

**Tenterfield Shire**

# Local Flood Emergency Sub Plan



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# TENTERFIELD SHIRE FLOOD EMERGENCY SUB PLAN

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

**Volume 1 of the Tenterfield Shire Flood Emergency Sub Plan**

**Version 3.0**

# AUTHORISATION

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



*NSW SES Local Commander – New England*

Print Name:

Johnathon Tarran

Date:

21/09/2023

## Endorsed

Signature:



*Chair, Local Emergency Management Committee*

Print Name:

Glenn Wilcox

Date:

14<sup>th</sup> December 2023

## VERSION HISTORY

Version Number	Description	Date
1.0	Tenterfield Shire Local Flood Plan	April 2011
2.0	Tenterfield Shire Local Flood Plan	March 2013
3.0	Tenterfield 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

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# 1 OUTLINE AND SCOPE

## 1.1 PURPOSE

- 1.1.1 The purpose of this plan is to set out the multi-agency arrangements for the emergency management of flooding in the Tenterfield Shire Council 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 Tenterfield Shire Local Emergency Management Plan (EMPLAN) and is endorsed by the Tenterfield 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 Tenterfield 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 Tenterfield Shire Council LGA. The Tenterfield Shire Council 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 Tenterfield Shire Council level emergency management arrangements for prevention, preparation, response and initial recovery for flooding in the Tenterfield Shire Council 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 Tenterfield Shire Council 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 Tenterfield Shire Council LGA.

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

Dam Name	Owner	High Risk Dam
Tenterfield Creek Dam	Tenterfield Shire Council	No
Humphries Creek Dam	White Rock Minerals Ltd	No
Humphries Creek Tailings Dam	White Rock Minerals Ltd	No
Glenlyon Dam (QLD)	SunWater	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).
- 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. Tenterfield Shire Council has developed and maintains a flash flood warning system for Tenterfield Creek.

- f. 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.
- g. NSW SES maintains a dedicated dam failure hotline and procedures to ensure priority dissemination of dam failure warnings.
- h. 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.
- i. 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. Councils will use the following established flash flood warning system for Tenterfield Creek to provide warnings and information to NSW SES, key stakeholders, and the community.
- c. Dam Owners will utilise the Dam Emergency Plan to provide warnings and information to NSW SES and communities (where appropriate).
- d. NSW SES Incident Controllers will issue the following NSW SES Flood Warnings aligning to the Australian Warning System:
  - Advice
  - Watch and Act
  - Emergency Warning
- e. NSW SES liaises with the Bureau to discuss the development of flood warnings as required.
- f. NSW SES provides alerts and deliver flood information to affected communities using a combination of public information.
- g. NSW SES may request supporting agencies redistribute NSW SES alerts and information, including through the provision of doorknocking teams.
- h. 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](http://www.livetraffic.com) or 'Transport InfoLine': 131 500. VMS messaging on roadways may also be used to advise motorists.
- i. 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.
- j. 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. Tenterfield 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 Tenterfield 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 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 **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 the Local EMPLAN.

- f. NSW Police Force will coordinate the provision of overall security for evacuated areas.

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

- a. NSW SES will control and coordinate the evacuation of affected communities.
- b. The NSW SES Commissioner (or delegate) will warn communities to prepare for a possible evacuation, where circumstances allow such lead time.
- c. The NSW SES Commissioner (or delegate) will order any necessary evacuations and provide information to the community about when and how to evacuate.
- d. Support to evacuation operations may be requested from other emergency services and supporting agencies using arrangements in the local EMPLAN and supporting plans.
- e. 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 Tenterfield 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 Tenterfield Shire Council Council(s) 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 SEOCAN 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.

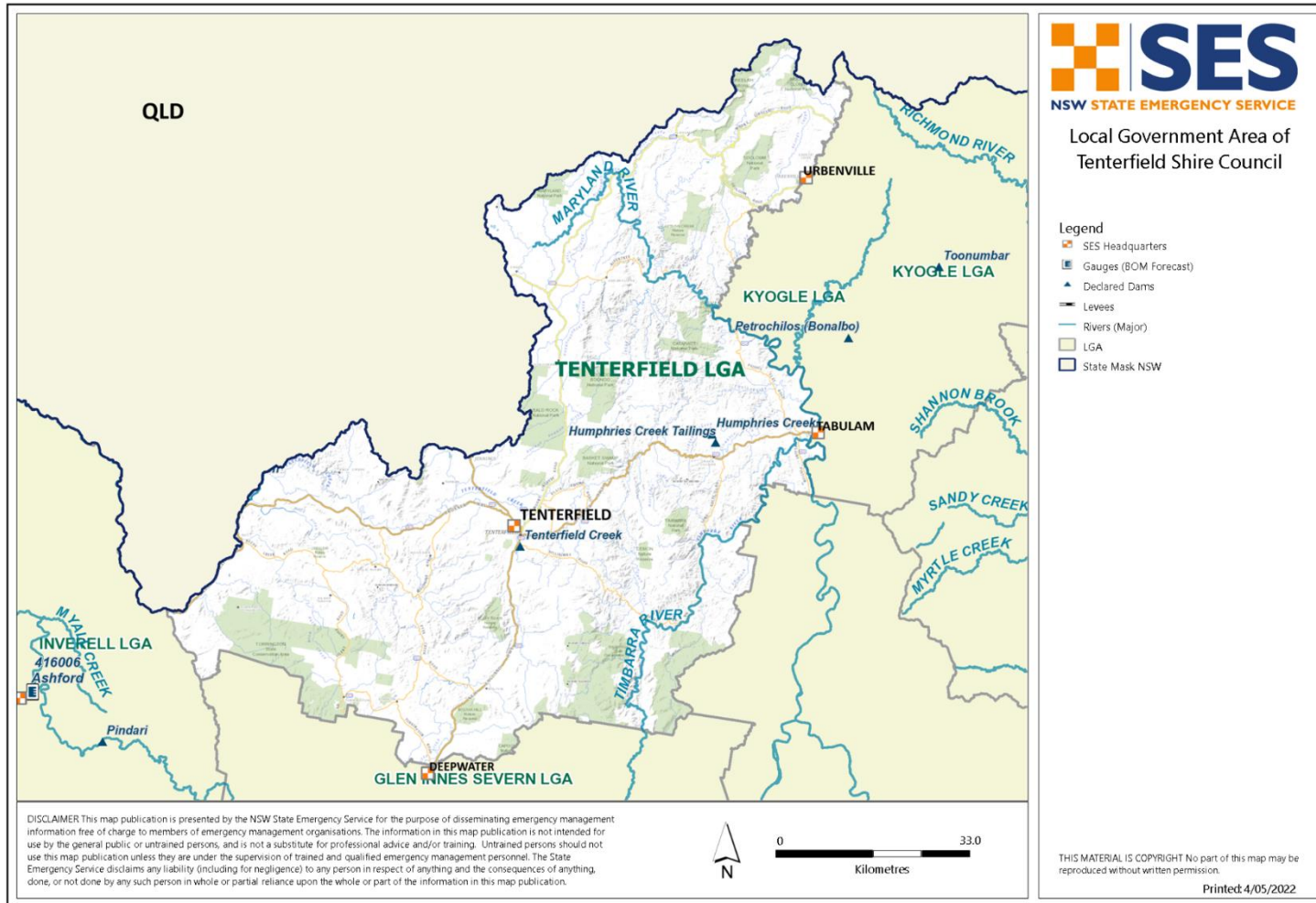
Readers should refer to EMPLAN Annex 9 – Definitions.

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 Tenterfield 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 <a href="#">NSW State Flood Plan</a> .

AGENCY	RESPONSIBILITIES
Agriculture and Animal Services Functional Area	The roles and responsibilities for Agriculture and Animal Services are outlined in the Agriculture and Animal Services Supporting Plan and NSW State Flood Plan.
Australian Government Bureau of Meteorology	The roles and responsibilities for the Australian Government Bureau of Meteorology are outlined in the NSW State Flood Plan.
Caravan Park Proprietor(s)	<ul style="list-style-type: none"> <li>• Prepare a flood emergency plan for the Caravan Park.</li> <li>• Ensure that owners and occupiers of movable dwellings are aware that the caravan park is flood liable by providing a written notice to occupiers taking up residence and displaying this notice and emergency management arrangement within the park.</li> <li>• Ensure that owners and occupiers of movable dwellings are aware that if they are expecting to be absent for extended periods, they should: <ul style="list-style-type: none"> <li>– Provide the manager of the caravan park with a contact address and telephone number in case of an emergency.</li> <li>– Leave any movable dwelling in a condition allowing it to be relocated in an emergency (i.e.: should ensure that the wheels, axles and draw bar of the caravans are not removed and are maintained in proper working order).</li> </ul> </li> <li>• Ensure that occupiers are informed of Flood Information. At this time, occupiers should be advised to: <ul style="list-style-type: none"> <li>– Ensure that they have spare batteries for their radios.</li> <li>– Listen to a local radio station for updated flood information.</li> <li>– Prepare for evacuation and movable dwelling (cabins) relocation.</li> </ul> </li> <li>• Ensure that owners and occupiers of caravans are aware of what they must do to facilitate evacuation and movable dwelling relocation when flooding occurs.</li> <li>• Coordinate the evacuation of people and the relocation of movable dwellings when floods are rising and their return when flood waters have subsided. Movable dwellings will be relocated back to the</li> </ul>

AGENCY	RESPONSIBILITIES
	<p>caravan park(s) by owners or by vehicles and drivers arranged by the park managers.</p> <ul style="list-style-type: none"> <li>• Secure any movable dwellings that are not able to be relocated to prevent floatation.</li> <li>• Inform NSW SES of the progress of evacuation and/or movable dwellings relocation operations and of any need for assistance in the conduct of these tasks.</li> </ul>
<b>Childcare Centres and Preschools</b>	<ul style="list-style-type: none"> <li>• When notified of possible flooding or isolation, childcare centres and preschools should. <ul style="list-style-type: none"> <li>– Liaise with NSW SES and arrange for the early release of children whose travel arrangements are likely to be disrupted by flooding and/or road closures.</li> <li>– Assist with coordinating the evacuation of preschools and childcare centres.</li> </ul> </li> </ul>
<b>Dams Safety NSW</b>	The roles and responsibilities for Dams Safety NSW (formerly NSW Dam Safety Committee) are outlined in the NSW State Flood Plan.
<b>Department of Defence</b>	Arrangements for Defence Assistance to the Civil Community are detailed within the State EMPLAN (section 448).
<b>Energy and Utilities Services Functional Area</b>	<p>The roles and responsibilities for Energy and Utilities Services are outlined in the Energy and Utility Services Supporting Plan (EUSPLAN).</p> <p>Roles and responsibilities in addition to the Supporting Plan are:</p> <ul style="list-style-type: none"> <li>• Assist NSW SES with identification of infrastructure at risk of flood damage where resources are available.</li> <li>• Facilitate local utility service distribution providers (electricity, gas, water, wastewater) to: <ul style="list-style-type: none"> <li>– Provide advice to NSW SES of any need to disconnect power/gas/water/wastewater supplies or of any timetable for reconnection.</li> <li>– Advise NSW SES of any hazards from utility services during flooding and coastal erosion/inundation.</li> <li>– Advise the public with regard to electrical hazards during flooding and coastal erosion/inundation, and to the availability or otherwise of the electricity supply.</li> <li>– Clear or make safe any hazard caused by power lines or electricity distribution equipment.</li> <li>– Reconnect customers' electrical/ gas/ water/wastewater installations, when certified safe to do so and as conditions allow.</li> <li>– Assist NSW SES to identify infrastructure at risk of flooding for incorporation into planning and intelligence.</li> </ul> </li> </ul>

<b>AGENCY</b>	<b>RESPONSIBILITIES</b>
<b>Engineering Services Functional Area</b>	The roles and responsibilities for Engineering Services are outlined in the Engineering Services Supporting Plan and NSW State Flood Plan.
<b>Environmental Services Functional Area</b>	The roles and responsibilities for Environmental Services are outlined in the Environmental Services (ENVIROPLAN) Supporting Plan.
<b>Floodplain Management Australia</b>	The roles and responsibilities for Floodplain Management Australia are outlined in the NSW State Flood Plan.
<b>Fire and Rescue NSW</b>	The roles and responsibilities for Fire and Rescue NSW are outlined in the NSW State Flood Plan.
<b>Forestry Corporation of NSW</b>	The roles and responsibilities for Forestry Corporation of NSW are outlined in the NSW State Flood Plan.
<b>Health Services Functional Area</b>	The roles and responsibilities for Health Services are outlined in the Health Services (HEALTHPLAN) Supporting Plan and NSW State Flood Plan.
<b>Local Emergency Operations Controller (LEOCON)</b>	<ul style="list-style-type: none"> <li>• Monitor flood operations.</li> <li>• If requested, coordinate support for the NSW SES Incident Controller.</li> </ul>
<b>Local Emergency Management Officer (LEMO)</b>	<ul style="list-style-type: none"> <li>• If requested by the NSW SES Incident Controller, advise appropriate agencies and officers of the start of response operations.</li> </ul>
<b>Manly Hydraulics Laboratory (MHL)</b>	The roles and responsibilities for Manly Hydraulic Laboratory are outlined in the NSW State Flood Plan.
<b>Marine Rescue NSW</b>	The roles and responsibilities for Marine Rescue NSW are outlined in the NSW State Flood Plan.
<b>NSW Ambulance</b>	The roles and responsibilities for NSW Ambulance are outlined in the Health Services (HEALTHPLAN) Supporting Plan and NSW State Flood Plan.
<b>NSW Department of Education, Association of Independent Schools of NSW, and National Catholic Education Commission</b>	The roles and responsibilities for NSW Department of Education, Association of Independent Schools of NSW, and National Catholic Education Commission are outlined in the NSW State Flood Plan.
<b>NSW Department of Planning and Environment (Environment and Heritage Group)</b>	The roles and responsibilities for NSW Department of Planning and Environment (Environment and Heritage Group) are outlined in the NSW State Flood Plan (referred to as DPIE EES).
<b>NSW Department of Planning and Environment (Water)</b>	The roles and responsibilities for NSW Department of Planning and Environment (Water) are outlined in the NSW State Flood Plan.
<b>NSW Food Authority</b>	The roles and responsibilities for NSW Food Authority are outlined in the Food Safety Emergency Sub Plan.
<b>NSW National Parks and Wildlife Services</b>	The roles and responsibilities for NSW National Parks and Wildlife Services are outlined in the NSW State Flood Plan.

AGENCY	RESPONSIBILITIES
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.
SEOCN/SEOC	The roles and responsibilities for the SEOCN/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.
Tenterfield Shire Council	<p><b>Preparedness</b></p> <ul style="list-style-type: none"> <li>• Establish and maintain floodplain and coastal risk management committees and ensure that key agencies are represented.</li> <li>• Develop and implement flood risk management plans in accordance with the NSW Government’s Flood Prone Land Policy and the Flood Risk Management Manual.</li> <li>• Provide levee studies, flood studies and flood risk management studies to NSW SES.</li> <li>• Maintain Dam Emergency Plans for the Tenterfield Creek dam and provide copies to NSW SES.</li> <li>• Provide information on the consequences of dam failure to NSW SES for incorporation into planning and flood intelligence.</li> <li>• Coordinate the development of warning services for catchments prone to flash flooding (small catchments), where appropriate.</li> <li>• Maintain council-owned flood warning networks and flood mitigation works.</li> <li>• Participate in NSW SES-led flood emergency planning meetings, to assist in the preparation of Flood Sub Plans.</li> </ul>

AGENCY	RESPONSIBILITIES
	<ul style="list-style-type: none"> <li>• Maintain a plant and equipment resource list for the council area.</li> <li>• Contribute to community engagement activities.</li> </ul> <p><b>Response</b></p> <ul style="list-style-type: none"> <li>• Subject to the availability of council resources, assist NSW SES with flood operations including: <ul style="list-style-type: none"> <li>– Traffic management on council managed roads.</li> <li>– Provision of assistance to NSW SES (plant, equipment, and personnel where able and requested).</li> <li>– Property protection tasks including sandbagging.</li> <li>– Assist with the removal of caravans from caravan parks.</li> <li>– Warning and/or evacuation of residents and other people in flood liable areas.</li> <li>– Provision of back-up radio communications.</li> <li>– Resupply of isolated properties.</li> <li>– Technical advice on the impacts of flooding.</li> <li>– Close and reopen council roads (and other roads nominated by agreement with Transport for NSW) and advise NSW SES, NSW Police Force and people who contact the council for road information.</li> <li>– Assist NSW SES to provide filled sandbags and filling facilities to residents and business in areas which flooding is expected.</li> </ul> </li> <li>• Assist with making facilities available for domestic pets and companion animals of evacuees during evacuations.</li> <li>• Operate a flash flood warning system.</li> <li>• Operate flood mitigation works including critical structures such as detention basins and levees and advise NSW SES regarding their operation.</li> <li>• Manage and protect council-owned infrastructure facilities during floods.</li> <li>• Provide advice to NSW SES and the Health Services Functional Area during floods about key council managed infrastructure such as sewerage treatment and water supply.</li> <li>• Advise the Environmental Protection Authority of any sewerage overflow caused by flooding.</li> <li>• Work with NSW SES and NSW Department of Planning and Environment to collect flood related data during and after flood events.</li> </ul>

AGENCY	RESPONSIBILITIES
	<p><b>Recovery</b></p> <ul style="list-style-type: none"> <li>• Provide for the management of health hazards associated with flooding including removing debris and waste.</li> <li>• Ensure premises are fit and safe for reoccupation and assess any need for demolition.</li> <li>• Provide services, assistance and advice to State Government in accordance with the State Recovery Plan.</li> </ul>
<b>Transport for NSW</b>	<ul style="list-style-type: none"> <li>• Transport for NSW coordinates information on road conditions for emergency services access.</li> <li>• Transport for NSW coordinates the management of the road network across all modes of transport.</li> <li>• Transport for NSW in conjunction will assist NSW SES with the evacuation of at-risk communities by maintaining access and egress routes.</li> <li>• Assist NSW SES with the communication of flood warnings and information provision to the public through Live Traffic and Social Media according to the VMS protocols and procedures.</li> <li>• Assist NSW SES with identification of road infrastructure at risk of flooding.</li> </ul>
<b>Transport Services Functional Area</b>	The roles and responsibilities for Transport Services are outlined in the Transport Services Functional Area Supporting Plan and NSW State Flood Plan.
<b>VRA Rescue NSW</b>	The roles and responsibilities for VRA Rescue NSW are outlined in the NSW State Flood Plan.
<b>Water NSW</b>	The roles and responsibilities for Water NSW are outlined in the NSW State Flood Plan.
<b>Welfare Services Functional Area</b>	The roles and responsibilities for Welfare Services are outlined in the Welfare Services Functional Area Supporting Plan and NSW State Flood Plan.



## 11 Appendix C – Community Specific Roles and Responsibilities

<p><b>Community Members</b></p>	<p><b>Preparedness</b></p> <ul style="list-style-type: none"> <li>• Understand the potential risk and impact of flooding.</li> <li>• Prepare homes and property to reduce the impact of flooding.</li> <li>• Understand warnings and other triggers for action and the safest actions to take in a flood.</li> <li>• Households, institutions, and businesses develop plans to manage flood risks, sharing and practicing this with family, friends, employees, and neighbours.</li> <li>• Have an emergency kit.</li> <li>• Be involved in local emergency planning processes.</li> </ul> <p><b>Recovery</b></p> <ul style="list-style-type: none"> <li>• Assist with community clean-up if required and able to do so.</li> <li>• Participate in After Action Reviews if required.</li> </ul>
<p><b>Aboriginal organisations or groups</b></p>	<ul style="list-style-type: none"> <li>• Act as the point of contact between NSW SES and the Tenterfield community.</li> <li>• Inform the NSW SES Incident Controller about flood conditions and response needs.</li> <li>• Disseminate flood information, including flood and evacuation warnings, to the Tenterfield community.</li> <li>• Moombahlene Local Aboriginal Land Council (LALC) – 02 6736 3219</li> </ul>

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# HAZARD AND RISK IN TENTERFIELD SHIRE

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**Volume 2 of the Tenterfield Shire Local Flood Plan**

**Last Update: April 2017**

## AUTHORISATION

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

Approved



\_\_\_\_\_  
Manager Emergency Risk Management

Date: 15/5/17

Approved



A/ \_\_\_\_\_  
NSW SES Namoi North West Region Controller

Date: 26/04/2017

Tabled at LEMC

Date:

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## VERSION LIST

The following table lists all previously approved versions of this Volume.

Description	Date
Tenterfield Shire Local Flood Plan – Annex A	February 2000

## AMENDMENT LIST

Suggestions for amendments to this Volume should be forwarded to:

The Tenterfield Local Controller

NSW State Emergency Service

418 Frome Street, MOREE NSW 2400

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

Amendment Number	Description	Updated by	Date

*Document Issue: Version 3-02052016*

# 1 THE FLOOD EROSION THREAT

## 1.1 OVERVIEW

- a. The Tenterfield Shire LGA is located in the New England Region of New South Wales. The northern border of the LGA is located on the New South Wales/Queensland border.
- b. The eastern portion of the LGA is located in the Clarence River Basin with the towns of Urbenville, Drake and Liston.
- c. The western portion of the LGA is located in the Border Rivers Basin with the towns of Tenterfield, Jennings, Mingoola and Bolivia.
- d. The Tenterfield Shire LGA is shown on Map 3.

## 1.2 LANDFORMS AND RIVER SYSTEMS

### Border Rivers Basin

- a. West of the Great Dividing Range the council area is drained by the Dumaresq River and its tributaries, among them the Mole, Bluff, Deepwater and Beardy Rivers and Tenterfield and Reedy Creeks (1).
- b. The Glenlyon Dam is located on Pike Creek, a tributary of the Dumaresq River near Mingoola, in Queensland (1).
- c. Tenterfield Creek Dam is located on Tenterfield Creek on the southern outskirts of Tenterfield (1).
- d. Much of the land drained by these streams is given over to agricultural land uses (1).
- e. The Borders River basin is shown on Map 1.

### Clarence River Basin

- f. The upper Clarence River is rugged, forested and lightly populated. The principal tributaries of the Clarence River are the Maryland, Cataract and Timbarra (Rocky) rivers and Tooloom Creek (1).
- g. The Clarence River Basin is shown on Map 2.

### 1.3 STORAGE DAMS

- a. Dam locations are shown on River Basin maps (Map 1 and Map 2).

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

<b>Glenlyon Dam (2)</b>	
Owner / Operator	Glenlyon Dam is managed and operated under a facility management contract by SunWater on behalf of the dam owner Dumaresq-Barwon Border Rivers Commission.
Description of Dam	Glenlyon Dam is also known as Pike Creek Reserve. The dam is a 47 metre high earthfill and rockfill structure with a total crest length of 560 metres with a 74.4m long spillway; storage capacity of 254,000 ML at full supply level.
Location	Glenlyon Dam is located on Pike Creek, a tributary of the Dumaresq River near Mingoola, in Queensland. The dam is not situated within the Tenterfield Shire LGA however any flooding related to the dam will affect the Dumaresq River and Mole River floodplains within Tenterfield Shire LGA boundaries.
Communities Downstream	While not directly downstream from the Glenlyon Dam, Mingoola is 16km from Glenlyon Dam (also known as Pike Creek Reservoir). The Mingoola Village is located 2.17 km up stream on the banks of the Mole River from the junction of the Dumaresq River. Much of Mingoola is situated in a large valley containing large areas of flat farm land. In the event of a dam failure, Mingoola would be greatly impacted by back up flow from the Dumaresq and Mole rivers creating considerable infrastructure damage and isolation concerns.
Monitoring System	Visual inspections, electric settlement measure, seepage measurement, piezometers.
Warning System	There is no warning system identified for downstream residents, however SunWater has pre-prepared shape files for utilisation in Emergency Alert or other spatially based alerting systems which include Mingoola.



Tenterfield Creek (3)	
Owner / Operator	Tenterfield Shire Council
Description of Dam	15 m high concrete structure with a total crest length of 360 m including a 202 m wide overflow ungated spillway at its centre. The storage capacity is 1,390 ML at full supply level.
Location	Located on the southern outskirts of Tenterfield within the Tenterfield LGA and the Macintyre-Dumaresq River Basin.
Communities Downstream	If Tenterfield Creek Dam failure were to occur, a dam-failure flood wave would inundate all bridges and lower lying roads within the town and inundate some 176 properties with 142 residential properties and several commercial and institutional buildings within five kilometres of the dam wall. Of the residential properties, 64 are located on the eastern side of Tenterfield Creek and 78 on the western side.
Monitoring System	SCADA telemetry automatically records rainfall and reservoir inflows.
Warning System	There are 3 sirens in the CBD which are activated when the Red alert condition develops.
Other	The structure has been assessed as being unable to withstand extreme flooding of near PMF proportions. Sunny Day Failure and PMF Failure would take 25mins for the flood wave peak to reach Douglas Street, Tenterfield.

- b. Other prescribed Dams in the Tenterfield Shire LGA include:
- i. Humphries Creek Dam
  - ii. Humphries Creek Tailings

These dams are located approximately 5km north of Drake Village and are owned by White Rock Minerals. While these dams are located in the Tenterfield Shire LGA, impacts would be into the Clarence River Catchment (4).

## 1.4 WEATHER SYSTEMS AND FLOODING

- a. Flooding within the council area can occur at any time of year, but summer floods tend to predominate. Four types of weather systems produce floods:
- i. **Low pressure troughs** moving into the council area from northern parts of Australia, usually during the summer and autumn months. These systems, which can include rain depressions originating as tropical cyclones in the Gulf of Carpentaria, can cause severe flooding within periods of a day or less. Minor flooding in the council area in January 1996 resulted from such a rain depression (5). This occurred again in January 2011 resulting in Major flooding (6).

- ii. **East Coast low-pressure systems** which travel along the coast, usually in the cooler months, may cause flooding even to the west of the Great Dividing Range. The flooding on the upper Clarence River and Tenterfield Creek in May 1996 was of such an origin (1).
  - iii. **Frontal systems** crossing the council area from west to east. These systems rarely produce high daily falls but flooding can occur when sequences of fronts cross the area over a period of a few days. In general, these systems are experienced during the winter and spring. Heavy rain in winter 1998 resulted from fronts of this type, leading to minor flooding (1).
  - iv. **High-intensity, short-duration convective thunderstorms** which usually occur during the summer months. The rain from such storms may cause town drainage systems to surcharge and small creeks to flood, but thunderstorm activity rarely causes significant rises in the major rivers (1).
- b. All the streams within the council area tend to rise and fall quickly, especially in the higher country, and much of the flooding which occurs is 'flash' flooding. Except for Flood Warnings, which the Bureau of Meteorology issue for major catchments such as the Clarence and Dumaresq-Macintyre when flood-producing rains are forecast, or the Severe Thunderstorm Advices which are issued between the months of October and March, formal flood warning services do not exist in the Tenterfield LGA. Often, the only warning of flooding is the rain which precedes it (1).

## 1.5 CHARACTERISTICS OF FLOODING

- a. All the streams within the council area tend to rise and fall quickly, especially in the higher country, and much of the flooding which occurs is 'flash' flooding (7).
- b. The rate of rise of flood levels in Tenterfield township will depend on the rainfall characteristics of individual storms, and the available storage in Tenterfield Dam. In general it is expected that creek water levels within the town will rise 2-3 hours after the start of heavy rainfall in upstream catchments. However in extreme events this may start to occur as quickly as 15 -30 minutes after heavy rainfall (8).

Table 2: Indicative Flow Travel Time for the Tenterfield Creek

Locations	Travel Distance (from Dam Wall)	Estimated Travel Time
Tenterfield Dam to Tenterfield township	3 km	33 minutes
New England Highway, downstream of the Tenterfield Dam	0.86 km	9.5 minutes
Currys Gap Creek contributing to Tenterfield Creek	1.92 km	21.3 minutes
Douglas St Bridge	2.04 km	22 minutes
Showground, the causeway, footbridge, the northern footbridge and the Manners St bridge	2.42 km	26 minutes
The Naas St (west) bridge	4.31 km	47.8 minutes
Rouse St bridge (or New England Highway to the north of the town)	4.47 km	49.6 minutes

**Note: these times are an estimate and may vary depending on environmental conditions.**

## 1.6 FLOOD HISTORY

- a. The largest recorded flood event in the hydrometric archive across the council area occurred in January 2011. This event produced large floods in Tenterfield Creek, the Deepwater River, the Mole River and the Dumaresq River. This event was produced by an intense storm lasting several days along the eastern edge of the catchment. This storm system produced very heavy rainfalls along the catchment divide, including the Tenterfield Creek catchment upstream of Tenterfield, and the Deepwater River catchment upstream of Deepwater (8).
- b. A flood event also affecting the entire council area but of slightly smaller magnitude occurred in 1976 (7).
- c. Flood events in upstream catchments have also been produced by smaller storms over local catchments. This includes significant events in the Deepwater River in 1996 and 2001, and in Tenterfield Creek in 2001 (8).

## 1.7 FLOOD MITIGATION SYSTEMS

- a. There are no formal engineered flood mitigation systems in the Tenterfield LGA (7).

## 1.8 EXTREME FLOODING

- a. Extreme flooding will cause severe and widespread resupply, road closure, infrastructure damage and property inundation problems (7).
- b. Rural residents in the Mole and Dumaresq valley floodplains will be isolated for extended periods with over floor flooding of farm residences and destruction of farmland infrastructure, fencing and crops. Additionally inundation will cause

damage to a large number of properties within Tenterfield and surrounding rural areas, including over floor inundation (7).

- c. Extreme flooding will also cause overtopping and potential loss of road bridges throughout the shire including those on the major Bruxner Highway and New England Highway, and inundation of lengths of these highways where they run along lower lying floodplain. All bridges within the Tenterfield township will be overtopped preventing movement between the eastern and western sides of the town (7).
- d. Within the Tenterfield township, extreme flooding in the Probable Maximum Flood (PMF) event is expected to produce an inundation extent on average 350 metres wide along the creek corridor; velocities within 100-200 metres of the creek channel will generally be greater than 0.5 metres per second, and 105 buildings within 100-200 metres of the creek channel will be flooded above floor level (8) (9).
- e. Extreme flooding will also cause disruption to power supplies and fixed and mobile telephony including destruction of network poles on floodplains (7).

## 2 EFFECTS ON THE COMMUNITY

### 2.1 COMMUNITY PROFILE

Table 2: Census of Housing and Population data (2011)

Census Description	Tenterfield LGA	Tenterfield	Urbenville
<b>Total Persons</b>	<b>6,811</b>	<b>3,959</b>	<b>613</b>
Aged 0-4 yrs	403	238	28
Aged 5-14 yrs	896	505	88
Aged 65 + yrs	1,424	936	128
Of Indigenous Origin	459	232	20
Who do not speak English well	10	3	0
Have a need for assistance (profound/severe disability)	467	290	46
Living alone (Total)	860	528	68
Living alone (Aged 65+)	350	248	34
Residing in caravans, cabins or houseboats or improvised dwellings	162	11	3
<b>Occupied Private Dwellings (Households)</b>	<b>2,685</b>	<b>1,603</b>	<b>237</b>
No Motor Vehicle	213	139	7
Caravan, cabin, houseboat or improvised dwell	80	7	3
Rented via State or Housing Authority	61	51	0
Rented via Housing Co-Op or Community Church Group	40	17	0
No Internet Connection	953	567	83
<b>Unoccupied Private Dwellings</b>	<b>704</b>	<b>289</b>	<b>59</b>
<b>Average persons per occup dwelling</b>	<b>2.3</b>	<b>2.2</b>	<b>2.5</b>
<b>Average vehicles per occup dwelling</b>	<b>1.7</b>	<b>1.7</b>	<b>1.9</b>

## SPECIFIC RISK AREAS - FLOOD

### Dumaresq Valley

#### 2.2 TENTERFIELD

##### 2.2.1 Community Overview

- a. Tenterfield is located in the upper headwaters of the Macintyre River valley, approximately 830 metres above sea level. The town is divided by Tenterfield Creek. In 2011 the population of Tenterfield was 3,959 with 21% of the population over the age of 65, and there is a significant amount of residential development on the creek floodplain (8).
- b. Tenterfield is shown on Map 4.

##### 2.2.2 Characteristics of flooding

- a. Flooding occurs quickly due to the steep nature of the upstream catchment to the east. Flood levels in the town are expected to rise rapidly within 2-3 hours of heavy rain falling (7).

##### 2.2.3 Flood Behaviour

- a. Tenterfield lies on the banks of Tenterfield Creek which is an upper tributary of the Darling River. Tenterfield Creek's total catchment area to town is 83 km<sup>2</sup> of which 33 km<sup>2</sup> drains into the upstream water supply dam. The other tributary catchments draining into the town catchment are Groombridges Creek (19 km<sup>2</sup>), Currys Gap Creek (17 km<sup>2</sup>) and two other unnamed creeks east of the town (14 km<sup>2</sup>) (9).
- b. In the 1% AEP design event the high velocity floodway is contained to Tenterfield Creek and to parkland at Naas Street and Manners Street, however in the PMF design flood event this area extends to include areas located 100-200m from the creek channel (10).

##### 2.2.4 Classification of Floodplain

- a. The Tenterfield Township community has rising road access away from the creek floodplain (7).
- b. No flood islands are evident in flood mapping of the creek inundation. Flood extents rise uniformly out of the creek channel without breakouts leaving from and returning to the channel and cutting off areas (8).

##### 2.2.5 Inundation

- a. Within Tenterfield Township minor floods will be contained within the parks and open spaces along the creek corridor, with minimal damage aside from debris fouling

of road and park infrastructure and amenities. In the 1% AEP design flood event at least 54 properties within the town will have either partial or extensive flooding of their yards, though only 6 properties will experience over floor flooding (9).

- b. As the flood magnitude reaches the 0.05% AEP design event 42 buildings have been identified as potentially being impacted by flooding above floor level with 105 properties experiencing over floor flooding in the PMF design event (10). Properties at greatest risk of inundation in the PMF design event are located within 100-200m to the Tenterfield Creek channel (9).
- c. There is no warning system for the community in the township for natural flooding. However Council does maintain a warning system for Tenterfield Creek Dam (7).

#### **2.2.6 Isolation**

- a. Tenterfield may become isolated during large flood events due to access to the by regional highways (Bruxner Highway east and west and the New England Highway north and south) becoming cut. This only occurs for short periods during large events. This most recently occurred in 2011 during a 1% AEP design event (8).
- b. In events above the 0.2% AEP design event, access between the eastern and western sides of Tenterfield becomes lost when all bridge crossings are closed. This may cause isolation of some of the population from critical facilities such as the hospital (9).
- c. Rural properties surrounding Tenterfield may experience isolation. This most recently occurred in 2011 during a 1% AEP design event with 20 people relocated to Tenterfield.

#### **2.2.7 Flood Mitigation Systems**

- a. There are no significant formal flood mitigation measures in Tenterfield (7).

#### **2.2.8 Dams**

- a. Tenterfield Creek Dam is located less than 1km upstream of the township and failure of this dam would result in flooding in Tenterfield (3).
- b. In a Sunny Day failure the peak flood wave would take approximately 25mins to reach Douglas Street and would impact 32 properties located adjacent to Tenterfield Creek with maximum water depths of 2.5m over floor level (3).
- c. A PMF failure would impact 176 properties located 100-200m from the creek channel with maximum water depths of 4.5m over floor level. The peak flood wave would take approximately 25 mins to reach Douglas Street (3).
- d. For more details on property locations please refer to mapping located in the Tenterfield Creek DSEP.

### **2.2.9 At Risk Facilities**

- a. There is one school, one aged care facility and the RFS compound that are impacted by flooding in the PMF design flood event. More information is shown in Annex 2.

### **2.2.10 Other Considerations**

- a. No other considerations



## 2.3 MINGOOLA

### 2.3.1 Community Overview

- a. Mingoola is a rural community, with the main settlement being located at the Bruxner Highway crossing of the Mole River, approximately 2km to the east of the confluence of the Mole and Dumaresq Rivers. The settlement comprises a small school for the local rural community and two houses with small rural holdings (8).
- b. In the wider Mingoola / Mole River area, there are a number of rural properties located along the Mole River and Dumaresq River floodplains. These are generally accessed from the Bruxner Highway and Mole Station Road on the lower Mole River and Dumaresq River floodplains, and from the Mole River Road along the Mole Valley (8).
- c. Mingoola is shown on Map 5.

### 2.3.2 Characteristics of Flooding

- a. Larger floods in the Mingoola area are likely to be generated by widespread heavy rainfall along the eastern side of the Macintyre - Dumaresq catchment. These large floods will take approximately 6-12 hours to rise after the start of heavy rainfall in upstream areas (8).

### 2.3.3 Flood Behaviour

- a. The Mole River and the outflow from the Queensland Glenlyon Dam (Pike Creek) meets west of Mingoola at the confluence with the Dumaresq River. The Severn River meets with the Tenterfield Creek approximately 5.4km upstream of Mingoola and at this point the water flows into the Dumaresq River. From the point where the Severn River and Tenterfield Creek meet, marks part of the border between Queensland and New South Wales. The Dumaresq then flows into the Macintyre River.
- b. There is no intelligence card information on Mole River.

### 2.3.4 Classification of Floodplain

- a. Mingoola is a rural community covering a wide area situated on the floodplain. Major roads run along the floodplain parallel to the rivers. Consequently a number of rural properties in the Mole River and Dumaresq River floodplains may become high flood islands as floods rise (7).

### 2.3.5 Inundation

- a. Widespread inundation occurs in the Mole and Dumaresq Valleys (7). This generally results in the Bruxner Highway, Mingoola Station Road and various un-named local

roads being inundated resulting in isolation issues for the larger Mole and Dumaresq Valleys, with the Bruxner Highway also being inundated at Bonshaw.

- b. In the Mingoola rural area, flooding along the Mole and Dumaresq Valleys isolates a large number of rural properties, and will cause above floor flooding of some residences (7).

#### **2.3.6 Isolation**

- a. Many rural properties will be isolated in larger events. This most recently occurred in 2011 during a 1% AEP flood event (8). The Mole River Road and the Bruxner Highway will be cut and most properties will be inaccessible by road (7).

#### **2.3.7 Flood Mitigation Systems**

- a. There are no flood mitigation works in the Mingoola area (7).

#### **2.3.8 Dams**

- a. There are no significant dams upstream of Mingoola on the Mole River. However Glenlyon Dam is situated on a nearby tributary of the Dumaresq River. Much of Mingoola is situated in a large valley containing large areas of flat farm land. In the event of a dam failure, Mingoola would be greatly impacted by back up flow from the Dumaresq and Mole rivers creating considerable infrastructure damage and isolation concerns. Failure may also produce a flood wave up the Mole River Valley (7).

#### **2.3.9 At Risk Facilities**

- a. Mingoola Public School and Post Office are at risk of flooding and/or isolation and are shown in Annex 2.

#### **2.3.10 Other Considerations**

- a. No other considerations.

## ROAD CLOSURES AND ISOLATED COMMUNITIES

### 2.4 ROAD CLOSURES

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

**Table 3: Roads liable to flooding in Tenterfield Shire LGA (7) (1).**

Road	Closure location	Consequence of closure	Alternate Route	Indicative gauge height
Bruxner Highway	Dumaresq Floodplain between Mingoola and Bonshaw	Rural properties along with access ways off the highway are isolated	None for properties with access ways off highways	Unknown
Mingoola Station Road / Mingoola Road	Between Mingoola and Glenlyon Dam Road to the north (the Dumaresq River crossing)	Local isolation from the north and west into Queensland	None	Unknown
Mole River Road	Approximately 4km east of Mole River Road and Bruxner Highway junction	Isolation of rural properties on Mole River Road to Mole River / Gibraltar Road intersection	None	Unknown
Mole River Road	Gibraltar Road to Mole Station Road (ford crossing)	Isolation of rural properties on Mole River Road to Mole Station Road intersection	Springs Rd / Silent Grover Rd for properties on the southern floodplain only	Unknown
Bruxner Highway	Immediately north of Bruxner Highway and Gibraltar Road intersection	Isolation of properties to the west of Clifton from Tenterfield	None	Unknown
New England Highway (9)	Tenterfield Creek crossing between Tenterfield and Wallangarra	Isolation of eastern side of Tenterfield from the north	None	Water of 0.11m over deck in 0.2% AEP design event (9)
Douglas Street crossing, Tenterfield (9)	Tenterfield Creek corridor	none	Via New England Highway until the 0.2% AEP event	Water of 0.12m depth over deck in 20% AEP design event.
Showground crossing, Tenterfield (9)	Tenterfield Creek corridor	none	Via New England Highway until the 0.2% AEP event	Water of 1.61m depth over deck in 20% AEP design event.
Manners Street crossing, Tenterfield (9)	Tenterfield Creek corridor	none	Via New England Highway until the 0.2% AEP event	Water of 1.01m depth over deck in 20% AEP design event.

Road	Closure location	Consequence of closure	Alternate Route	Indicative gauge height
High Street crossing, Tenterfield (9)	Tenterfield Creek corridor	none	Via New England Highway until the 0.2% AEP event	Water of 1.46m depth over deck in 20% AEP design event.
Molesworth Street crossing, Tenterfield (9)	Tenterfield Creek corridor	Isolation of eastern side of Tenterfield from the north	Via New England Highway until the 0.2% AEP event	Water of 1.05m depth over deck in 0.2% AEP design event.
Molesworth Street crossing, Tenterfield (9)	Eastern unnamed town creek corridor	none	Via Bulwer Street	Water of 0.06m depth over deck in 2% AEP design event.
Naas Street West crossing, Tenterfield (9)	Tenterfield Creek corridor	none	Via New England Highway until the 0.2% AEP event	Water of 1.13m depth over deck in 20% AEP event.
Naas Street East crossing (9)	Eastern unnamed town creek corridor	none	Via Bulwer Street	Water of 0.25m depth over deck in 0.2% AEP design event.
Rouse Street crossing, Tenterfield (9)	Tenterfield Creek corridor	none	Via New England Highway until the 0.2% AEP event	Water of 0.27m depth over deck in 1% AEP design event.
Pelham Street crossing, Tenterfield (9)	Curry's Gap Creek corridor	Isolation of 1 property	none	Water of 0.27m depth over deck in 20% AEP design event.
Clarence Street crossing, Tenterfield (9)	Eastern unnamed town creek corridor	none	Via Bulwer Street	Water of 0.28m depth over deck in 2% AEP design event.
New England Highway	Bluff River crossing; Creek crossing at Bolivia; Deepwater River floodplain between Bolivia and Deepwater	Closure of New England Highway from Tenterfield to the south	Bruxner Highway to the east of Tenterfield	Unknown
New England Highway	Bridge crossing south of Deepwater	Closure of New England Highway from Tenterfield to the south	Bruxner Highway to the east of Tenterfield	Unknown
Mt Lindsay Highway	Boonoo Boonoo River	Leaves campers in the Bald Rock and Boonoo Boonoo Falls areas isolated for up to 12-15 hours	Unknown	Unknown
Local roads	Boorook Creek area			

Road	Closure location	Consequence of closure	Alternate Route	Indicative gauge height
Mole River Road	Mole River at Mingoola	Cut for up to two days	Unknown	Unknown
Bruxner Highway	West of Tenterfield, at Reedy Creek, the Beardy River and the Dumaresq overflow Channels 1 and 2.	Unknown	Unknown	Unknown
Bruxner Highway	East of Tenterfield by Sandy Creek and the Clarence River Number 1 and Number 2 overflows near Tabulam	Unknown	Unknown	Unknown
Long Gully Road (Rocky River Road),	At concrete causeways in the vicinity of Macleods Creek	Closed for very short durations	Unknown	Unknown

## 2.5 SUMMARY OF ISOLATED COMMUNITIES AND PROPERTIES

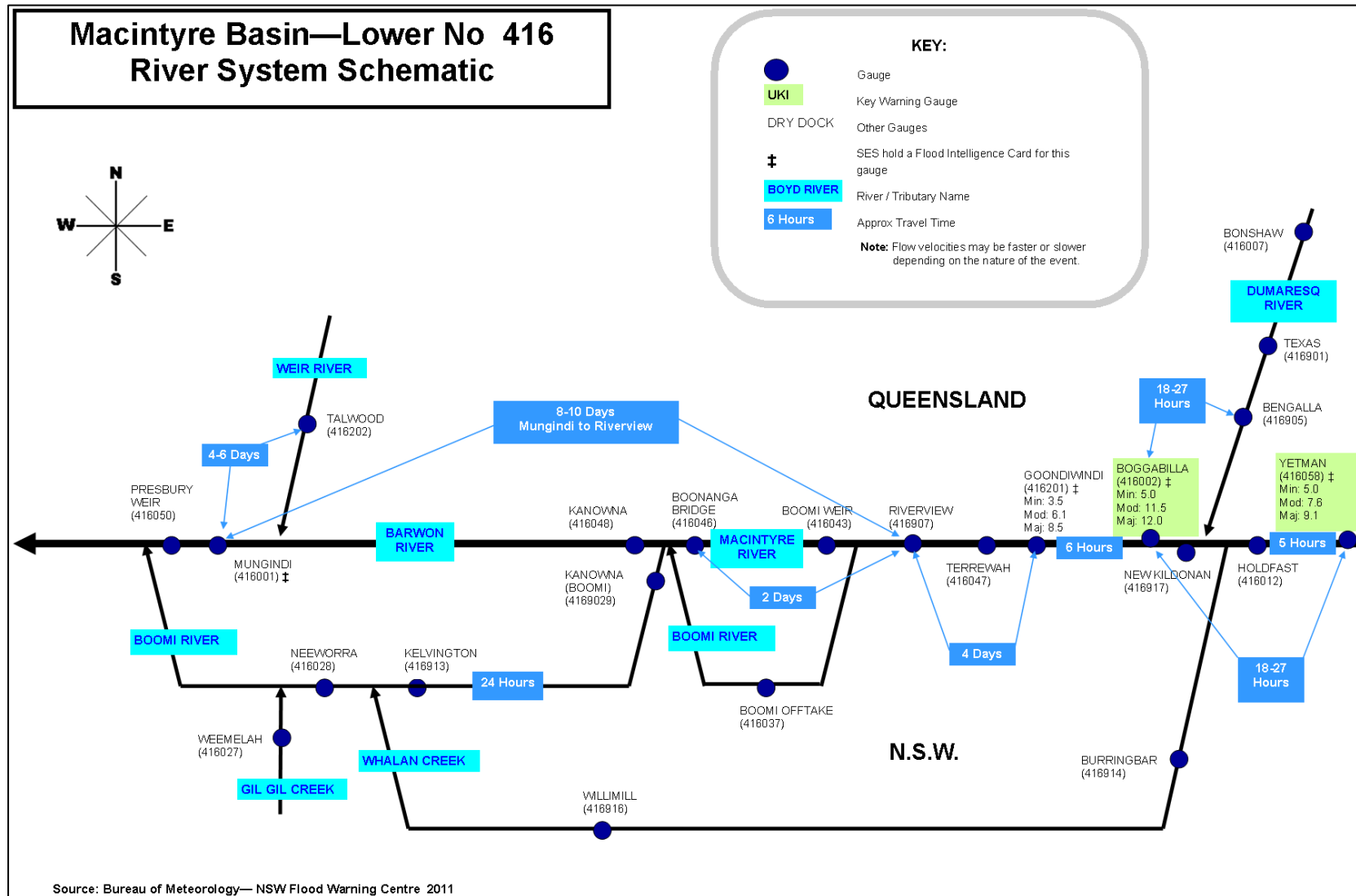
- a. Table 4 lists communities liable to isolation and potential periods of isolation. Information presented here is based on historical flooding in 2011 (8) and does not reflect the duration of isolation expected in larger and extreme events.

**Table 4: Potential Periods of Isolation for communities in the Tenterfield Shire LGA during a Major flood (7).**

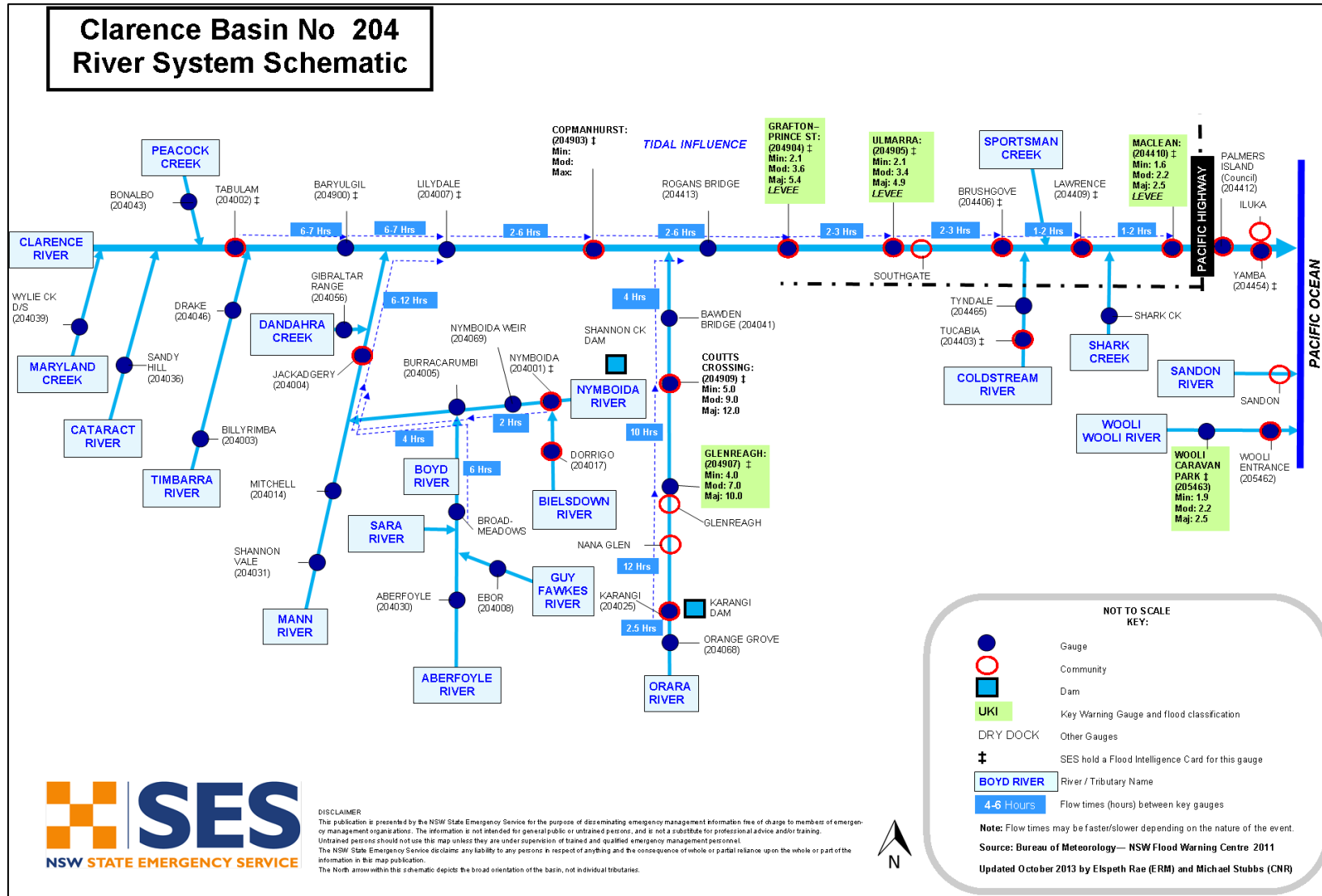
Town / Area (River Basin)	Population/ Dwellings	Flood Affect Classification	Approximate period isolation	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	NOTES
Tenterfield	2997 population	Area with Rising Road accessible; regional highways into area cut	1 – 2 days									Resupply not required Town cut in half
Mingoola/ Mole River Valley	Unknown	Area with Overland Escape Route	2 – 7 days									Resupply to individual properties likely to be required after 5 days

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

## ANNEX 1: MACINTYRE-DUMARESQ RIVER BASIN SCHEMATIC



## ANNEX 2: CLARENCE RIVER BASIN SCHEMATIC



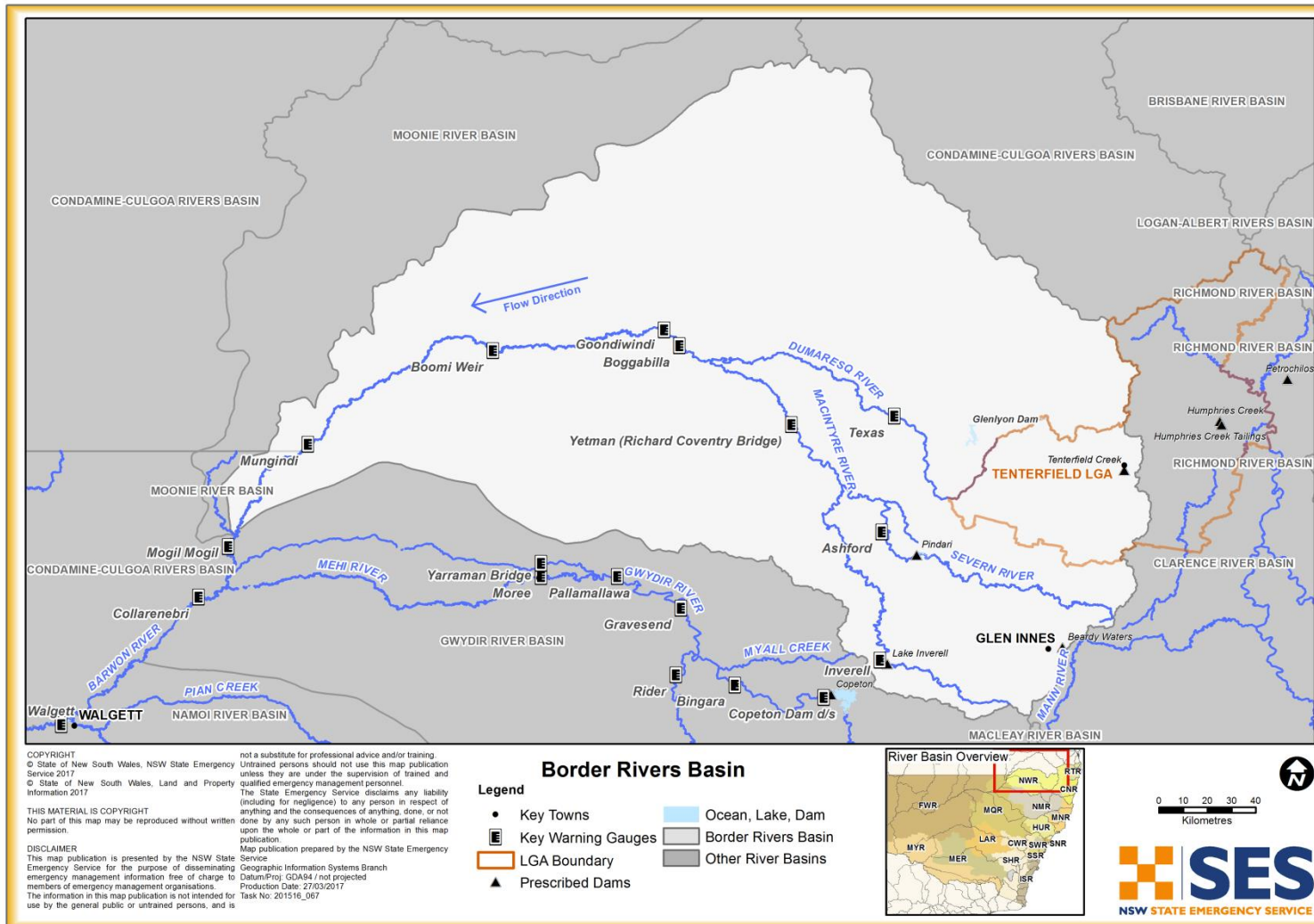


## ANNEX 3: FACILITIES AT RISK OF FLOODING AND/OR ISOLATION

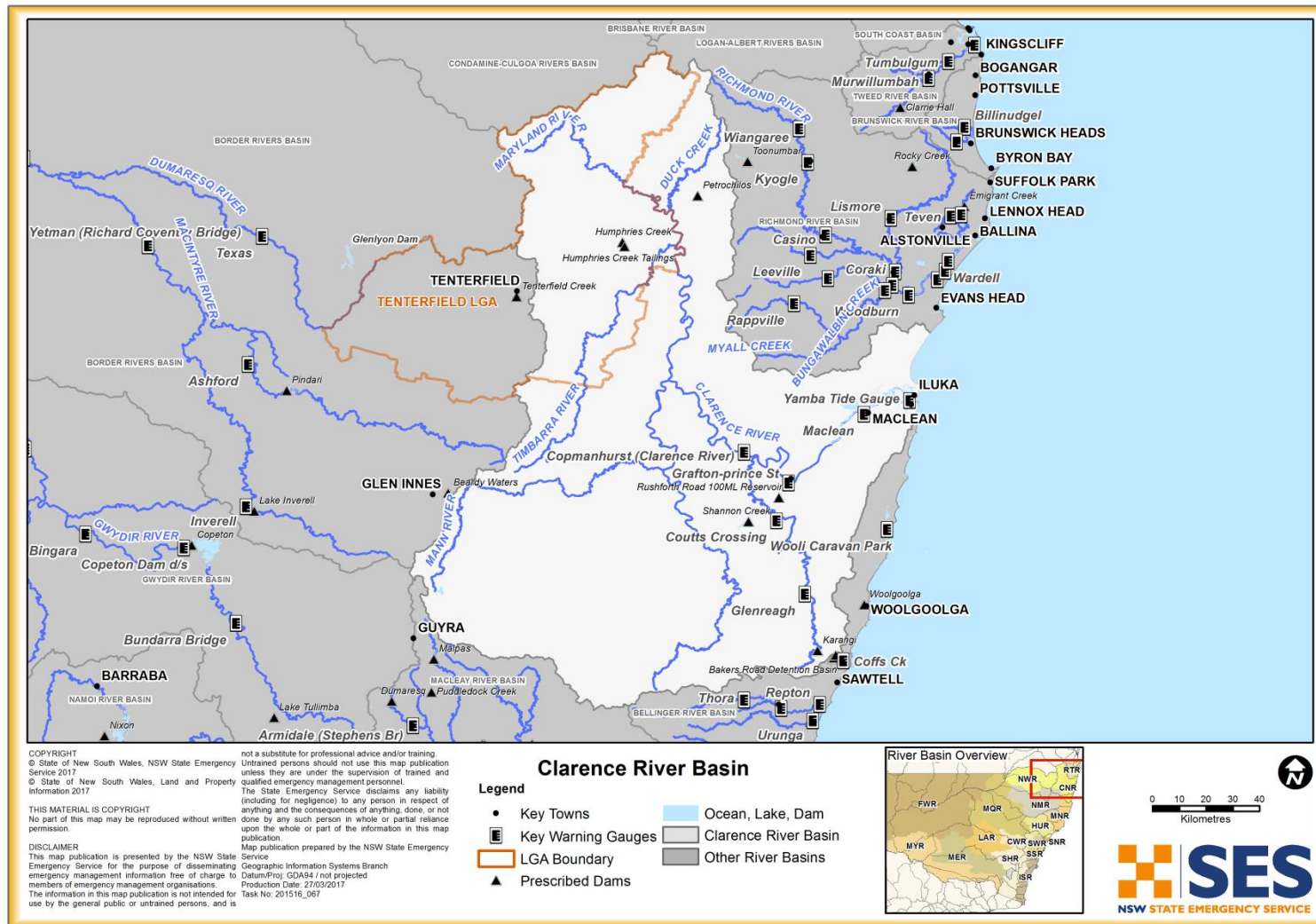
### Borders River Basin

Facility Name	Street	Suburb	Comment
<b>Schools</b>			
Tenterfield High School	High Street	Tenterfield	Is located in a high hazard floodway in the PMF design flooding event (9).
Mingoola Public School	Mingoola Station Road	Mingoola	It is thought to be susceptible to flooding in larger events (it did not flood in the 2011 event, which was assessed as having an ARI of approximately 1 in 100 years in the lower Mole River Valley) (7)
<b>Child Care Centres</b>			
Nil			
<b>Facilities for the aged and/or infirm</b>			
Millrace Hostel	422 Rouse Street	Tenterfield	Is located in a high hazard flood storage area in the PMF design flooding event (9)
<b>Utilities and infrastructure</b>			
RFS yard	Francis Street	Tenterfield	Is located in a high hazard floodway in the PMF design event however no water entered buildings in 2011 (4) (9).
Power lines over the waterway for domestic supply and mobile phone towers		Tenterfield	These were impacted by high volumes and flows of debris in Jan 2011 (4)
Mingoola Post Office			Is at risk of isolation during flooding events.
<b>Camping Ground / Caravan Parks</b>			
Nil			

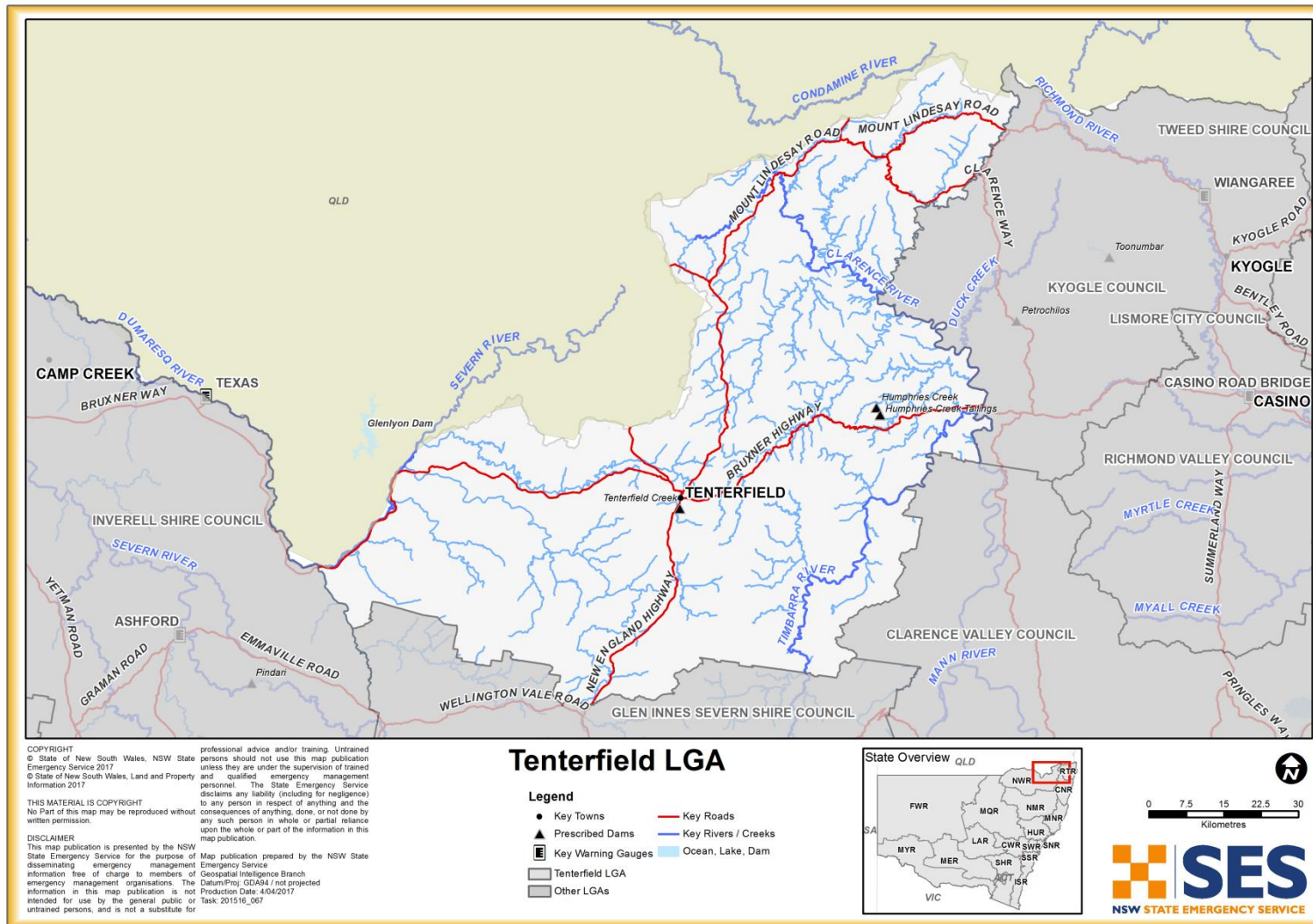
# MAP 1 - BORDER RIVERS RIVER BASIN



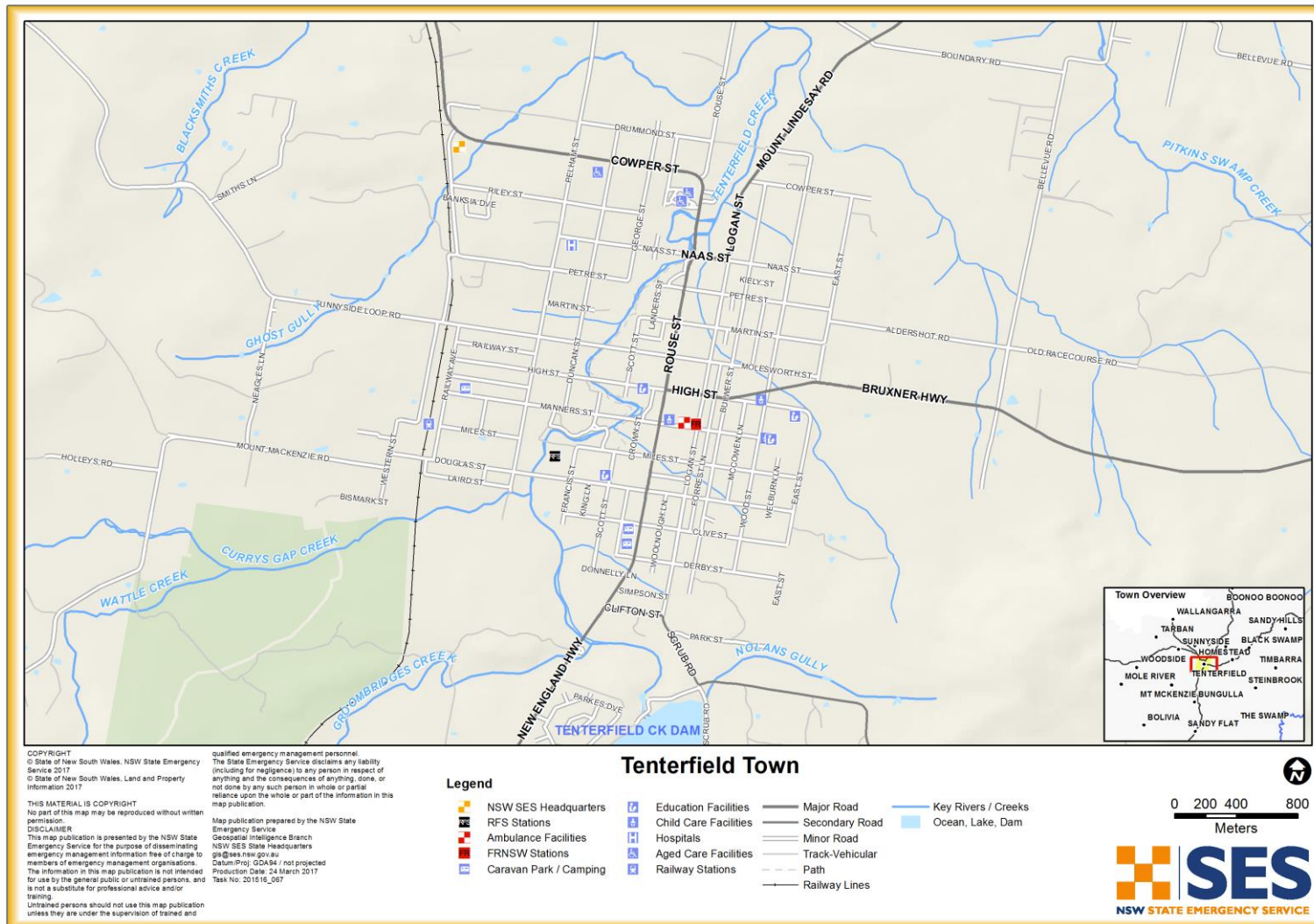
## MAP 2 - CLARENCE RIVER BASIN



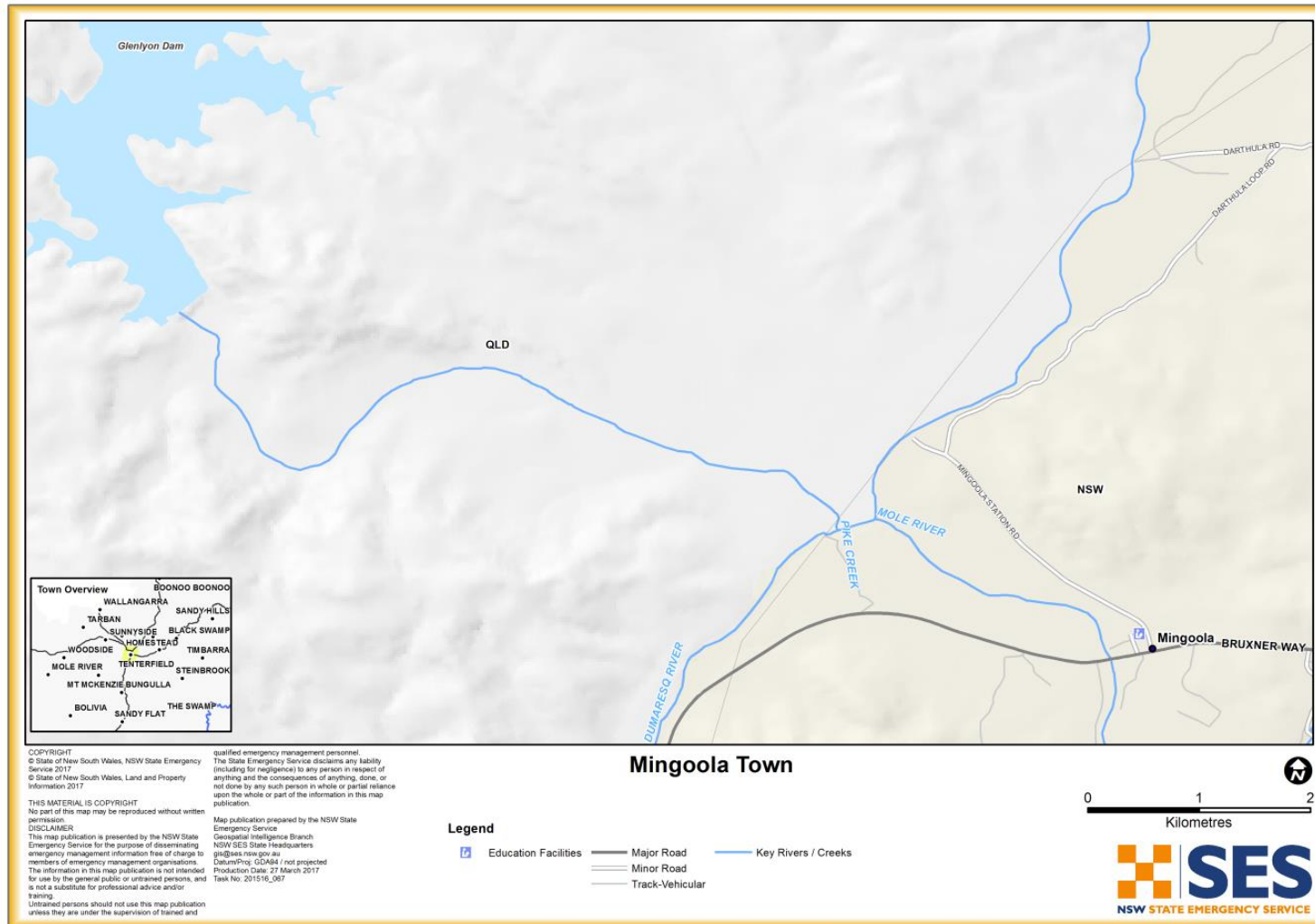
### MAP 3 - TENTERFIELD LGA



# MAP 4 - TENTERFIELD TOWN MAP



# MAP 5 - MINGOOLA TOWN MAP



## LIST OF REFERENCES

1. **NSW State Emergency Service.** *Tenterfield Shire Local Flood Plan.* February 2000.
2. **SunWater Limited.** *Glenlyon Dam Emergency Action Plan.* 2013.
3. **NSW Public Works.** *Dam Safety Emergency Plan for Tenterfield Creek Dam - Second Draft.* April 2015.
4. **Stephen Basham: NSW State Emergency Service North West Region Deputy Controller.** *Personal Coms.* December 2013.
5. **Service, NSW State Emergency.** *Tenterfield Local Flood Plan.* 2000.
6. **NSW State Emergency Service.** *Draft Tenterfield Shire Local Flood Plan - Volume 2 Hazard and Risk.* December 2013.
7. **DHI Water and Environment.** *Tenterfield Local Flood Plan Volume 2 Draft.* 2013.
8. —. *Flood Intelligence Collection and Review for the January 2011 Flood Event in the North West Region.* 2013.
9. **Jacobs.** *Tenterfield Floodplain Risk Management Study and Plan.* 2014.
10. *Tenterfield Flood Study report 2006.*
11. **Environment, DHI Water and.** *Tenterfield Local Flood Plan Volume 2 Draft.* 2013.

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# **SES RESPONSE ARRANGEMENTS FOR TENTERFIELD SHIRE**

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**Volume 3 of the Tenterfield Shire Local Flood Plan**

Last Update: February 2000 (DRAFT)



**ANNEX B TO THE  
TENTERFIELD SHIRE LOCAL FLOOD PLAN**

## **DETAILS OF ARRANGEMENTS FOR POTENTIAL DAM-FAILURE FLOODING**

### **GENERAL**

Because Tenterfield Dam has been assessed as being unable to withstand an extreme flood approaching PMF proportions, arrangements have been developed to guide the evacuation of people to safety should dam failure become possible. A Dam Failure Warning System is being established by June 2000, consisting of:

1. Gauging equipment to record rainfall levels in the dam's catchment area and water levels at the dam.
2. Telemetry to ensure these levels can be read remotely by Tenterfield Council and SES personnel at any time.
3. Arrangements for the warning of the occupants of dwellings and other buildings which would be inundated in the event of dam failure.
4. Arrangements for the management of evacuation to safe locations on both sides of Tenterfield Creek.

### **OPERATION**

The Dam Failure Warning System works as follows:

1. Rain over the dam's catchment area and water levels at the dam are monitored continuously by Tenterfield Council. Should extremely heavy rain (more than 25mm in an hour) fall or a particular flow level at the dam (200mm depth over the spillway) be reached:
  - a. Key Council and SES personnel will be alerted, and the personnel of other agencies will be advised to prepare for the evacuation of people from dwellings and other buildings located between the dam and a point five kilometres downstream of it.
  - b. Physical surveillance of the dam and downstream areas will be initiated.
  - c. Procedures will be instituted to disseminate evacuation warnings if the level at the dam continues to rise.

2. If the water level at the dam reaches a depth of 800mm over the spillway (the level of the dam's parapet), or if this level appears likely to be reached, people in downstream houses and other buildings will be advised to leave for designated evacuation centres. Warnings will be disseminated by:
  - a. Doorknocking of at-risk dwellings and other buildings.
  - b. Telephone.
  - c. Radio broadcasts over Radio Station 2TEN FM and ABC Regional Radio, Tamworth, preceded by the playing of the Standard Emergency Warning Signal.
  - d. Public address announcements from Police vehicles patrolling the streets.
3. If evacuation is required, it will be by private vehicles supplemented by community buses and ambulances. People will be taken or advised to go to evacuation centres as follows:
  - a. From Millrace Hostel for the Aged (40 residents), Rouse St: to Tenterfield Hospital, cnr Naas and Pelham sts.
  - b. From other areas west of Tenterfield Creek: to the Tenterfield Golf Club, Pelham St. If the Pelham St bridge is closed by flood waters, alternative assembly points are at:
    - ◆ Old Tenterfield Railway Station, Railway Ave.
    - ◆ Tenterfield Shire Council Depot, Cowper St.
  - c. From areas east of Tenterfield Creek: to the Tenterfield Church of England Hall, Martin St.

## THE PROCEDURES IN DETAIL

Notification, surveillance, warning and evacuation arrangements are detailed in the table at the end of this annex. Note that:

1. Actions indicated as occurring at particular Alert Levels may be brought forward if the development of a flood event warrants (for example, because of rapid rises towards these levels).
2. The 'Approximate Elapsed Times' are estimates of the worst possible case based upon PMF hydrographs. In real events which threaten to cause dam failure, it is likely that **much** more time would elapse between defined levels than is indicated in the table. Assessments of the speed of onset of developing events would be made at the time and advice given to residents would reflect these assessments.

3. A 'White Alert' condition was reached at the dam on 27 October 1999, when the depth of water in the spillway reached 315mm.

## **PRIOR ADVICE TO PEOPLE POTENTIALLY AT THREAT**

Residents and owners of non-residential properties downstream of the dam will be provided with written material incorporating:

1. Information on the nature of the threat and the circumstances under which dam failure should occur,
2. The arrangements governing the issuing of warnings, and
3. Advice on what they should do when advised to evacuate.

This written material is at the end of this annex and is intended to be placed in a prominent place in each building.

It should be noted that a flood large enough to cause Tenterfield Dam to fail would be exceedingly rare. It could, however, develop rapidly and the amount of time available to evacuate could be short.

The Tenterfield Shire Council is currently investigating means of strengthening the dam wall to minimise the risk of dam failure.

## NOTIFICATION, SURVEILLANCE, WARNING AND EVACUATION PROCEDURES FOR A POTENTIAL FAILURE OF TENTERFIELD DAM

CONDITION	ALERT LEVEL	ELAPSED TIME FROM NORMAL WATER LEVEL	FLOOD EFFECTS	PROCEDURES AND ACTIONS	
				EMERGENCY SERVICES	PEOPLE AT THREAT
Water level at spillway crest (normal water level).	NA	NA	None unless Curry's Gap Creek and Groombridges Creek in flood.	<ul style="list-style-type: none"> <li>◆ Tenterfield Shire Council Engineering Department inspects dam on a regular basis.</li> </ul>	No action required.
Water level 200mm above spillway crest (878.6m AHD) or rainfall intensity above dam of more than 25mm in an hour	<b>WHITE</b>	15 minutes minimum to reach depth of 200mm above spillway.	Minor flooding in Tenterfield Creek; low-level bridges submerged.	<ul style="list-style-type: none"> <li>◆ Council and SES personnel advised automatically by telephone, mobile phone or pager.</li> <li>◆ Council initiates surveillance of the dam; SES begins surveillance of at-risk areas downstream.</li> <li>◆ SES advises appropriate organisations and officers to be prepared for potential evacuation. These include the Local Emergency Operations Officer, the Police, Rural Fire Service, NSW Fire Brigades, Ambulance Service, DWS (including the Department of Community Services, Glen Innes, the Salvation Army, St Vincent de Paul, CWA and Quota Club), Lions and Rotary Clubs, Golf Club, Church of England, Hospital, Principals of High School and Sir Henry Parkes Primary School, Radio Station 2TEN FM and the Transport Functional Area Co-ordinator.</li> </ul>	No action: no short-term threat to dam.

CONDITION	ALERT LEVEL	ELAPSED TIME FROM NORMAL WATER LEVEL	FLOOD EFFECTS	PROCEDURES AND ACTIONS	
				EMERGENCY SERVICES	PEOPLE AT THREAT
Water level 800mm above spillway crest (879.25m AHD) or rising rapidly and likely to exceed this level.	<b>RED</b>	30 minutes minimum.	Severe flooding in Tenterfield Creek; all bridges submerged (including New England Hwy bridge).	<ul style="list-style-type: none"> <li>◆ Surveillance of dam and downstream areas continues.</li> <li>◆ SES: <ul style="list-style-type: none"> <li>• Ensures that evacuation centres are open and transport resources are ready.</li> <li>• Initiates warning by doorknocks, telephone, mobile public address system announcements and broadcasts over 2TEN FM and ABC Regional Radio. These warnings will advise people to prepare to evacuate or to do so immediately.</li> </ul> </li> <li>◆ SES verifies that evacuation has been completed.</li> <li>◆ SES Local Controller issues ALL CLEAR over Radio Station 2TEN FM, by doorknock or telephone or at evacuation centres.</li> </ul>	Prepare to evacuate or evacuate immediately to previously-agreed destinations (hospital, golf club or Church of England hall).
Water level 1850mm above spillway crest (880.3m AHD) Danger assessed as being over (note that this condition could be reached at any time after <b>WHITE ALERT</b> level is reached.	<b>DAM FAILURE IMMINENT</b> <b>ALL CLEAR</b>	1 hour minimum. NA	Extreme flooding in Tenterfield Creek; some houses possibly flooded. NA	<ul style="list-style-type: none"> <li>◆ SES verifies that evacuation has been completed.</li> <li>◆ SES Local Controller issues ALL CLEAR over Radio Station 2TEN FM, by doorknock or telephone or at evacuation centres.</li> </ul>	Stay at home, return home or await further advice.

## NOTICE TO THE OCCUPANTS OF THIS PROPERTY

The purpose of this notice is to remind you of what will happen and what you must do if Tenterfield Dam is threatened with failure. The chance of failure is extremely small because the dam is structurally sound and could fail only under extreme rainfall conditions. Should failure occur, however, this property could be severely flooded with dangerously fast-flowing flood waters. To ensure your safety it is vital that you read this card carefully, keep it in a visible indoors location and refer to it periodically.

Tenterfield Dam is kept under regular surveillance by the Shire Council and you will be warned if a flood capable of causing dam failure becomes possible. Such a warning will be issued by the Tenterfield State Emergency Service as part of a planned emergency response, warning messages being:

- ◆ Played over Radio Station 2TEN FM (89.7) and ABC Regional Radio (819 AM).
- ◆ Broadcast from Police vehicles over public address systems in streets near Tenterfield Creek.
- ◆ As far as possible, relayed by telephone calls and doorknocks by SES, Rural Fire Service and NSW Fire Brigades personnel.

Warnings will be provided well before actual dam failure becomes possible, and there will be time for you to prepare to evacuate.

If you are advised to evacuate, you should:

- ◆ Gather medicines, personal valuables and papers, money, photograph albums, family mementoes and other belongings which you can fit into your vehicle.
- ◆ Turn off the power, gas and water.
- ◆ Make your way, by car if you have one, to the evacuation centre on the same side of Tenterfield Creek as this building. These will be established at:
  - The Tenterfield Golf Club, Pelham St (for people located west of Tenterfield Creek).
  - The Tenterfield Church of England Hall, Martin St (for people located east of Tenterfield Creek).
  - The Tenterfield Hospital, cnr Naas and Pelham sts (for residents of Millrace Hostel. Transport will be provided for these residents).
- ◆ If you need help to evacuate, you should call the Tenterfield State Emergency Service Local Headquarters on 6736 2923.

Transport to the evacuation centre will be provided for you if you need it, and the Police will provide security for your property while you are away. Temporary accommodation will also be provided if necessary.

When the danger has passed, you will be advised either at home or at an evacuation centre. As soon as possible, you will be visited by an employee of the Tenterfield Shire Council or a member of one of the emergency service organisations to ensure that you are safe and to explain what has happened and what is likely in the future.

If you have any queries about the dam or about these arrangements, please phone the Tenterfield Shire Council's Engineering Services Department or the Tenterfield State Emergency Service.

## EVACUATION WARNING MESSAGE FOR OCCUPANTS OF BUILDINGS NEAR TENTERFIELD CREEK

**Date/Time of Issue:** \_\_\_\_\_ **Authorised by:** \_\_\_\_\_  
(name; position)

The Tenterfield Shire Council advises that the flow of water over Tenterfield Dam is approaching dangerous levels and that the dam may be at risk of failure.

You must prepare for evacuation and leave this building within the next \_\_\_\_\_ (minutes). If you leave it later, the roads may be congested or closed and water may have already entered the property.

To prepare for evacuation:

- ◆ Gather medicines, personal and financial documents and mementos together to take with you.
- ◆ Listen to Radio Station 2TEN FM (89.7) or ABC Regional Radio, Tamworth (819 AM) for further information and to confirm this warning.
- ◆ If possible, check to see whether your neighbours need help.
- ◆ Take pets or companion animals with you.

Before you leave:

- ◆ Turn off the power, gas and water.
- ◆ If you have a car, drive to the evacuation centre at Tenterfield Golf Course/the Church of England Hall, Martin St (*delete whichever does not apply*).
- ◆ If you don't have a car, special transport can also be provided on request by telephoning the State Emergency Service (Ph: 6736 2923).
- ◆ 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.

**WE WILL NOT BE ABLE TO GIVE YOU A SECOND WARNING BY DOORKNOCK. PLEASE LISTEN TO YOUR RADIO FOR UPDATES AND FURTHER INFORMATION.**