

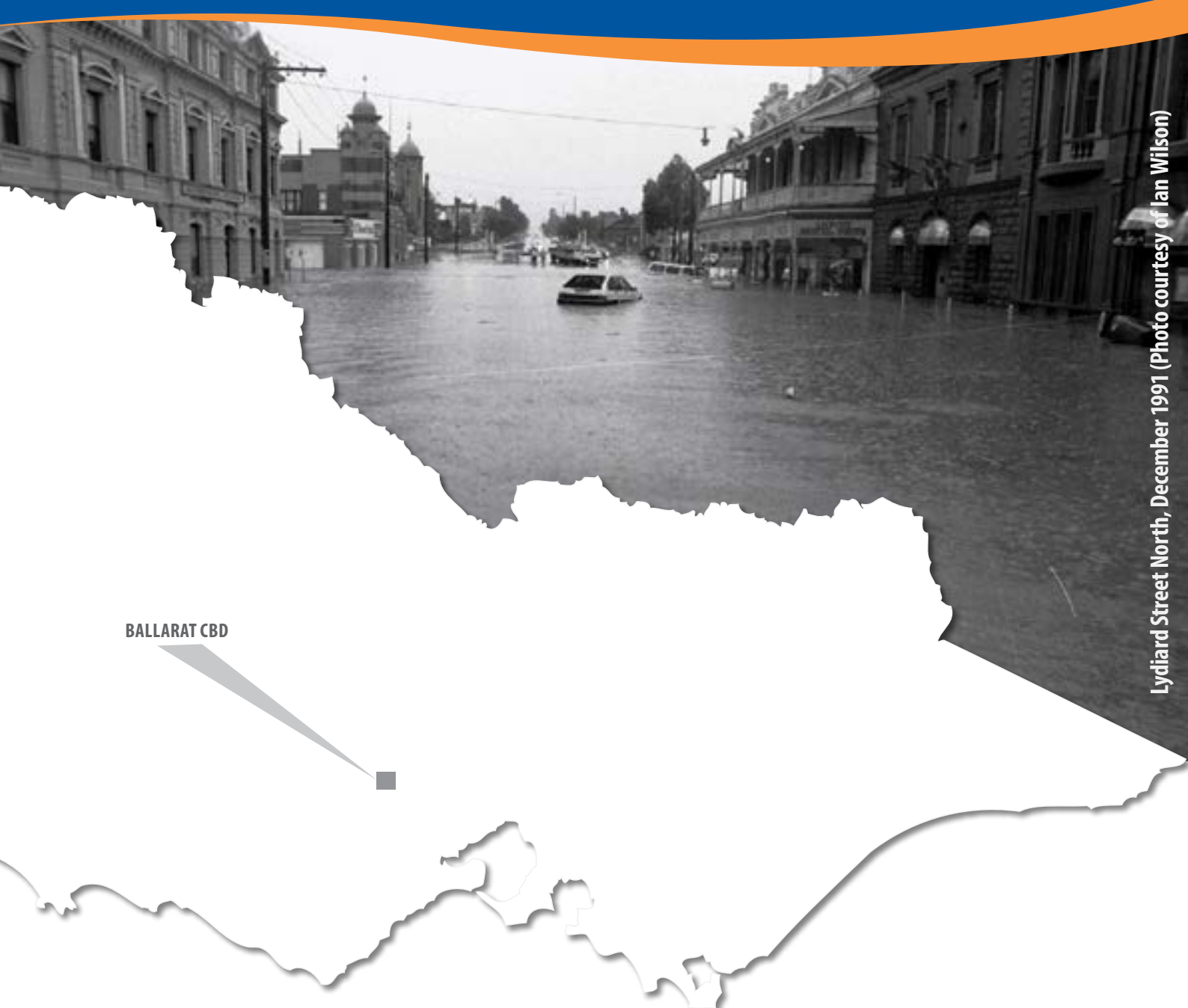


Local Flood Guide Ballarat Central Business District



FloodSafe

Flood information for the Gnarr Creek and Yarrowee River at Ballarat Central Business District



Lydiard Street North, December 1991 (Photo courtesy of Ian Wilson)

BALLARAT CBD



FLOOD STORM EMERGENCY **132 500**

For more information visit **ses.vic.gov.au**

The Ballarat Central Business District (CBD)

Much of the Ballarat CBD is vulnerable to flash flooding from Gnarr Creek and the Yarrowee River. The area covered by this guide lies between Humffray Street to the east, Dawson and Yuille Streets to the west, Market and Mair Streets to the north and Dana and Eastwood Streets to the south.

Gnarr Creek flows through Ballarat North, and enters underground channels from near the Creswick Road roundabout to where it joins Yarrowee River near Grenville Street.

Are you at risk of flooding?

Flooding in Ballarat CBD is usually caused by very heavy rainfall from local thunderstorms. These flash floods rise and fall quickly, so you may not receive any warning. Flash floods can result in swift water running down streets and footpaths posing a serious risk to pedestrians, particularly children.

Flooding from Gnarr Creek is the major flood risk to the Ballarat CBD. During heavy rain Gnarr Creek can overflow its channel near Doveton St and flow down Market, Mair and Grenville Streets before flooding the Bridge Mall. Gnarr Creek rises very quickly during major storms and can take as little as two hours to reach peak flood heights.

The Yarrowee flood threat has been substantially reduced by the construction of the Western Freeway Bypass as it provides protection by retarding flash flood surges down the Yarrowee River. Flood retarding basins have been constructed in the upper catchment of Gnarr Creek.

These significant drainage and flood mitigation works undertaken since 1991 have improved drainage, however there is still a high risk of major flash flooding in the CBD.

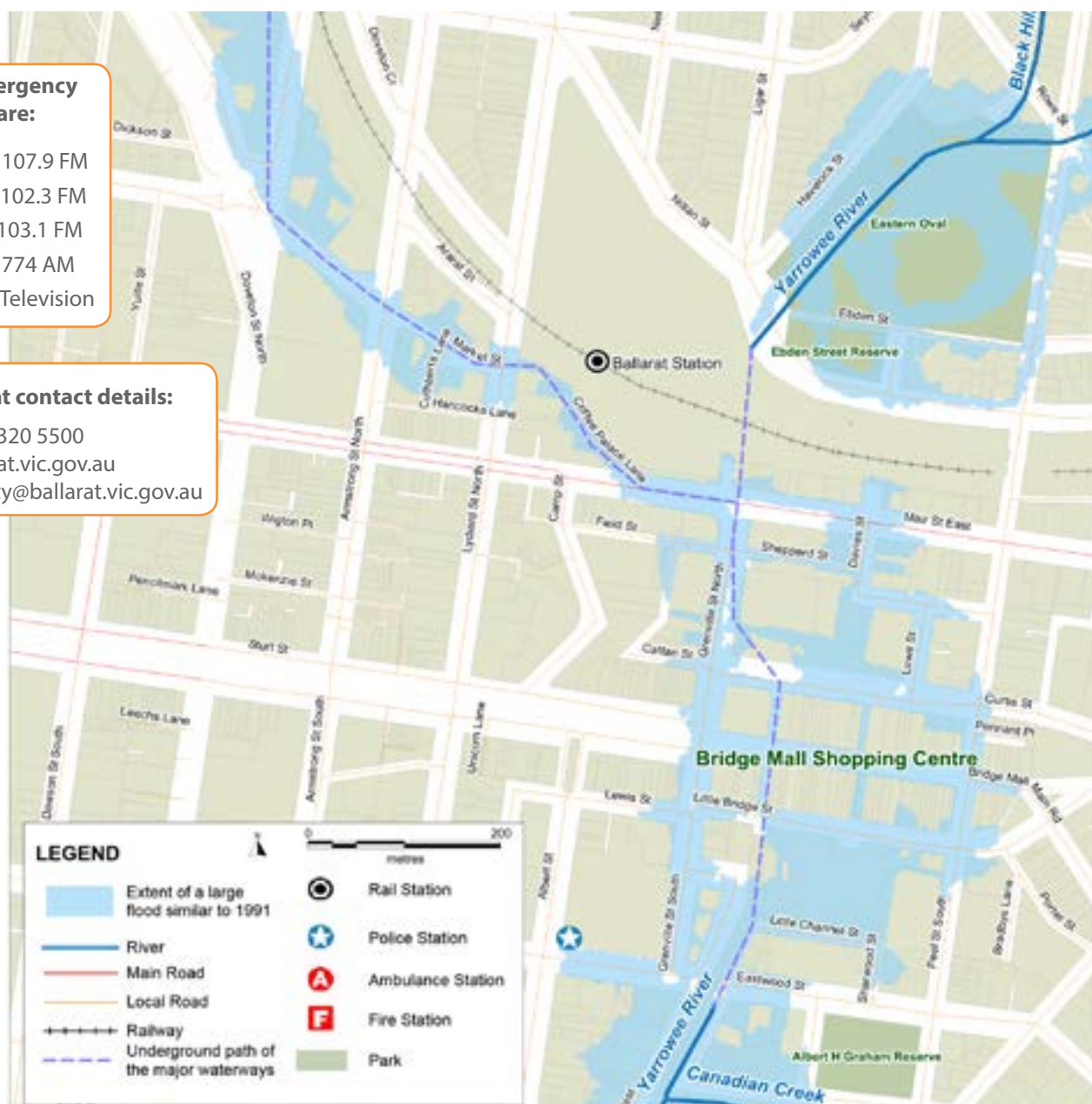
The map below shows areas that would be flooded if a large flood similar to the December 1991 flood happened today.

Your local emergency broadcasters are:

- ABC Radio 107.9 FM
- 3BA Radio 102.3 FM
- Power FM 103.1 FM
- ABC Radio 774 AM
- SKY NEWS Television

City of Ballarat contact details:

Phone: (03) 5320 5500
 Web: ballarat.vic.gov.au
 Email: ballcity@ballarat.vic.gov.au



Disclaimer

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Did you know?

The CBD has a history of flash flooding, with large flash floods recorded nine times in the 1800's and more recently in 1909, 1933, 1988, 1990, 1991 and 2011.

The December 1991 flash flood was one of the most severe flood events in living memory. It occurred after 76 millimetres of rain fell in a very intense 2 hour burst. The impacts of this flood were significant;

- Businesses in Doveton Street North, Market Street, Lydiard Street, Mair Street and Bridge Mall precinct were flooded above floor level.
- Residential properties in Doveton Street North were severely flooded.
- Road closures included Doveton, Market, Lydiard, Mair, Grenville, Eastwood, Curtis and Peel Streets.
- The financial loss incurred by the affected businesses from the 1991 flood exceeded \$90 million.

The December 1988 flood impacted similar areas to the 1991 flood. If a flood the size of the 1988 flood happened today 358 buildings would be flooded above floor level. The depth of the water in 1988 was 40 centimetres lower than the 1991 flood at the corner of Creswick Road and Market Street.

Floods like this or worse could occur again. If you live close to a creek, river or in a low-lying area you may be at risk of flooding.

Even if your home or business is not affected by flood water, you may be affected as roads could be closed, and power, sewerage and telephone services may be interrupted.

Past floods impacting Ballarat CBD

Year	Rainfall reported	Impacts
1909	37mm in 9 hours	Yarrowee River in flood but most damage done by the storm.
1933	148mm over approximately 48 hours	Yarrowee River in flood. White Horse Bridge across the Yarrowee River was destroyed.
December 1988	Approximately 100mm over 2 days	Gnarr Creek flooded with buildings in Creswick Road and Lydiard Street North as well as Mair and Curtis Streets.
February 1990	Approximately 100mm over 3 days	Flash flooding affecting the CBD.
December 1991	76mm in 2 hours on an already wet catchment	The largest recent flood event for the Gnarr Creek System, with the Lydiard Street and Bridge Mall areas most severely affected.
October 2011	31mm during a storm	Businesses in Mair Street and the Bridge Mall affected by flash flooding and storm damage.

Gnarr Creek and Yarrowee River flood impacts on the Ballarat CBD

While no two floods are the same, the following table indicates the likely impacts of flooding in Ballarat CBD. These impacts are based on rainfall amounts at the Ballarat Aerodrome Rainfall Gauge over a six or 12 hour period. Residents can view rainfall data for Ballarat Aerodrome (Ballarat AWS) by searching "Ballarat Aerodrome Rainfall" in your search engine.

Remember that the effects of rainfall are greater when soil conditions are saturated (wet catchment), and that the rainfall over the CBD may be quite different than that at the Ballarat Aerodrome Rainfall Gauge.

Rainfall levels and flooding

The following table gives an indication of what rainfall levels are likely to cause flooding in the area. The impact of rainfall can vary due to a number of factors including how wet the ground is prior to rainfall and how quickly it falls.

Rainfall	Potential Impacts
49mm in 6 hrs to 62mm in 12 hrs	Flooding roads Minor inundation in the CBD
56mm in 6 hrs to 71mm in 12hrs	Water flowing along Doveton, Market, Armstrong, Lydiard and Mair Streets, towards Grenville Street, with possible road closures and evacuations. Some properties impacted.
67mm in 6 hrs to 84mm in 12 hrs	Riverine and flash flooding across the urban areas of the municipality. Water flowing through the Peel Street North underpass Wider inundation through the CBD impacting Peel, Bridge, Anderson and Steinfeld Streets and possible closure of Dana Street.
82mm in 6 hrs to 103mm in 12 hrs	Water more extensive in Lydiard Street Additional inundation through the CBD including additional properties in Mair Street. Possible road closure of Havelock Street and properties impacted.
94mm in 6 hrs to 118mm in 12 hrs	Possible closure of Creswick Road Additional flooding of the streets immediately downstream of the CBD such as Anderson, Albert and James Streets. Water flowing through the Peel Street North underpass.



Gnarr Creek flood waters flowing down Market Street south of Doveton Street near Creswick Road roundabout, December 1991. Photo courtesy of The Ballarat Courier

About Flood Warnings

What warnings mean

There are no official warnings for Ballarat Central Business District, however, you can monitor rainfall to see whether Ballarat is likely to flood.

A **Flood Watch** means there is a developing weather pattern that might cause floods in one or two days.

Victoria State Emergency Service (SES) will give information about how floodwater might affect people and properties. This includes safety messages to remind you what to do.

As Ballarat CBD is prone to flash flooding, Severe Weather Warnings and Severe Thunderstorm Warnings are your earliest triggers to activate your Home Emergency Plan.

Severe Thunderstorm Warnings

Thunderstorms are classified as severe due to their potential to cause significant localised damage through: wind gusts, large hail, tornadoes or flash flooding. Severe Thunderstorm Warnings are issued to the community by BoM.

Severe Weather Warnings

These warnings are issued to the community by BoM when severe weather is expected that is not directly related to severe thunderstorms or bushfires. Examples of severe weather include damaging winds and flash flooding.

Flash flooding results in water rising rapidly and flowing powerfully and quickly. Ballarat residents should listen out for warnings with flash flooding and remember that flash flooding:

- Occurs so fast that it is difficult to provide a detailed warning. Often it arrives without any warning.
- Usually results from heavy rainfall falling during short, severe storms.

Listen to Severe Thunderstorm Warnings and Severe Weather Warnings for the Ballarat area. If you hear a warning, check the BoM and SES websites for information and advice. You can monitor rainfall conditions in Ballarat on the BoM website at bom.gov.au.

Know your local environment

If you live, work or visit Ballarat CBD, keep an eye on the weather, especially heavy or sustained rainfall in less than 24 hours.

Knowing your local area and making your own observations are a great way to help you prepare for future floods.

Remember, you may not receive any official warning.

Emergency assistance may not be immediately available. Be aware of what is happening around you to stay safe.

Never wait for a warning to act.

Emergency Alert

SES may provide alerts to the Ballarat CBD community through the Emergency Alert telephone warning system. All emergency service providers can use an Emergency Alert to warn communities about dangerous situations by voice message to landline telephones or text message to mobile phones.

If you receive a warning, make sure that all family members, people at work, and your neighbours are aware of the situation.

If you receive an Emergency Alert you should pay attention and act. It could mean life or death.

If you need help to understand a warning, ask a friend, neighbour or family member.

During flash flooding

When flash flooding is likely, if you decide to leave, do so **well before** flooding occurs. Leaving early before flooding occurs is always the safest option. You may decide to shelter with neighbours, family or friends in a safer area.

Evacuating through floodwater is very dangerous and you may be swept away. **Never** drive, ride or walk through floodwater.

If you do not leave early enough and become trapped by rising floodwater inside your home or business, stay inside your building and seek the highest part such as a second storey.

Stay there and call Triple Zero (000) if your emergency is life-threatening.

If you are staying in a caravan or temporary dwelling, move to higher ground **before** flooding begins.

Safety in flash flooding

Driving through floodwater is the number one cause of adult deaths during floods. Never walk, ride, swim or drive through floodwater.

Playing in floodwater is the number one cause of death during floods for children and teenagers. Floodwater is filled with unseen dangers, harbouring hidden debris such as broken glass, shattered timbers and twisted metals as well as sewage, putrid food waste and toxic chemicals.

Floodwater is toxic. Never allow your children to play or swim in floodwater.

Now – before a flood

- Check if your home or business is subject to flooding. For more information, contact City of Ballarat.
- Develop an emergency plan.
- Check if you could be cut off by floodwater.
- Know the safest way to go if you decide to leave your property and plan an alternative route.
- Check your insurance policies to ensure your equipment, property and business are covered for flood damage.
- Keep a list of emergency numbers near the telephone.
- Put together an emergency kit.
- Stay alert for weather warnings and heavy rainfall.

When a flood is likely

- Take action. Follow your emergency plan.
- Listen to your radio for information and advice.
- Check your neighbours are safe and know about the flood.
- Stack possessions on benches and tables with electrical goods in the highest places.
- Anchor objects that are likely to float and cause damage.
- Move rubbish bins, chemicals and poisons to the highest place.
- Put important papers, valuables, photos and other special personal items into your emergency kit.
- Business owners should raise stock, business records and equipment onto benches and tables.
- Rural property owners should move livestock, pumps and machinery to higher ground.
- If you are likely to be isolated, have enough food, drinking water, medicine, fuel and other needs to last at least three days.
- Do not forget pet food and stock feed.

Your emergency plan

Emergencies can happen at any time, with little warning. People who have planned and prepared for emergencies will reduce the impact and recover faster.

Taking the time to think about emergencies and make your own plan helps you think clearly, have more control and make better decisions when an emergency occurs.

Your emergency plan should identify:

- The types of emergencies that might affect you.
- How those emergencies might affect you.
- What you will do before, during and after an emergency.
- Where to get more information.
- Where you will go if you evacuate and the best way to go in different circumstances.
- A list of phone numbers you will need, including emergency service providers, your insurance company, friends and family.



Visit ses.vic.gov.au to obtain a copy of your Home Emergency Plan workbook

Evacuation

During a flood, police, SES, and other emergency service providers may advise you to evacuate to keep you safe. It is important that you follow this advice.

There are two types of evacuation notices that may be issued via your emergency broadcaster during a flood:

- **Prepare to evacuate** – means you should act quickly and take immediate action to protect your life and property. Be ready to leave your property.
- **Evacuate immediately** – you must leave immediately as there is a risk to lives. You may only have minutes to evacuate in a flash flooding situation.

Do not return to your home until you are sure it is safe to do so. You do not need to wait to be told to evacuate.

Emergency Kit

Every home and business should have a basic emergency kit:



Check your kit often. Make sure things work. Replace out of date items.

When a warning is issued, have ready for use or pack into your kit:



I need to add:

Write your list here. Tick items as you pack them into your kit.

- Special needs _____
- Photos _____
- Family keepsakes _____
- Valuables _____
- Documents _____
- Other _____

During and After a Flood

Never
Drive, Ride or Walk
Through Floodwater

During a flood

When flooding has begun:

- **Never drive, ride, swim or walk through floodwater.**
- Remember that floodwater can be deeper than you think and can hide damaged roads and bridges.
- Never let your children play or swim in floodwater. It is dirty, dangerous and deadly.
- Tune in to your emergency broadcasters: ABC Local Radio, Commercial Radio, designated Community Radio Stations and SKY NEWS Television.
- In life-threatening emergencies, call Triple Zero (000).
- For SES emergency assistance during floods and storms call 132 500.
- Stay away from all waterways including drains and culverts.
- Stay away from fallen powerlines as electricity travels easily through water.
- Be aware that animals such as snakes, rats, spiders and other pests may be on the move during a flood. These animals can come into houses and other buildings or hide around sandbags.
- Keep in contact with neighbours.
- Be prepared to act quickly.

After a flood

Flood dangers do not end when the water begins to fall. To make sure you stay safe:

- Keep listening to local emergency broadcasters.
- Do not return home until you are sure that it is safe.

Once you return to your home:

- Investigate the structural safety of your building.
- Keep the electricity and gas off until checked and tested by a professional.
- When entering a building, use a torch to light your way. Never use matches or cigarette lighters as there may be gas inside.
- Take photographs of all damage for insurance.
- Drink bottled water or boil all drinking water until advised that the water supply is safe.
- Throw away any food or medicines that may have been in contact with floodwater or affected by power outages.
- Clean your home straight away to prevent disease.

How SES helps the community

Victoria State Emergency Service (SES) is a volunteer based emergency service. Although SES volunteers attempt to reach everyone prior to or during an emergency, at times this is not possible, especially during flash flooding which occurs so quickly. Therefore it is advisable for you to be prepared for emergencies so that you can share responsibility for your own wellbeing during those times. In a flood, SES assistance may include:

- Giving flood advice
- Protecting essential services
- Helping to protect infrastructure
- Rescuing people from floodwater
- Advising of an evacuation

To assist your preparation, it is recommended that you obtain a copy of the SES Home Emergency Plan by visiting ses.vic.gov.au.



Emergency Checklist

NOW: Flood preparation

- Check if your insurance policies cover flooding.
- Keep this list of emergency numbers near the telephone.
- Put together an emergency kit and prepare a home or business emergency plan, see ses.vic.gov.au.

When you hear a Flood Watch or weather warning

- Listen to Severe Weather Warnings for flash flood.
- Listen to radio and check the SES website for more information and advice.
- Go over your emergency plan. Pack clothing and other extra items into your emergency kit and take this with you if you evacuate.
- Leave early if you intend to evacuate.

When flooding may happen soon (heavy rainfall)

- Make sure your family members and neighbours are aware of what is happening.
- Conditions change rapidly, roads and escape routes can be covered or blocked. Don't forget to take pets and your medicine with you.
- Put household valuables and electrical items as high as possible.
- Turn off water, gas and electricity at the mains.
- Secure objects likely to float and cause damage.
- If you are staying in a caravan or temporary dwelling, move to higher ground BEFORE flooding begins.

During the flood

- For SES emergency assistance, call 132 500.
- DO NOT drive, ride, swim or walk through floodwater. This is the main cause of death during floods.
- NEVER allow children to play in floodwater. This is the main cause of death during floods for children and young people.
- Stay away from drains, culverts and waterways as water can flow quickly and have strong currents.
- Stay well clear of fallen trees, powerlines and damaged buildings.
- If you are trapped inside a building, stay inside and shelter in the highest place. Call Triple Zero (000) in a life-threatening emergency.

After the flood: recovery

- Have all electrical and gas equipment professionally tested before use.
- If your property has been flooded, check with City of Ballarat for information and advice.

For more information visit:

-  ses.vic.gov.au
-  [facebook.com/vicses](https://www.facebook.com/vicses)
-  twitter.com/vicseswarnings

Emergency Contacts

Life-threatening emergency Triple Zero
Police Fire Ambulance **000** TTY106

Victoria State Emergency Service (SES) **132 500**
For SES emergency assistance

SES information line **1300 842 737**
Operates during major floods or storms **1300 VIC SES**

VicEmergency emergency.vic.gov.au
Victorian emergency warnings

Bureau of Meteorology (BoM) **1300 659 217**
Weather information, forecasts, warnings bom.gov.au

National Relay Service (NRS) relayservice.gov.au
The deaf, hearing or speech impaired can call SES or Triple Zero (000) using NRS:

	DIAL	THEN ASK FOR
■ Speak and Listen (SSR) users phone	1300 555 727	132 500
■ TTY / Voice users phone	13 36 77	132 500

VicRoads **13 11 70**
Road closures and hazard reporting service vicroads.vic.gov.au

City of Ballarat Contact Details

Phone: (03) 5320 5500
Email: ballcity@ballarat.vic.gov.au
Web: www.ballarat.vic.gov.au

Weather District: Central

Catchment Management Authority: Corangamite Catchment Management Authority

Emergency Broadcasters

Emergency broadcasters include ABC Local Radio, designated commercial radio stations across Victoria and SKY NEWS Television.

-  ABC Radio 107.9 FM
-  3BA Radio 102.3 FM
-  Power FM 103.1 FM
-  ABC Radio 774 AM
-  SKY NEWS Television

Complete the following and keep this information handy close to the phone:

Your electricity supplier: _____

Your gas supplier: _____

Doctor: _____

Vet: _____

Insurance

Policy Number: _____

Phone Number: _____