

## **Illawarra**

**(Wollongong City, Shellharbour City and  
Kiama Local Government Areas)**

# **Local Flood Plan**

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# ILLAWARRA FLOOD EMERGENCY SUB PLAN

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**A Sub Plan of the Local Emergency Management Plan (EMPLAN)**

**Volume 1 of the Illawarra Local Flood Plan for Wollongong City,  
Shellharbour City and Kiama Local Government Areas**

**Endorsed by the Local Emergency Management Committee**

**1 June 2022**

# AUTHORISATION

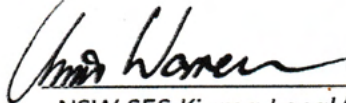
The Illawarra Flood Emergency Sub Plan is a sub plan of the Illawarra Local Emergency Management Plan (EMPLAN). It has been prepared in accordance with the provisions of the **State Emergency Service Act 1989 (NSW)** and is endorsed by the Local Emergency Management Committee in accordance with the provisions of the **State Emergency and Rescue Management Act 1989 (NSW)**.

Authorised



NSW SES Wollongong Local/Unit Commander

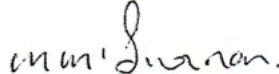
Date: 19.12.2022



Chris WARREN

NSW SES Kiama Local/Unit Commander

Date: 16/12/2022



NSW SES Shellharbour Local/Unit Commander

Date: 17/10/2022

Endorsed



Chair, Local Emergency Management Committee

Date: 7 October 2022

## VERSION HISTORY

Version Number	Description	Date

## PREVIOUSLY ENDORSED VERSION PRIOR TO LGA AMALGAMATION

The below table lists all previously endorsed versions of this plan.

Description	Date
Illawarra – Wollongong LFP	Jul 2017
Wollongong City Local Flood Plan	June 2010
Wollongong City Local Flood Plan	March 2004
Kiama/Shellharbour City Local Flood Plan	June 2009

## AMENDMENT LIST

Suggestions for amendments to this plan should be forwarded to:

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PO Box 6126, Wollongong NSW 2500  
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Amendments in the list below have been entered in this plan.

Amendment Number	Description	Updated by	Date
	Illawarra – Wollongong LFP		Updated Aug 2017

*Document issue: 12102021*

## DISTRIBUTION LIST

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# 1 OUTLINE AND SCOPE

## 1.1 PURPOSE

1.1.1 The purpose of this plan is to set out the multi-agency arrangements for the emergency management of flooding in the Wollongong City, Shellharbour City and Kiama Local Government Area (LGA).

## 1.2 AUTHORITY

1.2.1 This plan is written and issued under the authority of the [State Emergency and Rescue Management Act 1989 \(NSW\)](#) ('SERM Act'), the [State Emergency Service Act 1989 \(NSW\)](#) ('SES Act') and the NSW State Emergency Management Plan (EMPLAN).

1.2.2 This plan is a sub plan to the Illawarra Local Emergency Management Plan (EMPLAN) and is endorsed by the Emergency Management Committee (LEMC).

## 1.3 ACTIVATION

1.3.1 This plan does not require activation. The arrangements set out in this plan are always active.

1.3.2 The Illawarra Local Emergency Management Plan (EMPLAN) is active at all times in anticipation of the need to coordinate support and resources requested by combat agencies, including the NSW State Emergency Service (NSW SES).

## 1.4 SCOPE

1.4.1 The area covered by this plan is the Wollongong City, Shellharbour City and Kiama Council Local Government Areas (LGAs). The Wollongong City, Shellharbour City and Kiama Council LGAs and their principal towns, villages, rivers and creeks are shown in Appendix A.

1.4.2 The Wollongong City, Shellharbour City and Kiama Council areas are in the NSW SES South Eastern Zone and for emergency management purposes, are part of the Illawarra South Coast Emergency Management Region.

1.4.3 The plan sets out the Wollongong City, Shellharbour City and Kiama Councils level of emergency management arrangements for prevention, preparation, response and initial recovery for flooding in the Wollongong City, Shellharbour City and Kiama LGAs. Hazard and Risk information can be found in Volume 2 of this document, and NSW SES Response Arrangements can be found in Volume 3, where these documents exist.

1.4.4 In this plan a flood is defined as a relatively high water level which overtops the natural or artificial banks in any part of a stream, river, estuary, lake or dam, and/or local overland flooding associated with drainage before entering a watercourse, and/or coastal inundation resulting from super-elevated sea levels and/or waves (including tsunamis) overtopping coastline defences.

1.4.5 The arrangements for dealing with episodes of coastal erosion by severe weather, are described in the NSW State Storm Plan.

1.4.6 The arrangements for the emergency management of tsunami are dealt with in the NSW State Tsunami Emergency Sub Plan.

1.4.7 This plan outlines the local level arrangements for the management of downstream consequences of flooding due to dam failure, however it does not cover the management of flooding of an underground mine by inrush or other cause, which should be covered by the Mine Emergency Sub Plan for the respective mine.

## **1.5 GOALS**

1.5.1 The primary goals for flood emergency management in NSW are:

- a. Protection and preservation of life.
- b. Establishment and operation of flood warning systems.
- c. Issuing of community information and community warnings.
- d. Coordination of evacuation and welfare of affected communities.
- e. Protection of critical infrastructure and community assets essential to community survival during an emergency incident.
- f. Protection of residential property.
- g. Protection of assets and infrastructure that support individual and community financial sustainability and aid assisting a community to recover from an incident; and
- h. Protection of the environment and conservation values considering the cultural, biodiversity and social values of the environment.

## **1.6 KEY PRINCIPLES**

1.6.1 The protection and preservation of human life (including the lives of responders and the community) is the highest priority.

1.6.2 Evacuation is the primary response strategy for people impacted by flooding.

## **1.7 ROLES AND RESPONSIBILITIES**

1.7.1 General responsibilities of emergency service organisations and functional areas are set out in the NSW State EMPLAN and NSW State Flood Sub Plan.

1.7.2 Specific roles and responsibilities for agencies, functional areas and organisations in relation to flooding within Wollongong City, Shellharbour City and Kiama Councils are detailed within this plan, Appendix B and Appendix C.

1.7.1 Any agency with agreed responsibilities in this plan that are temporarily unable or no longer able to fulfil their responsibilities in response operations must as soon as possible notify the:

- a. NSW SES Incident Controller (for local or zone level responsibilities during response operations).
- b. NSW SES Zone Duty Commander (for regional level responsibilities outside of response operations).



## 1.8 PLAN MAINTENANCE AND REVIEW

- 1.8.1 The NSW SES will maintain the currency of this plan by:
- a. Ensuring that all supporting emergency services and functional areas, organisations and officers mentioned in it are aware of their roles and responsibilities.
  - b. Conducting exercises to test arrangements.
  - c. Reviewing the contents of the plan:
    - When there are changes which alter agreed plan arrangements.
    - When changes to land use strategic plans and policies increase the population at risk.
    - After a flood including recommendations from after action reviews, reports, or inquiries; and
    - As determined by the NSW SES Commissioner.
  - d. The plan is to be reviewed no less frequently than every five years or after a significant flood event.

## 1.9 SUPPLEMENTARY DOCUMENTS

- 1.9.1 Supplementary material published in previous versions of the Local Flood Emergency Sub Plan is now maintained on the NSW SES website at: [NSW SES Flood Storm and Tsunami Plans](#) including:
- a. Flood Plan Glossary.
  - b. NSW SES Dam Failure Notification Flowchart.
  - c. NSW SES Resupply Flowchart.

# 2 OVERVIEW OF NSW FLOOD HAZARD AND RISK

## 2.1 THE FLOOD THREAT

- 2.1.1 The NSW SES maintains information on the nature of flooding and effects of flooding on the community in the Wollongong City, Shellharbour City and Kiama LGAs. This is outlined in Volume 2 – Hazard and Risk in Wollongong City, where this document exists.
- 2.1.2 Declared dams in or upstream of Wollongong City, Shellharbour City and Kiama Local Government Areas.

Dam Name	Owner
<b>Barina Park Detention Basin</b>	Wollongong City Council
<b>Blackbutt Reserve</b>	Shellharbour City Council
<b>Brokers Road Retarding Basin</b>	Wollongong City Council
<b>Bucklands Retarding Basin</b>	Matt Crossingham
<b>Coalcliff</b>	Illawarra Coke Company
<b>Cordeaux</b>	WaterNSW
<b>Dobinsons Retarding Basin</b>	Roads and Maritime Services

<b>Foothills Estate Retention Basin 1</b>	Wollongong City Council
<b>Foothills Estate Retention Basin 3</b>	Wollongong City Council
<b>Foothills Road Basin</b>	Wollongong City Council
<b>Fountaindale</b>	Kiama Municipal Council
<b>Gannet Place Retarding Basin</b>	Wollongong City Council
<b>Greenmedows Retarding Basin</b>	Shellharbour City Council
<b>Gunyah Park Basin</b>	Wollongong City Council
<b>Kanahooka Retention Basin</b>	Forest Grove Community Association
<b>Nyrang Park Retention Basin</b>	Wollongong City Council
<b>Oak Flats Reservoir</b>	Sydney Water Corporation
<b>St Josephs School Retarding Basin</b>	Shellharbour City Council
<b>St Josephs School Retarding Basin</b>	Shellharbour City Council
<b>Shellcove Estate Detention Basin</b>	Shellharbour City Council
<b>Shellharbour City Centre Basin</b>	Shellharbour City Council
<b>South Bulli Basin 1</b>	Allied Coal Pty Ltd
<b>South Bulli Stormwater</b>	Wollongong Coal Ltd
<b>Upper Cordeaux 2</b>	WaterNSW
<b>Wollongong High School Retarding Basin</b>	Wollongong City Council

## 3 PREVENTION/ MITIGATION

### 3.1 INTRODUCTION

3.1.1 The Floodplain Development Manual outlines the NSW Government's Flood Prone Lands Policy which details the framework for managing flood prone land in New South Wales. Incorporation of floodplain risk management into land use planning is one of the key means to limit the exposure to flood risks to our communities and help build long term resilience to future flood events.

### 3.2 LAND USE PLANNING

3.2.1 **Strategy:** Effective land use planning is a key focus for minimising the impacts of flooding. NSW SES will work with land use planning and consent authorities to inform and influence the consideration of the risks arising from flood, storm and tsunami, to prevent the creation of intolerable impacts of these hazards on the community.

#### **Actions:**

- a. NSW SES will provide strategic input about land use planning matters which have or will create significant flood risk to life and/or property due to flooding.
- b. NSW SES will provide responses to land use planning proposal referrals that have or will create significant flood risk to life and/or property due to flooding.

### 3.3 FLOODPLAIN RISK MANAGEMENT

3.3.1 **Strategy:** Advocate for consideration of emergency management in decision making to reduce risks to the existing community and minimise the growth in future, continuing and residual risk due to development through input to the floodplain management program.

**Actions:**

- a. NSW SES will provide coordinated and consistent emergency management advice to councils and other agencies in relation to the management of land that is subject to flooding or coastal inundation; and
- b. NSW SES will provide advice, support, technical resources and training for NSW SES representatives to contribute effectively on local Floodplain Management Committees.

## 4 PREPARATION

### 4.1 INTRODUCTION

- 4.1.1 Preparation includes arrangements or plans to deal with an emergency or the effects of an emergency.

### 4.2 FLOOD EMERGENCY PLANNING

- 4.2.1 **Strategy:** NSW SES develop, review and maintain Flood Emergency Sub Plans

**Actions:**

- a. Develop and review this NSW SES Local Flood Emergency Sub Plan as required. Local Flood Emergency Sub Plans outline the specific arrangements for management of flood events within an LGA, and may include cross boundary arrangements; and
  - b. Review plans as per [Section 1.8](#).
- 4.2.2 Local EMPLAN Consequence Management Guides (CMG's) for flood are not required for communities covered by NSW SES Local Flood Emergency Sub Plans however may be utilised in place of Local Flood Emergency Sub Plan if agreed to by NSW SES.

### 4.3 FLOOD INTELLIGENCE SYSTEMS

- 4.3.1 **Strategy:** NSW SES develop and maintain a flood intelligence system to identify flood behaviour, its impact on the community and required response actions.

**Actions:**

- a. Gather and assess flood information for the full range of flood types and severities.
- b. Collect, collate, and assess information on the characteristics of communities at risk and the potential effects of flooding on communities at risk; and
- c. Share flood intelligence information with supporting agencies.

### 4.4 DEVELOPMENT OF WARNING SYSTEMS

- 4.4.1 **Strategy:** Develop, maintain and prepare systems for the provision of flood warnings and associated warning services.

**Actions:**

- a. All levels of government work in partnership to develop and maintain flood warning infrastructure.
- b. NSW SES maintains a list of the requirements for flood warnings for flood gauges in NSW (including flood classifications, warning times required and key statistics) and can be found in the supplementary document to the NSW State Flood Plan (see Section 1.9). Gauges of relevance within the Wollongong City, Shellharbour City and Kiama LGAs are also listed in Volume 3 of this plan, where this document exists.
- c. The NSW SES will recommend new warning services and changes to warning alert levels for gauges to the NSW and ACT Flood Warning Consultative Committee.
- d. The State Government, in partnership with Local Government, is responsible for developing and maintaining flash flood warning systems for local catchments where required.
- e. Dam Owners will provide Dam Emergency Plans (where required) and consult with NSW SES on alert levels and messaging. Alert level definitions are listed in Dam Emergency Plans.
- f. NSW SES maintains a dedicated dam failure hotline and procedures to ensure priority dissemination of dam failure warnings.
- g. NSW SES develops and maintains warning and flood information products by:
  - Utilising flood intelligence data.
  - Developing warning and flood information products.
  - Continuously reviewing warning and flood information products.
  - Consulting with affected communities, key stakeholders, Dam Safety NSW and the NSW and ACT Flood Warning Consultative Committee; and maintain Operational Readiness; and
  - Participating in the development of public information and warning systems.
- h. Gauge owners adequately maintain flood warning gauges and systems, including those identified in the 'Service Level Specification' maintained by the Bureau of Meteorology (Bureau) and those identified in the 'Provision and Requirements for Flood Warning in New South Wales' maintained by NSW SES.

## **4.5 BRIEFING, TRAINING AND EXERCISING**

4.5.1 **Strategy:** Ensure NSW SES, supporting agencies, functional areas and the community are prepared and familiar with the strategies and arrangements within the Flood Emergency Sub Plan and supporting documents.

### **Actions:**

- a. NSW SES will consult stakeholders throughout the development of plans.
- b. NSW SES will inform stakeholders of content changes after revisions.
- c. NSW SES will ensure their facilities and resources are maintained and operationally ready.

- d. NSW SES will train personnel for their expected flood operation roles; and
- e. NSW SES will regularly brief stakeholders on the exercise arrangements contained in the NSW Flood Emergency Sub Plan.

## **4.6 COMMUNITY RESILIENCE TO FLOODING**

4.6.1 **Strategy:** NSW SES provides and maintains a flexible volunteer workforce to support community resilience.

**Actions:**

- a. Ensure ongoing recruitment and training of a diverse range of volunteers.
- b. Ensure pre-planning to facilitate the management of spontaneous volunteers and community members during a flood.

4.6.2 **Strategy:** NSW SES works with individuals, communities, businesses and government agencies to build flood resilience.

**Actions:**

- a. Partners with and engage communities to understand and manage the risks associated with floods, including providing business continuity guidance (NSW SES Business FloodSafe), family preparedness (NSW SES Home FloodSafe) and other engagement strategies.
- b. NSW SES will collate, assess and disseminate flood information to the community.
- c. Collaborate with individuals, businesses, government agencies and communities when developing flood intelligence, preparedness and response information.
- d. Plan for floods collaboratively with communities through community and stakeholder participation and engagement.
- e. Collaborate with community sector and recognise the needs of individuals within communities who have an increased susceptibility during floods.

# **5 RESPONSE**

## **5.1 INTRODUCTION**

5.1.1 Flood response operations will begin:

- a. On receipt of a Bureau Severe Weather Warning or Thunderstorm Warning that includes heavy rain or storm surge; or
- b. On the receipt of a Bureau Flood Watch or Flood Warning; or
- c. On receipt warnings for flash flood; or
- d. On receipt of a dam failure alert; or
- e. When other evidence leads to an expectation of flooding.

## **5.2 INCIDENT MANAGEMENT ARRANGEMENTS**

5.2.1 **Strategy:** Maintain effective control of flood operations across New South Wales.

**Actions:**

- a. The NSW SES uses the Australasian Inter-service Incident Management System (AIIMS) to manage the flood response.
- b. Control of flood response will be at the lowest effective level and may be scaled to suit the incident.
- c. The NSW SES State Controller (or delegate) will appoint Incident Controllers and establish Incident Control Centres (see NSW SES facilities on map in Appendix A).
- d. The NSW SES Incident Controller, in consultation with participating supporting emergency services and Functional Areas will determine the appropriate breakdown of an Area of Operations into Divisions and/or Sectors in accordance with the principles of AIIMS.

5.2.2 **Strategy:** Maintain Incident Control Centre(s).

**Actions:**

- a. NSW SES will operate Incident Control Centre(s) as required.
- b. The NSW SES Incident Control Centre(s) will:
  - Control resources from NSW SES and coordinate resources of supporting emergency services and functional areas.
  - Manage Request for Assistance (RFA) tasking and ensure they are actioned in a timely manner.
  - Undertake response planning and determine future resourcing requirements; and
  - Coordinate information flow, including warnings, public information and social media.

5.2.3 **Strategy:** Provide effective liaison between the NSW SES and supporting agencies or functional areas in accordance with Local EMPLAN.

**Actions:**

- a. Supporting emergency services and Functional Areas should provide Liaison Officers to NSW SES Incident Control Centres and/or Emergency Operation Centres as required
- b. NSW SES will provide Liaison Officer(s) to Emergency Operations Centres as required; and
- c. Where possible Emergency Operation Centres to be co-located with NSW SES Incident Control Centres for Flood Emergency Response.

5.2.4 **Strategy:** Coordinate resources and logistics support to ensure operational effectiveness.

**Actions:**

- a. The NSW SES Incident Controller will notify agencies of potential access issues between locations, for the consideration of pre-deploying of resources.
- b. The NSW SES may request resources and logistics support directly from a supporting emergency service or Functional Area.
- c. Wherever possible, supporting organisations are to provide their own logistic support in consultation with NSW SES where appropriate.
- d. The NSW SES Incident Controller will control air support operations and may utilise supporting agencies in the management of aircraft.

### 5.3 USE OF INFORMATION AND COLLECTION OF INTELLIGENCE

5.3.1 **Strategy:** Ensure flood information is effectively utilised communicated and collected during and post a flood.

**Actions:**

- a. Information relating to the consequences of flooding, response strategies, situational awareness and operational updates will be distributed by NSW SES to supporting emergency services and Functional Areas listed under this Plan.
- b. All supporting emergency services and Functional Areas and Council will accurately record and report information relevant to their activities and any real time flood information (including road closure information) to the NSW SES Incident Controller. This may be in the form of a combined Emergency Operations Centre (EOC) report, or direct from agencies where an EOC has not been established.
- c. The NSW SES may establish and operate a Joint Intelligence Unit to coordinate the collection, collation, interpretation, mapping, actioning and dissemination of information; and
- d. Reconnaissance, mapping, damage assessments, intelligence validation and post flood evaluation will be coordinated by NSW SES. This may occur post impact and continue into the recovery phase.
- e. NSW SES may request Engineering to assist with the gathering of flood intelligence including (not limited to) maximum flood extents, peak flood heights, recording major flood damage at key high velocity locations and preparation of After-Flood Report.

5.3.2 **Strategy:** Ensure flood intelligence is incorporated into operational decision-making.

**Action:** The NSW SES will use flood intelligence, official forecasts, warnings, and flood scenario products to undertake an assessment of the predicted impact of a flood and to inform operational decision-making.

### 5.4 PROVISION OF INFORMATION AND WARNINGS TO THE COMMUNITY

5.4.1 **Strategy:** Timely and effective warnings are distributed to the community.

**Actions:**

- a. The Bureau issues public weather and flood warning products before and during a flood. These may include:

- Severe Thunderstorm Warnings – Detailed - issued for all capital cities and surrounding areas when individual severe thunderstorms are within range of the capital city radars,
  - Severe Thunderstorm Warnings - Broad-based - issued for the entire Australian State or territories affected highlighting broad areas where severe storms may occur within the next 3 hours,
  - Severe Weather Warnings with reference to heavy rainfall and/or storm surge,
  - Flood Watches, and
  - Flood Warnings.
- b. Dam Owners will utilise the Dam Emergency Plan to provide warnings and information to NSW SES and communities (where appropriate).
- c. NSW SES Incident Controllers will issue the following NSW SES flood information products incorporating warnings from the above, expected consequences and safety messages:
- Livestock and Equipment Warnings
  - Local Flood Advices
  - Flood Bulletins
  - NSW SES Evacuation Warning
  - NSW SES Evacuation Order
  - NSW SES All Clear
- d. NSW SES liaises with the Bureau of Meteorology to discuss the development of flood warnings as required.
- e. NSW SES provides alerts and deliver flood information to affected communities using a combination of public information.
- f. NSW SES may request supporting agencies redistribute NSW SES alerts and information, including through the provision of doorknocking teams.
- g. Road closure information will be provided to the community through the following agencies/methods:
- Local Government Council websites; and
  - Transport for NSW ‘Live Traffic’ website: [www.livetraffic.com](http://www.livetraffic.com) or ‘Transport InfoLine’: 131 500. VMS messaging on roadways may also be used to advise motorists.
- h. The Public Information and Inquiry Centre will be established by the NSW Police Force where required to provide information regarding evacuees and emergency information. Contact details will be broadcast once the centre is established.
- i. The Disaster Welfare Assistance Line will be established by Disaster Welfare Services where required to provide information on welfare services and



assistance. Assistance line contact details will be broadcast once Disaster Welfare Services commence.

## 5.5 PROTECTION OF PROPERTY

5.5.1 **Strategy:** Coordinate the protection of property including critical infrastructure from destruction or damage arising from floods.

**Action:** NSW SES, supporting agencies, and community volunteers will assist the community (where resources are available, feasible and safe to do so) in:

- a. The protection of properties through flood protection systems (e.g. sandbagging) to minimise entry of water into buildings; and
- b. The raising or moving of household furniture and commercial stock/equipment.

## 5.6 ROAD AND TRAFFIC CONTROL

5.6.1 **Strategy:** Coordinate the closing and re-opening of flood affected roads.

**Actions:**

- a. Wollongong City, Shellharbour City and Kiama Councils will coordinate the closure and reopening of council managed roads once inspections have been carried out by the relevant authority.
- b. Transport for NSW will coordinate the closure and reopening of the state road network.
- c. The NSW Police Force may close and re-open roads but will normally only do so (if the Wollongong City, Shellharbour City and Kiama Councils or Transport for NSW have not already acted and if public safety requires such action;
- d. NSW SES will assist with erecting road closure signs and barriers when time and resources permit.

5.6.2 **Strategy:** Coordinate traffic control measures in flood affected areas.

- a. The NSW SES Incident Controller may direct the imposition of traffic control measures into flood affected areas in accordance with the provisions of the *State Emergency Service Act, 1989* and the *State Emergency Rescue Management Act, 1989*.
- b. The NSW SES Incident Controller may request the Local Emergency Operations Controller provide suitable personnel to assist with traffic coordination.

## 5.7 PROTECTION OF ESSENTIAL SERVICES

5.7.1 Arrangements for the protection of local assets are outlined in Volume 3, where this document exists, of the NSW SES Local Flood Emergency Sub Plan. In addition, Local and Region EMPLAN's contain infrastructure inventories.

5.7.2 **Strategy:** Minimise disruption to the community by ensuring protection of infrastructure and supply of essential energy, utility services and lifelines.

**Actions:**

- a. The Transport Services Functional Area is to coordinate the provision of information about the assessment and restoration of transport network infrastructure.
- b. The Energy and Utility Services Functional Area is to coordinate the assessment and restoration of essential energy and utility services (not including telecommunications).
- c. The Telecommunications Services Functional Area is to coordinate the assessment and restoration of telecommunications and the Public Safety Network.
- d. The Engineering Services Functional Area is to
  - Coordinate the assessment and restoration of critical public buildings for example hospitals;
  - Assessment and operation of flood protection levees
  - Protection of property
  - Construction and repair of levees
  - Dam safety assessment and dam stability
  - Water supply and sewerage operations
  - Other critical infrastructure
- e. Functional Areas and Council will keep the NSW SES informed of the status of utilities and infrastructure.

## 5.8 EVACUATION

- 5.8.1 Evacuation is the NSW SES's primary response strategy for managing the population at risk of flooding.
- 5.8.2 Community specific evacuation arrangements are located in Volume 3 of this Plan, where this document exists.
- 5.8.3 **Strategy:** Conduct planning to ensure all evacuation constraints are considered.

### **Actions:**

- a. Evacuations will take place when there is a risk to public safety. Circumstances may include:
  - Evacuation of people when their homes or businesses are likely to flood.
  - Evacuation of people who are unsuited to living in isolated circumstances, due to flood water closing access; and
  - Evacuation of people where essential energy and/or utility services are likely to fail or where buildings have been or may be made uninhabitable; and
- b. The NSW SES will consider the following in evacuation decisions:
  - Duration of evacuation.
  - Characteristics of the community.
  - Numbers requiring evacuation.
  - Availability of evacuation routes and transport.

- The ability for existing levees or other flood protection works to fulfil their intended function.
  - Time available for evacuation.
  - Evacuee management requirements.
  - Resources and delivery of evacuation information
  - Length of isolation.
- c. NSW SES Incident Controllers, planning and intelligence officers will carefully consider the risks involved in conducting evacuations.
  - d. All evacuation decisions will be made as per the current NSW SES policies and procedures, and consistent with the NSW Evacuation Management Guidelines.
  - e. Potential Evacuation Centres are located in Volume 3, where this document exists / Local EMPLAN; and
  - f. The NSW Police Force will coordinate the provision of overall security for evacuated areas.

5.8.4 **Strategy:** Evacuate people pre-emptively from dangerous or potentially dangerous places and or locations created by the flood hazard to safe locations away from the hazard.

- a. NSW SES will control and coordinate the evacuation of affected communities.
- b. The NSW SES Commissioner (or delegate) will warn communities to prepare for a possible evacuation, where circumstances allow such lead time.
- c. The NSW SES Commissioner (or delegate) will order any necessary evacuations and provide information to the community about when and how to evacuate.
- d. Support to evacuation operations may be requested from other emergency services and supporting agencies using arrangements in the local EMPLAN and supporting plans.
- e. Health Services Functional Area will coordinate the evacuation of hospitals, health centres and aged care facilities (including nursing homes) in consultation with the NSW SES and Welfare Services.
- f. School administration offices (Government and Private) will coordinate the evacuation of schools in consultation with the NSW SES and Welfare Services, if not already closed.
- g. Caravan Park proprietors will inform the NSW SES Incident Controller when caravan park evacuations have been completed.
- h. People who are reluctant or refuse to comply with any Evacuation Order will be referred to the NSW Police Force.

## 5.9 EVACUEE MANAGEMENT AND WELFARE

5.9.1 Research and experience in flood operations shows that most evacuees go to family, friends and commercial accommodation outside the impact area.

5.9.2 **Strategy:** Maintain the welfare of communities and individuals affected by the impact of a flood.

**Actions:**

- a. NSW SES will provide initial welfare for evacuees where required but will hand the responsibility over to the Welfare Services Functional Area as soon as possible. The NSW SES will brief the Welfare Services Functional Area at the earliest opportunity regarding the level of assistance required.
- b. Welfare Services Functional Area will manage evacuation centres for affected residents and travellers in accordance with the Welfare Services Functional Area Supporting Plan.
- c. Schools Administration (Government and Private) will manage the safety of students directly affected by flooding and will work with the NSW SES in the temporary closure of schools and will coordinate with NSW SES Transport and Welfare Services in the management of school evacuees.
- d. Disaster Victim Registration will be controlled and coordinated by the NSW Police Force with the assistance of NSW SES and Welfare Services Functional Area.
- e. NSW SES will provide details of all residents assisted in evacuations to the Welfare Services Functional Area as early as possible.
- f. Where the expected remaining number of evacuees and the duration of evacuation is assessed to be beyond the capability and capacity of the established evacuation centre arrangements the SEOCON may establish Major Evacuation Centres or Mass Care facilities; and
- g. The decision to establish Major Evacuation Centres or Mass Care Facilities will be made by the NSW SES and SEOCON in consultation with members of the State Emergency Management Committee.

5.9.3 **Strategy:** Coordinate available and accessible health services for flood affected communities.

**Action:** The provision of environmental health advice, assessment of public health risks and coordination of immediate mental health support will be provided by Health Services Functional Area.

5.9.4 **Strategy:** Maintain the welfare of animals impacted by a flood.

**Actions:**

- a. Agriculture and Animal Services Functional Area will coordinate the welfare of livestock, pets, companion animals and wildlife including support to primary producers, animal holding establishments and community members; and
- b. Agriculture and Animal Services Functional Area role will coordinate the evacuation, emergency care of animals and assessment, humane destruction and disposal of affected animals, and supply of emergency fodder, water and aerial support where necessary.

## 5.10 FLOOD RESCUE

5.10.1 **Strategy:** Control and coordinate flood rescue of people and domestic animals.

**Actions:**

- a. NSW SES will perform flood rescue, where training and equipment is suitable and where a risk assessment has indicated that the risk to rescuers is acceptable.
- b. Flood rescue operations will be conducted in accordance with the State Rescue Board Land Rescue Policy and the NSW State Rescue Board Flood Rescue Policy which sets out the framework, governance, responsibilities and requirements for the management and conduct of flood rescue in NSW.
- c. NSW SES may request other supporting emergency services to undertake flood rescues on behalf of the NSW SES. Agencies must be authorised/accredited to undertake flood rescue operations in accordance with State Rescue Board requirements, as prescribed by NSW SES. Supporting emergency services must supply information regarding rescues performed to the NSW SES. Notification arrangements with NSW Police Force are outlined in the NSW State Rescue Board Flood Rescue Policy; and
- d. Rescue agencies will conduct rescue of domestic small and large animals as per the State Rescue Board Land Rescue Policy (and may include Large Animal Rescue of family horses and cows at a residence or property). The rescue of livestock (which includes commercial animals found on farming and breeding enterprises) will be coordinated through Animal and Agriculture Services Functional Area.

## **5.11 RESUPPLY**

5.11.1 **Strategy:** Coordinate resupply to towns and villages isolated by flooding to minimise disruption to the community.

### **Actions:**

- a. NSW SES will advise communities and businesses if flood predictions indicate that areas are likely to become isolated, and indicative timeframes where possible.
- b. Retailers should be advised to ensure sufficient stock is available for the duration of the flood.
- c. When isolation occurs, NSW SES will establish loading points where retailers can instruct suppliers to deliver goods.
- d. NSW SES will endeavour to support the delivery of mail to isolated communities but may not be able to do so according to normal Australia Post timetables.
- e. NSW SES will assist hospitals with resupply of linen and other consumables where able.
- f. NSW SES may request resupply assistance from supporting agencies.
- g. NSW SES may conduct resupply operations as per the designated resupply plan for the event.
- h. Where additional supplies are required Engineering be requested to coordinate the supply of goods and services in response to and recovery from the emergency.

5.11.2 **Strategy:** Coordinate resupply to rural properties isolated by flooding.

**Actions:**

- a. When requested, NSW SES will establish a resupply schedule and coordinate the resupply for isolated rural properties.
- b. NSW SES will provide local suppliers with designated loading points. Resupply items are to be packaged by the supplier; and
- c. Isolated households unable to afford resupply items will be referred to Welfare Services Functional Area for assistance.

## **5.12 ALL CLEAR AND RETURN**

5.12.1 **Strategy:** Coordinate the safe return of communities to flood affected areas when the immediate danger to life and property has passed.

**Actions:**

- a. NSW SES Incident Controller will determine when it is safe to progressively return in consultation with the relevant Emergency Operations Controller and supporting agencies considering the ongoing risk to public safety.
- b. NSW SES Incident Controller will specify the level of access to affected communities as the following:
  - Not suitable for access.
  - Limited access by emergency services and response agencies.
  - Limited access by residents and/or business operators; or
  - Full access
- c. NSW SES Incident Controller will issue an 'All Clear' message when the immediate danger to life and property has passed for areas assessed as safe; and
- d. The NSW SES will facilitate the return of evacuees to their homes.

## **5.13 END OF RESPONSE OPERATIONS**

5.13.1 **Strategy:** Conclude response operations.

**Actions:**

- a. Response operations will conclude when:
  - There is a reduced likelihood of additional flooding within the Area of Operation and flood waters have receded.
  - All requests for assistance related to the flood have been completed;
  - The need for warning and evacuation no longer exist.
  - There is no further likelihood of rescuing people.
  - Resupply is no longer required (resupply operations may occur concurrently with the recovery phase).
  - Response to fire and hazardous material incidents have concluded (not including subsequent clean-up of contaminated sites); and

- All affected areas have had an 'All Clear' issued.

## 5.14 POST IMPACT ACTIONS

5.14.1 **Strategy:** Learnings from the event are used to inform recovery and future events.

**Actions:**

- a. NSW SES will continue to engage with communities after significant floods through convening one or more community forums, workshops or other opportunities to provide communities a chance to provide feedback, address any concerns and provide input into the recovery process. These will typically include other agencies such as the Bureau of Meteorology, Welfare Services and Wollongong City Council representatives.
- b. NSW SES will conduct After Action Reviews, at the conclusion of response operations, which will involve all stakeholders. Findings will be shared and incorporated into improved disaster resilience planning.
- c. NSW SES will provide information and data throughout the emergency response to inform community recovery. A report will be developed at the request of the SERCON at the conclusion of the response within an area. Should a response summary report be required it will include the following:
  - The emergency action plan in place at conclusion of the response emphasising any continuing activities including community meetings/ engagement activities.
  - Resources allocated to the emergency response and associated exit strategies.
  - Details of any areas or situations with potential to re-escalate the emergency;
  - A recommendation for the conclusion of the NSW SES as lead agency to transition to Resilience NSW as the lead agency for Recovery.
  - Any actions that are incomplete or outstanding.
  - Damage Assessment Data and Information obtained throughout the response phase which will further support the long-term recovery of communities.
- d. NSW SES will undertake/coordinate a comprehensive review of intelligence and plans following significant flood events.

5.14.2 **Strategy:** Participate in post flood data collection analysis.

**Actions:** NSW SES works with relevant stakeholders and Wollongong City, Shellharbour City and Kiama Councils on post flood data collection analysis including review of flood intelligence where necessary.

## 6 RECOVERY OPERATIONS

### 6.1 INTRODUCTION

6.1.1 Recovery is the process of returning an affected community to its proper level of functioning after an emergency. It will generally commence simultaneously with the Response phase.

6.1.2 Recovery operations will be initiated and conducted as outlined in the NSW State EMPLAN and as further detailed in the NSW Recovery Supporting Plan.

## 6.2 NSW SES RECOVERY ROLE

6.2.1 **Strategy:** NSW SES will support recovery operations and established Recovery Committees.

6.2.2 **Actions:**

- a. NSW SES will provide representation to Recovery Committees as required and may have an ongoing role in the Recovery phase.
- b. NSW SES roles on Recovery Committees may include providing information about any continuing response, guidance on mitigation strategies and general advice and assistance to the committee as a subject matter specialist and or expert.
- c. NSW SES will provide information to Resilience NSW to support applications to Treasury for Natural Disaster Relief and Recovery Arrangements.
- d. The NSW SES, in conjunction with a Recovery Committee, will provide a service to support the information needs of a community immediately following a flood; and
- e. NSW SES and where required supporting agencies will assist with clean-up operations after floods, where possible when resources and personnel permit.
- f. NSW SES may coordinate immediate relief in collaboration with Resilience NSW.

## 7 ABBREVIATIONS

For a full list of abbreviations refer to the NSW State Flood Plan - Abbreviations

## 8 GLOSSARY

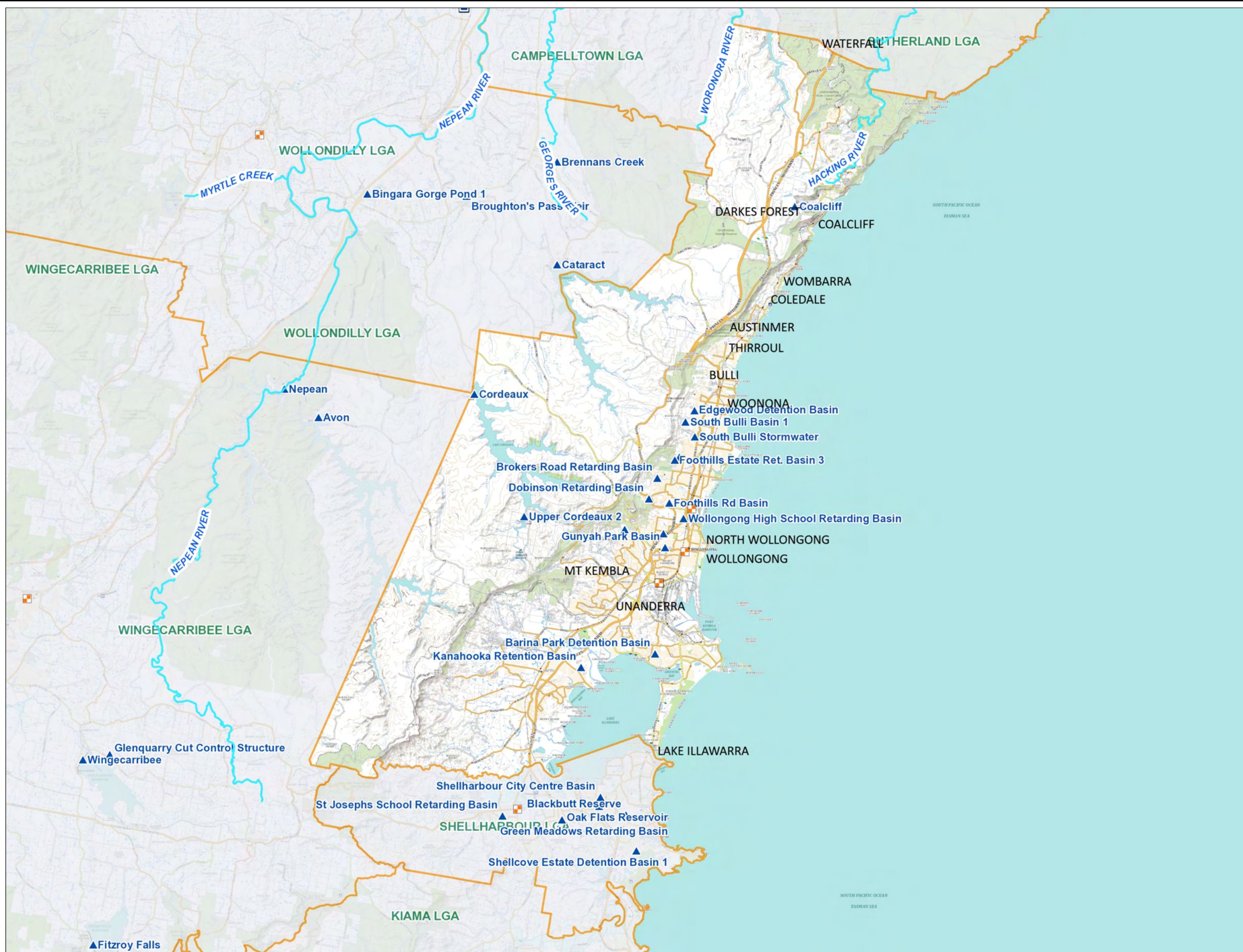
Common emergency service terminology can be found within the Australian Disaster Resilience Glossary.

Readers should refer to EMPLAN Annex 9 – Definitions.

Refer to the NSW State Flood Plan for a complete glossary of terminology used throughout this plan and within NSW SES Flood Plans.

**For a full list of definitions refer to the Supporting Document - State Flood Plan Glossary**  
<https://www.ses.nsw.gov.au/media/2650/glossary.pdf>





Legend

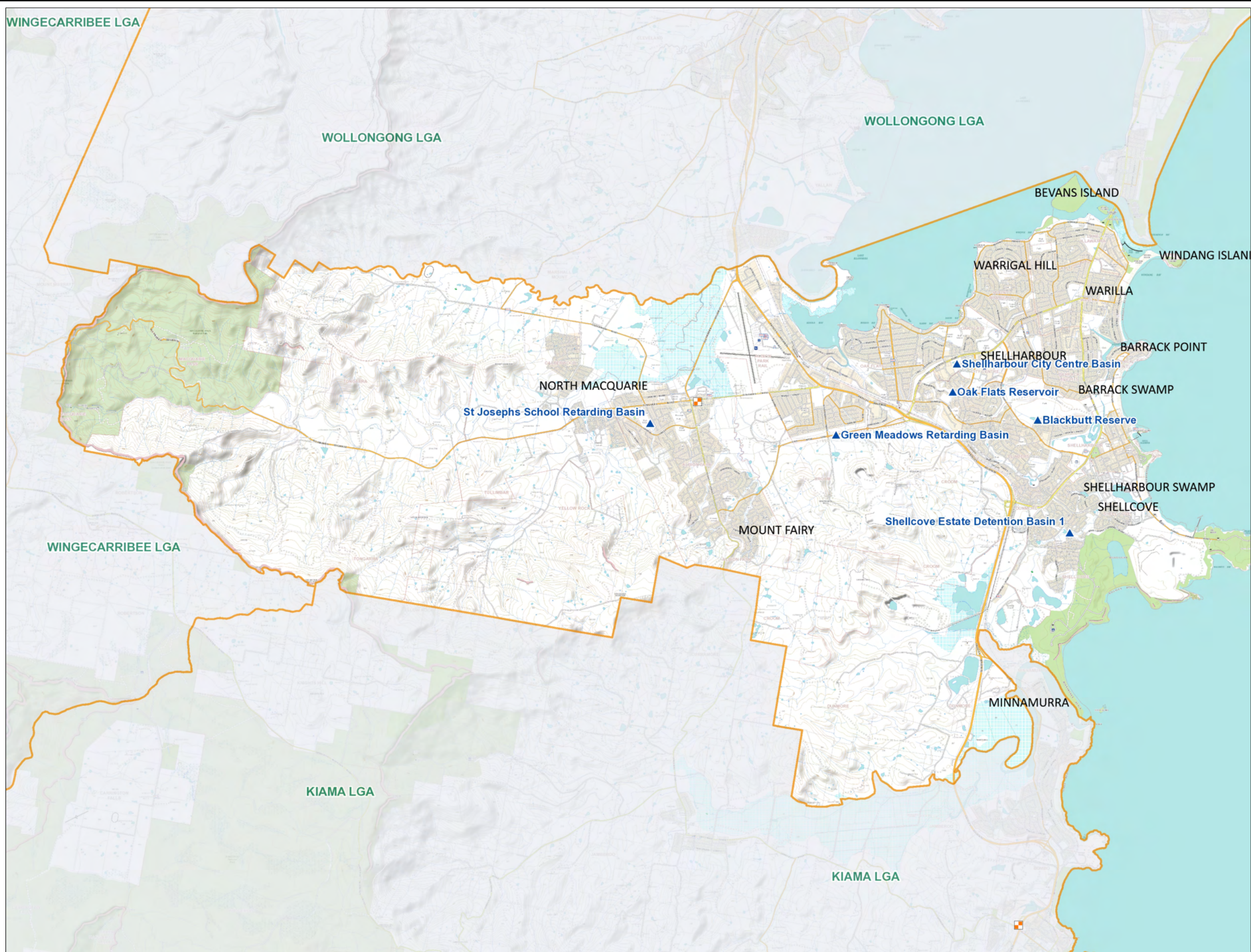
-  NSW SES Headquarters
-  Gauges BOM Forecast Locations
-  Major Rivers
-  Levees
-  Declared Dams (Prescribed)
-  Local Government Areas
-  States Australia

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Appendix A - Map of Shellharbour City Council Area

Local Flood Plan LGA Map

Legend

- NSW SES Headquarters
- Gauges BOM Forecast Locations
- Major Rivers
- Levees
- Declared Dams (Prescribed)
- Major Towns NSW
- Local Government Areas
- States Australia

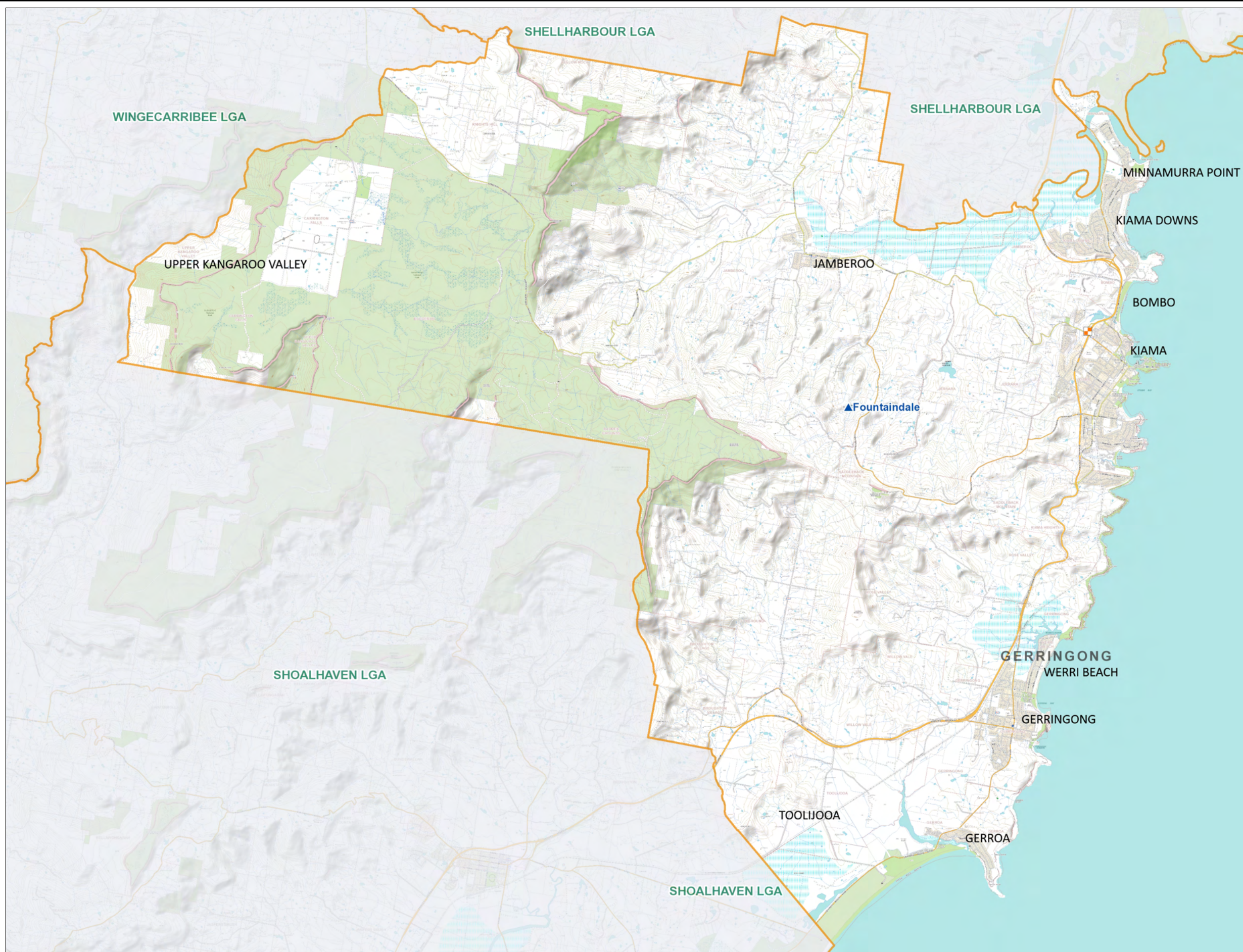
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Legend

-  NSW SES Headquarters
-  Gauges BOM Forecast Locations
-  Major Rivers
-  Levees
-  Prescribed Dams
-  Major Towns NSW
-  Local Government Areas

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# 1 Appendix B – Roles and Responsibilities

AGENCY	RESPONSIBILITIES
NSW State Emergency Service	NSW SES is the designated Combat Agency for floods, storms and tsunami and controls response operations. NSW SES roles and responsibilities in relation to floods are outlined in the <a href="#">NSW State Flood Plan</a> .

AGENCY	RESPONSIBILITIES
Agriculture and Animal Services Functional Area	The roles and responsibilities for Agriculture and Animal Services are outlined in the Agriculture and Animal Services Supporting Plan and NSW State Flood Plan.
Australian Government Bureau of Meteorology	The roles and responsibilities for the Australian Government Bureau of Meteorology are outlined in the NSW State Flood Plan.
«LGA_Name»	<p><b>Preparedness</b></p> <ul style="list-style-type: none"> <li>• Establish and maintain floodplain and coastal risk management committees and ensure that key agencies are represented.</li> <li>• Develop and implement floodplain risk management plans in accordance with the NSW Government’s Flood Prone Land Policy and the Floodplain Development Manual.</li> <li>• Provide levee studies, flood studies and floodplain management studies to NSW SES.</li> <li>• Maintain Dam Emergency Plans for the Council owned dams and provide copies to NSW SES.</li> <li>• Provide information on the consequences of dam failure to NSW SES for incorporation into planning and flood intelligence.</li> <li>• Coordinate the development of warning services for catchments prone to flash flooding (small catchments), where appropriate.</li> <li>• Maintain council-owned flood warning networks and flood mitigation works.</li> <li>• Participate in NSW SES-led flood emergency planning meetings, to assist in the preparation of Flood Sub Plans.</li> <li>• Maintain a plant and equipment resource list for the council area.</li> <li>• Contribute to community engagement activities.</li> </ul> <p><b>Response</b></p> <ul style="list-style-type: none"> <li>• Subject to the availability of council resources, assist NSW SES with flood operations including: <ul style="list-style-type: none"> <li>– Traffic management on council managed roads.</li> </ul> </li> </ul>

AGENCY	RESPONSIBILITIES
	<ul style="list-style-type: none"> <li>– Provision of assistance to NSW SES (plant, equipment and personnel where able and requested).</li> <li>– Property protection tasks including sandbagging.</li> <li>– Assist with the removal of caravans from caravan parks.</li> <li>– Warning and/or evacuation of residents and other people in flood liable areas.</li> <li>– Provision of back-up radio communications.</li> <li>– Resupply of isolated properties.</li> <li>– Technical advice on the impacts of flooding.</li> <li>– Close and reopen council roads (and other roads nominated by agreement with Transport for NSW) and advise NSW SES, NSW Police Force and people who contact the council for road information.</li> <li>– Assist NSW SES to provide filled sandbags and filling facilities to residents and business in areas which flooding is expected.</li> </ul> <ul style="list-style-type: none"> <li>• Assist with making facilities available for domestic pets and companion animals of evacuees during evacuations.</li> <li>• Operate flood mitigation works including critical structures such as detention basins and levees and advise NSW SES regarding their operation.</li> <li>• Manage and protect council-owned infrastructure facilities during floods.</li> <li>• Provide advice to NSW SES and the Health Services Functional Area during floods about key council managed infrastructure such as sewerage treatment and water supply.</li> <li>• Advise the Environmental Protection Authority of any sewerage overflow caused by flooding.</li> <li>• Work with NSW SES and NSW Department of Planning and Environment to collect flood related data during and after flood events.</li> </ul> <p><b>Recovery</b></p> <ul style="list-style-type: none"> <li>• Provide for the management of health hazards associated with flooding including removing debris and waste.</li> <li>• Ensure premises are fit and safe for reoccupation and assess any need for demolition.</li> <li>• Provide services, assistance and advice to State Government in accordance with the State Recovery Plan.</li> </ul>
<b>Caravan Park Proprietor(s)</b>	<ul style="list-style-type: none"> <li>• Prepare a flood emergency plan for the Caravan Park.</li> <li>• Ensure that owners and occupiers of movable dwellings are aware that the caravan park is flood liable by providing a written notice to</li> </ul>

AGENCY	RESPONSIBILITIES
	<p>occupiers taking up residence and displaying this notice and emergency management arrangement within the park.</p> <ul style="list-style-type: none"> <li>• Ensure that owners and occupiers of movable dwellings are aware that if they are expecting to be absent for extended periods, they should: <ul style="list-style-type: none"> <li>– Provide the manager of the caravan park with a contact address and telephone number in case of an emergency.</li> <li>– Leave any movable dwelling in a condition allowing it to be relocated in an emergency (i.e.: should ensure that the wheels, axles and draw bar of the caravans are not removed and are maintained in proper working order).</li> </ul> </li> <li>• Ensure that occupiers are informed of Flood Information. At this time, occupiers should be advised to: <ul style="list-style-type: none"> <li>– Ensure that they have spare batteries for their radios.</li> <li>– Listen to a local radio station for updated flood information.</li> <li>– Prepare for evacuation and movable dwelling (cabins) relocation.</li> </ul> </li> <li>• Ensure that owners and occupiers of caravans are aware of what they must do to facilitate evacuation and movable dwelling relocation when flooding occurs.</li> <li>• Coordinate the evacuation of people and the relocation of movable dwellings when floods are rising and their return when flood waters have subsided. Movable dwellings will be relocated back to the caravan park(s) by owners or by vehicles and drivers arranged by the park managers.</li> <li>• Secure any movable dwellings that are not able to be relocated to prevent floatation.</li> <li>• Inform NSW SES of the progress of evacuation and/or movable dwellings relocation operations and of any need for assistance in the conduct of these tasks.</li> </ul>
<b>Childcare Centres and Preschools</b>	<ul style="list-style-type: none"> <li>• When notified of possible flooding or isolation, childcare centres and preschools should. <ul style="list-style-type: none"> <li>– Liaise with NSW SES and arrange for the early release of children whose travel arrangements are likely to be disrupted by flooding and/or road closures.</li> <li>– Assist with coordinating the evacuation of preschools and childcare centres.</li> </ul> </li> </ul>
<b>Dams Safety NSW</b>	The roles and responsibilities for Dams Safety NSW (formerly NSW Dam Safety Committee) are outlined in the NSW State Flood Plan.
<b>Department of Defence</b>	Arrangements for Defence Assistance to the Civil Community are detailed within the State EMPLAN (section 448).

<b>AGENCY</b>	<b>RESPONSIBILITIES</b>
<b>Energy and Utilities Services Functional Area</b>	<p>The roles and responsibilities for Energy and Utilities Services are outlined in the Energy and Utility Services Supporting Plan (EUSPLAN).</p> <p>Roles and responsibilities in addition to the Supporting Plan are:</p> <ul style="list-style-type: none"> <li>• Assist NSW SES with identification of infrastructure at risk of flood damage where resources are available.</li> <li>• Facilitate local utility service distribution providers (electricity, gas, water, wastewater) to: <ul style="list-style-type: none"> <li>– Provide advice to NSW SES of any need to disconnect power/gas/water/wastewater supplies or of any timetable for reconnection.</li> <li>– Advise NSW SES of any hazards from utility services during flooding and coastal erosion/inundation.</li> <li>– Advise the public with regard to electrical hazards during flooding and coastal erosion/inundation, and to the availability or otherwise of the electricity supply.</li> <li>– Clear or make safe any hazard caused by power lines or electricity distribution equipment.</li> <li>– Reconnect customers’ electrical/ gas/ water/wastewater installations, when certified safe to do so and as conditions allow.</li> <li>– Assist NSW SES to identify infrastructure at risk of flooding for incorporation into planning and intelligence.</li> </ul> </li> </ul>
<b>Engineering Services Functional Area</b>	The roles and responsibilities for Engineering Services are outlined in the Engineering Services Supporting Plan and NSW State Flood Plan.
<b>Environmental Services Functional Area</b>	The roles and responsibilities for Environmental Services are outlined in the Environmental Services (ENVIROPLAN) Supporting Plan.
<b>Floodplain Management Australia</b>	The roles and responsibilities for Floodplain Management Australia are outlined in the NSW State Flood Plan.
<b>Fire and Rescue NSW</b>	The roles and responsibilities for Fire and Rescue NSW are outlined in the NSW State Flood Plan.
<b>Forestry Corporation of NSW</b>	The roles and responsibilities for Forestry Corporation of NSW are outlined in the NSW State Flood Plan.
<b>Health Services Functional Area</b>	The roles and responsibilities for Health Services are outlined in the Health Services (HEALTHPLAN) Supporting Plan and NSW State Flood Plan.
<b>Local Emergency Operations Controller (LEOCON)</b>	<ul style="list-style-type: none"> <li>• Monitor flood operations.</li> <li>• If requested, coordinate support for the NSW SES Incident Controller.</li> </ul>
<b>Local Emergency Management Officer (LEMO)</b>	<ul style="list-style-type: none"> <li>• If requested by the NSW SES Incident Controller, advise appropriate agencies and officers of the start of response operations.</li> </ul>

<b>AGENCY</b>	<b>RESPONSIBILITIES</b>
<b>Manly Hydraulics Laboratory (MHL)</b>	The roles and responsibilities for Manly Hydraulic Laboratory are outlined in the NSW State Flood Plan.
<b>Marine Rescue NSW</b>	The roles and responsibilities for Marine Rescue NSW are outlined in the NSW State Flood Plan.
<b>NSW Ambulance</b>	The roles and responsibilities for NSW Ambulance are outlined in the Health Services (HEALTHPLAN) Supporting Plan and NSW State Flood Plan.
<b>NSW Department of Education, Association of Independent Schools of NSW, and National Catholic Education Commission</b>	The roles and responsibilities for NSW Department of Education, Association of Independent Schools of NSW, and National Catholic Education Commission are outlined in the NSW State Flood Plan.
<b>NSW Department of Planning and Environment (Environment and Heritage Group)</b>	The roles and responsibilities for NSW Department of Planning and Environment (Environment and Heritage Group) are outlined in the NSW State Flood Plan (referred to as DPIE EES).
<b>NSW Department of Planning and Environment (Water)</b>	The roles and responsibilities for NSW Department of Planning and Environment (Water) are outlined in the NSW State Flood Plan.
<b>NSW Food Authority</b>	The roles and responsibilities for NSW Food Authority are outlined in the Food Safety Emergency Sub Plan.
<b>NSW National Parks and Wildlife Services</b>	The roles and responsibilities for NSW National Parks and Wildlife Services are outlined in the NSW State Flood Plan.
<b>NSW Police Force</b>	The roles and responsibilities for NSW Police Force are outlined in the NSW State Flood Plan.
<b>NSW Rural Fire Service</b>	The roles and responsibilities for NSW Rural Fire Service are outlined in the NSW State Flood Plan.
<b>Owners of Declared Dams within or upstream of the LGA</b>	The roles and responsibilities for Owners of Declared Dams are outlined in the NSW State Flood Plan.
<b>Public Information Services Functional Area</b>	The roles and responsibilities for Public Information Services are outlined in the Public Information Services Supporting Plan and NSW State Flood Plan.
<b>Resilience NSW</b>	The roles and responsibilities for Resilience NSW are outlined in the NSW State Flood Plan.
<b>SEOCN/SEOC</b>	The roles and responsibilities for the SEOCN/SEOC are outlined in the NSW State Flood Plan.
<b>Surf Life Saving NSW</b>	The roles and responsibilities for Surf Life Saving NSW are outlined in the NSW State Flood Plan.



<b>AGENCY</b>	<b>RESPONSIBILITIES</b>
<b>Telecommunications Services Functional Area</b>	The roles and responsibilities for Telecommunications Services are outlined in the Telecommunications Services (TELCOPLAN) Supporting Plan.
<b>Transport for NSW</b>	<ul style="list-style-type: none"> <li>• Transport for NSW coordinates information on road conditions for emergency services access.</li> <li>• Transport for NSW coordinates the management of the road network across all modes of transport.</li> <li>• Transport for NSW in conjunction will assist NSW SES with the evacuation of at-risk communities by maintaining access and egress routes.</li> <li>• Assist NSW SES with the communication of flood warnings and information provision to the public through Live Traffic and Social Media according to the VMS protocols and procedures.</li> <li>• Assist NSW SES with identification of road infrastructure at risk of flooding.</li> </ul>
<b>Transport Services Functional Area</b>	The roles and responsibilities for Transport Services are outlined in the Transport Services Functional Area Supporting Plan and NSW State Flood Plan.
<b>VRA Rescue NSW</b>	The roles and responsibilities for VRA Rescue NSW are outlined in the NSW State Flood Plan.
<b>Water NSW</b>	The roles and responsibilities for Water NSW are outlined in the NSW State Flood Plan.
<b>Welfare Services Functional Area</b>	The roles and responsibilities for Welfare Services are outlined in the Welfare Services Functional Area Supporting Plan and NSW State Flood Plan.

## 2 Appendix C – Community Specific Roles and Responsibilities

<b>Community Members</b>	<p><b>Preparedness</b></p> <ul style="list-style-type: none"><li>• Understand the potential risk and impact of flooding.</li><li>• Prepare homes and property to reduce the impact of flooding.</li><li>• Understand warnings and other triggers for action and the safest actions to take in a flood.</li><li>• Households, institutions and businesses develop plans to manage flood risks, sharing and practicing this with family, friends, employees and neighbours.</li><li>• Have an emergency kit; and</li><li>• Be involved in local emergency planning processes.</li></ul> <p><b>Recovery</b></p> <ul style="list-style-type: none"><li>• Assist with community clean-up if required and able to do so.</li><li>• Participate in After Action Reviews if required.</li></ul>
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# HAZARD AND RISK IN KIAMA LGA

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**Volume 2 of the Illawarra Local Flood Plan**

**Last Update: January 2017**

## AUTHORISATION

The Hazard and Risk in Kiama has been prepared by the NSW State Emergency Service (NSW SES) as part of a comprehensive planning process. The information contained herein has been compiled from the latest available technical studies.

Approved



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Manager Emergency Risk Management

Date: 16/1/17

Approved



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NSW SES Illawarra South Coast Region Controller

Date: 10 Jan 2017

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Tabled at LEMC

Date: 1 March 2017

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## VERSION LIST

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Description	Date

## AMENDMENT LIST

Suggestions for amendments to this Volume should be forwarded to:

The Kiama Unit Local Controller

NSW State Emergency Service

PO Box 546, Kiama, NSW, 2533

Amendments promulgated in the amendments list below have been entered in this Volume.

Amendment Number	Description	Updated by	Date

*Document Issue: Version 3-02052016*

# 1 THE FLOOD AND COASTAL EROSION THREAT

## 1.1 OVERVIEW

- a. The Kiama Council Local Government Area is located 120km south of Sydney. The Wollongong Coast River Basin covers the northern half of the LGA and the Shoalhaven River Basin covers the southern half of the LGA. The Minnamurra River forms the northern boundary of the LGA (1) (Maps 1, 2 and 3).
- b. The Kiama LGA contains the towns and suburbs of Kiama, Jamberoo, Gerringong, Gerroa, Kiama Downs and Minnamurra. A large portion of the LGA consists of rural farmlands (2).

## 1.2 LANDFORMS AND RIVER SYSTEMS

- a. The Kiama Council area is made up of the rugged country of the Illawarra Range in the western and central areas, undulating land in the north and along the coast and swampy lowland areas along the Minnamurra River. The Minnamurra River and its tributaries (Burra, Turpentine, Fryers, Hyams, Colyers, Fountaindale, Jerrara and Rocklow Creeks) drain most of the northern portion of the council area. These watercourses fall in the Wollongong Coast River Basin (3).
- b. Spring Creek and the Surf Beach Creek drain the town ship of Kiama. They are short catchments, beginning in the hills above Kiama and draining directly to the ocean (4).
- c. The Wollongong Coast River Basin is shown on Map 2.
- d. The western portion of the LGA is drained by the upper Kangaroo River and the tributary Gerringong and Brogers Creeks. Other streams include Middle, Spring, Munna Munnora, Ooaree and Broughton Creeks, Crooked River and a number of unnamed watercourses. These watercourses form part of the Shoalhaven River Basin (3).
- e. The Shoalhaven River Basin is shown on Map 3.

## 1.3 STORAGE DAMS

- a. Fountaindale Creek Dam is the only prescribed dam within the Kiama LGA. Jerrara Creek Dam has now been decommissioned and is no longer considered to be a prescribed dam. Dam locations are shown on Maps 1, 2 and 3.



**Table 1: Prescribed Dams in Kiama LGA; summary of information about each storage.**

<b>Fountaindale Creek Dam (5)</b>	
Owner / Operator	Kiama Municipal Council
Description of Dam	Concrete Arch 14.8m high, 88.9m crest length, overflow spillway, 61.2ML capacity.
Location	Fountaindale Dam is located south of Jamberoo on Fountaindale Creek. Access to the dam is from Clover Hill Road.
Communities Downstream	Rural properties on Jamberoo, Fountaindale and Clover Hill Roads.
Monitoring System	The dam is monitored by a telemetric system at Kiama Council.
Warning System	Warnings are provided directly from Kiama Council to the SES to disseminate to residents.
Other	In the event of a 1% AEP Failure event the peak flood would take 43-61 mins to reach properties. In the event of a PMF Failure event the peak flood would take 24-37 to reach properties.

## 1.4 WEATHER SYSTEMS AND FLOODING

- a. Flooding can occur at any time of year, but in different seasons it is triggered by different rain-producing mechanisms. There is a slight bias toward the January-June period as far as flood occurrence is concerned. Floods may result from:
  - i. Low-pressure systems located off the coast and producing moisture-laden on-shore winds which, when triggered by orthographic rainfall resultant from the Illawarra Range, can produce very heavy rains. Such systems generally occur during summer. In February 1984, such a system produced serious flooding immediately to the north of the council area (3).
  - ii. Frontal systems crossing the council area from west to east. Such systems can pass at any time of year, but they are most common during the winter months (3).
  - iii. High-intensity, short-duration convective thunderstorms which occur during the summer months. These storms can cause sharp rises on minor creeks and flooding in towns and villages when artificial drainage systems surcharge (3).
  - iv. King or storm tides can cause inundation of low-lying coastal areas and hold up the escape of flood waters from streams to the sea (3).
- b. Average annual precipitation varies from less than 1,100 mm along the coast to more than 1,500 mm on the high ground in the west of the council area. Daily rainfall totals of more than 200 mm have been recorded on several occasions in the council area and at nearby locations. In February 1984, more than 500 mm fell in a single

event, most of it in about nine hours over a portion of the catchment of the Macquarie Rivulet. Periods of near-constant rain for several days on end have also been recorded. More than 60% of the council area's rain occurs during the summer and autumn quarters, most of it in February, March and April (3).

- c. Floods may occur at any time of year, but they are more common in the late summer-early winter period (January to June) than at other times. Most of the more serious floods in the council area have been caused by storm durations between 6 and 24 hours (3).

## **1.5 CHARACTERISTICS OF FLOODING**

- a. The Kiama LGA is primarily affected by flash flooding. Riverine flooding can also occur on Minnamurra River and Crooked River.
- b. Creeks including Surf Beach Creek and Spring Creek can become fast flooding floodways which can spread and inundate the surrounding low lying streets and properties in Kiama (2).
- c. Slower flowing lower hazard flood storage areas can develop in areas of Kiama including near the Kiama Leisure Centre, the Spring Creek Wetlands and the West Kiama subdivision (4) (2).
- d. Flooding also occurs in Jamberoo, along the Minnamurra River, in Terragong Swamp, Gainsborough Oval, Werri Lagoon, the Campbell Street Creek, Crooked River, in Foxground and Toolijooa.

## **1.6 FLOOD HISTORY**

- a. 21 March 2011 - a total daily rainfall greater than 200mm, with hourly rates as high as 85.5mm lead to flooding across the Kiama LGA. The Minnamurra River near Browns Lane peaked at a height of 4m. 20 properties experienced over floor flooding and many roads were closed due to landslips, bridge damage and road damage. Jamberoo was isolated from Kiama for approximately 6 hours (1).

## **1.7 FLOOD MITIGATION SYSTEMS**

- a. There are no levees or flood mitigation systems located in the Kiama LGA.
- b. Refer to Table 1 and Section 2 for further detail.

## **1.8 EXTREME FLOODING**

- a. As far as is known, extreme flooding has not occurred in the Kiama Council City LGA areas since European settlement. Such flooding is possible, however, and floods more serious than the 1% AEP ('once-in-100-years') event can occur. Extreme floods

can reach much greater heights than were recorded in earlier events. They also tend to be both faster to rise and more dangerous in terms of depth and velocity than previous floods. Such floods would quickly overwhelm the storage capacities of the existing flood detention basins and cause disastrous flooding downstream (3).

- b. PMF – During the PMF event in Kiama, properties located adjacent to Spring Creek and to the Surf Beach Creek will be affected by floodwaters (4) (2).

Low lying areas in Werri Beach, Gerringong, Gerroa, Foxground, Jamberoo, Curramore and Minnamurra would also be affected by floodwaters during a PMF event. Historically, Jamberoo and Curramore have become isolated during flooding events. No flood modelling has been completed in these areas.

## 2 EFFECTS ON THE KIAMA COMMUNITY

### 2.1 COMMUNITY PROFILE

Table 2: Census of Housing and Population data for the Kiama Area (2011)

Census Description	Kiama LGA	Gerringong	Gerroa	Jamberoo	Kiama	Willow Vale
<b>Total Persons</b>	<b>19,986</b>	<b>4,544</b>	<b>497</b>	<b>1,757</b>	<b>13,572</b>	<b>671</b>
Aged 0-4 yrs.	998	257	18	47	732	44
Aged 5-14 yrs.	2,511	653	46	247	1,664	95
Aged 65 + yrs.	4,112	903	156	349	2,684	82
Of Indigenous Origin	285	121	9	11	159	18
Who do not speak English well	47	7	0	3	40	0
Have a need for assistance (profound/severe disability)	923	265	24	52	592	15
Living alone (Total)	1,649	368	50	104	1,109	39
Living alone (Aged 65+)	922	223	27	44	616	21
Residing in caravans, cabins or houseboats or improvised dwellings	50	13	20	0	13	0
<b>Occupied Private Dwellings (Households)</b>	<b>7,414</b>	<b>1,583</b>	<b>192</b>	<b>622</b>	<b>5,110</b>	<b>220</b>
No Motor Vehicle	341	67	6	9	275	3
Caravan, cabin, houseboat or improvised dwell	21	7	5	0	7	0
Rented via State or Housing Authority	63	10	0	0	57	0
Rented via Housing Co-Op or Community Church Group	57	37	0	3	22	0
No Internet Connection	1,284	281	44	88	898	23
<b>Unoccupied Private Dwellings</b>	<b>1,723</b>	<b>380</b>	<b>255</b>	<b>104</b>	<b>940</b>	<b>12</b>
<b>Average persons per occupied dwelling</b>	<b>2.5</b>	<b>2.7</b>	<b>2.2</b>	<b>2.7</b>	<b>2.4</b>	<b>2.9</b>
<b>Average vehicles per occupied dwelling</b>	<b>1.8</b>	<b>1.9</b>	<b>1.6</b>	<b>2.2</b>	<b>1.8</b>	<b>2.2</b>

## SPECIFIC RISK AREAS - FLOOD

### 2.2 JAMBEROO

#### 2.2.1 Community Overview

- a. Jamberoo is located 11km inland from Kiama (Map 4). Jamberoo had a population of 1,757 in 2011. The town is surrounded by rural properties and farmlands. The Minnamurra River is adjacent to Jamberoo.

#### 2.2.2 Characteristics of flooding

- a. Jamberoo is affected by a combination of flash flooding, overland flooding and riverine flooding.

#### 2.2.3 Flood Behaviour

- a. The farmland east of Jamberoo, located adjacent to the Minnamurra River, along Swamp Road historically acts as flood storage during flooding events. This occurs frequently, generally multiple times each year.
- b. No flood studies have been completed in the Jamberoo Area.

#### 2.2.4 Classification of Floodplain

- a. Historically the town of Jamberoo can become a High Flood Island whereby it becomes isolated and surrounded by floodwaters cutting access roads out. This occurred during the 2011 flooding event.
- b. Historically rural properties located outside of the Jamberoo town have had Rising Road access whereby they are able to retreat by road as floodwaters rise. Alternatively they have been able to utilise overland escape where road access has been unavailable.
- c. Further classifications will be identified in a flood study.

#### 2.2.5 Inundation

- a. No flood modelling has been completed in the Jamberoo Area.
- b. Historically, low lying farm areas can become inundated during flooding events.
- c. Inundation is also known to occur at the Jamberoo Preschool located on Allowrie Street, Jamberoo.

#### 2.2.6 Isolation

- a. Historically, rural properties surrounding Jamberoo may become isolated due to flooded roads. Isolations only occur for short periods of time – less than 12

hours. The majority of these rural properties however, have overland access through unaffected farmlands.

- b. Jamberoo Township becomes isolated when surrounding roads become cut.

### **2.2.7 Flood Mitigation Systems**

- a. There are no flood mitigation systems located in Jamberoo.

### **2.2.8 Dams**

- a. Fountaindale Dam is located to the south of Jamberoo. Failure of the dam would result in the inundation of downstream rural properties, but would not impact the Jamberoo Township itself (5).
  - i. No properties or roads would be impacted by a Sunny Day failure (5).
  - ii. 5 houses and 7 buildings located on Fountaindale and Jamberoo Roads would experience over flood flooding in a 1% AEP dam break. Additionally 3 road bridges would be overtopped (5). In the event of a 1% AEP Failure event the peak flood wave would take 43-61 minutes to reach properties.
  - iii. 10 houses and 8 buildings located on Fountaindale and Jamberoo Roads would experience over flood flooding in a PMF dam break. Additionally 3 road bridges would be overtopped (5). In the event of a PMF Failure event the peak flood wave would take 24-37 minutes to reach properties.

### **2.2.9 At Risk Facilities**

- a. Jamberoo Preschool located on Allowrie Street has historically been affected by floodwaters. This occurred most recently in 2011.
- b. Jamberoo Public School is located on Churchill Street. Its playing fields may have been affected by flooding in the past (To be confirmed).

### **2.2.10 Other Considerations**

- a. No other considerations.

## 2.3 CURRAMORE

### 2.3.1 Community Overview

- a. Curramore is a rural locality located to the north of Jamberoo. It consists of rural properties. Curramore is shown on Map 4.

### 2.3.2 Characteristics of flooding

- a. Curramore is affected by overland and riverine flooding.

### 2.3.3 Flood Behaviour

- a. Unknown.

### 2.3.4 Classification of Floodplain

- a. No flood studies have been completed for Curramore.
- b. In previous flooding events Curramore has had Rising Road Access.

### 2.3.5 Inundation

- a. Unknown.

### 2.3.6 Isolation

- a. In the 2011 flooding event:
  - i. Curramore became isolated from Jamberoo and Albion Park due to flooding on Jamberoo Road. Isolation occurred for under 12 hours.
  - ii. Jamberoo Action Park became isolated due to closures on Jamberoo Road. Isolation was for a short period (3-6 hours).

### 2.3.7 Flood Mitigation Systems

- a. There are no flood mitigation systems located in Curramore.

### 2.3.8 Dams

- a. There are no dams that impact on Curramore.

### 2.3.9 At Risk Facilities

- a. There is a privately run **aged care facility** on Jamberoo Road in Curramore. The facility has historically experienced isolation, most recently in the 2011 event.
- b. **Jamberoo Action Park** is located in Curramore. The action park is open to the public from September until April, however the conference centre can be open all year round and after business hours. In peak season the park can accommodate over 5,000 people. Historically the park has experienced isolation, most recently in the 2011 event.

## **2.4 MINNAMURRA/KIAMA DOWNS**

### **2.4.1 Community Overview**

- a. Minnamurra and Kiama Downs are located to the north of the Kiama Township. The Minnamurra River flows adjacent to both suburbs. The population in 2011 was 5,737 with 2,008 residences (6).
- b. Minnamurra is shown on map 6.
- c. Kiama Downs is shown on map 7.

### **2.4.2 Characteristics of flooding**

- a. Kiama Downs and Minnamurra are affected by riverine and overland flooding.

### **2.4.3 Flood Behaviour**

- a. No studies have been completed for this area.
- b. The swamp area to the north and west of Kiama Downs and Minnamurra, adjacent to the Minnamurra River acts as flood storage. This occurs frequently, in minor rainfall events multiple times a year.

### **2.4.4 Classification of Floodplain**

- a. Unknown.

### **2.4.5 Inundation**

- a. No flood studies have been completed for Kiama Downs or Minnamurra.
- b. Historically, flooding has occurred only on properties due to localised overland flows.

### **2.4.6 Isolation**

- a. Historically, there have been no known isolations in the Kiama Downs and Minnamurra Areas.

### **2.4.7 Flood Mitigation Systems**

- a. Gainsborough Oval, located on Meehan Drive in Kiama Downs is a detention basin which acts as a storage area in flooding events. Details on this basin are unknown.

### **2.4.8 Dams**

- a. There are no dams which impact Minnamurra or Kiama Downs.



#### 2.4.9 At Risk Facilities

- a. **Minnamurra Primary School** is located on Charles Avenue. No flood studies have been done to confirm the flood risk, however the school is located on low ground.
- b. **North Kiama Neighbourhood Centre** is located on Meehan Drive, adjacent to the detention basin at Gainsborough Oval. The Centre was impacted in the 2011 flooding event with above floor flooding. The facility is used by community groups, including children's' groups.
- c. **Kiama Kids Preschool & Childcare Centre** is located on Barton Drive and has been previously inundated by overland flows. This has occurred on multiple occasions however there has been no modelling at this location to determine the exact event this occurs.

#### 2.4.10 Other Considerations

- a. No other considerations.

## 2.5 KIAMA

### 2.5.1 Community Overview

- a. Kiama is located 120km south of Sydney. In 2011 the population was 13,572 with 5,110 residences. The Spring Creek and Surf Beach catchments are located within Kiama (6).
- b. Kiama is shown on map 8.

### 2.5.2 Characteristics of flooding

- a. Kiama is affected by a combination of riverine, overland and flash flooding (2).

### 2.5.3 Flood Behaviour

#### 10 to 20% AEP events

- a. In the 10 and 20% AEP events the creek running from Surf Beach to the Princes Highway acts as a floodway (4). Water pools in areas adjacent to the creek including within properties located on Barney Street, Manning Street, Farmer Street, Shoalhaven Street and Bland Street (4).

#### 5% AEP events

- b. In the 5% AEP event floodways develop in Spring Creek and Surf Beach Creek.
  - i. Areas affected by Spring Creek include the Jamberoo Road/ Spring Creek crossing area, the Dido Street crossing and the Princes Highway and Rail crossing bridges crossing Spring Creek (2).
  - ii. Surf Beach creek is contained within its banks until around Barney Street where floodwaters leaves the creek and flow overland across Manning Street towards Surf Beach. It then splits around the north and south side of Elizabeth Court and re-joins to flow across Barney Street into Surf Beach (4).
- c. During the 5% AEP event flood storage occurs in Spring Creek Wetlands, properties on the Southern side of Glenbrook Drive, Farmer Street, Manning Street and Barney Street, the Leisure Centre Carpark and the rear of the Kiama FRNSW Station (2) (4).
- d. Flood fringe areas in the 5% AEP consist of overland flows located on properties on Terralong Street, Spring Creek Drive, Cedar Ridge Road, Brown Street, lower Hothersal Street, Bland Street, Shoalhaven Street, Farmer Street, Manning Street and Barney Street (2) (4).

### 1% AEP events

- e. In the 1% AEP the Spring Creek floodway extends further from Jamberoo Road, to the Banksia Drive intersection. The yards of properties located on the southern side of Glenbrook Drive may also form part of this floodway (2).
- f. In the 1% AEP event the Surf Beach creek floodway follows the creek channel until it reaches the Shoalhaven Street crossing where it splits into two parts, one part flowing through the Kiama Coachlines property and the other along Farmer Street only to merge again and flow under the Farmer Street rail crossing. Further downstream the floodway again leaves the creek and flows overland across Manning Street towards Surf Beach, where it again splits around the north and south side of Elizabeth Court and re-joins to flow across Barney Street into Surf Beach (4).
- g. In addition to the flood storage areas already described for the 5% events, the swamp area located adjacent to the entrance of Spring Creek can also act as flood storage areas during the 1% AEP event. This area extends north of the swamp into the adjacent Kiama Cemetery.

### PMF Events

- h. During a PMF event both Spring Creek and Surf Beach creek again act as floodways.
  - i. In this case properties located on the southern side of Glenbrook Drive and on the lower parts of Dido Street will form part of the Spring Creek floodway. The swamp located at the entrance to Spring Creek, extending into the south eastern section of the Kiama Cemetery will also form part of this floodway. The Princes Highway Bridge, the rail crossing bridge and the Highway adjacent to the cemetery will all also become floodways (2).
  - ii. In addition, the unnamed creek running through Cedar Ridge and properties on Cedar Ridge Road adjacent to the creek may also become part of the floodway (2).
  - iii. The Surf Beach floodway again flows the creek channel splitting at Bland Street, joining again at Shoalhaven Street before re-splitting around the north and south side of Elizabeth Court and re-joining to flow across Barney Street into Surf Beach (4).
- i. Additional properties located on Eugene Street, Danube Street and Old Saddleback Road in West Kiama may also become flood storage areas during the PMF (2).

## 2.5.4 Classification of Floodplain

### High Flood Island

- a. In events above the 1% AEP properties located on Cedar Ridge Road, north of the Bele Place intersection form a High Flood Island (2).

### Overland Escape

- b. The Cedar Grove estate to the south of Jamberoo Road accessed off Banksia Drive is an Overland Escape Area in events above the 5% AEP due to the flooding of Jamberoo Road. The estate to the north of Jamberoo Road, accessed off Dido Street becomes an Overland Escape Area in events above and including the 20% AEP (2).
- c. Properties located on Mt Brandon Road become Overland Escape Areas when the Jerrara Creek causeway becomes inundated. It is unknown when this occurs.

### Rising Road Access

- d. All other areas have Rising Road Access in all flooding events (2) (4).

## 2.5.5 Inundation

Flood inundation maps are available in the Surf Beach Catchment (South) Flood Study which show the locations described in detail below (4).

### Below 5% AEP

- a. In events below the 5% AEP inundation occurs on Manning Street, Barney Street, Farmer Street, Shoalhaven Street, Dido Street, Cedar Ridge Road, Jamberoo Road and in the yards of properties located in these streets (2). Some properties in Manning and Barney Street may experience inundation (4).
- b. In the 5% AEP, inundation begins to occur in properties located on Jamberoo Road, Manning Street, Barney Street, Farmer Street, Shoalhaven Street, and Bland Street and to a property located on Glenbrook Drive. Jamberoo Road, Bland Street, Shoalhaven Street, Farmer Street, Manning Street, Barney Street, Dido Street and Cedar Ridge Road are also affected by floodwaters, and the Kiama Cemetery begins to become inundated in its southern fringes (2) (4).

### 1% AEP

- c. In the 1% AEP inundation occurs in properties located on the eastern side of Spring Creek Drive, Jamberoo Road, Bland Street, Shoalhaven Street, Farmer Street, and Manning Street, Barney Street the lower part of Spring Creek Drive, Hothersal Street and Cedar Ridge Road. The FRNSW Station on Terralong Street, and the Leisure Centre carparks and grounds experience inundation in the 1% AEP. The Kiama Cemetery also experiences inundation to over 50% of its grounds (2) (4).

## PMF

- d. During the PMF event inundation occurs in properties located on both sides of Glenbrook Drive, Eastern View Place, Dido Street, Jamberoo Road, Spring Creek Drive, Cedar Ridge Road, Hothersal Street, Bland Street, Shoalhaven Street, Farmer Street, Manning Street, Barney Street, Brown Street and the lower parts of Banksia Drive. The FRNSW Station on Terralong Street, and the Leisure Centre carparks and grounds experience inundation in the PMF event. All of the Kiama Cemetery and the properties located on Riddell Street are inundated in the PMF event (2) (4).

### 2.5.6 Isolation

- a. Properties located on Mt Brandon Road become isolated when the Jerrara Creek causeway becomes flooded. Historically isolation can occur for up to 12 hours.
- b. Properties located in the estate off Jamberoo Road to the north, accessed by Dido Street become isolated when the Dido Street Bridge becomes flooded. This occurs at the 20% EAP event (2). Historically, isolation can occur for up to 12 hours.
- c. Properties located in the Cedar Grove estate off Jamberoo Road to the south, accessed by Banksia Drive become isolated when Jamberoo Road becomes flooded. This occurs at the 5% AEP event (2). Historically, isolation can occur for up to 12 hours.
- d. Properties located on Cedar Ridge Road, north of the Bele Place intersection become isolated in events above the 1% AEP (2).

### 2.5.7 Flood Mitigation Systems

- a. There are no flood mitigation systems located in Kiama.

### 2.5.8 Dams

- a. There are no dams that impact Kiama.

### 2.5.9 At Risk Facilities

- a. St Peter and Paul Catholic School is located on Manning Street in Kiama and is affected by flooding in the PMF event (2).
- b. Easts Beach Holiday Park was impacted by flooding in 1974. The event caused the evacuation of the Park and resulted in the camping area and low lying caravan sites to experience flash flooding.

### 2.5.10 Other Considerations

- a. Kiama is a tourist town and the population in the summer months and school holidays can increase significantly, with holiday parks reaching capacity. Kiama

holds seaside markets, farmers markets and other events at Black Beach each month which can draw large crowds to the area.

## Shoalhaven River Basin

### 2.6 GERRINGONG/WERRI BEACH

#### 2.6.1 Community Overview

- a. Gerringong and Werri Beach are located 12km south of Kiama and are situated on the coastline (Maps 9 and 10). Werri Beach is surrounded by Werri Lagoon to the north and west. The population of Gerringong was 4,544 with 1583 dwellings in 2011 (6).

#### 2.6.2 Characteristics of flooding

- a. Historically Gerringong and Werri Beach have been affected by a combination of flash flooding, riverine flood and overland flooding.

#### 2.6.3 Flood Behaviour

- a. Flooding has historically occurred in areas surrounding Werri Lagoon and the creek running parallel to Campbell Street. The Werri Lagoon entrance is controlled by Kiama Council, who open it when necessary.
- b. Werri Lagoon, and the surrounding farmlands have historically acted as flood storage in flooding events.

#### 2.6.4 Classification of Floodplain

- a. Unknown.
- b. Historically Gerringong and Werri Beach have had Rising Road Access.

#### 2.6.5 Inundation

- a. Historically inundation has occurred on properties located adjacent to the Werri Lagoon.
- b. Roads that have become inundated include Fern Street and Belinda Street.

#### 2.6.6 Isolation

- a. Historically Gerringong has become isolated from Kiama to its north when Fern Street and Belinda Street were flooded. Fern Street has recently been raised with the Princes Highway upgrade so flooding should no longer occur on this road.

#### 2.6.7 Flood Mitigation Systems

- a. There are no flood mitigation systems located in Gerringong or Werri Beach.

### 2.6.8 Dams

- a. There are no dams which impact Gerringong or Werri Beach.

### 2.6.9 At Risk Facilities

- a. **Gerringong Public School** is located on Archibald Road. The grounds back onto the creek that runs parallel to Campbell Street. No flood study is yet available to confirm this flood risk.
- b. **Mayflower Nursing Home and Retirement Village** is located on Belinda Street. The grounds back onto the creek that runs parallel to Campbell Street. No flood study is yet available to confirm this flood risk.
- c. **Little Cherubs Children Centre** located on Fern Street has been historically impacted by floodwaters.

### 2.6.10 Other Considerations

- a. Gerringong and Werri Beach are popular tourist locations and the population can increase during summer months and school holidays.



## 2.7 GERROA

### 2.7.1 Community Overview

- a. Gerroa is located 3km south of Gerringong and is situated on the northern end of Seven Mile Beach (Map 11). The Crooked River runs to the south of Gerroa. The population of Gerroa was 497 with 192 dwellings in 2011 (6).

### 2.7.2 Characteristics of flooding

- a. Gerroa has historically been affected by riverine and flash flooding.

### 2.7.3 Flood Behaviour

- a. Unknown.

### 2.7.4 Classification of Floodplain

- a. Unknown.
- b. Historically Gerroa has had Rising Road Access during flooding events.

### 2.7.5 Inundation

- a. Inundation has historically occurred in the Seven Mile Beach Holiday Park, Discovery Parks Gerroa, properties located on Park Road, Burke Parade and Riverleigh Avenue. It is unknown at what events this occurs.

### 2.7.6 Isolation

- a. Unknown.
- b. Historically there have been no isolations in Gerroa.

### 2.7.7 Flood Mitigation Systems

- a. There are no flood mitigation systems located in Gerroa.

### 2.7.8 Dams

- a. There are no dams that will impact Gerroa.

### 2.7.9 At Risk Facilities

- a. **Seven Mile Beach Holiday Park** located on Crooked River Road has been previously inundated.
- b. **Discovery Park Gerroa** located on Crooked River Road has previously been inundated.

### 2.7.10 Other Considerations

- a. No other considerations.

## **2.8 FOXGROUND/TOOLIJOOA**

### **2.8.1 Community Overview**

- a. Foxground and Toolijooa are rural localities located to the west of Gerringong (Map 12 and 13). Broughton Creek runs through Foxground and Crooked River runs through Toolijooa.

### **2.8.2 Characteristics of flooding**

- a. Unknown.

### **2.8.3 Flood Behaviour**

- a. Unknown.

### **2.8.4 Classification of Floodplain**

- a. Unknown.

### **2.8.5 Inundation**

- a. Historically inundation occurs on Toolijooa Road and Foxground Road.

### **2.8.6 Isolation**

- a. The inundation of Toolijooa Road and Foxground Road can result in the isolation of properties upstream.

### **2.8.7 Flood Mitigation Systems**

- a. There are no flood mitigation systems located in Foxground or Toolijooa.

### **2.8.8 Dams**

- a. There are no dams that can impact Foxground or Toolijooa.

### **2.8.9 At Risk Facilities**

- a. There are no school located in Foxground or Toolijooa.

### **2.8.10 Other Considerations**

- a. No other considerations.

## ROAD CLOSURES AND ISOLATED COMMUNITIES

### 2.9 ROAD CLOSURES

- a. Table 3 lists roads liable to flooding in the Kiama LGA.

**Table 3: Roads liable to flooding in Kiama LGA (3)**

Road	Closure location	Consequence of closure	Alternate Route	Indicative gauge height
Kiama-Jamberoo Road (Main Road 264)	At Colyers, Fountaindale, Jerrara and Spring Creeks	Usually for the period of intense rainfall with a number of hours after.	Fountaindale Road	
Albion Park – Jamberoo Road Main Road 264 & 266	At Hyams and Turpentine Creeks	Usually for the period of intense rainfall with a number of hours after		
Roads across the lower reaches of the Minnamurra River	Including: Minnamurra Lane, Factory Lane, Browns Lane and Swamp Road	Usually for the period of intense rainfall with a number of hours after. Swamp Rd can be non-trafficable for periods of up to a week.		
Numerous other local roads	Including: Falls Rd, Wyalla Rd, Curramore Rd, Fountaindale Rd, Mt Brandon Rd and Foxground Rd at creek crossings and causeways	Usually for the period of intense rainfall with a number of hours after.		
Fern St	Near Mecure Resort, Gerringong	Sometimes for more than 12 hours.	Belinda Street, Gerringong	

In addition, roads can be cut by landslides during periods of heavy rain. This has occurred on the Princes Highway at Mt Pleasant and at several locations on Jamberoo Mountain Rd (3).

## 2.10 SUMMARY OF ISOLATED COMMUNITIES AND PROPERTIES

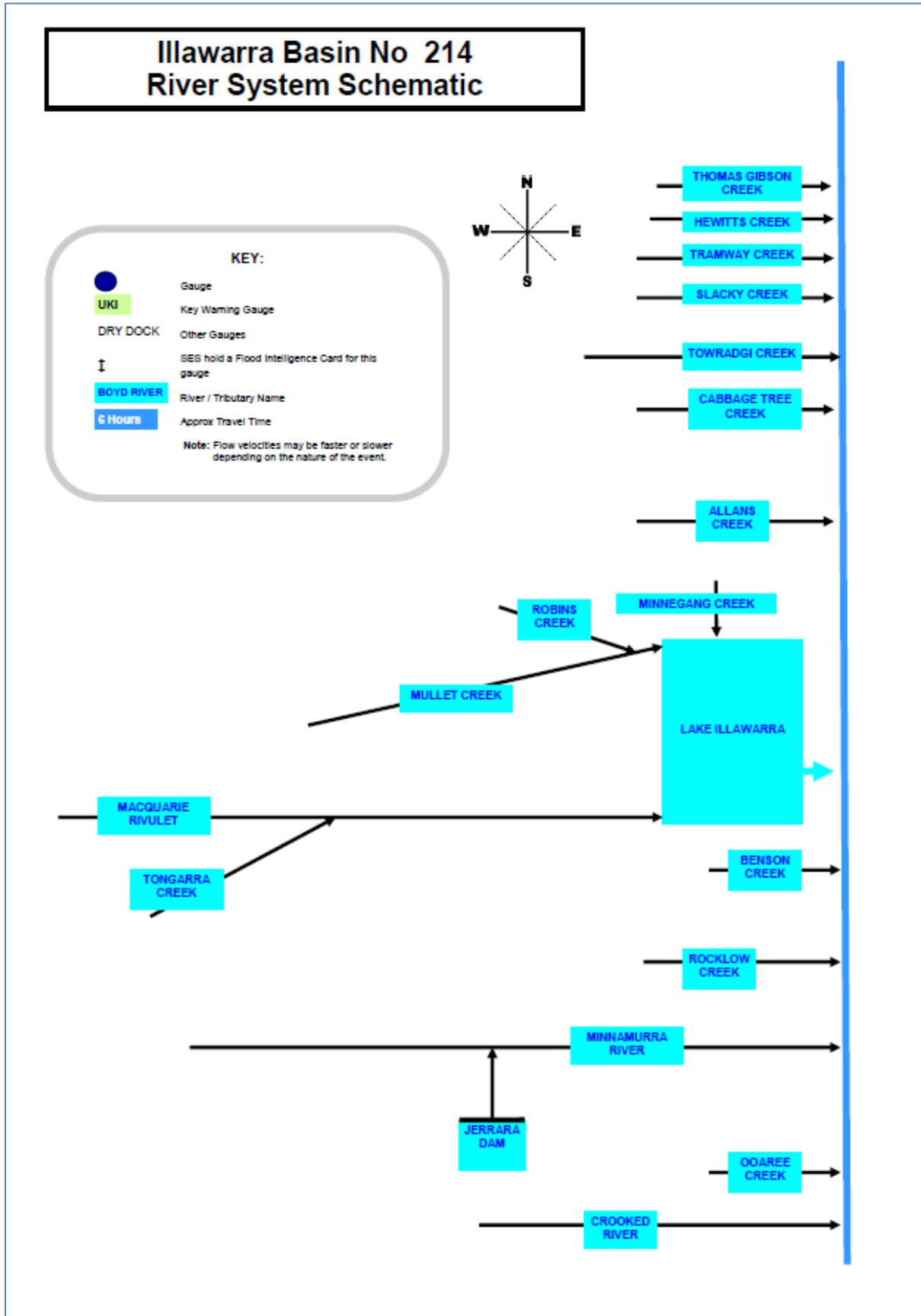
- a. Table 4 lists communities liable to isolation and potential periods of isolation. Information presented here is based on historical events and does not reflect the duration of isolation expected in larger and extreme events.

**Table 4: Potential Periods of Isolation for communities in the Kiama LGA experienced during past flood events.**

Town / Area (River Basin)	Population/ Dwellings	Flood Affect Classification	Approximate period isolation	NOTES
Rural properties surrounding Jamberoo		Overland Escape	Less than 12 hours	Most properties have overland access through unaffected farmland.
Jamberoo Action Park			3-6 hours	Can be isolated due to closures on Jamberoo Road
Curramore			Less than 12 hours	Can be isolated from Albion Park and Jamberoo due to closures on Jamberoo Road
Mt Brandon Road, Kiama	13 dwellings	Overland Escape Area	Up to 12 hours	Properties on Mount Brandon Road can be isolated when Jerrara Creek causeway becomes flooded.
Estate off Dido Street Nth of Jamberoo Road, Kiama	80 dwellings	Overland Escape Area	Up to 12 hours	Properties in this estate can become isolated when the Dido Street Bridge is flooded. This occurs in the 20% AEP event.
Cedar Grove Estate off Banksia South of Jamberoo Rd, Kiama	80 dwellings with expected	Overland Escape Area	Up to 12 hours	Isolated when Jamberoo Road becomes flooded. Number of dwellings in this area is expected to increase.
Cedar Ridge Rd, Nth of Bele Place, Kiama	48 dwellings	High Flood Island		Become isolated in events above the 1% AEP.
Toolijooa Rd, Toolijooa		Unknown		Inundation can cause isolation of properties upstream.
Foxground Rd, Foxground		Unknown (Trapped Perimeter TBC)		Inundation can cause isolation of properties upstream.

Note: Periods of isolation are a guide only. Liaison with the Local Controller and communities/residents involved is essential during periods of potential and actual isolation.

## ANNEX 1: ILLAWARRA RIVER BASIN SCHEMATIC



## ANNEX 2: FACILITIES AT RISK OF FLOODING AND/OR ISOLATION

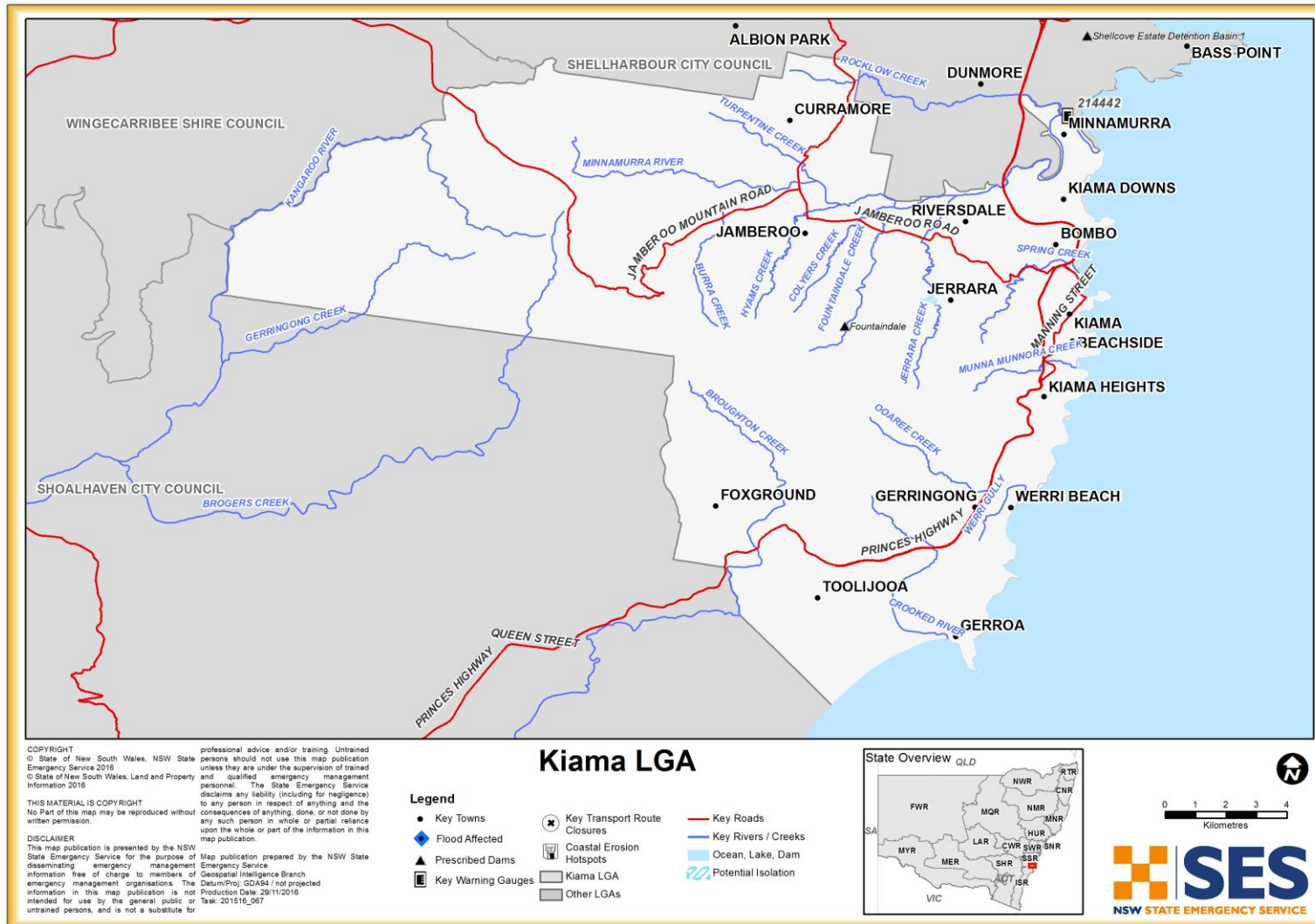
Table 5: Facilities at risk of flooding in the Kiama LGA

Facility Name	Street	Suburb	Comment
<b>Schools</b>			
Jamberoo Public School	Churchill Street	Jamberoo	Grounds may be affected by floodwaters
Minnamurra Public School	Charles Avenue	Minnamurra	May be affected by floodwaters
St Peter and Paul Catholic School	Manning Street	Kiama	Is affected by flooding in the PMF event.
Gerringong Public School	Archibald Street	Gerringong	May be affected by floodwaters
<b>Child Care Centres</b>			
Kiama Kids Preschool and Childcare Centre	88 Barton Drive	Kiama Downs	Has been previously flooded by overland flows
Little Cherubs Childcare Centre	Fern Street	Gerringong	Historically impacted by floodwaters
Jamberoo Pre School	Allowrie Street	Jamberoo	Is affected by floodwaters – most recently in 2011. Required evacuation
<b>Facilities for the aged and/or infirm</b>			
Private Aged Care facility	1183 Jamberoo Road	Curramore	Can be isolated when Jamberoo Road is closed
Mayflower Retirement Village and Nursing Home	Belinda Street	Gerringong	May be affected by flooding
<b>Other</b>			
North Kiama Neighbourhood Centre	Meehan Drive	Kiama Downs	Adjacent to the Detention Basin at Gainsborough Oval. Was impacted in the 2011 flood event with above floor flooding.
Jamberoo Action Park	1215 Jamberoo Road	Curramore	Can be isolated when Jamberoo Road is closed

Facility Name	Street	Suburb	Comment
<b>Utilities and infrastructure</b>			Nil identified
<b>Camping Ground / Caravan Parks</b>			
East Beach Caravan Park	Ocean St	Kiama	Was impacted by flooding in 1974 and required evacuation.
Discovery Park Gerroa	Crooked River Rd	Gerroa	Has been previously inundated
Seven Mile Beach Holiday Park	Crooked River Rd	Gerroa	Has been previously inundated

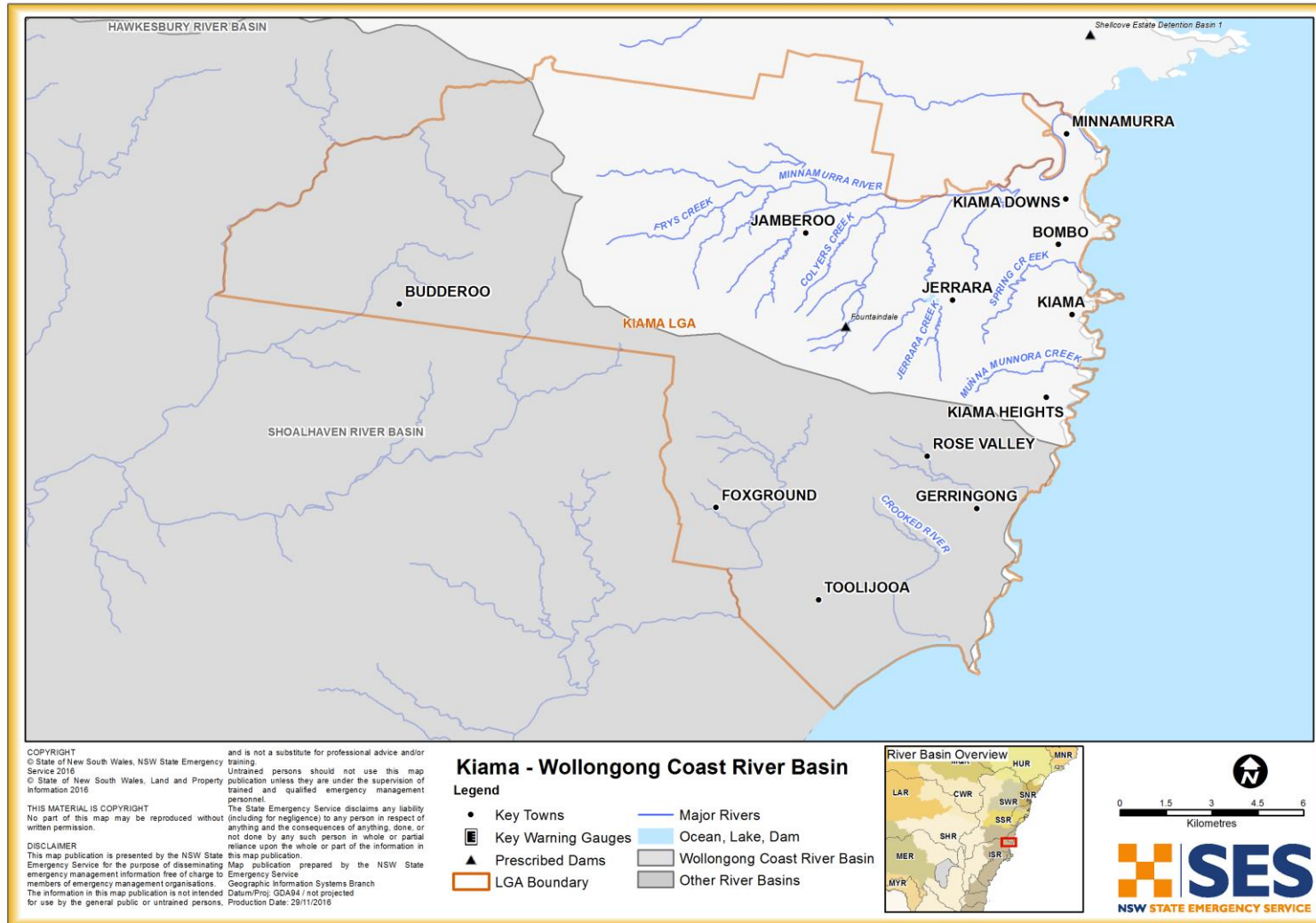
Note: This list is not exhaustive. It was based on the best information at the time.

# MAP 1: KIAMA LOCAL GOVERNMENT AREA





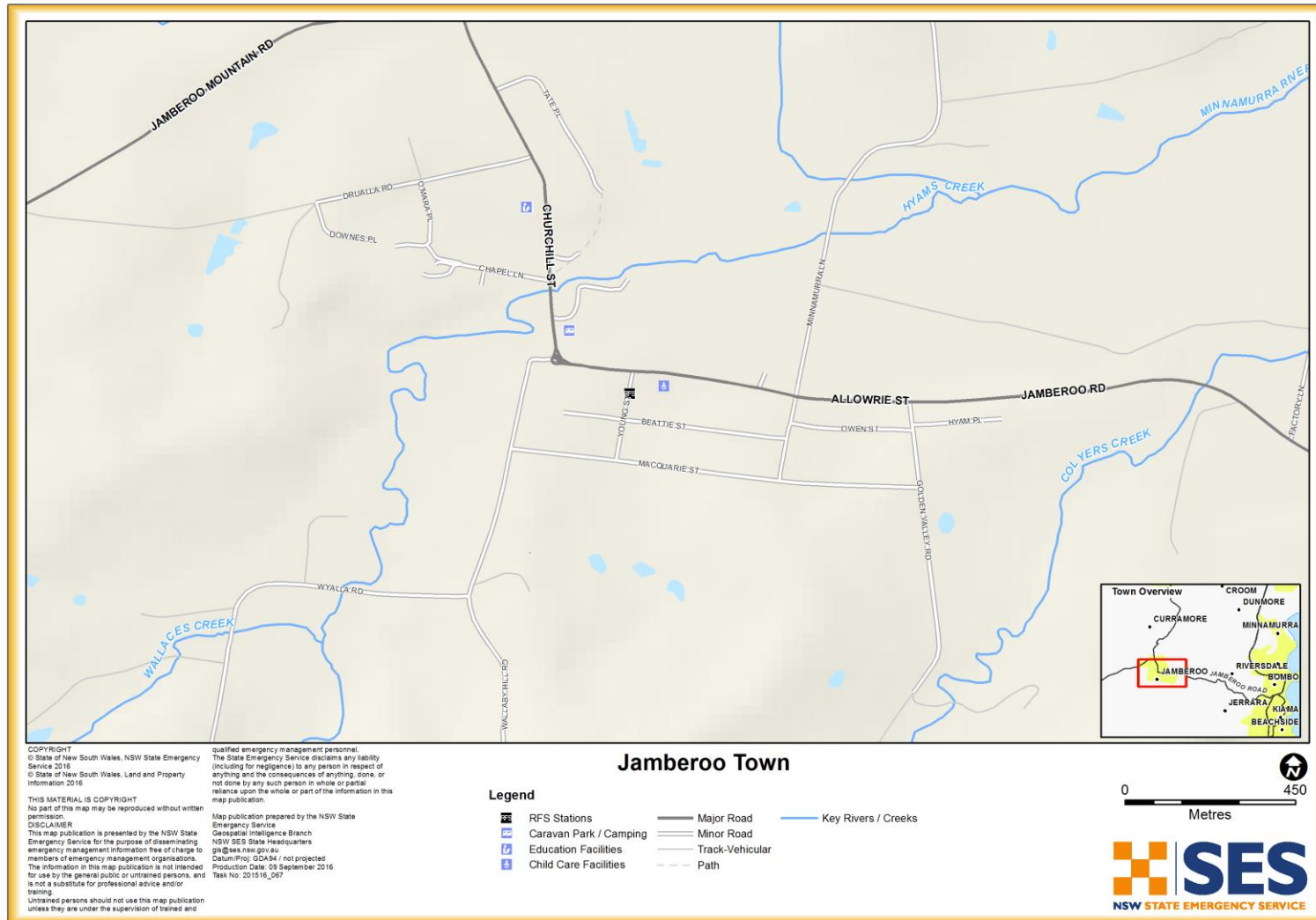
## MAP 2: WOLLONGONG COAST RIVER BASIN



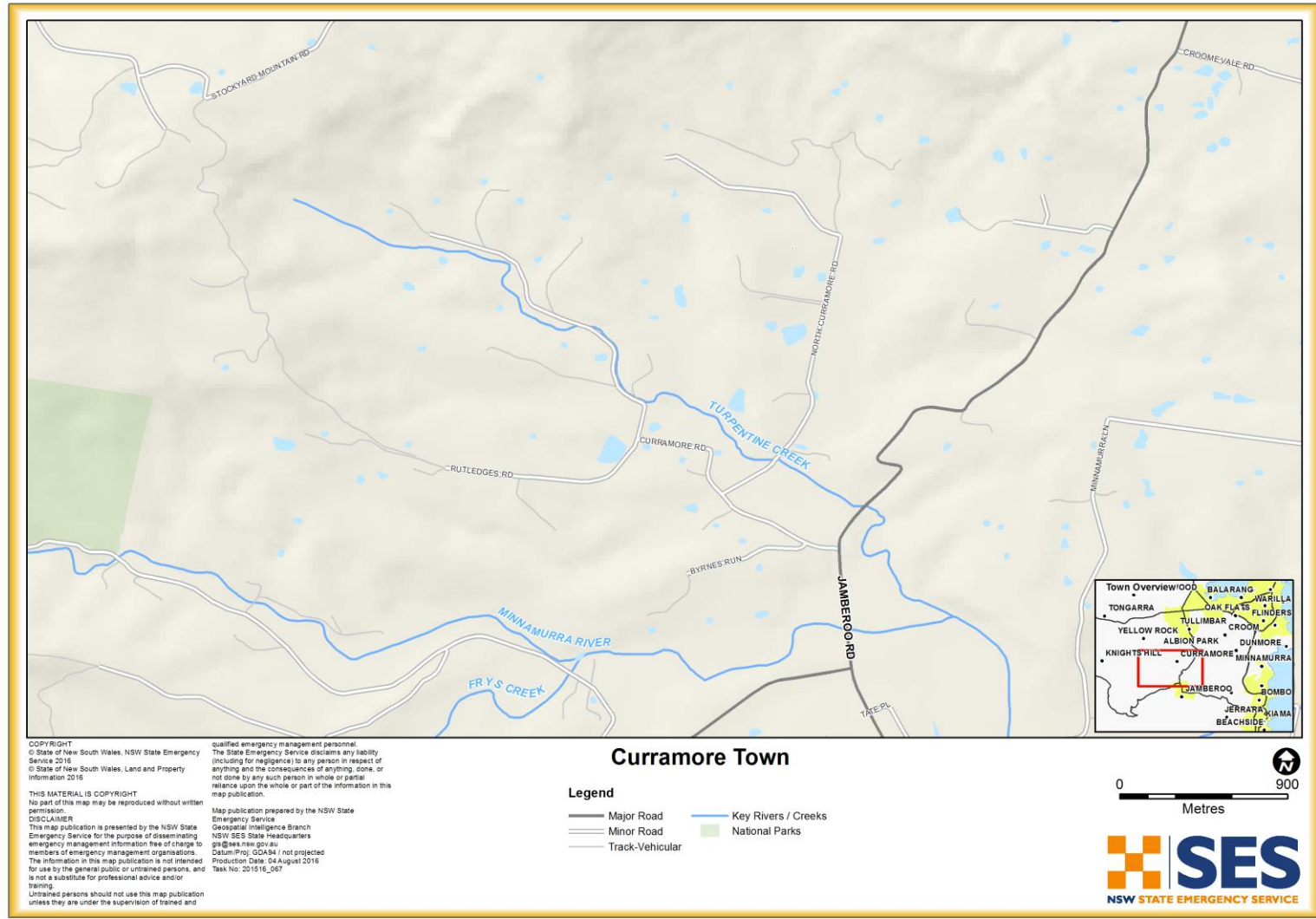
### MAP 3: SHOALHAVEN RIVER BASIN



# MAP 4: JAMBEROO TOWN MAP

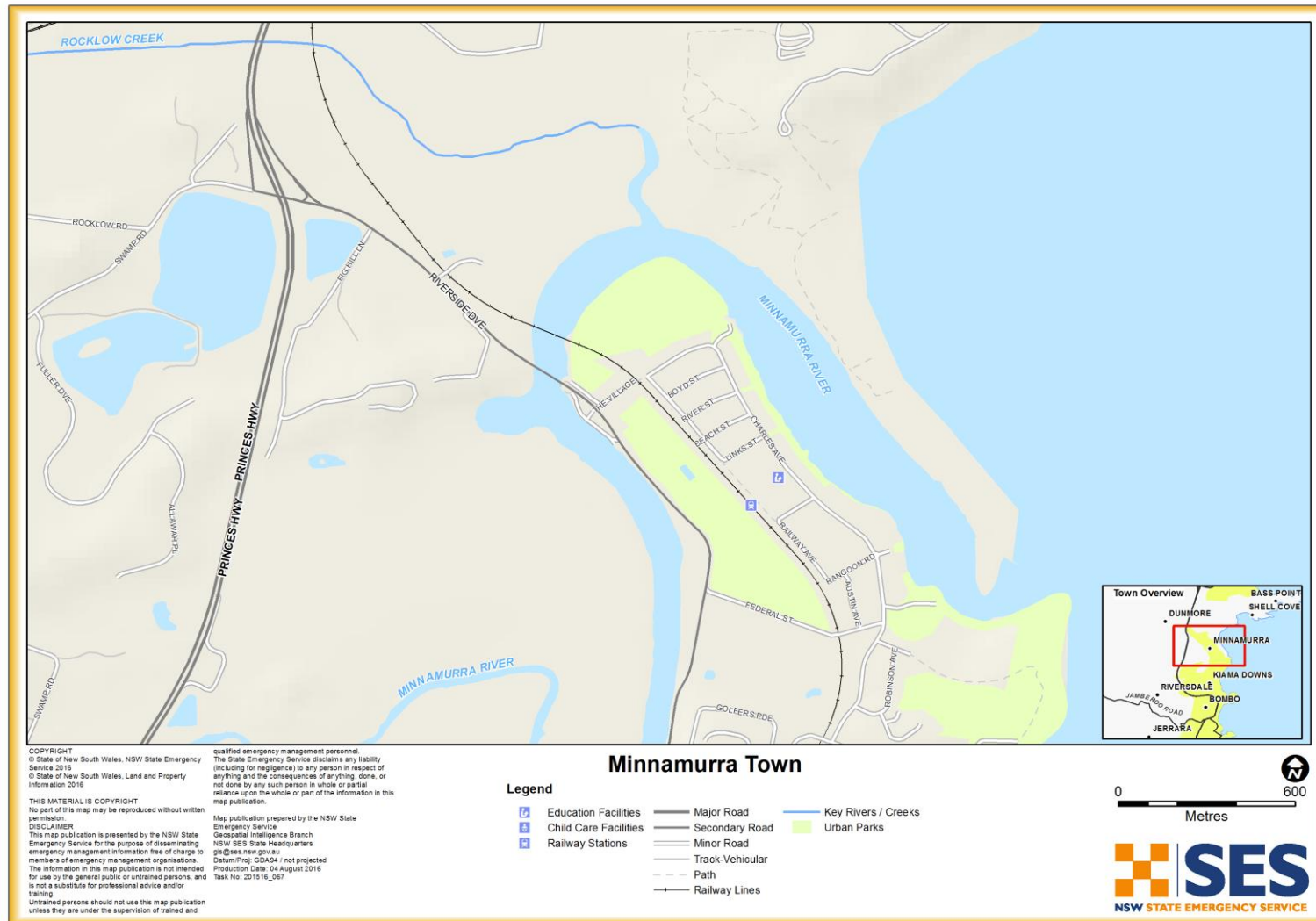


# MAP 5: CURRAMORE TOWN MAP

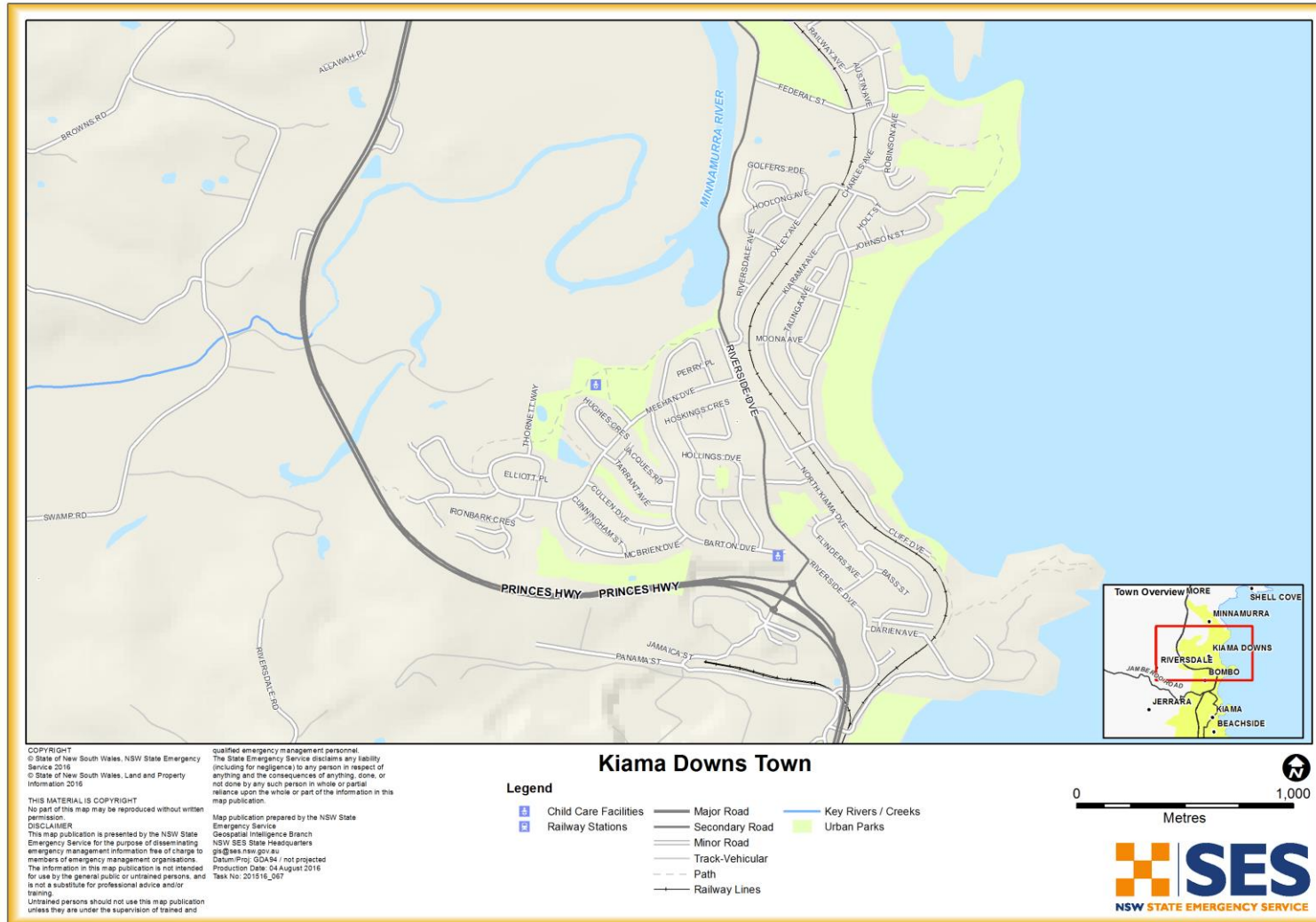




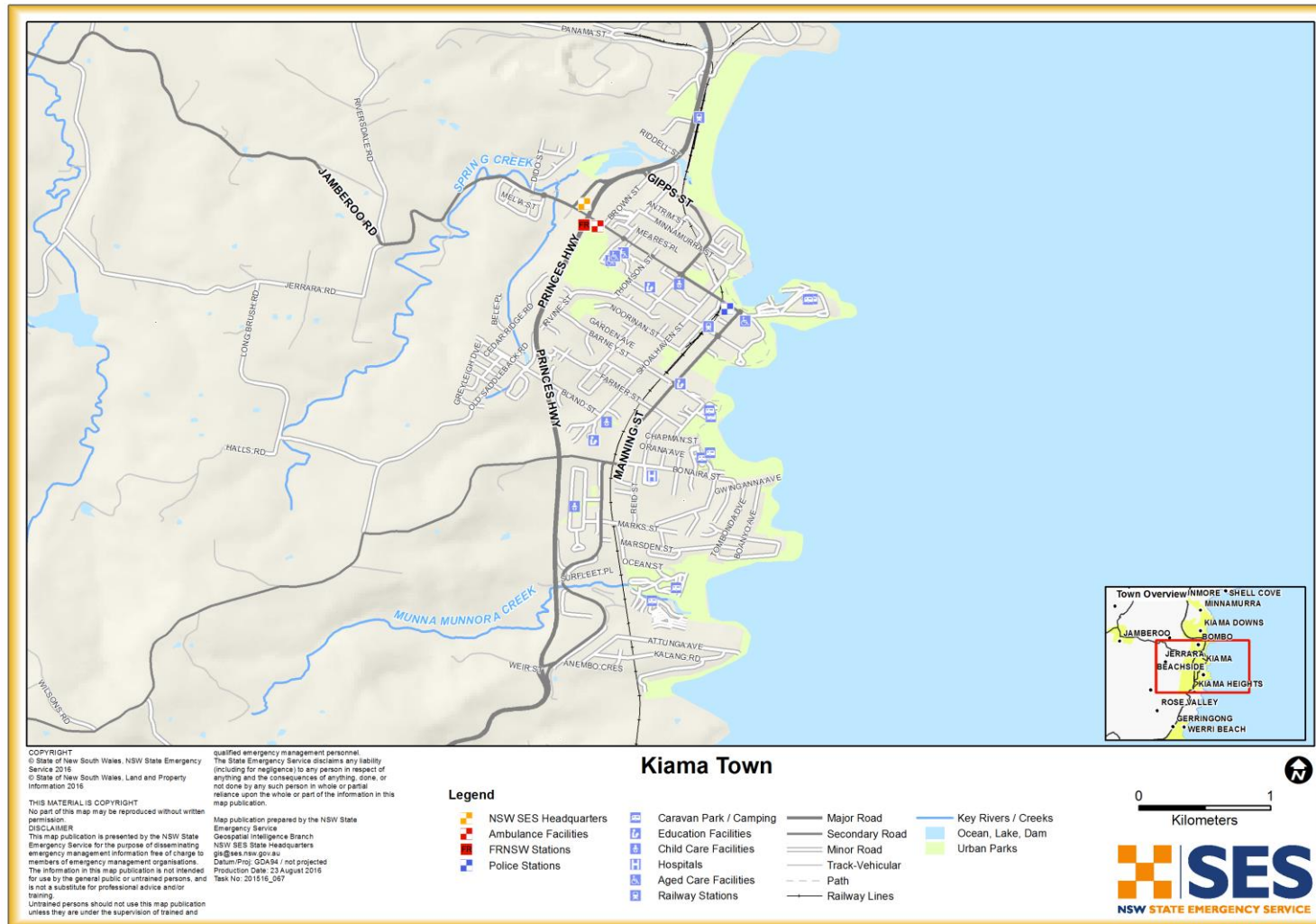
# MAP 6: MINNAMURRA TOWN MAP



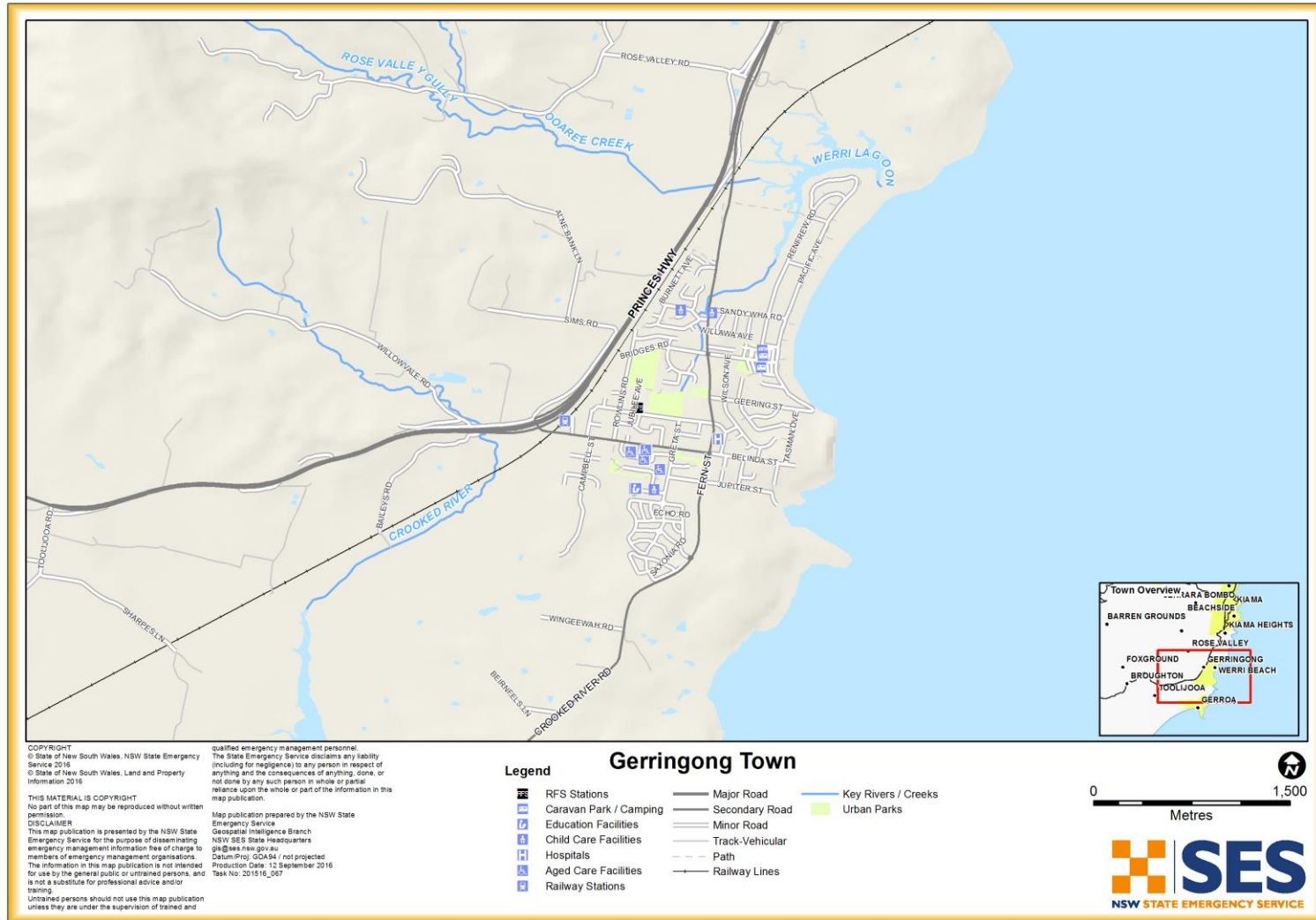
# MAP 7: KIAMA DOWNS TOWN MAP



# MAP 8: KIAMA TOWN MAP

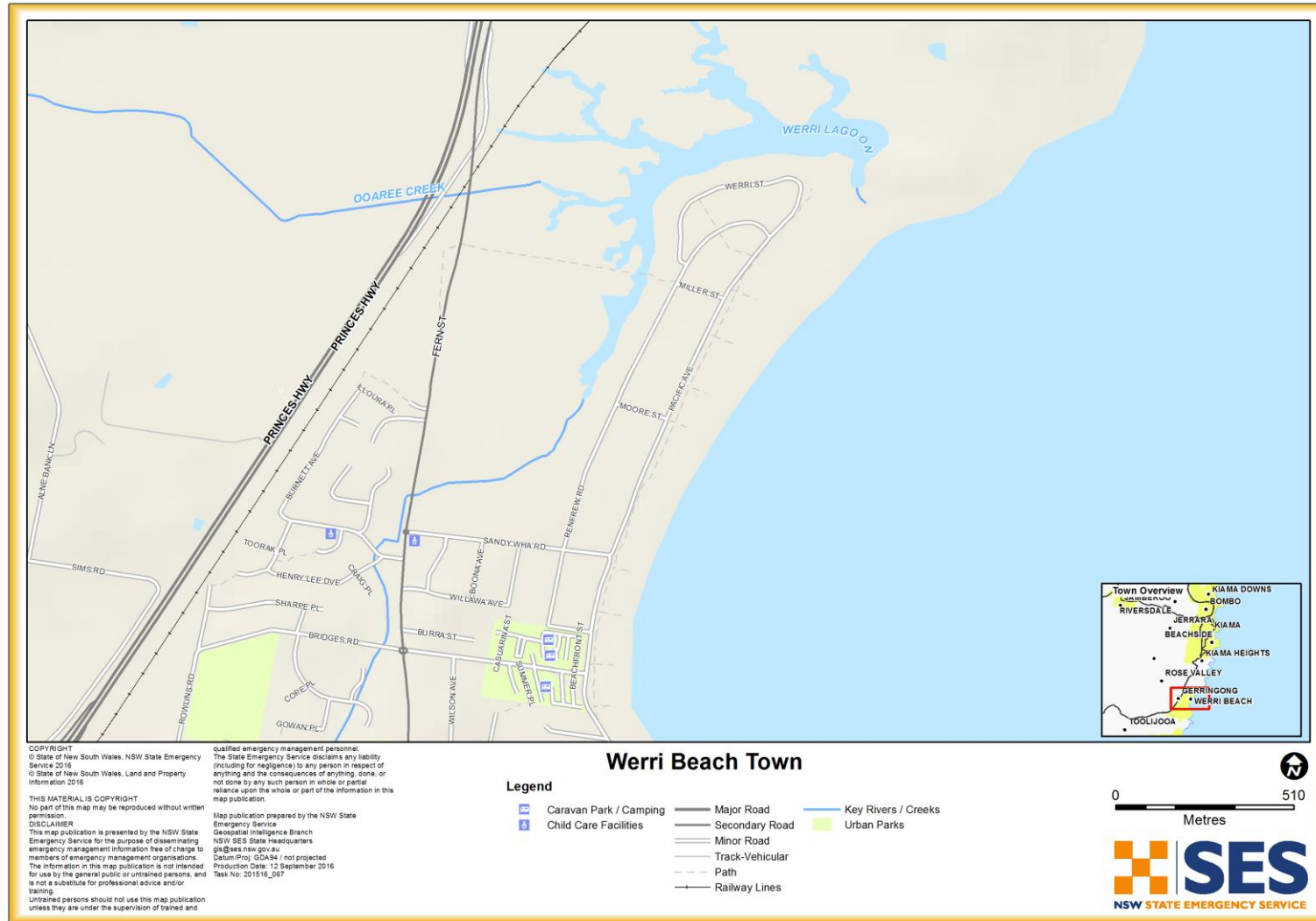


# MAP 9: GERRINGONG TOWN MAP

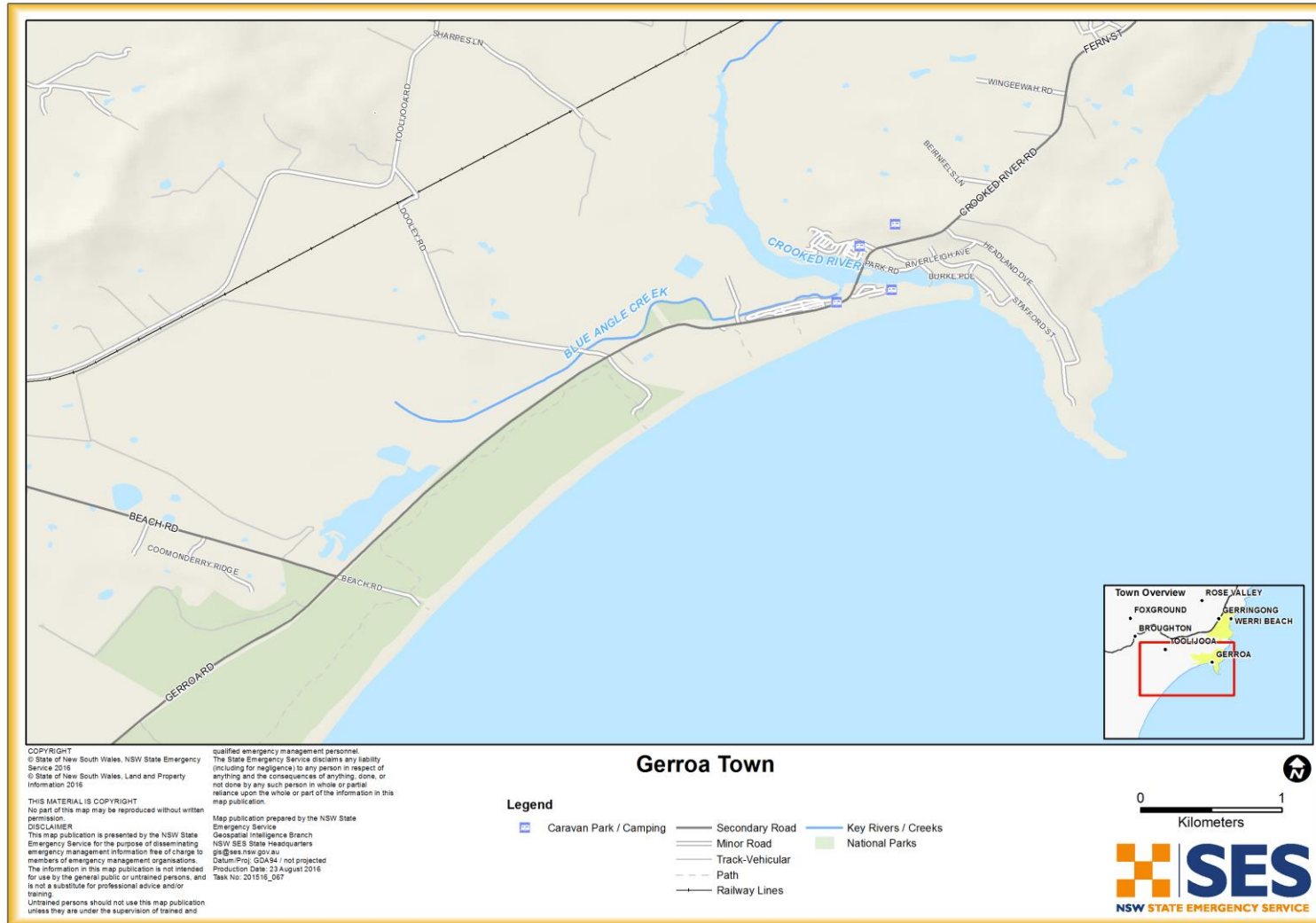




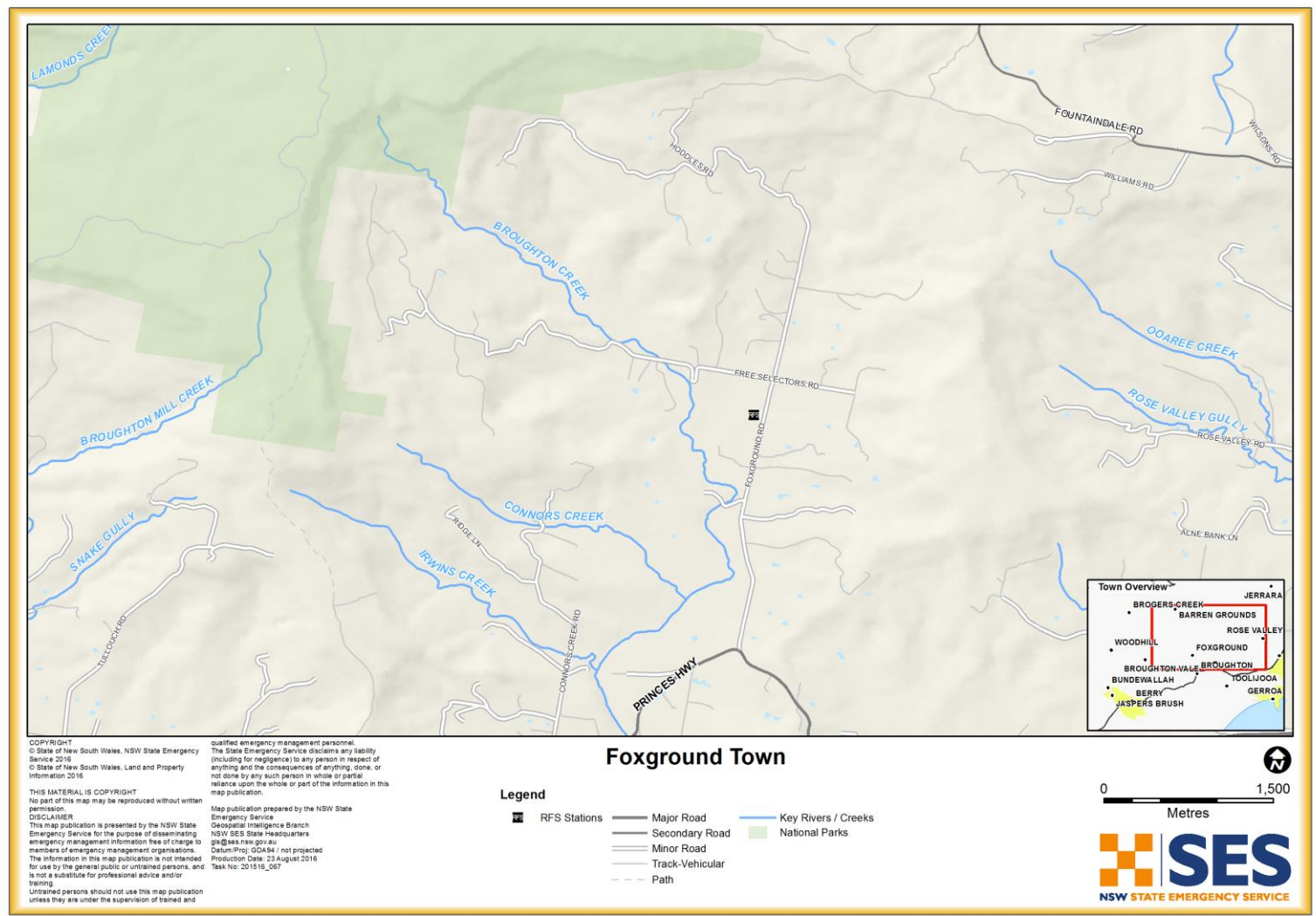
# MAP 10: WERRI BEACH TOWN MAP



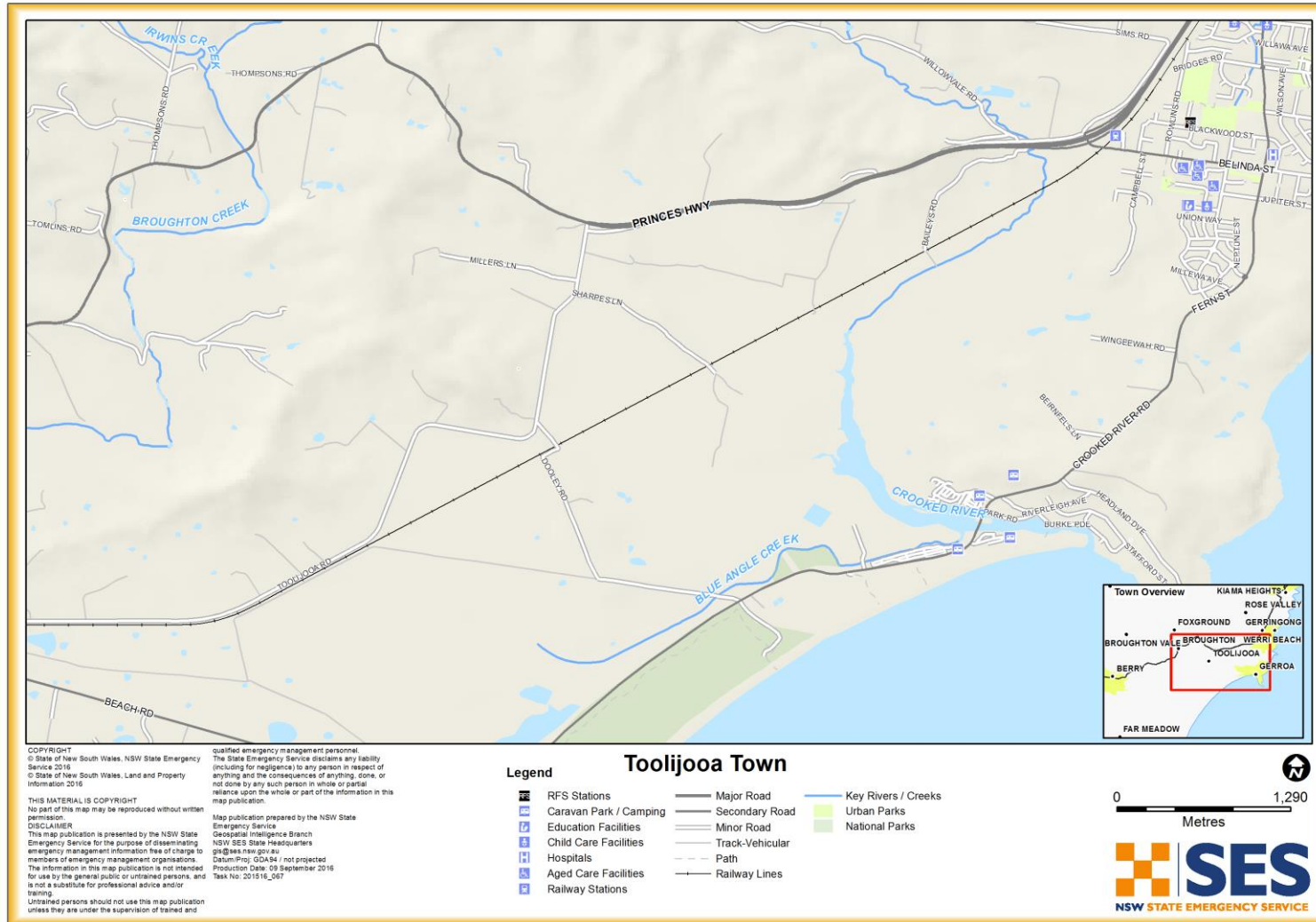
# MAP 11: GERROA TOWN MAP



# MAP 12: FOXGROUND TOWN MAP



# MAP 13: TOOLIJOOA TOWN MAP



## LIST OF REFERENCES

1. **Risk Frontiers.** *An integrated research assessment of the physical and social aspects of the March 2011 flash flooding in Shellharbour, Kiama and Bega Valley, NSW.* s.l. : Risk Frontiers, 2013.
2. **GHD.** *Spring Creek Catchment Flood Study.* s.l. : GHD, 2014.
3. **NSW SES.** *Kiama/Shellharbour City Local Flood Plan, June 2008.* 2008.
4. **Footprint Sustainable Engineering.** *Surf Beach Catchment (South) Flood Study.* s.l. : Footprint Sustainable Engineering, 2012.
5. **NSW Public Works.** *DSEP Fountaindale Dam.* s.l. : NSW Public Works, 2009.
6. **Australian Bureau of Statistics.** *2011 Census of Population and Housing.* 2012.

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# **SES RESPONSE ARRANGEMENTS FOR KIAMA-SHELLHARBOUR**

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**Volume 3 of the Illawarra Local Flood Plan**

Last Update: June 2008

## ANNEX C - EFFECTS OF FLOODING ON THE KIAMA COMMUNITY

### Community Profile

Census Description	Total LGA	Kiama	Gerringong	Gerroa	Jamberoo Village
Total Persons	18,988	12,288	3,588	475	937
Total Dwellings	6,818	4,553	1,219	188	312
Total persons aged 65 years and over	3,573	2,299	721	122	144
Total persons aged below 15 years	3,589	2,284	754	66	208
Total persons of indigenous origin	219	123	69	3	9
Total persons using Internet	4,515	2,958	789	119	230
Single parent families	650	464	109	16	35
Persons living alone	1,536	1,061	285	53	44
Total persons who do not speak English well	53	42	3	3	0
Total persons who lived at a different address 5 years ago	5,462	3,573	1,086	181	210
Households without vehicles	416	311	82	9	8
Total persons residing in caravans, cabins or houseboats	58	40	0	10	0
Have a disability requiring assistance	849	506	253	26	30
Average household size	3	3	3	2	3

*Source: Australian Census of Housing and Population 2006*

### Specific Risk Areas

1. There are few records of flooding and its consequences, but floods are relatively infrequent and usually not severe. Inundation of low-lying farm lands along the lower Minnamurra River and in Terragong Swamp, in the Omega, Toolijooa, Rose Valley, Willow Vale, Broughton Creek areas and in Foys Swamp. Such flooding requires the lifting of pumps and the movement of farm animals.



2. Inundation of low-lying properties in villages and towns as a result of the surcharging of drains. Small numbers of houses can experience inundation of basements and floors.
3. On very rare occasions, small numbers of evacuations or rescues may be necessary.

## Road Closures

4. The following roads within the Kiama Local Government Area are flood liable.

Road	Affected at	Comments/Implications
Princes Hwy	At Omega Flat	Closure is infrequent and brief at this point and is usually restricted to light vehicles.
Kiama - Jamberoo Road (Main Road 264)	At Colyers, Fountaindale, Jerrara and Spring creeks	Usually for the period of intense rain fall with a number of hours after.
Albion Park – Jamberoo Road Main Road 264 & 266)	At Hyams and Turpentine creeks,	Usually for the period of intense rain fall with a number of hours after.
Roads across the lower reaches of the Minnamurra River	Including: Minnamurra Lane, Factory Lane, Browns Lane and Swamp Rd.	Usually for the period of intense rain fall with a number of hours after.  Swamp Rd can be non-trafficable for periods of up to a week.
Numerous other local roads	Including: Falls Rd, Wyalla Rd, Curramore Rd, Fountaindale Rd, Mt Brandon Rd and Foxground Rd at creek crossings and causeways	Usually for the period of intense rain fall with a number of hours after.
Fern St	Between the Princes Highway (at Omega) and Gerringong	Sometimes for more than 12 hours.

5. In addition, roads can be cut by landslides during periods of heavy rain. This has occurred on the Princes Highway at Mt Pleasant and at several locations on Jamberoo Mountain Rd.



## ANNEX D - GAUGES MONITORED BY THE KIAMA / SHELLHARBOUR SES LOCAL HEADQUARTERS

Gauge Name	Type	AWRC No	Stream	Flood Classification			Reading Arrangements
				Min	Mod	Maj	
Macquarie Rivulet – Albion Park	Automatic	214003	Macquarie Rivulet				Manly Hydraulics Website
Macquarie Rivulet – Princes Hwy		214402	Macquarie Rivulet				DWE
Lake Illawarra – Cudgeree Bay	Automatic	966060					Manly Hydraulics Website
Little Lake	Automatic						Manly Hydraulics Website
Tongarra		214002	Tongarra Creek				DWE
Jamberoo		214004	Minnamurra River				DWE

## ANNEX E - DISSEMINATION OF SES FLOOD BULLETINS

The Illawarra South Coast SES Region Headquarters distributes SES Flood Bulletins and other flood related information (including Flood Warnings) to the following regional media outlets:

### Television Stations:

Station	Location
WIN TV	Wollongong
Prime TV	Berkeley
Capital TEN	Canberra, ACT
Southern Cross TEN	Warrawong
ABC TV	Wollongong
SBS	Artarmon

### Radio Stations:

Station	Location	Frequency
i98 Radio	Wollongong	98.1 FM
Wave FM	Warrawong	96.5 FM
ABC Radio Illawarra	Wollongong	97.3 FM
Power FM	Nowra	94.9 FM
Ninefourone FM	Coniston	94.1 FM
VOX FM	Wollongong	106.9 FM

### Newspapers:

Name	Location
Illawarra Mercury	Wollongong

### Other Agencies:

Name	Location
Shellharbour City Council.	Shellharbour
The Council for the Municipality of Kiama	Kiama
NSW Police Southern Region Command	Wollongong
SES Local Controller	Kiama
SES Local Controller	Shellharbour
RTA – Southern Region	Wollongong
NSW Ambulance Service – Southern Region Control Centre	Wollongong
NSW Fire Brigades – Illawarra Area Command	Wollongong
NSW Rural Fire Service – South Region East	Homebush Bay
Dept of Community Services – Kiama/Shellharbour Local Area	Shellharbour

## ANNEX F - TEMPLATE EVACUATION WARNING MESSAGE FOR [ENTER NAME OF AREA]

Evacuation Warning for [ ]

Date/Time of Issue: [ ]

Authorised By: [ ]

[Insert details of current and forecast flood situation]

It is recommended that you prepare to evacuate/for evacuation within the next [ ] hours. If you leave it later, the roads may be congested or closed.

To prepare for evacuation, you should:

- Raise belongings by placing them on tables, beds and benches. Put electrical items on top. Some items may be able to be placed in ceilings.
- Gather medicines, personal and financial documents and mementos together to take with you.
- Listen to radio stations [enter station] for further information and to confirm this warning.
- If possible, check to see whether your neighbours need help.
- Make arrangements for care of pets or companion animals.

If evacuation is necessary:

- Turn off the electricity, gas and water.
- Take three days' supply of clothes with you.
- If you have a car, drive to the evacuation centre at [ ] (*specify route if appropriate*).
- If you don't have a car, buses will operate on normal routes. Special transport can also be provided on request if necessary, telephone [ ].
- So that you can be accounted for, it is important that you register at the evacuation centre.
- After registering, you may go to the house of a friend or relative. Alternatively, accommodation will be arranged for you.
- The Police will provide security for your property while you are away.

## **ANNEX G - ARRANGEMENTS FOR THE EVACUATION OF CARAVAN PARKS AND THE RELOCATION OF CARAVANS**

### **General**

1. The following caravan parks are flood liable:

#### **Shellharbour**

- a. Lake Windemere Caravan Park: from Bensons Creek.
- b. Oakleigh Caravan Park
- c. Surfrider Caravan Park

#### **Kiama**

- d. Easts Beach Caravan Park
- e. Kendalls Beach Caravan Park

### **Caravan Parks**

1. Flooding of low-lying caravan parks at Kendalls and Easts beaches as a result of sea-water invasion and local drainage (including flooding of Munna Munnora Creek in the case of East Beach). Such flooding is rare, having last occurred in the mid-1970s.
2. Gerroa Shores and Seven Mile Beach Caravan Park at Gerroa experiences flooding due to Crooked River estuarine flooding. Such flooding is rare and only occurs when the river entrance is blocked by Sand from Seven Mile Beach. Minor nuisance flooding of some van and caravan sites will occur until the river entrance breaks through into the ocean.
3. In the absence of a gauge specific flood warning, Flood Watches and Severe Weather Warnings should be heeded in order to make adequate preparations for the possibility of flooding.
4. Tidal Surge is a potential threat for these caravan parks. Predictive capacity is limited due to the qualitative nature of Severe Weather Warnings.

### **Advising Procedures**

5. Caravan Park proprietors are encouraged to ensure that the owners and occupiers of caravans are:
  - a. Made aware that the caravan park is flood liable by:

- Handing a printed notice to occupiers taking up residence. The notice will indicate that the caravan park is liable to flooding and outline the evacuation and van relocation arrangements as detailed in this Annex.
  - Displaying this notice prominently in each van.
- b. Made aware that if they are expecting to be absent from their vans for extended periods, they must:
- Provide the manager with a key; in a sealed envelope; to the van.
  - Provide a contact address and telephone number.
  - Inform the manager if a vehicle will be required to relocate the van during flood time.
  - Leave any mobile van in a condition allowing it to be towed in an emergency (ie: tyres inflated, jacks wound up, personal effects secured and annexes and lines for water, sewer, electricity and gas readily detachable).
- c. Informed when a flood is rising. At this time, occupiers will be advised to:
- Ensure that they have spare batteries for their radios.
  - Listen to a local radio station for updated flood information.
  - Prepare for evacuation and van relocation.
6. The SES Local Operations Controller will ensure that the managers of caravan parks are advised of flood watches or severe weather warnings and the details of any evacuation order.

### **Evacuation of Occupants and Relocation of Vans**

7. Caravan park proprietors are encouraged to install flood depth indicators and road alignment markers within their caravan parks.
8. When an evacuation order is given:
- a. Occupiers of non-movable vans should:
- Secure their vans by tying them down to prevent flotation.
  - Isolate power to their vans.
  - Collect personal papers, medicines, a change of clothing, toiletries and bedclothes.
  - Lift the other contents of their vans as high as possible within the van.

- Move to a designated evacuation centre at the Police-Citizens Youth Club if they have their own transport, or move to the caravan office to await transport.
- b. Where possible, vans that can be moved will be relocated by their owners. Park managers will arrange for the relocation of mobile vans whose owners do not have a vehicle. Council and SES personnel will assist if required and may be able to provide additional vehicles. Vans are to be moved to the following locations:
- Easts Beach Caravan Park: movement from low ground to high land within the park. Relocations will be co-ordinated by the park proprietor with the assistance of the SES.
  - Kendalls Beach Caravan Park: movement to local streets and Bonaira St Reserve. Relocations will be co-ordinated by the council with the assistance of the SES.
9. Caravan park managers are encouraged to:
- a. Ensure that their caravan park is capable of being evacuated within a reasonable timeframe. Guidance can be provided by SES during the planning stages.
  - b. Advise the SES Local Operations Controller of:
    - The number of people requiring transport.
    - Details of any medical evacuations required.
    - Whether additional assistance is required to effect the evacuation.
  - c. Check that no people remain in non-removable vans that are likely to be inundated.
  - d. Inform the SES Local Operations Controller when the evacuation of the caravan park has been completed.
  - e. Provide the SES Local Operations Controller with a register of people that have been evacuated.

### **Return of Occupants and Vans**

- 10. The SES Local Operations Controller, using council resources as necessary, will advise when it is safe for the caravan parks to be re-occupied.
- 11. Vans will be towed back to the caravan park(s) by van owners or by vehicles and drivers arranged by the park managers. Again, Council and SES personnel will assist if available.

## ANNEX H - EVACUATION ARRANGEMENTS FOR GENERAL EVACUATIONS

### Background

1. Some parts of Kiama/Shellharbour may require short-term evacuations because of flooding from river systems or their tributaries within the following areas:
  - a. Albion Park
  - b. Albion Park Rail
2. Evacuations may be necessary because of oceanic flooding within the following areas:
  - a. Warilla
  - b. Barrack Point
  - c. Shellharbour
  - d. Minnamurra
  - e. Gerroa

### Arrangements

3. **Control.** Evacuations will be controlled by SES during floods, the threat of coastal erosion or threat of oceanic inundation.

Within their respective council areas, evacuations will be controlled by the SES Local Operations Controller and conducted by supporting agency personnel as outlined in [Part 2 - Responsibilities](#).

4. **Conduct.** Evacuations will be conducted in four phases:
  - a. Phase 1 – Warning
  - b. Phase 2 – Withdrawal
  - c. Phase 3 – Shelter
  - d. Phase 4 - Return
5. **Decision to evacuate.**
  - a. The decision to evacuate. The responsibility for issuing any general evacuation order during flooding rests with the SES Local Operations Controllers who exercises their authority in accordance with Section 22(1) of The State Emergency Service Act 1989. However, the decision to evacuate will usually be made after consultation with the Local

Emergency Operations Controller and the SES Region Operations Controller.

- b. When evacuation should occur. As far as possible, evacuation will be carried out before inundation occurs.
- c. Self-motivated evacuation. Some residents may make their own decision to evacuate and move to alternative accommodation using their own transport. Such evacuees must be advised via the media to inform the Police or the SES of their evacuation and their temporary address.
- d. **Evacuation Centres.** When evacuations are likely, the SES Local Operations Controller will advise relevant DoCS personnel so that evacuation centres and welfare support can be set up in timely fashion.

## 6. PHASE 1 - Warning

- a. **Evacuation warnings.** On the receipt of flood intelligence or other warning products indicating the possibility of flooding, the SES Local Operations Controller will consult as necessary with other emergency managers to determine the level of the threat and the need to consider evacuations. As soon as possible after the decision to evacuate is made, the SES Local Operations Controller will issue evacuation warnings to the 'at risk' residents, indicating what people should do before evacuating and when actually doing so.
- b. **Content of Evacuation Warnings.** A template guide to the content of evacuation warning messages is at [Annex F](#). These are disseminated via:
  - The radio and TV stations listed in Annex D.
  - SES Flood Bulletins
  - Door-knocks by emergency service personnel.
  - Public address systems from emergency service vehicles.
  - Telephone.

## 7. PHASE 2 – Withdrawal

- a. **Introduction.** Withdrawal involves the actual removal of the community/individuals from dangerous or potentially dangerous areas to safer areas.
- b. **Movement.** Evacuees are to be encouraged to move using their own transport where possible. The SES Local Operations Controllers will arrange transport for those people without their own vehicles.

Some residents may make their own decision to evacuate and move to alternative accommodation using their own transport. Such evacuees must be advised via the media to inform the Police or the SES of their evacuation and their temporary address.



- c. **Evacuation routes.** Evacuation routes will be communicated to evacuees and management of movement will be vested into the relevant Councils and/or NSW Police undertaking support roles.
- d. **Animals.** Assistance animals (guide dogs, hearing assistance animals, etc) will remain in the care of their owners throughout the evacuation. This includes transport and access into evacuation centres etc. Due to safety restrictions, it may not be possible to allow companion animals to accompany their owners when being transported via aircraft or flood rescue boats. DPI will make separate arrangements for the evacuation and care of companion animals.
- e. **Doorknocking.** Field teams conducting doorknocks will record and report back the following information back to the Operations Centre:
  - Addresses and locations of houses doorknocked and/or evacuated.
  - The number of occupants.
  - Details of support required (such as transport, medical evacuation, assistance to secure house and/or property and raise or move belongings).
  - Details of residents who refuse to comply with the evacuation order.

The field teams will then carry out evacuations as required. Details of these premises will be passed to the Lake Illawarra Local Area Command.

- f. **Refusal to evacuate.** Field teams should not waste time dealing with people who are reluctant or refuse to comply with any evacuation order. These cases should be referred to the Local Emergency Management Operations Controller who will arrange for Police to ensure their evacuation.
- g. **Identification of evacuated premises.** An appropriate marking visible from the street is to be used, as directed, to identify those premises that have been evacuated. Details of these premises will be passed to the SES Operations Centre and Lake Illawarra Local Area Command
- h. **Security.** The NSW Police will provide security for evacuated premises/areas.
- i. **Transport and Storage.** Transport and storage of furniture from flood threatened properties will be arranged as time and resources permit.
- j. **Caravan Parks.** The caravan parks known to be flood liable are listed in [Annex G](#), along with arrangements relating to the evacuation of residents and the removal of caravans.

## 8. PHASE 3 – Shelter

- a. **Evacuation centres.** Evacuees will be taken to or advised to go to the nearest accessible evacuation centre, which may initially be established at the direction of the SES Local Operations Controller but which will be

managed as soon as possible by the Department of Community Services.  
Any or all of the following sites may be used as evacuation centres:

Evacuation centres are listed in the Shellharbour/Kiama Local Disaster Plan.

b. **Action on arrival.** On arrival, evacuees will be:

- registered;
- medically checked, if necessary; and
- provided with their immediate welfare needs.

c. **Registration.** NSW Police will ensure that evacuees and other displaced persons are registered in accordance with the standard Disaster Victim Registration procedures

Assistance with registration will be provided by persons who have the appropriate training/oversight and capabilities as determined by NSW Police

d. **Animal shelter compounds.** Animal shelter compounds will be set up for the domestic pets and companion animals of evacuees. These facilities will be coordinated by the Department of Primary Industries (DPI).

Assistance animals are to accompany and/or remain in the care of their owners at all times. This includes transport and access into evacuation centres etc.

e. **Assistance for Animals.**

Matters relating to the welfare of livestock, companion animals and wildlife (including feeding, rescue and emergency housing) are to be referred to Department of Primary Industries (DPI).

Requests for emergency supply and/or delivery of fodder to stranded livestock, or for livestock

## 9. **PHASE 4 - Return**

- a. Once it is considered safe to do so, the SES Local Operations Controller will authorise the return of evacuees to their normal or alternative place of residence. This decision will be made in consultation with appropriate officers in regard to matters such as the electrical safety of buildings.
- b. The return will be controlled by the SES Local Operations Controller and may be conducted, at his/her request, by DoCS

# **ANNEX I - MANAGEMENT OF COASTAL EROSION / INUNDATION**

## **1. THE PROBLEM AND THE AREAS AT RISK**

- 1.1 The coastal erosion / inundation problem in the local government area takes two forms:
  - a. Undercutting of the seashore, threatening the collapse of dwellings and other buildings.
  - b. The potential breaking through of the dunes by seawater, causing flooding and isolation of property on the landward side of the dunes.
- 1.2 The most severe problems of coastal erosion / inundation occur as a result of oceanic storm conditions associated with the passage of East Coast low-pressure systems. These storms may cause temporary sea level rises with large associated waves. The worst erosion is likely when severe weather conditions occur in conjunction with unusually high tides.
- 1.3 Storm activity is sometimes accompanied by heavy rain causing flooding in the creeks behind the sand dunes. This flooding can be exacerbated by an elevated sea level preventing the escape of floodwaters to the sea.
- 1.4 The role of the SES as the combat agency for storms does not include coastal erosion and inundation caused by astronomical high tides when severe weather is not actually developing or occurring.
- 1.5 Warilla Beach has been identified as a coastal erosion hotspot within the Shellharbour City council area.
  - a. Warilla Beach is located on the south side of the entrance of Lake Illawarra some 15 kilometres south of Wollongong. The main concern at Warilla beach is erosion at the southern end threatening development built on the foredune.
  - b. Foreshore land along the southern section of Warilla Beach was developed with dwelling mainly in the early 1950's following subdivision of the land commencing in December 1948. Between 1948 and 1966 the beach area adjacent to the development receded to such an extent that erosion during the 1966 storms threatened private properties and a sewer main servicing the properties.
  - c. To halt the recession, rock-fill was dumped along the toe of the erosion scarp at the back of the beach over two years from 1966. Maintenance, upgrading and extension of the rock seawall were carried out following the major storm events in 1974 and 1978. The seawall has caused a dramatic reduction in amenity with no beach for most of states of the tide.

- d. The assets presently located behind the seawall include 49 residential dwellings, a refuge centre (previously Warilla Surf Club); four vacant properties purchased by council, a sewer main and open space recreation areas.

## **2. CONCEPT OF OPERATIONS**

### **1.1 Control**

- a. The SES is the designated combat agency for damage control from storms, including coastal erosion and inundation from storm activity.
- b. Within this role and as specified under the State Storm Plan the SES is responsible for the following during and in the period immediately prior to a storm event occurring out at sea:
  - i Advising the community at risk of the likely problem and actions they should take;
  - ii The protection of life through the warning and evacuation of residents at risk; and
  - iii The coordination of the lifting and/or relocation of readily movable household items and commercial stock and equipment.
- c. The role of the SES as the combat agency for storms does not include coastal erosion and inundation caused by astronomical high tides when severe weather is not actually developing or occurring.

1.2 **DECC** will provide ongoing advice to local councils and coastal zone management committees on the formulation and implementation of coastal zone management plans including procedures for addressing coastal processes, coastline hazards and risks, management options and coastal policies.

1.3 **BoM** will provide Severe Weather Warnings as a product to assist the SES in determining triggers for action.

## **3. RESPONSIBILITIES**

### **3.1 Before the Storm**

- a. The **SES** will:
  - i Consult with councils, Coastal Zone Management Committees, Department of Natural Resources and other agencies during the development of emergency arrangements for the management of coastal erosion / inundation for inclusion in SES Sub-plans and Coastal Zone Management Plans;
  - ii Prepare, coordinate and deliver community awareness programs and educational material with the assistance of the local councils to ensure

that people in locations potentially threatened by coastal erosion / inundation understand the threat and its management;

- iii Develop and maintain a coastal erosion / inundation intelligence system
- b. **BoM** will:
- i Formulate and issue official forecasts and Severe Weather Warnings and provide them to the SES, radio stations and other organisations prior to and during potential and actual coastal erosion events. (Note: Severe Weather Warnings for dangerous surf are issued when onshore waves in the surf zone are expected to reach at least 5 metres within the following 24 hours or when a storm surge of 0.5 metres or greater is anticipated).
- c. **DECC** will:
- i Develop and advise on state wide coastal policy, planning and management.
  - ii Provide ongoing advice to local councils and Coastal Zone Management Committees on coast and estuary management including procedures for addressing coastal hazards, coastal processes and risks, management options and coastal policies.
  - iii Provide the SES and councils with advice on likely erosion ‘hotspots’ along the New South Wales coastline.
- d. **Shellharbour City Council and Kiama Municipal Council** will:
- i Carry out ecologically sustainable planning and management of the coastal zone;
  - ii Prepare Coastal Zone Management Plans in accordance with the Coastal Protection Act, 1979 including arrangements for the emergency management of coastal erosion (see section 4.3 for more details);
  - iii Provide SES with copies of coastal hazard and management studies to assist with emergency planning and operational intelligence systems;
  - iv Consult with the SES and other relevant agencies when developing emergency management arrangements for inclusion in Coastal Zone Management Plans;
  - v Establish and maintain Coastal Zone Management Committees to facilitate the development of the Coastal Zone Management Plans and ensure that key agencies are represented on such committees;

- vi Assist the SES with community awareness programs to ensure people in locations potentially threatened by coastal erosion understand the threat and its management;

### 3.2 **During the Storm**

- a. Response operations will be initiated when:
  - i The BoM issues a severe weather warning for dangerous waves or storm surge (forecast on-shore waves of 5 metres or more, or storm surge of 0.5 metres or more) for the NSW north coast.
  - ii Response operations may also be initiated by the SES when large storm induced waves are observed locally and no BoM warning has been issued.
- b. The **SES** will:
  - i Advise local council and other emergency agencies of the likelihood of coastal erosion in the council area.
  - ii Advise the community at-risk of the likely problem and actions they should take;
  - iii Coordinate regular reconnaissance at locations identified as being susceptible to coastal erosion / inundation;
  - iv Coordinate the evacuation of people at risk;
  - v Coordinate the transport of removable household and business contents (if time and resources permit);
  - vi Provide a 'phone-in' service via 132 500 for the local community to take requests for assistance and give advice as necessary; and
  - vii Where practicable coordinate the sandbagging of properties at-risk of flooding from coastal inundation.
  - viii Note the SES is not responsible for controlling or conducting any physical mitigation works to protect properties or structures at risk from coastal erosion, either during or outside the period of storm activity. This includes, but is not limited to:
    - ix The placement of rocks or other materials on beaches or foreshore areas; and
    - x The construction of temporary walls made of sandbags, geotechnical tubes or other materials.

- c. **Shellharbour City Council** and **Kiama Municipal Council** will:
- i Assist the SES with reconnaissance of areas susceptible to coastal erosion / inundation;
  - ii Where emergency physical mitigation works to protect coastal property or other structures have been identified as being required in a Coastal Zone Management Plan, construct works. Where no Coastal Zone Management Plan exists Councils should seek appropriate technical, legal and environmental advice before constructing or allowing the construction of physical mitigation works to protect coastal property or other structures. These works should ensure protection of beach environments and beach amenity and allow continuing and undiminished access to beaches, headlands and waterways; and
  - iii Assist the SES with lifting and/or relocating readily moveable household and business contents in areas where coastal storms (likely to result in coastal erosion / inundation) are forecast or occurring.
- d. **BoM** will formulate and issue official forecasts and Severe Weather Warnings and provide them to the SES, radio stations and other organisations prior to and during potential and actual coastal erosion events.
- e. **Other supporting agencies** may be requested to assist where necessary, particularly with warning and evacuation tasks.

### 3.3 After the Storm

- f. The **SES** will:
- i Assign personnel to gather intelligence in areas susceptible to coastal erosion/inundation;
  - ii Review and update the arrangements for managing coastal erosion/inundation; and
  - iii Liaise with DECC to obtain information on the impact of storm events on coastal properties, once the storm has abated.
- g. **Shellharbour City Council** and **Kiama Municipal Council** will:
- i Liaise with DECC to determine any changes to the coastal zone and any new areas at risk following storms at sea;
  - ii Maintain and review council Coastal Zone Management Plans in consultation with other stakeholders; and
  - iii Review and update changes to the emergency action plan for coastal erosion in the Coastal Zone Management Plan; and

- iv Remove and/or mitigate the impact of temporary physical protective measures on the beach if applicable.
- h. **DECC** will provide the SES and council with updates on the current state of the coastal zone and any new areas at risk following a storm event.



## ANNEX J - FLOOD INTELLIGENCE COLLECTION SHEET

Date:

Unit:

Observer:

Contact No:

Time	Location	Description

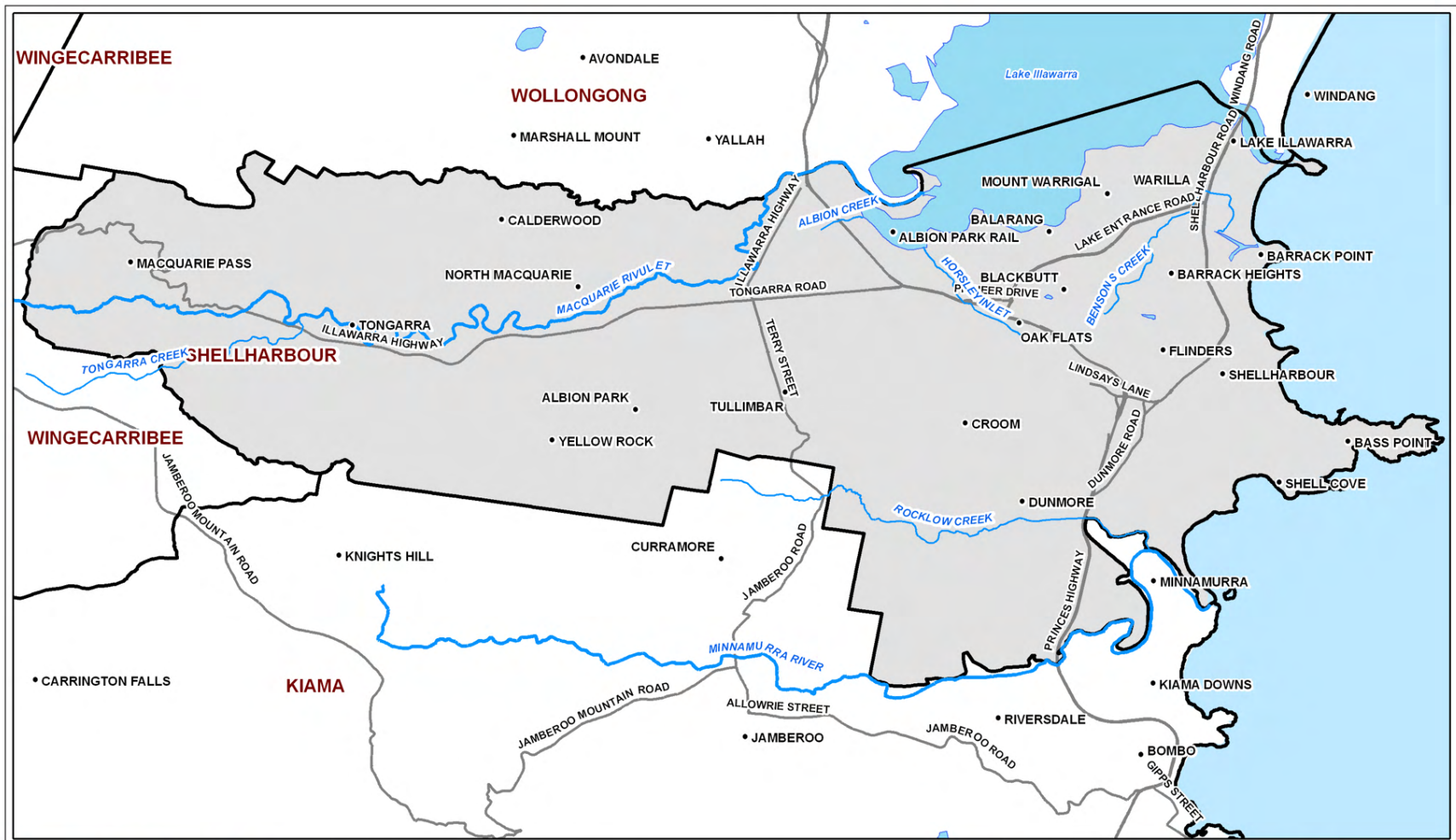
**Example**

Time	Location	Description
0900	Smith St, Karodan	Six houses in lower end of Smith St flooded to one metre over-floor
0900	Thomas St, Karodan	Thomas Street beginning to flood. Water coming across from Regal Park
1100	Benson Hwy	Benson Hwy not flooded at Fords Bridge

- Complete sheet by recording the **time** of observation, **location** of observation and flood **effects** observed
- Remember it is just as important to record the observation of effects that are not occurring as it is to record the effects that are occurring
- Return completed sheet to Planning Officer of the OMT. Planning section to collate sheets and forward to Region Headquarters

I

# MAP 1 - SHELLHARBOUR LGA & RIVER BASIN

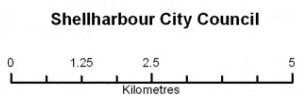


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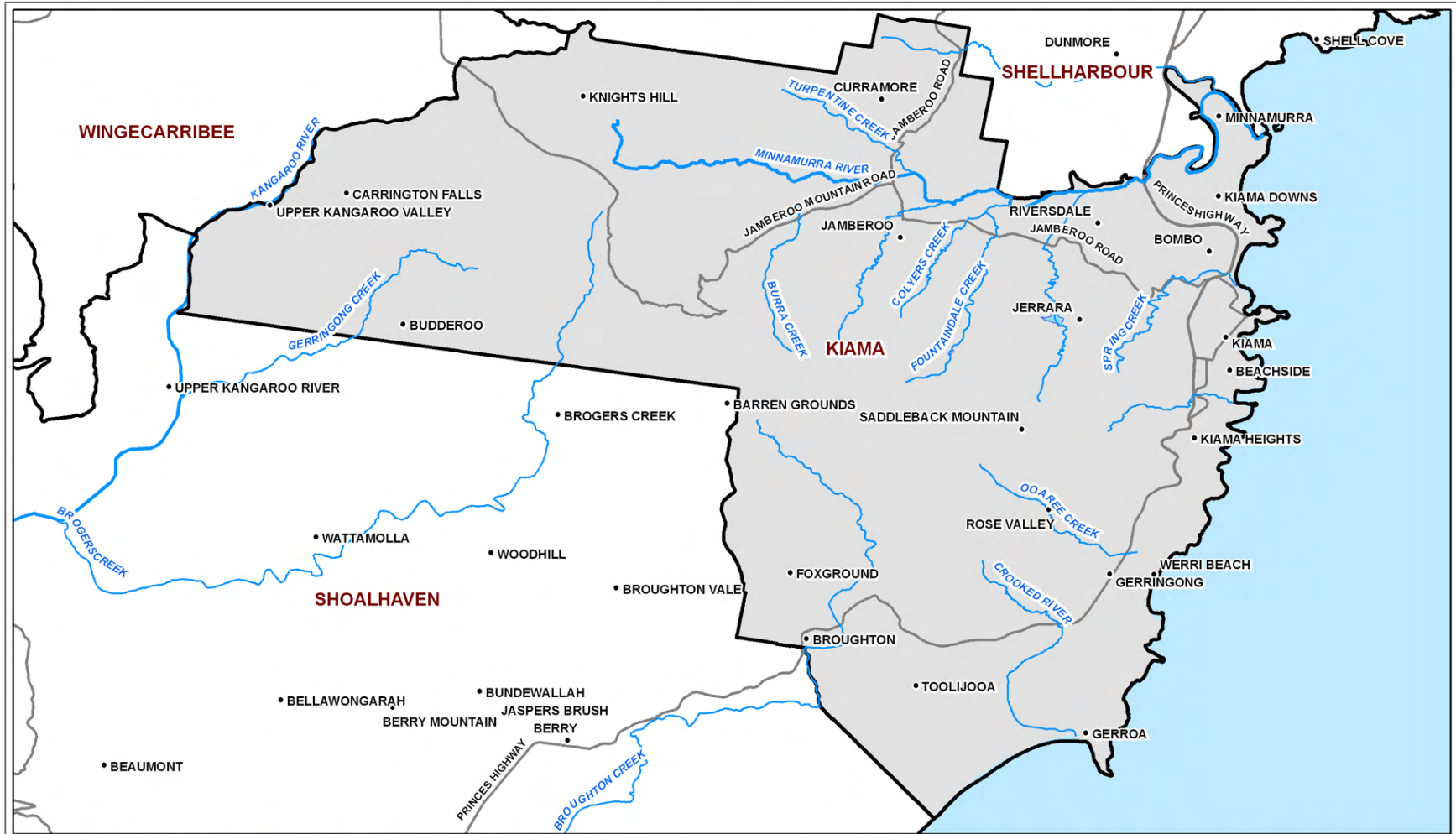


Print Date: 22 July 2008



- Legend**
- LGA Boundary
  - Rivers
  - Major Roads
  - Ocean

# MAP 2 - KIAMA LGA & RIVER BASIN

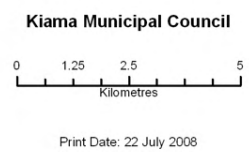


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**Legend**

- LGA Boundary
- Rivers
- Major Roads
- Ocean