NSW STATE EMERGENCY SERVICE

Gunnedah Shire

Local Flood Emergency Sub Plan

FloodSafe

GUNNEDAH SHIRE FLOOD EMERGENCY SUB PLAN

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

Volume 1 of the Gunnedah Shire Flood Emergency Sub Plan

Version 3.0

AUTHORISATION

The Gunnedah Shire Flood Emergency Sub Plan is a sub plan of the Gunnedah Shire 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

Signature: Matthew Kirby

NSW SES Deputy Zone Commander

Print Name: Superintendent Matthew Kirby

Date: 10 October 2023

Endorsed

Signature:

Chair, Local Emergency Management Committee

Print Name:

Date: 8/11/23.

VERSION HISTORY

Version Number	Description	Date
1.0	Gunnedah Local Flood Plan	September 2002
2.0	Gunnedah Shire Local Flood Plan	April 2014
3.0	Gunnedah Shire Local Flood Plan	October 2023

AMENDMENT LIST

Suggestions for amendments to this plan should be forwarded to:

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Amendments in the list below have been entered in this plan.

Amendment Number	Description	Updated by	Date
01	Update of references to 'Flood Development Manual' – replaced with 'Flood Risk Management Manual'	Melissa Lloyd	
02	Update of wording in section 5.4 relating to flood warnings, to reflect the change to the Australian Warning System	Melissa Lloyd	
03	Update of wording from 'DPIE' to 'DPE'	Melissa Lloyd	
04	Recovery Operations – updated 6.22 reference from Resilience NSW to NSW Reconstruction Authority	Melissa Lloyd	
05	Insertion of text under Section 5.9.4 - "The roles and responsibilities for Agriculture and Animal Services are outlined in the Agriculture and Animal Services Functional Area Supporting Plan."	Melissa Lloyd	

DISTRIBUTION LIST

Available for general use and distribution on the NSW State Emergency Service website www.ses.nsw.gov.au

CONTENTS

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 Gunnedah Shire 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 Gunnedah Shire Local Emergency Management Plan (EMPLAN) and is endorsed by the Gunnedah Shire 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 Gunnedah Shire 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 Gunnedah Shire LGA. The Gunnedah Shire LGA and its principal towns, villages, rivers and creeks are shown in Appendix A.

1.4.2 The Council area is in the NSW SES North Western Zone and for emergency management purposes, is part of the New England Emergency Management Region.

1.4.3 The plan sets out the Gunnedah Shire level emergency management arrangements for prevention, preparation, response and initial recovery for flooding in the Gunnedah Shire LGA.

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 tsunami) overtopping coastline defences.

1.4.5 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.

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 Gunnedah Shire are detailed within this plan, Appendix B and Appendix C.

1.7.3 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:

a. The NSW SES Incident Controller (for local or zone level responsibilities during response operations).

b. The NSW SES Zone Duty Commander (for regional level responsibilities outside of response operations).

1.8 PLAN MAINTENANCE AND REVIEW

1.8.1 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. Conduct a minimum of one exercise every five years or within two years of the plan being reviewed.

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.
- 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 and supporting material of the Local Flood Emergency Sub Plan is maintained on the NSW SES website at: https://www.ses.nsw.gov.au/about-us/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 NSW SES maintains information on the nature of flooding and effects of flooding on the community in the Gunnedah Shire LGA.

2.1.2 Declared dams in or upstream of the Gunnedah Shire Local Government Area.

Dam Name	Owner	High Risk Dam
Keepit Dam	**Water NSW**	**No**

3 PREVENTION/ MITIGATION

3.1 INTRODUCTION

3.1.1 The Flood Risk Management Manual outlines the NSW Government's Flood Prone Land Policy which details the framework for managing flood prone land in New South Wales. Incorporation of flood 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 flood risk 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.

b. NSW SES will provide advice, support, technical resources and training for NSW SES representatives to contribute effectively on local Flood Risk 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.

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.

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 Gunnedah Shire LGA are also listed in Volume 3 of this plan.

c. 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 maintains Operational Readiness.

- 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 Australian 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.

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 NSW.

Actions:

a. 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.

- Coordinate information flow, including warnings, public information and social media.

5.2.3 **Strategy**: Provide effective liaison between 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 Centre(s) and/or Emergency Operation Centres (EOC) as required.

b. NSW SES will provide Liaison Officer(s) to EOC as required.

c. Where possible EOC 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. 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. NSW SES may establish and operate a Joint Intelligence Unit to coordinate the collection, collation, interpretation, mapping, actioning and dissemination of information.

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: 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.
- 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 Warnings aligning to the Australian Warning System:

- Advice
- Watch and Act
- Emergency Warning

d. NSW SES liaises with the Bureau 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.
- Transport for NSW 'Live Traffic' website: 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 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 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 including critical infrastructure through flood protection systems (e.g. sandbagging) to minimise entry of water into buildings.

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. Gunnedah Shire Council 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. NSW Police Force may close and re-open roads but will normally only do so if the Gunnedah Shire Council 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.

Actions:

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 of this 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. The Functional Areas and Council will keep NSW SES informed of the status of utilities and infrastructure.

5.8 EVACUATION

5.8.1 Evacuation is 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.

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.
- Evacuation of people where essential energy and/or utility services are likely to fail or where buildings have been or may be made uninhabitable.

b. 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 / Local EMPLAN.

f. 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.

Actions:

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. The Health Services Functional Area will coordinate the evacuation of hospitals, health centres and aged care facilities (including nursing homes) in consultation with NSW SES and Welfare Services.

f. School administration offices (Government and Private) will coordinate the evacuation of schools in consultation with 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 Emergency Warning will be referred to 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. NSW SES will brief the Welfare Services Functional Area at the earliest opportunity regarding the level of assistance required.

b. The 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 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 NSW Police Force with the assistance of NSW SES and the 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.

g. The decision to establish Major Evacuation Centres or Mass Care Facilities will be made by 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 the Health Services Functional Area.

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

Actions:

a. The 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.

b. The 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.

The roles and responsibilities for Agriculture and Animal Services are outlined in the *Agriculture and Animal Services Functional Area Supporting Plan*.

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 NSW State 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 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 NSW SES. Notification arrangements with NSW Police Force are outlined in the State Rescue Board NSW State Rescue Policy.

d. Rescue agencies will conduct rescue of domestic small and large animals as per the State Rescue Board NSW State 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 the 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 Services Functional Area 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.

c. Isolated households unable to afford resupply items will be referred to the Welfare Services Functional Area for assistance.

5.12 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. The 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. The NSW SES Incident Controller will specify the level of access to affected communities as the following:

- Not suitable for access; or
- Limited access by emergency services and response agencies; or
- Limited access by residents and/or business operators; or
- Full access.

c. The NSW SES Incident Controller will issue an Advice Warning advising "Reduced Threat: Return with Caution" when the immediate danger to life and property has passed for areas.

d. 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).
- All affected areas have had an 'Reduced Threat: Return with Caution' 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, Welfare Services and Gunnedah Shire 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 NSW SES as lead agency to transition to NSW Reconstruction Authority 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 Gunnedah Shire Council 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 NSW Reconstruction Authority to support applications to Treasury for Natural Disaster Relief and Recovery Arrangements.

d. NSW SES, in conjunction with a Recovery Committee, will provide a service to support the information needs of a community immediately following a flood.

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 SEOCON and SERCON.

7 ABBREVIATIONS

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

8 GLOSSARY

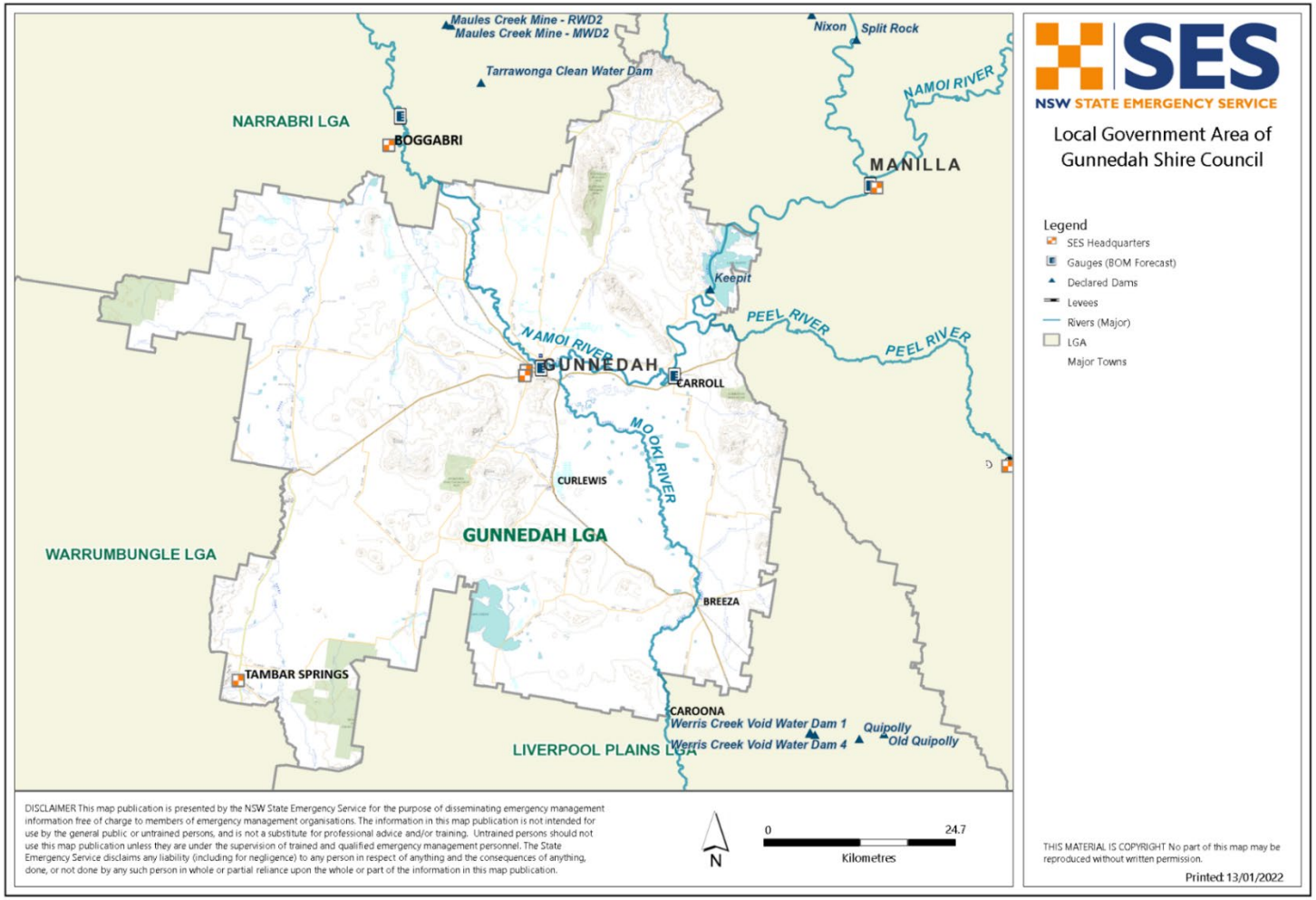
Common emergency service terminology can be found within the Australian Disaster Resilience Glossary.

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

9 Appendix A – Map of Gunnedah Shire Council Area



10 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 NSW State Flood Plan.

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.
Caravan Park Proprietor(s)	• Prepare a flood emergency plan for the Caravan Park. • Ensure that owners and occupiers of movable dwellings are aware that the caravan park is flood liable by providing a written notice to occupiers taking up residence and displaying this notice and emergency management arrangement within the park. • Ensure that owners and occupiers of movable dwellings are aware that if they are expecting to be absent for extended periods, they should: – Provide the manager of the caravan park with a contact address and telephone number in case of an emergency. – 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). • Ensure that occupiers are informed of Flood Information. At this time, occupiers should 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 movable dwelling (cabins) relocation. • Ensure that owners and occupiers of caravans are aware of what they must do to facilitate evacuation and movable dwelling relocation when flooding occurs. • 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

AGENCY	RESPONSIBILITIES
	caravan park(s) by owners or by vehicles and drivers arranged by the park managers. • Secure any movable dwellings that are not able to be relocated to prevent floatation. • 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.
Childcare Centres and Preschools	• When notified of possible flooding or isolation, childcare centres and preschools should. – 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. – Assist with coordinating the evacuation of preschools and childcare centres.
Dams Safety NSW	The roles and responsibilities for Dams Safety NSW (formerly NSW Dam Safety Committee) are outlined in the NSW State Flood Plan.
Department of Defence	Arrangements for Defence Assistance to the Civil Community are detailed within the State EMPLAN (section 448).
Energy and Utilities Services Functional Area	The roles and responsibilities for Energy and Utilities Services are outlined in the Energy and Utility Services Supporting Plan (EUSPLAN). Roles and responsibilities in addition to the Supporting Plan are: • Assist NSW SES with identification of infrastructure at risk of flood damage where resources are available. • Facilitate local utility service distribution providers (electricity, gas, water, wastewater) to: – Provide advice to NSW SES of any need to disconnect power/gas/water/wastewater supplies or of any timetable for reconnection. – Advise NSW SES of any hazards from utility services during flooding and coastal erosion/inundation. – Advise the public with regard to electrical hazards during flooding and coastal erosion/inundation, and to the availability or otherwise of the electricity supply. – Clear or make safe any hazard caused by power lines or electricity distribution equipment. – Reconnect customers' electrical/ gas/ water/wastewater installations, when certified safe to do so and as conditions allow. – Assist NSW SES to identify infrastructure at risk of flooding for incorporation into planning and intelligence.

AGENCY	RESPONSIBILITIES
Engineering Services Functional Area	The roles and responsibilities for Engineering Services are outlined in the Engineering Services Supporting Plan and NSW State Flood Plan.
Environmental Services Functional Area	The roles and responsibilities for Environmental Services are outlined in the Environmental Services (ENVIROPLAN) Supporting Plan.
Floodplain Management Australia	The roles and responsibilities for Floodplain Management Australia are outlined in the NSW State Flood Plan**.**
Fire and Rescue NSW	The roles and responsibilities for Fire and Rescue NSW are outlined in the NSW State Flood Plan.
Forestry Corporation of NSW	The roles and responsibilities for Forestry Corporation of NSW are outlined in the NSW State Flood Plan.
Gunnedah Shire Council	**Preparedness** • Establish and maintain floodplain and coastal risk management committees and ensure that key agencies are represented. • Develop and implement flood risk management plans in accordance with the NSW Government's Flood Prone Land Policy and the Flood Risk Management Manual. • Provide levee studies, flood studies and flood risk management studies to NSW SES. • Maintain council-owned flood warning networks and flood mitigation works. • Participate in NSW SES-led flood emergency planning meetings, to assist in the preparation of Flood Sub Plans. • Maintain a plant and equipment resource list for the council area. • Contribute to community engagement activities. **Response** • Subject to the availability of council resources, assist NSW SES with flood operations including: – Traffic management on council managed roads. – Provision of assistance to NSW SES (plant, equipment and personnel where able and requested). – Property protection tasks including sandbagging. – Assist with the removal of caravans from caravan parks. – Warning and/or evacuation of residents and other people in flood liable areas. – Provision of back-up radio communications. – Resupply of isolated properties. – Technical advice on the impacts of flooding.

AGENCY	RESPONSIBILITIES
	– 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. – Assist NSW SES to provide filled sandbags and filling facilities to residents and business in areas which flooding is expected. • Assist with making facilities available for domestic pets and companion animals of evacuees during evacuations. • Operate flood mitigation works including critical structures such as detention basins and levees and advise NSW SES regarding their operation. • Manage and protect council-owned infrastructure facilities during floods. • 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. • Advise the Environmental Protection Authority of any sewerage overflow caused by flooding. • Work with NSW SES and NSW Department of Planning and Environment to collect flood related data during and after flood events. **Recovery** • Provide for the management of health hazards associated with flooding including removing debris and waste. • Ensure premises are fit and safe for reoccupation and assess any need for demolition. • Provide services, assistance and advice to State Government in accordance with the State Recovery Plan.
Health Services Functional Area	The roles and responsibilities for Health Services are outlined in the Health Services (HEALTHPLAN) Supporting Plan and NSW State Flood Plan.
Local Emergency Operations Controller (LEOCON)	• Monitor flood operations. • If requested, coordinate support for the NSW SES Incident Controller.
Local Emergency Management Officer (LEMO)	• If requested by the NSW SES Incident Controller, advise appropriate agencies and officers of the start of response operations.
Marine Rescue NSW	The roles and responsibilities for Marine Rescue NSW are outlined in the NSW State Flood Plan.

AGENCY	RESPONSIBILITIES
NSW Ambulance	The roles and responsibilities for NSW Ambulance are outlined in the Health Services (HEALTHPLAN) Supporting Plan and NSW State Flood Plan.
NSW Department of Education, Association of Independent Schools of NSW, and National Catholic Education Commission	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.
NSW Department of Planning and Environment (Environment and Heritage Group)	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).
NSW Department of Planning and Environment (Water)	The roles and responsibilities for NSW Department of Planning and Environment (Water) are outlined in the NSW State Flood Plan.
NSW Food Authority	The roles and responsibilities for NSW Food Authority are outlined in the Food Safety Emergency Sub Plan.
NSW National Parks and Wildlife Services	The roles and responsibilities for NSW National Parks and Wildlife Services are outlined in the NSW State Flood Plan.
NSW Police Force	The roles and responsibilities for NSW Police Force are outlined in the NSW State Flood Plan.
NSW Reconstruction Authority	The roles and responsibilities for NSW Reconstruction Authority are outlined in the NSW State Flood Plan.
NSW Rural Fire Service	The roles and responsibilities for NSW Rural Fire Service are outlined in the NSW State Flood Plan.
Owners of Declared Dams within or upstream of the LGA	The roles and responsibilities for Owners of Declared Dams are outlined in the NSW State Flood Plan.
Public Information Services Functional Area	The roles and responsibilities for Public Information Services are outlined in the Public Information Services Supporting Plan and NSW State Flood. Plan**.**
SEOCON/SEOC	The roles and responsibilities for the SEOCON/SEOC are outlined in the NSW State Flood Plan**.**
Surf Life Saving NSW	The roles and responsibilities for Surf Life Saving NSW are outlined in the NSW State Flood Plan.
Telecommunications Services Functional Area	The roles and responsibilities for Telecommunications Services are outlined in the Telecommunications Services (TELCOPLAN) Supporting Plan.
Transport for NSW	• Transport for NSW coordinates information on road conditions for emergency services access.

AGENCY	RESPONSIBILITIES
	• Transport for NSW coordinates the management of the road network across all modes of transport. • Transport for NSW in conjunction will assist NSW SES with the evacuation of at-risk communities by maintaining access and egress routes. • 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. • Assist NSW SES with identification of road infrastructure at risk of flooding.
Transport Services Functional Area	The roles and responsibilities for Transport Services are outlined in the Transport Services Functional Area Supporting Plan and NSW State Flood Plan.
VRA Rescue NSW	The roles and responsibilities for VRA Rescue NSW are outlined in the NSW State Flood Plan.
Water NSW	The roles and responsibilities for Water NSW are outlined in the NSW State Flood Plan.
Welfare Services Functional Area	The roles and responsibilities for Welfare Services are outlined in the Welfare Services Functional Area Supporting Plan and NSW State Flood Plan.

11 Appendix C – Community Specific Roles and Responsibilities

Community Members	**Preparedness** • Understand the potential risk and impact of flooding. • Prepare homes and property to reduce the impact of flooding. • Understand warnings and other triggers for action and the safest actions to take in a flood. • Households, institutions and businesses develop plans to manage flood risks, sharing and practicing this with family, friends, employees and neighbours. • Have an emergency kit. • Be involved in local emergency planning processes. **Recovery** • Assist with community clean-up if required and able to do so. • Participate in After Action Reviews if required.
Aboriginal organisations or groups	• Act as the point of contact between NSW SES and the Kamilaroi community. • Inform the NSW SES Unit Commander about flood conditions and response needs. • Disseminate flood information, including flood and evacuation warnings, to the Kamilaroi community. • Red Chief Local Aboriginal Land Council (LALC) – 02 6742 3602
Communication	• Coordinate the restoration of telephone facilities damaged by flooding. • Coordinate additional telecommunications support for the NSW SES Headquarters as required. • Assist the NSW SES to identify infrastructure at risk of flooding for incorporation into planning and intelligence.
Cross-border assistance arrangement	• By local arrangement, the NSW SES Tambar Springs Unit is responsible for the headwaters of Coxs Creek and its upper tributaries including Bundella, Garrawilla, Saltwater, Bomerra and Dorans creeks. Some of this area extends into the Coonabarabran and Liverpool Plains Shire Council areas.

NSW STATE EMERGENCY SERVICE

HAZARD AND RISK IN GUNNEDAH SHIRE

Volume 2 of the Gunnedah Shire Local Flood Plan

Last Update: September 2002

FloodSafe

ANNEX A - THE FLOOD THREAT

The Namoi River Basin

1. The Namoi River is one of the major tributaries of the Barwon-Darling River system and drains an area of about 43,000 square kilometres extending from near Walcha westward to Walgett. It rises as the MacDonald River in the elevated New England Plateau until approximately 43 kilometres north-east of Manilla where it becomes the Namoi River. The main headwater tributaries are the Manilla and Peel Rivers and downstream, at Gunnedah, the Mooki River.

2. The Manilla and Namoi Rivers flow from the high mountainous country in the north of the catchment and combine upstream of Keepit Dam. The contributing catchment area to the dam measures approximately 5,700 km^2 and is capable of producing high runoff peaks. The Peel River drains the eastern portion of the catchment to join the Namoi between Keepit Dam and Carroll, contributing an additional 4,670 km^2 at Carroll Gap. The south-eastern portion of the catchment is drained by the Mooki River which quickly falls onto the flat terrain of the Liverpool Plains downstream of Quirindi. At Breeza, the Mooki catchment area is 3,630 km^2.

3. Downstream of Carroll and Breeza, the Namoi and Mooki Rivers flow onto an expansive floodplain before combining just upstream of Gunnedah. The total contributing catchment area at Gunnedah is approximately 17,100 km^2.

4. The Manilla and Peel Rivers both provide higher runoff than the Mooki although high flows from the Mooki catchment can severely influence flood conditions at Gunnedah and further downstream when coinciding with major flows in the Namoi itself.

5. The Coxs, Maules and Bohena Creeks all join the main river below Gunnedah.

6. A map of the Namoi River Basin (Basin No 419) is shown as Map 4.

MacDonald River

7. The MacDonald River rises on the New England Plateau in the Walcha Shire to the east of Tamworth. From here it flows north-west to Woolbrook then Bendemeer. From Bendemeer, it flows north and west through the high mountainous country before becoming the Namoi River in the northern part of the Moombi Range, about 43 kilometres north-east of Manilla.

Namoi River

8. The Namoi River enters a wide valley plain at Manilla. From Manilla it flows into Keepit Dam and on to Gunnedah. From here, the Namoi River flows in a north-west direction to Boggabri and Narrabri before it eventually joins the Barwon River near Walgett. The Namoi River extends for a direct distance of about 370 kilometres and a river distance of about 860 kilometres.

Manilla River

9. At Manilla a right-bank tributary of that name flows into the Namoi from the north. It has its headwaters on the slopes of the western part of the Nandewar Range and occupies a horseshoe shaped basin between the eastern and western spurs of that range. It flows north at first before turning east to Barraba and then south to Manilla. The surrounding country is undulating to steep. The Manilla Basin is separated from the Horton River, a tributary of the Gwydir River, by a hilly lateral ridge connecting the two main Nandewar spurs.

Peel River

10. An important tributary from the east, the Peel River, flows into the Namoi below Keepit Dam. The Peel River rises in the southern portion of the Nundle Shire and emerges on to a flat to undulating plain, which at Tamworth is about 24 kilometres wide. It is joined by the Cockburn River which flows through river flats about eight kilometres wide, Attunga Creek from the north and Goonoo Goonoo and Tangaratta Creeks from the south.

Mooki River

11. The Mooki and its tributaries including Werris and Quirindi Creeks, drain the southern part of the Liverpool Plains. Downstream of Carroll and Breeza, The Namoi and Mooki Rivers flow onto an expansive floodplain before combining just upstream of Gunnedah.

12. A large part of the Mooki catchment drains into Goran Lake to the west of Breeza. When the lake is full it in turn feeds floodwaters into the Mooki River to the south of Breeza. Floodwaters also flow to the south-west through Carroll Creek and other channels to join the Mooki River between Battery Hill and Gunnedah.

Coxs Creek

13. Coxs Creek drains a large part of the northern side of the Warrumbungle Range to the south of Premer. Downstream of Premer it is joined by its major high catchment tributaries, Bundella and Bomera Creeks. Further downstream towards Mullaley, local catchments and Garrawilla Creek contribute significantly to flooding. Below Mullaley, a number of smaller creeks carry local floodwaters into Coxs Creek, which enters the Namoi River at Boggabri.

Storage Dams

14. Four large storage dams are located on the Namoi River and its tributaries upstream of Gunnedah. These dams are Split Rock Dam on the Manilla River, Keepit Dam on the Namoi River, Chaffey Dam on the Peel River and Dungowan Dam on Dungowan Creek. The dams have a combined catchment area of 6,215 km^2, which is approximately 59% and 36% of the catchment area to Carroll and Gunnedah respectively.

Keepit Dam

15. The largest of these dams is Keepit Dam located on the Namoi River, upstream of its confluence with the Peel River. Gunnedah is about 40km downstream of the dam. The dam is owned by the Department of Land and Water Conservation.

16. Keepit Dam has a storage capacity of 425,510 megalitres at full supply level (FSL) and supplies water for stock, domestic, irrigation and hydro-electric power. Although the dam is for conservation storage it can have mitigating effects on some floods. The dam has a catchment area of 5,700 km^2 and the MacDonald River, Walls Creek and the Manilla River flow into it. Keepit Dam has a gated spillway comprising six radial gates.

17. The construction of Keepit Dam commenced in 1946, and was not completed until 1958 due to post-war shortages of funds. The then Water Conservation and Irrigation Commission (now the Department of Land and Water Conservation) investigated, designed and constructed Keepit Dam. An unprecedented storm which devastated areas in the north, west, central and Hunter regions of the state in 1955 resulted in significant modifications to the spillway to increase its capacity.

18. The main wall of the dam consists of a 54 metre high concrete gravity structure, incorporating gated spillway and outlet works, with a 39 metre high rolled fill main embankment faced with rockfill rip rap abutting the left end of the concrete gravity section.

19. The spillway contains six radial gates, each 14.94 metres long by 11.21 metres high, each weighing 96.5 tonnes, which can be automatically controlled for the discharge of flood water.

20. A gantry crane travelling on rail on the crest of the dam allows for lowering of a bulkhead upstream of a radial gate for maintenance purposes and for lifting of trashracks, covers and other equipment. This bulkhead was designed to be placed under flow conditions and at FSL the gates hold back about 75 per-cent of the storage.

21. A rolled fill Saddle Dam (subsidiary embankment), 12 metres high by 914 metres long, is located about 3 kilometres south of the main wall in a saddle of a ridge separating the Peel and Namoi Valleys.

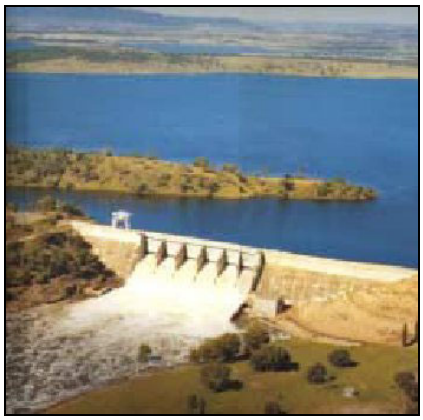


Figure 1 - Keepit Dam

Chaffey Dam

22. Chaffey Dam is situated on the Peel River 43km south east of Tamworth and 5km above the village of Woolomin. Access is via the Nundle - Tamworth Road, turning off the Hume Highway at Nemingha, 7 km east of Tamworth or off the New England Highway north of Wallabadah. The dam comprises a 54 metre high earth and rock fill embankment with a morning glory spillway and is located on the Peel River and 40 kilometres above the city of Tamworth. The dam retains storage of 62,000 megalitres for the supply level. This storage retention can increase to in excess of 160,000 megalitres for the existing design flood level with the potential to release a flood flow down the valley which is more than five times the revised estimate of the PMF which could occur naturally. The Chaffey Dam spillway has the ability to handle only 53% of the PMF without overtopping and failure of the dam. This imminent failure flood has an exceedence of such a flood in a period of 100 years range from 1:13 (8%) to 1:6 (17%). Chaffey Dam is operated by the Department of Land and Water Conservation and provides in excess of 90% of the water supply for the city of Tamworth.

23. The Chaffey Dam embankment and spillway configuration (where flood flows are pondered and throttled through the morning glory spillway) results in significantly reduced discharge under the flood conditions that would precede an overtopping failure. This mitigation effect presents advantages under normal flood conditions. However, for abnormal flood conditions that might cause failure of the dam, this mitigation effect is extremely hazardous to residents in the downstream valley extending from the dam to the outskirts of Tamworth. This is due to lack of prior extreme flooding in the river valley that would forewarn impending failure flood conditions at the dam.

24. These failure flood conditions would produce a flood discharge from the dam at failure being approximately 40 times the largest flood recorded in the valley and more than five times the PMF that would occur naturally.

25. If Chaffey Dam failed, Somerton; population 111 (41 houses) and Carroll; population 188 (63 houses); would need to be completely evacuated.

Figure 2 - Chaffey Dam

Characteristics of flooding

26. Carroll is located approximately 16 kilometres downstream of the confluence of the Namoi and Peel Rivers. Gunnedah is located on the confluence of the Namoi and Mooki Rivers. The magnitude of flooding experienced at both Carroll and Gunnedah depends on the relative contribution and time of arrival from each river.

27. The Namoi River, during major floods, is generally well confined from Keepit Dam to the Peel River junction. Downstream of this junction the valley widens with floodplains becoming increasingly more apparent. Break outs of floodwaters from the Namoi River onto a relative narrow floodplain occur immediately upstream of Carroll. The floodplain flow passes directly through the township of Carroll, with a significant portion passing over the Hoss Causeway, and flows into the wide, flat alluvial Mooki River floodplain to the south-west.

28. Carroll village is extremely flood liable with the entire village population requiring evacuation in major floods.

29. Downstream of Carroll the Namoi Valley widens considerably with extensive flat alluvial floodplains becoming a major characteristic. Major break outs of floodwaters from the Namoi River occur between Carroll and Gunnedah with some of these floodwaters moving to the Mooki River floodplain to the south. One of the major break outs from the Namoi River occurs at Tommy Swamp immediately downstream of Carroll. A considerable portion of the Namoi River flow is redistributed south onto the Mooki River floodplain via this floodway.

30. The floodwaters that leave the Namoi River and flow in a southerly direction combine with flood water originating from the Mooki River. This combined flood water flows in a north-westerly direction and rejoins the Namoi River floodwaters immediately upstream of Gunnedah.

31. The floodwaters that leave the Namoi River and flood the northern floodplain, flow in a westerly direction towards Gunnedah. Just upstream of Gunnedah (upstream of the Kelvin Road) these floodwaters move along clearly defined floodways that cross the Kelvin Road. It then flows under the Kelvin Road about 300 metres to the north of Cohen's Bridge (at a location known as the 'Pig Hole'; BOGGABRI Sheet 8936 (Ed 1) Series R651, 1:100,000, GR 378701). It then continues on and flows either side of Gunnible Mountain before rejoining the Namoi River about 6 to 7 kilometres downstream of Gunnedah.

32. Higher levels of flooding cause extensive inundation of the floodplain north of the river, opposite Gunnedah. The source of this water varies between the Namoi and Mooki Rivers depending on relative flows. Generally, if the Namoi is full or in flood when the Mooki River peak arrives at the junction of the two rivers, flood water from the Mooki tends to flow across to the north. If however the Namoi River is above 6.8 metres at Cohen's Bridge (Gunnedah gauge AWRC No 419), it will divert Mooki River floodwaters west through the Talibah Flat area and across the northern edge of Gunnedah.

33. The floodplain opposite Gunnedah is also affected by Rangari Creek which rises in the Kelvin area. As this water enters the floodplain it tends to flow west

through a number of channels before reaching Landry or Gunnible Lagoons. This floodplain was about 12 kilometres wide during the 1971 flood but narrows to the close vicinity of the river banks by the northern boundary of the Gunnedah Shire. The behaviour of floodwaters on this floodplain area will change because of the large area developed for cotton growing.

34. Either Mooki or Namoi water or a combination of the two can flood Talibah Flat (on the northern edge of Gunnedah). The water flows between Maitland and Talibah Streets in Mullibah Lagoon; is diverted by a natural levee along the southern bank of the Namoi River and flows along the line of Maitland Street; and eventually rejoins the Namoi River at the Woolshed Reserve.

35. Downstream of Gunnedah, a major break out from the Namoi River into Deadman's Creek occurs in the vicinity of "Cedar Vale" homestead. Deadman's Gully is a perched creek that runs parallel to the Namoi River before re-entering the Namoi River upstream of Boggabri.

36. The floodplain downstream of Gunnedah slowly narrows as the Namoi River approaches Boggabri. Immediately downstream of Boggabri, the valley narrows considerably to a natural control known as the "Dam Site". All flood flows pass through this narrow opening in the valley.

37. Flooding along the length of Coxs Creek usually poses no problems to dwellings. However, roads are closed and flooding along its entire length isolates a number of rural properties. At extreme flood heights, flood water from Coxs Creek may move eastwards into Lake Goran. When the lake is full, this water may in turn move further east into the Mooki River.

Indicative peak flow travel times

38. Some indicative peak flow timings are as follows:

Stream	From	To	Travel Time (Hours)
Manilla River	Barraba	Manilla	6
Namoi River	Manilla	Keepit Dam	5
Namoi River	Keepit Dam	Carroll	4 - 6
Peel River	Tamworth	Carroll Gap	7 - 14
Peel River	Carroll Gap	Carroll	6 - 8
Bundella/Coxs Creek	Bundella	Mullaley	12
Coxs Creek	"Rokewood"	McBurnies Crossing	5.5
Coxs Creek	McBurnies Crossing	Mullaley	2.5 - 3
Coxs Creek	"Rokewood"	Mullaley	8 – 8.5
Coxs Creek	Mullaley	Boggabri	26

Flood History

39. **Introduction.** Floods have been observed at Gunnedah since 1864. However, official records commenced in 1892 when a gauge was installed on Cohens Bridge (Gunnedah gauge, AWRC No 419001). The 1864 flood is considered to be the largest flood to have occurred at Gunnedah since white settlement. The level for this flood was obtained by survey level and recorded in the then Water Conservation and Irrigation Commission Register but no definitive confirmation was found as to its origin. The February 1955 flood is the second largest flood that has occurred at Gunnedah and the largest since official records commenced. A chart depicting the major floods that have occurred at Gunnedah is shown in Figure 1.

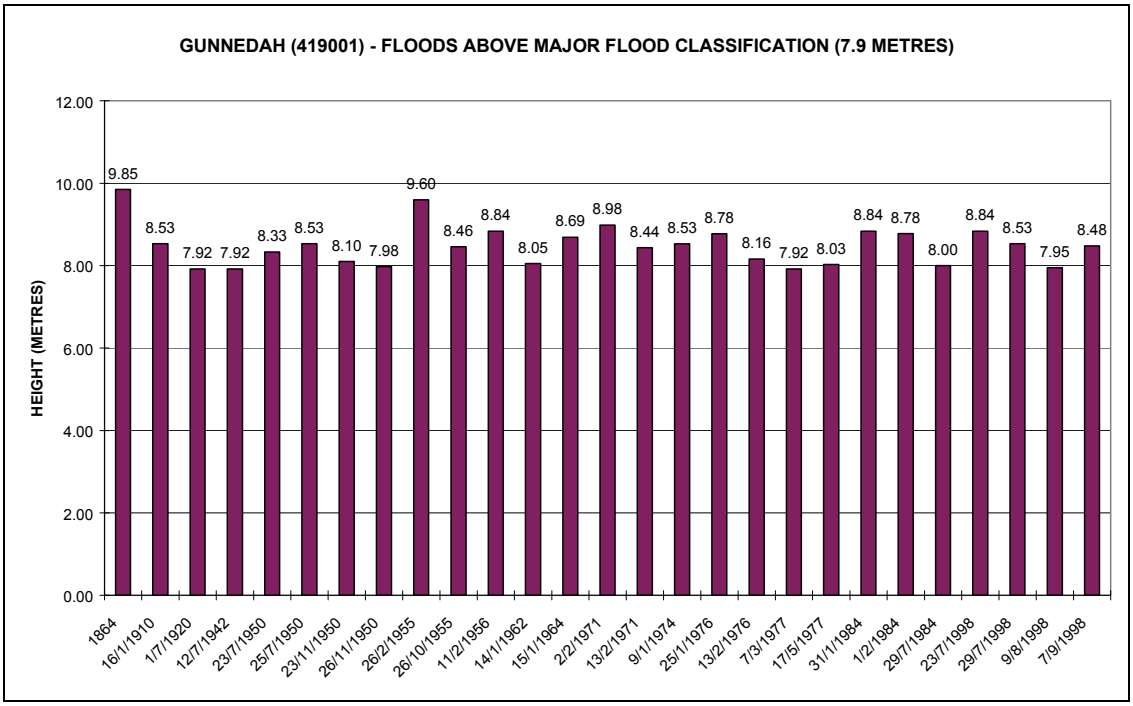


Figure 3 - Floods above the major flood classification at Gunnedah

40. **February 1955**

a. The February 1955 flood is the largest recorded flood in terms of peak discharges. Large inflows were recorded from all parts of the catchment area, indicating an intense and widespread rainfall distribution. The highest rainfall recordings were in the Mooki and Manilla catchments with the Mooki catchment receiving the most. The Manilla catchment received most rain in the upper reaches above Barraba. It was also the largest flood on the Peel River and significant contributions came from the Manilla and Mooki Rivers. This combination led to the highest flood at Gunnedah since 1864 (determined to be 9.85 metres) with a recurrence probability of about 1% AEP.

b. Although both the Peel and Namoi systems contributed very high flows, their peaks did not coincide at the Peel-Namoi Junction, thus producing a smaller peak at Gunnedah than might have occurred otherwise. The Peel River contributed about 34% of the total volume estimated to have passed Gunnedah. During this event, about 171 houses/businesses were flooded.

41. **January 1964**

a. The January 1964 flood originated in the Namoi River catchment upstream of the junction with the Peel River. This flood exceeded the magnitude of the 1955 flood, both in terms of gauge height and peak discharge at a number of locations in this part of the catchment. As a result, the 1964 flood was relatively large at Carroll. The remaining catchment to Gunnedah contributed little in terms of flood flow with minor flow being recorded at the Mooki River at Breeza Station gauge (419027). As a result of the relatively small flood volume along with the rapid attenuation of the flood wave, flooding was not prolonged in the lower Namoi River valley.

b. The January 1964 flood was the largest flood recorded at the Carroll SES gauge and was similar in terms of magnitude to the 1955 and 1910 flood events.

42. **February 1971**

a. The February 1971 flood differed again with little contribution from the Upper Namoi and only a moderate flood on the Manilla River. High discharges in both the Peel and Mooki Rivers combined with releases from Keepit Dam to produce major flooding at Gunnedah. The total volume measured during this event was the greatest of all of the major floods in the Namoi Valley in 1971. During this event, about 80 houses/businesses in Gunnedah were flooded.

43. **January 1974**

a. Above average monthly rainfall totals were recorded throughout the Namoi Valley in the latter months of 1973 causing the catchment to be wet at the onset of the flood producing rains in early January 1974. The volume of this flood was only one third of that of the flood of 1971 although the Mooki contribution was the same in both. The Mooki catchment contributed about 38% of the total flow passing Gunnedah. In this event, there was a total of about 50-60 houses evacuated.

44. **January/February 1976**

a. The January 1976 flood was the result of heavy flood rains falling across an already saturated catchment. Unsettled conditions over the Namoi Valley early in January were followed by a severe rain depression that moved slowly across NSW from 11 -15 January 1976. This was followed by a widespread rain depression; remnants of

Tropical Cyclone "David" which had crossed the Queensland coast on 20 January 1976; bringing very heavy rainfall to the Namoi Valley before clearing on about 24 January 1976.

b. The flood of February 1976 was the result of a secondary flood following the major flood of 8.78 metres on 25 January 1976. It was caused by follow up flood rains on an already saturated catchment.

45. **July/September 1998**

a. Heavy rainfall over an already saturated catchment resulted in four peaks above the major flood classification at Gunnedah (23/7/98 - 8.84 metres, 29/7/98 – 8.53 metres, 9/8/98 – 7.95 metres and 7/9/98 – 8.48 metres). In this event, 30 houses were evacuated due to over-floor inundation. A further 99 houses were effected by flood water (ie raised/elevated houses with water around them or houses surrounded by flood water which required flood boat access). A total of 32 business premises were inundated and a further 15 were effected due to restricted access and the subsequent loss of business. The Department of Community Services provided support and assistance to 186 families in the Gunnedah area. A map showing the approximate extent of flooding at the peak of the flood of 23 July 1998 is shown as Map 5.

Weather systems and flooding patterns

46. Historical records indicate that most common months for flooding at Gunnedah are January, February and July.

47. The most severe floods recorded have mostly occurred in the summer months, particularly January and February when summer cyclonic weather systems often move south from Queensland and the Northern Territory. In these wetter months the catchment is often saturated and more liable to flooding.

48. Fronts passing the state from west to east, usually during the cooler months of the year, normally constitute the principle flood producing mechanisms of the southern inland parts of the state and winter flooding from frontal systems is less common in the more northern inland parts of the state. It can happen, however, and was experienced in 1998 on the Namoi River which had several flood peaks in quick succession between July and September as the result of rains from the passage of frontal systems.

49. The pattern of occurrences of floods above the major flood classification (7.90 metres) recorded at the Gunnedah gauge is depicted in Figure 2.

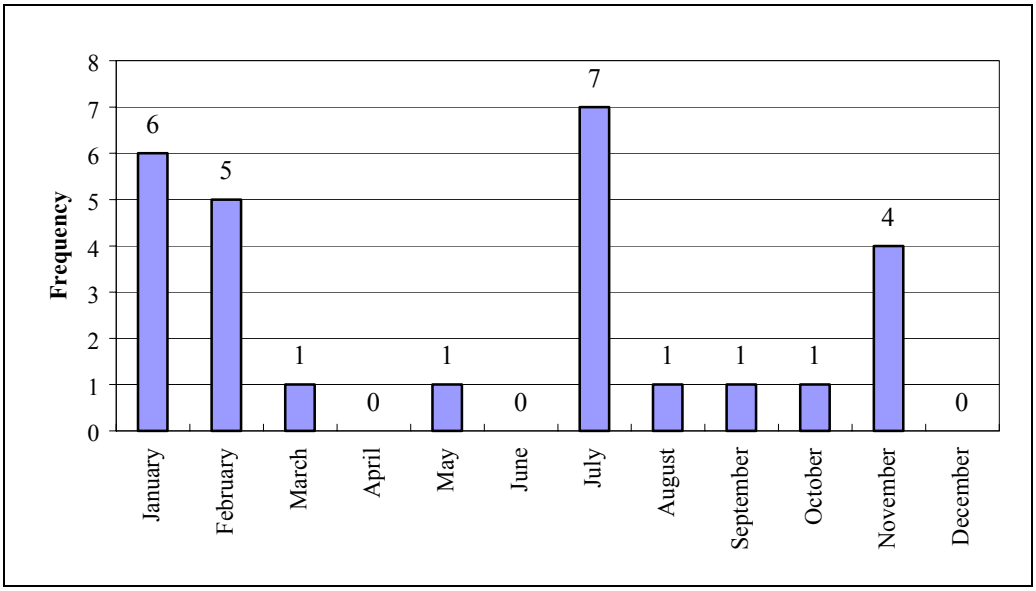


Figure 4 - Frequency of major floods at Gunnedah

Design floods

50. The Gunnedah Flood Study Report for Gunnedah and Carroll (Report No HO/16/96 dated August 1996 recommended the following design flood heights:

AEP %	Gunnedah (419001)	Carroll (SES Gauge)
0.5	9.98	
1.0	9.73	9.90
2.0	9.35	9.70
5.0	8.82	9.45
10.0	8.38	9.20

Figure 5 - Design flood heights for Gunnedah and Carroll

Extreme flooding

51. If all of the upstream tributaries had a major flood simultaneously, flooding in the floodplain and riverine area could potentially be significantly greater than anything yet recorded. The probability of such an event is very low but it does indicate that the high flood levels of the period from 1955 to 1998 should not be considered as freaks.

52. An estimate of an appropriate extreme flood was examined in the Gunnedah Flood Study (Flood Study Report Gunnedah and Carroll dated August 1996). It was stated therein that a detailed estimate of the Probable Maximum Flood (PMF) at Gunnedah had not been undertaken because of the size and complex nature of the catchment above Gunnedah. As a result of this study, the estimated extreme flood discharge of 30,000 m^3/s (2,592,000 ML/d) has been obtained. This figure is approximately three times the record floods of 1864 and February 1955.

ANNEX B - EFFECTS OF FLOODING ON THE COMMUNITY

Gunnedah

1. The town of Gunnedah is one of the urban centres of the Namoi Valley and at the 1996 Census had a population of 8,315. It is located on the Oxley Highway approximately 80 kilometres west of Tamworth. Gunnedah is located on the southern bank of the Namoi River approximately three kilometres west of the confluence of the Mooki and Namoi rivers.

2. The flood problem at Gunnedah essentially consists of the inundation of the northern part of town due to floodwaters of the Namoi and Mooki Rivers, and internal drainage problems caused by Ashfords Watercourse and Blackjack Creek.

3. As floodwaters rise they progressively affect more residences and business premises on the northern side of the town. Only a small number of residences are affected by floodwaters up to moderate flood levels. However, once the major flood level of 7.9 metres is exceeded the problem escalates as shown below:

   a. 8.78 metres - 87 premises flood affected.

   b. 8.84 metres - 96 premises flood affected.

   c. 8.86 metres - 169 premises flood affected (30 houses to be evacuated due to over floor inundation, 32 businesses inundated).

4. The main streets in Gunnedah that are affected by floodwaters are Conadilly, Little Conadilly, Tempest, Bloomfield, Marquis, Maitland and Elgin Streets.

5. The 1955 flood approximated a 1% AEP (one-in-100 years) flood event. A repeat of this flood would result in the lower parts of the Tourist Caravan Park and the Gunnedah Public School having floodwaters in the grounds. In the unlikely event of failure of the Chaffey Dam, the area affected may be greater than for a 1% AEP flood. One estimate is that a height of 10 metres could be reached at Gunnedah.

Carroll

6. Carroll is a small village of about 182 residents located on the southern bank of the Namoi River, approximately 20 kilometres east of Gunnedah on the Oxley Highway. It is extremely flood liable and can become isolated at moderate flood levels. Many of the residences are raised and floodwaters usually only stay up for about three days. However, in extreme circumstances the whole village may need to be evacuated. The entire population has been evacuated at least five times.

Breeza

7. Six homes were evacuated from the low-lying area of Breeza during the 1971 flood that peaked at a height of 7.85 metres.

Mooki River area

8. The Mooki floodplain between Breeza and Gunnedah is bounded on the west by the hills on the western side of Trunk Road 72 and the Melville Range on east. The northern boundary is the Oxley Highway between Gunnedah and Carroll.

9. The flooding of this area is due to flood flows down the Mooki and Namoi Rivers and also local runnoff. During floods, the Mooki River spreads across the plain to join the Namoi floodwaters spreading across the Oxley Highway from the north. Numerous creeks originating from the hills to the east and west of the Mooki plains cause local flooding.

10. Approximately 32 rural properties can be isolated in this area (20 along the Mooki River and 12 on the Namoi River between Carroll and Gunnedah).

11. Flooding on the Mooki River can cause about 20 rural homesteads to be isolated and flooding along the Namoi River between Carroll and Gunnedah can isolate up to 12 homesteads.

Air Transport Disruptions

12. At 7.32 metres on the Gunnedah gauge, the Gunnedah to Kelvin road is closed at Cohens Bridge to all but high clearance vehicles and normal road access to the Gunnedah airport is lost. An alternative access is available via the Ballyreagan Bridge and Bluevale Road until 7.5 metres. A shuttle service by high clearance vehicles is provided to ferry stores and people across during daylight hours until 7.8 metres when flood boats take over this role.

13. At 8.10 metres, water covers part of Runway 11/29 at the western end of the Gunnedah Airport. The airport is normally closed once this occurs and an emergency airfield is established and controlled by the Gunnedah Shire Council. This airfield is located about eight kilometres south of Gunnedah on the Pullaming Stock Route just off the Quirindi road. The airfield is 1,100 metres long and suitable for use by twin engine aircraft up to and including the RAAF Caribou.

Road Closures

14. Roads that may be affected by flooding are detailed in the following table:

Gauge Height	Road	Designation	Location of Closure
	Gunnedah to Quirindi	SH 29	At Watermark, 28km from Gunnedah.
	Gunnedah to Boggabri	SH 29	At Barlows Corner, 25km from Gunnedah.
Breeza Station 6.60 Gunnedah 8.38	(Oxley Highway) Gunnedah to Tamworth	SH 11	Causeway between Weakley Bridge on Mooki Overflow and the Ruvigne

Gauge Height	Road	Designation	Location of Closure
			Bridge on Carroll Creek at Gunnedah
Carroll 9.00	(Oxley Highway) Gunnedah to Tamworth	SH 11	Tommy Swamp, Dewson's Corner and Noggabri Reserve
N/A	(Oxley Highway) Gunnedah to Coonabarabran	SH 11	N/A
	Mullaley to Tambar Springs	MR 55	McBurnies, 12km.
	Keepit Dam to Manilla		Carroll Gap, 29km.
Gunnedah 7.32	Gunnedah to Kelvin	SR 5	Cohens Bridge
Gunnedah 7.50	Gunnedah to Kelvin via Bluevale road		Northern approach to Ballyreagan Bridge
	Gunnedah to Tambar Springs via Wandobah and Red Bobs	SR 10	Red Bob, 34km.
	Mullaley to Boggabri	Stock Route	20km from Mullaley.
Breeza Station 2.18	Breeza to Carroll via Long Point road	SR 103	Long Point and causeways, 11.5km.
Breeza Station 2.18	Breeza to Carroll via Clifton road	SR 37	Simpson's Bridge causeway, 4km.
Breeza Station 2.18	Breeza to Currabubula	SR 43	Werris Creek, 10km.
Breeza Station 2.18	Breeza to Werris Creek via Gap road	SH 29	The Gap.

Figure 6 - Road Closures in the Gunnedah Shire Council area

NSW STATE EMERGENCY SERVICE

SES RESPONSE ARRANGEMENTS FOR GUNNEDAH SHIRE

Volume 3 of the Gunnedah Shire Local Flood Plan

Last Update: September 2002

FloodSafe

ANNEX C - GAUGES MONITORED BY THE SES

Gauges Monitored by Gunnedah SES

Station	AWRC No	Stream	Flood Classification			Type
			Min	Mod	Maj	
Hokey Pokey	419066	Goran Lake				Manual
Breeza Station	419027	Mooki River		3.9	4.8	Telemetric
Gunnedah (Mooki Bridge)	10170	Mooki River				Manual
Ruvigne	419084	Mooki River				Telemetric
Carroll	10081	Namoi River				Manual
Gunnedah	419001	Namoi River	7.3	7.6	7.9	Telemetric
Keepit Dam D/S	419007	Namoi River				Telemetric
Keepit Dam W/L	419041	Namoi River				Telemetric
Weir D/S Keepit Dam	419058	Namoi River				Manual
Carroll Gap	419006	Peel River				Telemetric

Gauges Monitored by Tambar Springs SES

Station	AWRC No	Stream	Flood Classification			Type
			Min	Mod	Maj	
Bert Gunning	10228	Cox's Creek				Manual
Bert Gunning Bridge	10022	Cox's Creek				Manual
Boggabri (Cox's Creek)	419032	Cox's Creek				Telemetric
Bomera Creek (SES)	10031	Cox's Creek				Manual
Mullaley	419052	Cox's Creek				Manual
Premer	10303	Cox's Creek				Manual
Rokewood	10333	Cox's Creek				Manual
Tambar Springs	419033	Cox's Creek				Telemetric
Breeza (Ernie's)	10046	Mooki River				Manual

Notes:

1. The Bureau of Meteorology provides flood warnings for the Gunnedah (AWRC No 419001) and Keepit Dam D/S (AWRC No 419007) gauges.
2. The SES issues local flood advices for the Breeza gauge on the Mooki River (AWRC No 419027).

ANNEX D - DISSEMINATION OF SES FLOOD BULLETINS

The Namoi SES Division Headquarters distributes SES Flood Bulletins and other flood related information (including Flood Warnings) to the following regional media outlets:

Television Stations:

Station	Location
Prime TV	Tamworth
NBN TV	Tamworth
ABC	Tamworth
NRTV	Tamworth

Radio Stations:

Station	Location	Frequency	Modulation
2TM	Tamworth	1287	AM
Tamworth FM	Tamworth (co-located with 2TM)	92.9	FM
2NU (ABC)	Tamworth	648	AM
2MO	Gunnedah	1080	AM
2GGG	Gunnedah (co-located with 2MO)	97.5	FM
2VM	Moree	1530	AM
2CR (ABC)	Orange	549	AM
2AD	Armidale	1134	AM
2DU	Dubbo	1251	AM
2WEB	Bourke	585	AM
MAX FM	Narrabri	91.3	FM
2NZ	Inverell	1188	AM

Newspapers:

Name	Location
The Northern Daily Leader	Tamworth
Namoi Valley Independent	Tamworth

Other Agencies:

- All SES units and Emergency Services in the Namoi area.
- Councils in the Namoi area.
- Members of Parliament in the Namoi area.
- Tourist Information Centres
- NRMA

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

Evacuation Warning for [ ]

Date/Time of Issue: [ ]

Authorised By: [ ]

The Bureau of Meteorology has predicted a flood level of [ ] metres at [ ] ***(place)*** at [ ] ***(time).*** This means that the following area(s) may be inundated **[ ]**.

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 [ ] 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 other 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 where possible 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 F - EVACUATION ARRANGEMENTS FOR THE GUNNEDAH SHIRE COUNCIL AREA

Situation

1. During periods of major flooding there is a requirement to evacuate portions of Gunnedah, Carroll and Breeza.

2. In Gunnedah the main streets that are affected by floodwaters are Conadilly, Little Conadilly, Chandos, Tempest, Bloomfield, Marquis, Maitland and Elgin streets. A number of homes in the rural sub-division on the northern side of the Namoi River are also flood affected. Evacuations from these areas can be expected shortly after the river reaches the major flood classification level of 7.9 metres. By the time the river reaches 8.85 metres, approximately 30-40 houses and 30 businesses will have been inundated and this number could climb as high as 171 properties by 9.6 metres.

3. Carroll is extremely flood liable and can become isolated during periods of major flooding. Many of the houses in Carroll are elevated and residents tend to stay in situ as the floodwaters tend to remain at the high levels for only about three days. There will be a requirement to evacuate at risk residents (the aged, infirm, sick, young and mothers) before the village is isolated. In extreme circumstances, the whole village (about 188 people) will need to be evacuated. This has occurred on five occasions in the past.

4. In 1971, six houses in the low-lying area of Breeza were evacuated during a flood that peaked at 6.78 metres on the Breeza Station gauge.

5. In the highly unlikely event that Keepit Dam was to experience a 'sunny day' failure, the entire village of Carroll, rural properties downstream of the dam and the low-lying areas of Gunnedah would have to be evacuated.

Mission

6. The SES is to arrange for and control the evacuation of areas at risk of flooding in order to ensure the safety of residents.

Execution

7. **Control.** During floods, the NSW SES will control evacuation operations. The Gunnedah SES Local Controller will control small-scale evacuations. In the event of large-scale evacuations, the Gunnedah Local SES Controller will discuss special control arrangements with the Namoi SES Division Controller.

8. **General Outline**. During floods, evacuations will be controlled by the Gunnedah SES Local Controller and conducted in four phases:

   a. Phase 1 - Warning.

   b. Phase 2 – Withdrawal.

c. Phase 3 – Shelter.

d. Phase 4 – Return.

9. **Coordinating Instructions**

a. **Responsibility.** The responsibility for issuing a general evacuation order during flooding rests with the Gunnedah SES Local Controller who exercises his/her authority in accordance with Section 22(1) of The State Emergency Service Act 1989. However, the decision to order large-scale evacuations will normally be made after consultation with the Namoi SES Division Controller and the Gunnedah Local Emergency Operations Controller.

b. **When Evacuation Should Occur.** As far as possible, evacuation will be carried out before inundation occurs.

c. **Self-Motivated Evacuation.** Some people will make their own decision to evacuate earlier and move to alternative accommodation using their own transport. These evacuees will be advised, via the media, to inform the Police or SES of their evacuation and their temporary address.

d. **Evacuation Triggers - Gunnedah (Gunnedah gauge).**

- The first evacuation can be expected when a house is inundated by over floor flooding in Chandos Street at 7.5 metres on the Gunnedah gauge.
- Further evacuations will commence as the floodwaters rise above the major flood classification of 7.9 metres.
- Once the major flood level of 7.9 metres is exceeded the first major evacuations commence as houses and businesses are progressively flooded.
- By the time the floodwaters reach 8.85 metres, approximately 30 houses and 32 businesses will have experienced over the floor flooding and will require evacuation or relocation. A further 114 houses and businesses would be flood affected (ie water in the yards or under raised houses).
- By 8.98 metres the number of houses and businesses requiring evacuation could be as high as 80 and this could climb to about 171 by 9.6 metres.

e. **Evacuation Triggers - Carroll (Carroll gauge).** The majority of the houses in Carroll have been elevated above the 1955 flood level (9.9 metres). About five houses will experience over floor inundation and will have to be evacuated before the river reaches 9 metres. By 9.3 metres the entire village is surrounded by flood water and isolated.

10. **Phase 1 - Warning.**

a. **Evacuation Warnings.** On the receipt of flood warnings predicting peak heights of 7.9 metres and above at the Gunnedah gauge; the Gunnedah SES Local Controller will consult as necessary 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 Gunnedah SES Local 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 E. These are disseminated via:

- The radio and TV stations listed in Annex D.
- Door-knocks by emergency service personnel.
- Public address systems from emergency service vehicles.
- Telephone.
- Two-way radio.
- SES Flood Bulletins.

11. **Phase 2 – Withdrawal**

a. **Introduction.** Withdrawal involves the actual removal of the community/individuals from dangerous or potentially dangerous areas to safer areas.

b. **Conduct.** Evacuations will be controlled by the Gunnedah SES Local Controller and conducted by SES, RFS and Police personnel.

c. **Movement.** Evacuees are to be encouraged to move using their own transport where possible. The Gunnedah SES Local Controller will arrange transport for those people without their own vehicles.

d. **Animals**. Assistance animals (ie guide dogs, hearing assistance animals, etc) will remain in the care of their owners. This includes transport and access into evacuation centres etc. NSW Agriculture will assist with the provision of resources for the transport of companion animals (pets), if required, to an animal compound, which it will establish.

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.

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 NSW Police.

g. **Security.** The NSW Police will provide security for evacuated premises.

h. **Airport.** Normal road access to the Gunnedah airport remains open until 7.32 metres on the Gunnedah gauge. After that, an alternative route is available via the Ballyreagan Bridge and Bluevale Road until it is closed by floodwaters at 7.5 metres on the Gunnedah gauge. The airport is normally closed by floodwaters at 8.1 metres.

12. **Phase 3 – Shelter**

a. **Evacuation Centres.** The usual purpose of evacuation centres is to meet the immediate needs of victims, not to provide them with accommodation. Evacuees will be advised to go to or be taken to the nearest accessible evacuation centre, which may initially be established at the direction of the Gunnedah SES Local Controller but managed as soon as possible by the Department of Community Services. Initially, an assembly area will be established at the pavilion at the Gunnedah Showground.

b. **Relocation of Caravans.** Gunnedah Tourist Caravan Park in Henry Street and the Marcroft Caravan Park in Warrabungle Street are flood liable. In the event that the parks have to be evacuated, the caravans from each of these parks will be moved to the pavilion at the Gunnedah Showground.

c. **Action on Arrival.** On arrival, evacuees will be:

- Registered.
- Medically checked, if necessary.
- Provided with their immediate welfare needs.

d. **Registration.** The NSW Police will ensure that all evacuees are registered on arrival at the designated evacuation centres and details of the registrations are to be sent to the Oxley Police Local Area Command Headquarters by the quickest means available.

13. **Phase 4 - Return.**

a. Once it is considered safe to do so, the Gunnedah SES Local 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 regards to matters such as the electrical safety of buildings.

b. The return will be controlled by the Gunnedah SES Local Controller and may be conducted, at his/her request, by DoCS.

Administration and Logistics

14. **Transport and Storage.** Transport and storage of furniture from flood-threatened properties will be arranged as time and resources permit.

15. **Support Provided At Evacuation Centres.** The expected duration of the evacuation will dictate the need for and level of facilities and support at the evacuation centres. If evacuations are expected to be of a short duration, evacuees may be provided with short-term accommodation at the centres. However, if they are expected to last for longer than 24 hours, evacuees will be encouraged to go to alternative accommodation or stay with friends where possible. Alternatively, accommodation will be arranged for them in hotels, motels or by billeting.

16. **Animal Shelter Compounds**. Animal shelter compounds will be set up for the domestic pets and companion animals of evacuees. NSW Agriculture will establish these facilities. Companion animals will not be allowed to accompany their owners into the Evacuation Centres.

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

General

1. The following caravan parks are flood liable:

   a. Gunnedah Tourist Caravan Park in Henry Street, Gunnedah (54 sites – 20 permanent and 28 semi-permanent); and

   b. Marcroft Caravan Park in Warrabungle Street, Gunnedah (14 permanent sites).

Advising Procedures

2. Caravan Park proprietors will 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 should consider:

      - Providing the manager with a key; in a sealed envelope; to the van.

      - Providing a contact address and telephone number.

      - Informing the manager if a vehicle will be required to relocate the van during flood time.

      - Leaving 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.

3. The Gunnedah SES Local Controller will ensure that the managers of caravan parks are advised of flood warnings and the details of any evacuation order.

Evacuation of Occupants and Relocation of Vans

4. 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 the designated evacuation centre 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 showground caravan park area. Powered sites are available there and in the large open area adjacent to the pavilion.

5. Occupants of vans that are being relocated should go to a designated evacuation centre if they have their own transport. Those without their own transport are to report to the caravan park office.

6. Caravan park managers will:

   a. Advise the Gunnedah SES Local Controller of:

      - The number of people requiring transport.
      - Details of any medical evacuations required.
      - Whether additional assistance is required to effect the evacuation.

   b. Check that no people remain in non-removable vans that are likely to be inundated.

c. Inform the Gunnedah SES Local Controller when the evacuation of the caravan park has been completed.

d. Provide the Gunnedah SES Local Controller with a register of people that have been evacuated.

Return of Occupants and Vans

7. The Gunnedah SES Local Controller, using council resources as necessary, will advise when it is safe for the caravan parks to be re-occupied.

8. Vans will be towed back to the caravan parks by van owners or by vehicles and drivers arranged by the park managers. Again, Council and SES personnel will assist if available.

ANNEX H - DETAILS OF THE EARLY WARNING SYSTEM FOR KEEPIT DAM

Introduction

1. As part of a regular review process State Water has identified that Keepit Dam does not meet current design standards for flood handling capacity and earthquake. Consequently State Water has embarked on a program of upgrading Keepit Dam to meet these standards. As an interim measure State Water (NSW Department of Land and Water Conservation) has installed an Early Warning System (EWS) to warn affected residents downstream of the Dam. The EWS is designed to warn landholders who would be affected by a flood resulting from the unlikely event of failure of Keepit Dam. These are people who that live within 1.5 hours flood travel time of the dam. This means that all affected landholders / residents downstream of the dam, up to and including Carroll have been included in the EWS. Some landholders further downstream of Carroll, have also asked to be included in the system. This Early Warning System will be used until the dam construction and upgrade process has been completed. This program is currently planned for completion in 2007.

2. The EWS has been provided for the protection of affected downstream residents and is in addition to other measures that exist to safeguard the dam and downstream residents. In particular a Dam Safety Emergency Plan (DSEP) has also been developed. This DSEP caters for all emergencies at the dam. It makes available to dam staff a group of experienced Dam Engineers for support and advice in any situation where the integrity of the dam is at risk.

3. State Water and the State Emergency Service have been working together to ensure that the SES are equipped with the best possible data on dam failure flooding in the Namoi River Valley. This will also help the SES provide mitigation of flood effects to residents in the Valley for most other natural flood events that may occur.

4. The system was designed in consultation with the State Head Quarters and the Namoi Division of the SES.

5. The EWS would be activated by abnormally high water levels in the dam and has been designed to be automatic in its operation, with the additional capability of being operated “manually”. The system is normally operated in the automatic mode.

6. Components of the system include:

   a. a storage level recorder situated at Keepit Dam;

   b. river flow recorders (gauging station) situated downstream of Keepit Dam;

   c. radio repeater network linking gauging stations (upstream and downstream of the dam), and the storage recorder at the dam to the command centre situated at Narrabri;

   d. proprietary software for monitoring the system;

e. an automated telephone system;

f. two town warning units situated in Carroll.

Keepit Dam EWS Operation

7. An automatic storage level recorder, built into the main dam wall at Keepit Dam, determines the storage level at the dam. The river flow downstream of the dam is also measured as part of the EWS. This information is relayed via a radio repeater network to the State Water office, situated at Narrabri. A Personal Computer compares the storage level at Keepit Dam and the river flow downstream of the dam with pre-determined set points. When the storage level and/or the downstream river flow reach these set points the system converts to a pre-determined "state". Each of these states has defined actions associated to them. Alerts will be sent to the SES and affected residents. Residents who live outside the village of Carroll will be contacted by telephone and, at the same time, the sirens and lights of the town warning units (TWUs) will begin sounding and flashing in the village of Carroll. The residents of Carroll will not receive automated telephone calls.

Keepit Dam EWS States

8. The four different states determined for the Keepit Dam EWS are listed below:

a. **Green.** The system is operational and signals the **'ALL CLEAR'**.

b. **White.** A recorded message is sent to the SES only.

- This is a preliminary alert to assist the SES in its preparation. The SES will respond by alerting the warden responsible for Carroll.
- The state is activated when the river flow downstream of Keepit Dam reaches or exceeds approximately 100,000 Megalitres per day (1,157 m^3/s).
- An automated message is relayed to the SES. Communication between the dam staff and the SES begins and will continue throughout the period of high flows downstream of Keepit Dam.

c. **Amber.** A notification is sent to the SES and residents. Residents will be advised to prepare to evacuate.

- A high storage level (equivalent to the original Design Flood Level) at Keepit Dam has been reached. The dam is not at risk at this stage, but may be at risk if the situation at the dam worsens.
- Once this state is activated the SES, and residents affected by dam failure flooding, will be notified by automated telephone calls and, in the case of Carroll residents, flashing lights and sirens on the two TWUs.

d. **Red.** Once reached, an alert is sent to the SES and residents. Residents should evacuate the area and proceed immediately to the evacuation centre and await instructions from the SES and / or the NSW Police.

- The storage level at Keepit Dam has reached a critical level, nominated as 300 mm below the top of the upstream parapet wall on the main dam wall. Modelling done on Keepit Dam has shown the dam to not be at risk at this point but should the situation worsen the dam may be at risk.

- Automated telephone calls are made to the SES and affected residents and lights and sirens are activated on the Town Warning Units situated in Carroll.

Keepit Dam EWS Messages

9. The recorded messages for the Amber and Red alert states are:

a. **Amber**:

"This is the Keepit Dam Early Warning System. Circumstances have arisen which may endanger Keepit Dam. Please prepare to evacuate. Please enter your PIN to acknowledge."

b. **Red**:

"This is the Keepit Dam Early Warning System. The situation at Keepit Dam is critical. Please evacuate to the evacuation centre. Please enter your PIN to acknowledge."

Town Warning Units

10. The village of Carroll has been equipped with two radio activated TWUs that are located at the corner of Breeza and Stephens streets and the corner of Breeza and Bernard streets. Each of the TWUs is equipped with a light and sirens to notify residents of the alert status of the system.

11. **Amber Alert.** For the Amber alert, the siren will sound a rising tone from low to high pitch that will be repeated. The siren will sound for five minutes.

12. **Red Alert.** For the Red alert, the sound will heard as a falling tone from high to low pitch that will be repeated continuously. The siren will sound for five minutes.

13. **All Clear.** Once it has been ascertained that the danger has passed the 'All Clear' siren will be sounded. This will be an undulating high to low to high rising and falling sound similar to an 'air raid' siren. The siren will sound for one minute and may be accompanied by a message broadcast via the public address system.

Notification, Warning and Evacuation Arrangements

14. The notification, warning and evacuation arrangements for a Potential Failure of Keepit Dam are detailed in the following tables.

NOTIFICATION, WARNING AND EVACUATION ARRANGEMENTS FOR A POTENTIAL FAILURE OF KEEPIT DAM IN THE EVENT OF A SUNNY DAY FAILURE

Alert Level	Defining Conditions	Flood Effects	Time Elapsed (Worse Case)	Notification Arrangements and Actions			
				State Water / DLWC	Gunnedah SES	Namoi SES Division HQ	People at Threat
Green	System operating normally, storage at or near to Full Supply Level	Nil	N/A	No action required apart from standard surveillance; no danger implied; normal water level	No action required.	No action required.	No action required.
Amber, possibly progressing to Red	Significant earthquake felt at Keepit Dam	None unless failure occurs; failure would cause serious flooding in the Namoi Valley	N/A	Activate Earth Tremor Evaluation and Procedure, Figure 4 of Keepit Dam DSEP. Institute visual surveillance. Inform State Water Dam Engineers and SES Namoi Division by telephone and maintain contact. Light / siren alarm may be triggered by State Water staff and automated telephone calls made.	Activate the Gunnedah Local Flood Plan.	Ensure that the evacuation centre is ready.	Move to Evacuation point immediately. Follow directions of SES and/or NSW Police. Wait for the "ALL CLEAR" to be announced.

Alert Level	Defining Conditions	Flood Effects	Time Elapsed (Worse Case)	Notification Arrangements and Actions			
				State Water / DLWC	Gunnedah SES	Namoi SES Division HQ	People at Threat
Amber, possibly progressing to Red	Increased seepage and cracking indicated by monitoring instruments	None unless failure occurs; failure would cause serious flooding in the Namoi Valley	N/A	Initiate ACTION 2 of Keepit Dam DSEP. Institute visual surveillance. Inform State Water Dam Engineers and SES Namoi Division by telephone and maintain contact. Light / siren alarm may be triggered by State Water staff and automated telephone calls made.	Activate the Gunnedah Local Flood Plan.	Ensure that the evacuation centre is ready.	Follow directions of SES and/or NSW Police. Prepare to evacuate flood affected area.

NOTIFICATION, WARNING AND EVACUATION ARRANGEMENTS FOR A POTENTIAL FAILURE OF KEEPIT DAM

Alert Level	Defining Conditions	Flood Effects	Time Elapsed (Worse Case)	Notification Arrangements and Actions			
				State Water / DLWC	Gunnedah SES	Namoi SES Division HQ	People at Threat
Green	System operating normally, storage at or near to Full Supply Level	Nil	N/A	No action required apart from standard surveillance; no danger implied; normal water level.	No action required.	No action required.	No action required.
White	Downstream gauging station indicates a flow of 100,000 ML/day being released from Keepit Dam	The Namoi River normally flows within the banks of the river. The low-level bridge at Carroll Gap is affected at about 25 000 ML/day. Other tributaries (Peel River) may affect the flow at Carroll and Gunnedah.	Not available	Continue routine surveillance. Inform local State Water staff and SES Namoi Division by telephone and maintain contact. Automated telephone calls made to SES	Activate the Gunnedah Local Flood Plan. Monitor the behaviour of the storage and areas below the spillway. Advise Namoi SES Division Headquarters and other emergency services.	Ensure that the evacuation centre is ready.	No action required unless directed to do so by SES

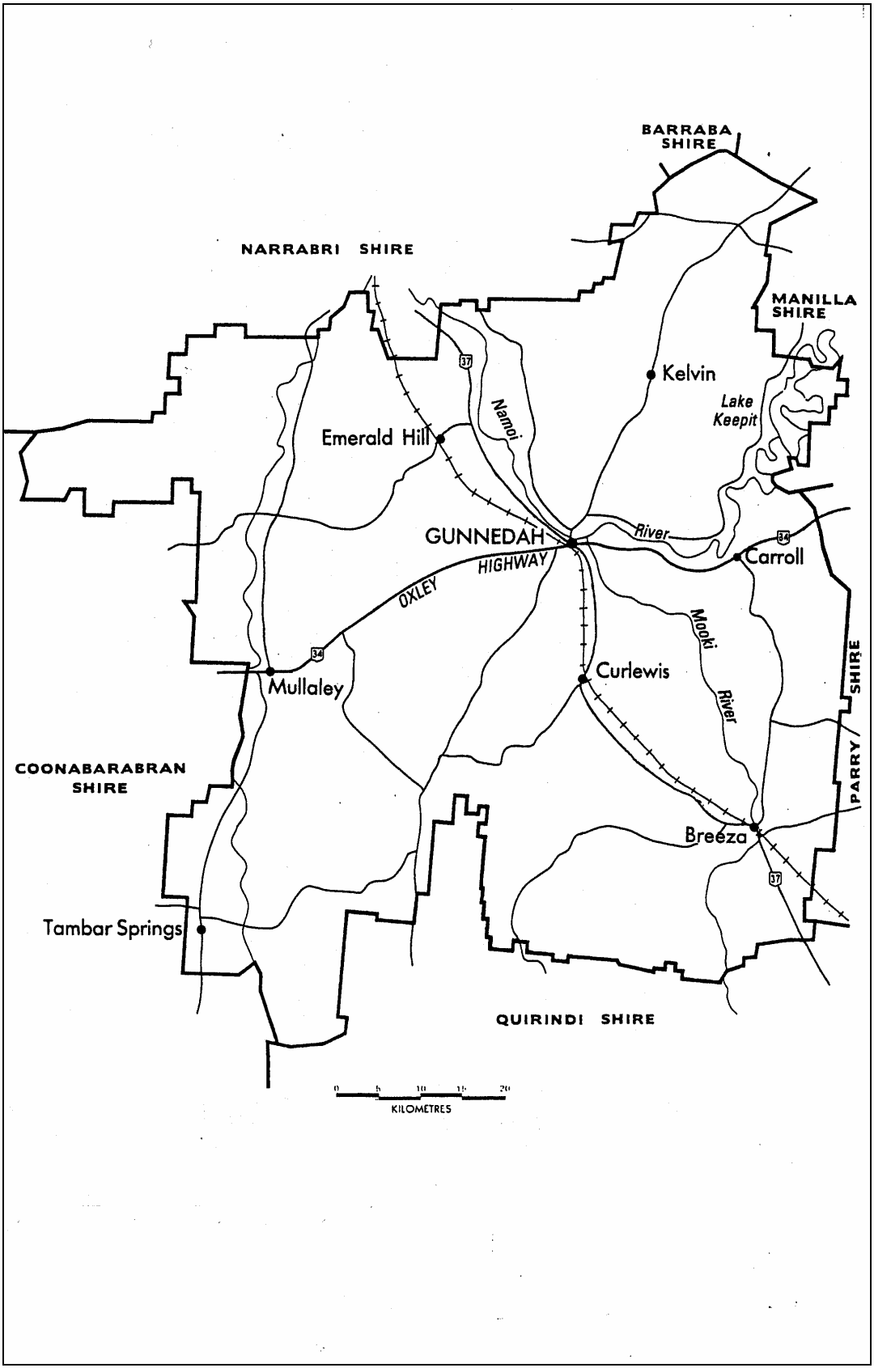
Alert Level	Defining Conditions	Flood Effects	Time Elapsed (Worse Case)	Notification Arrangements and Actions			
				State Water / DLWC	Gunnedah SES	Namoi SES Division HQ	People at Threat
Amber	Storage reaches the original Design Flood Level of RL 333.530; ie. 3.962 metres above Full Supply Level (Spillway discharge will be approximately 900,000 ML/day).	Significant flooding in the Namoi Valley. Carroll and Gunnedah have water flowing through them	5 hours from commencement of inflow to the storage. (Gates not raised.)	Initiate ACTION 2 of Keepit Dam DSEP. Continue visual surveillance. Inform State Water Dam Engineers and SES Namoi Division by telephone and maintain contact. Trigger light/siren alarms and activate automated telephone calls.	Warn downstream residents and prepare for possible evacuation of all residences at risk of dam failure flood.	Ensure that warnings are broadcast over radio stations 2MO, 2GGG, 2TM, Tamworth FM and 2NU (ABC).	Prepare to evacuate. (Collect valuables and dependents.)
Red	Dam storage level at RL334.45 (4.88 metres above Full Supply Level). This level is 0.3 metres below the top of the upstream parapet wall. (Spillway discharge will be approximately 940,000 ML/day).	Serious flooding in the Namoi Valley. Carroll and the affected areas of Gunnedah should already be evacuated.	8 hours from start of inflow to the storage. (Gates not raised.)	Initiate ACTION 1 of Keepit Dam DSEP, documenting process. Inform State Water Dam Engineers and SES Namoi Division by telephone and maintain contact. Trigger light/siren alarms and activate automated telephone calls.	Evacuate Carroll, low-lying portions of Gunnedah and the occupants of the homesteads immediately downstream of the dam. ***List the homesteads***	Arrange for the evacuation of homesteads further than 15 km downstream of the dam, parts of Gunnedah and areas further down the Namoi Valley.	Area affected is the low-lying areas of the Namoi River valley below Keepit Dam. Affected people should immediately move to assembly points identified by the SES

Alert Level	Defining Conditions	Flood Effects	Time Elapsed (Worse Case)	Notification Arrangements and Actions			
				State Water / DLWC	Gunnedah SES	Namoi SES Division HQ	People at Threat
ALL CLEAR	No apparent threat to life or property		N/A	Confirm stream flows with SES and confirm the "ALL CLEAR"			Return to normal

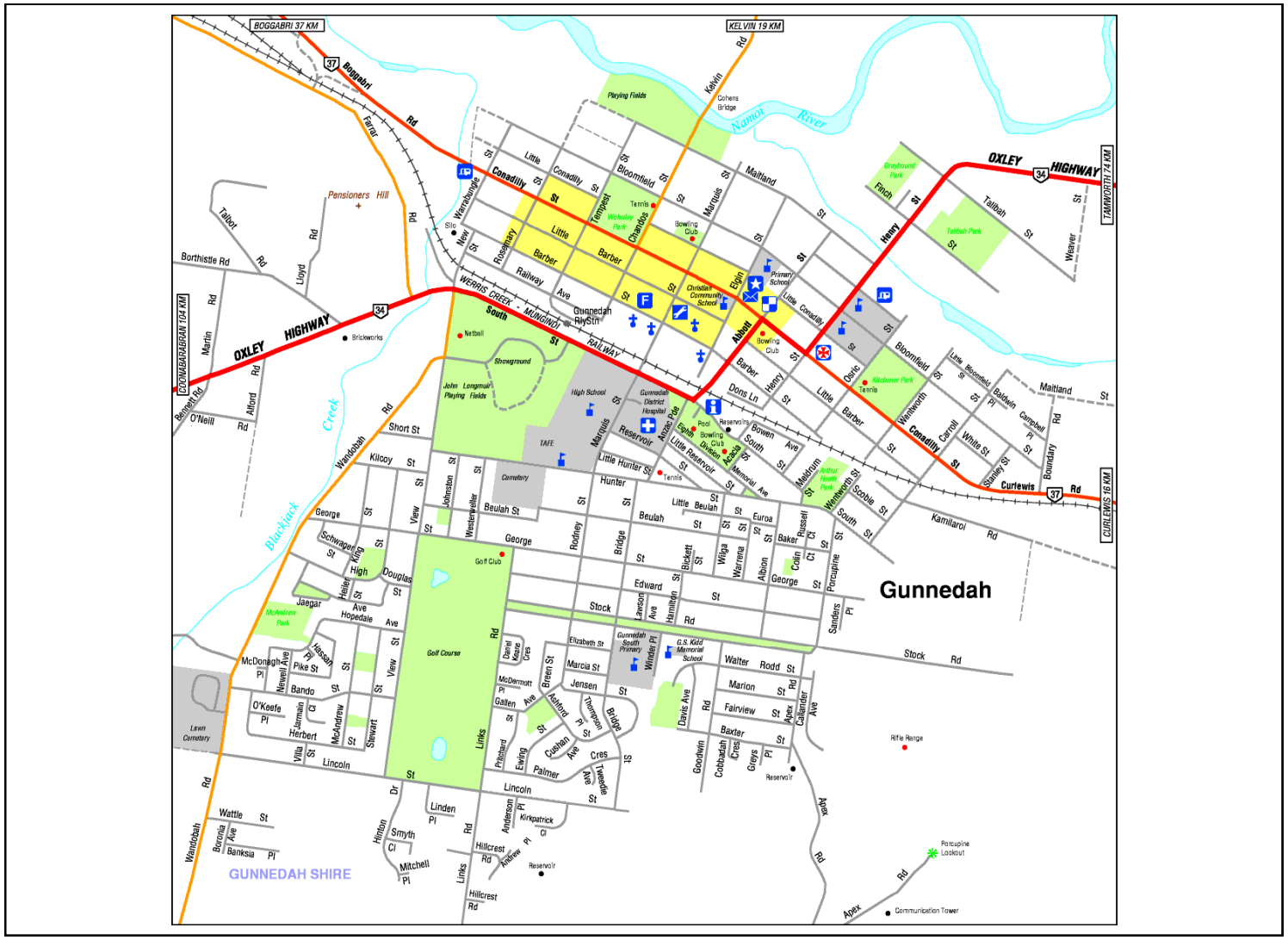
Notes:

1. All Reduced Levels (RL) are in metres AHD.
2. The storage level will normally only reach the white, amber and red levels in a flood.
3. Other circumstances may also trigger the white, amber and red levels.
4. These alert levels will need to be reviewed on completion of the Keepit Dam Upgrade Works.
5. Flows in the Namoi River have been removed since the releases from Keepit Dam will be dependent on the storage level and inflows to the storage.
6. The above information related to minimum times available has been calculated and may be subject to error depending on the rainfall that occurs in the Keepit Dam catchment.

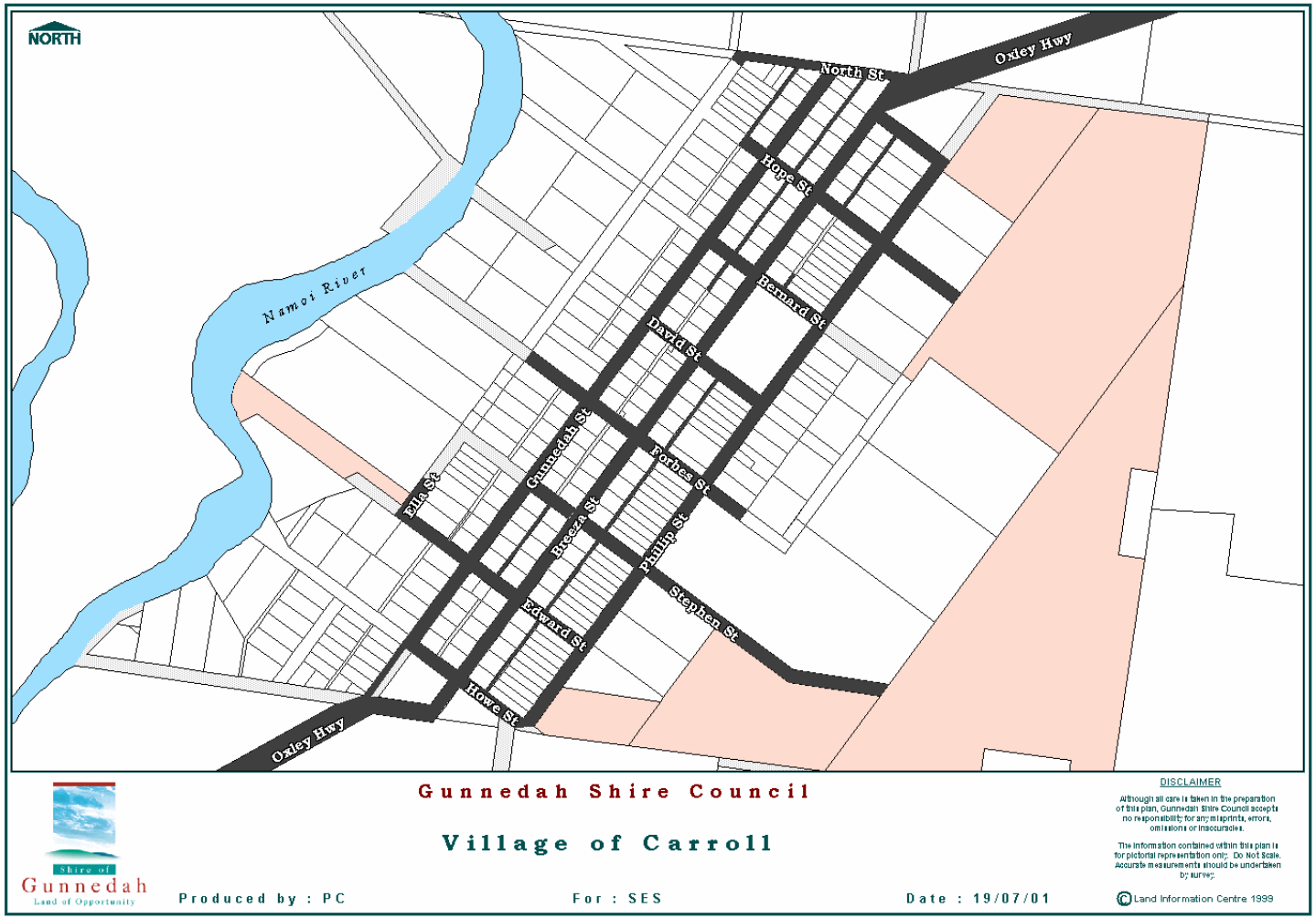
MAP 1 - GUNNEDAH SHIRE COUNCIL AREA



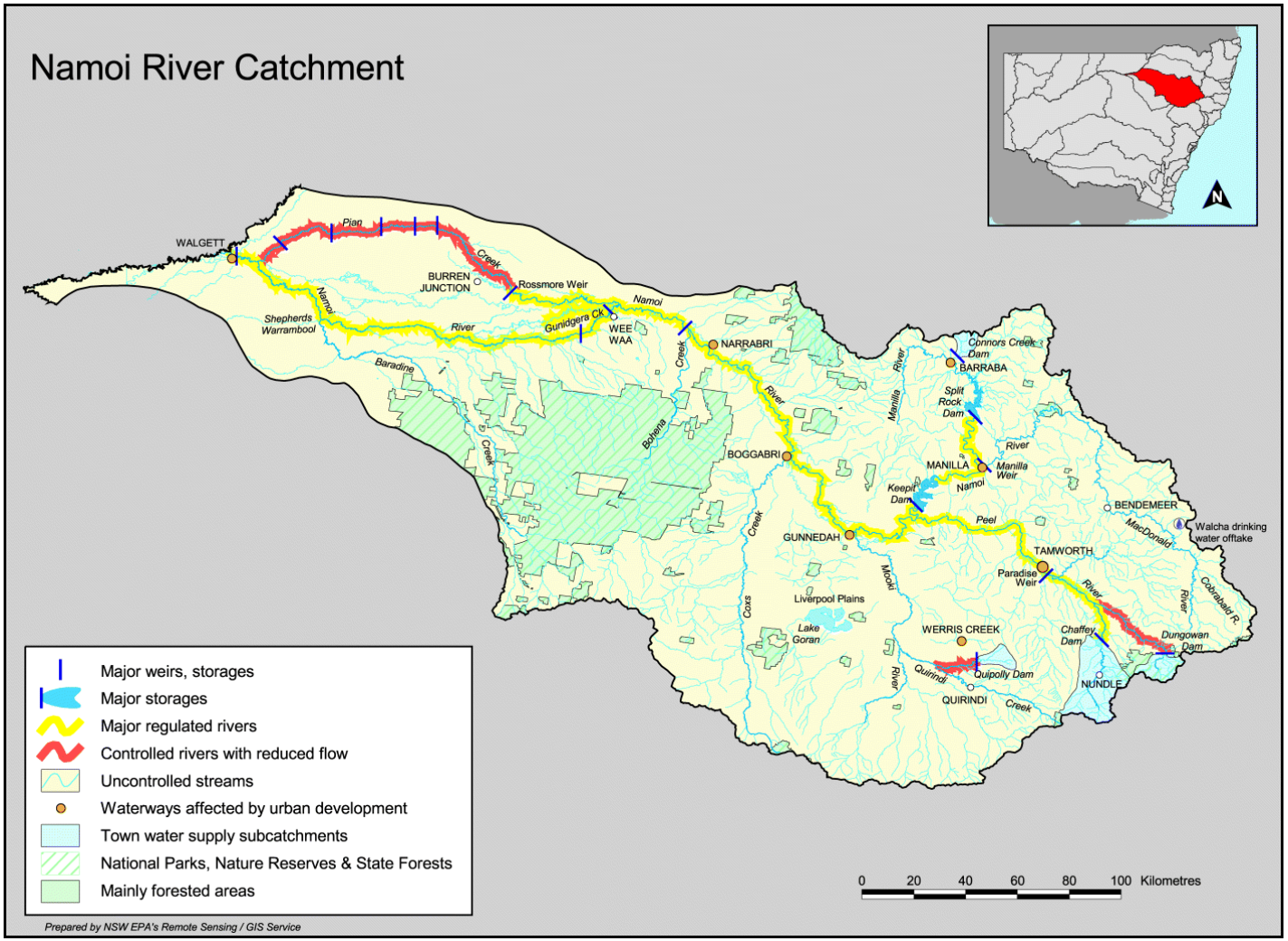
MAP 2 - GUNNEDAH



MAP 3 - CARROLL



MAP 4 - NAMOI RIVER BASIN



MAP 5 - FLOODING AT GUNNEDAH 27 JULY 1998 (8.84m)