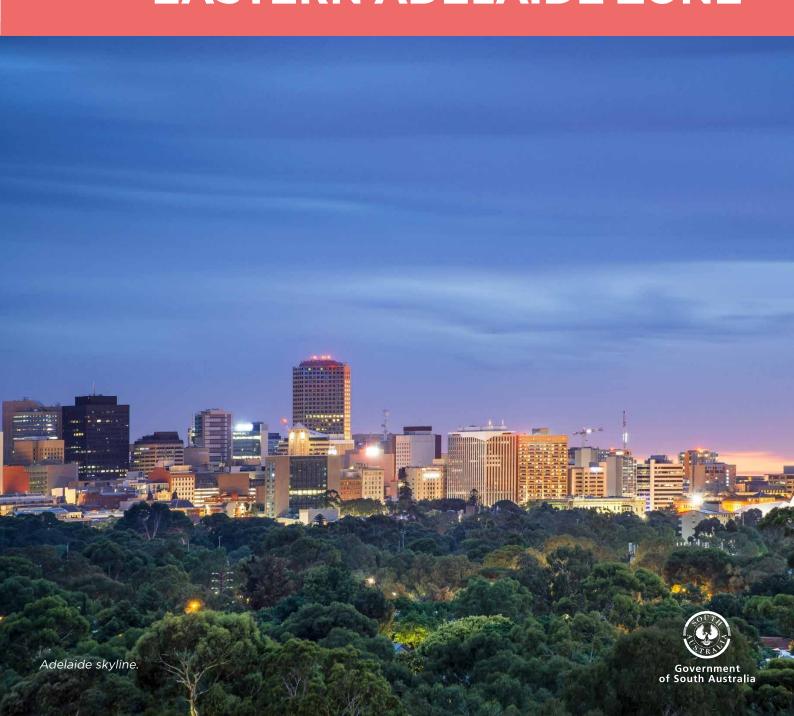
## KEY HAZARDS & RISKS SUMMARY

**Emergency Management Plan** 

## **EASTERN ADELAIDE ZONE**



#### **CONTENTS**

INTRODUCTION	3
TOP HAZARDS AT A GLANCE	4
EASTERN ADELAIDE ZONE IN FOCUS	6
UNDERSTANDING OUR RISK PROFILE	7
MAJOR HAZARDS	9
1. Extreme Weather - Storm	10
2. Extreme Weather - Heat	- 11
3. Flood	12
4. Bushfire	13
5. Earthquake	14
6. Human Disease	15
CHECKLIST	16
NOTES	17

# councils

Adelaide City Council
City of Burnside
Campbelltown City Council
City of Norwood Payneham
and St Peters

City of Prospect
The City of Unley
The Corporation of the Town
of Walkerville

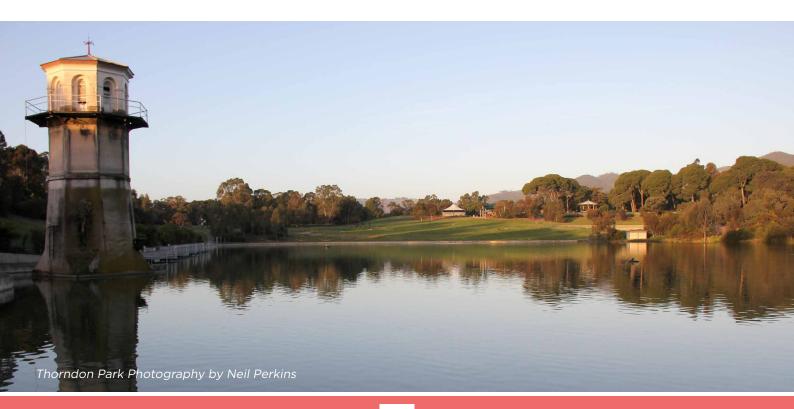
#### **PUBLISHED AUGUST 2018**

**Disclaimer:** The information contained in this Zone Emergency Management Plan (ZEMP) Summary is provided by the South Australian SES as a public service. This ZEMP Summary has been prepared in good faith and is derived from sources believed to be reliable and accurate at the time of publication. Nevertheless, the reliability and accuracy of the information cannot be guaranteed and the South Australian SES expressly disclaims liability for any act or omission done or not done in reliance on the information and for any consequences, whether direct or indirect, arising from such act or omission. This ZEMP Summary is intended to be a guide only and readers should obtain their own independent advice and make their own necessary inquiries.

#### INTRODUCTION

Across South Australia, there are a range of disasters, including natural disasters such as bushfires, storms, heatwaves and floods that have significant effects on peoples' health and wellbeing along with severe impacts on communities, social, environmental and economic structures.

This is a concise summary of the Eastern Adelaide Zone Emergency Management Plan (ZEMP), which provides information on natural disasters and hazards identified as having a specific relationship to the Eastern Adelaide Zone.



## TOP HAZARDS AT A GLANCE FOR EASTERN ADELAIDE ZONE AND THEIR IMPACTS

Hazard	People	Economy	Social/ Community	Environment
Extreme Weather - Storm	233			
Extreme Weather - Heat	233			
Flood	233			
Bushfire	233			
Earthquake	<b>23</b>			
Human Disease	233			

The table above gives an indication of the impacts of disaster events on different aspects of the community. The extent of the impact felt is influenced by the intensity of the event, the actions taken to reduce or avoid the effects and the ability of the community, businesses and government to respond and recover.

**Extreme Weather (Storm)** – Extreme storms are more commonly observed than any other natural hazard in South Australia. To stay safe you should move vehicles under cover or away from trees; secure or put away loose items around your property and stay indoors, away from windows, while conditions are severe.

**Extreme Weather (Heat)** - Extreme heat causes more deaths in Australia than all other natural hazards combined. Take precautions to keep cool, take shelter from the heat and drink water; even individuals who are healthy can be affected. Never leave children or pets in cars as vehicles can quickly heat up to deadly temperatures even on relatively mild days.

**Flood** - Flood is the most costly natural disaster in South Australia. It is important to be aware of flood and severe weather warnings, ensure you have adequate insurance if you live in a flood prone area and never drive in floodwaters.

**Bushfire** - South Australia can expect 6 or 7 serious fires every 10 years. Be prepared for a bushfire if you live in a bushfire area, and be bushfire ready by having a bushfire plan.

**Earthquake** - Adelaide is the most earthquakeprone capital city in Australia. Earthquakes occurring in urban areas pose a risk to residents and essential societal systems, including critical infrastructure. In an earthquake, it's important that you quickly **DROP** to the ground close to you, where you can avoid injury from flying debris; take **COVER** under something strong, like a sturdy table; and **HOLD** on to it until the shaking stops.

Human Disease - Pandemic outbreak of human disease affects a large number of people, usually crossing international borders. Pandemic diseases have a prolonged emergency response phase and a short recovery period unlike other natural hazards where the emergency response phase is often short, but have lengthy recovery periods. To help avoid spreading or catching an infectious disease, get your seasonal flu vaccination every year, wash your hands, wipe down frequently touched surfaces, cover your coughs and sneezes with a tissue, stay away from work and social situations if you have flu like symptoms.



#### **EASTERN ADELAIDE ZONE IN FOCUS**

councils

## <u>Ť</u>ŶŤŶŤŶŤŶŤŶ

**Population 225,855** (a)

430,400

SIZE

108.25

square kilometres

employment 114,500

**Gross Regional Product** 

more than 23.000

small businesses

registered South Australian

heritage places

places of

worship

migrated to Australia in the previous **5-10 years** 

population speak another language

approx 60 adults sleeping rough

**AJOR Industries Tourism** 

Property & Business Services Finance & Insurance

RETAIL TRADE

HEALTH & COMMUNITY SERVICES public sector

ADELAIDE CENTRAL BUSINESS DISTRICT

Adelaide Railway Station

infrastractur

**Major transport routes** 

**DATA CENTRES** 

HEALTH SERVICES **MAJOR** health facilities

nursing homes and retirement villages

schoo

university campuses

Montessori and kindergartens

#### **First to Fifth Creeks**

Brownhill Keswick Creek

**RIVER TORRENS** 



2°C 7% WARMER RAINFALL **DECLINE** 10% MORE INTENSE

ART GALLERY OF SOUTH AUSTRALIA

#### **Adelaide Zoo**

**Botanic Park** 

State Library of South Australia

ADELAIDE CITY most popular area for visitors to the state

#### **UNDERSTANDING OUR RISK PROFILE**

Disasters are having an increasing financial and social impact on individuals, communities and businesses. There are large upfront costs for response and recovery and long-term impacts on wellbeing. The cost of disasters, both direct and intangible, are expected to rise significantly in the coming years.

In 2011, the Australian Government released the National Strategy for Disaster Resilience<sup>1</sup> (the Strategy). The Strategy aims to promote a shared responsibility between governments, business, not-for-profit organisations, communities and individuals. The Strategy recognises that Australians need to focus more on understanding risks relevant to their community and preparing for potential impacts.

Keeping the community informed is a key aspect in building community resilience - before an emergency to help with prevention

and preparedness, while responding to the emergency and after, to help with recovery.

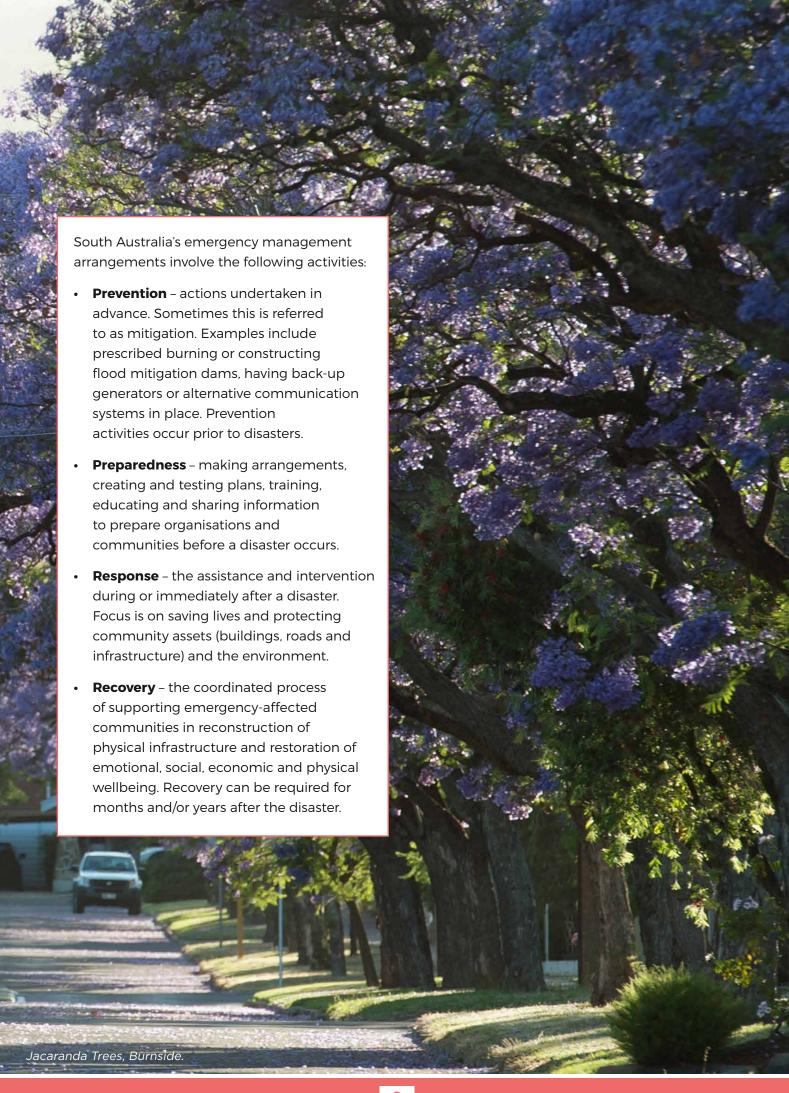
This plan is a public version of the Eastern Adelaide Zone Emergency Management Plan (ZEMP). The ZEMP relies on strong, cooperative, coordinated and consultative relationships among State Government agencies and Local Governments to work together in disasters. State Government and Local Government have plans to maintain effective service delivery to ensure that an efficient and coordinated response and recovery can be delivered to any disaster.



All sectors of the community have a collective responsibility when it comes to emergency management.

National Strategy for Disaster Resilience: http://www.safecom.sa.gov.au/site/emergency\_management/natural\_disaster\_resilience\_program.jsp





#### **MAJOR HAZARDS**

#### **The Eastern Adelaide Zone**

- 1. Extreme Weather (storm)
- 2. Extreme Weather (heatwave)
- Flood
- 4. Bushfire
- 5. Earthquake
- 6. Human Disease

#### **Risk Assessment Process**

The arrangements for the State to manage emergencies are outlined in the <u>State Emergency</u> Management Plan (SEMP).

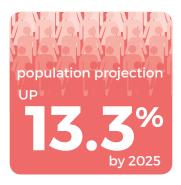
The SEMP identifies the State's eleven Emergency Management Zones. Each of these Zones has specific characteristics that are vulnerable to disasters, for example different demographics, industry, infrastructure, businesses and economic factors.

Each Zone has a Zone Emergency Management Committee (ZEMC) made up of Local and State Government and emergency management staff. These committees have a risk assurance role and provide regional leadership in emergency management in their Zones. One of their main roles is the development of a Zone Emergency Management Plan. This is important as understanding the potential impact of disasters on the region is essential for planning and preparation.

Zone Emergency Management Plans were produced by conducting risk assessment workshops with stakeholders from government and non-government organisations. These workshops used realistic scenarios about a hazard. Attendees then assessed which risks were the most likely to occur and could have the greatest impacts in the Zone.

The Eastern Adelaide Zone Emergency
Management Plan includes detailed information
about the six relevant hazards in the Zone:
earthquake, extreme storm, extreme heat,
flood, bushfire and human disease, and the
main risks associated with each. Information
about the priority hazards and their likely
impacts are detailed in the following pages.

Risk assessments used *The National Emergency Risk Assessment Guidelines* based on ISO 31000 to ensure a consistent and rigorous approach.



EMERGENCY SERVICES

2 SES units

1 CFS Group

5 MFS stations

6 AMBULANCE stations

3 POLICE stations History of Emergencies

2016
1999, 2005, 2008,
2010 and 2016
EXTREME STORMS
and statewide blackout in the numbered creeks

2014
Burnside STORMS
Black Hill & ASH Wednesday

#### 1. EXTREME STORM

Extreme storms are more commonly observed than any other natural hazard in South Australia and the Zone experiences storms several times per year. Extreme thunderstorms can occur at any time of the year, however in South Australia, they are more common in spring and summer. The Zone experiences storms several times per year. The Bureau of Meteorology has identified two types of extreme storm that can impact the Zone. These are:

#### Thunderstorm:

- Heavy rainfall leading to flash flooding (>30 mm/h)
- Wind gusts (90 km/h or greater)
- Damaging hailstones (2cm diameter or greater)
- Tornadoes

**Synoptic Storm** (could include some/all of the above but also):

- Mean wind speed 63 km/h or greater (land gale)
- Storm tide/surge higher than astronomical tide causing damage/destruction to foreshore.

The extreme storm risk assessment identified a number of risks to the Zone. Extreme storms can cause injury or death as well as increased demands on the health services. The risk of death and serious illness is particularly high for homeless and people sleeping rough. These storms may cause houses to become unliveable due to damage or lack of essential services.

Extreme storms also significantly affect the economy through disruption and damage to infrastructure such as electricity and telecommunications, loss of productivity due to employees being unable to work, and damage to, or loss of buildings. Local and State Government agencies may experience service disruptions and damage to maintenance depots. Waterways might be affected because of toxic substances or contaminants entering due to damage/disruption to waste and waste water systems. Landslide or landslip could occur due to extreme storm conditions.

To stay safe people should:

Move vehicles under cover or away from trees;

#### **Risk Assessment Scenarios**

To understand the impact of storm on the Zone, the following scenarios were considered as part of the risk assessment:

**Scenario 1** – example was 22 January 1991 hailstorm

- \$25 million estimated damage
- More than 2000 private insurance claims
- Damaged electricity lines and poles resulting in widespread power outage
- \$700,000 damage cost of electricity infrastructure

**Scenario 2** - hypothetical storm event - synoptically driven extreme storm event, triggering smaller scale, very dangerous supercell thunderstorms. Long-lived and widespread.

- Long term power outages
- Extensive damage to houses
- Large number of deaths and/or injuries
- · Roads blocked by trees
- Health and other response agencies overwhelmed

#### **RECENT EXTREME STORM EVENTS**

February 2014 - a very localised storm hit parts of Burnside and Campbelltown suburbs. The storm cost more than \$1.5m in clean-up costs to Burnside Council.

September 2016 - a state-wide extreme storm led to state-wide power outages and flooding in the Zone. The storm cost \$367m to businesses state-wide.

- Secure or put away loose items around your property.
- Stay indoors, away from windows, while conditions are severe.
- For information on how to minimise the impact to you and your family or business visit: www.sa.gov.au/topics/emergencies-and-safety/types/extreme-storm

#### 2. EXTREME HEAT

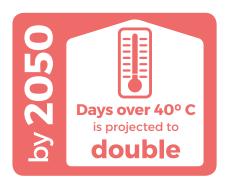
Extreme heat causes more deaths in Australia than all other natural hazards combined.

Extreme heat, also known as a heatwave, is defined as three or more days of high maximum and minimum temperatures that are unusual for that location.

Heatwaves can be the cause of death and significant health issues in people with kidney, heart disease and mental health issues. The risk of death and serious illness is particularly high for the elderly, children and those working or enjoying recreational activities outdoors. People are encouraged to take shelter from the heat, drink water and keep cool. Never leave children or pets in cars as they can heat quickly to deadly temperatures even on relatively mild days. Heatwaves are a particular risk for anyone who does not take precautions to keep cool, even individuals who are healthy.

Extreme heat also significantly affect the economy through disruption and damage to infrastructure such as electricity and telecommunications and loss of productivity due to employees being unable to work. Animals, the natural environment and infrastructure, such as power, communications, water and transport are also at risk. Public facilities such as shopping centres, theatres and public buildings can experience an increase in patronage.

For more information on how to minimise the impact to you and your family visit: www.sa.gov.au/topics/emergencies-and-safety/types/extreme-heat



#### **Risk Assessment Scenarios**

To understand the impact of extreme heat on the Zone, the following scenarios were considered as part of the risk assessment:

**Scenario 1** - In March 2008, a heat event with 15 consecutive days with a max temp >37.8°C (in Adelaide), caused at least \$150 million in damage and reduced income for South Australia. There was a threefold increase in heat related hospital admissions.

**Scenario 2** - The January / February 2009 heat event which ran for 13 consecutive days across South Australia with temperatures up to almost 49°C recorded and over 34 deaths in South Australia.

Scenario 3 - A hypothetical heat scenario - a combination of the extended period of the 2008 event and the intensity of the 2009 event with expected breakdown of critical infrastructure such as electricity, transport network and communications. Likely impacts included increased demand on ambulance and hospitals, hundreds of deaths, outdoor work ceases and food shortages.

#### RECENT EXTREME HEAT EVENTS

Heat Event of 2014

- 38 deaths
- 294 heat-related emergency presentations at hospitals

#### 3. FLOOD

There are a number of waterways in the Eastern Adelaide Zone including First to Fifth Creeks, Brownhill Keswick Creek and the River Torrens.

All creeks in the zone are prone to flash flooding and can flood in a few hours during storms. The River Torrens is classified as riverine flooding as it takes longer than six hours for flooding to occur.

The Zone is also impacted by stormwater flooding. Stormwater flooding occurs when drainage infrastructure becomes blocked. This is generally localised and often occurs in storms.

The assessments showed that the main risks to people were death and injury, of particular concern was for people driving through floodwater or those caught in fast moving water.

Floods also significantly affect the economy through disruption and damage to infrastructure such as roads, transport, interruptions to major events and loss to businesses. Communities are also affected, as people are unable to return to their homes due to loss or damage to their property.

It is very important to never drive through floodwaters and ensure that you have adequate insurance if you live in a flood-prone area.

For information on how to minimise the impact to you and your family visit: http://www.sa.gov.au/topics/emergencies-and-safety/types/flood

#### A HISTORY OF FLOODING IN THE ZONE

1981 Flash flooding in Third and Fourth Creeks with 24 hour rainfall totals of 132 mm in Magill and 88 mm in Adelaide.

1992 Flooding in the River Torrens due to a wetter than average spring.

2016 River Torrens floods due to heavy rainfall, with sections of the linear park damaged. Brownhill Keswick Creek flooded due to heavy rainfall, damaging Waterfall Gully Rd and Corkscrew Rd and causing property damage to homes and cars.

Flood is the most costly natural disaster in South Australia. For the period of 1967-2013 the cost of flooding was approximate \$48 million per year.

The main types of flooding include:

**Flash flooding** – flooding that occurs quickly from heavy rainfall and can be very localised

**Riverine flooding** – flooding that occurs in a river catchment or watercourse

**Infrastructure failure** – including structural failure of pipes, dams or levees

#### **Risk Assessment Scenarios**

To understand the impact of flood on the Zone, the following scenarios were considered as part of the risk assessment:

**Hypothetical Scenario 1** – a very heavy thunderstorm over metropolitan Adelaide producing over 120 mm rain in a few hours. This scenario was based on an event from 1925.

- damage to shops, buildings, railway, tram and telephone services and significant disruption to metropolitan Adelaide
- greater economic loss, traffic accidents and delays
- potential deaths and injuries
- increased demands on hospitals and aged care centres

**Hypothetical Scenario 2** – simultaneous flooding in a number of creeks in the zone including Brown Hill Keswick Creek, River Torrens and First to Fifth Creeks.

- damage to residential and commercial buildings
- loss of life and injuries
- increased demands on hospitals, schools and aged care facilities
- interruptions to transport and essential services such as electricity, telecommunications etc.

#### 4. BUSHFIRE

The Australasian Fire and Emergency Services Authorities Council (AFAC) defines bushfire as:

"An unplanned vegetation fire. A generic term which includes grass fires, forest fires and scrub fires."

South Australia can expect 6 or 7 serious fires every 10 years. The Zone has a history of bushfires including Ash Wednesday and 2010 new year's Black Hill fire.

The bushfire risk assessment was based on the direct fires depicted in the scenarios used, however there are additional risks for the Zone based on the ember attacks which weren't included in the original scenarios.

The bushfire risk assessment showed that the main risks to people were death and injury resulting from last minute evacuations, traffic accidents and people staying to defend their homes or protect their animals.

High winds can contribute to the impact of a fire by increasing the spread rate of the fire, as well as by carrying burning embers further downwind. Embers can cause fires many kilometres in front of the main fire and can start falling up to an hour before the fire.

It is important to be aware of your bushfire risk and have a plan in case a bushfire threatens your home. You will need to make sure that your home is properly prepared to withstand ember attack.

For information on how to minimise the impact to you and your family, visit: http://www.sa.gov.au/topics/emergencies-and-safety/types/bushfire

#### **Risk Assessment Scenarios**

To understand the impact of bushfire on the Zone, the following scenarios were considered as part of the risk assessment:

Scenario 1 - Cygnet River Fire (Kangaroo Island) - February 2013

- 80 hectares of farm and bushland burnt
- Telstra telephone exchange damaged

Scenario 2 - Ash Wednesday - January 1983

- 28 fatalities, over 600 injuries
- Estimated loss of up to \$400m (in 1983 \$ value)
- 190 homes lost
- 250,000 sheep and cattle lost
- 21,000 hectares of pine plantation burnt



#### A HISTORY OF BUSHFIRE

1985 Black Hill fire in January burnt 1600 hectares

1998 Black Hill fire in February burnt 42 hectares

2004 Sugarloaves track fire

2005 Freeway - Mt Osmond fire burnt 144 hectares

2010 New Year's Black Hill fire

### **5. EARTHQUAKE**

An earthquake is shaking of the surface of the earth caused by underground movement, such as along a fault line or by volcanic activity. They range in strength from slight tremors to major shaking, lasting from a few seconds to a few minutes and may be followed by aftershocks. Apart from the damage caused by the ground shaking, earthquakes can also lead to liquefaction (soil becoming liquid) which can cause extensive damage to buildings.

Earthquakes are measured on the Richter Scale, with 9.5 being the highest possible magnitude. Australia averages 80 earthquakes per year with a magnitude greater than 3.0. An earthquake of 5.5 is experienced approximately every two years and a 6.0 every five years.

Earthquake was considered for this Zone as there has been recorded earthquake activity in the past.

Earthquakes may cause injury and death. Damage to high-rise, residential, schools, care facilities, government, commercial and industrial buildings built prior to 1985 are possible. Transport infrastructure such as roads, bridges, rail tracks and electricity and communication network; gas and water networks may be impacted and/or damaged.

The social fabric of the community is affected when people are unable to return to community due to loss of houses or businesses, interruption to public services and amenities or access and egress to their properties.

In an earthquake, it's important that you quickly:

- DROP to the ground close to you, where you can avoid injury from flying debris.
- Take COVER under something strong, like a sturdy table.
- HOLD on to it until the shaking stops.

#### **RECENT EARTHQUAKE EVENTS**

In 1954, Darlington experienced a 5.5 magnitude earthquake causing 16 injuries and damage to buildings totalling \$90 million. Damage is expected to have occurred up to 20kms away and felt up to 250kms away.

#### **Risk Assessment Scenarios**

To understand the impact of earthquake on the Zone, the following scenarios were considered as part of the risk assessment:

**Scenario 1** – 5.6 magnitude – hypothetical event based on Newcastle 1989 earthquake

- \$2 billion damage to residential homes
- \$732 million damage to commercial and industrial buildings
- 2 severe injuries or deaths
- 18 light to moderate injuries

**Scenario 2** - 5.6 magnitude hypothetical event based on Newcastle 1989 earthquake

- \$7 billion damage to residential homes
- \$2,729 million damage to commercial and industrial buildings
- 45 severe injuries or deaths
- 115 minor to moderate injuries
- For information on how to minimise the impact to you and your family or business visit: https://www.sa.gov.au/topics/emergencies-and-safety/types/earthquake

#### **6. HUMAN DISEASE**

A human disease is:

"any impairment of normal physiological function affecting all or part of an organism, especially a specific pathological change caused by infection, stress etc., producing characteristic symptoms, illness or sickness in general."

Influenza, commonly known as the flu, is a highly infectious viral infection that can cause fever, runny nose, sore throat, and muscle pain or fatigue. Influenza can lead to complications in the elderly, people with poor immune systems and pre- existing respiratory, cardiac and endocrine disease. It can also cause deaths in healthy adults and children. Seasonal influenza normally affects Australia during winter and spring.

Pandemic Influenza, is an outbreak of a new type of influenza virus, which spreads on a worldwide scale and infects a large proportion of the human population. Pandemic was chosen as the specific human disease because it is a life threatening and highly contagious illness. Pandemics are unpredictable. When the next pandemic will occur, how rapidly it will emerge and how severe the illness will be are all unknown.

The Pandemic Influenza risk assessments identified specific risks to the State of South Australia. These include increased number of deaths and illness as well as increased demand on health services and medications; social distancing including school closures and reduction in mass gatherings, reduced access to daily services such as food, shopping, fuel and banking. Pandemic Influenza also significantly affects the economy through a reduction in workforce.

There are a number of things that you can do to help avoid spreading or catching an infectious disease. These include taking precautions such as:

- · Get your seasonal flu vaccination every year
- Wash, Wipe, Cover:
  - Wash your hands, particularly after going to the toilet or handling used tissues
  - Wipe down frequently touched surfaces

#### **Risk Assessment Scenarios**

To understand the impact of bushfire on the Zone, the following scenarios were considered as part of the risk assessment:

**Scenario 1** - based on the 2009 Human Swine Flu (H1N1)

- Estimated 284,000 deaths worldwide,
   191 deaths in Australia, 17 deaths in South
   Australia
- 9,170 notified cases and estimated loss of \$314 m in South Australia
- H1N1 is widely circulating and is now established in humans as a seasonal influenza virus

**Hypothetical Scenario 2** - based on the 1918 Spanish Flu

- Estimated 20-50 million deaths worldwide; around 73,800 deaths in the South Australia
- Estimated loss of \$1.46billion to the state
- Estimated loss of up to \$400m in 1983 \$
- 190 homes lost
- 250,000 sheep and cattle lost
- 21,000 hectares of pine plantation burnt

#### **RECENT PANDEMIC EVENTS**

1957 Asian Influenza caused 1 million deaths

1968 Hong Kong Influenza caused 1 million deaths

- Cover your coughs and sneezes with a tissue or your elbow
- When you have flu like symptoms, stay away from work and social situations
- Plan in your business for a reduction in staffing
- For more information visit https:// www.sa.gov.au/topics/emergenciesand-safety/types/human-disease

# ARE YOU PREPARED? Checklist

### Are you prepared? Do you know what types of emergency and disaster might affect you? Does your household have an emergency plan? (more details on this page) In the last year, have you done anything to protect your home? (e.g. clear gutters or vegetation) Do you have appropriate and adequate insurance cover? Have you prepared an emergency kit? (visit sa.gov.au/emergencies/ and look up emergency preparation for more information) To assist in your Emergency Management Planning, the following list provides questions to consider: Who will you include in the plan? Family, pets, neighbours, grandparents, children etc What will you do if some of you are not home? Consider when to evacuate during flood, storm, bushfire or other emergencies Where will you evacuate to? Meeting place near home, meeting place away from home? Can you keep your business going during and after disasters? (go to sa.gov.au/emergenciesand-safety/ for more information)

Think about the different kind of emergencies that could affect you.

Have you considered making a plan? For help with making a plan:

- Red Cross: redcross.org.au/prepare
- CFS Bushfire plan:
   cfs.sa.gov.au/site/prepare\_for\_a\_fire/5\_minute\_bushfire\_plan.jsp
- Emergency plans: sa.gov.au/topics/emergencies-andsafety/prepare-for-an-emergency/ emergency-plan

Equipment connected over the nbn™ access network will not work during a power blackout.

Make sure you have a battery powered radio and your mobile phone is fully charged.



**NOTES** 



### Warnings and advice can be obtained from a number of sources:

- sa.gov.au/topics/emergencies-and-safety
- your local radio station (ABC Radio 891 AM,
  ABC Classic FM 103.9FM, ABC Digital Radio 206.352MHz)
- **bom.gov.au** for Bureau of Meteorology (BoM) weather and warnings updates including local seven day forecasts.

