

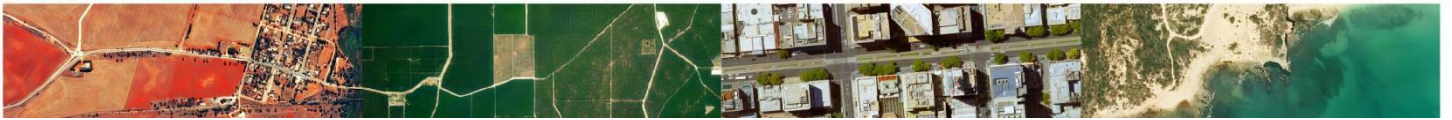


# SOUTH AUSTRALIAN EXTREME WEATHER HAZARD PLAN

Hazard Leader: SA State Emergency Service

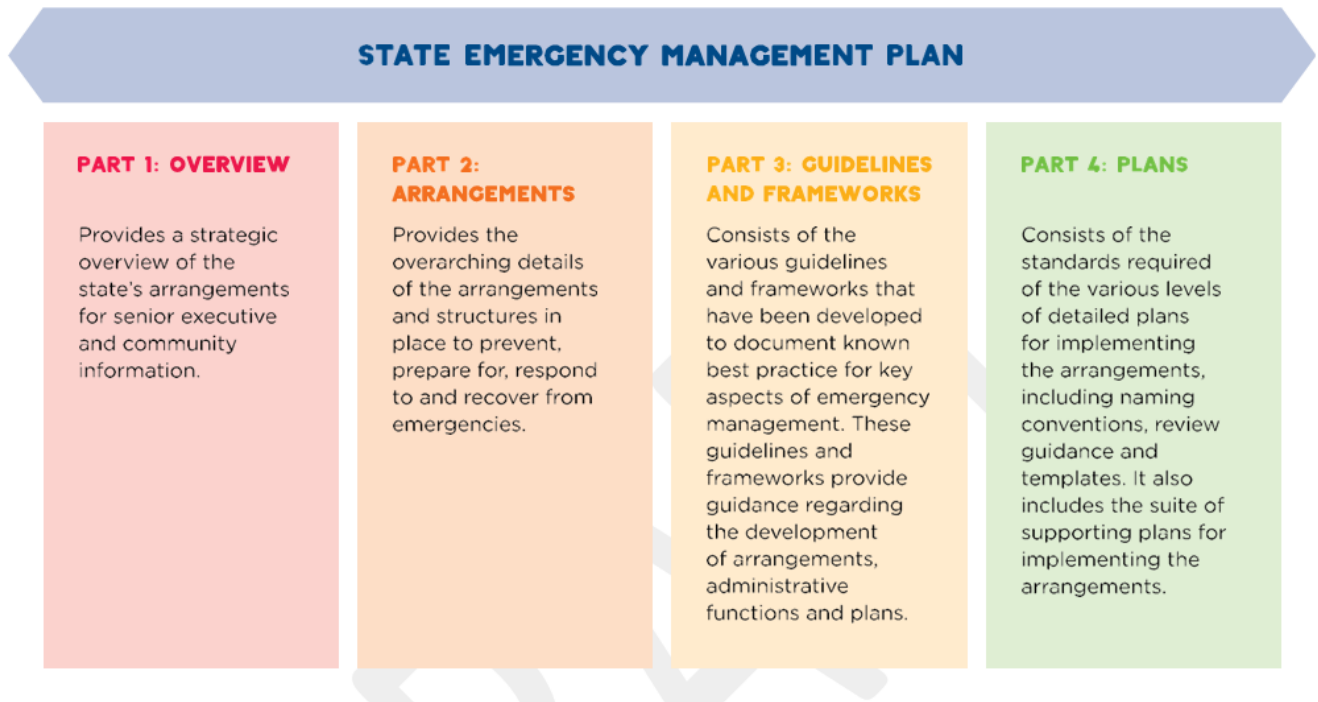


**Government  
of South Australia**



## 1. SEMP STRUCTURE

The State Emergency Management Plan (SEMP) is a four-part plan containing a range of documents that further detail strategies for dealing with emergencies in South Australia. The parts are described in more detail below.



*Figure 1: The South Australian State Emergency Management Plan is actually a series of documents split over 4 Parts with a number of accompanying annexes*

This Hazard Plan is an Annex to Part 4 of the SEMP.

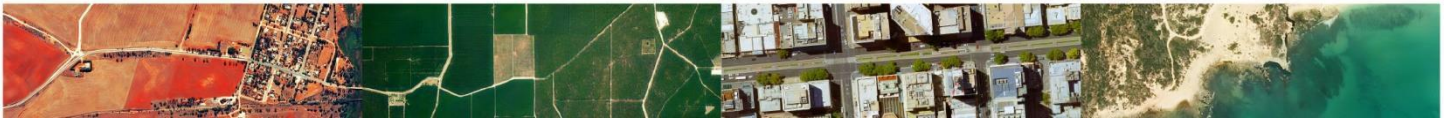


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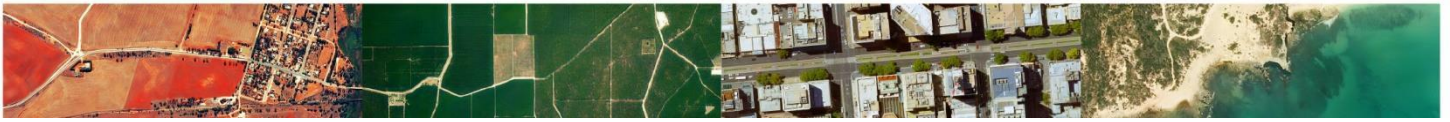
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## 2. AUTHORITY

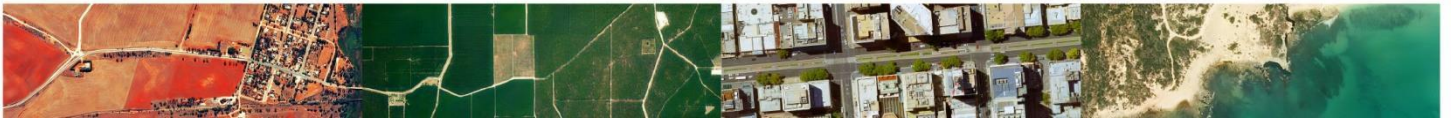
The Australian Constitution states that each of the states and territories is responsible for the protection of its citizens. The Australian Government has a role to assist where a state or territory is unable to meet a need or seeks assistance, but the primary role lies with the respective states/territories.

All emergency management arrangements in South Australia are governed by the *Emergency Management Act 2004* (the Act). The Act establishes the State Emergency Management Committee (SEMC) and lists its functions and powers.

The State Emergency Management Plan (SEMP) is prepared under section 9(1)(b) of the Act to manage all emergencies. It is a function of the SEMC to prepare and keep this plan under review, and to ensure arrangements reflect best practice.

This Hazard Plan is prepared under Part 4 of the SEMP. It is consistent with the *Emergency Management Act 2004*, SEMP, other legislation (State and Commonwealth) and government agreements.





### 3. AUTHORISATION

The Hazard Leader for Extreme Weather is the South Australian State Emergency Service (SASES). This Plan is approved by the Chief Officer of SASES.

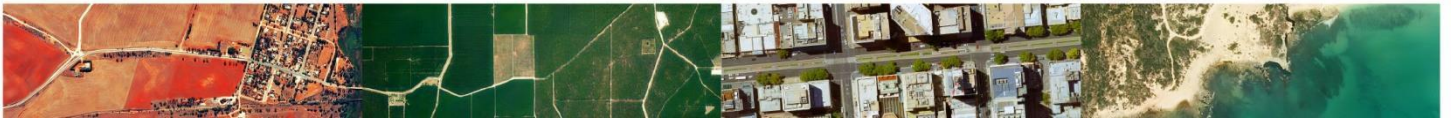
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Chris Beattie

Chief Officer

SA State Emergency Service

Date: 30 / 10 / 2020.



## 4. REVIEW

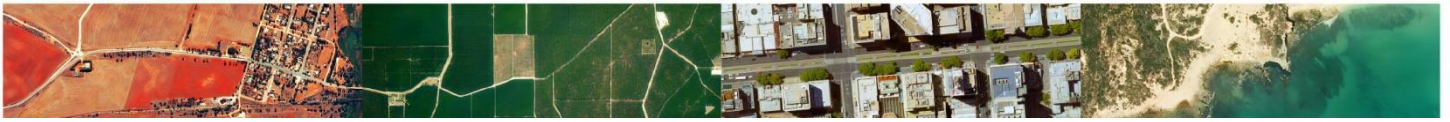
Part 4 of the SEMP requires Hazard Plans to be reviewed and updated at least once every two years by the Extreme Weather Hazard Leader and submitted to the State Emergency Management Committee (SEMC) prior to 30 June. SASES is responsible for the preparation of the Extreme Weather Hazard Plan (hereafter referred to as 'the Plan').

The plan is prepared and maintained by the Extreme Weather Hazard Leader in consultation with relevant stakeholders.

This Plan was approved on 30 October 2020.

The Plan must be reviewed and updated prior to 30 June 2022





## 5. THE EXTREME WEATHER HAZARD

### 5.1 DEFINITION OF THE EXTREME WEATHER HAZARD

Extreme Weather has three main elements, Extreme Storm, Heatwave (previously known as Extreme Heat) and Extreme Cold. The following three definitions are used to identify an Extreme Weather event.

#### 5.1.1 Extreme Storm

Extreme Storm can include heavy rainfall conducive to flash flooding (in excess of 30 mm/h) and/or damaging wind (average of 63 km/h or greater, or gusts of 90 km/h or greater) and/or damaging hailstones (2 cm in diameter or greater).

There are two types of Extreme Storm:

- Thunderstorm – defined as:
  - Heavy rainfall leading to flash flooding > 30 mm/h
  - Wind gusts of 90 km/h or greater
  - Damaging hailstones 2cm diameter or greater; and/or
  - Tornadoes
- Synoptic Storm – defined as:
  - Could include some/all of the above; but also
  - Mean wind speed of 63km/h or greater (land gale)
  - Storm tide/surge higher than astronomical tide

Thunderstorms develop when warm, humid air near the ground receives an initial upward push from converging surface winds and rises rapidly in an unstable atmosphere. Thunderstorms can become severe when the atmosphere is particularly unstable and/or additional energy is drawn in from surrounding.

#### FORMATION OF A THUNDERSTORM

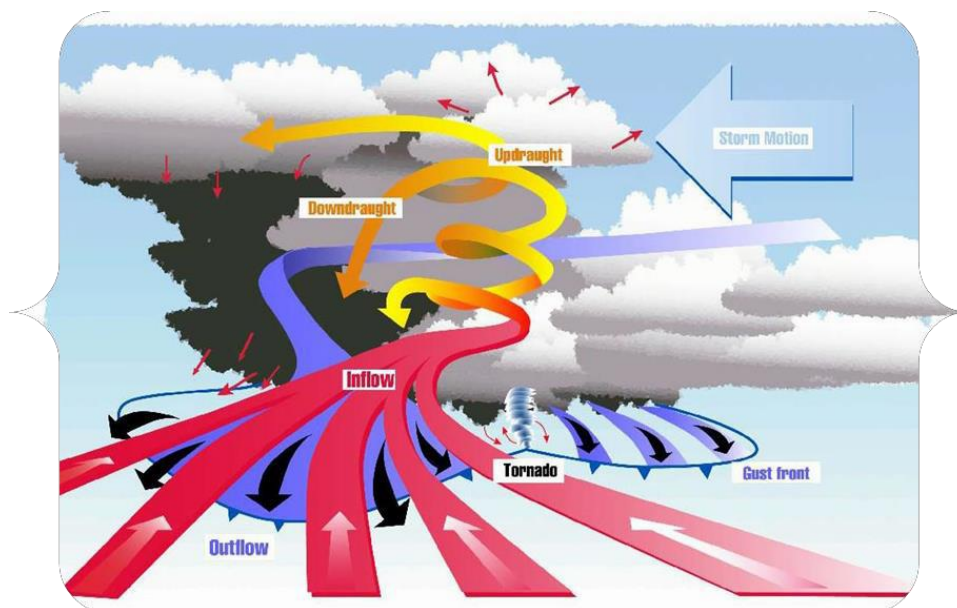
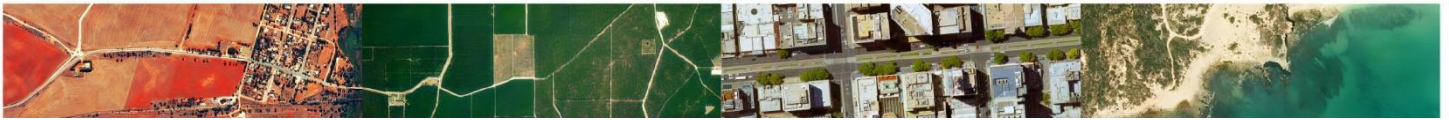


Figure 2: <http://www.bom.gov.au/info/thunder>



### 5.1.2 Heatwave

A Heatwave event is an extended period of very high temperatures which is related, but not confined, to heatwave conditions. It has the potential to adversely affect urban and rural communities, infrastructure and the natural environment. Heatwaves can cause death and significant health issues, extensive stock and crop losses, damage to roads, railway lines and bridges, it can disrupt power supplies and contribute to an elevated fire hazard.

The Bureau of Meteorology (BOM) has defined a heatwave to occur when a period of at least three days where the combined effect of excess heat and heat stress is unusual with respect to the local climate. Both maximum and minimum temperatures are used in this assessment.

A heatwave day is defined by the BOM as any day for which the extreme heat factor (EHF) is positive (greater than zero). The EHF is calculated based on average daily temperatures over three consecutive days and measured in relation to the local long-term climate (by comparing the three days to observed temperatures over the previous thirty days at that particular location).

A heatwave event is defined as one or more consecutive heatwave days and is calculated using the forecast maximum and minimum temperatures over the next three days, comparing this to actual temperatures over the previous 30 days, and then comparing these same three days to the 'normal' temperatures expected for that location. This calculation also considers people's ability to adapt to the heat.

High minimum temperatures overnight are likely to contribute to a greater impact if communities, infrastructure and the environment are unable to recover from protracted heat stress. High temperatures can be exacerbated by high humidity.

Heatwaves are classified into three types based on intensity.

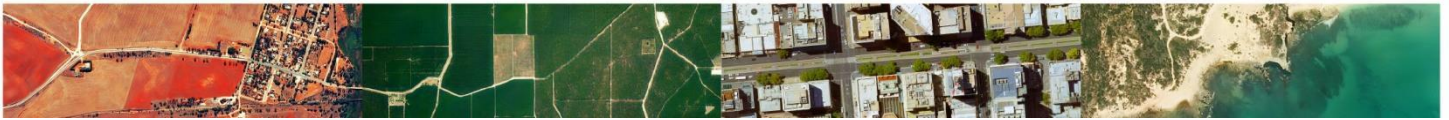
- Low-intensity heatwaves are more frequent during summer. Most people can cope during these heatwaves.
- Severe heatwaves are less frequent and are likely to be more challenging for vulnerable people such as the elderly, particularly those with medical conditions.
- Extreme heatwaves are rare. They are a problem for people who don't take precautions to keep cool – even for people who are fit and healthy. People who work or exercise outdoors are also at greater risk of being affected.

During a heatwave, Housing SA may activate its Code Red Plan. This is an emergency winter response plan to assist people sleeping rough in the Adelaide central business district (CBD) and selected regional centres. The activation may include resources to ensure that there is shelter and food available for rough sleepers during the heatwave.

### 5.1.3 Extreme Cold

For the purpose of this plan, an Extreme Cold event is when the BOM predicts inclement weather for at least three consecutive days consisting of colder than usual low temperatures coinciding with rain and damaging wind gusts. In a Mediterranean climate such as Adelaide an unusually low temperature in association with wind gusts and rain can be 6°C. Extreme Cold is site specific, places like Mt Gambier or Yunta may regularly experience consecutive low minimum temperatures, therefore Extreme Cold to those places will be based on temperatures lower than 6°C.

When there is a strong possibility of high winds, rain and unusually cold temperatures based on the BOM 3-day weather forecasts, Housing SA activates its Code Blue Plan. This is an emergency winter response plan to assist people sleeping rough in the Adelaide central business district (CBD) and selected regional centres. The activation may include resources to ensure that there is shelter and food available for rough sleepers during the expected Extreme Cold weather event.



## **5.2 HISTORY OF EXTREME WEATHER EVENTS IN SOUTH AUSTRALIA**

### **5.2.1 Extreme Storm Events**

#### **October 2017**

A storm, with fine hail the size of rice grains, caused damage to 25% of the State's apple, cherry and pear crop. Growers were facing losses estimated at \$32M in fruit sales. The industry was impacted a second time when a series of wild storm fronts during November 2018 impacted up to 70% of the apple and pear crop.

#### **2016**

Over a period of five months between May and October 2016, emergency service organisations (ESOs), the South Australian State Emergency Service (SASES), Country Fire Service (CFS) and Metropolitan Fire Service (MFS) were exceptionally busy and attended over ten thousand Requests For Assistance (RFAs). SASES is the control agency for extreme weather and flooding and responded to a significant proportion of the RFAs, particularly for trees down. (Burns, et al., 2016)

#### **May 2016**

An intense low-pressure system, with wind gusts up to 100km/h and rainfall of up to 88mm, resulted in nearly 800 RFAs for SASES assistance. The resultant king tide and storm surge led to coastal inundation, and significant damage to some sections of the coastline, including 1.3M damage to the rock sea wall at West Beach.

#### **September 2016**

On 28 September 2016, the BOM released both severe weather warnings and severe thunderstorm warnings for large areas of the state. Wind gusts of 90-100 km/h and approximately 50,000 lightning strikes resulted in damage to high voltage power infrastructure and a state-wide loss of power. Three of the four transmission lines transferring power between Adelaide and the north of South Australia, and 23 towers across the network were damaged. Port Lincoln and surrounding areas suffered power loss for three days. SA Power Networks were disconnected from interstate energy supplies by a special protection scheme which had automatically tripped the interconnector.

The power outage had a major impact on Greater Adelaide where all traffic lights, train and tram services ceased to operate. It also impacted water supply and other critical infrastructure. Many people throughout the Adelaide Central Business District were trapped in lifts. There were also reports from a number of hospitals and nursing homes that they were without power.

On the evening of 28 September, the State Coordinator made a Declaration of Major Incident and requests for assistance were made to other States in Australia.

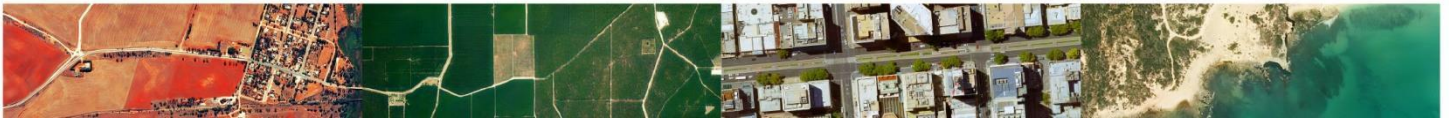
Over the following seven days, many communities experienced damaging and destructive winds, at least six tornados, very heavy rain and hail, severe flooding in a number of catchments, storm tides and coastal impacts. The SA ESOs received 4,280 RFAs during that period.

#### **November 2016**

An intense late afternoon storm, with golf-ball sized hail and wind gusts of more than 90km/h, resulted in more than 500 RFAs by SASES. Damage in the Riverland region was estimated at \$100M for affected grape, almond, stone fruit and grain crops.

#### **December 2016**

A severe storm, resulting in 1,600 RFAs by SASES, caused a power outage for 155,000 customers and impacted upon 5% of the state's grain crop. A subsequent price fall of \$50-\$80 per tonne potentially resulted in a \$100-\$200M loss of value on the forecast record grain crop.



Previous Years:



#### **February 2014**

Wind gusts brought down trees onto numerous power lines. There also was serious damage to some properties and vehicles from the fallen trees and branches. Power was lost to about 90,000 properties. There were approximately 1200 RFAs to the SASES and Burnside Council received around 470 RFAs for tree issues and clearing debris. The total estimated cost to Burnside Council alone, to manage and recover from the storm, was an estimated \$1,377,000.



#### **August 2013 – Tornado at Kingston SE**

The damage bill from a weekend storm that ripped through Kingston in the south-east of South Australia was estimated at \$10 million.

More than 30 houses were damaged as roofs were ripped off, sheds destroyed, and trees uprooted. Electricity poles and wires were torn down causing over 1000 homes and businesses to lose power.

### **5.2.2 Heatwave Events**

#### **December 2019**

South Australia as a whole had its hottest day on record on 19 December, when it reached 47.1 °C, exceeding the previous record of 45.7 °C on 24 January 2019. Fifteen locations in South Australia recorded new highest temperatures including Nullarbor 49.9 C and Ceduna 48.9 °C.

#### **December 2015**

A Heatwave event was centered over Adelaide and surrounding areas in 2015. The temperature reached 40°C in Adelaide on each of the four days from 16–19 December. This was the first occasion that four consecutive days of 40°C or above had occurred in Adelaide in December: High maximum temperatures extended throughout South Australia including four consecutive days of 40°C or above. The towns of Snowtown, Murray Bridge and Eudunda all experienced six consecutive days of 35°C or above.

Whilst maximum temperatures during this event were well above average, with numerous December records broken in South Australia, the most significant aspect was the exceptionally high minimum temperatures on the night of 19–20 December, due to the combination of the very hot air mass and strong winds ahead of the approaching trough. (Bureau of Meteorology, 2016)

In December 2015, a building apprentice was hospitalised in Adelaide, in a critical condition after collapsing from heat stroke while working on a construction site during a day of over 40-degree heat.

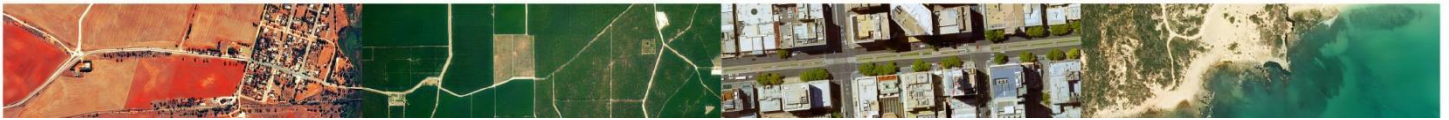
#### **January 2014**

Adelaide recorded five consecutive days above 42 °C between the 13 and 17 January 2014. There were 294 heat related emergency presentations at hospitals and 38 excess heat-related deaths reported.

#### **2011**

Australia experienced three notable heatwave events during 2011; on 31 January 2011, Adelaide recorded the highest capital city maximum temperature with 42.9 °C The heatwave included an all- time record of 48.1 °C at Woomera on 25 January. (Bureau of Meteorology, 2011)





In one Price Waterhouse Coopers report it was estimated that there were around 70 heat-related deaths associated with top heat events in the City of Adelaide in 2011. That report also predicted that without intervention and based on population growth alone, that this figure could almost double by 2050. (Price Waterhouse Coopers, 2011)

### **January/February 2009**

South Australia experienced a prolonged Heatwave event in Jan/Feb 2009, which extended over 13 days, with five consecutive days over 40°C. During this period, mortality increased by 37% (above what would have been expected normally for that period) in the 15-64 age groups. Estimates of excess deaths ranged from 50-150, with more than 3000 reports of heat-related illnesses including large increases in renal, ischemic heart disease and direct heat-related morbidity (Queensland University of Technology 2010, n.d.) (Zhang, et al., 2016)

During the 2009 heatwave there were also a total of 518 excess ambulance call outs above what would have normally been expected during this period. Heat related hospital admissions were 14 times higher compared to non-heatwave days in summer for the general population and 19 times higher for people over 75. (Nitschke, et al., 2013) (Zhang, et al., 2016)

### **5.2.3 Extreme Cold Events**

#### **2017**

Code Blue emergency response for people sleeping rough across the state on three occasions in 2017:

- 10 nights in early June (1 – 4 June, 6 – 7 June; and 9 – 12 June)
- 3 nights between 29 June and 1 July
- 2 nights of 17 July and 18 July

In 2017 the Code Blue activations were extended into regional centres including Berri, Mount Gambier, Murray Bridge, Port Lincoln, Coober Pedy, Ceduna, Port Pirie, Port Augusta, and Whyalla.

Over the abovementioned 15 nights, hundreds of additional city and regional homelessness services were provided to give basic assistance to people who were sleeping rough and connecting them with emergency accommodation services.

#### **2016**

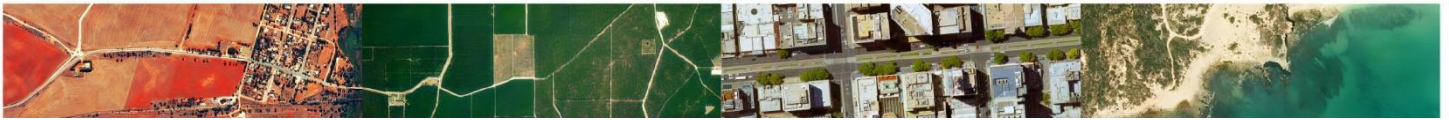
Code Blue was activated in the Adelaide CBD over 9 nights in July 2016. A range of inner-city homelessness services and government agencies assisted 128 people who had been sleeping rough. These services included shelter, provision of meals, transport and bedding.

Code Blue was again activated on Wednesday 28 September 2016 and remained active until 30 September following the catastrophic storm event that occurred in South Australia.

## **5.3 THE IMPACT OF EXTREME WEATHER**

Extreme weather events regularly impact the health and welfare of the community, they also impact our landscape, flora and fauna. Storms, cold and heat have the potential to impact critical infrastructure such as power networks and transport facilities affecting trains and trams.

The Australian Government Department of Agriculture, Water and the Environment states that climate change could also impact on the average number of days above 35°C in Adelaide which could potentially increase from 17 days currently to 21-26 days by 2030 and to 24-47 days by 2070. (Dept of Environment & Energy, n.d.)



Many factors may influence the severity and impact of Heatwave and storm events which can be highly variable, these include:

- mitigation activities
- climate change
- community demographic and resilience capability
- warning systems and appropriate information broadcasting
- location

In a recent report, the Climate Council of Australia referred to the “vicious extra-tropical cyclone that roared over South Australia” in September 2016. It stated that “The evidence for the link between

climate change and extreme weather is already very strong for heatwaves and bushfire weather, and it is getting stronger for intense cyclones and heavy rainfall events. All of these severe weather events are now occurring in an atmosphere that is packing more energy and carrying more moisture than it did 70 years ago. Generally, this means more intense storms and more devastation around the world.” (Steffen & Alexander, 2016)

The Climate Council compared recent heatwaves with heatwaves prior to 1980 and found that heatwaves in the state are becoming longer and more intense, with an average of four days increased length, 2.5 degrees increase in average heat intensity, and 4.3 degrees increase in peak heat intensity. Increasing intensity of storms is also extremely likely due to the impacts of climate change. (Hughes, et al., 2016)

### 5.3.1 People

Extreme weather events can impact on the physical and mental health of people throughout the state.

Heatwave is the biggest killer in Australia, killing more people than all other natural hazards put together. A report on heat related deaths in Australia estimated that there were at least 5,332 heat associated deaths between 1844 and 2010. It also estimated that in the 2009 Heatwave event there were 432 heat associated deaths. (Coates, et al., 2014)

Direct heat-related illnesses include heat cramps and heat stroke. Heatwaves can also trigger or exacerbate pre-existing medical conditions, causing higher rates of conditions such as heart attacks and renal failure. In particular, people with vulnerabilities including the aged, young children, people with chronic illness or disabilities and the homeless are particularly at risk of adverse health impacts. (Hughes, et al., 2016)

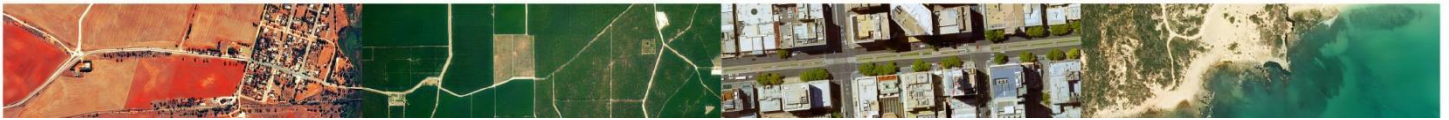
Injuries or deaths can also happen as a result of Extreme Storms through lightning strikes and branch drop or tree fall during extreme weather events. In 2016 alone besides the many injuries recorded that were caused by storm events, there was one death caused by lightning strike and another due to tree fall.

Exposure to elements of Extreme Cold such as wind, rain, hail and cold temperatures, especially impacts on those without shelter, such as the homeless. Normal body temperature is usually 36 or 37°C; hypothermia occurs when a person’s core body temperature falls below 35°C. Use of alcohol, nicotine, and narcotics commonly increase the threat of hypothermia and other life-threatening illness.

In South Australia, most hypothermia related deaths involved elderly women indoors who were living alone, often with multiple underlying health issues and who were socially isolated. The report stated that between 2006 and 2011, South Australia had more fatalities due to hypothermia per capita than Sweden. They reasoned that it was likely that poor heating, insulation, and lack of energy efficiency, played a role. (Bright F, 2013)

In 2015, there were 44 inpatients treated for hypothermia in South Australian public hospitals.





### **5.3.2 Economy**

Extreme weather causes economic impacts throughout the state by preventing businesses from functioning as normal. This is due to the loss of essential utilities and services (power, water, wastewater and communication technology failure), mechanical failure of industrial machines, or the inability of staff to attend their place of employment.

Infrastructure such as bridges, roads and rail can be damaged through extreme weather and ferries are often cancelled due to Extreme Storm conditions. Restricted transport routes often cause business interruption and reduced productivity.

Industries that employ outdoor workers, such as construction and farming can also experience a downturn in productivity or extensive damages to stock and equipment.

According to Business SA the extreme weather storm event which commenced 28 September 2016 was estimated to have cost the State \$367 million. The damage to government roads was estimated at \$20m in addition to the millions of dollars damage caused to other roads, rail, bridges and jetties. There was major flood damage to 43 buildings and minor flood damage to almost 100 other buildings; current and future horticultural crop damages; and economic losses to many businesses involved in the tourism industry due to cancelled holidays and community events. (Burns, et al., 2016)

### **5.3.3 Social Setting**

Extreme weather events impact society and its social fabric.

Community morale can be impacted by loss of earnings resulting from extreme weather events. Damage or failure of transport, communications and other infrastructure can also result in psychological and emotional stress across the community.

Morbidity and mortality due to extreme weather can cause stress to people across the state. In addition, the death and injury of domestic animals or livestock can impact on people's wellbeing.

Extreme weather has the capacity to disrupt communities through the cancellation of planned events. The ability for people to socialise is also affected during extreme weather events, which can lead to the breakdown of social frameworks particularly in regional centres that rely on this interaction for individual wellbeing.

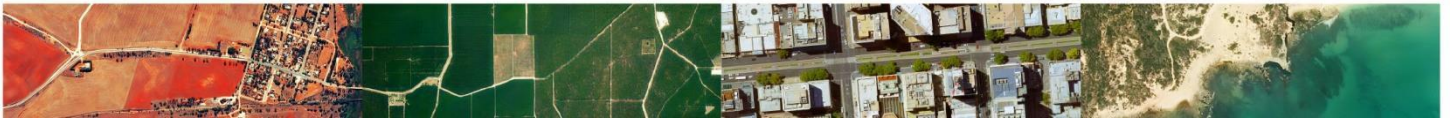
Closure of educational facilities as a result of extreme weather events can cause disruption to daily routines of families, impacting on the community's resilience.

There is also evidence to suggest that there can be an increase in aggressive violent crimes and mental health issues such as rioting, civil unrest, attacks, homicides, road rage domestic violence and other mental health issues during heatwaves (Price Waterhouse Coopers, 2011) As heatwaves become more severe and frequent in the future, these behaviours may be observed more often throughout the state. (Deloitte, 2016).

### **5.3.4 Public Administration**

Extreme weather can disrupt the delivery of core functions by governing bodies to the community due to:

- power failure caused by overloading in heat events or damage caused by lightning or strong winds to power lines and associated infrastructure
- infrastructure used for delivery of core functions (e.g. transport, communications) being damaged or incapacitated by Heatwaves or storms
- resources for delivery of core functions being redirected to the emergency management effort
- additional demand for social services by affected communities



Core functions of government that can be particularly sensitive to extreme weather events include health care, aged care, and social welfare services. Prolonged or more severe events can require the closure of schools and the level of home services may reduce due to safety concerns caused by impacted transport routes.

### **5.3.5 Environment**

Extreme weather impacts ecosystems throughout the state, including fauna, flora, air, land and water. Vulnerable ecosystems and endangered fauna can be particularly impacted as habitat condition is adversely impacted by heat or storm. Protected areas, including botanic gardens, national and conservation parks, zoos, animal sanctuaries and animal shelters may also be at risk of damage.

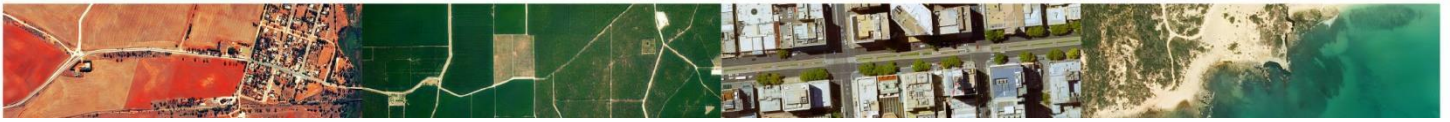
Heatwaves contribute to catastrophic fire weather conditions. They can also cause an increase in blue-green algae and other water quality related risks in river systems and other waterways which feed both natural system functions and potable and stock and domestic water supply.

Storm events create issues in the state's wetlands and waterways. Impacts can include the potential for contamination of retention systems, rivers and other water systems due to overloading of stormwater systems or release of chemicals or hazardous materials. There is potential for untreated waste from wastewater systems to impact on water and ecosystems. Landslides can also occur following intense rain events, impacting on built and natural environments.

Soil erosion and coastal erosion, salinity and rising groundwater levels can result in damage to or destruction of native and agricultural land throughout the state. Soil erosion can also cause algal blooms, due to nutrient rich soils running off into the sea and other waterways.

The state-wide Extreme Storm event that commenced in September 2016 caused widespread cliff erosion, lowering of beaches and dune erosion occurred along much of the South Australian coast. An emergency seawall at Kingston SE was breached which required the construction of a permanent seawall to stabilise the foreshore.

Extreme Storms often produce large hail stones, gale force winds and heavy rainfall. These storms can have a significant impact on primary producers by destroying crops and the farming infrastructure used to maintain the land.



## **6. LEGAL AND ADMINISTRATION FRAMEWORK**

### **6.1 SOUTH AUSTRALIAN LEGISLATION**

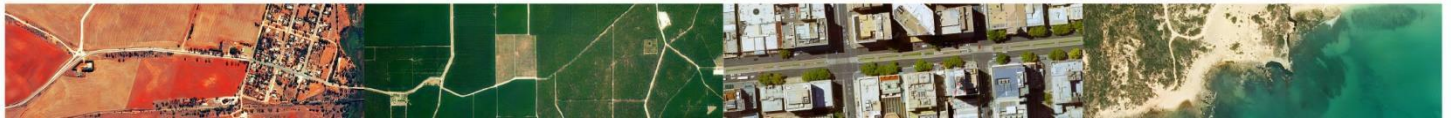
South Australian legislation with a linkage or support to this Plan includes:

- Emergency Management Act 2004
- Fire and Emergency Services Act 2005 and Fire and Emergency Services Regulations 2005
- Local Government Act 1999
- Planning, Development and Infrastructure Act 2016 and Regulations 2017

### **6.2 PLANS**

Plans with a linkage or support to this Plan include:

- State Emergency Management Plan
- Flood Hazard Plan
- SASES Control Agency Plan
- SASES Heatwave Response Plan
- SASES State Flood Plan
- SASES Business Continuity Plan
- SA Government Extreme Heat Communications Plan
- Land Use Planning and Building Design and Construction
- DHS Code Blue Plan
- DHS Code Red Plan
- Black System Event Hazard Plan



## 7. ROLES, RESPONSIBILITIES, CAPABILITIES AND STRATEGIES

### 7.1 PREVENTION AND PREPAREDNESS

Extreme weather as a hazard cannot be prevented, however education, information and warnings regarding the pending hazards may assist in reducing the impacts from the hazard elements.

For the purposes of this plan, prevention is defined as activities that eliminate or reduce the probability of occurrence of a specific hazard, and/or reduce the degree of damage likely to be incurred. Preparedness is defined as activities that focus on essential emergency response capabilities through the development of plans, procedures, organisation and management of resources, training and public education.

Effective governance, information management and warning systems to support response and recovery efforts can considerably reduce the risks and consequences of extreme weather on vulnerable communities.

#### 7.1.1 SASES as Extreme Weather Hazard Leader

The SEMP, as described in Part 2, has assigned the role of Extreme Weather Hazard Leader to the SASES. The role of Control Agency for extreme weather has also been assigned to the SASES. The role of SASES as Hazard Leader Extreme Weather includes to:

- undertake a leadership role for the planning of emergency management activities pertaining to Extreme Weather including heatwaves, cold and storm events
- engage with and lead a collaboration of all agencies of government, non-government, local or Commonwealth, nongovernment entities to undertake necessary planning for this hazard
- prepare risk assessments as per the requirements of the National Emergency Risk Assessment Guidelines
- adhere to the reporting arrangements as outlined in the SEMP (Capability and Capacity Sub-group to SEMC)
- work with the various advisory groups and Control Agencies, Support Agencies and Functional Support Groups to ensure that all aspects of the state's approach to the hazard, including mitigation, response and recovery measures, are coordinated
- undertake ongoing review of the continuing need for the hazard to remain listed within the SEMP and provide advice to SEMC on any proposals to amend or remove the listing
- review plans to ensure that all aspects of the extreme weather hazards have been addressed
- ensure that appropriate processes are in place to enable Control Agencies to gather information about pending incidents, to ensure that maximum warning can be obtained
- develop specific policies or guidance notes with regard to undertaking evacuations where appropriate

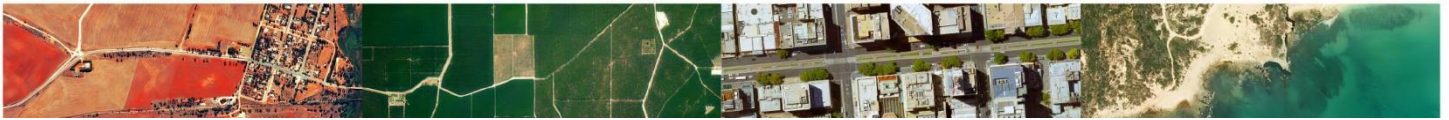
#### 7.1.2 Community and Individuals

The National Strategy for Disaster Resilience states that disaster resilience is based on individuals taking their share of responsibility for preventing, preparing for, responding to and recovering from disasters. When provided with guidance and resources from government and community organisations individuals and communities can be self-reliant and capable of organising themselves before, during and after disasters which helps to restore social, institutional and economic activity.

#### 7.1.3 Extreme Weather Warnings

Public information and warnings shall be provided in accordance with the SEMP.

The SASES will issue suitable Heatwave Warning messages as well as a State Heatwave Summary to stakeholder agencies prior to Heatwave events. This ensures SA whole of government preparedness.



Heatwave Warning messages will be issued by SASES to the media, public and stakeholder agencies. These warnings are triggered based on the BOM forecast information for area particular district.

The BOM will issue Severe Weather Warnings and Severe Thunderstorm warnings.

#### **7.1.4 Warning Dissemination**

Extreme weather warnings are distributed by the BOM and SASES prior to an extreme weather event where possible and directly to control agencies as well as via:

- free-to-air broadcast media (radio and television)
- public internet, including the SASES and BOM websites
- social media (Twitter and Facebook)
- emergency alert (landline and mobile voice messaging and text messaging).

Following the issuing of any warning products, the SASES State Headquarters will maintain regular contact with the BOM until the potential threat has eventuated or passed.

#### **7.1.5 Communication Strategy**

The SASES communication plans for Heatwave and storm events identify the warning and communication stages, specific objectives and key messages. They also identify the new and existing communications channels and community-based initiatives.

Communication plans are updated on an annual basis prior to each heat or storm season.

Extreme Weather Advisory Committee

The extreme weather hazard leader leads the Extreme Weather Hazard Advisory Committee to coordinate management of the South Australian extreme weather hazard.

The Extreme Weather Hazard Advisory Committee meets to:

- progress the aims of the hazard plan
- create working groups to undertake activities required for the hazard plan
- review the progress of the implementation of the plan
- review and recommend changes to the plan
- review and recommend changes to the work program associated with the implementation of the plan
- work with other hazard leaders to align extreme weather hazard with other hazards, and
- advise the extreme weather hazard leader on additional resources required for the effective management of the South Australian extreme weather hazard

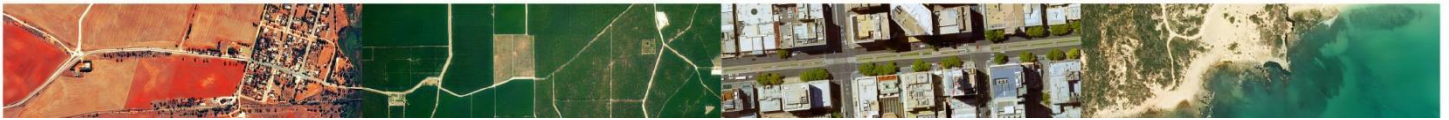
#### **7.1.6 Bureau of Meteorology**

The BOM is the Commonwealth government agency responsible for the provision of weather forecasting and climate data.

In February 2017, the Commonwealth and all Australian states and territories signed the intergovernmental agreement on the provision of BOM hazard services to the states and territories. This agreement formalized and standardized the services to be provided by the BOM to state and territory emergency services agencies for extreme weather, flood and hazard impact event management.

In addition to the above agreement, a joint funding agreement between BOM, SASES, CFS and DEW has resulted in the permanent deployment of a meteorologist to be co-located with and provide education, training and meteorological advice to the aforementioned agencies.





The Extreme Weather Warning Coordinator (BOM) will:

- liaise with the extreme weather Control Agency to determine the warning requirements for extreme weather
- assess the current warning systems resources in cooperation with the custodians of the monitoring information. Warning systems will be assessed in accordance with:
  - importance to the prevention of and preparedness for each extreme weather hazard element
  - reduction of extreme weather vulnerability across each extreme weather hazard element
  - effectiveness in transmitting an extreme weather warning signal to response agencies, and triggering an appropriate response, and
- collaboration with the extreme weather Control Agency, effectiveness in transmitting an extreme weather warning signal to affected communities, and triggering an appropriate response
- progress a work program that describes:
  - current extreme weather warning systems for each extreme weather hazard element, and the resources required to maintain them
  - recommended extreme weather warning systems for each extreme weather hazard element, and the resources required to progress them
- contribute to the development and implementation of extreme weather community awareness / education programs
- report back to the Extreme Weather Hazard Advisory Committee as required
- coordinate implementation of the work program with relevant agencies when resources are available
- liaise with State Controller Public Information Functional Support Group

The BOM also provides live data to SASES on rainfall and river levels for locations throughout the state. Additional data is collected by multiple agencies including the BOM, DEW, SA Water and councils then provided to SASES.

### **7.1.7 Local Government**

Local Government comprises 68 local Councils currently operating in South Australia. They manage more than \$8 billion worth of community infrastructure and invest about \$1 billion a year in providing services to people who live, work, do business in, and visit the local Council area.

Local Government provides support to the extreme weather hazard leader through its membership in Zone Emergency Management Committees and contributing advice and assurance on mitigation controls, planning, risk management and recovery responsibilities

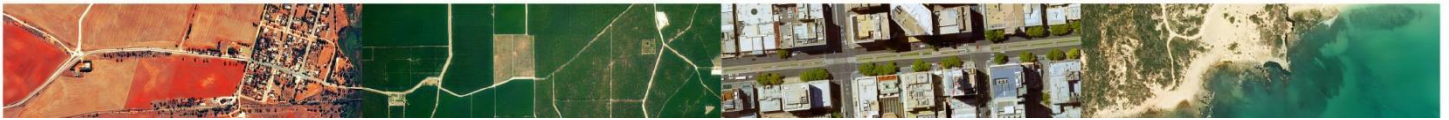
In accordance with the SEMP, the Local Government Association (LGA) leads the Local Government Functional Support Group. Where required, they assist the extreme weather Control Agency by supporting the response to an extreme weather event.

### **7.1.8 Health Planning**

The SA Health – Extreme Heat Strategy outlines a series of SA Health guiding principles to aid identifying responsibilities and authorities to prepare for the impact of, as well as strategies to manage and recover from a Heatwave event impacting upon SA Health. These guiding principles are specific to an Heatwave event.

The Extreme Heat Strategy is overarching, intended for use across SA Health, the Local Health Networks and SA Ambulance Service (SAAS) to guide Health Services in developing and maintaining their localised, contextual arrangements (Extreme Heat Plans).





It is intended that each Health Service and relevant agencies that form part of SA Health use these plans to establish their own procedures, arrangements or plans specific to their context.

SA Health implements their Heatwave plans, prepare for and respond to heat events. In the planning and preparation phase, SA Health works with other government departments, departmental program areas and service providers including the SASES and the BOM that provide information and services to at-risk groups and their carers in a heat event, to provide advice and support.

Additionally, a communication strategy is implemented to provide heat health information to health and community service providers, non-government organisations and community groups who will further distribute information to their clients and their carers.

#### **7.1.9 Tourism**

International visitors, especially those visiting from northern European countries, are particularly vulnerable to heat related safety risks.

SA Tourism and other tourism associations and operators will be contacted to assist with distribution of Heatwave information and heat health-related advice for visitors. The SASES works with tourism operators in preparation for heat events.

#### **7.1.10 Energy**

South Australia's electricity is supplied through an aggregate of local fossil fuel generation, a growing range of renewable generation and, connections to interstate energy through the National Electricity Market (NEM) which is managed by the Australian Energy Market Operator (AEMO). Electranet, the transmission company in South Australia, and SA Power Networks (SAPN), the distribution company, transport and distribute the energy from the generators to customers.

In accordance with the requirements of the National Electricity Rules, AEMO is responsible for developing arrangements with the interconnected states ie South Australia, Victoria, New South Wales, Tasmania and Queensland, to coordinate the response to events which affect the security, stability or reliability of the NEM. On occasions extreme weather can affect the security, reliability or stability of the NEM in which case load is shed either automatically, or when there is sufficient time, the electricity industry sheds loads in accordance with established protocols, to restore the balance between supply and demand. Some extreme weather events can result in the interruption of all electricity supply to the state.

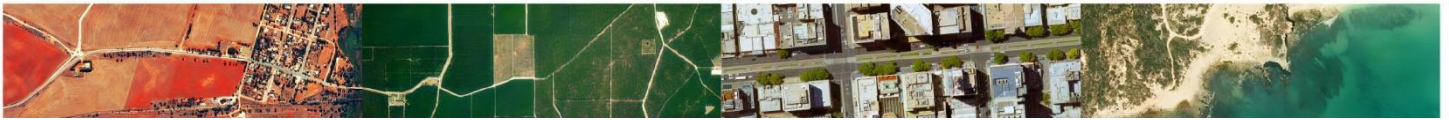
SAPN has protocols in place to either manage or cancel planned work in advance of forecast extreme weather such as storms or heatwaves. To ensure they're aware of outages, customers are encouraged to register with their energy retailer to receive SMS notifications of either planned or unplanned outages. This will include receiving advice of when scheduled works need to be cancelled at short notice.

Electricity retailers provide SAPN with details of power dependent customers (termed 'life support customers'). State electricity codes require SAPN to manage information to such customers for planned and unplanned outage events.

#### **7.1.11 Public transport**

Individual transport operators are responsible for their own emergency management plans. Adelaide Metro oversees the public transport operators in Adelaide.

Transport operators undertake activities relating to their own infrastructure. Most have rosters for extra maintenance staff during Heatwave events. Additional inspections are carried out on signalling equipment and track structures, and temporary speed restrictions are put in place where necessary to reduce the load on rail and tram tracks.



Public transport operators have protocols in place to deal with service disruption, which can be quickly put into place should disruptions occur. These include:

- using weather warnings as a trigger to roster additional maintenance and customer service staff
- replacing affected passenger rail and tram services with buses
- using trucks to transport rail freight where rail lines are unavailable for extended periods and providing (where possible) identified road freight routes to minimise subsequent damage to local roads
- activating protocols with other departments for the management of school bus services
- undertaking routine inspections of train lines on a regular basis, with additional inspections during periods of hot and wet weather
- Adelaide Metro planning for weather and other disruptions, with various mitigation measures including special procedures, conditions and operating limits
- trams undertaking additional inspections of infrastructure and maintenance of rolling stock prior, during and after Heatwave events
- DPTI undertaking road maintenance inspections on a regular basis during periods of hot weather to monitor heat damage

#### **7.1.12 Water**

Heatwave events may cause a significant increase in the demand for water services, particular drinking water. There may be concurrent risks, such as the potential loss of power supplies, which are required for water distribution and treatment. On occasion, these events can lead to reduced pressures in some systems.

SA Water holds the responsibility for drinking water and wastewater services in South Australia. SA Water have a range of strategies and emergency management plans that will limit any disruption to water supplies and wastewater treatment before, during and after extreme weather events including:

- bringing forward or postponing any scheduled work
- increasing water production, treatment and distribution to meet expected demand increases
- monitoring water system performance to manage any reduced pressure
- promptly repairing water main breaks to minimise outage times
- providing alternative power supplies at key water sites
- providing alternative water supplies, such as bottled water or temporary tanker water

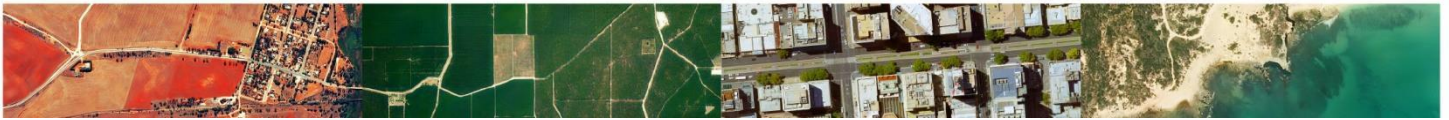
#### **7.1.12 Animal Welfare**

Under the current SEMP, the official role of the RSPCA South Australia is to assist the Department of Primary Industries and Regions South Australia (PIRSA) during the response and recovery phases of animal care during Heatwave events. The planning and management of companion animals during Heatwave events is the owner's responsibility.

The SA Government website <https://www.sa.gov.au/topics/emergencies-and-safety/animals-in-emergencies> is a one-stop shop information hub for animals in emergencies.

#### **7.1.13 Resourcing, Training and Exercises**

To effectively deliver services the SASES has developed a best practice guide which is documented in the SASES Capability Management Framework and the SASES Resource Allocation Framework (RAF). The RAF describes each capability required by SASES and defines the training standards, equipment requirements and ensures that service provision aligns with organisational and legislative requirements.



The SASES is a Registered Training Organisation (RTO) and provides a broad range of accredited and non-accredited training courses to ensure that members are trained in all aspects required to minimize and recover from the impacts of extreme weather events.

The SASES maintains membership within the Central Exercise Writing Team (CEWT) which supports the writing and running of extreme weather hazard exercises in the State.

#### **7.1.14 Information Technology**

SASES uses the SASES Incident Information and Management System (SESIIMS) for information sharing between stakeholder agencies and incident reporting.

SASES has implemented a flash flood information system called FloodMon which is designed to monitor, in near real-time, rainfall and water level gauge information from around the state. FloodMon enables the SASES to monitor conditions and use that information to inform the public through warnings of areas of likely impact. SASES first responders are able to identify local areas of concern and better allocate resources in a more timely manner.

#### **7.1.15 Other State Government Departments and/or Services**

All State Government departments should have Heatwave Plans and programs that they implement and use to reduce the impact of heat events on their staff clients and work practices. These plans and programs are triggered and activated at the release of a Heatwave Warning message.

### **7.2 RESPONSE**

#### **7.2.1 SASES as Extreme Weather Control Agency**

The SEMP identifies SASES as the Control Agency for an extreme weather event, they are primarily responsible for response to these events. Part 2 section 5.4.3 of the SEMP describes the ten responsibilities of a Control Agency.

The SASES has developed and maintains a Control Agency Plan and response plans which address its legislative responsibilities for extreme weather and flood response.

Additionally, the SASES are working with DEW and the BOM to develop local, regional or zone plans to address specific risks of flooding and other impacts of extreme weather.

#### **7.2.2 Incident Management**

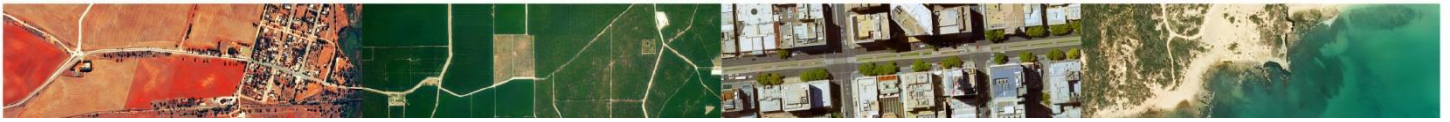
The SEMP requires each Control Agency to adopt an incident management structure to demonstrate how the responsibilities of the Control Agency are to be addressed. The SASES Incident Management Manual uses the Australian Inter-service Incident Management System (AIIMS) for SASES response to incidents when they are the designated Control Agency.

#### **7.2.3 SASES State Control Centre Manual**

The SASES State Control Centre Manual details the agency objectives, triggers, structures, operational arrangements, implementation and records management arrangements. It also includes support information that maybe required from hydrologists or weather forecasters located in other agencies such as BOM and DEW.

#### **7.2.4 SASES State Control Agency Plan**

The SASES Control Agency Plan provides the framework for state and local response plans in compliance with the responsibilities as described in the SEMP.



## 7.3 RECOVERY

As the Control Agency for extreme weather response, the SASES has responsibility for ensuring that there is a seamless transition from response to recovery and for liaising with the State Coordinator and State Recovery Coordinator to facilitate this transition. It is important that the Control Agency works closely with the State Recovery Coordinator / Assistant State Coordinator - Recovery to ensure that all aspects of the recovery process are properly assessed and acted upon.

The State Recovery Office (SRO) is a unit within the Department of Human Services (DHS) that works across government and non-government sectors to increase the State's disaster recovery capacity and understanding. The SRO develops and maintains recovery policies, plans and arrangements, zone recovery planning and undertakes practice improvement initiatives arising from lessons learnt from emergencies, exercises and research. It provides support to the State Recovery Coordinator / Assistant State Coordinator – Recovery and local recovery planning support to the Zone Emergency Management Committees (ZEMC).

During and after an emergency, the SRO provides management and administrative support to the assigned recovery leaders and consultative bodies at Australian, state and local levels. This includes leadership, coordination, advocacy and support roles in recovery operations in all areas of the State.

State relief and recovery arrangements are outlined in the SEMP Parts 2 and 3. The DHS Disaster Recovery website provides general information about disaster recovery services that may be offered. Specific information relating to a disaster or emergency may be found at the [sa.gov.au/recovery](http://sa.gov.au/recovery) website.

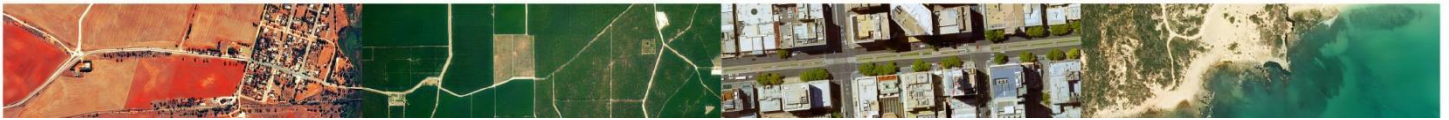
### 7.3.1 Damage Assessment

An important function in the transition process from relief to recovery is to provide recovery agencies with a damage assessment to enable these agencies to understand the impact of the damage and develop a picture of the extent and nature of the recovery tasks faced.

An accurate and timely damage assessment is also necessary to provide information necessary to apply for State and Commonwealth funding assistance.

In accordance with the Damage Assessment Support Plan the SASES will ensure that damage assessments are undertaken as per the SEMP.





## **8. SPECIAL ACTIONS FOR CONSIDERATION**

### **8.1 PUBLIC INFORMATION AND MEDIA**

Public information guidelines have been developed and agreed between government media advisors and public information officers. Core principles include:

- public safety is the highest priority
- information flow should only be restricted in the interests of safety and/or operational security
- public information and media responses must undergo all necessary clearances
- agencies must not make unapproved comment on an area of responsibility of another agency

During an event for which they are the Control Agency, the SASES is responsible for managing the media in consultation with the affected agencies or organisations.

### **8.2 TRAFFIC MANAGEMENT**

Traffic management requires co-ordination between South Australia Police (SAPOL) and Department for Planning, Transport and Infrastructure (DPTI). SAPOL has the responsibility of assisting the public, regulating road use and preventing road crashes. The DPTI Traffic Management Centre makes provision for a safe and efficient road system and liaises with local governments who have responsibility for their local road.

During extreme weather (heat, storm or resultant flooding) there may be a requirement for special traffic considerations such as monitoring, restriction or closure which may need actioning due to:

- trees on roads
- traffic jams
- damage to roads, verges etc from heat or rain or stormwater

Guidelines are outlined in the SEMP (Part 3, Annex H: Traffic management during emergencies).

### **8.3 EVACUATION**

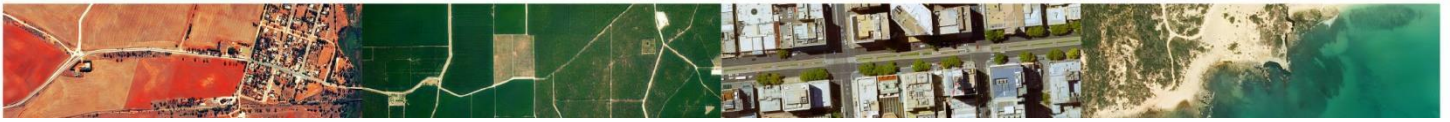
The SEMP outlines the general position of the State's emergency management agencies. It differentiates between immediate evacuation, pre-warned evacuation and self-evacuation. A Control Agency may only cause a directed evacuation where it has the legislative authority to do so. Such evacuation will only occur when members of the community are at risk and do not have the capability to make an informed decision or when it is evident that loss or life or injury is imminent and almost certain. Guidelines for evacuations are contained in SEMP (Part 3 - Annex A: Evacuation).

### **8.4 LESSONS MANAGEMENT AND DEBRIEFS**

The SEMP (Part 3 – Annex F: Lessons Management and Debriefs) outlines the South Australian Lessons Management Framework guidelines. It provides for the methodology including process, systems and standards for how observations, insights and lessons will be captured, analysed, validated, actioned and monitored.

SASES will conduct debriefs to collect observations which will be analysed, and lessons reported. Actions will be identified and implemented, monitored and evaluated, and learnings will be embedded in training, policy and processes, and shared and communicated resulting in behaviour change.

The SASES also conducts state, regional, unit and stakeholder (including community) debriefs to consolidate issues for further investigation related to extreme weather.



## **9. STATE SUPPORTING STRUCTURES/COMMITTEES/FACILITIES**

### **9.1 FUNCTIONAL SUPPORT GROUPS**

Functional Support Groups (FSG) assist in response and recovery activities during an emergency for all hazards. FSGs contribute to the coordination role of the State Emergency Centre (SEC). Part 2 section 5.8 of the SEMP identifies the FSGs and the lead agency. The delegated roles and responsibilities are outlined in Part 2, section 5.8.1 of the SEMP.

### **9.2 SUPPORT AGENCIES**

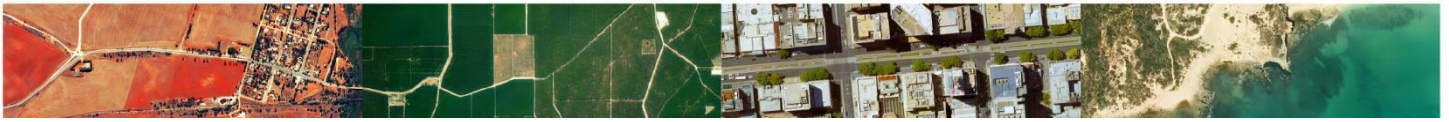
Part 2, section 5.5 of the SEMP outlines the role and responsibilities of support agencies and their participating agencies.

The SASES may request the assistance of support agencies who will support SASES as the Control Agency.

### **9.3 EXTREME HEAT AND CULTURALLY AND LINGUISTICALLY DIVERSE (CALD) COMMUNITIES WORKING GROUP**

The Extreme Heat and CALD Communities Working Group comprises representatives from University of Adelaide, Multicultural SA, SA Health, SASES, BOM, Red Cross and the Department for Education. It provides information on the latest Extreme Heat research and recommendations on ways to communicate preventive measures and Heatwave advice to minimise the risk of harm for migrants and refugees during a Heatwave. The working group reports to the State Mitigation Advisory Group (SMAG).





## **10. VULNERABLE SECTORS OF THE COMMUNITY**

### **10.1 SECTORS OF THE COMMUNITY VULNERABLE TO EXTREME HEAT OR COLD:**

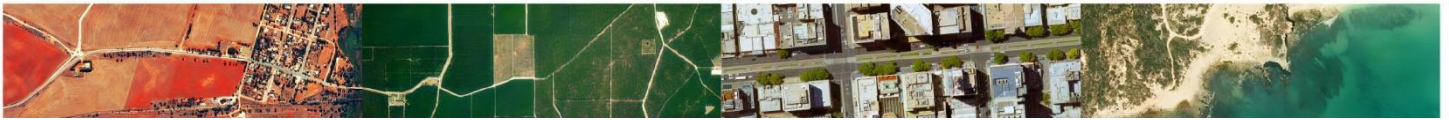
Prolonged heat or cold events can affect anybody. The following population groups may be susceptible to heat or cold related illness:

- people aged over 65 years, especially those who are socially isolated
- people who have a medical condition such as heart disease, high blood pressure, diabetes, cancer or kidney disease and those taking medications that may affect the way the body reacts to temperature
- people who have a mental illness, particularly those on medication (antidepressants or antipsychotics)
- people with problematic alcohol or other drug use such as amphetamines
- people with an illness or infection that causes dehydration or fever
- people with physical or cognitive impairment who may not be able to identify or communicate their discomfort or need for water, warmth or dry conditions
- people who are overweight or obese
- pregnant women, breastfeeding mothers, babies and young children
- people who work outdoors (such as gardeners and labourers) can be susceptible to heat or chill
- homeless people or those who live alone or are socially isolated
- people without heating or cooling devices in their homes
- visitors from other temperate zones
- non-English speaking people who may not be able to understand heat event announcements or have reduced access to, or understanding of, appropriate health or support services

### **10.2 SECTORS OF THE COMMUNITY VULNERABLE TO EXTREME STORM**

Extreme Storm can have a detrimental effect on health, safety and wellbeing but there are precautions that can be taken to reduce these effects. Areas of high-risk demographics are as follows:

- all areas of SA
- homeless people
- people outdoors including those playing sport or taking part in mass gatherings for social or cultural events.
- motorists, caravaners and campers
- tourists
- mariners
- the elderly especially those with medical or physical challenges who are also socially isolated
- people with disabilities who are socially isolated
- people who do not / cannot receive warnings
- non-English speaking people who may not be able to understand extreme weather warnings or have reduced access to, or understanding of appropriate support services



## 11. RISK ASSESSMENTS

### 11.1 RISK ASSESSMENT AND MITIGATION SUMMARY

South Australia (SA) has a history of being affected by extreme weather events, they are not localised to any particular area of the State. In 2013, the Extreme Storm and Extreme Heat Risk Assessments using the National Emergency Risk Assessment Guidelines were completed and signed off by the Hazard Leader in 2014. In 2019, the priority risks were reviewed and updated in the State Heat Risk Register.

### 11.2 KEY RISKS IN SOUTH AUSTRALIA

The principal elements at risk for both Extreme Storm and Heatwave are:

- people
- economy
- social setting
- public administration
- environment

Risk statements were identified for potential minor, major and catastrophic scenario extreme weather events. A total of 186 Extreme Storm risk statements and 198 Extreme Heat risk statements were identified. The Extreme Heat risk management report identified the tolerability of the top 34 of risks, 2 of those rated intolerable and the other 32 rated As Low As Reasonably Practical (ALARP) 2. Both of the intolerable rated risks related to catastrophic Extreme Heat events with impacts on people and the economy. The intolerable rating was due to the low confidence in the controls to cope with this level event. However, the likelihood of the risk occurrence was 'unlikely'.

The Extreme Storm State Risk Management Report identified 186 risk statements, none of those were calculated to be intolerable risks. There were 28 top risks identified as ALARP level 2, most of these (21) were 1;1000 year events that were rated as unlikely to occur.

The reports identified a number of control improvements and treatment objectives in order to mitigate or minimise the risks. The Extreme Weather Hazard Leader has been working towards implementing those suggestions under their control and, working with key stakeholders to improve other treatments and controls. These include:

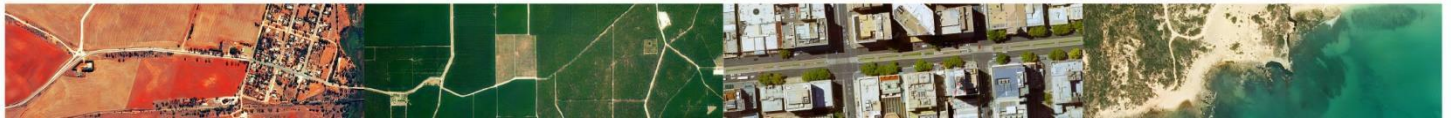
- annually reviewing the SASES business continuity plan and participating in the relevant exercises
- providing information to councils on business continuity planning
- developing and distributing a land development policy document to assist in the mitigation of the impacts of extreme weather
- broadening community education through a multi-faceted communication strategy
- establishment of the heat *and storm* campaign to promote community awareness of the impact of Extreme Heat
- working with the BOM in the expansion of the Extreme Heat forecasting and communication strategy a graphic device has been developed for use by all agencies when communicating about Extreme Heat. This whole-of-state branding provides a coordinated approach to community safety messaging. For more information on the use of this device contact the Senior Corporate Communication Officer at SASES by telephone (08) 8115 3800.



## 12. GLOSSARY

The Glossary provides definitions for terms used within this plan that are not included in Part 2 of the SEMP. It is essential terms are used in their correct context.

TERM	DEFINITION
Emergency Plans	An agreed set of arrangements for preventing, mitigating, preparing for, responding to and recovering from an incident or emergency, involving the definition of responsibilities, the analysis of resources and the definition of command control structures.
Exercise	Realistically planned simulations of an incident designed and coordinated in such a manner that the response of the emergency organisation and other personnel closely approximates the response to the actual incident.
Heatwave	As per section 5 of this plan
Extreme Weather	As per section 5 of this plan
Extreme Storm	As per section 5 of this plan
Hail	Hailstones are falling particles of ice with a diameter that can vary between 5 and 50 millimetres. They \ can form in a thunderstorm with a strong updraught when frozen raindrops, 'suspended' in the updraught, grow rapidly by 'sweeping up' small cloud droplets which freeze on contact. Hailstones larger than cricket balls have been recorded in Australia.
Heatwave	A heatwave occurs when a period of at least three days where the combined effect of excess heat and heat stress is unusual with respect to the local climate. Both maximum and minimum temperatures are used in this assessment.
Lightning	Lightning is the discharge produced when voltage differences between ground and atmospheric electrical charge are large enough (several hundred million volts) to overcome the insulating effect of the air. Strikes can occur within the cloud, between clouds, or between clouds and the ground.
Resilience	The capacity of an individual, system, community or society that is exposed to shock to cope, withstand and learn or adapt.



Response	Actions taken in anticipation of, during and immediately after an emergency to ensure that its effects are minimised, and that people affected are given immediate relief and support.
SASES State Control Centre	A facility from which the total operation or aspects of the operation are managed to control and coordinate the response and support to an incident or emergency.
Severe thunderstorm	<p>As per the “Severe Weather” phenomena but including damaging hailstones (2 cm in diameter or greater).</p> <p>Note: Thunderstorms that do not produce any of these phenomena are not defined as “Severe” but may still cause death, injury or property damage due to lightning.</p>
Severe weather	Heavy rainfall conducive to flash flooding (in excess of 30 mm/h), damaging wind (average of 63 km/h or greater, or gusts of 90 km/h or greater).
Thunderstorm	Sudden electrical discharges manifested by a flash of light (lightning) and a sharp or rumbling sound (thunder).
Tornadoes	Are the rarest and most violent of thunderstorm phenomena. They are rapidly rotating columns of air that descend in the well-known funnel shape from the base of a storm cloud. A tornado vortex, which can range in width from a few metres to hundreds of metres, usually whirls clockwise (viewed from above) and contains very damaging winds that may reach more than 450 km/h.
Thunder	Thunder is the sound produced by the explosive expansion of air heated by the lightning stroke to temperatures as high as 30,000°C.
Wind gusts	<p>A gust is any sudden increase of wind of short duration, usually a few seconds. In a mature thunderstorm, the falling rain and hail drag the surrounding air downwards. In addition, evaporation from the raindrops cools the nearby air, accelerating the downward rush. This strong downdraught spreads out upon reaching the ground, producing a cool, gusty wind that can cause damage.</p>



## 13. ACRONYMS

Acronym	Meaning
ADT	Average Daily Temperature
BCP	Business Continuity Plan
BOM	Bureau of Meteorology
CALD	Culturally and Linguistically Diverse
CFS	South Australian Country Fire Service
CSIRO	Australian Commonwealth Scientific and Research Organisation
DHS	Department of Human Services
DEW	Department for Environment and Water
DPTI	Department of Planning, Transport and Infrastructure
EM	Emergency Management
EMA	Emergency Management Australia
EWHAG	Extreme Weather Hazard Advisory Group
EWHP	Extreme Weather Hazard Plan
LGA	Local Government Association
PIRSA	Department of Primary Industries and Regions
PPRR	Preparation, Prevention, Response and Recovery
SA	South Australia
SAAS	South Australian Ambulance Service
SAFECOM	South Australian Fire and Emergency Services Commission
SAMFS	South Australian Metropolitan Fire Service
SAPOL	South Australia Police
SASES	South Australian State Emergency Service
SDO	State Duty Officer
SEC	State Emergency Centre



SEMC	State Emergency Management Committee
SEMP	State Emergency Management Plan
SITREP	Situational Report
SMAG	State Mitigation Advisory Group
SRO	State Recovery Office

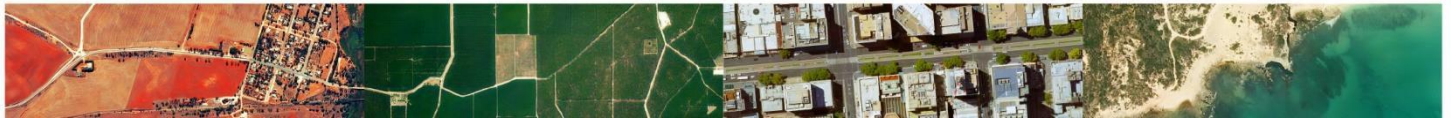
The above acronyms also apply to the other plans that make up the SEMP.





## 14. DOCUMENT CONTROL

Classification/DLM		Public-I2-A2	
Authority		Part 4 of the State Emergency Management Plan, which is prepared by the State Emergency Management Committee pursuant to Section 9(1)(b) of the <i>Emergency Management Act 2004</i>	
Managed & maintained by		South Australian State Emergency Service (SASES)	
Issued		3 October 2018	
Scheduled Review Date		30 June 2020	
Version	Date	Author	Comments
1.0	Jun 2009		First release.
2.0	Dec 2013		Major Update to 1.0
2.1	Oct 2015	G Wynwood	Revision
3.0	Nov 2016	G Wynwood	Revision
4.0	Oct 2018	J Brooks	Major Review
4.1	Jun 2020	C Retsas	Review



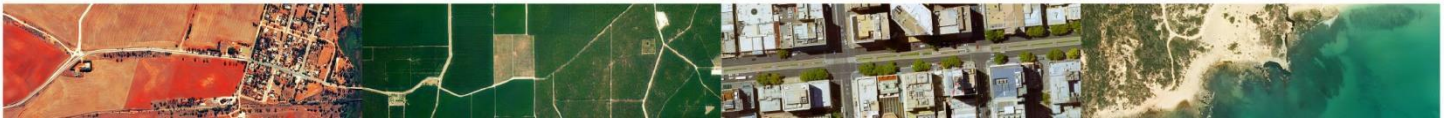
## 15. REFERENCES

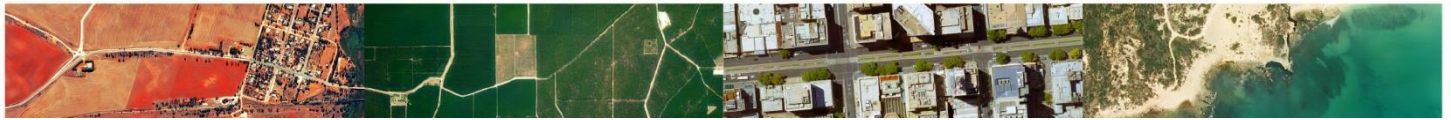
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## ANNEX A - LINKAGES BETWEEN EXTREME WEATHER AND OTHER HAZARDS

Hazard	Degree of linkage with extreme weather hazard	Comments
Flood	High	<ul style="list-style-type: none"> <li>• Extreme weather can be associated with intense rainfall and contribute to stormwater and riverine flooding.</li> <li>• Extreme weather can affect the integrity of infrastructure, and contribute to major dam burst, farm dam burst and infrastructure failure flooding (e.g.; home flooding).</li> </ul>
Urban Fire	Medium	<ul style="list-style-type: none"> <li>• Extreme weather can cause or exacerbate urban fire events.</li> <li>• Extreme weather can seriously and adversely impact on the ability to contain and extinguish an urban fire.</li> </ul>
Rural Fire	High	<ul style="list-style-type: none"> <li>• Extreme weather can cause or exacerbate rural fire events – through lightning strikes, land gales and severe heat.</li> <li>• Extreme weather can seriously and adversely impact on the ability to contain and extinguish a rural fire.</li> </ul>
Animal – Plant Disease	Medium	<ul style="list-style-type: none"> <li>• Extreme weather can cause or exacerbate animal and plant disease outbreaks.</li> <li>• Extreme weather can seriously and adversely impact on the ability to contain and eradicate crop and livestock disease.</li> </ul>
Terrorism	Low	<ul style="list-style-type: none"> <li>• Extreme weather can seriously and adversely impact on the ability to contain and nullify terrorism attacks.</li> <li>• An extreme weather event may be chosen as the time to launch a terrorist attack in order to maximise its impact on the target community.</li> </ul>
Human Disease	Low	<ul style="list-style-type: none"> <li>• Extreme weather can cause or exacerbate human disease outbreaks.</li> <li>• Extreme weather in the form of Extreme Heat can exacerbate chronic or acute human disease conditions.</li> <li>• Extreme weather can seriously and adversely impact on the ability to contain and eradicate human disease.</li> <li>• Extreme weather can assist in the spread of dangerous substances leading to an increased incidence of human disease.</li> </ul>





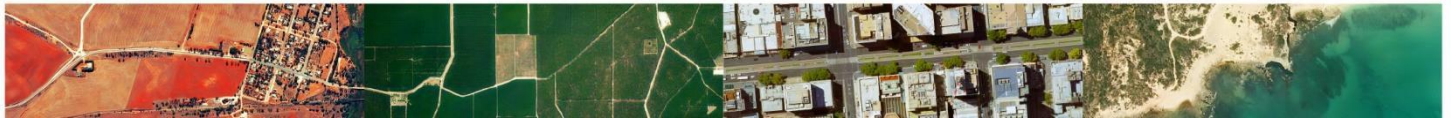
## ANNEX B: HEAT RELATED ILLNESSES

Illness	Symptoms	Treatment
Dehydration	<ul style="list-style-type: none"> <li>• Profuse sweating</li> <li>• Increase in body temperature</li> <li>• Lethargy and tiredness</li> <li>• Loss of appetite</li> <li>• Being thirsty</li> <li>• Irritability</li> </ul>	<ul style="list-style-type: none"> <li>• On feeling unwell, cease activity and go to a cool shaded place</li> <li>• Drink plenty of fluids (avoid caffeine and alcohol)</li> <li>• Try to keep cool by: <ul style="list-style-type: none"> <li>• turning on a fan or air-conditioner</li> <li>• using a spray bottle of water on the face and body</li> </ul> </li> <li>• If remaining unwell, seek medical advice as soon as possible</li> </ul>
Heat Cramps	<ul style="list-style-type: none"> <li>• Muscle spasms</li> <li>• Painful muscle cramps in the limbs or abdomen</li> <li>• Twitching</li> <li>• Moist cool skin</li> </ul>	<ul style="list-style-type: none"> <li>• On feeling unwell, cease activity and go to a cool shaded place</li> <li>• Drink plenty of fluids (avoid caffeine and alcohol)</li> <li>• Try to keep cool by: <ul style="list-style-type: none"> <li>• turning on a fan or air-conditioner</li> <li>• using a spray bottle of water on the face and body to cool down, or use a wet towel</li> <li>• having a cool shower or bath</li> </ul> </li> <li>• Lie in a cool place with legs supported and slightly elevated</li> <li>• Massage limbs gently to ease the spasms, or firmly if cramped, then apply ice packs</li> <li>• If remaining unwell, seek medical advice as soon as possible</li> </ul>
Heat Syncope	<ul style="list-style-type: none"> <li>• Dizziness and Fainting</li> </ul>	<ul style="list-style-type: none"> <li>• May be aggravated by cardiovascular disease, and certain medications</li> <li>• On feeling unwell, cease activity and go to a cool shaded place</li> <li>• Drink plenty of fluids (avoid caffeine and alcohol)</li> <li>• Try to keep cool by: <ul style="list-style-type: none"> <li>• turning on a fan or air-conditioner</li> <li>• using a spray bottle of water on the face and body to cool down, or use a wet towel</li> <li>• having a cool shower or bath</li> </ul> </li> <li>• Lie in a cool place with legs supported and slightly elevated</li> <li>• If heat cramps present, massage limbs gently to ease the spasms, or firmly if cramped, then apply ice packs</li> <li>• If remaining unwell, seek medical advice asap</li> </ul>





Illness	Symptoms	Treatment
Heat Exhaustion	<ul style="list-style-type: none"> <li>• Headaches</li> <li>• High temperature</li> <li>• Profuse sweating</li> <li>• Cold, clammy pale skin</li> <li>• Fatigue, weakness and restlessness</li> <li>• Nausea and vomiting</li> <li>• Weak but rapid pulse</li> <li>• Poor coordination</li> <li>• Circulatory collapse</li> </ul>	<ul style="list-style-type: none"> <li>• May be aggravated by cardiovascular disease, and certain medications</li> <li>• On feeling unwell, cease activity and go to a cool shaded place</li> <li>• Drink plenty of fluids (avoid caffeine and alcohol).</li> <li>• Try to keep cool by:               <ul style="list-style-type: none"> <li>• turning on a fan or air-conditioner</li> <li>• using a spray bottle of water on the face and body to cool down, or use a wet towel</li> <li>• having a cool shower or bath</li> </ul> </li> <li>• Put cool packs under the armpits, in the groin or on the back of the neck (or all three places) to reduce body heat</li> <li>• Lie in a cool place with legs supported and slightly elevated</li> <li>• If heat cramps present, massage limbs gently to ease the spasms, or firmly if cramped, then apply ice packs</li> <li>• If remaining unwell, seek medical advice as soon as possible</li> <li>• If vomiting continues, seek medical assistance immediately by calling 000 for an ambulance</li> </ul>
Heatstroke	<ul style="list-style-type: none"> <li>• Confusion, headaches, dizziness and nausea</li> <li>• Skin flushed, hot and unusually dry</li> <li>• Intense thirst</li> <li>• Dry, swollen tongue</li> <li>• Sudden rise in high body temperature (40oC+)</li> <li>• Disorientation, delirium</li> <li>• Slurred speech</li> <li>• Aggressive or bizarre behavior</li> <li>• Sleepiness</li> <li>• Convulsions</li> <li>• Unconsciousness may develop rapidly</li> <li>• Seizures or coma</li> </ul>	<ul style="list-style-type: none"> <li>• This is an extreme medical emergency. Ring 000 immediately for an ambulance!</li> <li>• May be aggravated by cardiovascular disease, and certain medications</li> <li>• On feeling unwell, cease activity and go to a cool shaded place</li> <li>• Drink plenty of fluids (avoid caffeine and alcohol)</li> <li>• Try to keep cool by:               <ul style="list-style-type: none"> <li>• turning on a fan or air-conditioner</li> <li>• using a spray bottle of water on the face and body to cool down, or use a wet towel</li> <li>• having a cool shower or bath</li> </ul> </li> <li>• Put cool packs under the armpits, in the groin or on the back of the neck (or all three places) to reduce body heat</li> <li>• Lie in a cool place with legs supported and slightly elevated</li> <li>• If heat cramps present, massage limbs gently to ease the spasms, or firmly if cramped, then apply ice packs</li> <li>• If conscious – try to keep the person calm and stay with them until ambulance arrives</li> <li>• If unconscious – check airway for breathing and monitor pulse rate until ambulance arrives</li> <li>• Do not give aspirin or paracetamol to a person affected by the heat</li> </ul>



## ANNEX C: COLD RELATED ILLNESSES

Illness	Symptoms	Treatment
Frostbite	<ul style="list-style-type: none"> <li>• Skin looks white or greyish-yellow, is very cold, and has a hard or waxy feel</li> <li>• Skin may also itch, burn, or feel numb</li> <li>• Deep frostbite can cause blistering or hardening</li> <li>• As the area thaws, the flesh becomes red and painful</li> </ul>	<ul style="list-style-type: none"> <li>• If you're outside, warm your frostbitten hands by tucking them into your armpits. Protect your face, nose, or ears by covering the area with dry, gloved hands. Don't rub the affected area and never rub snow on frostbitten skin.</li> <li>• Get out of the cold. Once you're indoors, remove wet clothes</li> <li>• Do not walk on frostbitten feet or toes</li> <li>• If there's any chance the affected areas will freeze again, don't thaw them. If they're already thawed, wrap them up so that they don't become frozen again.</li> <li>• Get emergency medical help. If numbness or pain remains during warming or if blisters develop seek medical attention.</li> </ul>
Hypothermia (a severe medical emergency)	<ul style="list-style-type: none"> <li>• Shivering</li> <li>• Slow speech</li> <li>• Slow Breathing</li> <li>• Cold, pale skin</li> <li>• Loss of coordination</li> <li>• Tired feeling</li> <li>• Confusion or memory loss</li> </ul>	<p><b>This is an extreme medical emergency. Ring 000 immediately for an ambulance!</b></p> <ul style="list-style-type: none"> <li>• Ask someone to help you move to a warmer place.</li> <li>• Remove wet clothing and cover yourself with dry clothing.</li> <li>• Be sure to keep the chest area warm. Do not apply direct heat to the body.</li> <li>• Do not rub or massage the body</li> <li>• Do not drink alcohol.</li> </ul>