au/vic/flood/.

Continue to conduct reconnaissance of low-lying areas.

Liaise with relevant flood mitigation infrastructure managers.

Community information and warnings including media communications.

Guidelines for the distribution of community/public information and warnings are contained in the VICSES Barwon South West Flood and Storm emergency sub-plans and State Flood and Storm emergency sub-plans.

Refer to Appendix E for more details on public information and warnings for the municipality.

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. The Glenelg Shire Council will work with the IC/VICSES RDO to assist with the dissemination of public messaging and/or warnings to ensure that consistent and timely messaging occurs.

Initial Impact assessment

In accordance with the SEMP and SEMP flood sub-plan (3.6.5 Initial impact assessment), the IC should initiate an initial impact assessment during the first 48 hours of an emergency. It should capture the nature and scale of the flood impact on people, community infrastructure, and the economic, natural, and built environments, in order that emergency relief and early recovery activities can commence. This information may then be used to provide the basis for further needs assessment and recovery planning by Emergency Recovery Victoria (ERV), Glenelg Shire Council and recovery agencies.

Agencies that typically support initial impact assessment in the municipality are:

Type	Agency	Data Access
IIA data	FRV	EM-Collaboration website (under relevant event folder) accessible with EM-COP login.
RPAS Data	FRV & VicPol	Data can be viewed via the FRV IIA Liaison Officer or the VicPol MERC as appropriate
Field Observer Snap.Send.Solve data	VICSES	Located in EM-COP, accessible by selecting the Situation tab > Data > Observations > Snap Send Solve
Ground Observation data	CFA and FRV Div B	Located in EM-COP, accessible by selecting the Situation tab > Data > Observations > Bushfire Observation
AIG Aerial Data	EMV	Located in EM-COP, accessible by selecting the Situation tab > Data > Observations > Airborne Information Gathering
Agriculture related data	Agriculture Victoria (DEECA)	Direct granular report from DEECA via emergency.recovery@delwp.vic.gov.au Aggregate report via the EM-Impact system

Wildlife, Public and Crown land data (RRATs)	DEECA	Direct from DEECA via emergency.recovery@delwp.vic.gov.au

Impact Assessment Guidelines V3.0 2023

Preliminary deployments to flooding.

When 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 may include but not limited to emergency service personnel, food items and non-food items such as medical supplies, shelter, assembly areas, relief centres.

Response to flash flooding.

Flash flooding can be defined as flooding that occurs within six hours or less of the flood-producing rainfall within the affected catchment. This may result in isolation of individuals and communities as time to warn and respond to flash flooding is limited. The safest place to be in a flash flood is well away from the affected area. Accordingly, pre-event planning for flash floods should commence with an assumption that evacuation is the most effective strategy, provided evacuation can be safely implemented.

Emergency management response to flash flooding should be consistent the SEMP Storm Sub-Plan.

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

- Determine if there are barriers to evacuation by considering warning time, safe routes, and resources available.
- 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.
- Where it is likely people will become trapped by floodwaters due to limited evacuation time or options the IC needs to ensure they provide safety advice to people at risk. This advice should advise people not to attempt to flee by entering floodwater. If people become trapped, it may be safer to seek the highest point within the building and to telephone 000 if they require rescue.
- Where this plan has identified buildings that are known to be structurally unsuitable, the plan needs to provide for an earlier evacuation trigger (return to step 1 of this cycle).
- If an earlier evacuation is not possible then the IC must make specific preparations to rescue occupants trapped in structurally unsuitable buildings either pre-emptively or as occupants call for help.
- Contact the Glenelg Shire MERC and MEMO at the earliest opportunity to allow for relief preparation to commence.

Due to the rapid development of flash flooding, it will often be difficult, to establish relief centres ahead of triggering the evacuation. While this is normal practice it should not be used as a reason for not adopting evacuation.

Evacuation for all flooding

Where practical, evacuation is the primary strategy for ensuring the safety of at-risk communities. The purpose of evacuation is for people to relocate temporarily from areas at risk of the consequences of flooding, to places of safety. It is essential to assess risks involved in undertaking an evacuation, as evacuation may not always be the most appropriate action. This will ensure that people are not exposed to

more hazardous environments because of their evacuation, for example, travelling through deep, fast-flowing floodwater.

Under the SEMP, Victoria Police (VicPol) has the responsibility for evacuation (Evacuation Manager) – in consultation with the control agency and other expert advice. EMV has developed a standardised procedure for evacuation under JSOP J03.12.

The IC decides whether to warn people to evacuate within a specified timeframe or whether it is necessary to advise them to evacuate immediately. The IC must make this decision having regard for the requirements of the JSOP.

Once the IC decides to recommend evacuation, VicPol's Evacuation Manager is responsible for the management of the evacuation process where possible. VICSES and other agencies will assist where practical. VICSES is responsible for the development and communication of evacuation warnings.

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

Refer to the Glenelg Shire MEMP for additional local evacuation considerations for the municipality.

Except in limited circumstances, evacuation is not compulsory in Victoria. Recent historic floods that were managed under current legislation and emergency management arrangements, demonstrated that some people will choose not to evacuate. Therefore, this plan must consider arrangements for managing these people in the event they require assistance or rescue.

Considerations include:

- Registering persons who intend not to evacuate (refer to Appendix D).
- Providing additional information that may assist them in deciding to evacuate.
- Identifying vulnerable people who may be willing to evacuate if assisted.

Flood rescue

Under the SEMP Response table 9 the control agency for rescue from land and water is VicPol, which operates the Rescue Coordination Centre. VICSES is a support agency for search and rescue on land and water evacuations and incidents involving mass casualties.

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

Victoria Police Rescue Coordination Centre should be notified of any rescues that occur.

On occasion, VicPol may opt to respond a field capability of its rescue coordination centre to a location near the emergency. It may also work with the Triple Zero Victoria to deploy its dispatch capability to the same location to enhance rescue coordination and dispatch. Details in this plan may assist VicPol and Triple Zero Victoria in undertaking this function in the field or from the primary rescue coordination centre.

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

Resource type	Unit / Location
Rescue Boat	**South West** – Balmoral, Camperdown, Dartmoor, Hamilton, Warrnambool.
Storm Trailer	**South West** – Cobden, Hamilton, Mortlake, Portland, Warrnambool (x2).
Land Based Swift Water	**South West** - Warrnambool.
Lighting Trailer	**South West** – Cobden, Hamilton, Warrnambool.

Aircraft management

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

The IC controls the conduct of Air support operations. The IC may request aircraft support through the State Air Desk located at the SCC. The Air Desk Supervisor will establish priorities.

Considerations for aircraft operations for flood events.

Resupply

Communities, neighbourhoods, or households can become isolated during floods and in some cases, storms. This can be because of road closures or damage to roads, bridges, and causeways. Under such circumstances, the need may arise to resupply isolated communities/properties with essential items.

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

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

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

Essential community infrastructure and property protection

Essential community infrastructure and property such as residences, businesses, roads and utilities may be affected in the event of a flood.

The IC will determine the priorities related the use of sandbags, which will be consistent with the strategic priorities.

The VICSES Operations Management Manual sets out the principles for sandbag use and allocation to the community. These principles do not apply to the use of sandbags by VICSES to construct and/or alter a levee. Refer to SOP036 Construction, Removal or Altering of Levee and Removal of Debris for further detail.

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

Property may be protected by:

- Sandbagging to minimise entry of water into buildings.
- Encouraging businesses and households to lift or move contents.

- Construction of temporary levees in consultation with the CMA, LGA and VicPol and within appropriate approval frameworks.

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

Contact your local VICSES representative for the most current sandbag guidelines or download it from IMT Toolbox in EMCOP-Operations.

Disruption to services

Disruption to services other than essential community infrastructure and property can occur in flood events. Refer to Appendix C for specific details of likely disruption to services and proposed arrangements to respond to service disruptions in Glenelg Shire.

Road closures

Glenelg Shire Council and DTP will carry out their formal functions when safe to do so, provide support to the incident and/or regional control centres through partial/full closure of council-managed areas to exclude the public from dangerous areas, and provide support to the incident and/or regional control centres through partial/full local road closures and determination of alternative routes.

DTP are responsible for designated main roads and highways and LGAs are responsible for the designated local and regional road network.

DTP and Glenelg Shire Council will provide community information direct to the public regarding road closures. Glenelg Shire Council will also place the relevant information of advisory signage and/or road closures in the RID system (Road Incident Data). Information will be updated on the VIC Traffic website: https://traffic.transport.vic.gov.au/.

Refer to Appendix C for specific details of potential road closures (Assets & Infrastructure table).

Dam spilling/ failure

The Department of Energy, Environment and Climate Action (DEECA) is the control agency for dam safety incidents. This includes breach, failure or potential breach/failure of a dam. However, VICSES is the control agency for any resultant flooding.

DEECA has developed Dam Safety Emergency Plans and Dam Breach Inundation Maps for municipalities where it is applicable.

Major dams with potential to cause structural and community damage within the municipality are described in Appendix A.

Wastewater related public health issues and critical sewerage assets.

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

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

The responsible agency/s for critical sewage assets in the municipality are:

- Wannon Water

It is the responsibility of the Glenelg Shire Council environmental health officer to inspect and report to the MEMO and the ICC on any water quality issues relating to flooding.

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.

Relief.

Relief is the provision of assistance to meet the essential needs of individuals, families, and communities during and in the immediate aftermath of an emergency.

As per the role statement for municipal councils within the SEMP, municipal councils are responsible for municipal level relief coordination. **Emergency Recovery Victoria (ERV)** are responsible for Relief Coordination where event becomes too large for single Council to manage.

Activation of emergency relief.

The IC is responsible for activating relief arrangements through the Municipal Emergency Response Coordinator (MERC) and Municipal Recovery Manager (MRM). The decision to recommend the opening of an emergency relief centre sits with the IC.

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

Refer to the SEMP Roles and Responsibilities - Relief for more detail of services that may be provided and the responsible coordinating agencies.

Suitable potential relief facilities identified are detailed in the Glenelg Shire MEMP and at Glenelg Shire Council website.

Animal welfare.

Matters relating to the welfare of livestock and companion animals (including feeding and rescue) are to be referred to Department of Energy, Environment and Climate Action (DEECA) - Agriculture Victoria.

Requests for emergency supply and/or delivery of fodder to stranded livestock or for livestock rescue are passed to DEECA - Agriculture Victoria.

Matters relating to the welfare of wildlife are also to be referred to DEECA who has developed the Victorian Emergency Animal Welfare Plan.

The Glenelg Shire Council and the Municipal Animal Welfare Plan outlines local arrangement for the management of animal welfare in an emergency.

After: Emergency Recovery Arrangements.

General

As per the role statement for municipal councils within the SEMP, municipal councils are responsible for coordinating local level recovery activities. They are also the lead agency to coordinate post emergency needs assessment to determine long term recovery needs (Post Emergency Needs Assessment).

Arrangements for recovery from a flood and/or storm event within the Glenelg Shire is detailed in the Glenelg Shire MEMP.

ERV are responsible for Regional Recovery Coordination if it exceeds Councils local capability or extends beyond a single Council.

Transition from response to recovery

The SEMP sets out the transition to recovery arrangements. During the response phase, the IC will ensure they develop a plan for transition from response to recovery. The IC at the municipal tier should take a lead role in facilitating transition to recovery, working with the MRM, as it marks the end of the response phase which the Controller leads and manages.

After action review – Lessons management

Lessons management is the critical process of learning from how we worked before and during an event, to improve the system for next time.

Depending on the size and scale of the flood event, VICSES will normally coordinate a debrief or after-action review of flood operations as soon as practical following an event. Under the VicPol SEMP role statement, it is the responsibility of the **Municipal Emergency Response Coordinator (MERC)** to ensure that this occurs.

When the flood is being managed as a Level 3 event, it may be that Emergency Management Victoria in consultation with VICSES assumes responsibility for debriefing.

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

Appendix A – Flood threats for Glenelg Shire.

General

Riverine flooding

Within the municipality, large severe floods generally occur because of a moist warm airflow from northern Australia bringing moderate to heavy rainfall over a period of 12 hours or more following a prolonged period of general rainfall. The period of general rainfall "wets up" the catchments and (partially) fills both the on-stream dams and the natural floodplain storage. These combine to increase the runoff generated during the subsequent period of heavy rainfall.

Large but less severe floods result from sequences of cold fronts during winter and spring that progressively wet up the catchments and fill the on-stream dams and the natural floodplain storage. Prolonged moderate to heavy rain leads to major flooding.

The Glenelg Shire has a long history of riverine flood events. Towns impacted by riverine flooding include Casterton, Portland, Heywood, and Narrawong. Flood events within the Glenelg Shire have been infrequent during the last decade. The most recent flood event was recorded in Casterton during 2016.

Estuaries

Many south west Victorian estuaries close intermittently following the formation of a sand bar at the estuary mouth. Estuaries that intermittently close typically reopen following high rainfall events when there is enough water flowing down the river to flush built-up sand from the estuary mouth.

Most estuaries in the Glenelg Hopkins CMA region are naturally intermittently closed estuaries – the exception being Fawthrop Lagoon, which is artificially kept open. The Estuary Entrance Management Support System (EEMSS) considers the social, economic, and environmental values of each estuary and the likely impact of opening and not opening at different times of the year and at different water levels.

Estuaries within the Glenelg Shire include.

- Glenelg River estuary (Nelson),
- Fawthrop Lagoon estuary (Portland),
- Surry River estuary (Narrawong),
- Fitzroy River estuary (Tyrendarra).

Estuaries that are closed during riverine flood events may increase flood levels on adjacent property.

Flash flooding and overland flows

Short Duration, high intensity rainfall (usually associated with severe weather thunderstorms) can also cause localised flooding within the municipality, along overland flow paths when the local urban drainage system surcharges. Such events, which are mainly confined to the summer months, do not generally create widespread flooding since they only last for a short time and affect limited areas. Flooding from these storms occurs with little warning and localised damage can be severe.

High intensity rainfall such as associated with thunderstorms giving average rainfall rates of more than 20mm/hour for an hour or more is likely to lead to flash flooding and / or overland flows, across the urbanised parts of the municipality.

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

Tidal flooding and storm surges.

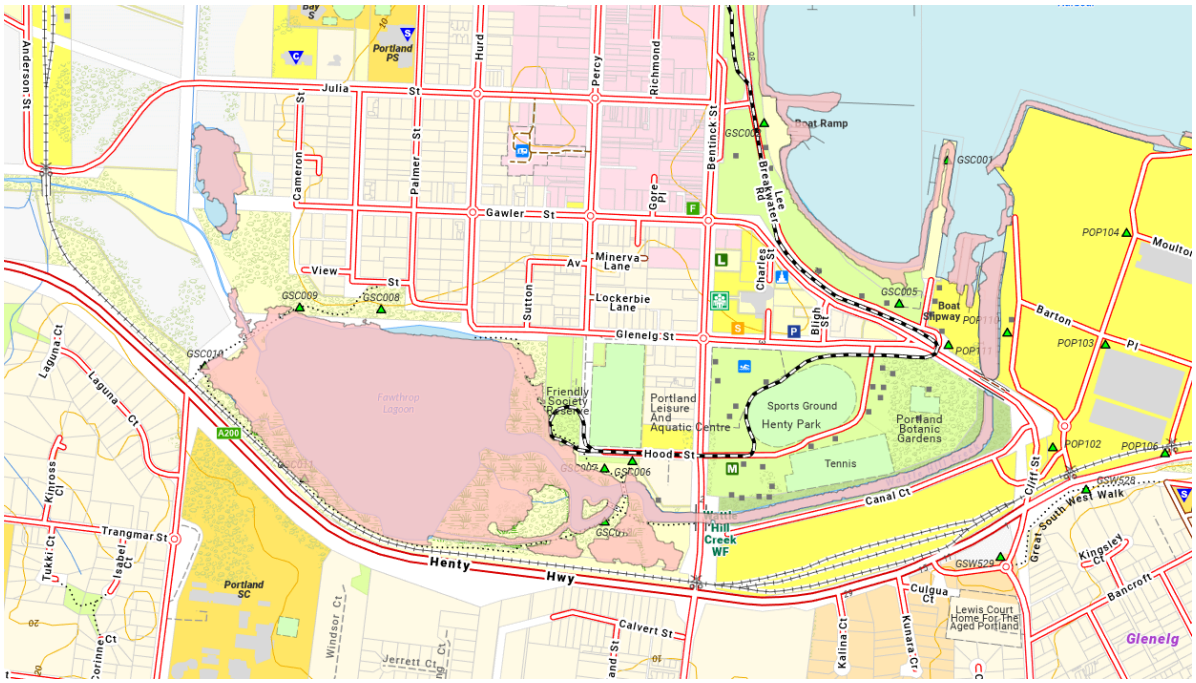
Coastal areas where storm surge flooding is known to occur includes:

- Dutton Way, north of Portland,
- Nelson,
- Bridgewater Bay Café and Surf Life Saving Club at Cape Bridgewater.

Low atmospheric depressions at sea along with strong consistent winds perpendicular to the coastline can cause flooding due to storm surge. If combined with spring tides this may result in abnormally high storm tides along the coastline. While there are limited records of historic storm surge events, a significant storm surge event occurred on the 24th of June 2014. During this event several buildings were impacted by flooding along Dutton Way, at Nelson and the Bridgewater Bay Café and Surf Life Saving Clubrooms at Cape Bridgewater.

For BOM Marine Warnings web page: http://www.bom.gov.au/marine/. Portland tidal Information can be found at Bureau of Meteorology.

Inflows from the Spring tide events fills Fawthrop Lagoon, causing nuisance flooding, refer to map below for approximate area impacted. Access to walking tracks and adjacent roads surrounding Fawthrop Lagoon may be impacted as shown in the map below of 1% AEP storm tide level.



https://www.floodzoom.vic.gov.au/FIP.Site/map

Description of major waterways and drains.

Waterway	Description
Crawford River	The Crawford River in southwest Victoria starts at an elevation of 127m and ends at an elevation of 16.1m merging with the Glenelg River. The Crawford River drops around 111m over its 75.3km length. The following creeks and rivers flow into the Crawford River: Deep Creek, Kangaroo Creek, and Portland Creek.
Fitzroy River	The Fitzroy River catchment has an area of 1,460 km2 extending 57 km north westerly from Portland Bay to a maximum elevation of 170 m AHD in the Cobbobonee State Forrest. Heywood is in the middle reaches of this river, with a total catchment area at Heywood of 234 km2. Much of the Heywood township sits adjacent to the Fitzroy River, with several stream crossings through town, including the low-level Bond St crossing, Henty Hwy bridge crossing and Railway crossing. Downstream of Heywood, the Fitzroy River meets its major tributary Darlot Creek before discharging into Portland Bay. The Fitzroy River drops around 138 m over its 58.3 km length.
Glenelg River	The Glenelg River flows through Victoria and South Australia and starts below The Chimney Pots at an elevation of 759 m and flows into the Southern Ocean. The Glenelg River flows through Rocklands Reservoir (194 m) and drops around 760 m over its 467 km length. The Glenelg River 32 creeks and rivers flow into the Glenelg River. The five longest tributaries are: Wannon River, Crawford River, Stokes River, Chetwynd River, and Pigeon Ponds Creek.
Stokes River	The following 6 creeks and rivers flow into the Stokes River (ordered by descending elevation): Buckle Creek (105 m), Humpy Creek (84 m), Bobby Creek (80 m), McKenzie Creek (73 m), Teakettle Creek (64 m) and Morgan Creek (45 m).
Surrey River	The Surrey River in southwest Victoria starts below Mount Kincaid at an elevation of 146 m and flows into the Southern Ocean. The Surrey River drops around 144 m over its 46.4 km length. The Mount Kincaid Creek flows into the Surrey River.
Wando River	The Wando River in southwest Victoria starts at an elevation of 250 m and ends at an elevation of 59.4 m flowing into the Macpherson Creek. The Wando River drops around 190 m over its 33.8 km length.

Dam spilling or failure

Flooding resulting from spilling or failure of the following dams is likely to cause significant structural and community damage.

DEECA is the control agency for dam safety incidents (such as breach, failure, or potential breach/failure of a dam). VICSES is however the control agency for any resultant flooding.

Flooding resulting from spilling or failure of the following dam is likely to cause significant structural and community damage to Harrow and Casterton.

Location	Owner	FSL. Volume	Max Operating level. Volume	Comments
Rocklands Reservoir	GWM Water	194.67 m AHD 296,000 ML	195.47m AHD 348,300 ML	See below for further details. GWM Water – Reservoir Levels Summary

AHD = Australian Height Datum (as meters above sea level)

FSL = Full supply level

ML = Megalitres (=1,000,000L)

Rocklands Reservoir

Rocklands Reservoir is the largest reservoir within Grampians Wimmera Mallee Water's (GWM Water) supply system and is located on the Glenelg River upstream of the Balmoral Township. All entitlement holders, including the environment, can be supplied with water from the reservoir.

GWM Water maintains a Dam Safety Plan. When Rocklands Storage is full there is a high risk that the storage could spill and exacerbate flood impacts downstream.

The Storage Manager for the Wimmera-Mallee system headworks has assessed the risk of spill for the system headworks, as per the methodology defined in the Storage Management Rules for the Wimmera Mallee System Headworks.

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 (for example, the first flood after a dry period will travel more slowly than the second flood in a series of floods). Therefore, recent flood history, soil moisture and forecast weather conditions all need to be considered when using the following information to direct flood response activities.

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

Typical travel times have been collated from recorded historical events and from the Glenelg Hopkins Flood Intelligence Summary.

Glenelg River @ Casterton (Flood Class Level)

Location From (gauge)	Location To (gauge)	Flood Peak Travel Time	Comments	Duration
Start of rainfall (upper catchment)	Casterton (# 238212)	24 - 36 hours	Begin to rise from normal levels	2 days
Wando Vale (Wando River)	Casterton (# 238212)	3 - 14 hours	To peak – average 8 hours	
Dergholm (Glenelg River)	Casterton (# 238212)	11 – 30 hours	To peak	

Portland (Fawthrop Lagoon, Wattle Hill & Finn Creeks) (non-Flood Class Level)

Location From (gauge)	Location To (gauge)	Flood Peak Travel Time	Comments	Duration
Start of rainfall (upper catchment)	Portland	6 - 12 hours	Begin to rise from normal levels	20 hours
Start of rainfall (upper catchment)	Portland	12 - 24 hours	To peak	

Fitzroy River @ Heywood (non-Flood Class Level)

Location From (gauge)	Location To (gauge)	Flood Peak Travel Time	Comments	Duration
Start of rainfall (upper catchment)	Heywood (# 237202)	3.5 - 6 hours	Begin to rise from normal levels	2.5 days
Start of rainfall (upper catchment)	Heywood (# 237202)	7 - 12 hours	Minor flooding	
Start of rainfall (upper catchment)	Heywood (# 237202)	10 - 18 hours	Moderate flooding	
Start of rainfall (upper catchment)	Heywood (# 237202)	12 - 20 hours	Major flooding	

Surry River @ Narrawong (non-Flood Class Level)

Location From (gauge)	Location To (gauge)	Flood Peak Travel Time	Comments	Duration
Start of rainfall (upper catchment)	Narrawong	12 - 24 hours	Begin to rise from normal levels	2.5 days
Heathmere (# 237207)	Narrawong Caravan Park	< 2 hours	To peak	

Appendix C – Flood Emergency Plans

C1 – Casterton Flood Emergency Plan

Overview of Flooding

Casterton is located on the banks of the Glenelg River and lies within the Glenelg River catchment. The Glenelg River has a catchment area of approximately 12,000 km2, with its point of discharge to Bass Strait at Nelson.

The catchment headwaters start in the Grampians which drain west towards Rockland Reservoir. From Rocklands the Glenelg River generally drains to the west until its confluence with the Chetwynd River upstream of Dergholm. The river then gradually turns to the south east and flows towards Casterton, with the Wando River contributing flows to the Glenelg River 8 km upstream of Casterton. The Wannon River contributes flows to the Glenelg River 4 km downstream of Casterton.

A summary of significant Casterton flood events.

Year	Outcome
1893/94	Highest flood recorded since the founding of the township in 1846.
1906	Significant stock losses and damage to properties in the low part of town near the Glenelg River
1946	221mm of rain fell in four days. Glenelg River rose at a rate of 30cm per hour. The Major Mitchell monument on the Sandford Road was almost covered. Six Casterton men were awarded Silver bravery medals.
1956	Evacuation of several residents.
1983	Evacuation of several residents.
1991	Major flooding and evacuation of several residents.
2010/2011	Minor flooding on the Glenelg River (bridge water level 4.8 m).
2016	Moderate flooding on the Glenelg River (bridge water level 5.8 m).

Influence of Wando River

During the September 2016 flood the initial flood peak recorded in Casterton was from inflows from the Wando River (peak height 2.4m, flow 1900 ML/day recorded at the Wando Vale gauge #238223.

Refer to the Casterton Flood Intelligence Card below for other flood events where the Wando River contributed to flooding in Casterton.

Influence of the Wannon River (downstream of Casterton)

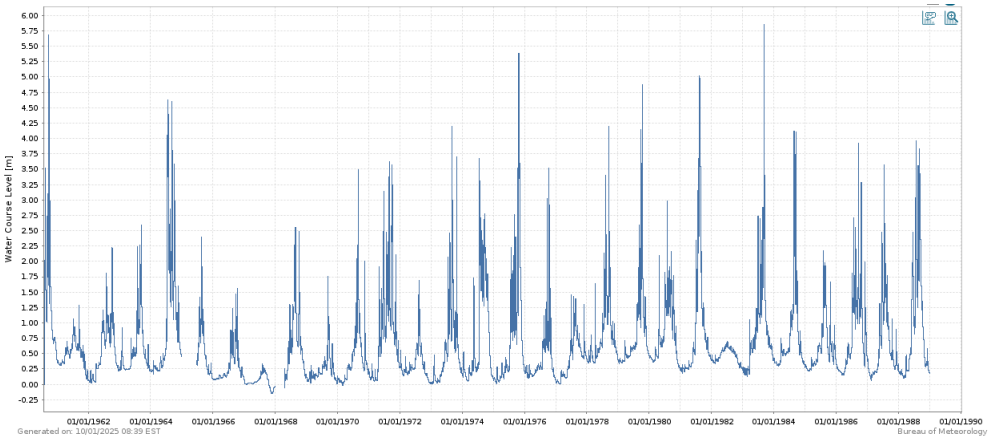
The Wannon River contributes significant inflows to the Glenelg River 4 km downstream of Casterton. The peak 1% AEP (100yr. ARI) flow for the Wannon River is 69,120 ML/d compared to the Glenelg River 35,856 ML/d. If inflows from the Wannon River enter the Glenelg River when the Glenelg River is in flood, this will reduce the discharge capacity of the Glenelg River, causing floodwater to flow back upstream of the confluence (river junction). This is described as a backwater effect. An analysis undertaken as part of the Casterton Flood Study *(BMT 2014 page 44)* showed that flows from the Wannon River does not influence flood levels at Casterton for events up to and including the 1% AEP (100yr. ARI) event (this analysis

assumed both waterways' peaks coincided – 0.0001% or 10,000yr ARI). To monitor the Wannon River flows during flood events, check Henty gauge #238228.

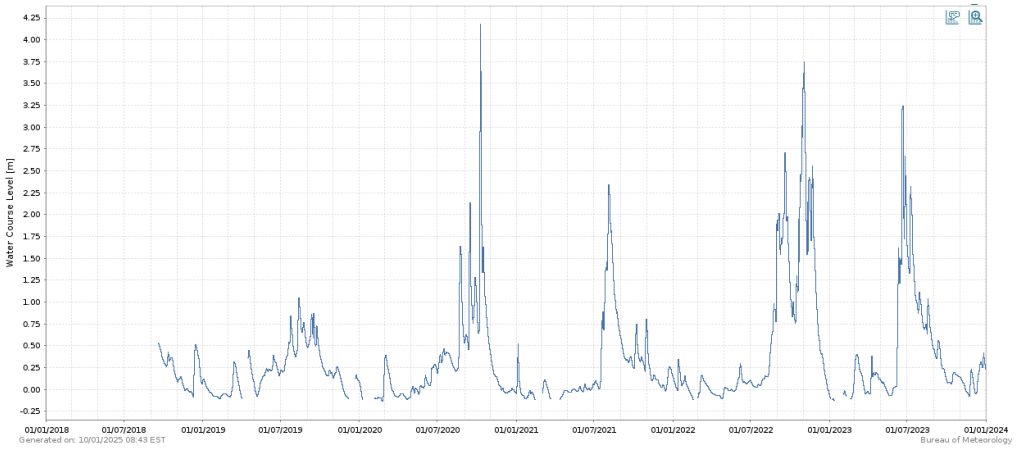
Glenelg River @ Casterton (Flood Class Level)

Location From (gauge)	Location To (gauge)	Flood Peak Travel Time	Comments	Duration
Start of rainfall (upper catchment)	Casterton (# 238212)	24 - 36 hours	Begin to rise from normal levels	2 days
Wando Vale (Wando River)	Casterton (# 238212)	3 - 14 hours	To peak – average 8 hours	
Dergholm (Glenelg River)	Casterton (# 238212)	11 – 30 hours	To peak	

Glenelg River @ Casterton 1960 - 1990



Glenelg River @ Casterton 2018 – 2024



Bureau of Meteorology – Water Data Online http://www.bom.gov.au/waterdata/

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 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 – Glenelg River, Casterton.

Property		
Properties	**166**	166 total impacted, 78 structures above floor.
Residential	40	
Commercial	22	Primarily on Henty St (Glenelg Hwy), Murray St, Tyers St, Jackson St. Glenelg Inn Pub, Albion Hotel, FoodWorks Supermarket, Post Office.
Industrial	11	Casterton Farm supplies, BP & Mobil service station
Public Land	1	Island Park includes multiple properties – Casterton Sandford Football/Netball club, Casterton swimming pool, Cricket club, Casterton bowling club, CMCA Island Caravan Park, CFA running track, Rotary Park playground & Casterton Vic Regal Band centre.
Rural	1	Alpacas – 37 Bahgallah Rd.
Community Infrastructure		
Essential Infrastructure		
Major Roads		Casterton - Naracoorte (Apsley) Road, Casterton - Penola Road, Dartmoor – Hamilton Road, Glenelg Highway
Key local roads		Addison Street, Anderson Road, Bahgallah Road, Boiling Down Rd, Casterton – Dartmoor Rd (@ Stokes Bridge), Dunan Road, Henty St, Lower Coleraine Road, McPherson Street, Murray Street, Myaring - Pieracle Road, Noss Retreat Road, Racecourse Road, Ridge Road, Sandford - Bahgallah Road, Tyers Street.
Major Rail		Nil
Sewerage Facilities	1	Wannon Water – Wastewater Sewerage Treatment (Bahgallah Rd)
Levees		Nil
Tourism / Recreation		
Sports Facilities		Island Park includes multiple properties – Casterton Sandford Football/Netball club, Casterton swimming pool, Casterton bowling club & Little Athletics club. CFA running track.
Recreation Facilities		CMCA Island Caravan Park, Rotary Park playground & Casterton Vic Regal Band centre.
Government Boundaries		

Summary of Consequences in a 1% AEP (100yr ARI) flood – Glenelg River, Casterton.

Local Gov't Areas		Glenelg Shire Council	CMA		Glenelg Hopkins CMA Southern Rural Water
Adjacent LGAs		Southern Grampians Shire, West Wimmera Shire, South Australia (to west).	CFA District		District 4 (South West Region)
SES Resp' Boundary		Dartmoor	Adjacent SES GRBs		Balmoral, Hamilton, Edenhope & SA SES

Warnings and Gauges

The Bureau of Meteorology currently provides flood forecasts for Glenelg River.

Warnings are available for flooding expected along the Glenelg River which include areas adjacent to the river in and around Casterton township. Flood class levels for the Dergholm and Casterton gauges are detailed in table below and are used in the issuing of a flood warning for Glenelg River. These and other gauge details within the Glenelg River catchment are contained within table below.

	River/creek Flood Class Level		
Gauge	**Minor**	**Moderate**	**Major**
Glenelg River @ Dergholm (# 238211)	**4.00 m**	**4.80 m**	**5.10 m**
Glenelg River @ Casterton (# 238212)	**3.80 m**	**5.20 m**	**6.00 m**

Gauges with established Flood Class Levels within the Glenelg River Catchment

At these sites within the Glenelg River catchment, the Bureau of Meteorology (the BoM) will issue flood warnings if levels reach those classified above. Warnings will be placed on the Bureau's website (bom.gov.au/vic/warnings/index.shtml?ref=hdr) and the VicEmergency website emergency.vic.gov.au.

Gauge	Station No.	Location	Stream Level & Flow Gauge	Map Reference
Glenelg River, Dergholm	238211	Dergholm – Chetwynd Bridge, east of Dergholm.	Height	Lat: -37.36 Long: 141.24
Wando River, Wando Vale	238223	Retreat Hummocks Rd, Wando Bridge.	Height	Lat: -37.49 Long: 141.42
Glenelg River, Casterton	238212	Noss Retreat Rd, at Henty St bridge, Casterton.	Height	Lat: -37.58 Long: 141.41
Wannon River, Henty	238228	Boiling Down Rd, Henty	Height	Lat: -37.64 Long: 141.51
Glenelg River, Sandford	238202	Sandford - Bahgallah Rd, Sandford	Height	Lat: -37.36 Long: 141.24
Glenelg River Dartmoor	238206	Gambier Rd, Dartmoor	Height	Lat: -37.92 Long: 141.28

Gauges within the Glenelg River catchment within Glenelg Shire.

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

Properties at Flood Risk

Properties listed in the table below are at risk from flooding along the Glenelg River. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Casterton Flood Intelligence & Warning Improvements (BMT 2014) flood intelligence 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.

Address	Building type	Floor level AHD (m)	20% AEP (m over floor)	10% AEP (m over floor)	5% AEP (m over floor)	1% AEP (m over floor)
Gauge height - m			**5.82m**	**6.14m**	**6.38m**	**6.80m**
Height - m AHD			**44.28m**	**44.59m**	**44.84m**	**45.26m**
37 BAHGALLAH ROAD	Primary production	42.92	0.06	0.61	0.79	1.10
2 MURRAY STREET	Island Park precinct	44.35		0.44	0.71	1.14
12 MURRAY STREET	Shed – industrial	44.39		0.41	0.68	1.13
8 MURRAY STREET	Jeffrey's Bros	44.39		0.41	0.68	1.12
31 MURRAY STREET	Industrial building	44.43		0.37	0.65	1.11
2 MURRAY STREET	Island Park precinct	44.48		0.35	0.61	1.05
36 MCPHERSON STREET	Old cordial factory	44.55		0.25	0.53	0.98
2 MURRAY STREET	Casterton Bowls Club	44.52		0.22	0.49	0.93
6 THE TERRACE	Industrial	43.99		0.21	0.42	0.83
126 HENTY STREET	Shed	44.61		0.19	0.47	0.92
17 MCKINLAY STREET	House	44.62		0.18	0.47	0.95
1-5 HENTY STREET	Industrial complex	44.23		0.16	0.36	0.75
14-24 CLARKE STREET	Senior citizens	44.68		0.12	0.38	0.81
14-16 MURRAY STREET	Casterton Tyrepower	44.70		0.10	0.38	0.83

10 RACECOURSE ROAD	Industrial Shed	44.36		0.02	0.18	0.64
35 MCPHERSON STREET	Vinnies	44.79		0.01	0.29	0.74
23 MCKINLAY STREET	House	44.83			0.26	0.74
2 MURRAY STREET	Memorial Swimming Pool	44.78			0.26	0.69
2 RACECOURSE ROAD	Dowfarm Machinery	44.47			0.22	0.65
17-19 HENTY STREET	Commercial / Shop	44.70			0.19	0.60
25 HENTY STREET	Shed	44.42			0.13	0.55
19 NOSS RETREAT ROAD	Unknown building	44.84			0.12	0.56
21-23 HENTY STREET	Industrial Building	44.82			0.10	0.51
34 HENTY STREET	Second-hand dealer	44.88			0.06	0.48
38 HENTY STREET	Commercial	44.90			0.05	0.48
13-15 HENTY STREET	Almar Zaadstra	44.84			0.05	0.46
24-28 HENTY STREET	Shop	44.89			0.04	0.46
38 MCPHERSON STREET	House	45.05			0.03	0.48
30-32 HENTY STREET	Shop	44.91			0.03	0.44
2-10 HENTY STREET	Glenelg Hotel	44.90			0.01	0.42
16 RACECOURSE ROAD	House	44.50				0.43
21 MCKINLAY STREET	House	45.10				0.47
5 THE TERRACE	House	44.60				0.47
53 MCPHERSON STREET	House	45.10				0.45
41 MCPHERSON STREET	Industrial building	45.09				0.44
16 ADDISON STREET	House	45.12				0.44
17 ADDISON STREET	House	45.14				0.43

6 ADDISON STREET	House	45.12				0.42
12 ADDISON STREET	House	45.14				0.41
11 HENTY STREET	Laundry	44.89				0.40
27 MCKINLAY STREET	House	45.17				0.42
15 ADDISON STREET	House	45.15				0.41
1-5 HENTY STREET	Hardware	44.89				0.39
13 ADDISON STREET	House	45.17				0.39
14 ADDISON STREET	House	45.17				0.39
2 MURRAY STREET	Island Park precinct	45.15				0.38
54 MCPHERSON STREET	House	45.17				0.38
34 MCPHERSON STREET	House	45.16				0.37
33 MCKINLAY STREET	House	45.24				0.36
2 RACECOURSE ROAD	Shed	44.76				0.34
30 MURRAY STREET	House	45.22				0.32
8 ADDISON STREET	House	45.23				0.32
46-52 HENTY STREET	FoodWorks	45.09				0.31
10 ADDISON STREET	House	45.24				0.31
15 MCKINLAY STREET	House	45.26				0.30
36 MURRAY STREET	House	45.26				0.29
2 MURRAY STREET	Island Park precinct	45.25				0.28
52 MCPHERSON STREET	House	45.26				0.28
2-10 HENTY STREET	Hotel Rooks	45.07				0.25
58 BAHGALLAH ROAD	House	43.46				0.20

3 RACECOURSE ROAD	Visitor centre	44.86				0.24
25 MCKINLAY STREET	House	45.35				0.23
7 ADDISON STREET	House	45.32				0.22
34 MURRAY STREET	House	45.33				0.22
57 MCPHERSON STREET	House	45.34				0.22
55 MCPHERSON STREET	House	45.33				0.22
31 MCKINLAY STREET	House	45.37				0.22
20 MCKINLAY STREET	House	45.36				0.20
22 ADDISON STREET	House	45.40				0.17
4 THE TERRACE	Industrial building	44.88				0.15
18 ADDISON STREET	House	45.44				0.13
17 RACECOURSE ROAD	House	44.78				0.11
42 MCPHERSON STREET	House	45.44				0.09
11 ADDISON STREET	House	45.48				0.07
20 ADDISON STREET	House	45.52				0.05
16-22 HENTY STREET	Shop	45.31				0.02
4 ADDISON STREET	House	45.52				0.02
45 MCPHERSON STREET	House	45.51				0.02

Assets, Roads & Infrastructure.

Asset Name and location	AEP %	Level (m) Casterton [# 238212]	Consequence / Impact	Mitigation/ Action
		3.80m	**Minor Flood Class Level**	
Island Park (Bowls Club, Swimming Pool, Caravan Park, Cricket ground, football/netball club)	< 20%	4.8m	Nil access/egress via M.Carmichael Dve. All parts of Island Park isolated.	Glenelg Shire activate Island Park Flood Response Guidelines where water level exceeds 4.2m. Evacuate before flood level reaches 4.8 m.
Roads within township.			Murray, Clarke & Tyers Streets - LGA Henty St (Glenelg Hwy) - DTP.	Undertake traffic management as needed. Deploy road closure signs as needed.
		5.20m	**Moderate Flood Class Level**	
Local Roads – Glenelg Shire Council.	20%	5.82m	Racecourse Road ~ 0.2m, McPherson Street ~ 0.4m, Murray Street ~ 0.5m, Bahgallah Road ~ 0.6m, Tyers Street ~ 2.1m.	Undertake traffic management as needed. Deploy road closure signs as needed.
		6.00m	**Major Flood Class Level**	
Local Roads – Glenelg Shire Council.			Casterton – Dartmoor Rd (Stokes Bridge) Dunan Road, Boiling Down Rd, Lower Coleraine Road, Ridge Road, Sandford - Bahgallah Road, Noss Retreat Road, Addison Street, Anderson Road, Myaring - Pieracle Road.	Undertake traffic management as needed. Deploy road closure signs as needed.
DTP Roads			Casterton - Naracoorte (Apsley) Road Casterton - Penola Road Dartmoor - Hamilton Road	Undertake traffic management as needed. Deploy road closure signs as needed.

DTP Roads - Glenelg Highway	10%	6.1 m	Glenelg Highway access/egress begins to be impacted by flooding (depth 0.18M).	Undertake traffic management as needed. Deploy road closure signs as needed.
Island Park Caravan Park, Casterton Bowels Club, M.Carmichaels Drive.	10%	6.1 m	Flooded above floor	Sandbag and evacuate building as needed.
Casterton Visitor Information Centre	10%	6.1m	VIC cut off > 20% and over floor at 10%.	Sandbag and evacuate building as needed.
Glenelg Shire & DTP Roads	10%	6.14m	Casterton – Naracoorte Road ~ 0.3m Racecourse Road ~ 0.7m, McPherson Street ~ 0.8m, Murray Street ~ 1m, Bahgallah Road ~ 1.1m, Tyers Street ~ 2.5m.	Undertake traffic management as needed. Deploy road closure signs as needed.
Glenelg Shire & DTP Roads	5%	6.38m	Glenelg Highway ~ 0.3m Casterton-Naracoorte Road ~ 0.6m Racecourse Road ~ 0.9m McPherson Street ~ 1m Bahgallah Road ~ 1.3m Murray Street ~ 1.3m Tyers Street ~ 2.8m	Undertake traffic management as needed. Deploy road closure signs as needed.
	5%	6.38m	Casterton - Naracoorte Road ~ 0.6m Glenelg Highway depth > 0.7m.	Undertake traffic management as needed. Deploy road closure signs as needed.
Casterton Swimming Pool (buildings), M.Carmichaels Drive.	5%	6.38m	Flooded above floor	Sandbag and evacuate building as needed.
Glenelg Inn Pub, 2 Henty Street.	5%	6.38m	Flooded above floor	Sandbag and evacuate building as needed.
FoodWorks Supermarket, 46 Henty Street.	2%	6.64m	Flooded above floor	Sandbag and evacuate building as needed.
Casterton Racecourse	2%	6.64m		

Flood intelligence card

Gauge location: Glenelg River at Casterton gauge (238212).

River height (m)	River flow Ml/d (cumecs)	% AEP	Consequence/ impact	Action may include evacuation, closure of road, sandbagging, Vic Emergency advice/warnings.
3.80m		**>20%**	**Minor Flood Class Level** (Level reached 12 times in past 50 years) (DEECA WMIS Glenelg River @ Casterton & Sandford gauges)	VICSES RDO/RAC to monitor (VicPol, CFA or DEECA may support). Casterton – Naracoorte Rd may start to be impacted north of Casterton. VICSES RDO/RAC to include advice farmers lift machinery and pumps to higher ground in **Minor Flood Warning**, Glenelg Shire advise occupiers of Casterton.
3.80m			**July 1995**	
4.20m			Glenelg River may exceed 4.2m without a prediction and may be due to inflows from the Wando River. This happened during the 2016 flood event.	Glenelg Shire activate Island Park Flood Response Guidelines where water level is predicted to or exceeds 4.2m.
4.45m			**September 1992**	
5.00m			Forecast Glenelg River >5.0m @ Casterton.	Glenelg Shire to activate Flood Response Guidelines - Island Park where prediction is > 5.00m. VICSES – establish a community sandbag location.
5.20m			**Moderate Flood Warning Level**	Floodwater starts to impact areas between the river and Racecourse Rd. Water starts to impact area near corner of Murray St and Tyers St. Access to Casterton Recreation reserve (adjoining river front) cut off.
5.82m		**20%**	**September 1978**	
5.82m	**14,169 Ml/d** (164 m^3s^{-1})	**20%**	20% AEP event results in flooding of flow lying land, in and around Casterton. Includes the area around Island Park and Murray St, the paddocks along Racecourse Rd between the Glenelg Highway and Anderson Rd, as well as the land between Bahgallah Rd and the Glenelg River.	Glenelg Shire deploy road closure signs as needed at Murray St b/w Henty St and McKinlay St, Clarke St, Spurrel Drive, Oak St, Racecourse Rd, Bahgallah Rd, Anderson Rd. 37 Bahgallah Rd flooded above floor (evac poss. via McKinlay Street).

			The low lying land between Gazzard St and Bahgallah Rd was also inundated during this event.	Early on houses along Racecourse Road and The Terrace become isolated (evac poss. via Shiels Terrace, Glenelg Highway). Best option to evacuate these buildings before access/egress is likely cut when water level exceeds 5.9m @ Casterton gauge. Glenelg Shire MEMO/MRM & VicPol MERC – consider Relief Centre is on stand-by (Casterton Town Hall Henty St).
5.84m			**October 1975**	
6.00m			**Major Flood Warning Level** Glenelg Highway access/egress will begin to be impacted by flooding. Casterton-Naracoorte Road and the Glenelg Highway/Henty Street is likely to be closed.	Consider evacuation of areas around Racecourse Rd, Murray St, McPherson St, Addison St, and Mckinlay St. Sandbag and evacuate building as needed - Vinnies flooding over floor 0.01m at 10% AEP.
6.08m			**October 1996**	
6.10m			**September 2016**	
6.14m	**19,008 Ml/d** (220 m^3s^{-1})	**10%**	Increased flood depths in all previously noted areas. In addition, the fields and paddocks to the north of Casterton experience shallow flooding. The extent of flooding in the vicinity of Island Park and Murray St increased encompassing McPherson, McKinlay and Kirby Sts. Depth also increased along Murray St. The flooding now extends to the north of Bahgallah Rd and access to the bridge along Anderson Rd is overtopped.	DTP to deploy road closure signs as needed at Casterton-Naracoorte Rd, Casterton-Dartmoor Rd and Dartmoor-Hamilton Rd.
6.19m			**August 1991**	
6.30m			**August 1983**	
6.38m	**23,933 Ml/d** (277 m^3s^{-1})	**5%**	In general, there is a relatively minor increase in flood extent due to the steep nature of the catchment.	DTP to deploy road closure signs as needed at the Glenelg Highway. The town is split into two with no access to Casterton from the east side of the Glenelg River. Sandbag and evacuate building as needed - FoodWorks Supermarket flooding over floor 0.15m at 50 year ARI.
6.45m			**March 1946**	
6.64m	**30,672 Ml/d** (355 m^3s^{-1})	**2%**	General increase in flood depths in the 2% AEP event compared with the 5% AEP event there are only small increases in flood extent, due to the steep nature of the	

			floodplain in and around Casterton. During this event access along the Glenelg Highway is cut.	
6.80m	35,856 Ml/d (415 m^3s^{-1})	**1%**	General increase in flood depths comparing the 1% AEP event to the 2% AEP event and there were only small increases in flood extent, due to the steep nature of the floodplain in and around Casterton.	VICSES IC – Community Information re flooding downstream of Casterton. Advice to SASES re potential flooding at Donovans (SA).
10.90m			**Probable Maximum Flood (PMF)**	

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 Institute of Disaster Resilience (AIDR) Handbook series on managing the Floodplain.

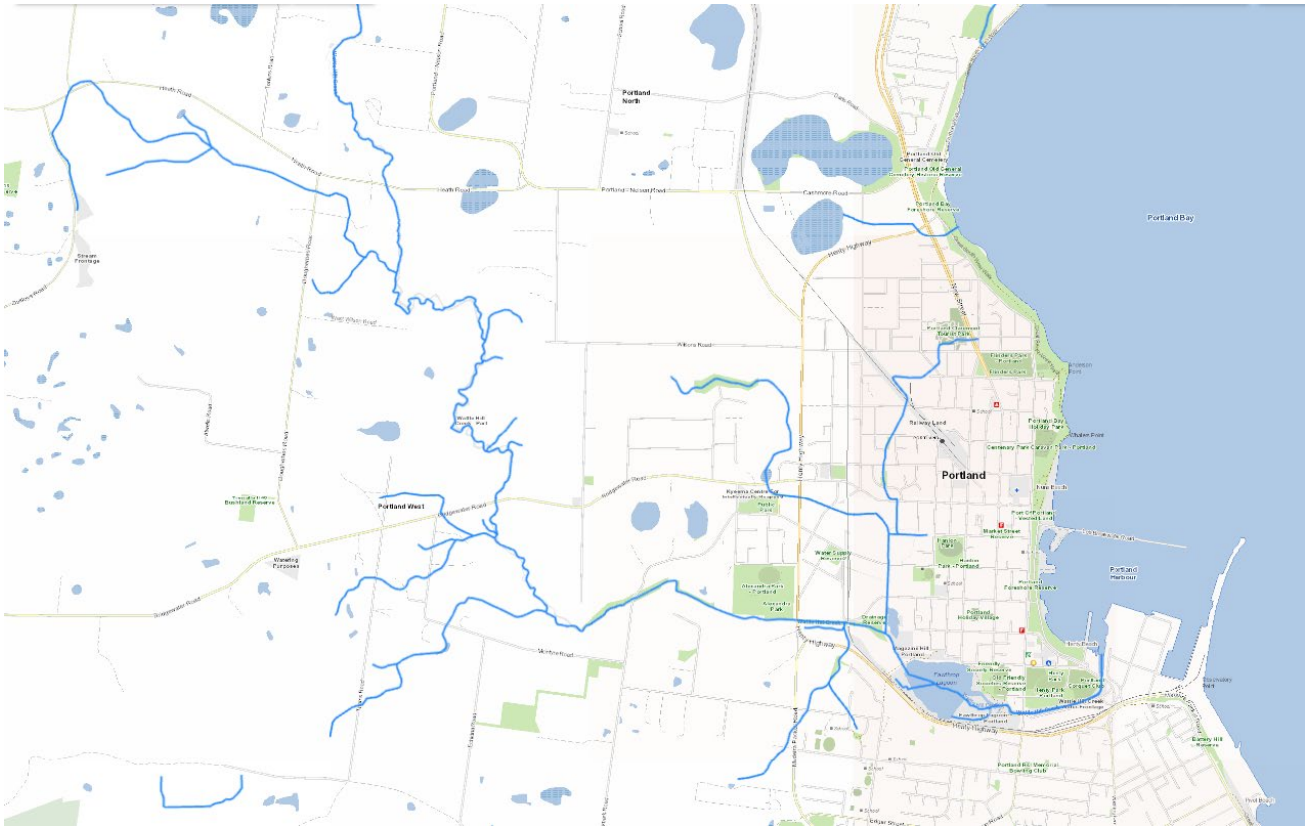
AEP – Annual Exceedance Probability
Ml/d = megalitres per day (1 Ml = 1,000,000 litres),
m^3s^{-1} = 1 cubic meter per second (cumecs). 1 Ml/d = cumecs x 86.

C2 – Portland Flood Emergency Plan

Overview of Flooding

Portland is impacted by flooding from Wattle Hill Creek and Finn Creek, refer to map below. Wattle Hill Creek rises north west of Portland at Gorae West. Finn Creek is a modified creek/drain through urbanised parts of Portland West into Fawthrop Lagoon.

There are no stream or rainfall gauges monitoring to provide flood warning for the community. Emergency management agencies rely on local flood observers to provide early warning regarding flood impacts.



https://digitaltwin.vic.gov.au/portals/44/map/?share=926b5afb-3196-46d4-9d58-cca9d83462d1

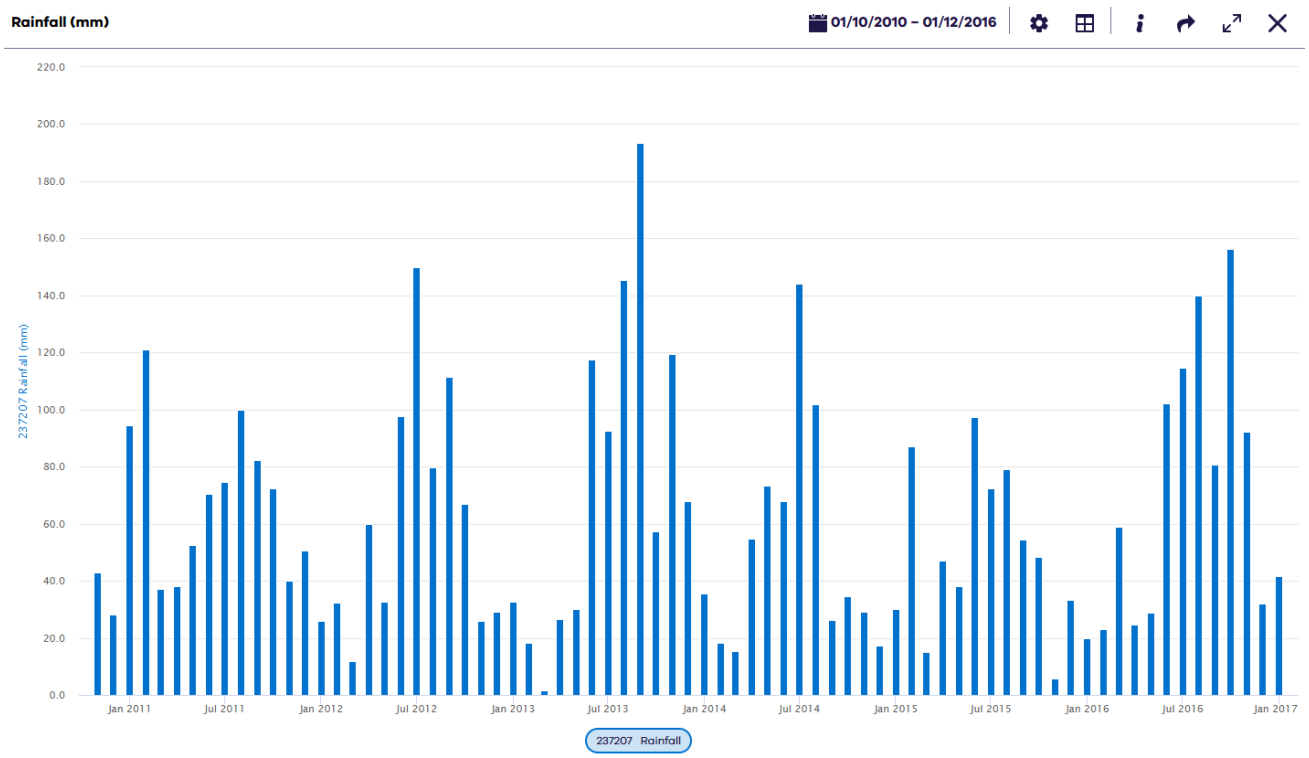
Historic Flood Events

Recent flood events occurred in Portland during 2012, 2013, 2014 and 2016.

The graph below displays a summary of these recent rainfall events (01/10/2011-01/12/2016).

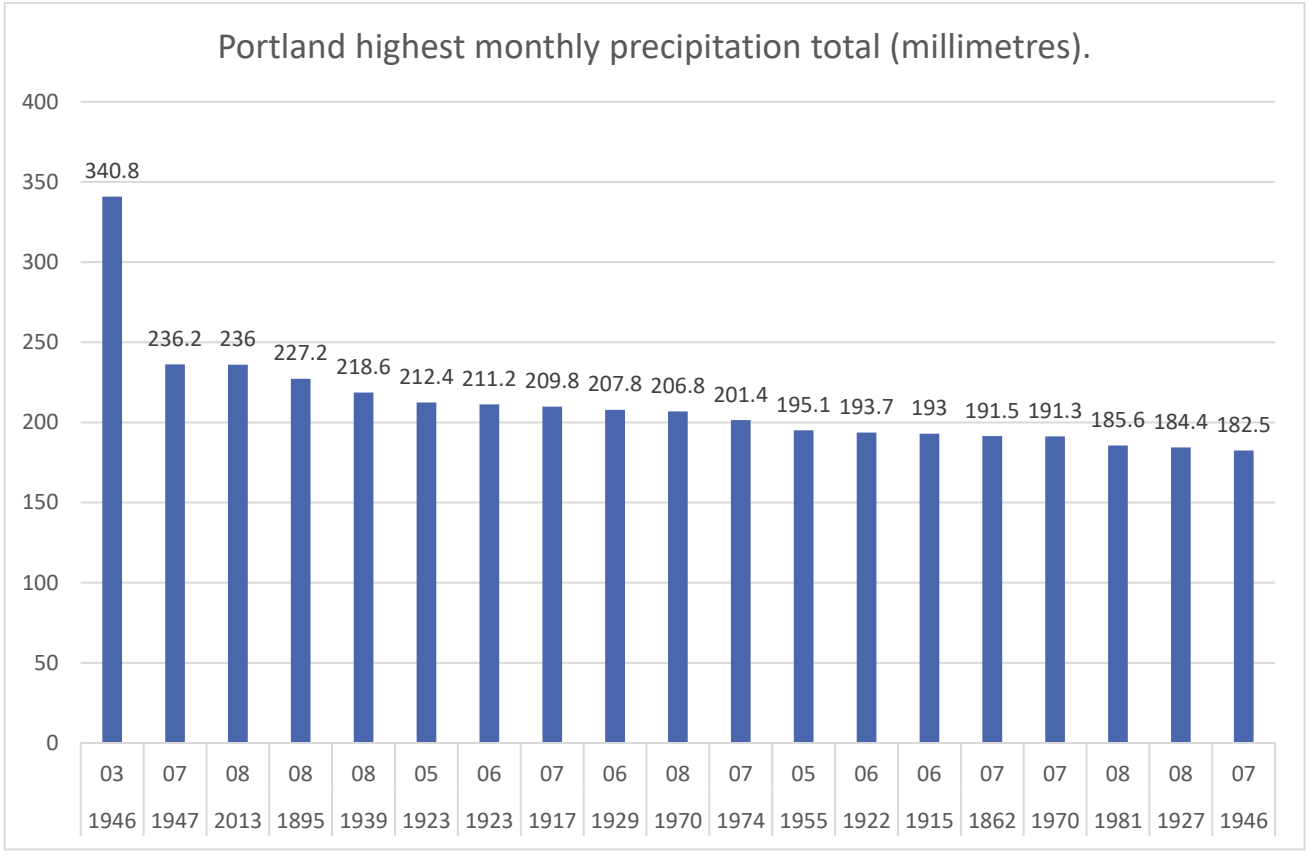
The 2013 flood event was the largest recent flood event to impact Portland. The Glenelg Hopkins CMA undertook a survey of the high water level marks for this flood event. These survey points were compared to the 10% AEP (10yr ARI) and 5% AEP (20yr ARI) flood extents. The comparison shows the Portland 2013 flood event was between a 10% AEP and 5% AEP flood event.

Although there is limited information regarding above floor damages, anecdotal information indicates that 8 houses were recorded to be at risk of above floor flooding



Surry River @ Heathmere (#237207)
Water Measurement Information System

Rainfall data was taken from the Portland weather station (# 090070)



Commenced: 1857 Latitude: 38.35° S Longitude: 141.59° E Elevation: 55 m Status: Open.

Storm surge flooding

Storm surges are powerful ocean movements caused by wind action and low pressure on the ocean's surface. A storm surge raises sea level over and above the normal (astronomical) tide levels. The above normal water levels resulting from the combination of astronomical tides, storm surge and waves are called storm tides.

Portland has been impacted by storm tide events. Inflows from the spring tide events also fill Fawthrop Lagoon, causing nuisance flooding, impacting access to walking tracks and adjacent roads surrounding Fawthrop Lagoon.

An assessment of the Portland tidal data and streamflow from Surry and Merri Rivers indicated that there is no discernible correlation between riverine flood events and extreme tidal levels. It was concluded that these two variables are independent of each other.

The probability of a 1% AEP flood event occurring in conjunction to a 1% AEP tidal event would be approximately 0.01% or 10,000 year ARI event, too conservative to use for flood planning and mitigation.

Portland (Fawthrop Lagoon, Wattle Hill & Finn Creeks) (non-Flood Class Level)

Location From (gauge)	Location To (gauge)	Flood Peak Travel Time	Comments	Duration
Start of rainfall (upper catchment)	Portland	6 - 12 hours	Begin to rise from normal levels	20 hours
Start of rainfall (upper catchment)	Portland	12 - 24 hours	To peak	

Typical travel times have been collated from recorded historical events. There is steep rise in flood levels 6 to 12 hours from rainfall, peak river flows occur within 12 to 24 hours from rainfall. Given there is no stream monitoring data available, there is uncertainty in these estimates, they should be used only as a guide.

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 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 – Portland.

Property					
Properties					
Residential	86	***Floor level studies not completed for Portland. Potential to flood above floor based on local non verified information.***			
Commercial	5	Powerhouse Motor Car Museum Special Development School Portland children's and family complex.			
Industrial	1	ARTC Operations Centre (13/15 Henty Ct)			
Public Land	4	Alexander Park Friendly Society Reserve Graham Husson Fauna Park Fawthrop Lagoon (and associated infrastructure)			
Rural	Nil				
Community Infrastructure					
		Friendly Society Reserve Husson Fauna Park Fawthrop Lagoon (and associated infrastructure)			
Essential Infrastructure					
Major Roads	1	Henty Hwy (multiple locations b/w Madeira Packet Rd & Bridgewater Rd)			
Key local roads	6	Kerrs Rd, Bridgewater Rd (b/w Henty Hwy and Lalor St) Henty St & Henty Ct (west of Blair st) Blair St (@ Tyers St) Anderson & Julia Sts.			
Major Rail	2	Portland Railway Line & Portland Railway Operations Centre (Henty Ct)			
Sewerage Facilities	1	Wannon Water Pump Station (Hood St - Fawthrop Lagoon)			
Levees	Nil				
Tourism / Recreation					
Sports Facilities		Alexander Park, Friendly Society Reserve			
Recreation Facilities		Fawthrop Lagoon, Friendly Society Reserve, Graham Husson Fauna Park			
Government Boundaries					
Local Gov't Areas		Glenelg Shire Council	CMA		Glenelg Hopkins CMA
Adjacent LGAs		Moyne Shire, Southern Grampians & South Australia	CFA (FRV) District		District 4 – South West (North & West Regional)
SES Resp' Boundary		Portland	Adjacent SES GRBs		Dartmoor, Heywood & Port Fairy

Warnings and Gauges

The Bureau of Meteorology currently provides flood warnings and advice for Portland Coast catchment.

Locations without a Total Flood Warnings System (unmonitored locations) the authoriser must ensure that the risk to life or property is significant enough to warrant issuing a community notification, and that the risk has been verified from a flood analyst or Catchment Management Authority (CMA). Only the dedicated 'unmonitored warning templates' should be used (available in EM-COP Public Publishing). Warnings will be placed on the BoM website and the VicEmergency website emergency.vic.gov.au.

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 flood or severe weather warnings present for their area.

Note: If impacts are expected less than 6 hours, follow EM-COP Flash Flood Business Rules

	River/creek Flood Class Level		
Gauge	**Minor**	**Moderate**	**Major**
N/A	**N/A**	**N/A**	**N/A**

Gauges with established Flood Class Levels within the Portland Coast Catchment.

Gauge	Station No.	Location	Rain Gauge	Map Reference
Surry River @ Heathmere	237207	Wades Rd, Heathmere. 3305	Yes	Lat: -38.243 Long: 141.663
Fitzroy River @ Heywood	237202	Gorrie St Heywood. 3304	Yes	Lat: -38.126 Long: 141.620
Portland Airport	090171	Portland Airport AWS	Yes	Lat: -38.3148 (38°18'53"S) Long: 141.4705 (141°28'14"E)
Portland	090070	Portland	Yes	Lat: -38.3148 (38°18'53"S) Long: 141.4705 (141°28'14"E)
Cape Nelson Lighthouse	090184	1138 – 1144 Cape Nelson Rd, Portland West	Yes	Lat: -38.4306 (38°25'50"S) Long: 141.5437 (141°32'37"E)
Dartmoor	090194	McIntyre Antenna and Spotter Towers, 6155 Princes Hwy, Dartmoor VIC 3304	Yes	Lat: -37.9222 (37°55'20"S) Long: 141.2614 (141°15'41"E)
Drik Drik	090036	LIddles Lane, Winnap. 3304	Yes	Lat: -37.9695 (37°58'10"S) Long: 141.3077 (141°18'28"E)

Rainfall Gauges near Portland.

Properties at Flood Risk

Properties listed in the table below are at risk from flooding within Portland. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Portland Flood Study – Implementation Works (Cardno 2011).

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.

Floor level studies not completed for Portland. Potential to flood above floor based on local non verified information.

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.

Address	Building type	10% AEP	5% AEP	1% AEP
Gauge height - m		N/A	N/A	N/A
Height - m AHD		N/A	N/A	N/A
72 DALWOOD LANE PORTLAND WEST	House – nil structure rear of property only	1.56	1.71	1.88
75-77 HENTY STREET PORTLAND	Portland Bay School (Special) – may impact access.	0.00	0.00	<0.30
81 HENTY STREET PORTLAND	Portland's Community Garden	<0.80	<1.2	>1.2
1 WILLIAM STREET PORTLAND	House	1.43	1.67	1.86
31 GLENELG STREET PORTLAND	Fawthrop Lagoon - Some infrastructure	1.31	1.58	1.94
63 KERRS ROAD PORTLAND	House – nil structure rear of property only	1.29	1.42	1.59
23 GLENELG STREET PORTLAND	Powerhouse Motor Car Museum	1.20	1.48	1.84
69 TYERS STREET PORTLAND	Rural infrastructure possibly affected	1.12	1.39	2.03
75 WATTLE HILL ROAD PORTLAND	House – nil structure, riverside property only	1.03	1.20	1.41
1B LALOR STREET PORTLAND	House – nil structure rear of property only	1.01	1.17	1.34
9 OAKPARK ROAD PORTLAND WEST	House – nil structure, property only	1.00	1.11	1.23
89 OTWAY STREET PORTLAND	House. Rear Shed impacted	1.00	1.28	1.91

87 OTWAY STREET PORTLAND	House. Rear of property	0.98	1.26	1.89
188B-190 WYATT STREET PORTLAND	House - Rear of property	0.93	1.15	2.08
97 OTWAY STREET PORTLAND	House. Rear of property	0.93	1.20	1.84
85 OTWAY STREET PORTLAND	House. Rear of property	0.90	1.18	1.81
15 HAYNES LANE PORTLAND WEST	House – nil structure– driveway isolated @ >10%	0.90	1.20	1.56
95 OTWAY STREET PORTLAND	House. Rear of property	0.89	1.17	1.81
13 PARK STREET PORTLAND	Alexander Park – nil structures assets	0.87	0.97	1.16
7 CLARKE STREET PORTLAND	House.	0.87	1.14	1.78
41 KERRS ROAD PORTLAND	House. Unknown structure impacted	0.87	0.99	1.12
15 BRIDGEWATER ROAD PORTLAND	Graham Husson Fauna Park	0.84	0.86	0.96
66 DALWOOD LANE PORTLAND WEST	House – nil structure rear of property only	0.82	0.95	1.09
50 WATTLE HILL RD PORTLAND WEST	House – nil structure rear of property only	0.82	1.02	1.25
69 OTWAY STREET PORTLAND	House. Rear of property	0.81	1.08	1.72
28 MCINTYRE ROAD PORTLAND WEST	House – nil structure rear of property only	0.81	0.97	1.17
76-78 HENTY STREET PORTLAND	House	0.77	1.05	1.69
56 DALWOOD LANE PORTLAND WEST	House – nil structure rear of property only	0.76	0.89	1.04
38 DALWOOD LANE PORTLAND WEST	House – nil structure rear of property only	0.74	0.85	0.99
73 KERRS ROAD PORTLAND	House – nil structure rear of property only	0.71	0.81	0.94
40 MCINTYRE ROAD PORTLAND WEST	House – nil structure rear of property only	0.65	0.82	1.02
184 WYATT STREET PORTLAND	House. Outbuildings affected	0.58	0.69	1.29
81 OTWAY STREET PORTLAND	House. Rear of property	0.55	0.82	1.46
79 OTWAY STREET PORTLAND	House. Rear of property	0.51	0.78	1.42
31 KERRS ROAD PORTLAND	House – nil structure rear of property only	0.49	0.60	0.75

145 OTWAY STREET PORTLAND	Rural Shed Rear of property	0.47	0.56	1.15
15 HENTY COURT PORTLAND	Industrial area	0.45	0.73	1.37
401 HENTY HIGHWAY PORTLAND	Rural Shedding possible house	0.43	0.54	1.14
30 DALWOOD LANE PORTLAND WEST	Rural Shed – nil structure rear of property only.	0.39	0.50	0.63
83 OTWAY STREET PORTLAND	House. Rear of property	0.39	0.67	1.30
25 GLENELG STREET PORTLAND	Industrial Site.	0.39	0.66	1.02
5 PORTLAND COURT PORTLAND	House & shedding	0.37	0.64	1.28
67 KERRS ROAD PORTLAND	House – nil structure rear of property only.	0.36	0.47	0.59
70 MCINTYRE ROAD PORTLAND WEST	House – nil structure rear of property only.	0.29	0.46	0.67
10 OAKPARK ROAD PORTLAND WEST	House – nil structure rear of property only.	0.27	0.41	0.59
10 MADEIRA PACKET ROAD PORTLAND WEST	House – nil structure front of property only.	0.22	0.51	0.87
166 WYATT STREET PORTLAND	House.		0.62	1.59
170 WYATT STREET PORTLAND	House. Shedding impacted		0.56	1.52
18 BRIDGEWATER ROAD PORTLAND	House		0.33	0.98
50 FINN STREET PORTLAND	House. Sheds Impacted		0.21	0.84
74 HENTY STREET PORTLAND	House		0.21	0.84
2-4 CLARKE STREET PORTLAND	House		0.19	0.91
71 BLAIR STREET PORTLAND	House		0.18	0.82
94 JULIA STREET PORTLAND	Portland children’s and family complex		0.18	0.81
67 OTWAY STREET PORTLAND	House. Outbuildings affected		0.16	0.80
73 BLAIR STREET PORTLAND	House		0.14	0.78
13 GLENELG STREET PORTLAND	Friendlies Reserve Buildings impacted		0.12	0.63
6 CLARKE STREET PORTLAND	House		0.02	0.89

79 BLAIR STREET PORTLAND	House			0.85
75 BLAIR STREET PORTLAND	House			0.82
46 DALWOOD LANE PORTLAND WEST	House – nil structure rear of property only			<0.8
8 CLARKE STREET PORTLAND	House			0.67
1/81 BLAIR STREET PORTLAND	Unit			0.67
153 OTWAY STREET PORTLAND	House			0.47
4/81 BLAIR STREET PORTLAND	Unit			0.58
72 HENTY STREET PORTLAND	House			0.57
186 WYATT STREET PORTLAND	House			0.44
4 PORTLAND COURT PORTLAND	House			0.56
188 WYATT STREET PORTLAND	House			0.38
69 BLAIR STREET PORTLAND	House. Rear Shed impacted			0.53
3/81 BLAIR STREET PORTLAND	Unit			0.50
13 CLARKE STREET PORTLAND	House			0.42
12/1 HOOD STREET PORTLAND	Units			0.38
70 HENTY STREET PORTLAND	House			0.39
5/81 BLAIR STREET PORTLAND	Unit			0.61
1/81 BLAIR STREET PORTLAND	Unit			0.38
7 BENTINCK STREET PORTLAND	House			0.52
11 CLARKE STREET PORTLAND	House			0.34
67 BLAIR STREET PORTLAND	House. Possibly 2 properties Rear buildings impacted			0.33
11 BENTINCK STREET PORTLAND	House			0.46
10 CLARKE STREET PORTLAND	House.			0.29

3/9 BENTINCK STREET PORTLAND	House. Possibly 3 houses on site			0.46
9 CLARKE STREET PORTLAND	House			0.27
431 HENTY HIGHWAY PORTLAND	Warehouse			0.43
23-25 CAMERON STREET PORTLAND	House			0.19
19 BENTINCK STREET PORTLAND	House			0.82
6 PORTLAND COURT PORTLAND	House			0.25
61 OTWAY STREET PORTLAND	House			0.25
15 BENTINCK STREET PORTLAND	House			0.63
2/81 BLAIR STREET PORTLAND	Unit			0.23
13 BENTINCK STREET PORTLAND	House			0.53
3/17 BENTINCK STREET PORTLAND	Unit			0.68
4/17 BENTINCK STREET PORTLAND	Unit			0.66
5 GLENELG STREET PORTLAND	House			0.44
3 GLENELG STREET PORTLAND	House			0.43
21 BENTINCK STREET PORTLAND	House. Garage affected.			0.22
15 CLARKE STREET PORTLAND	House			0.18
7 PORTLAND COURT PORTLAND	House. Rear shedding impacted			0.16
17 CLARKE STREET PORTLAND	House			0.08
65 OTWAY STREET PORTLAND	House. Garage impacted			0.08
83 BLAIR STREET PORTLAND	Unit impacted. 2/83 and 1/83 close to being impacted			0.07

Assets, Roads & Infrastructure.

Asset Name and location	AEP %	Consequence / Impact	Mitigation/ Action
Fawthrop Lagoon Reserve	<20%	Access/egress may be cut to walking & riding paths.	Deploy road closure signs as needed.
Kerrs & Oakpark Roads	20%	Access/egress may be impacted by flooding	Undertake traffic management as needed. Deploy road closure signs as needed.
Henty Street (Court)	10%	Begins to be impacted by flooding.	Undertake traffic management as needed. Deploy road closure signs as needed.
Friendly Society Reserve	10%	Inundation begins impacting reserve.	Deploy road closure signs as needed.
Kerrs & Oakpark Roads	10%	Access/egress is likely to be cut.	Undertake traffic management as needed. Deploy road closure signs as needed.
Portland Railway Operations Centre (13 Henty Court)	10%	Access/egress is likely to be cut, and buildings may start to be impacted by flooding	Australian Rail Track Corporation (ARTC)
Portland Railway line (V05 - Maroona to Portland), between Otway Street & Henty Highway	10%	Railway begins to be impacted by flooding.	Australian Rail Track Corporation (ARTC)
Graham Husson Fauna Park (Bridgewater Road)	10%	Site begins to be impacted by flooding.	GSC to notify landholder to relocate animals at Graham Husson Fauna Park as needed.
Anderson & Julia St	10%	May be impacted during 10% flood, Mt Richmond-Portland bus route	
Anderson & Julia St	5%	Anderson St likely impacted during 5% flood, Mt Richmond-Portland bus route.	
Hood St	5%	Begins to be impacted by flooding. May impact access/egress to Fawthrop Community Centre.	Undertake traffic management as needed. Deploy road closure signs as needed.
Clarke Street	5%	End of street impacted. Properties at # 7, 6 & 2-4 may be isolated.	
Henty Street (@ Henty Court)	5%	Access/egress is likely to be cut. Impact to local public transport bus lines.	Undertake traffic management as needed. Deploy road closure signs as needed.
Portland Railway Operations Centre (13 Henty Court)	5%	Site impacted by flooding. Nil access/egress.	Evacuate the buildings and car park before access is cut. Australian Rail Track Corporation (ARTC)
Portland Railway (V05 - Maroona to Portland) line, between Otway Street & Henty Highway	5%	Railway impacted by flooding.	Australian Rail Track Corporation (ARTC)

Council Toilet blocks in Hood Street	5%	Site begins to me impacted by flooding.	Deploy signs as needed.
Wannon Water Pump Station (Percy Street)	5%	Begins to be impacted by flooding.	Sandbag as needed.
Portland Powerhouse Motor and Car Museum (Glenelg Street)	5%	Begins to be impacted by flooding.	Sandbag and evacuate building as needed.
Portland Special Development School 75 – 77 Henty Street	2%	The school grounds of the Portland Special Development School are impacted by flooding, access/egress is cut to the west.	Evacuate the buildings of the school before access is cut. Floodwater is a hazard to students attending the school.
Fawthrop Community Centre (Hood Street)	2%	Building isolated, access/egress is cut. (building could be impacted above floor in a 100 year flood)	Evacuate the building before access is cut.
Henty Highway at two Wattle Hill Creek (adjacent to Alexandra Park)	2%	Access/egress is cut to the Henty Highway. Impact to local public transport bus lines.	Undertake traffic management as needed. Deploy road closure signs as needed.
Henty Highway – between Bridgewater Rd & Wyatt Street	2%	Access/egress is cut to the Henty Highway. Impact to local public transport bus lines.	Undertake traffic management as needed. Deploy road closure signs as needed.
Blair Street William, Julia & Anderson Streets	2%	Inundation begins impacting roads. May not be accessible.	Undertake traffic management as needed. Deploy road closure signs as needed.
Henty Highway between Madeira Packet Rd & Bentinck St / Cape Nelson Rd bridge.	1%	Henty Highway access/egress may be impacted by flooding at several locations.	Undertake traffic management as needed. Deploy road closure signs as needed.
Fawthrop Community Centre (Hood Street)	1%	Building isolated, could be impacted above floor. Access/egress is cut.	Sandbag and evacuate building as needed.
Portland Railway (V05 - Maroona to Portland) line, between Otway Street & Henty Highway	1%	Railway line inundated from Otway Street to Bentinck St / Cape Nelson Rd bridge & junction yards	

Flood intelligence card

Due to the lack of recorded stream and rainfall data for Portland there is considerable uncertainty with the design flood extent mapping and above floor building damage estimates (defined using anecdotal information).
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 Institute of Disaster Resilience (AIDR) Handbook series on managing the Floodplain.

**** Floor level studies not completed for Portland. Potential to flood above floor based on local non verified information.***

AEP – Annual Exceedance Probability
Ml/d = megalitres per day (1 Ml = 1,000,000 litres),
m^3s^{-1} = 1 cubic meter per second (cumecs). 1 Ml/d = cumecs x 86

Forecast or recorded rainfall triggers (BoM)	River flow Wattle Hill Creek (Ml/d)	% AEP (ARI)	Consequence / Impact	Roads impacted	Actions
		<20% (<5 yr)	Fawthrop Lagoon Reserve & Friendly Society Reserve - Access may be cut to walking & riding paths.		Glenelg Shire Council (GSC) deploy reserve/facility closure signs as needed.
~54 mm in 24 hrs to ~77 mm in 72 hrs	1,708	20% (5 yr)	Flooding generally within Wattle Hill Creek. Finn Creek minor flooding along Smith Street. Minor overtopping reducing access/egress Fawthrop Lagoon Reserve & Friendly Society Reserve	Spinks Rd (GSC)	VICSES RDO/RAC to activate Field Observers to take photos (SSS) and record flood levels for Flood Intelligence. Situation reports to RDO or IC. GSC deploy water over road and/or road closure signs as needed. Undertake traffic management as needed.
~61 mm in 24 hrs to ~84.4 mm in 72 hrs.			August 2013 flooding.	Clarke St (GSC)	
~68 mm in 24 hrs to ~97 mm in 72 hrs	3,170	10% (10 yr)	Flooding of Wattle Hill Creek beginning to impact rural and semi-rural properties upstream of Henty Hwy – i.e. Kerrs & Oakpark Rds. and Dalwood Lane. Levee upstream of Fawthrop Lagoon overtopped – Access/egress cut to some walking & riding paths. Graham Husson Fauna Park (Bridgewater Rd) starts to be impacted by flooding. Portland Community Garden & Friendly Society Reserve	**As above plus:** Kerrs Rd (GSC) Oakpark Rd (GSC) Henty St (GSC) Henty Ct (GSC) Smith St (GSC) Anderson St (GSC) Julia St (GSC)	VICSES RDO/RAC to activate Field Observers to take photos (SSS) and record flood levels for Flood Intelligence. Situation reports to RDO or IC. GSC deploy water over road and/or road closure signs as needed. Undertake traffic management as needed. GSC to notify landholder to relocate animals at Graham Husson Fauna Park as needed.

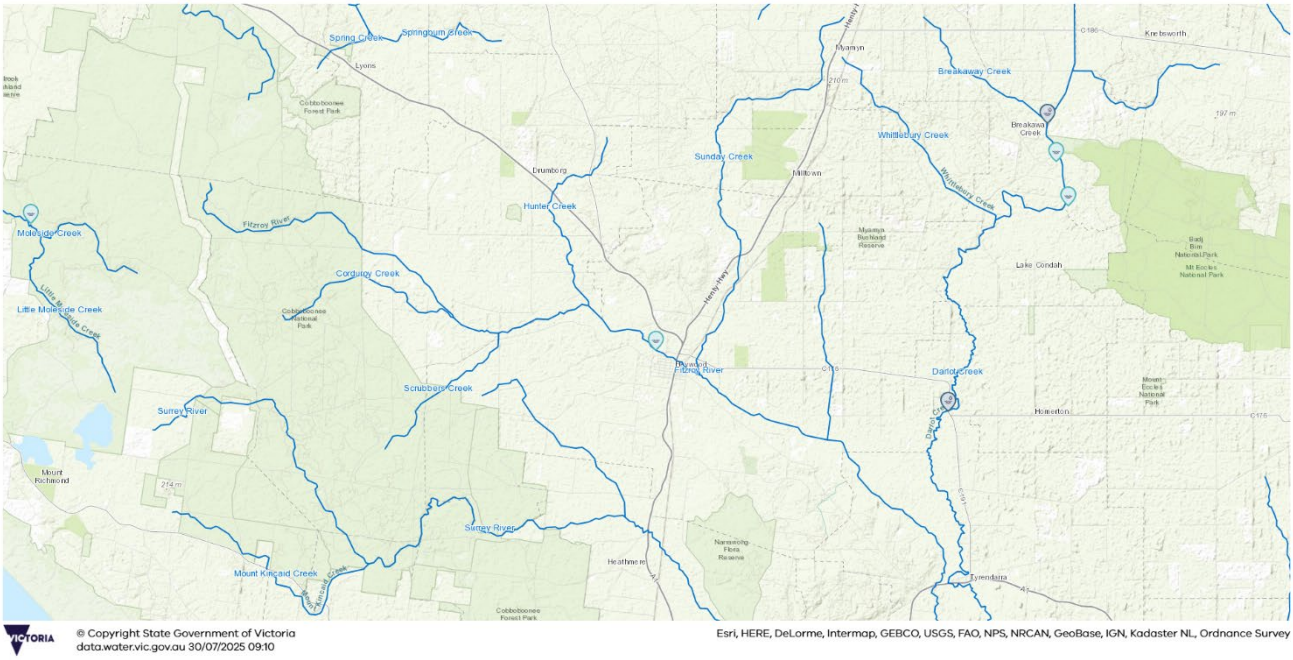
			Portland Railway Operations Centre (Henty Court) and Portland Railway (V05 - Maroona to Portland) line, between Otway Street & Henty Hwy. Mt Richmond-Portland bus route impacted (Anderson & Julia Streets)		Victoria Police consider evacuation (if required) of: • Portland Railway Operations Centre (Henty Ct), & • Units @ 10 Smith St. Notification to Australian Rail Track Corporation (ARTC). Sandbag building as needed and appropriate.
~84 mm in 24 hrs to ~120 mm in 72 hrs	4,847	5% (20 yr)	*Residential dwelling with potential to flood above floor and/or become isolated: • 76-78 Henty St • 2-4 Clarke St • 5 Portland Ct • 73 Blair St • 10 Smith St (Units may become isolated) *Industrial/commercial flooded above floor – • Powerhouse Museum (23 Glenelg Street) • Industrial land (25 Glenelg St) Wannon Water Pump Station (Percy Street) may be impacted by flooding. Fawthrop Community Centre and facilities (Hood St) may be impacted or isolated. Portland Railway (V05 - Maroona to Portland) line, Port side of Wattle Hill Creek bridge, parallel to Henty Hwy.	**As above plus:** Hood St (GSC) William St (GSC) Percy St (GSC)	VICSES RDO/RAC to activate Field Observers to take photos (SSS) and record flood levels for Flood Intelligence. Situation reports to RDO or IC. Glenelg Shire Council (GSC) deploy water over road and/or road closure signs as needed. Undertake traffic management as needed. VICSES sandbag the Wannon Water Pump Station (Percy Street) as needed.
~108 mm in 24 hrs to ~153 mm in 72 hrs	6,972	2% (50 yr)	*Residential dwelling with potential to flood above floor and/or become isolated (as above +): • 10 Smith St (all 10 units). • 6 Smith St. • Bentinck St - #s 7, 9, 11, 13, 15, 17. • 166 Wyatt St. • Henty St - #s 74, 72 & 70. • Portland Ct - #s 4, 5, 6. • Clarke St - #s 6, 7, 8, 9, 10, 11, 13. • Blair St - #s 67, 1/67, 69, 71, 73, 75, 79, 81 (x2), 83 (x3). • 71a Otway St. • Cameron St - 23-25.	**As above plus:** Finn St, Henty Highway at: Wattle Hill Creek (adjacent to Alexandra Park), & between Bridgewater Rd & Wyatt Street.	VICSES RDO/RAC to activate Field Observers to take photos (SSS) and record flood levels for Flood Intelligence. Situation reports to RDO or IC. Department of Transport (DTP) & Glenelg Shire Council (GSC) deploy water over road and/or road closure signs as needed. Undertake traffic management as needed.

			Flooding impacts the school grounds of the Portland Special Development School, 75 Henty Street. Access/egress is cut to the Fawthrop Community Centre (Hood Street) Large area of flooding north of Fawthrop Lagoon with properties along Glenelg Street now affected.		
~128 mm in 24 hrs to ~183 mm in 72 hrs	8,933	1% (100 yr)	*Residential dwelling with potential to flood above floor and/or become isolated (as above +): • 1 Hood St • Otway St - #s 87, 85, 67, 65, 61. • Clarke St - #s 15, 17. • 7 Portland Ct. • 68 Henty St. • Glenelg St - #s 40, 38, 36, 34. Commercial/industrial/community: • Fawthrop Community Centre (Hood Street) • Portland Bay School Properties along Clarke Street, Otway Street and Glenelg Street are impacted above floor.		VICSES RDO/RAC to activate Field Observers to take photos (SSS) and record flood levels for Flood Intelligence. Situation reports to RDO or IC. Glenelg Shire Council (GSC) deploy water over road and/or road closure signs as needed. Undertake traffic management as needed.
~152 mm in 24 hrs to ~219 mm in 72 hrs	11,206	0.5% (200 yr)			
~104 mm in 24 hrs to ~191 mm in 72 hrs	14,575	16-18th March 1946 ~ 0.2% (500 yr)			

C3 – Heywood Flood Emergency Plan

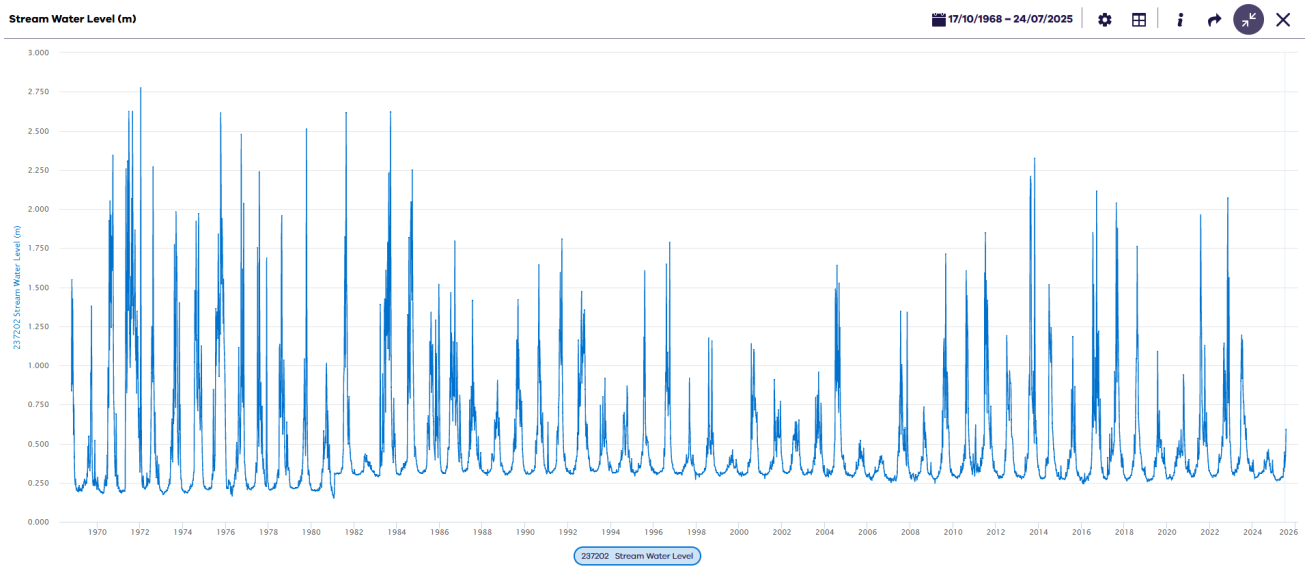
Overview of Flooding

Heywood is impacted by flooding from the Fitzroy River. The Fitzroy River rises in the Cobboboonee National Park before flowing through Heywood, with tributaries Corduroy, Scrubbers & Hunter Creeks upstream of Heywood. Sunday and Darlot Creeks are significant tributaries downstream from Heywood. Refer to the map below for the location of the Heywood stream gauge on the Fitzroy River.



Fitzroy River including Stream flow and level gauge (#237202)

The Fitzroy River stream records shows that Heywood has experienced frequent flood events since the early 1970's.



Fitzroy River stream level – 1968 to current (gauge # 237202).

Fitzroy River Flood Behaviour

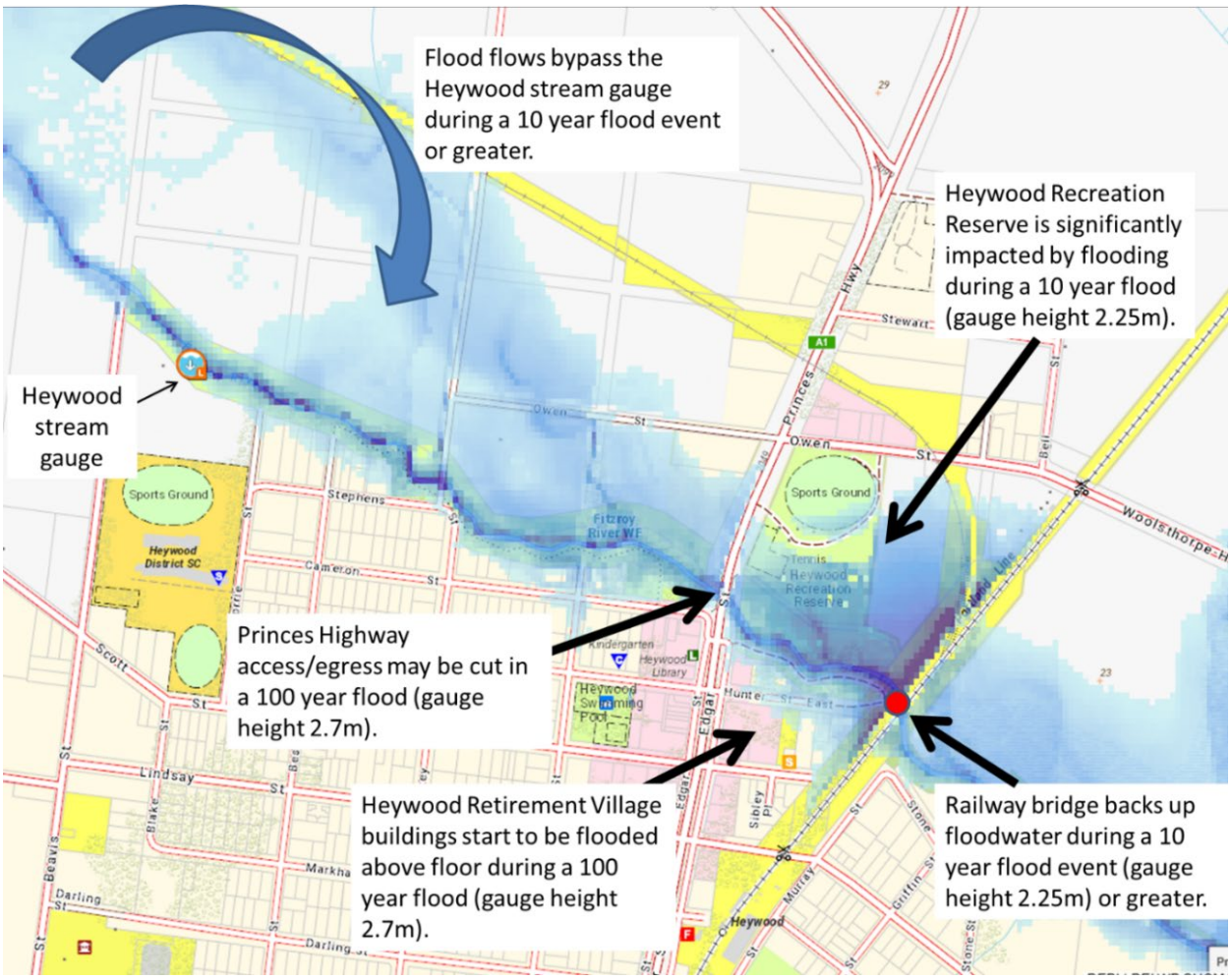
The Fitzroy River at Heywood gauge is also situated adjacent to the key township of Heywood, a critical location with respect to flood mapping. It was found that high flow gauges at Fitzroy River at Heywood gauge was unreliable due to flow bypassing the gauge to the north between the river and the railway line.

Influence of the Fitzroy Estuary

The Fitzroy River discharges into Portland Bay via an intermittently open/closed estuary. The position of the river mouth has been variable over time. The effect of closure of the entrance is an increase in the extent of inundation across the estuary, particularly south of the Princes Hwy. Artificial openings of the estuary entrance do occur and are managed by the Glenelg Hopkins CMA. The Fitzroy River Estuary is only likely to influence localised flooding.

Influence of the Railway Bridge

The railway bridge structure and embankments in Heywood present a major flow constriction. The rail bridge over the Fitzroy River (east of Hunter Street East) restricts flow and floodwater starts to back up on the western side of the railway during a 10% AEP (10 yr ARI) event. The impact of the rail bridge increases with flood magnitude. Flood levels in Heywood are sensitive to the rail bridge opening, and potential increases in the bridge culvert capacity should be considered when assessing future flood mitigation options (Water Technology 2017).



Heywood 100 year ARI flood extent with a summary of key flood impacts. For more detailed information regarding buildings and roads impacted refer to the Heywood Flood Intelligence Card.

Fitzroy River @ Heywood (non-Flood Class Level)

Location From (gauge)	Location To (gauge)	Flood Peak Travel Time	Comments	Duration
Start of rainfall (upper catchment)	Heywood (# 237202)	3.5 - 6 hours	Begin to rise from normal levels	2.5 days
Start of rainfall (upper catchment)	Heywood (# 237202)	7 - 12 hours	Minor flooding	
Start of rainfall (upper catchment)	Heywood (# 237202)	10 - 18 hours	Moderate flooding	
Start of rainfall (upper catchment)	Heywood (# 237202)	12 - 20 hours	Major flooding	

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 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 – Fitzroy River, Heywood.

Property					
Properties	**63**	14 Flooded above floor.			
Residential	5	1 & 4 Hunter St, 9, 12 & 14 Cameron St			
Commercial	5	Heywood Bolts & Bits, Heywood Pioneer Wagon Shed & Museum, Retirement Village main building, Daly's IGA, Heywood Horse & Country.			
Industrial	1	Wannon Water Heywood Sewer Pump Station No.1.			
Public Land	3	Heywood Recreation Reserve – Football, Netball, Cricket & Tennis clubs. Heywood Public Gardens Reserve Heywood Swimming Pool & Public Park Reserve			
Rural		Agriculture – cropping and stock			
Community Infrastructure					
		Football, Netball, Cricket & Tennis clubs. Heywood Public Gardens Reserve Heywood Swimming Pool & Public Park Reserve			
Essential Infrastructure					
Major Roads		Princes Highway (Edgar Street), Woolsthorpe-Heywood Rd (Sunday Ck crossing Heywood), Woolsthorpe-Heywood Rd (Darlot Ck crossing Homerton), Tyrendarra-Ettrick Rd (Darlot Ck crossing Tyrendarra)			
Key local roads		Miltons Rd (nth of Hedditchs Rd), Bond St, Owen St, Cameron St, Fitzroy St, Edgar St, Hunter St, Scott St.			
Major Rail		Portland Railway line (V05 - Maroona to Portland - ARTC)			
Sewerage Facilities		Wannon Water Heywood Sewer Pump Station No.1			
Levees		Nil			
Tourism / Recreation					
Sports Facilities		Heywood Recreation Reserve – Football, Netball, Cricket & Tennis clubs. (Henty Hwy)			
Recreation Facilities		Heywood Swimming Pool & Public Park Reserve (Cameron St)			
Government Boundaries					
Local Gov't Areas		Glenelg Shire Council	CMA		Glenelg Hopkins CMA
Adjacent LGAs		Moyne Shire, Southern Grampians & South Australia	CFA (FRV) District		District 4 – South West (North & West Regional)
SES Resp' Boundary		Heywood	Adjacent SES GRBs		Hamilton, Port Fairy, Portland & Dartmoor.

Warnings and Gauges

The Bureau of Meteorology currently provides flood warnings and advice for Portland Coast catchment.

Refer to Portland Coast Warnings & Gauges (Pg.45)

Properties at Flood Risk

Properties listed in the table below are at risk from flooding along the Fitzroy River. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Fitzroy River, Darlot Creek and Heywood Regional Floodplain Mapping Study (Water Technology 2017).
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.

Address	Building type	20% AEP	10% AEP	5% AEP	2% AEP		1% AEP	
		Maximum Depth of Flooding on Property for each AEP event (m) ***Depth of known over-floor flooding at property for each AEP event (m)***						
Level at Fitzroy River @ Heywood		1.95	2.25	2.44	2.61		2.70	
Equivalent level AHD (m)		25.77	26.07	26.26	26.43		26.52	
1 Hunter St	Heywood Pioneer Wagon Shed & Museum	0.94	1.25	1.61	1.94	***0.19***	2.17	***0.42***
1 Hunter St	Wannon Water Sewer Pump Station No.1	0.94	1.25	1.61	1.94		2.17	***0.08***
4 Hunter St	House & sheds (front & rear)			0.28	0.61	***0.14***	0.84	***0.37***
66 Edgar St	Heywood Bolts & Bits		0.17	0.50	0.83	***0.14***	1.06	***0.35***
12 Cameron St	House & rear shed		0.36	0.58	0.89	***0.22***	1.12	***0.47***
14 Cameron St	House & rear shed	0.09	0.34	0.56	0.86	***0.22***	1.09	***0.45***
1 Hunter St	House & garage		0.22	0.59	0.93	-	1.18	***0.19***
2042 Princes Hwy	All clubrooms & buildings	0.99	1.33	1.67	2.00	-	2.23	***0.13***
9 Hunter St	Retirement Village Main Building				0.17	-	0.42	***0.16***
64 Edgar St	Daly's IGA Supermarket				0.27	-	0.50	***0.08***
2A Scott St	Rear Shed				0.20	-	0.45	-

9 Cameron St	House & rear shed				0.14	-	0.37	***0.14***
3/7 Hunter St	Retirement Village Unit 3				0.22	-	0.46	-
4/7 Hunter St	Retirement Village Unit 4				0.22	-	0.46	-
2/7 Hunter St	Retirement Village Unit 2				0.22	-	0.46	-
58 Edgar St	Rotunda (Tourist Information)				0.17	-	0.42	-
1/7 Hunter St	Retirement Village Unit 1				0.22	-	0.46	-
69-71 Edgar St	Heywood Horse & Country					-	0.23	***0.08***
3 Hunter St	St. Andrew's Presbyterian Church				0.28	-	0.54	-
7 Cameron St	House & rear shed				0.13	-	0.36	***0.02***
75 Edgar St	Vacant Shop					-	0.15	-
81 Edgar St	House (& shed fronts Cameron St)					-	0.26	-
11 Cameron St	House & garage				0.15	-	0.39	-
1 Cameron St	House & rear shed					-	0.27	-
23-25 Hunter St	Barclays Tyre & Battery Centre					-	0.10	-
5 Cameron St	Rear Shed				0.13	-	0.36	-
5/7 Hunter St	Retirement Village Unit 5				0.22	-	0.46	-
16-18 Cameron St	House & rear shed	0.08	0.30	0.55	0.86	-	1.08	-
8 Scott St	Shed					-	0.10	-
6/7 Hunter St	Retirement Village Unit 6				0.22	-	0.46	-
73 Edgar St	Holly Rock Milk bar					-	0.23	-
8/7 Hunter St	Retirement Village Unit 8				0.28	-	0.54	-
6 Scott St	VICSES Heywood Unit					-	0.10	-
30 Hunter St	Rear Shed					-	0.15	-

7/7 Hunter St	Retirement Village Unit 7				0.22	-	0.46	-
13 Cameron St	House				0.22	-	0.47	-
65-67 Edgar St	Caremore Pharmacy					-	0.16	-
3 Cameron St	Shed				0.01	-	0.25	-
61 Edgar St	Bendigo Bank					-	0.16	-
22 Hunter St	Immunisation Building					-	0.29	-
59 Edgar St	Heywood Newsagency					-	0.06	-
1 Stone St	House	1.19	1.42	1.60	1.77	-	1.89	-
77 Edgar St	Council building and library					-	0.22	-
51 Edgar St	Heywood Patchwork & Craft				0.17	-	0.42	-
2049 Princes Hwy	St. Gregory's Catholic Church					-	0.33	-
10 Stephens St	Rear Shed		0.15	0.29	0.63	-	0.87	-
24-26 Cameron St	Front Shed					-	0.12	-
27 Hunter St	Angling Club	0.09	0.34	0.56	0.86	-	1.09	-
28 Hunter St	House					-	0.10	-
2-6 Stephens St	Rear Shed					-	0.17	-
32-40 Edgar St	Heywood Plumbing Services		0.28	0.48	0.61	-	0.69	-

Assets, Roads & Infrastructure.

Asset Name and location	AEP %	Level (m) Heywood [# 237202]	Consequence / Impact	Mitigation/ Action
Parkland areas adjacent Fitzroy River	<20%	1.88m	Flooding starts to inundate the Heywood parkland areas.	Glenelg Shire Council (GSC) deploy reserve/facility closure signs as needed.
Wannon Water Sewer Pump Station No.1	20%	1.95m	Surrounding grounds begin to be impacted by flooding.	Sandbag as needed.
Bond St	20%	1.95m	Access/egress may be impacted by flooding	Glenelg SC - Undertake traffic management as needed. Deploy road closure signs as needed.
Heywood Recreation Reserve (Football, netball, tennis)	20%	1.95m	Grounds begin to be impacted by flooding.	Glenelg Shire Council (GSC) deploy reserve/facility closure signs as needed. Consider evacuation of facilities flood level predicted to exceed 1.95m (at gauge).
Heywood Swimming Pool & recreation reserve	20%	1.95m	Grounds begin to be impacted by flooding.	Glenelg Shire Council (GSC) deploy reserve/facility closure signs as needed.
Portland Railway line (V05 - Maroona to Portland)	10%	2.25m	Railway begins to be impacted by flooding.	Notification to Australian Rail Track Corporation (ARTC).
Bond St	10%	2.25m	Access/egress may be impacted by flooding	Glenelg SC - Undertake traffic management as needed. Deploy road closure signs as needed.
Owen St	10%	2.25m	Access/egress may be impacted by flooding	Glenelg SC - Undertake traffic management as needed. Deploy road closure signs as needed.
Hunter St	10%	2.25m	Access/egress may be impacted by flooding	Glenelg SC - Undertake traffic management as needed. Deploy road closure signs as needed.
Woolsthorpe-Heywood Rd	10%	2.25m	Access/egress may be impacted by flooding	DTP - Undertake traffic management as needed. Deploy road closure signs as needed.
Fitzroy St (Northern end)	10%	2.25m	Access/egress may be impacted by flooding	Glenelg SC - Undertake traffic management as needed. Deploy road closure signs as needed.
Heywood Recreation Reserve (Football, netball, tennis)	10%	2.25m	Grounds significantly impacted	Restrict access - Glenelg Shire Council (GSC) deploy reserve/facility closure signs as needed.
Cameron St	2%	2.61m	Access/egress may be impacted by flooding	Glenelg SC - Undertake traffic management as needed. Deploy road closure signs as needed.
Hunter St East	2%	2.61m	Access/egress may be impacted by flooding	Glenelg SC - Undertake traffic management as needed. Deploy road closure signs as needed.

Princes Highway (in Heywood at the Fitzroy River crossing)	2%	2.61m	Princes Highway access/egress may be impacted by flooding	DTP - Undertake traffic management as needed. Deploy road closure signs as needed.
Princes Highway (in Heywood at the Fitzroy River crossing)	1%	2.7m	Access/egress is cut to Princes Highway	DTP - Undertake traffic management as needed. Deploy road closure signs as needed.
Heywood Retirement Village Main Building (9 Hunter Street)	1%	2.7m	Flooded above floor	Sandbag and evacuate building as needed.
Daly's Supermarket (64 Edgar Street)	1%	2.7m	Flooded above floor	Sandbag and evacuate building as needed.
Wannon Water Heywood Sewer Pump Station no1 (Hunter Street)	1%	2.7m	Impacted by flooding	Sandbag as needed.
9 units at the Heywood Retirement Village (9 Hunter Street)	0.5%	2.78m	Flooded above floor.	Sandbag and evacuate building as needed.

Flood intelligence card

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 Institute of Disaster Resilience (AIDR) Handbook series on managing the Floodplain.

The Fitzroy River in Heywood does not have a Total Flood Warning System service level. Definitions of minor, moderate and major can be found at Bureau of Meteorology.

AEP – Annual Exceedance Probability
Ml/d = megalitres per day (1 Ml = 1,000,000 litres),
m^3s^{-1} = 1 cubic meter per second (cumecs). 1 Ml/d = cumecs x 86

Fitzroy River at Heywood (gauge # 237202)

Forecast or recorded rainfall triggers (BoM)	River height (m)	Flow Ml/d (cumecs)	% AEP (ARI)	Consequence/ impact	Roads impacted	Actions
	1.88m		>20% (<5 yr)	Flooding begins to inundate the riverside parkland and public park reserve.		Minor flood impacts to Heywood and surrounding areas.
37.2 mm in 12 hrs, 50.4 mm in 24 hrs	1.95m	604 Ml/d (7 m^3s^{-1})	20% (5 yr)	Flooding inundates parkland and river water frontage, begins to inundate Heywood Recreation Reserve (football, netball, cricket & tennis) impacted, buildings below floor. Wannon Water Sewer Pump Station No.1 – surrounding grounds impacted.	• Bond Street, • Hunter St	**Glenelg Shire Council (GSC)** deploy reserve/facility closure signs as needed. Consider evacuation of facilities flood level predicted to exceed 1.95m (at gauge). Notify Wannon Water EM Duty Officer – 0498 464 491 or emergencycontact@wannonwater.com.au VICSES sandbag the Wannon Water Heywood Sewer Pump Station No1 if forecast >2% AEP.
	2.18m			Flooding inundates parkland and river water frontage, begins to inundate Heywood Recreation Reserve (football, netball, cricket & tennis) impacted, buildings below floor.		Moderate flood impacts in Heywood and surrounding areas.
42 mm in 12 hrs, 55.2 mm in 24 hrs	2.25m	1,036 Ml/d (12 m^3s^{-1})	10% (10 yr)	Heywood Recreation Reserve (football, netball, cricket & tennis) impacted, buildings below floor. Portland Railway line (V05 - Maroona to Portland).	In addition to above: • Owen St, • Tyrendarra School Rd, • Thompsons Rd, • Miltons Rd.	Restrict access - Glenelg Shire Council (GSC) deploy reserve/facility closure signs as needed. Notification to **Australian Rail Track Corporation (ARTC)**.

				Widespread rural flooding, with access & egress to some local roads and tracks restricted or cut.		**Department of Transport (DTP)** & GSC deploy water over road and/or road closure signs as needed. Undertake traffic management as needed. VICSES RDO/RAC to activate Field Observers to take photos (SSS) and record flood levels for Flood Intelligence. Situation reports to RDO or IC.
48 mm in 12 hrs, 64.8 mm in 24 hrs	2.44m	1,728 Ml/d (20 m^3s^{-1})	5% (20 yr)	Properties adjacent to Fitzroy River on Stephens, Cameron & Hunter Streets inundated, potentially isolated, nil above floor.	In addition to above: • Princes Hwy, (in Heywood), • Cameron St, • Hunter St E.	DTP & GSC deploy water over road and/or road closure signs as needed. Undertake traffic management as needed. VICSES RDO/RAC to activate Field Observers to take photos (SSS) and record flood levels for Flood Intelligence. Situation reports to RDO or IC.
	2.49m		Oct 2013	Flooding causes extensive inundation of roadways and rural properties in the catchment.		Major flood impacts to Heywood and surrounding areas.
	2.56m		Sept 2016	Flooding causes extensive inundation of roadways and rural properties in the catchment.		
56.4 mm in 12 hrs, 76.8 mm in 24 hrs	2.61m	2,592 Ml/d (30 m^3s^{-1})	2% (50 yr)	Streets where properties are impacted, potentially isolated incl: • Stephens St, • Cameron St, • Hunter St, • Hunter St E. Residential dwelling with potential to flood above floor and/or become isolated: • 9 Hunter St (Retirement village building), • 9 Hunter St (Retirement village all units), • 4 Hunter St (house & sheds), • 12 Cameron St (house & rear shed), • 14 Cameron St (house & rear shed). Public/Community/Industrial/Commercial with potential to flood above floor and/or become isolated: • 1 Hunter St ○ Pioneer shed & museum	In addition to above: • Edgar Street (Princes Hwy) • Fitzroy St.	DTP & GSC deploy water over road and/or road closure signs as needed. Undertake traffic management as needed. Sandbag building(s) as needed. Owner/occupiers to consider relocation. Victoria Police consider evacuation of residents at Retirement Village Main Building (9 Hunter Street). All units likely to be isolated. VICSES RDO/RAC to activate Field Observers to take photos (SSS) and record flood levels for Flood Intelligence. Situation reports to RDO or IC.

				○ Wannon water pump station • 66 Edgar St (Heywood Bolts & Bits).		
	2.65m	2,597 Ml/d (30 m^3s^{-1})	Nov 2007			DTP & GSC deploy water over road and/or road closure signs as needed. Undertake traffic management as needed.
63.6 mm in 12 hrs, 86.4 mm in 24 hrs	2.70m	3,196 Ml/d (37 m^3s^{-1})	1% (100 yr)	Streets where properties are impacted, potentially isolated incl: • Fitzroy St, • Stone St. Residential dwelling with potential to flood above floor and/or become isolated: • Cameron St (1, 3, 5, 7, 9, 13) • Cameron St (16-18, 24-26), • Scott St (1, 2A, 8) • Stone St (1) • Hunter St (30) Public/Community/Industrial/Commercial with potential to flood above floor and/or become isolated: • 2042 Princes Hwy (Recreation reserve – all sports clubrooms & buildings), • 3 Hunter St (St. Andrew's Church), • 22 Hunter St (GSC building), • 23-25 Hunter St (Barclays Tyre & Battery), • 64 Edgar St (Daly's IGA) • 63-65 Edgar St (Pharmacy) • 69-71 Edgar St (Heywood Horse & Country), • 73 Edgar St (Café & shop) • 75 Edgar St (formerly Landmark) • 61 Edgar St (Bendigo bank) • 57 Edgar St (Heywood butchers) • 59 Edgar St (Heywood newsagent)	In addition to above: • Woolsthorpe-Heywood Rd (at Sunday Creek), • Princes Hwy / Edgar Street • Tyrendarra-Ettrick Rd (at Darlot Creek), • Princes Hwy (at Tyrendarra).	VICSES RDO/RAC to activate Field Observers to take photos (SSS) and record flood levels for Flood Intelligence. Situation reports to RDO or IC. Sandbag building(s) as needed. Owner/occupiers to consider relocation. DTP & GSC deploy water over road and/or road closure signs as needed. Undertake traffic management as needed.
70.8 mm in 12 hrs, 96 mm in 24 hrs	2.78m	3,888 Ml/d (45 m^3s^{-1})	0.5% (200 yr)	Streets where properties are impacted, potentially isolated incl: • Silby Pl., • Scott St.		

				Residential dwelling with potential to flood above floor and/or become isolated: • Edgar St (81) • Stephens St (2-6 &10 – rear shedding) Public/Community/Industrial/Commercial with potential to flood above floor and/or become isolated: • Hunter St (20) • 27 Hunter St (Angling Club) • 28 Hunter St (kindergarten) • 46 Edgar St (Elders) • 50 Edgar St (Café & bakery) • 50 Edgar St (Budj Bim office & Gunditj Mirring Traditional Owners Aboriginal Corp. • 51 Edgar St (Shop) • 52 Edgar St (Post Office) • 58 Edgar St (Old Heywood school) • 77 Edgar St (GSC building & Library) • 9 Scott St (Scout Hall) • 2049 Henty (Princes) Hwy (St. Gregory's Catholic Church).		
			March 1946	The south west of Victoria, including Heywood, receives its worst flood in living memory. Many rivers are in flood, including the Fitzroy River and Darlot Creek. Estimated as a 0.5% AEP (200 yr ARI) event.		
	2.89m	4,771 Ml/d (55 m^3s^{-1})	Oct 1976			
80.4 mm in 12 hrs, 110.4 mm in 24 hrs	2.90m	5,097 Ml/d (59 m^3s^{-1})	0.2% (500 yr)	Residential dwelling with potential to flood above floor: • Cameron Street (7, 11, 16-18), • 15 Stone Street, • 28 Hunter Street. Flooding has proceeded on the southern side of the Fitzroy River as far as Stephens Street, Mount Clay Road, Scott Street and Stone Street.	In addition to above: • Stone Street.	VICSES RDO/RAC to activate Field Observers to take photos (SSS) and record flood levels for Flood Intelligence. Situation reports to RDO or IC. Sandbag building(s) as needed. Owner/occupiers to consider relocation. DTP & GSC deploy water over road and/or road closure signs as needed. Undertake traffic management as needed.
	2.92m		Sept 2010	Significant flooding over Edgar St south to Barclay St.		

	3.01m		October 1975	Largest recorded flood at Heywood.		
530.4 mm in 24 hrs, 638.4 mm in 28 hrs	5.41m		Probable Max. Flood (PMF)	Most of the town is inundated on the southern side of Fitzroy River, with only the most southerly blocks free of floodwater. The north side of the town is also heavily inundated, with at least 1km of the Princes Hwy inundated. The railway line through town is also inundated.		

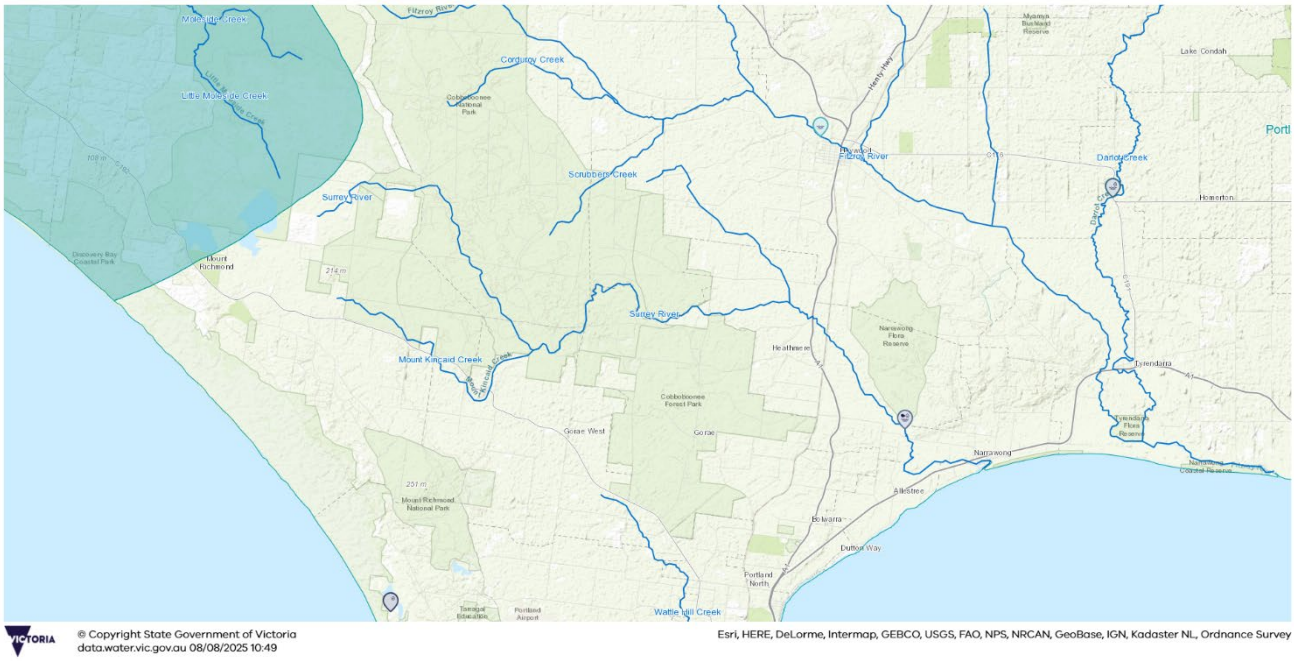
C4 – Narrawong Flood Emergency Plan

Overview of Flooding

Narrawong is impacted by flooding from the Surry River. The Surry River rises in the Cobboboonee National Park , east of Mt Richmond, with Mount Kincaid Creek its major tributary. The Surry River discharges into Portland Bay via an intermittently open/closed estuary. The position of the river mouth has been variable over time. The effect of a closed mouth is an increase in the extent of inundation across the estuary, particularly south of the Princes Hwy.

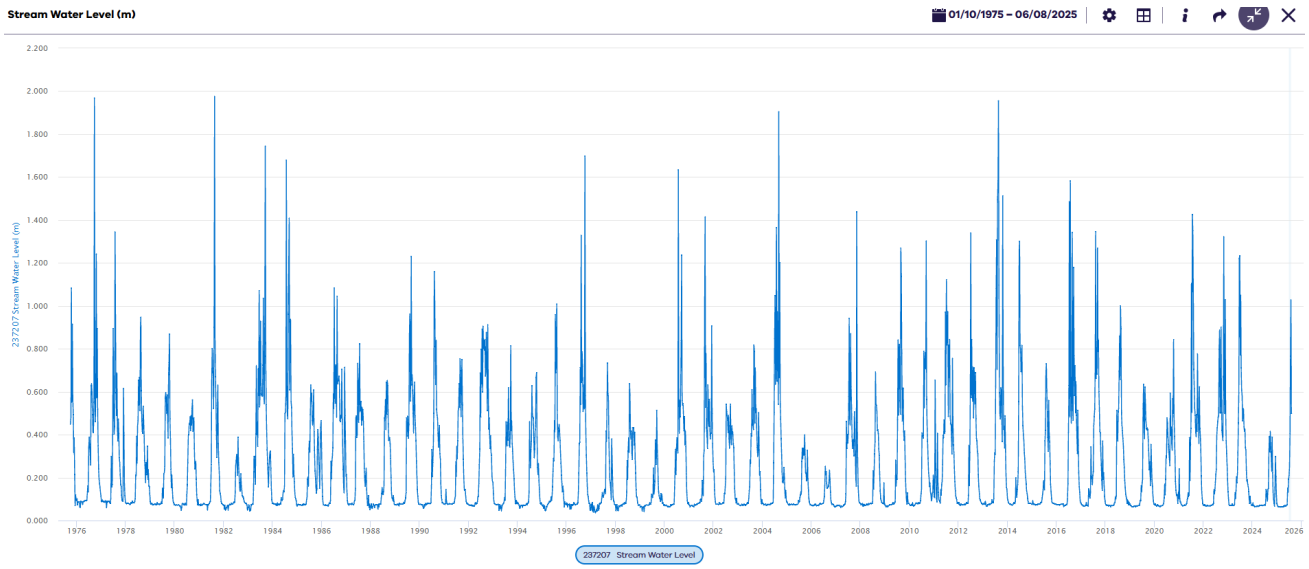
When the estuary berm (sandbar) is closed, this has a relatively localised effect on flood levels through the estuary with negligible difference observed upstream of the highway bridge. Caution should be used when using the Heathmere gauge to infer flood magnitude. If the sandbar is closed, this can cause localised increases in flood levels.

The Heathmere stream gauge on the Surry River, is located 3 km upstream of Narrawong. Surry River stream records show that Narrawong has experienced flood events since the early 1970's, refer to graph below.



Surry River including river height, streamflow & rainfall gauge (#2372027).

Victorian *Water Management Information system (WMIS)* records multiple flooding events as measured from the gauge at Heathmere, with 2004 and 2013 being the most recent significant flooding events.



Surry River @ Narrawong (non-Flood Class Level)

Location From (gauge)	Location To (gauge)	Flood Peak Travel Time	Comments	Duration
Start of rainfall (upper catchment)	Surry River @ Heathmere (# 237207)	12 - 24 hours	Begin to rise from normal levels	2.5 days
Heathmere (# 237207)	Narrawong Caravan Park	< 2 hours	To peak	

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 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 – Surry River, Narrawong.

Property					
Properties	**30**	Impacted by floodwaters			
Residential	24	Floodwaters impacting land, potential to impact 3 residential dwelling. Potential to impact access/egress and create isolated dwellings.			
Commercial	1	Narrawong Island Holiday Park, including public land infrastructure, sporting fields and buildings. Cabins and accommodation likely to flood over floor.			
Industrial	0				
Public Land	1	Narrawong coastal reserve, Football reserve, tennis courts			
Rural	5	Floodwaters primarily impacting riverside land, paddocks and shedding. Potential to impact dwellings on Wilson & Wades Roads.			
Community Infrastructure					
		Narrawong coastal reserve – playground & toilet facilities, Football reserve, tennis courts			
Essential Infrastructure					
Major Roads	Nil	Princes Highway (Windham St) Bridge not impacted by ≤ 1% AEP.			
Key local roads		Caravan Park Road, Wades Rd, Willian Drive, Ocean View Drive (East & West), Snapper Point Rd			
Major Rail	Nil				
Sewerage Facilities	Nil				
Levees	Nil				
Tourism / Recreation					
Sports Facilities		Football reserve, tennis courts.			
Recreation Facilities		Narrawong coastal reserve.			
Government Boundaries					
Local Gov't Areas		Glenelg Shire Council	CMA		Glenelg Hopkins
Adjacent LGAs		Moyne (east)	CFA (FRV) District		District 4 (N & W Regional)
SES Resp' Boundary		Portland (BSW)	Adjacent SES GRBs		Heywood & Port Fairy

Warnings and Gauges

The Bureau of Meteorology currently provides flood warnings and advice for Portland Coast catchment.

Refer to Portland Coast Warnings & Gauges (Pg.45).

Properties at Flood Risk

Properties listed in the table below are at risk from flooding along the Surry River. As more intelligence becomes available, this list may change. This table has been populated based on modelling work as part of the Surry River Estuary Flood Study (Water Technology 2008) and does not include floor level data. ***Flood depths indicate deepest modelled depth on property.***
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.

Address	Building/property type	Risk to Property	10% AEP	1% AEP
Gauge height - m			**2.12m**	**2.63m**
Height of gauge = 1.98 m AHD			**m**	**m**
234 Wilsons Road Heathmere 3305	Residential / Farming zone	Flooding Riverside land & paddocks	4.88	5.70
107 Wades Road Narrawong 3285	Farming zone	Riverside land only, potential to flood access track.	4.73	5.49
The Esplanade – Clarke St ext. Narrawong 3285	Crown land		4.46	4.93
8116 Princes Highway Narrawong 3285	Residential / Rural living	Nil threat to structures, riverside land only.	4.12	4.86
8160-8126 Princes Highway Narrawong 3285	Residential / Rural living	Nil threat to structures, riverside land only.	Not avail	Not avail
8352 Princes Highway Allestree 3305	Residential / Rural living	Nil threat to structures, flooding in back paddock & riverside land only.	3.99	4.82
8316 Princes Highway Allestree 3305	Residential / Rural living	Nil threat to structures, flooding in back paddock & riverside land only.	3.91	4.74
8302 Princes Highway Allestree 3305	Residential / Rural living	Nil threat to structures, flooding in back paddock & riverside land only.	3.81	4.63

288 Wilsons Road Heathmere 3305	Residential / Farming zone	Riverside land, flooding paddocks, floodwater with potential to enter building, threat to sheds.	3.49	4.43
8248 Princes Highway Allestree 3305	Residential / Rural living	Nil threat to structures, flooding in back paddocks.	3.54	4.36
241 Wades Road Narrawong 3285	Residential / Farming zone	Riverside land & paddocks, potential to flood access track.	3.55	4.32
286 Wilsons Road Heathmere 3305	Residential / Farming zone	Riverside land, floodwater with potential to enter building, threat to sheds.	2.90	3.81
8228 Princes Highway Allestree 3305	Residential / Rural living	Nil threat to structures, riverside land only.	2.72	3.51
8200 Princes Highway Allestree 3305	Residential / Rural living	Riverside land, floodwater with potential to enter building, threat to sheds.	2.70	3.47
8210 Princes Highway Allestree 3305	Residential / Rural living	Nil threat to structures, riverside land only.	Not avail	Not avail
90 Caravan Park Road Narrawong 3285	Narrawong Caravan Park	Flooding Caravan Park Road, property isolated access/egress cut. Over floor flooding for multiple structures including cabins & infrastructure.	2.79	3.36
8086 Princes Highway Narrawong 3285	Residential / Rural living	Nil threat to structures, riverside land only, jetty impacted.	1.65	2.32
30 Caravan Park Road Narrawong 3285	Residential / Rural living	Flooding over Caravan Park Road, property isolated access/egress cut.	1.58	2.31
58 Caravan Park Road Narrawong 3285	Residential / Rural living	Flooding over Caravan Park Road, property isolated access/egress cut.	Not avail	Not avail
68 Caravan Park Road Narrawong 3285	Residential / Rural living	Flooding over Caravan Park Road, property isolated access/egress cut.	Not avail	Not avail
8090 Princes Highway Narrawong 3285	Residential / Rural living	Nil threat to structures, riverside land only.	1.57	2.28
8258 Princes Highway Allestree 3305	Residential / Rural living	Nil threat to structures, flooding in back paddocks.	0.94	2.24
8266 Princes Highway Allestree 3305	Residential / Rural living	Nil threat to structures, flooding in back paddocks.	Not avail	Not avail
8286 Princes Highway Allestree 3305	Residential / Rural living	Nil threat to structures, flooding in back paddocks.	Not avail	Not avail
Ocean View Drive E Narrawong 3285	Residential / Rural living	Flooding over William Drive, property isolated access/egress cut.	1.34	2.13
Ocean View Drive E Narrawong 3285	Residential / Rural living	Flooding over William Drive, property isolated access/egress cut.	Not avail	Not avail

8133 Princes Highway Narrawong 3285	Residential / Rural living	Nil threat to structures.	0.91	2.13
21 William Drive Narrawong 3285	Residential / Rural living	Floodwater with potential to enter building, may become isolated.	1.34	2.08
Snapper Point Road Allestree 3305	Residential / Rural living	Flooding in paddocks, may be isolated.	0.00	1.02
8283 Princes Highway Allestree 3305	Residential / Rural living	Flooding in paddocks, may be isolated.	0.00	0.58
8368 Princes Highway Allestree 3305	Residential / Rural living	Nil threat to structures, flooding in back paddock & riverside land only.	0.00	0.40

Flood intelligence card

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 Institute of Disaster Resilience (AIDR) Handbook series on managing the Floodplain.

The Surry River does not have a Total Flood Warning System service level. Definitions of minor, moderate and major can be found at Bureau of Meteorology.

AEP – Annual Exceedance Probability
Ml/d = megalitres per day (1 Ml = 1,000,000 litres),
m^3s^{-1} = 1 cubic meter per second (cumecs). 1 Ml/d = cumecs x 86

River height (m)	River flow Ml/d (cumecs)	% AEP (ARI) or Event	Consequence/ impact	Action may include evacuation, closure of road, sandbagging, Vic Emergency advice/warnings.
1.56 m	1,214 m^3s^{-1}	August 2017	Big 4 Narrawong Island Holiday Park is not flooded. Minor flooding of Caravan Park Road, south of the Princes Highway.	Notify the Glenelg MEMO and the Big 4 Narrawong Island Holiday Park that minor flooding is likely and if stream levels at the Heathmere gauge continue to raise access/egress could be cut to the Caravan Park Road. Restrict access - Glenelg Shire Council (GSC) deploy reserve/facility closure signs as needed.
1.93 m	2,678 m^3s^{-1}	20% (5 yr)	Flooding of two buildings above floor at the Narrawong Holiday Park. Access/egress may be cut to the Caravan Park Road, Ocean View Drive (East & West) and William Drive.	Victoria Police consider evacuation of the Narrawong Holiday Park due to access/egress of Caravan Park Road may be cut. Undertake traffic management as needed. Deploy road closure signs as needed.
2.05 m	2,996 m^3s^{-1}	November 2007		
2.12 m	3,370 m^3s^{-1}	10% (10 yr)	Access/egress cut to the Caravan Park Road and William Drive. Two additional buildings at the Narrawong Caravan Park are flooded above floor.	Undertake traffic management as needed. Deploy road closure signs as needed.
2.27 m	N/A	10 Sept 2016		
2.30 m	4,406 m^3s^{-1}	5% (20 yr)		

2.49 m	5,875 m^3s^{-1}	2% (50 yr)		
2.56 m		August 2013		
2.63 m	7,171 m^3s^{-1}	1% (100 yr)	Narrawong Holiday Park – caretaker's property only identified at risk under 1% AEP. Four additional buildings at the Narrawong Caravan Park are flooded above floor.	

This table has been populated based on modelling work as part of the Surry River Estuary Flood Study (Water Technology 2008) and does not include floor level data. Flood depths indicate deepest modelled depth on property.

Appendix D - Flood Evacuation Arrangements.

Phase 1 - Decision to Evacuate

Under the SEMP, Victoria Police (VicPol) has the responsibility for evacuation (Evacuation Manager) – in consultation with the control agency and other expert advice. EMV has developed a standardised procedure for evacuation under JSOP J03.12.

The IC decides whether to warn people to evacuate within a specified timeframe or whether it is necessary to advise them to evacuate immediately. The IC must make this decision having regard for the requirements of the JSOP.

Once the IC decides to recommend evacuation, VicPol's Evacuation Manager is responsible for the management of the evacuation process where possible. VICSES and other agencies will assist where practical. VICSES is responsible for the development and communication of evacuation warnings.

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

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 because of flooding and the IC considers that evacuation is the most effective risk treatment. The AV Health Commander is responsible for supporting the evacuation of vulnerable people. Refer to the State Health Emergency Response Plan (SHERP) for details.
- essential services have been damaged and are not available to a community, therefore the IC considers evacuation is the most effective risk treatment.

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

When planning evacuation, the IC will consider triggers for evacuation. For example, specific flood heights are predicted.

EMV Evacuation Guidelines V4.0, November 2023.

Phase 2 – Warning

Warnings may include a warning to 'prepare to evacuate' and a warning to 'evacuate now'. Once the IC has made the decision to evacuate, the at-risk community will be warned to evacuate.

Evacuation warnings should be disseminated in accordance with Public Information and Warnings for Class 1 Emergencies JSOP 4.01.

Phase 3 – Withdrawal

VicPol is the responsible agency for evacuation. In accordance with the JSOP 3.12, The VicPol Evacuation Manager will consult with the IC and IEMT on the most appropriate relief options.

When preparing the Schedule 2 Evacuation Recommendation as per the JSOP 3.12, it is important to ensure that the recommended routes and specified relief centres are accessible to the relevant community.

Vulnerable persons register and people with special needs

Vulnerable people and those who may care for them, including facilities such as hospitals, aged care facilities, educational facilities and prisons, are likely to need more time, resources, support and assistance to evacuate safely. Further information on evacuation can be found at Joint Standard Operating Procedure (JSOP) – Evacuation for Major Emergencies (JO3.12).

A list of vulnerable people in facilities refer to Appendix 3 Vulnerable Person Register is also maintained and available by request from the MEMO but is not for public distribution.

https://www.glenelg.vic.gov.au/Our-Council/Emergency-Information/Vulnerable-Persons-Register

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.

VicPol (MERC) in consultation with VICSES (IC) will liaise with Local Government (MRM) and Emergency Recovery Victoria (ERV) (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 though the Incident Emergency Management Team (IEMT).

The flood relief centres and/or assembly areas are listed in the Glenelg Shire MEMP.

Phase 5 – Return

The Incident Controller (& Evacuation Manager) is responsible for planning and managing the return of evacuated people with the assistance of other agencies where required and in accordance with JSOP 3.12, Schedule 3: Considerations for Return of Evacuees after an Evacuation; and Schedule 4: Recommendation – Safe to Return.

Appendix E – Flood And Storm Warning Systems

Flood &/or Storm Warning

Flood and storm warning products and Flood Class Levels can be found on the VICSES, Bureau of Meteorology and VicEmergency websites.

The Bureau provides flood forecasts and warnings for areas covered by the Total Flood Warning System (TFWS), with arrangements outlined in the Service Level Specification for Flood Forecasting and Warning Services for Victoria. The TFWS does not cover all catchments in Victoria. For areas not covered by the TFWS, the Bureau will not provide specific products but may provide advice on expected conditions where applicable. Flash floods can occur due to severe weather or severe thunderstorms without concurrent riverine flooding. The Bureau provides severe weather warning products including, severe weather and thunderstorms warnings and coastal hazard warnings. These are outlined in the Thunderstorm and Severe Weather Service Level Specification.

The EM-COP platform enables simultaneous publishing to the VicEmergency app, website, hotline (1800 226 226) and Emergency Broadcasters. Communities can also access this information through EMV and VICSES social media channels (VicEmergency, Victoria State Emergency Service on Facebook and VICSES News on X) and emergency broadcasters, such as Sky News TV, ABC Local radio (**ABC Local 96.6 FM, 594 AM, 774 AM**) and various other local emergency broadcaster radio stations (current list available via the EMV website).

EM-COP Public Publishing Business Rules for Riverine Flood, Flash Flood and Severe Weather/Thunderstorm are available in the Public Information tab of the IMT Toolbox, providing further guidance on specific triggers, roles and responsibilities.

Hazard	EMCOP Business Rules document location	VICSES Standard Operating Procedure
Riverine Flooding	Riverine Flood Business Rules	SOP009 Flood Notification and Activation Process
Flash Flooding	Flash Flood Business Rules	SOP008 Severe Weather Notification and Activation
Dam Failure	EMCOP Business Rules – Dam Failure Business Rules	SOP009 - Attachment 4 - Dam Safety Incident
Severe Weather and Thunderstorm	Severe Weather and Thunderstorm Business Rules	SOP008 Severe Weather Notification and Activation

VICSES SOP057 and JSOP 4.01 - Public Information and Warnings for Class 1 Emergencies, provide further guidance.

VICSES Flood Warning Products

Issuing of public information and warnings for flood and storms occurs in accordance with the principles outlined in the SEMP and the Victorian Warning Arrangements. These documents provide overall guidance on the expectations around the issuing of public information and warnings and relevant definitions. This includes outlining the need for timely, relevant, tailored and accessible warnings and public information, which is delivered across a range of channels.

Bureau of Meteorology flood warning services.

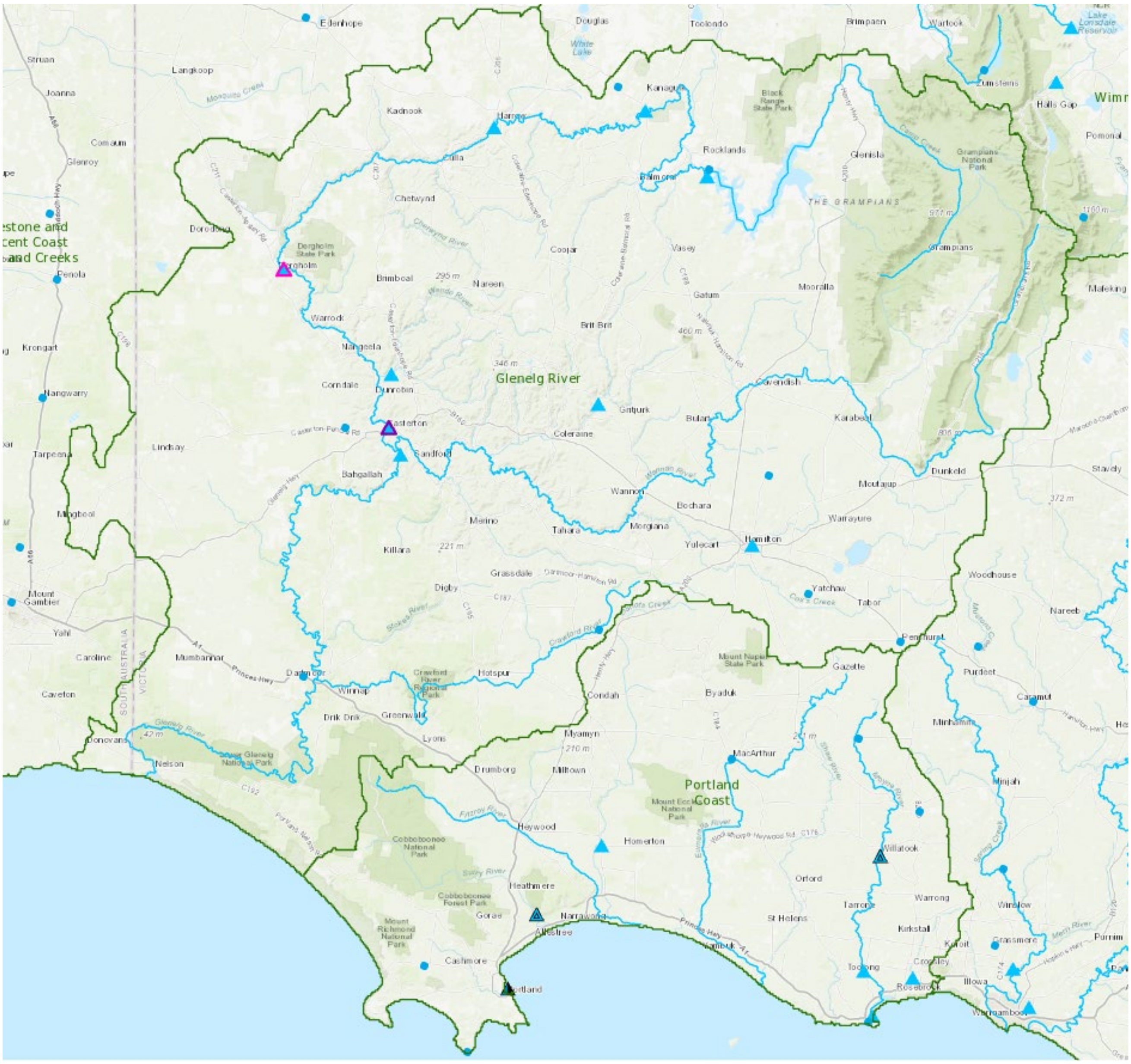
Bureau of Meteorology Flood Watch areas.
www.bom.gov.au/australia/flood/knowledge-centre/about-warning-service.shtml

Local Flood Warning System Arrangements

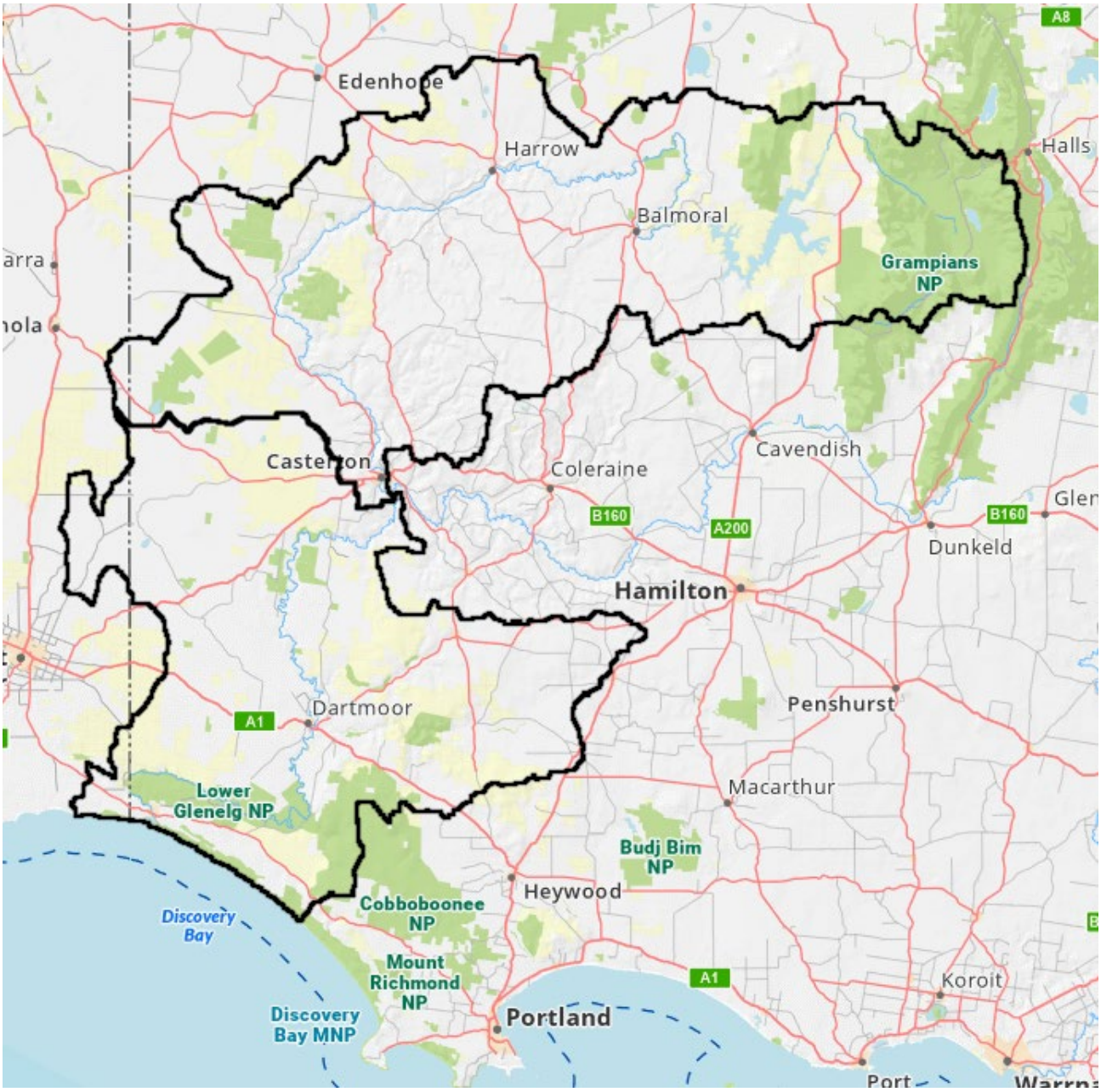
A flood watch provides early advice of a developing situation that may lead to flooding. It's not a warning of imminent flooding. A Flood Watch contains links to weather warnings, other flood-related information, and contact details for emergency services. It can be issued up to 4 days in advance of expected flooding.

A Flood Warning is issued when there is more certainty that flooding will occur at a particular location. Warnings include the expected severity of the flood and predictions about the level the river will rise to. If data isn't available to make specific predictions, the information is more general.

Glenelg Shire has two river catchments – Glenelg River and Portland Coast.



National Flood Gauge Network – Australian Water Data Service



FloodZoom – BoM Flood Warning Areas – Glenelg River to Casterton and downstream from Casterton.

The Glenelg River catchment is monitored within the Total Flood Warning System at Dergholm and Casterton.

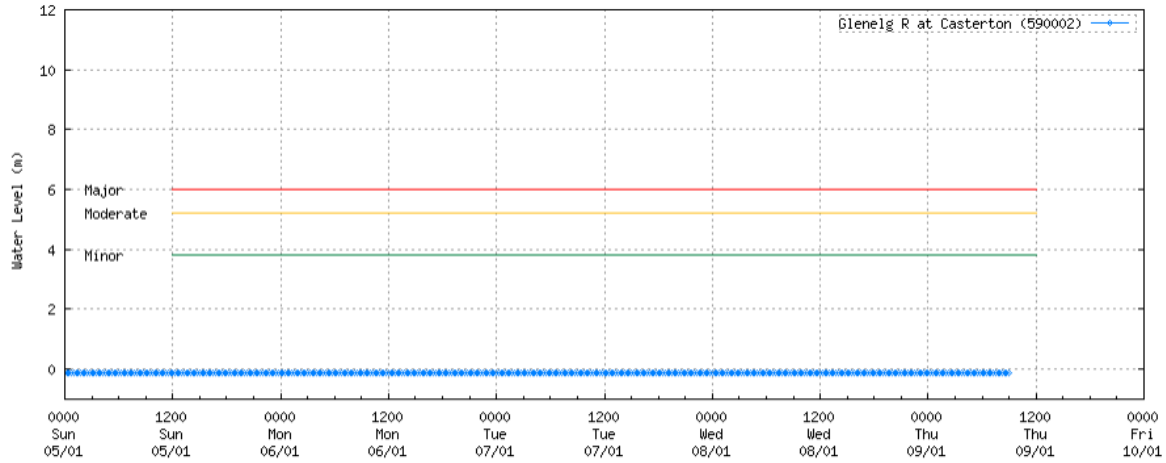
All other catchments are not monitored and are therefore receive advice and warnings that will not contain specific river height measurements aligned with flood categories.

See comparison water level plots of a monitored (TWMS) river (Glenelg River) compared with non-monitored river (Darlot Creek, tributary of Fitzroy River – Portland coast).

Latest river heights for Glenelg River at Casterton

Station details: Station Number: 590002 Name: Glenelg R at Casterton
Flood levels: Minor: 3.80 Moderate: 5.20 Major: 6.00

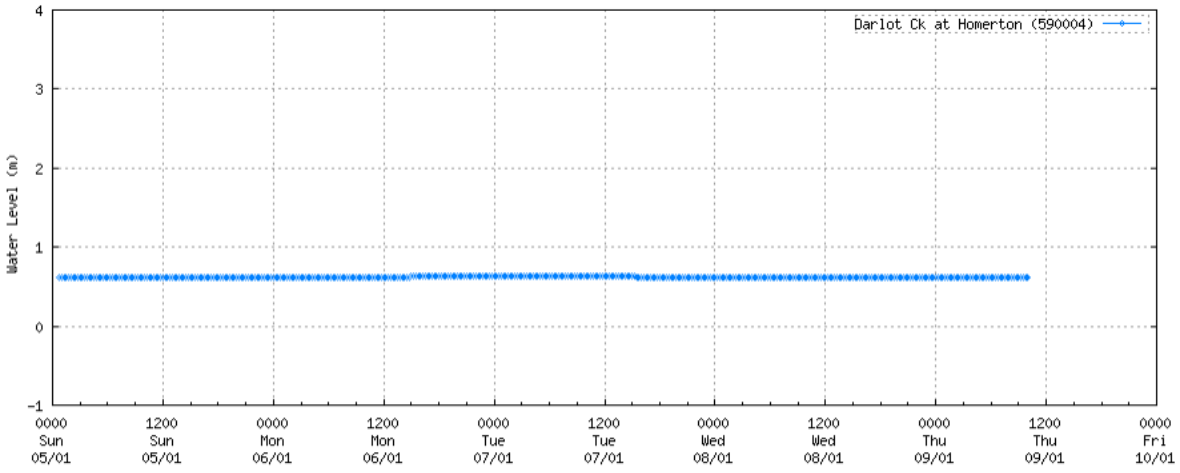
Data from the previous 4 days.



Latest river heights for Darlot Creek at Homerton

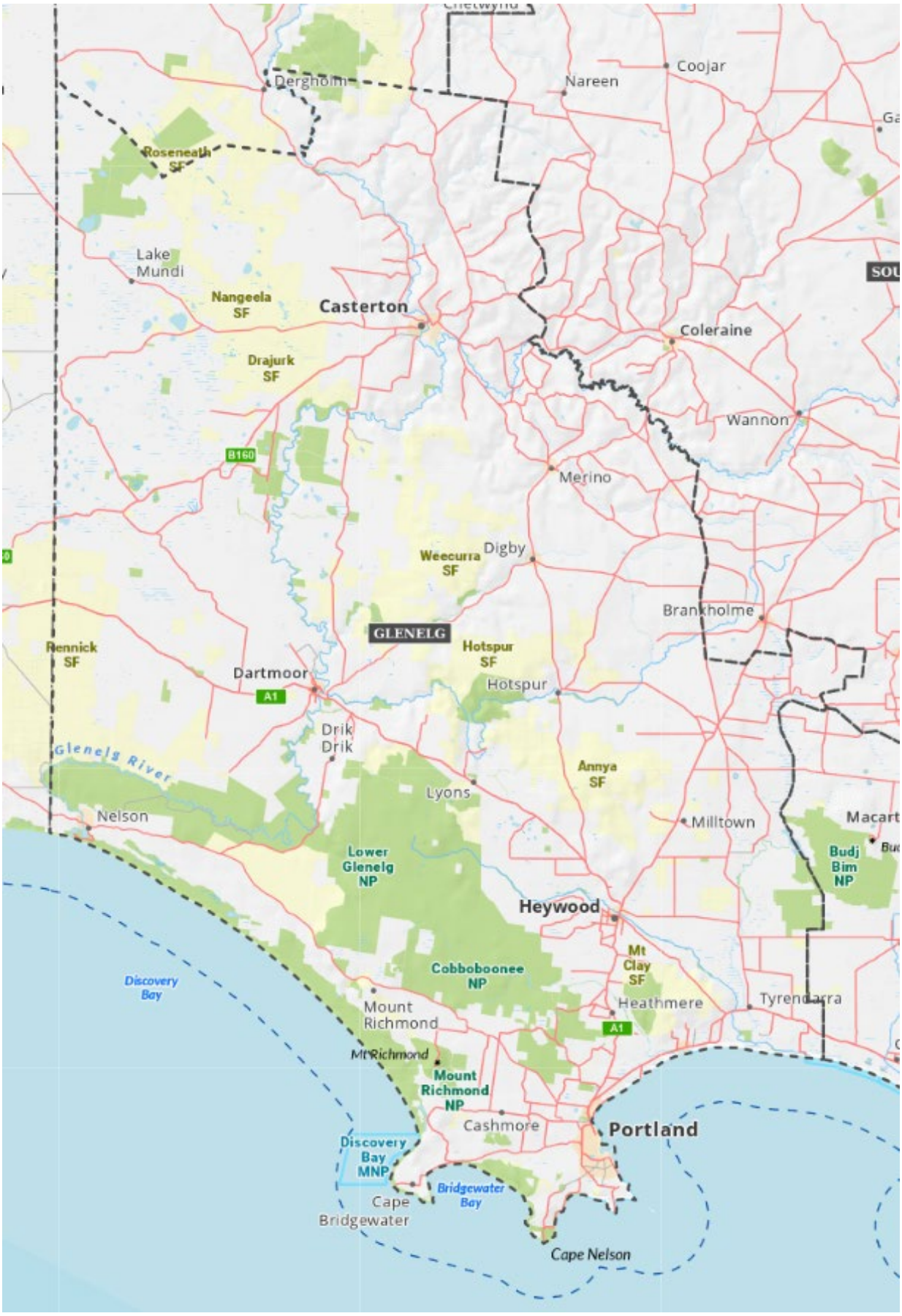
Station details: Station Number: 590004 Name: Darlot Ck at Homerton

Data from the previous 4 days.

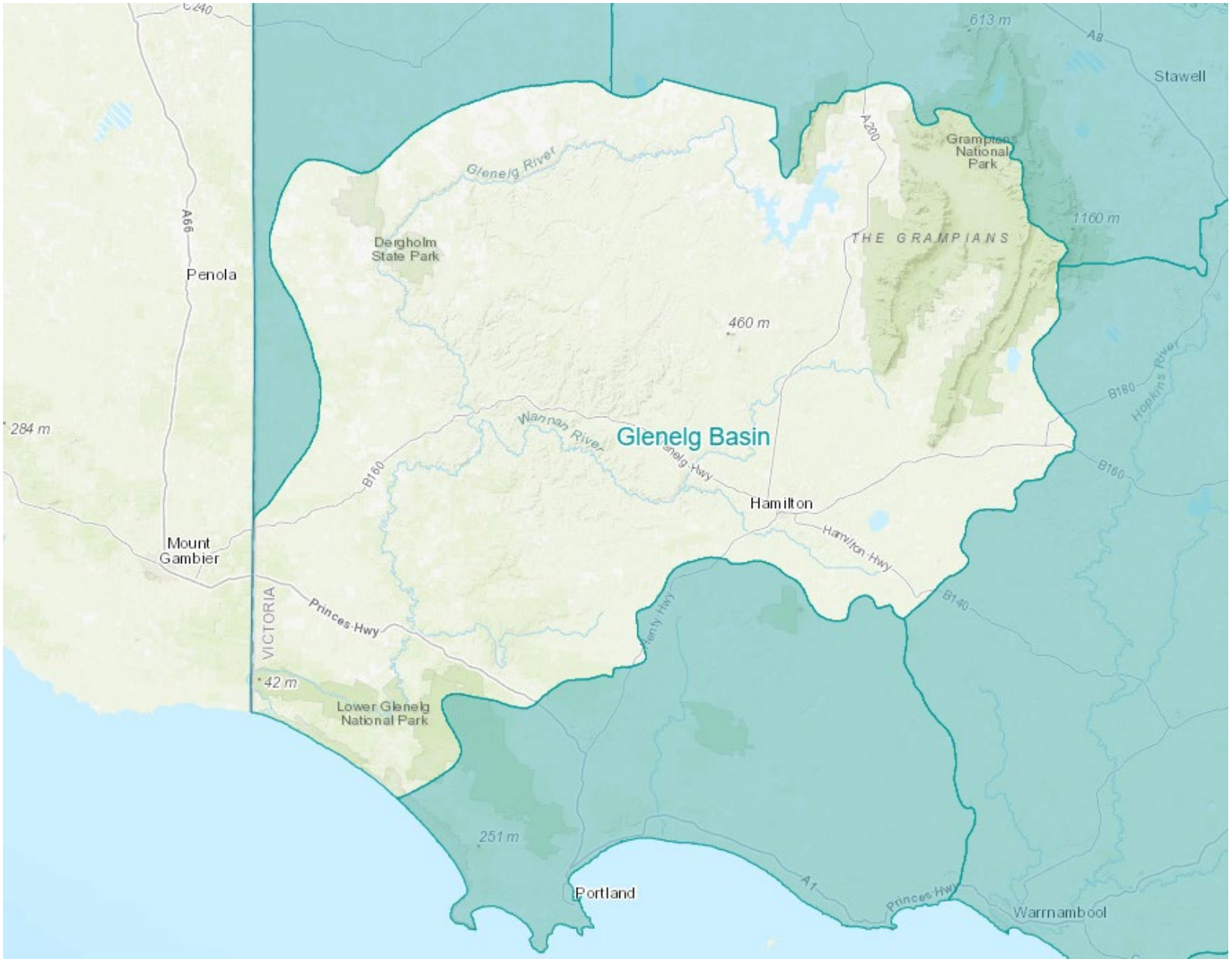


Appendix F – Maps & Schematics

Glenelg Shire

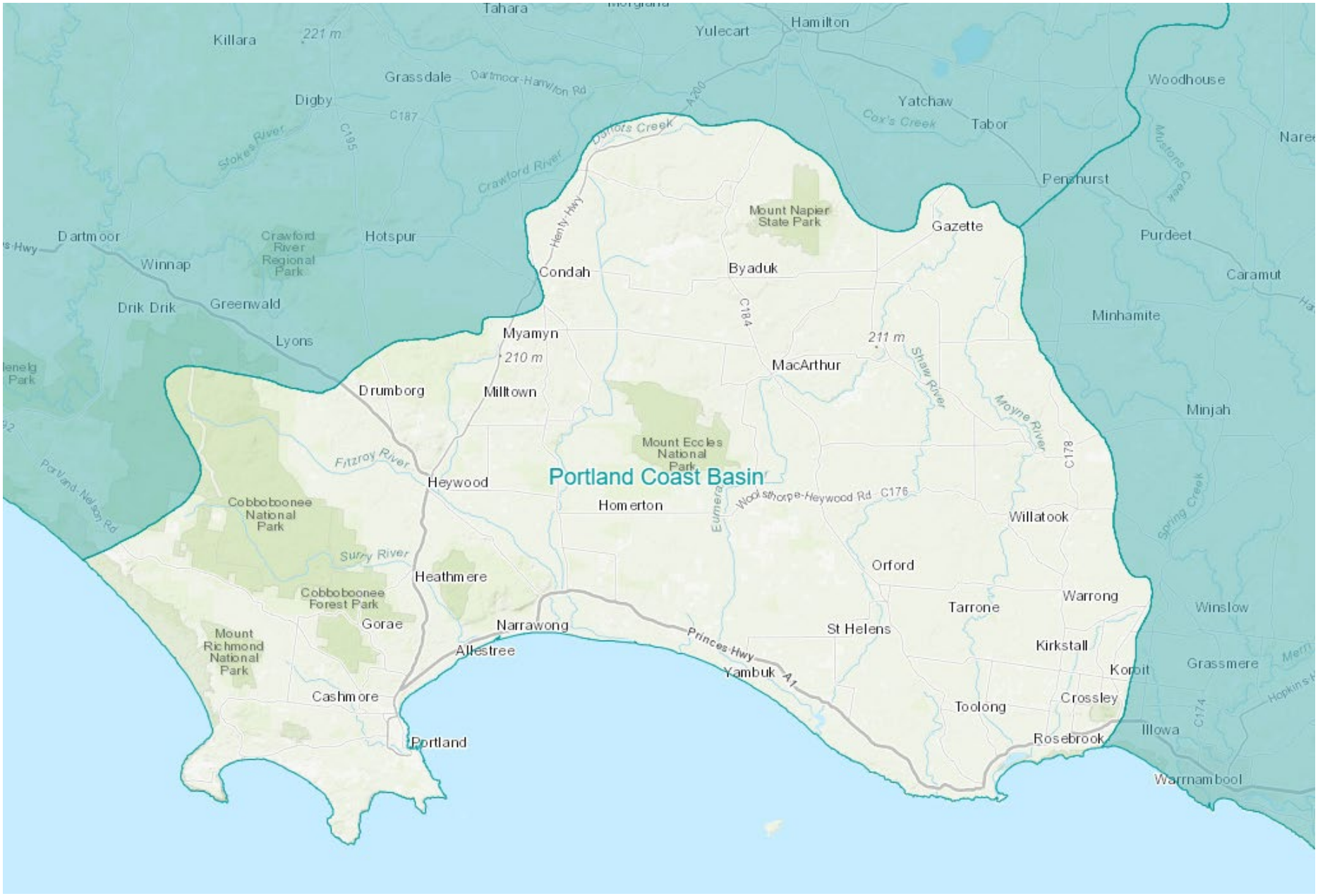


Glenelg River catchment



DEECA – *Water Management Information System*

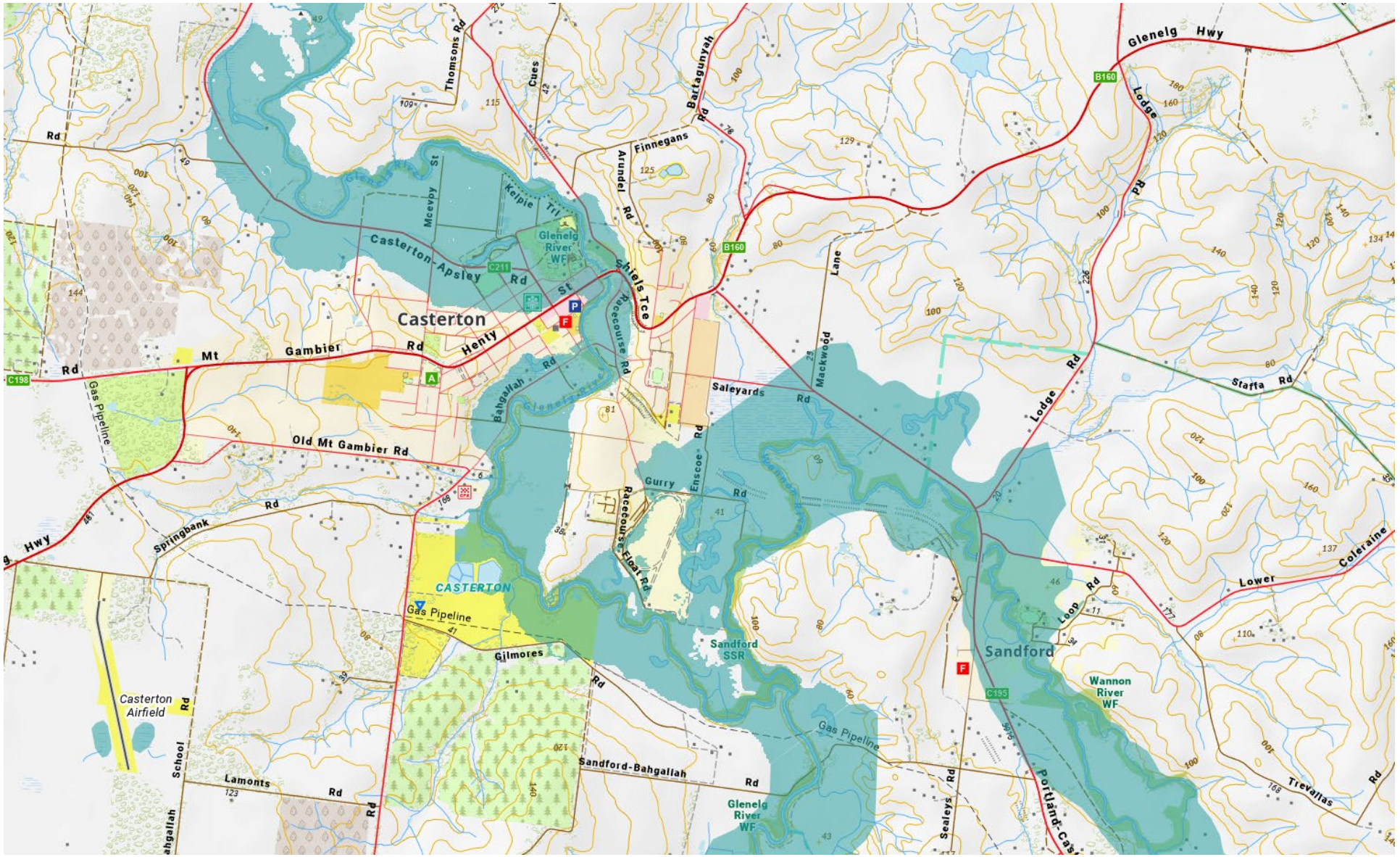
Portland Coast catchment



DEECA – *Water Management Information System*

Flood Maps

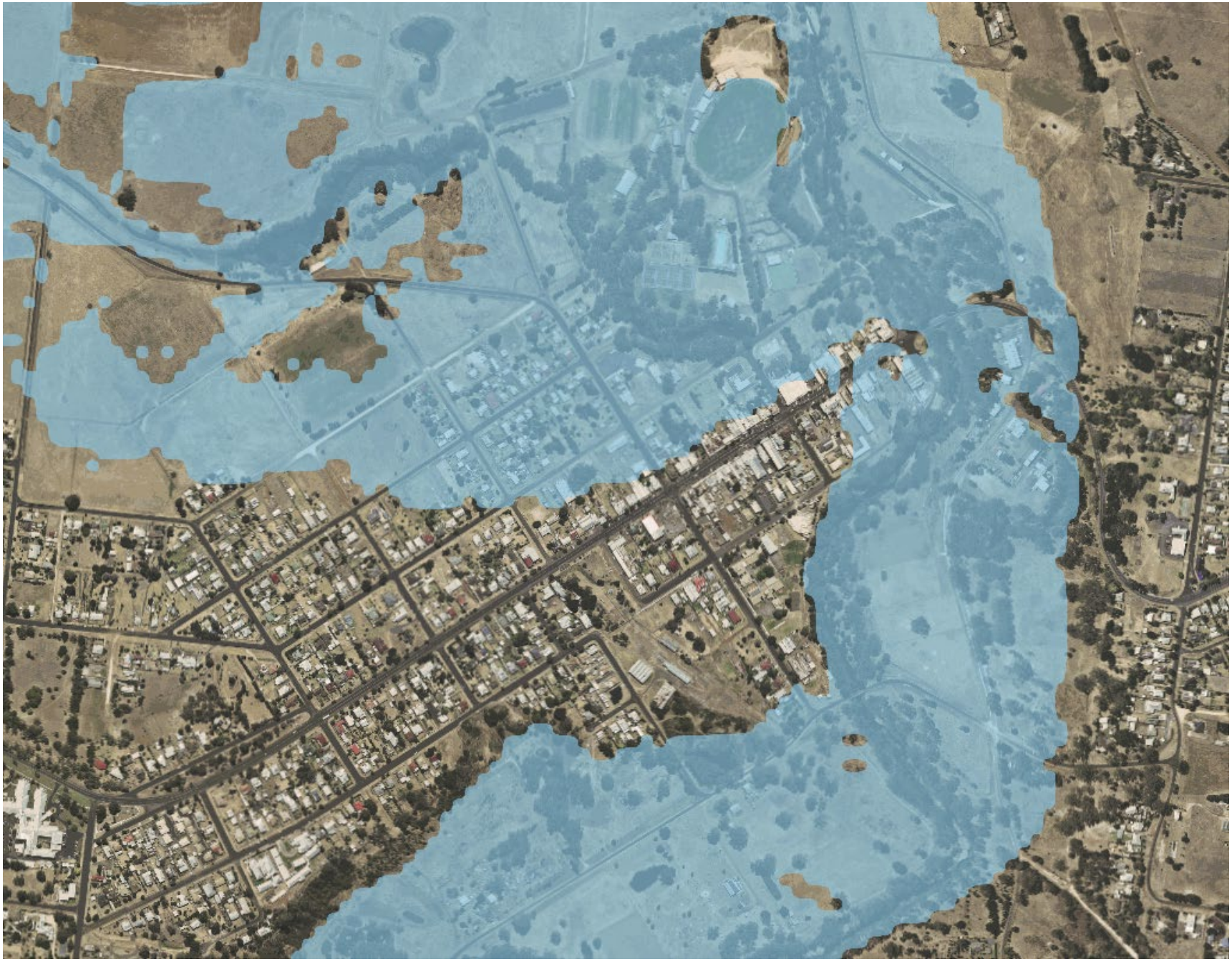
Casterton, Glenelg River.



FloodZoom – Glenelg River @ Casterton, 1% AEP Extent (1 in 100 ARI)

FloodZoom – Glenelg River @ Casterton, 1% AEP Extent (1 in 100 ARI) (Northen part of township)

FloodZoom – Glenelg River @ Casterton, 1% AEP Extent (1 in 100 ARI) (Southern part of township)



FloodZoom – Glenelg River @ Casterton, 5% AEP Extent (1 in 20 ARI)

FloodZoom – Glenelg River @ Casterton, 20% AEP Extent (1 in 5 ARI)

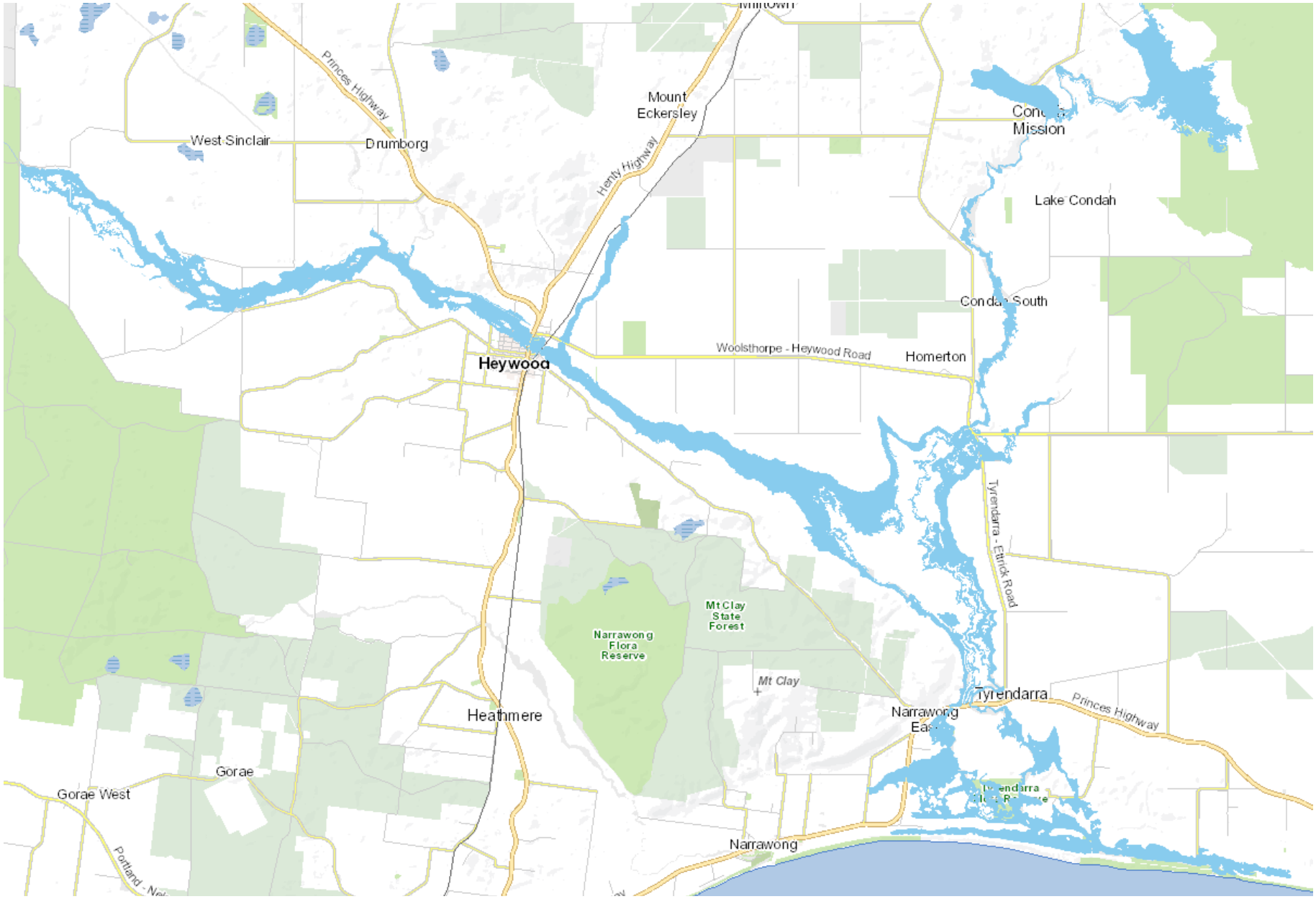
Portland, Wattle Hill & Finn Creeks.

FloodZoom – Wattle Hill Creek & Finn Creek, Portland 1% AEP Extent (1 in 100 ARI)

FloodZoom – Wattle Hill Creek & Finn Creek, Portland 5% AEP Extent (1 in 20 ARI)

FloodZoom – Wattle Hill Creek & Finn Creek, Portland 10% AEP Extent (1 in 10 ARI)

Heywood, Fitzroy River.

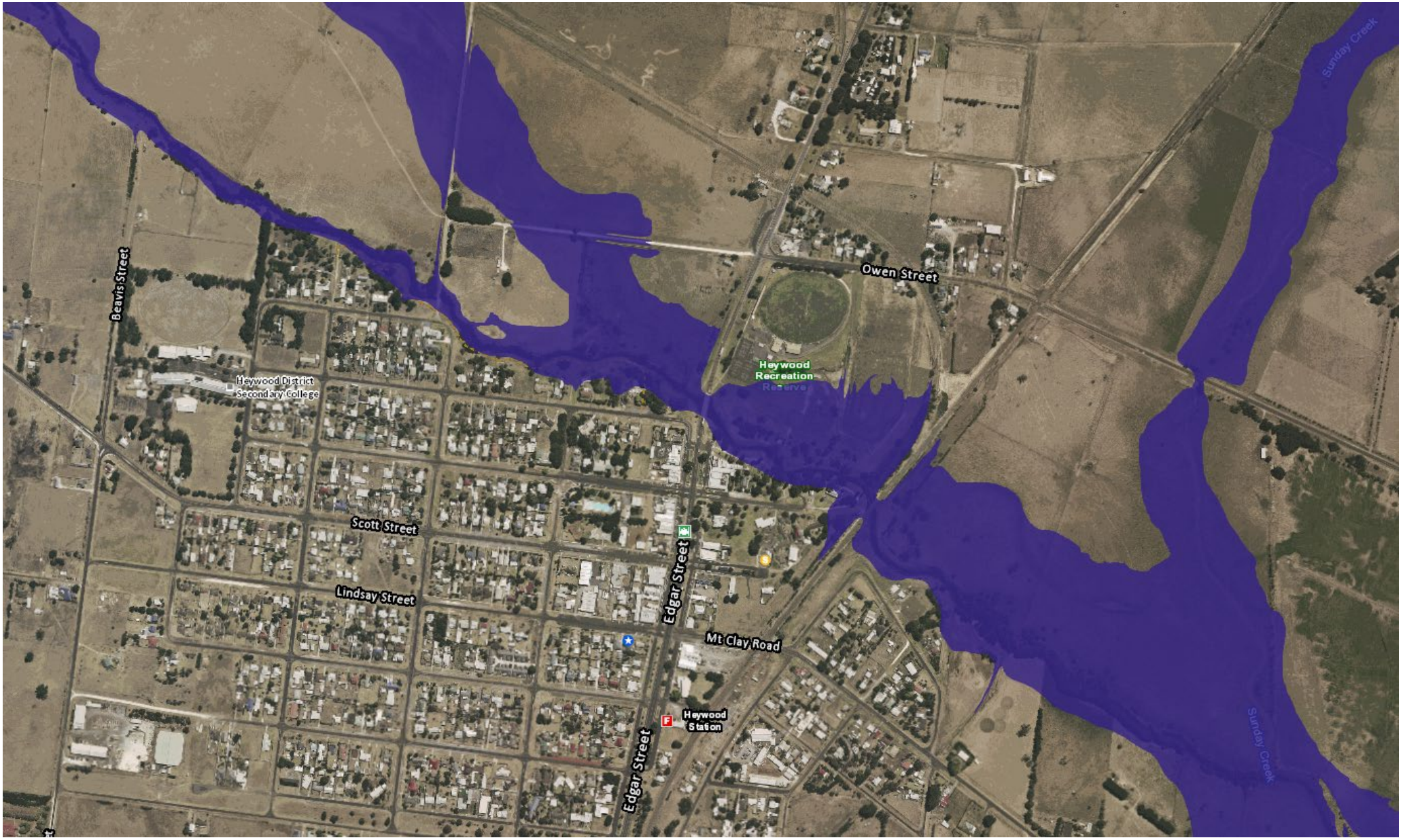


FloodZoom – Fitzroy River (& Darlot Creek) catchment 1% AEP Extent (1 in 100 ARI)

FloodZoom – Fitzroy River, Heywood 0.5% AEP Extent (1 in 200 ARI)

FloodZoom – Fitzroy River, Heywood 1% AEP Extent (1 in 100 ARI)

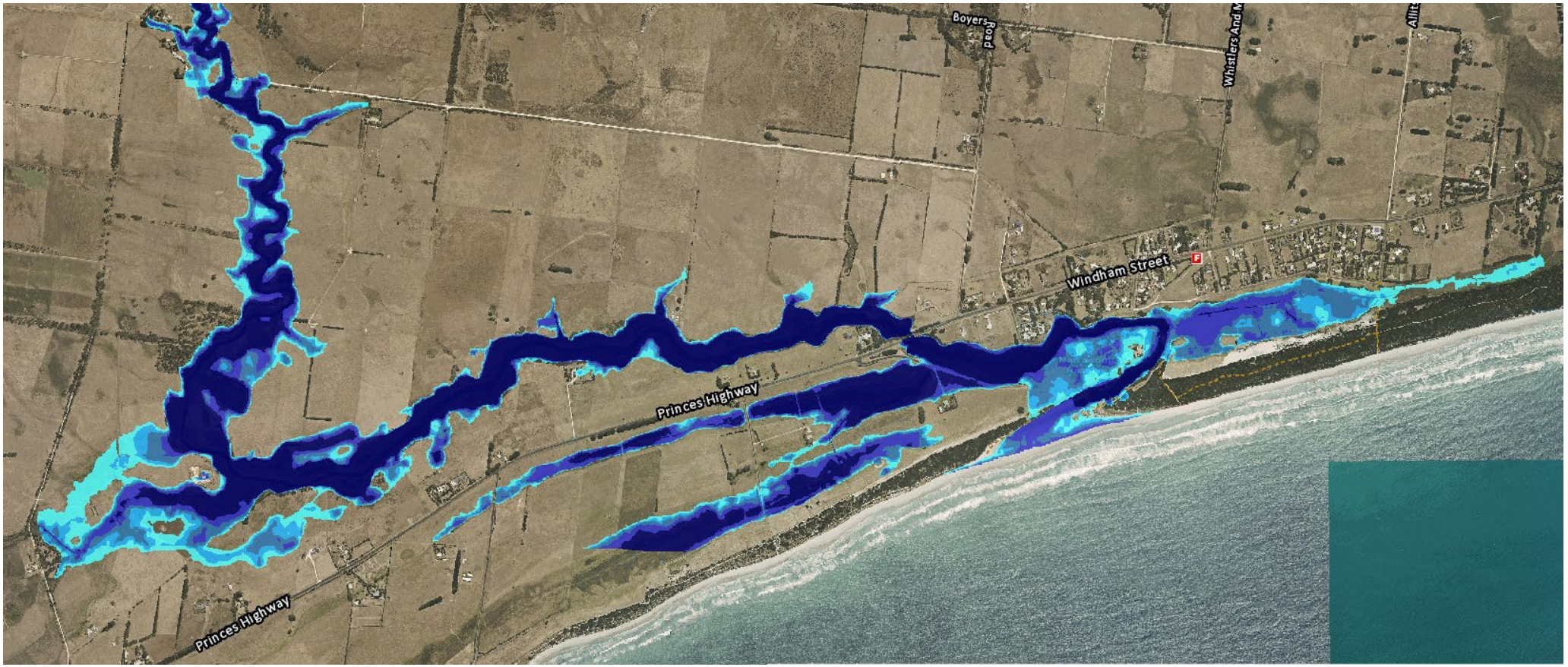
FloodZoom – Fitzroy River, Heywood 5% AEP Extent (1 in 20 ARI)



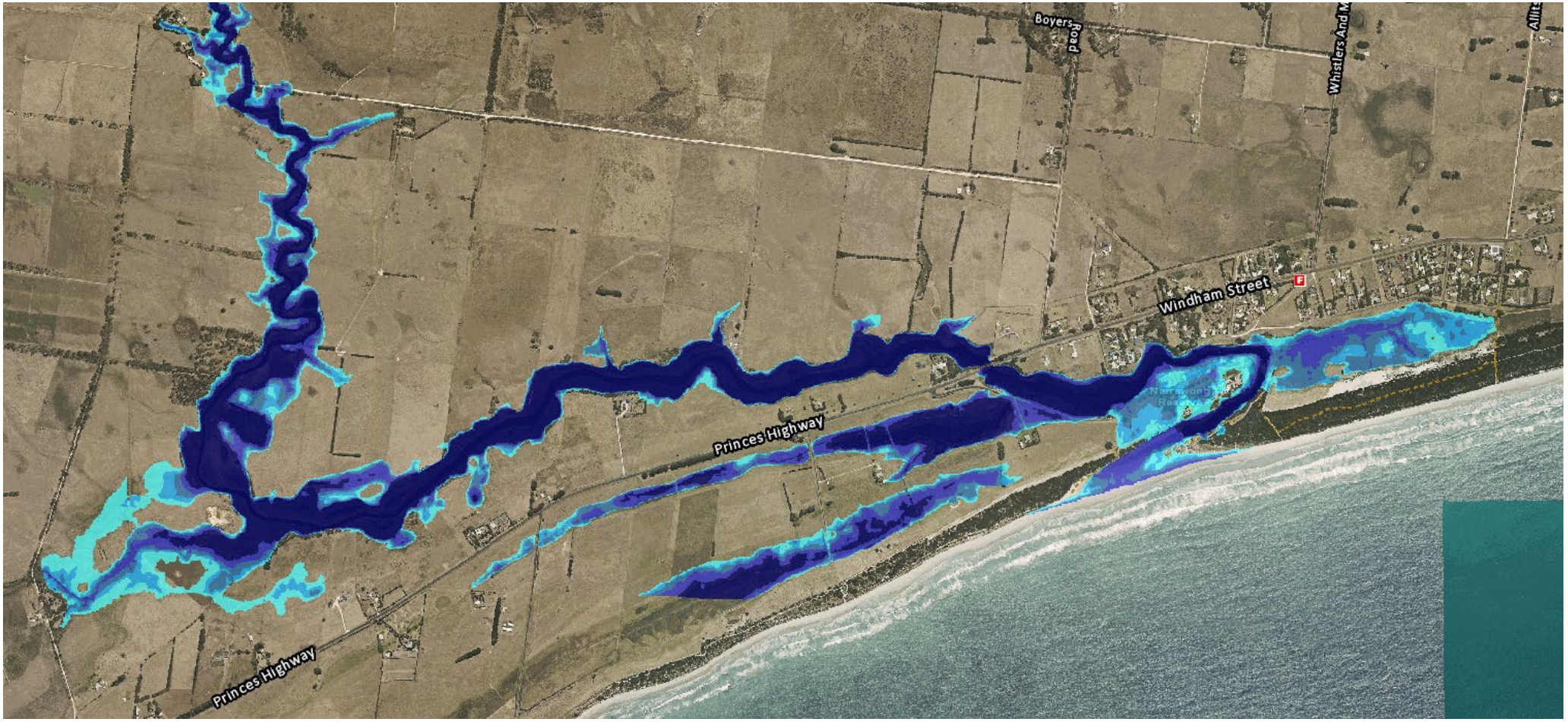
FloodZoom – Fitzroy River, Heywood 10% AEP Extent (1 in 10 ARI)

FloodZoom – Fitzroy River, Heywood 20% AEP Extent (1 in 5 ARI)

Narrawong, Surry River.

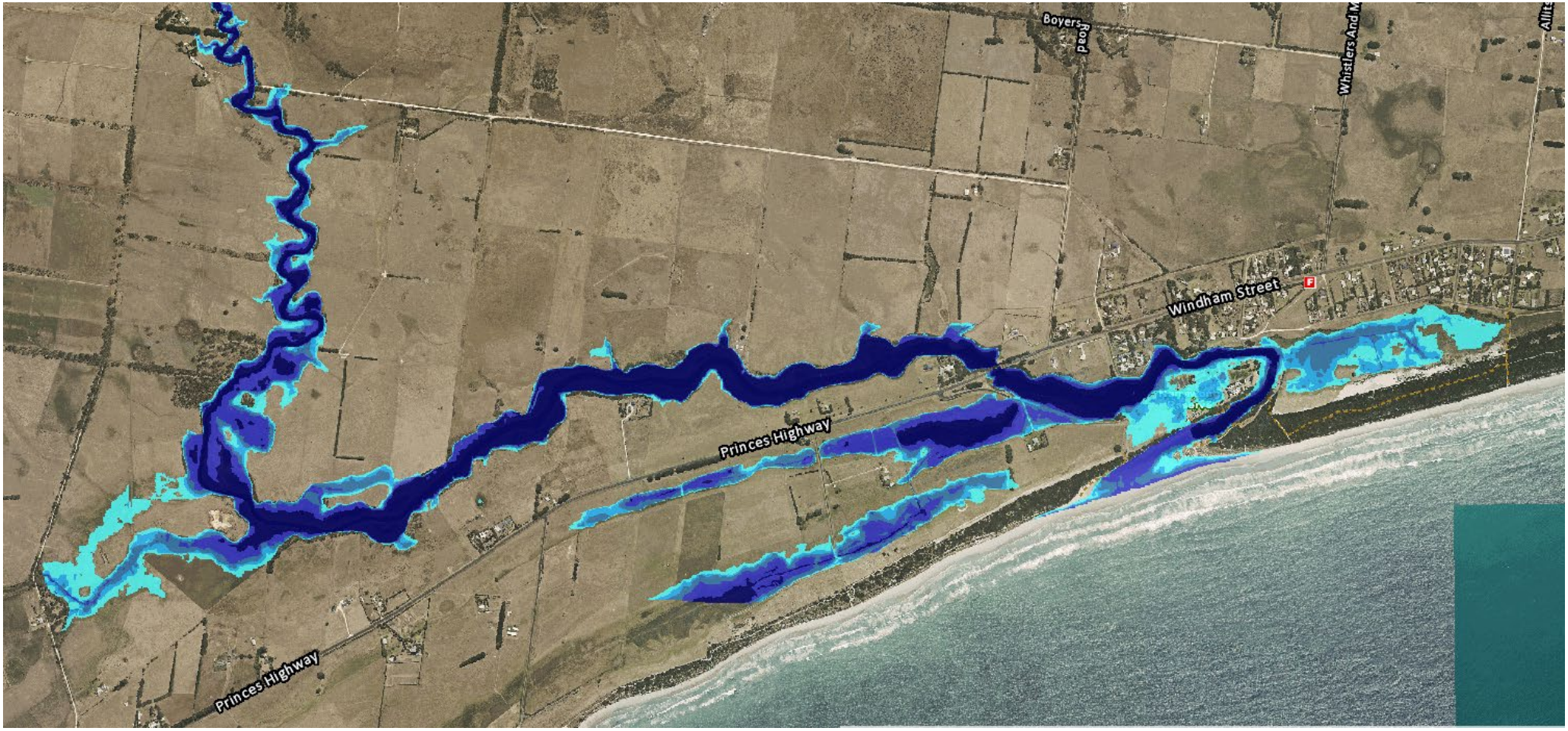


FloodZoom – Surry River, Narrawong 1% AEP Extent (1 in 100 ARI)



FloodZoom – Surry River, Narrawong 2% AEP Extent (1 in 50 ARI)

FloodZoom – Surry River, Narrawong 5% AEP Extent (1 in 20 ARI)



FloodZoom – Surry River, Narrawong 10% AEP Extent (1 in 10 ARI)

Appendix G – Severe Weather (Storm & Flood) Events

As control agency for flood in Victoria, VICSES is committed to ensuring the incorporation of local knowledge in decision making before, during and after incidents. This is guided by the VICSES policy 10.02 Local Knowledge.

Information from community sources including but not limited to observations, historical information, and information about current and possible consequences of an incident may be utilised to help inform the process of incorporating local knowledge into decision making during an incident. Field observers, Local Information Officers (LIOs) and other agency networks, where identified in this plan will help support this process.

Field Observers

Field Observers may support:

- the monitoring and reporting on observations of incidents. For example, during a flood event a Field Observer may be regularly taking photos via mobile app technology of the local stream gauge board if it is safe to do so.
- The provision of local advice regarding the consequences of incidents.
- Establishing linkages with key groups within local communities during emergency management planning and operational response. During operational response, this may be through an LIO or direct to the Intelligence cell. In some circumstances it may also be through a Community Liaison Officer if one is in place within the Public Information Unit or via a Community Field Officer.
- The provision of authorised information to community members where requested.

For the Glenelg Shire, identified field observers can be contacted via the VICSES RDO/RAC.

Local Information Officers

LIOs operating out of sectors or divisions provide a key communication interface to field observers and other sources of local knowledge.
For Glenelg Shire Local Information Officers identified can be contacted via VICSES RDO/RAC.

Intelligence Gathering System

VICSES has teamed up with Snap Send Solve to create a flood/storm and other VICSES hazard observation App and Portal.

The existing functionality of the smartphone app has been adapted for VICSES in a well presented and user-friendly way. The app is used to capture field observations during an event such as a flood, by filling in a simple form on a smartphone and using the camera to upload photos. This information is then displayed through an administration portal to collate and view the data.

The app component will be made available to trusted field observers in the community, and their observations will be visible via EMCOP where Intelligence personnel in Incident Management Teams can access them during events. The intent is that better access to local knowledge will add to information sources to maximise public information communications and response efforts.

Trusted field observers include both internal and external stakeholders (community members, ESOs such as CFA/VicPol). They can be activated and deployed by the VICSES RDO to use the app during an event and to report on valuable information with a level of accuracy.

The portal has been successfully integrated with EMCOP and eMap, both platforms are available to use in an IMT. The Snap Send Solve logo also appears within the intelligence section on the EM-COP desktop for easy access to the portal.

Important Notes

These arrangements do not give field observers and existing agency networks any responsibility for operational decisions. Nor does it permit field observers and existing agency networks to direct operational activity, including the management of flood levees.

Information provided from sources of local knowledge must be processed and validated before it can become intelligence to inform decision making.

Field Observations – Intelligence Team Guide, and Snap Send Solve & VICSES Portal Manual

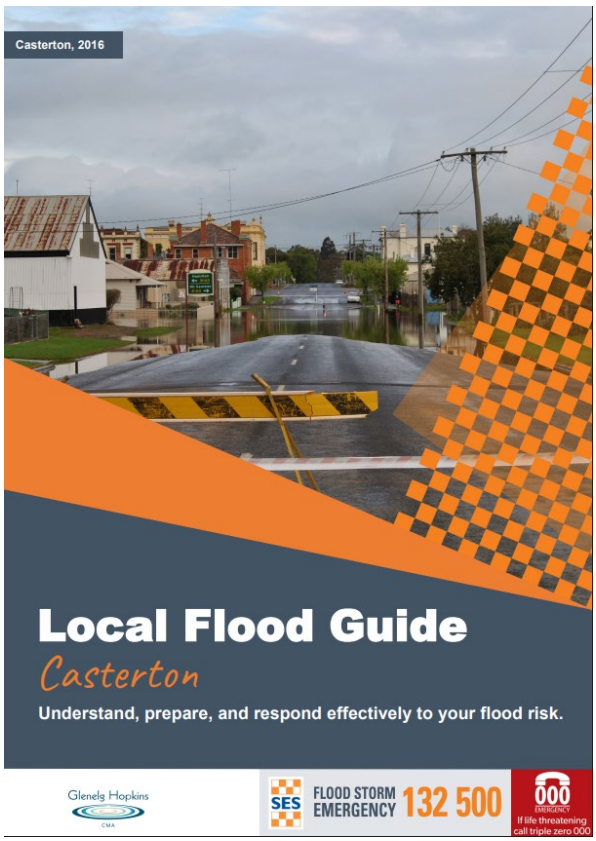
(EM-COP login required)

Appendix H – Local Flood Information

VICSES Local Flood Guides – Casterton

Casterton Local Flood Guide - pdf

Glenelg Hopkins Catchment Management Authority – Flood plain management & Flood portal
DEECA Flood Intelligence Platform – FloodZoom (FIP)



Appendix I – Storm Response

Consequences of severe thunderstorm

Severe thunderstorms and its associated weather conditions such as a tornado or microburst may have the same effect on the community and the natural environment. The difference is likely to be in terms of the geographic expanse. A severe thunderstorm can move over a large part of the land mass whereas in Victoria, a tornado or microburst is likely to be heavily concentrated in a small geographic area affecting one or two localities.

Consequences of storm damage typically involve the following:

- wind damage to residence and buildings,
- fallen trees damaging buildings and blocking roadways,
- flooding,
- road damage and road closures,
- power outages,
- telecommunications outages,
- impacts on a wide range of critical infrastructure,
- Entrapment of people in vehicles or in homes.

Bureau of Meteorology weather districts

The Glenelg Shire Municipality falls within the South West weather district.

Storm specific community education programs

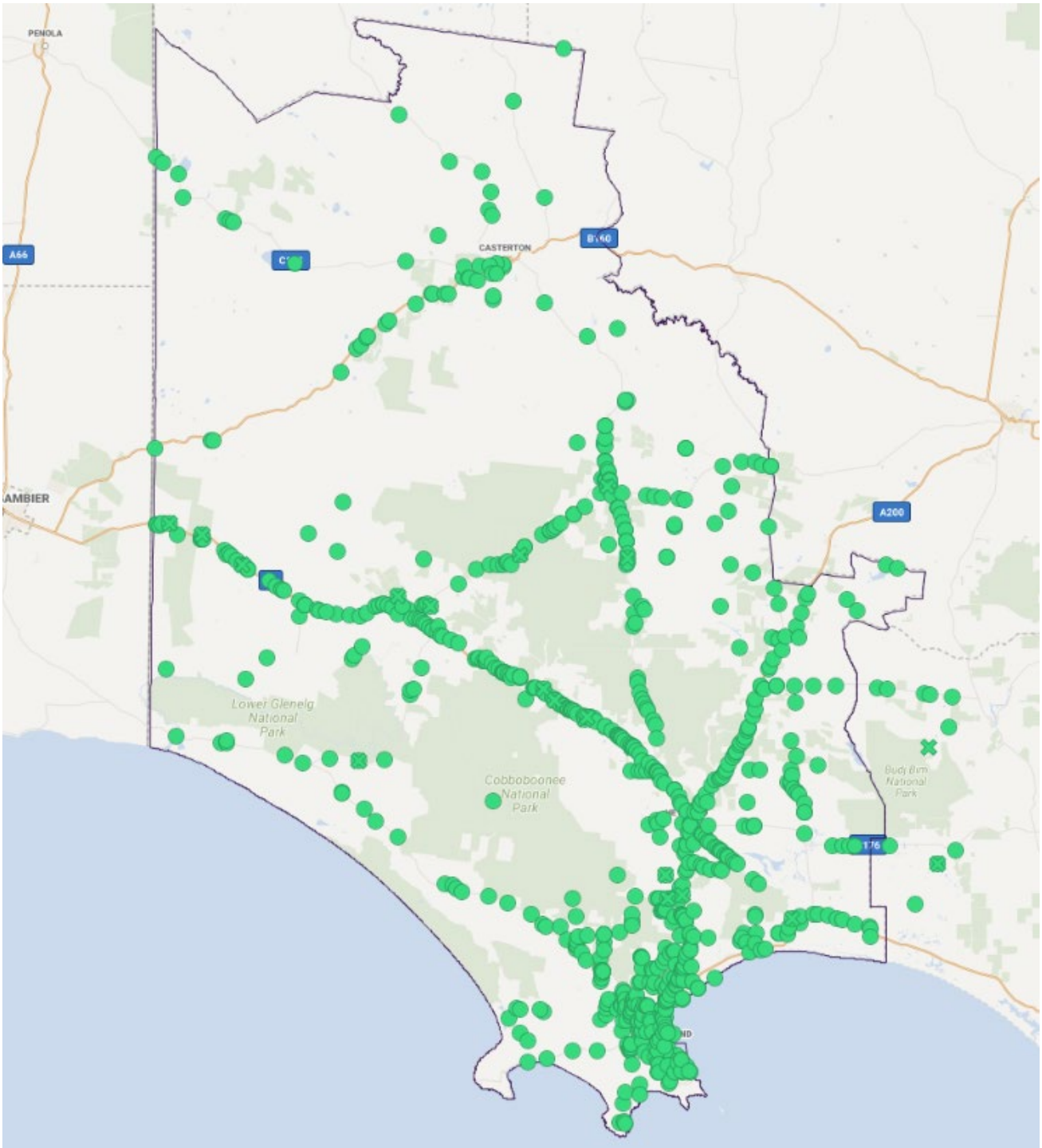
VICSES provides standard community education material on what to do during a storm on its public website.

Areas most likely to be affected by Storm damage

The Municipality of Glenelg has experienced and is susceptible to severe weather events all year around. Storms can occur anywhere and at any time. They often bring strong winds, flash flooding, large hailstones, and lightning. They can cause major damage and put your life at ris

Locations of historic storm damage

The following map indicates where the hot spots have been for historic storms of significance that have generated a larger than normal number of requests for assistance. Note that while the map is based on historic data, a severe storm can affect any part of the municipality.



VICSES Request for Assistance data 2018 – 2025.

Storm Damage Specific Response Arrangements

In the initial response phase, managing the response to widespread property damage resulting from a severe thunderstorm involves the coordinated assignment of resources to individual requests for assistance. It is akin to a fire service suddenly having to respond to a widespread outbreak of individual domestic house fires at the same time.

This is different to the approach taken for some other hazards such as riverine flooding or bushfire, where there is more likely to be a need to undertake common tasks around building defensive structures or control lines.

After the initial response phase, and in the most severe cases, relief and recover may take on a more familiar look to other natural hazards. However, there may be unique aspects that vary from planning associated with riverine flooding.

An example of this may be assisting vulnerable people. In a flood, the plans typically identify the areas subject to inundation, whereas in a storm, the damage may occur anywhere. As such, there may be high risk premises such as aged care or medical facilities that need assistance after a severe storm but are not identified as at risk from riverine flooding.

In the example of the 2021 cyclogenesis windstorm event that affected the Dandenong Ranges, parts of Gippsland, Macedon Ranges and other localities, the effect on the community lasted weeks with access and power restoration taking weeks to achieve. In the aftermath of that event the community gained value from the sector establishing early on, relief centres and community hubs, however, their establishment was hindered due to the consequences of the storm and flood event.

In addition, initial welfare calls made to community members by the Department of Families, Fairness and Housing (DFFH) and AusNet due to being listed as a power dependent customer or experiencing prolonged power outages were generally appreciated.

Incident Control Centres and Divisional/Sector command points

Unless stated otherwise here, the same pre-determined locations are to be used for Incident Control Centres

Each unit local headquarters listed below are suitable for use as a divisional or sector command point.

Unit name and Location/address	Divisional or sector command point suitability	Ability to manage small, medium or large-scale response
Warrnambool Unit **40 Walsh Rd** **Warrnambool 3280**	Divisional	Level 1 & 2
Hamilton Unit **58 Shakespeare St** **Hamilton 3300**	Divisional	Level 1 & 2

The nature of severe storm damage may preclude one of the above locations from being used as intended due to factors such as road blockages (trees down), damage to its infrastructure or loss of mains power. Alternative Control Facilities may be activated subject to Regional Controller.

Response planning and escalation

In the initial response phase, units will receive requests for assistance (RFA's) direct from Triple Zero Victoria and will typically respond in a business-as-usual mode, typically attending events in order of receipt or priority. This is in accordance with the VICSES Operations Management Manual.

As a unit begins to receive a volume of RFAs, it is important that it shifts focus to efficient use of resources through the application of:

- ensuring it has geographic situational awareness through visualising the location and spread of RFAs via EM-COP situation map or if unable to login, via the public access Emergency.vic.gov.au incidents and warnings page. This will prevent unnecessary travel times and can assist in allocating resources to manage multiple RFAs located in nearby streets.
- Triaging RFAs including call-backs to residents where appropriate to clarify needs and priority
- Seeking support via the RDO and escalation of response arrangements as appropriate (transfer of control from level 1 to level 2 response arrangements).
- Potential deployment of field observers and intelligence gathering via Snap Send Solve to assess areas where the storm impacted as in many cases, there will be unreported cases of damage that requires assistance from the community

Support arrangements – other agencies assistance

While VICSES units provide the initial response to storm damage, this section details the local arrangements for events where VICSES will require support from local emergency services and government departments/agencies to manage a large number of requests for assistance from the community.

For agencies that are likely to provide regular assistance such as CFA brigades and FRV, it is strongly encouraged that these organisations promote to its responders the benefit of completing the E-learn Maintain safety at storm and flood operations. This E-Learn is accessible via the EMV intranet site EM-Learning.

In the municipality, the following agencies typically provide immediate support to assist VICSES units in responding to RFAs.

- Glenelg Shire Council
- Department of Transport & Planning
- Country Fire Authority (CFA) / Fire Rescue Victoria (FRV)
- Victoria Police
- Forest Fire Management Victoria (DEECA, Parks Victoria)

The following headings details each agency, the resources that it typically has within the municipality and operational region within first response distance, and the types of tasks its crews are authorised and trained to be tasked with when supporting VICSES storm operations.

Glenelg Shire Council

During flood and storm events Council will support VICSES by providing logistical assistance, and coordination support as required, consistent with the Municipal Emergency Management Plan

Council will support with debris clearance, restoration of Council roads, drainage, and other Council-managed assets following flood or storm impacts

During business or after-hours Councils staff can be contacted by calling 1300 453 635 (1300 Glenelg).

Country Fire Authority

CFA brigades in the municipality are made up of a mix of urban and rural brigades.

Urban brigades typically have the capability to pump water from basements, cellars etc. General manpower as required. Activation time – pagers activated within 90 seconds, response within 8 minutest

Rural brigades typically have the capability to pump water from basements, cellars etc. General manpower as required. Activation time -pagers activated within 90 seconds, response time varies from 8-16 minutes.

Duty Officer contact arrangements – district duty activation via 000 (such as page/phone direct or activation via 000VIC)

Brigade locations and capabilities – pumpers, tankers, quick fill pumps

Pre-approved RFA types for initial tasking such as clearing blocked roads, chainsaw task limited to downed trees only (does not include felling), pumping storm water from premises.

Fire Rescue Victoria

Local FRV station (#71). Activities similar to CFA above if relevant to this municipality.

DEECA/FFMV

Far South West Duty Officer contact arrangements.

External panel of contractors

The Victorian Government has established a panel of contractors that are approved to provide services in emergencies without the need for quote or tender processes.

- Tree surgeons
- Bulldozers/debris clearance equipment such as front-end loaders and dump trucks.

Power & Water utilities

In the event of a severe storm, significant loss of mains electricity/power is highly likely. Ensuring there is effective coordination between the power distribution network operators and the Incident Control Centre will enhance community information and assist with elements of relief such as ensuring vulnerable people that require medical / or other life sustaining equipment remains functional.

Early liaison with the distribution networks may assist in establishing priorities for power restoration, identifying areas of outages and matching this with any known vulnerable premises such as aged care, medical facilities.

Powercor: Service faults 13 24 12; Life support customers 1300 364 301.

Wannon Water: Service outages & faults & 1300 926 666

Considerations for operating with other agencies

As other agencies are deployed to assist the IC should consider the following actions:

Establish a communications plan to enable the tasking of other agency resources. This may include:

- Use of other agency portable radios at the Sector/Division command point,
- Embedding an CFA member in the comms team so that they can page allocated tasks via EAS/VIPER direct to its brigade resources,
- Embedding an EMLO from other assisting agencies at the sector/Division command point for comms purposes,
- Use of mobile phones or sat phones to communicate,
- Determining an agreed response to downed powerlines as this is often a predominant hazard for storm events,
- Ensuring other agency personnel who are undertaking EMLO roles have access to EM-COP.

Preparing a briefing to support in-coming other agency resources to identify:

- staging area location and any safety issues with accessing it (closed roads/powerlines down),
- resources available such as re-supply of consumables (tarps/sandbags),
- welfare arrangements,
- duty time limitations (these should be consistent with VICSES SOP 003.

Severe Weather and Thunderstorm – Readiness and Response Arrangements			
Readiness Level (JSOP 2.03)	**Readiness Level 3**	**Readiness Level 4**	**Readiness Level 5**
Severe Weather or Severe Thunderstorm Warning	**Possible for:** • Average winds (60 - 80 km/hr) with wind gusts (101-115 km/hr). • Heavy rainfall. • Hail (3-5cm). • Flash flooding.	**Likely for:** • Average winds (60 - 80 km/hr) with wind gusts (101-115 km/hr). • Heavy rainfall. • Hail (3-5cm). • Flash flooding. **Possible for:** • Average winds (80+ km/hr) with wind gusts (115+ km/hr). • Intense rainfall. • Giant hail (5cm+). • Flash flooding. • Tornado. • Microburst.	**Likely for:** • Average winds (80+ km/hr) with wind gusts (115+ km/hr). • Intense rainfall. • Giant hail (5cm+). • Flash flooding. • Tornado. • Microburst.
Social Impacts to people	**Building Damage:** *Potential for building damage exists in all places with strong winds.* Dislocation of people due to uninhabitable dwellings.	**Building Damage:** *Potential for building damage exists in all places with strong winds.* Dislocation of people due to uninhabitable dwellings.	

Built Community / Essential Infrastructure		**Essential Infrastructure** **RMR Sites:** Casterton SAGRN - 570 Casterton-Penola Rd, Corndale. 3311. Casterton SMR – 112 Cues Lane, Casterton. 3311 Spencer Lookout SMR – Sheepwash Rd (Spencer Lane), Paschendale. 3315. Rennick – Princes Hwy, Mumbannar. 3304. Nelson – 42 Wade St, Nelson. 3292 Jones Ridge – 937 Winnap-Nelson Rd, Drik Drik. 3304 Greenwald – 4531 Princes Greenwald. 3304 Mount Kincaid – Blacks Lane, Mt Richmond. 3305. Mount Clay – 120 Angelino Rd, Narrawong. 3285. Cape Bridgewater – 8 Blowholes Rd, Cape Bridgewater. 3305. Portland – 25 Tyers St, Portland. 3305 **Fire Tower/lookout:** Corndale – 750 Casterton-Penola Rd, Corndale. Annya – 167 Loop Rd, Hotspur. 3303 Balrook – 1143 Winnap-Nelson Rd, Frik Drik. 3304. Mt Clay – 120 Angelino Rd, Narrawong. 3285. Rennick (HVP) – Princess Margaret Rose Caves Rd, Mumbannar. 3304. **Renewable Energy**: Cape Bridgewater wind farm Cape Nelson South wind farm Cape Sir William Grant wind farm Cape Nelson North wind farm

Environment Ecosystems Tourism		**National/State Parks:** Roseneath State Forest Nangeela State Forest Drajurk State Forest Killara State Forest Stokes State Forest Annya State Forest Hotspur State Forest Mt Clay State Forest Lower Glenelg National Park Cobboboonee National (& Forest) Park Narrawong Flora Reserve Mt Richmond National Park Discovery Park Coastal Park Budj Bim National Park (South west section) Rennick State Forest Wilkin Flora and Fauna Reserve Weecurra State Forest Tooloy Lake Mundi Wildlife Reserve Bahgallah State Forest Crawford River Regional Park Brimboal State Forest (southern section) Dergholm State Park **Trails & Walks:** Great South West Walk **Caravan Parks & Camp Grounds:** Island Park Caravan Park, M Carmichael Drive Casterton. Lake Monbeong, Lake Monbeong Rd, Nelson VIC 3292 Camping grounds along Glenelg River between Pines Landing canoe camping area (Drik Drik) and Lasletts canoe camping area (Sandy Waterholes Track, Mumbannar, 3304). Fitzroy River Camping ground. Sawpit (Boyers Road Mount Clay SF)

		Annya Campground (Annya SF) Fort O'Hare (Dartmoor) Long Lead Picnic Campground (Nangeela SF) Big 4 Narrawong Island Holiday Park Holiday Lifestyle Henty Bay, Dutton Way, Bolwarra Portland Seaside Holiday Park, Dutton Way, Bolwarra Portland Tourist Park, Garden ST, Portland. NRMA Portland Bay Holiday Park, Bentinck St Portland. Portland Holiday Village, Percy St Portland. Kywong Caravan Park, Nelson Rd, Nelson. Pinewood Caravan Park, Henty Hwy Heywood.

Economic Roads / infrastructure Livelihoods Industry Cost of recovery	**<u>Major Roads</u>** **Tree down – traffic hazards:** **<u>Local Roads</u>** **Tree down – traffic hazards:** **Flash Flooding:** *Potential for flash flooding exists in all places with intense rainfall.*	**<u>Major Roads (DTP)</u>** **Tree down – traffic hazards:** A1 Princes Highway A200 Henty Highway B160 Glenelg Highway C176 Woolsthorpe – Heywood Rd C186 Myamyn – MacArthur Rd C187 Dartmoor – Hamilton Rd C192 Portland – Nelson Rd C193 Bridgewater Rd C195 Portland - Casterton Rd C198 Casterton - Penola Rd C211 Casterton – Naracoorte (Apsley) Rd **<u>Local Roads (LGA)</u>** **Tree down – traffic hazards:** Bahgallah Rd Cape Nelson Rd Condah – Coleraine Rd Cockatoo Valley Rd Digby – Strathdownie Rd Ettrick – Condah Rd Foleys Rd Golf Course Rd Holmes Rd Hotspur – Grassdale Rd Kentbruck Rd Mt Clay Rd Surry River – Gorae Rd Westlakes Rd Winnap – Nelson Rd

Public Administration Political Government services ability to operate	**Local Government services:**	Refer to Glenelg Shire online mapping (public).
Community Resilience Community wellbeing Social networks Heritage Community Services	**Heritage:** **Community services:**	Refer to Glenelg Shire online mapping (public). Community facilities including cultural, care and admin within Cultural layers.