NSW STATE EMERGENCY SERVICE

Bathurst Regional

Local Flood Emergency Sub Plan

FloodSafe

BATHURST REGIONAL FLOOD EMERGENCY SUB PLAN

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

Volume 1 of the Bathurst Regional Flood Emergency Sub Plan

Endorsed by the Bathurst Local Emergency Management Committee

6 August 2024
Version 3.0

AUTHORISATION

The Bathurst Regional Flood Emergency Sub Plan is a sub plan of the Bathurst Regional 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/Unit Commander

Print Name: Andrew McDonough

Date: 6/8/2024

Endorsed

Signature: _____

Chair Local Emergency Management Committee

Print Name: Nicholas Murphy

Date: 6/8/2024.

VERSION HISTORY

Version Number	Description	Date
1.0	Bathurst Regional Local Flood Plan	February 2008
2.0	Bathurst Regional Local Flood Plan	February 2014

AMENDMENT LIST

Suggestions for amendments to this plan should be forwarded to:

Manager Emergency Planning
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Amendments in the list below have been entered in this plan.

Amendment Number	Description	Updated by	Date

DISTRIBUTION LIST

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

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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 Bathurst Regional 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 Bathurst Regional Local Emergency Management Plan (EMPLAN) and is endorsed by the Bathurst Regional Local 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 Bathurst Regional 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 Bathurst Regional LGA. The Bathurst Regional 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 Western Zone and for emergency management purposes, is part of the Central West Emergency Management Region.

1.4.3 The plan sets out the Bathurst Regional level emergency management arrangements for prevention, preparation, response, and initial recovery for flooding in the Bathurst Regional LGA. Hazard and Risk information can be found in Volume 2 of this document, and NSW SES Response Arrangements can be found in Volume 3.

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 Bathurst Regional LGA are detailed within this plan, Appendix B and Appendix C.

1.7.3 Any agency with agreed responsibilities in this plan which 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 and/or the NSW SES Western Zone Office (for regional level responsibilities outside of response operations).

1.8 PLAN MAINTENANCE AND REVIEW

1.8.1 The NSW SES will maintain the currency of this plan by:

a. Ensuring that all supporting emergency services and functional areas, organisations and officers mentioned in it are aware of their roles and responsibilities.

b. 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 The NSW SES maintains information on the nature of flooding and effects of flooding on the community in the Bathurst Regional LGA. This is outlined in Volume 2 – Hazard and Risk.

2.1.2 Declared dams in or upstream of the Bathurst Regional Local Government Area.

Dam Name	Owner	High Risk Dam
Chifley Dam	Bathurst Regional Council	NO
Winburndale Dam	Bathurst Regional Council	YES
Oberon Dam	WaterNSW	NO

3 PREVENTION/ MITIGATION

3.1 INTRODUCTION

3.1.1 The Floodplain 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 floodplain risk management into land use planning is one of the key means to limit the exposure to flood risks to our communities and help build long term resilience to future flood events.

3.2 LAND USE PLANNING

3.2.1 **Strategy:** Effective land use planning is a key focus for minimising the impacts of flooding. The 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. The 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. The NSW SES will provide responses to land use planning proposal referrals that have or will create significant flood risk to life and/or property due to flooding.

3.3 FLOODPLAIN RISK MANAGEMENT

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

Actions:

a. The 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.

b. The NSW SES will provide advice, support, technical resources and training for NSW SES representatives to contribute effectively on local Floodplain 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 (CMGs) 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 the NSW SES.

4.3 FLOOD INTELLIGENCE SYSTEMS

4.3.1 **Strategy**: The 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. The NSW SES maintains a list of the requirements for flood warnings for flood gauges in NSW (including flood classifications, warning times required and key statistics) and can be found in the supplementary document to the NSW State Flood Plan (see Section 1.9). Gauges of relevance within the Bathurst Regional LGA are also listed in Volume 3 of this plan.

c. The NSW SES will recommend new warning services and changes to warning alert levels for gauges to the NSW and ACT Flood Warning Consultative Committee.

d. The State Government, in partnership with Local Government, is responsible for developing and maintaining flash flood warning systems for local catchments where required.

e. Dam Owners will provide Dam Emergency Plans (where required) and consult with NSW SES on alert levels and messaging. Alert level definitions are listed in Dam Emergency Plans.

f. The NSW SES maintains a dedicated dam failure hotline and procedures to ensure priority dissemination of dam failure warnings.

g. The NSW SES develops and maintains warning and flood information products by:

- Utilising flood intelligence data.
- Developing warning and flood information products.
- Continuously reviewing warning and flood information products.

- Consulting with affected communities, key stakeholders, Dam Safety NSW and the NSW and ACT Flood Warning Consultative Committee and maintains Operational Readiness.
- Participating in the development of public information and warning systems.

h. Gauge owners adequately maintain flood warning gauges and systems, including those identified in the 'Service Level Specification' maintained by the Bureau of Meteorology (Bureau) and those identified in the 'Provision and Requirements for Flood Warning in New South Wales' maintained by the NSW SES.

4.5 BRIEFING, TRAINING AND EXERCISING

4.5.1 **Strategy**: Ensure the 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. The NSW SES will consult stakeholders throughout the development of plans.

b. The NSW SES will inform stakeholders of content changes after revisions.

c. The NSW SES will ensure their facilities and resources are maintained and operationally ready.

d. The NSW SES will train personnel for their expected flood operation roles.

e. The 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**: The 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**: The 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. The 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. The NSW SES uses the Australasian Inter-service Incident Management System (AIIMS) to manage the flood response.

b. Control of flood response will be at the lowest effective level and may be scaled to suit the incident.

c. The NSW SES State Controller (or delegate) will appoint Incident Controllers and establish Incident Control Centres (see NSW SES facilities on map in Appendix A).

d. The NSW SES Incident Controller, in consultation with participating supporting emergency services and functional areas will determine the appropriate breakdown of an Area of Operations into Divisions and/or Sectors in accordance with the principles of AIIMS.

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

Actions:

a. The NSW SES will operate Incident Control Centre(s) as required.

b. The NSW SES Incident Control Centre(s) will:

- Control resources from the NSW SES and coordinate resources of supporting emergency services and functional areas.

- Manage incident 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 the NSW SES and supporting agencies or functional areas in accordance with the 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 as required.

b. The NSW SES will provide Liaison Officer(s) to Emergency Operations Centres as required.

c. Where possible Emergency Operation Centres are to be co-located with NSW SES Incident Control Centres for Flood Emergency Response.

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

Actions:

a. The NSW SES Incident Controller will notify agencies of potential access issues between locations, for the consideration of pre-deploying of resources.

b. The NSW SES may request resources and logistics support directly from a supporting emergency service or functional area.

c. Wherever possible, supporting organisations are to provide their own logistic support in consultation with the 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 the NSW SES to supporting emergency services and functional areas listed under this plan.

b. All supporting emergency services and functional areas and Council will accurately record and report information relevant to their activities and any real time flood information (including road closure information) to the NSW SES Incident Controller. This may be in the form of a combined Emergency Operations Centre (EOC) report, or direct from agencies where an EOC has not been established.

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

d. Reconnaissance, mapping, damage assessments, intelligence validation and post flood evaluation will be coordinated by the NSW SES. This may occur post impact and continue into the recovery phase.

e. The NSW SES may request the Engineering Services Functional Area 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 the after-flood report.

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

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

5.4 PROVISION OF INFORMATION AND WARNINGS TO THE COMMUNITY

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

Actions:

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

- Severe Thunderstorm Warnings – Detailed - Issued for all capital cities and surrounding areas when individual severe thunderstorms are within range of the capital city radars.
- Severe Thunderstorm Warnings - Broad-based - Issued for the entire Australian state or territories affected highlighting broad areas where severe storms may occur within the next 3 hours.
- Severe Weather Warnings with reference to heavy rainfall and/or storm surge.
- Flood Watches.
- Flood Warnings.

b. Dam Owners will utilise the Dam Emergency Plan to provide warnings and information to NSW SES and communities (where appropriate).

c. NSW SES Incident Controllers will issue the following NSW SES Flood Warnings aligning to the Australian Warning System:

- Advice
- Watch and Act
- Emergency Warning

d. The NSW SES liaises with the Bureau to discuss the development of flood warnings as required.

e. The NSW SES provides alerts and deliver flood information to affected communities using a combination of public information.

f. The NSW SES may request supporting agencies redistribute NSW SES alerts and information, including through the provision of doorknocking teams.

g. Road closure information will be provided to the community through the following agencies/methods:

- Local Government websites.
- Transport for NSW 'Live Traffic' website: www.livetraffic.com or 'Transport InfoLine': 131 500. VMS messaging on roadways may also be used to advise motorists.

h. The Public Information and Inquiry Centre will be established by NSW Police Force where required to provide information regarding evacuees and emergency information. Contact details will be broadcast once the centre is established.

i. The Disaster Welfare Assistance Line will be established by the Disaster Welfare Services Functional Area 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: The 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. Bathurst Regional 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. The NSW Police Force may close and re-open roads but will normally only do so (if the Bathurst Regional Council or Transport for NSW have not already acted and if public safety requires such action.

d. The NSW SES will assist with erecting road closure signs and barriers when time and resources permit.

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

a. The NSW SES Incident Controller may direct the imposition of traffic control measures into flood affected areas in accordance with the provisions of the *State Emergency Service Act, 1989* and the *State Emergency Rescue Management Act, 1989.*

b. The NSW SES Incident Controller may request the Local Emergency Operations Controller provide suitable personnel to assist with traffic coordination.

5.7 PROTECTION OF ESSENTIAL SERVICES

5.7.1 Arrangements for the protection of local assets are outlined in Volume 3 of this NSW SES local Flood Emergency Sub Plan. In addition, Local and Region EMPLANs 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 Bathurst Council will keep the NSW SES informed of the status of utilities and infrastructure.

5.8 EVACUATION

5.8.1 Evacuation is the NSW SES' primary response strategy for managing the population at risk of flooding.

5.8.2 Community specific evacuation arrangements are located in Volume 3 of this Plan.

5.8.3 **Strategy**: Conduct planning to ensure all evacuation constraints are considered.

Actions:

a. Evacuations will take place when there is a risk to public safety. Circumstances may include:

- Evacuation of people when their homes or businesses are likely to flood.
- Evacuation of people who are unsuited to living in isolated circumstances, due to flood water closing access.
- Evacuation of people where essential energy and/or utility services are likely to fail or where buildings have been or may be made uninhabitable.

b. The NSW SES will consider the following in evacuation decisions:

- Duration of evacuation.
- Characteristics of the community.
- Numbers requiring evacuation.
- Availability of evacuation routes and transport.
- The ability for existing levees or other flood protection works to fulfil their intended function.
- Time available for evacuation.
- Evacuee management requirements.
- Resources and delivery of evacuation information.
- Length of isolation.

c. NSW SES Incident Controllers, planning and intelligence officers will carefully consider the risks involved in conducting evacuations.

d. All evacuation decisions will be made as per the current NSW SES policies and procedures, and consistent with the NSW Evacuation Management Guidelines.

e. Potential Evacuation Centres are located in the Local EMPLAN.

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

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

a. The 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 the NSW SES and the Welfare Services Functional Area.

f. School administration offices (government and private) will coordinate the evacuation of schools in consultation with the NSW SES and the Welfare Services Functional Area, 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 the NSW Police Force.

5.9 EVACUEE MANAGEMENT AND WELFARE

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

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

Actions:

a. The NSW SES will provide initial welfare for evacuees where required but will hand the responsibility over to the Welfare Services Functional Area as soon as possible. The NSW SES will brief the Welfare Services Functional Area at the earliest opportunity regarding the level of assistance required.

b. 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 the NSW SES in the temporary closure of schools and will coordinate with the NSW SES, the Transport and Welfare Services Functional Areas in the management of school evacuees.

d. Disaster Victim Registration will be controlled and coordinated by the NSW Police Force with the assistance of the NSW SES and the Welfare Services Functional Area.

e. The 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 State Emergency Operations Controller (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 the NSW SES and SEOCON in consultation with members of the State Emergency Management Committee (SEMC).

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 and assessment of animals, humane destruction and disposal of affected animals and the supply of emergency fodder and water (with aerial support where necessary).

5.10 FLOOD RESCUE

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

Actions:

a. The 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. The NSW SES may request other supporting emergency services to undertake flood rescues on behalf of the NSW SES. Agencies must be authorised/accredited to undertake flood rescue operations in accordance with State Rescue Board requirements, as prescribed by the NSW SES. Supporting emergency services must supply information regarding rescues performed to NSW SES. Notification arrangements with the 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. The 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, the NSW SES will establish loading points where retailers can instruct suppliers to deliver goods.

d. The 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. The NSW SES will assist hospitals with resupply of linen and other consumables where able.

f. The NSW SES may request resupply assistance from supporting agencies.

g. The 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, the NSW SES will establish a resupply schedule and coordinate the resupply for isolated rural properties.

b. The 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. The NSW SES will facilitate the return of evacuees to their homes.

5.13 END OF RESPONSE OPERATIONS

5.13.1 **Strategy**: Conclude response operations.

Actions:

a. Response operations will conclude when:

- There is a reduced likelihood of additional flooding within the Area of Operation and flood waters have receded.
- All requests for assistance related to the flood have been completed.
- The need for warning and evacuation no longer exists.
- 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. The 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, the Welfare Services Functional Area and Bathurst Regional Council representatives.

b. The 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. The NSW SES will provide information and data throughout the emergency response to inform community recovery. A report will be developed at the

request of the SERCON at the conclusion of the response within an area. Should a response summary report be required it will include the following:

- The emergency action plan in place at conclusion of the response emphasising any continuing activities including community meetings/ engagement activities.
- Resources allocated to the emergency response and associated exit strategies.
- Details of any areas or situations with potential to re-escalate the emergency.
- A recommendation for the conclusion of the NSW SES as lead agency to transition to the 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. The 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: The NSW SES works with relevant stakeholders and Bathurst Regional Council on post flood data collection analysis including review of flood intelligence where necessary.

6 RECOVERY OPERATIONS

6.1 INTRODUCTION

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

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

6.2 NSW SES RECOVERY ROLE

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

6.2.2 **Actions**:

a. The NSW SES will provide representation to Recovery Committees as required and may have an ongoing role in the recovery phase.

b. The 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. The NSW SES will provide information to the NSW Reconstruction Authority. to support applications to Treasury for Natural Disaster Relief and Recovery Arrangements.

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

e. The NSW SES and where required supporting agencies will assist with clean-up operations after floods, where possible when resources and personnel permit.

f. The NSW SES may coordinate immediate relief in collaboration with SEOCON and State Emergency Recovery Controller (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 Bathurst Regional Council Area

10 Appendix B – Roles and Responsibilities

AGENCY	RESPONSIBILITIES
NSW State Emergency Service	The NSW SES is the designated Combat Agency for floods, storms and tsunami and controls response operations. The NSW SES roles and responsibilities in relation to floods are outlined in the NSW State Flood Emergency Sub Plan.

AGENCY	RESPONSIBILITIES
Agriculture and Animal Services Functional Area	The roles and responsibilities for the Agriculture and Animal Services Functional Area 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 (Bureau) are outlined in the NSW State Flood Plan.
Bathurst Regional Council	**Preparedness** • Establish and maintain floodplain and coastal risk management committees and ensure that key agencies are represented. • Develop and implement floodplain risk management plans in accordance with the NSW Government's Flood Prone Land Policy and the Floodplain Risk Management Manual. • Provide levee studies, flood studies and floodplain management studies to the NSW SES. • Maintain Dam Emergency Plans for the Chifley and Winburndale dams and provide copies to the NSW SES. • Provide information on the consequences of dam failure to NSW SES for incorporation into planning and flood intelligence. • Maintain council-owned flood warning networks and flood mitigation works. • Participate in NSW SES-led flood emergency planning meetings, to assist in the preparation of Flood Emergency Sub Plans. • Maintain a plant and equipment resource list for the council area. • Contribute to community engagement activities. **Response** • Subject to the availability of council resources, assist the NSW SES with flood operations including: – Traffic management on council managed roads. – Provision of assistance to the NSW SES (plant, equipment, and personnel where able and requested). – Property protection tasks including sandbagging. – Assist with the removal of caravans from Caravan Parks.

AGENCY	RESPONSIBILITIES
	– Warning and/or evacuation of residents and other people in flood liable areas. – Provision of back-up radio communications. – Resupply of isolated properties. – Technical advice on the impacts of flooding. – Close and reopen council roads (and other roads nominated by agreement with Transport for NSW) and advise the NSW SES, the NSW Police Force and people who contact the council for road information. – Assist the NSW SES to provide filled sandbags and filling facilities to residents and business in areas which flooding is expected. • Assist with making facilities available for domestic pets and companion animals of evacuees during evacuations. • Operate flood mitigation works including critical structures such as detention basins and levees and advise the NSW SES regarding their operation. • Manage and protect council-owned infrastructure facilities during floods. • Provide advice to the NSW SES and the Health Services Functional Area during floods about key council managed infrastructure such as sewerage treatment and water supply. • Advise the Environmental Protection Authority of any sewerage overflow caused by flooding. • Work with the NSW SES and NSW Department of Planning and Environment to collect flood related data during and after flood events. **Recovery** • Provide for the management of health hazards associated with flooding including removing debris and waste. • Ensure premises are fit and safe for reoccupation and assess any need for demolition. • Provide services, assistance and advice to State Government in accordance with the State Recovery Plan.
Caravan Park Proprietor(s)	• Prepare a flood emergency plan for the caravan park. • Ensure that owners and occupiers of movable dwellings are aware that the caravan park is flood liable by providing a written notice to occupiers taking up residence and displaying this notice and emergency management arrangement within the park. • Ensure that owners and occupiers of movable dwellings are aware that if they are expecting to be absent for extended periods, they should:

AGENCY	RESPONSIBILITIES
	– Provide the manager of the caravan park with a contact address and telephone number in case of an emergency. – Leave any movable dwelling in a condition allowing it to be relocated in an emergency (i.e. should ensure that the wheels, axles and draw bar of the caravans are not removed and are maintained in proper working order). • Ensure that occupiers are informed of Flood Information. At this time, occupiers should be advised to: – Ensure that they have spare batteries for their radios. – Listen to a local radio station for updated flood information. – Prepare for evacuation and movable dwelling (cabins) relocation. • Ensure that owners and occupiers of caravans are aware of what they must do to facilitate evacuation and movable dwelling relocation when flooding occurs. • Coordinate the evacuation of people and the relocation of movable dwellings when floods are rising and their return when flood waters have subsided. Movable dwellings will be relocated back to the caravan park(s) by owners or by vehicles and drivers arranged by the park managers. • Secure any movable dwellings that are not able to be relocated to prevent floatation. • Inform the NSW SES of the progress of evacuation and/or movable dwellings relocation operations and of any need for assistance in the conduct of these tasks.
Childcare Centres and Preschools	• When notified of possible flooding or isolation, childcare centres and preschools should: – Liaise with the NSW SES and arrange for the early release of children whose travel arrangements are likely to be disrupted by flooding and/or road closures. – Assist with coordinating the evacuation of preschools and childcare centres.
Dams Safety NSW	The roles and responsibilities for Dams Safety NSW (formerly NSW Dam Safety Committee) are outlined in the NSW State Flood Plan.
Department of Defence	Arrangements for Defence Assistance to the Civil Community are detailed within the State EMPLAN (section 448).
Energy and Utilities Services Functional Area	The roles and responsibilities for the Energy and Utilities Services Functional Area are outlined in the Energy and Utility Services supporting plan (EUSPLAN). Roles and responsibilities in addition to the Supporting Plan are:

AGENCY	RESPONSIBILITIES
	• Assist the NSW SES with identification of infrastructure at risk of flood damage where resources are available. • Facilitate local utility service distribution providers (electricity, gas, water, wastewater) to: – Provide advice to the NSW SES of any need to disconnect power/gas/water/wastewater supplies or of any timetable for reconnection. – Advise the NSW SES of any hazards from utility services during flooding and coastal erosion/inundation. – Advise the public with regard to electrical hazards during flooding and coastal erosion/inundation, and to the availability or otherwise of the electricity supply. – Clear or make safe any hazard caused by power lines or electricity distribution equipment. – Reconnect customers' electrical/ gas/ water/wastewater installations, when certified safe to do so and as conditions allow. – Assist the NSW SES to identify infrastructure at risk of flooding for incorporation into planning and intelligence.
Engineering Services Functional Area	The roles and responsibilities for the Engineering Services Functional Area are outlined in the Engineering Services Supporting Plan and NSW State Flood Plan.
Environmental Services Functional Area	The roles and responsibilities for the Environmental Services Functional Area are outlined in the Environmental Services (ENVIROPLAN) Supporting Plan.
Floodplain Management Australia	The roles and responsibilities for Floodplain Management Australia are outlined in the NSW State Flood Plan**.**
Fire and Rescue NSW	The roles and responsibilities for Fire and Rescue NSW are outlined in the NSW State Flood Plan.
Forestry Corporation of NSW	The roles and responsibilities for Forestry Corporation of NSW are outlined in the NSW State Flood Plan.
Health Services Functional Area	The roles and responsibilities for the Health Services Functional Area are outlined in the Health Services (HEALTHPLAN) Supporting Plan and NSW State Flood Plan.
Local Emergency Operations Controller (LEOCON)	• Monitor flood operations. • If requested, coordinate support for the NSW SES Incident Controller.
Local Emergency Management Officer (LEMO)	• If requested by the NSW SES Incident Controller, advise appropriate agencies and officers of the start of response operations.
Manly Hydraulics Laboratory (MHL)	The roles and responsibilities for Manly Hydraulic Laboratory are outlined in the NSW State Flood Plan.

AGENCY	RESPONSIBILITIES
Marine Rescue NSW	The roles and responsibilities for Marine Rescue NSW are outlined in the NSW State Flood Plan.
NSW Ambulance	The roles and responsibilities for NSW Ambulance are outlined in the Health Services (HEALTHPLAN) Supporting Plan and NSW State Flood Plan.
NSW Department of Education, Association of Independent Schools of NSW, and National Catholic Education Commission	The roles and responsibilities for NSW Department of Education, Association of Independent Schools of NSW, and National Catholic Education Commission are outlined in the NSW State Flood Plan.
NSW Department of Planning and Environment (Environment and Heritage Group)	The roles and responsibilities for NSW Department of Planning and Environment (Environment and Heritage Group) are outlined in the NSW State Flood Plan (referred to as DPIE EES).
NSW Department of Planning and Environment (Water)	The roles and responsibilities for NSW Department of Planning and Environment (Water) are outlined in the NSW State Flood Plan.
NSW Food Authority	The roles and responsibilities for the NSW Food Authority are outlined in the Food Safety Emergency Sub Plan.
NSW National Parks and Wildlife Services	The roles and responsibilities for NSW National Parks and Wildlife Services are outlined in the NSW State Flood Plan.
NSW Police Force	The roles and responsibilities for the NSW Police Force are outlined in the NSW State Flood Plan.
NSW Reconstruction Authority.	The roles and responsibilities for the NSW Reconstruction Authority. are outlined in the NSW State Flood Plan.
NSW Rural Fire Service	The roles and responsibilities for the 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 the Public Information Services Functional Area are outlined in the Public Information Services Supporting Plan and NSW State Flood Plan**.**
State Emergency Operations Controller (SEOCON)	The roles and responsibilities for the SEOCON/SEOC are outlined in the NSW State Flood Plan**.**
Surf Life Saving NSW	The roles and responsibilities for Surf Life Saving NSW are outlined in the NSW State Flood Plan.

AGENCY	RESPONSIBILITIES
Telecommunications Services Functional Area	The roles and responsibilities for the Telecommunications Services Functional Area are outlined in the Telecommunications Services (TELCOPLAN) Supporting Plan.
Transport for NSW	• Transport for NSW coordinates information on road conditions for emergency services access. • Transport for NSW coordinates the management of the road network across all modes of transport. • Transport for NSW in conjunction will assist NSW SES with the evacuation of at-risk communities by maintaining access and egress routes. • Assist the NSW SES with the communication of flood warnings and information provision to the public through Live Traffic and Social Media according to the VMS protocols and procedures. • Assist the NSW SES with identification of road infrastructure at risk of flooding.
Transport Services Functional Area	The roles and responsibilities for the Transport Services Functional Area are outlined in the Transport Services Functional Area Supporting Plan and NSW State Flood Plan.
VRA Rescue NSW	The roles and responsibilities for VRA Rescue NSW are outlined in the NSW State Flood Plan.
Water NSW	The roles and responsibilities for Water NSW are outlined in the NSW State Flood Plan.
Welfare Services Functional Area	The roles and responsibilities for the Welfare Services Functional Area are outlined in the Welfare Services Functional Area Supporting Plan and NSW State Flood Plan.

11 Appendix C – Community Specific Roles and Responsibilities

Community Members	**Preparedness** • Understand the potential risk and impact of flooding. • Prepare homes and property to reduce the impact of flooding. • Understand warnings and other triggers for action and the safest actions to take in a flood. • Households, institutions, and businesses develop plans to manage flood risks, sharing and practicing this with family, friends, employees, and neighbours. • Have an emergency kit. • Be involved in local emergency planning processes. **Recovery** • Assist with community clean-up if required and able to do so. • Participate in After Action Reviews if required.
Aboriginal Organisations or Groups	**Bathurst Aboriginal Land Council**. 149 Russell Street, Bathurst NSW 2795 Ph: (02) 6332 6835 • Act as the point of contact between the NSW SES and the Bathurst Aboriginal community. • Inform the NSW SES Incident Controller about flood conditions and response needs. • Disseminate flood information, including flood and evacuation warnings, to the Bathurst Aboriginal community.
Communication	• NSW SES Bathurst Facebook Page. • NSW SES Sofala Facebook Page.

BATHURST REGIONAL COUNCIL

NSW STATE EMERGENCY SERVICE

HAZARD AND RISK IN BATHURST REGIONAL

Volume 2 of the Bathurst Regional Local Flood Plan

Last Update: November 2014

FloodSafe

AUTHORISATION

.The Hazard and Risk in Bathurst Regional 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: 21/10/14

Approved

NSW SES Central West Region Controller

Date: 27/10/2014

Tabled at LEMC

Date: 25/11/14.

CONTENTS

LIST OF TABLES

VERSION LIST

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

Description	Date
Bathurst Regional Local Flood Plan	Feb 2008

AMENDMENT LIST

Suggestions for amendments to this Volume should be forwarded to:

The Bathurst Regional Local Controller

NSW State Emergency Service

C/- Central West Region Headquarters

79 Corporation Avenue

BATHURST NSW 2795

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

Amendment Number	Description	Updated by	Date
1	Removed sentence from Chifley Dam detail	P Harrington	14/08/2017

Document Issue: V2-10022014

1 THE FLOOD THREAT

1.1 LANDFORMS AND RIVER SYSTEMS

1.1.1 Most of the Bathurst Regional Council area falls within the catchment of the Macquarie River system, whose tributary headwaters rise to the east in the Oberon, Lithgow and Mid-Western Regional Council areas. The southern and south-western portions of the Council area are drained by the Abercrombie River system, the waters from which flow into Lake Wyangala and thence into the Lachlan River.

1.1.2 The Macquarie Basin extends in a north-westerly direction from the Great Dividing Range near Oberon, to the Barwon River between Brewarrina and Walgett and covers an area of 87,000 square kilometres.

1.1.3 The Macquarie River is formed near Bathurst by the joining of the Fish and Campbells Rivers which are fed by the Duckmaloi River and numerous other upstream tributaries. The Fish and Campbells systems drain a high plateau area within the Oberon council area consisting largely of undulating to hilly terrain with watercourses confined within narrow, steep valleys. The Macquarie River itself passes through the undulating lowlands that form the Bathurst Plains area where the first substantial floodplain is found.

1.1.4 Downstream of Bathurst, the river becomes confined once again in a narrow valley until it leaves the council area near Peisleys Hole in the north-west.

1.1.5 Within the urban area of Bathurst, the Macquarie River is joined by three major tributaries, the Queen Charlottes (Vale), Jordan and Raglan Creeks. Downstream of Bathurst, the main tributaries are the Winburndale Rivulet (which rises in the Winburndale Nature Reserve), Clear Creek and the Turon River. Turon River's headwaters are near Portland in the Lithgow City Council area and the river flows through Sofala from the east before joining the Macquarie River downstream of Bruinbun.

1.1.6 Other tributaries of the Macquarie River rise in the Mid-Western Regional Council area. Numerous smaller tributaries also join the Macquarie River. At Bathurst itself, the Macquarie River has a catchment area of 2,830 square kilometres.

1.1.7 Refer to Map 1 and 2.

1.2 STORAGE DAMS

1.2.1 Dam locations are shown on MAP 3 - Bathurst Town Map. Details of the three main dams (Chifley, Winburndale and Oberon Dams) are summarised in Table 1 to Table 3.

Chifley Dam

Table 1: Prescribed Dams in Bathurst Regional LGA; summary of information about Chifley Dam storage.

Chifley Dam	
Owner / Operator	Bathurst Regional Council
Description of Dam	It has a capacity of approximately 30,800 ML. This dam has recently been upgraded to a height of 34.35m and is one of the two only significant storage dams located upstream of Bathurst. This dam has little mitigating effect on flooding at Bathurst. It is used for town water supply purposes and is kept as full as possible to maintain security of supply. The combined capacity of Chifley and Oberon dams is greatly exceeded by the flood volumes of the 1986, 1990 and 1998 events. It has a 6 bay fuse plug spillway at a height of 710.62m AHD. The probable maximum inflow is 9346m3/s, and probable maximum outflow of 9172m3/s.
Location	17 kilometres south of Bathurst and 3.5 kilometres south east of The Lagoon on the Campbell's River
Communities Downstream	A sunny day failure would inundate 350 houses (population at risk equivalent to 875), with travel time of the crest to the first dwelling less than 30 minutes after failure. A PMF would inundate 650 houses (population at risk equivalent to 875), with travel time of the crest to the first dwelling less than 15 minutes after failure. Further details of the dam break inundation maps are located in Appendix C of the Chifley Dam Safety Emergency Plan (2013).
Monitoring System	A telemetric reservoir level recorder system is installed at the site.
Warning System	NSW SES is notified through the 24 hour State Operations Centre, who notifies Region Headquarters and then the Local Controller/After-hours Duty Officer. White Alert 712.62m AHD (with 1 hour warning between each alert level) Amber Alert 713.22m AHD (with 1 hour warning between each alert level) Red Alert 714.12m AHD (with 1 hour warning between each alert level) It also has a protection alert level set at 711.82m AHD

Winburndale Dam

Table 2: Prescribed Dams in Bathurst Regional LGA; summary of information about Winburndale Dam storage.

Winburndale Dam	
Owner / Operator	Bathurst Regional Council
Description of Dam	Winburndale Dam (owned by Bathurst Regional Council) is a small structure, which impounds a small lake. Its capacity is approximately 1700 million litres and has a catchment of around 88 square kilometres. It is identified as a highest risk dam (1). It has been assessed as not being able to safely pass a PMF event.
Location	21km north east of Bathurst on the Winburndale Rivulet
Communities Downstream	Seven dwellings would be inundated with travel time of the crest to the first dwelling less than 30 minutes after failure. 13 dwellings would be inundated in a PMF. There would also be potential damage to some bridges located on the Limekilns Road, Sofala Road, Turondale Road and the Bridle Track. Warning and evacuation procedures for the potential failure of Winburndale Dam are detailed in Volume 3.
Monitoring System	Telemetry system and SMS message is sent to the dam operator, relayed to LEMO/SES. Environmon provides rainfall and stream flow conditions.
Warning System	White 797.17m (FSL +0.3m) – approximately 12-24 minutes from FSL in PMF and DCF respectively Amber 797.67m (FSL +0.8m) – approximately 20-36 minutes from FSL Red 798.27m (FSL +1.4m) – approximately 28-48 minutes from FSL

Oberon Dam

Table 3: Prescribed Dams in Bathurst Regional LGA; summary of information about Oberon Dam storage.

Oberon Dam	
Owner / Operator	State Water
Description of Dam	Otherwise known as the Fish River Dam. Capacity approximately 45,000 million litres. This dam has little mitigating effect on flooding at Bathurst. It is used for town water supply purposes is also used for Wallerawang Power Station and is kept as full as possible to maintain security of supply The combined capacity of Chifley and Oberon dams is greatly exceeded by the flood volumes of events like those of 1986, 1990 and 1998 . It is able to withstand an inflow of 935m3/s and outflow of 282m3/s,
Location	It is located 2 kilometres south east of Oberon on the Fish River about 27 kilometres upstream from the junction with the Duckmaloi River.
Communities Downstream	27 residential properties are identified at risk, 10 likely, on the southern fringe of Oberon toward Edith. Significant damage would be caused to bridges, roads and main western railway line. Time to reach the first property would be 60 minutes.
Monitoring System	Manual gauges located on the Fish River and Oberon Dam monitor water levels. A flood sensor activates a siren hear by employees who notify SES. Electronic piezometers, seepage monitors, and standpipe piezometers are also installed at the dam.
Warning System	White – RL 1069.73m AHD (1.65m above FSL) – 45 minutes to Amber. Amber - RL 1071.05m AHD (2.97m above FSL) – 35 minutes to Red Red – RL 1072.13m AHD (4.05m above FSL)

1.3 WEATHER SYSTEMS AND FLOODING

1.3.1 Most of the headwaters of the Macquarie and Abercrombie river systems have average annual rainfalls of 600-800mm and large amounts of rain can fall at any time of year. In the most severe events, over half the average annual rainfall may be recorded at some stations over a period of several days.

1.3.2 Flooding in the Bathurst Regional Council areas usually results from one of four mechanisms:

a. **Cyclonic depressions** forming troughs extending from northern Australia and directing northerly streams of moist, unstable air into northern and central western NSW. Such systems, which occur during the warmer months, frequently produce intense short-period rainfalls leading to flooding. However, flooding from this mechanism is rare.

b. **Well-developed low-pressure troughs** associated with depressions well to the south and crossing the council areas from west to east. Sequences of such troughs can produce high rainfall totals over a period of weeks, usually in the winter months, with daily falls being less intense

than those experienced as a result of the cyclone depressions noted above. The 1964, and 1990 floods were of this origin.

c. **Low-pressure systems** situated off the coast of NSW and causing flows of moist air across the Great Dividing Range. This mechanism was responsible for the flood of August 1986 and August 1998.

d. **High-intensity, short-duration convective thunderstorms** bringing very heavy rain and causing local run off, 'flash' flooding on minor tributaries and the surcharging of storm water drainage systems in built-up areas. Such storms are largely confined to the late spring, summer and early autumn months and do not create mainstream flooding.

1.3.3 While summer thunderstorms are common, in general it is the winter mechanisms, which are the most significant in terms of flood production in the Bathurst Regional Council area. There is a tendency towards a concentration of flooding in July and August, nearly half of the significant events at Bathurst this century having occurred in these two months. Several floods have also been recorded in October.

1.4 CHARACTERISTICS OF FLOODING

1.4.1 It is a characteristic of flooding in the Bathurst Regional Council area that warning times are short, in the order of hours rather than days. Historically, floods have been usually of short duration with flood waters receding in less than one day in the Turon and Macquarie Rivers, and in Queen Charlottes (Vale) and Raglan Creeks. In addition, flash flooding can occur anywhere within the Bathurst Regional local government area as a result of severe thunderstorm activity, generally within the summer months. Such activity is often responsible for floods on minor creeks and in built-up areas when artificial drainage systems begin to surcharge.

Table 4: Indicative Flow Travel Time for the Macquarie River

Locations	Travel Time
Oberon Dam - Oberon	1h
Chifley Dam - Bathurst	1-2h
Fish River Junction - Bathurst	15-20h
Winburndale Rivulet - Peel	1h

1.5 FLOOD HISTORY

1.5.1 Since the establishment of Bathurst in 1815, numerous floods have broken the Macquarie River's banks within the urban area. The record flood, which was recorded in 1823, is believed to have reached a level more than a metre higher (approximately 7.60 metres on the Stanley Street Gauge) than was reached in the floods of 1964, 1986, 1990 and 1998.

1.5.2 The 1964, 1986, 1990 and 1998 floods were of severities that can be expected, on average, roughly every 50-80 years however none of these

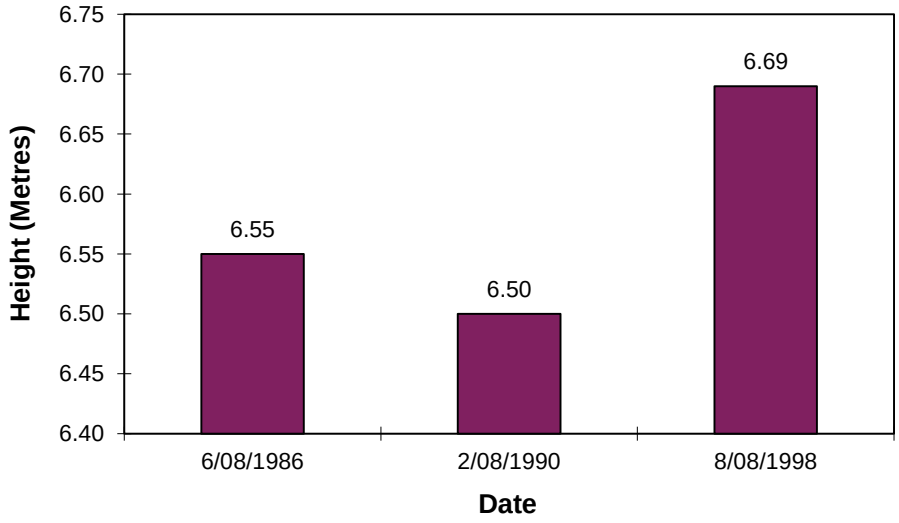
floods reached a 1% AEP (a 1% AEP flood has a 1 in 100 chance of being reached or exceeded in any given year / 1% ARI) or 7.38m at the Bathurst (Stanley Street) gauge (3). A flood which was almost as severe as these was recorded in 1952 (approximately 6.4 metres on the Stanley Street Gauge) and a lesser one in 1916 (approximately 6.0 metres on the Stanley Street Gauge). Other flood episodes occurred in earlier years but the record is imprecise and the heights reached are not known.

1.5.3 During the last two decades, three major floods (5.70 metres or above) have been recorded on the Bathurst (Stanley Street) gauge as shown in Figure 1 below. The most recent of these, in August 1998, was also the most severe this century, in terms of the flood peak reached on the Stanley Street gauge.

1.5.4 Severe flooding was experienced in Perthville in August 1990 (estimated to have a 60 year ARI, i.e. a 1.7% AEP), when flooding of Vale Creek resulted in approximately 19 houses flooded overfloor (2).

1.5.5 The Turon River at Sofala has a history of flooding, with the largest recorded flood occurring in August 1986 (4).

Figure 1: Flood History on the Stanley Street gauge, Macquarie River (421908)



1.6 FLOOD MITIGATION SYSTEMS

1.6.1 Bathurst Regional Council has implemented a number of flood mitigation strategies since the August 1998 flood. The council has constructed levee banks to the old design height of the 1% flood (6.9m on the Stanley Street gauge) between the Denison and Evans bridges and behind the Showground; around the western side of the Macquarie River towards Baillie Street, the railway embankment and over Acheron Street to Russell Street and along Alpha Street and around the western side of the Macquarie River between Stewart and Commonwealth Streets.

1.6.2 Further additional levee banks have been constructed on the western, northern and eastern side of Lyall and Upfold Streets and at the eastern

approach of Bathurst preventing flooding of the Highway up to the revised 1% AEP flood (7.38m on the Stanley Street gauge); in Kelso on the western side of Gilmour Street between Camidge Close and south of Tareena Avenue and in Perthville/Georges Plains at Perthville. As a result of this work, future flood behaviour will be quite different from what has occurred in previous events and will need to be monitored closely.

1.6.3 The design height of the Showground levee at Old Vale Creek is estimated to be 8.25 metres (on Stanley Street gauge).

1.6.4 The design height of the levee at Russell St is estimated to be 11.75 metres (on Stanley Street gauge).

1.6.5 Upfold Levee (Upfold St – 1.4km long) protects 15 residential and 7 commercial premises at the 1% AEP flood (design height of 1% +0.5m freeboard). It is designed to fail at specific locations to control inundation (5).

1.6.6 Kelso Industrial Estate Levee (1.35km long) inundates first at the railway embankment at the northern end prior to the 1% AEP (7.38m on the Stanley St gauge) if the area is not sandbagged, as the embankment is lower than the levee (5).

1.6.7 Gilmour St Levee (1.7km long) runs parallel to Gilmour St along Raglan Creek. It has a overtopping height of 1% AEP (plus 0.5m freeboard) (5).

1.6.8 Carlingford Levee (700m long u-shaped levee) protects the Carlingford Street areas of 13 residential and 2 commercial premises to the 1% AEP. There is a low point of the crest at Russell St. For events exceeding the 1% AEP, the levee has been design to fail at specific locations to control inundation (5).

1.6.9 Havannah and Morrisset Street Levees (2.2 and 1.45km long respectively) protect 100 and 58 properties respectively up to the old 1% AEP flood (6.9m on the Stanley Street gauge). They also protect the Electrical substation at Russell/Alpha St. The Morrisset Levee consists of the man levee and a spur levee which protects the sewage treatment works. The design height is the old 1% (6.9m on the Stanley Street gauge) (plus 0.5m freeboard). For events exceeding this level, it has been designed to fail at specific locations at Penstocks and spillways to control inundation (5).

1.6.10 As a result of this work, future flood behaviour will be quite different from what has occurred in previous events and will need to be monitored closely.

1.7 EXTREME FLOODING

1.7.1 The worst floods experienced in the Bathurst Regional Council area in living memory should not be regarded as the most severe which can occur there. Worse floods than have been seen by present residents are possible, as is indicated by the fact that the 1823 flood greatly exceeded the heights reached in 1964, 1986, 1990 and 1998. The August 1998 flood was 0.30 metres below the calculated 1% AEP flood level for the Bathurst (Stanley Street) gauge (7.38m metres) peaking at 6.60 metres.

1.7.2 There is also a risk of dam-failure flooding. Winburndale Dam, located on the Winburndale Rivulet (capacity around 1,700 million litres) approximately 21 kilometres north east of Bathurst has been assessed as being unable to safely retain structural integrity during a Probable Maximum Flood (PMF) event should it occur.

1.7.3 Design flood heights are summarised in Table 5.

Table 5: Design flood heights (3) (5)

Gauge	10% AEP	5% AEP	2% AEP	1% AEP	PMF
Stanley St (421908)	5.1	5.8	6.5	7.38 (revised from 6.9m)	n/a
Perthville Bridge (AWRC 421910)	n/a	n/a	n/a	3.32	n/a

2 EFFECTS ON THE COMMUNITY

2.1 COMMUNITY PROFILE

Table 6: Census of Housing and Population data (2011)

Census Description	Bathurst Regional (A)	Kelso	Bathurst	Eglinton	South Bathurst	Abercrombie
Total Persons	38519	7725	6634	2109	1835	1011
Aged <15 years	7996	1909	897	549	372	288
Aged 65 + yrs	5353	1037	1155	191	329	83
Of Indigenous Origin	1635	462	219	39	103	46
Who do not speak English well	84	16	0	0	3	0
Have a need for assistance (profound/severe disability)	1691	414	286	58	135	22
Living alone (Total)	3549	519	1233	89	219	48
Residing in caravans, cabins or houseboats or improvised dwellings	55	40	0	0	0	0
Number of Dwellings (Households)	13655	2817	2858	1982	1698	337
No Motor Vehicle	1033	165	450	6	80	7
Total persons using Internet	3109	2016	1915	557	489	271
Average persons per dwelling	2.5	0.4	0.4	0.9	0.9	0.3
Average vehicles per dwelling	1.8	n/a	n/a	n/a	n/a	n/a

Census Description	Gormans Hill	Perthville	Sofala	Georges Plains
Total Persons	871	819	363	361
Aged <15 years	159	213	63	81
Aged 65 + yrs	205	121	78	46
Of Indigenous Origin	42	28	24	27
Who do not speak English well	6	0	0	0
Have a need for assistance (profound/severe disability)	104	31	25	6
Living alone (Total)	116	57	60	31
Residing in caravans, cabins or houseboats or improvised dwellings	0	0	4	3
Number of Dwellings (Households)	771	343		348
No Motor Vehicle	41	9	12	0
Total persons using Internet	207	101		88
Average persons per dwelling	0.9	0.4	0.0	1.0
Average vehicles per dwelling	n/a	2.2	n/a	n/a

2.2 SPECIFIC RISK AREAS - FLOOD

Macquarie River Basin

BATHURST CENTRAL

2.2.1 Bathurst central (population 6634) is built on the floodplains of the Macquarie River and the Queen Charlottes (Vale), Jordan and Raglan Creeks and is subject to inundation.

2.2.2 Havannah and Morrisset Streets are mainly residential, located near the Bathurst Central Business District (CBD) and includes Baillie, Bryant, Durham, Havannah, Howick, Seymour, Russell, Morrisset, Stanley, Kefford, Stewart, Peel, Commonwealth and Hope Streets and Kendall Avenue. The area also includes the Bathurst Sewage Treatment Works and the Bathurst Regional Council Depot.

Cultural and Linguistic Diversity

2.2.3 There are approximately 220 indigenous persons in Bathurst (central) and there are no identified persons who do not have proficiency in English.

Schools and childcare centres

2.2.4 There are no childcare centres identified at risk of flooding and/or isolation.

Facilities for the aged and/or infirm

2.2.5 The following facilities are at risk of flooding and/or isolation:

a. Bathurst Base Hospital Rehabilitation Unit

b. St Vincent's Private Hospital

c. Macquarie Care Centre

d. Chifley Village

Utilities and Infrastructure

2.2.6 The following utilities and infrastructure are at risk of flooding:

a. Essential Energy Sub-station located at Russell Street, Bathurst. This is now protected by a concrete barrier to a height of 7.6m (Bathurst Stanley Street gauge), but needs to be monitored to prevent major blackouts of the CBD and rural feeders.

b. The Sewage Treatment Works.

c. Bathurst Regional Council Depot.

2.2.7 Caravan Parks are listed in Volume 3, Chapter 4 of this Local Flood Plan (SES Caravan Park Arrangements).

Classification of Floodplain

2.2.8 Rising Road Access up to the PMF.

Inundation

2.2.9 Bathurst utilises the warnings provided by The Bureau for the Stanley Street gauge (AWRC 421908).

2.2.10 Moderate floods (5-5.4m on the Stanley St gauge) over floor flooding occurs in Howick and Upfold Streets and the Showground and Kennerson Park to become inundated, as well as Hereford St, Kefford St, the lower end of Stewart St and Morrissett St.

2.2.11 In a Major flood (between 5.7-6.3m), lower Russell St, Acheson St, Bryant St, Havannah and Seymour Streets below Russell St, Howick and Durham Streets below Betinck St, Baillie St, Kendall Ave, Stanley St, and Lower Peel St become inundated. Carrington Park becomes inundated over floor and some parts of Hope St. Depths of floods exceed 2.4m.

2.2.12 In Major floods (exceeding 6.9m on the Stanley St gauge), 100 houses in the Havannah Street area and 58 in the Morrissett Street are may be inundated. These are located in Baillie St (6); Bryant St (4), Havannah St (36), Durham St (2), Howick St (22), Seymore St (14), Russell St (16), Morrissett St (22), Stanley St (19), Kefford St (4), Hope St (8), Peel St (4), Stewart St (1).

2.2.13 Backwater flooding (in an event greater than a 1% AEP flood event, 7.38m on the Stanley St gauge) can occur from the Macquarie River up the (new) Queen Charlottes (Vale) Creek. This can also lead to flows discharging through the Russell Street railway underpass and overland along Havannah and Russell Streets inundating parts of the Havannah Street area. During past events, flows through this underpass have been fast flowing and dangerous.

2.2.14 It has been estimated that during a 1% AEP flood on the Macquarie River (7.38m on the Stanley St gauge), which would be less severe than the flood of record of 1823, over-floor flooding of over 70 dwellings including commercial/industrial buildings would occur in the Bathurst urban area alone. Floods more severe than a 1% AEP would probably result in additional buildings becoming inundated (3).

2.2.15 Flooding in the Morrisset Street area would come from overbank flow from the Macquarie River. A total of 58 residential properties could experience over floor flooding in a 1% AEP event (7.38m on the Stanley St gauge). These properties are located in Morrisset, Stanley, Kefford, Hope, Peel and Stewart Streets. The Sewage Treatment Works and the Bathurst Regional Council Depot would be affected.

2.2.16 In the major flood of August 1986, approximately 700 people had to be evacuated and several industrial properties were affected. In this flood and in the August 1990 and August 1998 events the Great Western Highway was closed and the main part of Bathurst was cut off from Eloura, Kelso, Marsden and Raglan to the east. Such floods may cut off power supplies causing serious disruption to infrastructure generally (3).

Isolation

2.2.17 Bathurst may become isolated if the Great Western Highway becomes inundated (from 6.3m, depending on flood behaviour and the recently installed levee at this location).

Characteristics of flooding

2.2.18 Flood warning times are short, in the order of hours.

2.2.19 Even during floods of relatively minor significance, flood waters may close local roads and affect residential properties (3).

2.2.20 Most of the flood liable areas have portions where flow velocity and flood depths may be considerable, leading to severe difficulties of evacuation by foot or by vehicle once flooding is well advanced.

Flood Mitigation Systems

2.2.21 During past events, this area has been inundated due to overbank flow from the Macquarie River or from back flow up the Queen Charlottes (Vale) Creek, or from flooding up the old course of the Queen Charlottes (Vale) Creek. This area is now protected to 6.90 metres on the Bathurst (Stanley Street) gauge, by the Havannah Street and Morrisset Street levee banks, between the Denison and Evans bridges, and behind the Showground; around the western side of the Macquarie River towards Baillie Street, the railway embankment and over Acheron Street to Russell Street and along Alpha Street and around the western side of the Macquarie River between Stewart and Commonwealth Streets.

2.2.22 Further additional levee banks have been constructed on the western, northern and eastern side of Lyall and Upfold Streets and to the east of Bathurst diverting flow away from the Highway to a design height of the revised 1% AEP (7.38m on the Stanley Street Gauge).

2.2.23 The main flood threats for residents in these areas is from levee overtopping floods (floods of 6.90 metres or greater on the Stanley Street gauge) or from local rain causing back up flooding inside the levee banks. Bathurst Regional Council has installed pumps and gates to remove water from inside the levee during local rainfall events.

2.2.24 The design height of the Showground levee at Old Vale Creek is estimated to be 8.25 metres (on Stanley Street gauge).

2.2.25 The design height of the levee at Russell St is estimated to be 11.75 metres (on Stanley Street gauge).

2.2.26 As a result of this work, future flood behaviour will be quite different from what has occurred in previous events and will need to be monitored closely.

Dams

Chifley Dam

2.2.27 Consequences in Bathurst (Railway Bridge) of sunny day dam failure. The travel time of the will take approximately 2 hours from the dam to the Railway Bridge. In the event of a Sunny Day Dam Failure it is estimated that there could be up to 350 houses that could be inundated, with a population at risk of 875. Flood velocity is estimated at 4m/s (5).

2.2.28 Consequences in Bathurst (Railway Bridge) of PMF Dambreak failure. The travel time of the will take approximately 1 hour from the dam to the Railway Bridge. In the event of a PMF Dam Failure it is estimated that there could be up to 650 houses that could be inundated, with a population at risk of 1625. Flood velocity is estimated at about 3.7m/s to 4.6m/s (5).

2.2.29 In August 1998, a red alert was issued when the Chifley dam gauge reached 7.47m, contributing to major flooding in Bathurst (6.69m on the Stanley Street gauge) (6).

Other Considerations

2.2.30 Bathurst 1000 is an annual touring car race held at mount Panorama, held on the first or second Sunday of October. This event attracts over 187 000 people over the four day period (4).

2.2.31 The other top 10 festivals in the Bathurst LGA are the Royal Bathurst Show, Bathurst Spring Spectacular, B2B Cyclo Challenge, Gold Crown Festival, Party in the park, Edgell Jog, Rockey Road and Bathurst Esteddfod (4).

KELSO

2.2.32 Kelso is located to the north-east of Bathurst central. The floodplain between Macquarie River Channel and the eastern flood extremity, and generally north of the Main Western Railway to the Racecourse.

2.2.33 Residential properties in River Road, First, Church, Stephens and Edgells Lanes, Hereford and Gilmour Streets, Lions Club and Eleven Mile Drive can all be inundated. The Kelso floodplain is subject to flooding from both the Macquarie River and Raglan Creek and this has been the zone of major evacuations during past floods in Bathurst. The council under their voluntary purchase scheme has purchased many of the homes inundated in the floods of August 1986 in the Kelso area. However, approximately 30 residential dwellings remain in this area.

Schools and childcare centres

2.2.34 The following schools and childcare centres are at risk of flooding and/or isolation in a PMF. Facilities in Kelso will be isolated from Bathurst Central from floods exceeding the 1% AEP flood, as Kelso becomes isolated from Bathurst Central (including Kelso Kindy, Holy Family School, Denison College of Secondary Education).

a. Schools

- Kelso Public School, 19 Gilmour St

b. Childcare centres

- ABC Developmental Learning Centre, Kelso West, 151 Gilmour St
- Early Start Kelso Preschool, 7 Lee St

Facilities for the aged and/or infirm

2.2.35 The following facilities are at risk of isolation from Bathurst Central:

a. Ilumba Gardens, Ilumba Way, Kelso

b. Bathurst Nursing Home, 61 Boyd St, Kelso

Utilities and Infrastructure

2.2.36 The following utilities and infrastructure are at risk of flooding:

a. Pump station off Gilmour Street (7).

2.2.37 Caravan Parks are listed in Volume 3, Chapter 4 of this Local Flood Plan (SES Caravan Park Arrangements).

Classification of Floodplain

2.2.38 The community of Kelso is in a rising road access area, in particular along Gilmour Street.

2.2.39 In the event that the Gilmore Levee is overtopped when a flood event exceeds a 1% AEP flood (7.38m on the Stanley St Gauge) the area will become a high flood island.

Inundation

2.2.40 Kelso utilises the warnings provided by The Bureau for the Stanley Street gauge (AWRC 421908).

2.2.41 The Kelso floodplain is subject to flooding from both the Macquarie River and Raglan Creek and this has been the zone of major evacuations during past floods in Bathurst.

2.2.42 Residential properties in River Road, First, Church, Stephens and Edgells Lanes, Hereford and Gilmour Streets, Lions Club and Eleven Mile Drive can all be inundated (approximately 41 houses up to the 1% AEP flood – 7.38m on the Stanley St gauge).

2.2.43 The council under their voluntary purchase scheme has purchased many of the homes inundated in the floods of August 1986 in the Kelso area. However, approximately 30 residential dwellings remain in this area.

2.2.44 Residential properties in River Road, First, Church, Stephens and Edgells Lanes, Hereford and Gilmour Streets, Lions Club and Eleven Mile Drive can all be inundated.

2.2.45 In events exceeding 6.9m on the Stanley St Gauge, the industrial area of Toronto, Kobe, Coventry, Zagreb and Littlebourne Streets, Sheffield Place, Whyalla Circuit and Hampden Park Road may experience inundation. These areas are protected by levees up to the old 1% AEP flood level (6.9m on the Stanley St gauge).

Isolation

2.2.46 The Great Western Highway may become closed by flood waters at Raglan Creek and local stormwater during major floods cutting access from Kelso to Bathurst. This area is now protected by a levee up to the 1% AEP (7.38m on the Stanley St gauge). There is generally no isolation of properties within the Kelso area as the residents have access to the East if required; however there is no access to Bathurst.

Characteristics of flooding

2.2.47 Generally flooding within the Kelso area is a result of flash flooding. It can result from the flooding from both the Macquarie River and Raglan Creek.

Flood Mitigation Systems

2.2.48 Levees in Kelso are located on the western side of Gilmour Street between Camidge Close and south of Tareena Avenue. The “Gilmore” Levee is predominately an earth embankment of approximately 2.5 metres high and 1700 metres in length. A small section, approximately 100 metres, of

reinforced concrete levee wall has been constructed adjacent Learmonth Park, off Dorman Place.

2.2.49 A levee has been constructed that is designed to provide protection for the Stockland Drive and Kelso Industrial Area (Toronto St) to a height of 6.9m on the Bathurst (Stanley St) gauge. This is known as the Raglan Creek Levee. If this height is exceeded the levees would be in danger of overtopping, flooding approximately 273 properties in Bradford St, Lee St, Toronto St, Kobe St, Coventry St, Zagreb St, Littlebourne St, Sheffield Pl, Cardiff Pl, Newcastle Pl, Whyalla Cct and Stockland Dr are likely to experience inundation.

2.2.50 A levee is also situated in the Kelso Industrial Park. It is approximately 1350 metres long commencing at White Rock and its southern end and abutting the Great Western Highway at its northern end.

Dams

2.2.51 Consequences in Kelso of Chifley dam failure include inundation of Hereford St, Stephens Ln, Church Ln, River Rd, the Great Western Highway, Toronto St and White Rock Road in a Sunny Day Failure. In a PMF dambreak, Gilmour St, Eleven Mile Drive and Leo Grant Dr will also become inundated (7).

Other Considerations

2.2.52 Bathurst 1000 is an annual touring car race held at mount Panorama, held on the first or second Sunday of October. This event attracts over 187 000 people to the area over the four day period (4).

2.2.53 The other top 10 festivals in the Bathurst LGA are the Royal Bathurst Show, Bathurst Spring Spectacular, B2B Cyclo Challenge, Gold Crown Festival, Party in the park, Edgell Jog, Rockey Road and Bathurst Esteddfod (4).

GORMANS HILL

2.2.54 Gormans Hill is a suburb of Bathurst, located south west of Bathurst central.

2.2.55 This area is located upstream of the railway line in the vicinity of Upfold Street, bounded by the Macquarie River to the east and the Queen Charlottes (Vale) Creek to the west.

Schools and childcare centres

2.2.56 The following schools and childcare centres are at risk of flooding and/or isolation.

a. **Schools**

- MacKillop College

b. **Childcare centres**

- ABC Developmental Learning Centre, 1 Russell Street, Bathurst

Facilities for the aged and/or infirm

2.2.57 The following facilities are at risk of flooding and/or isolation:

a. Bathurst Base Hospital Rehabilitation Unit

b. St Vincent's Private Hospital

c. Macquarie Care Centre

d. Chifley Village

2.2.58 Caravan Parks are listed in Volume 3, Chapter 4 of this Local Flood Plan (SES Caravan Park Arrangements).

Utilities and Infrastructure

2.2.59 There are no utilities and infrastructure identified as at risk of flooding.

2.2.60 Caravan Parks are listed in Volume 3, Chapter 4 of this Local Flood Plan (SES Caravan Park Arrangements).

Classification of Floodplain

2.2.61 Within the Gormans Hill area the floodplain can be classified as having high flood islands.

Inundation

2.2.62 Gormans Hill utilises the warnings provided by The Bureau for the Stanley Street gauge (AWRC 421908).

2.2.63 Approximately 230 residential properties are located in this area along with St Vincent's Private Hospital, MacKillop College and a number of commercial properties. Flooding in this area can occur as a result of overbank flooding from the Macquarie River and/or Queen Charlottes (Vale) Creek, or from backwater flow from the river up the creek. Lyall, Upfold and Russell Streets

are inundated during floods, as are parts of Waterworks Lane and Eric Sargeant Drive.

2.2.64 In a 1% AEP flood (7.38m on the Stanley Street gauge) approximately 15 residential dwellings and 10 commercial properties would be subject to over-floor flooding,

Isolation

2.2.65 During major flooding, the entire Gormans Hill area can form an island with no vehicular access to Bathurst once the Russell Street railway underpass is closed by flood waters (less than a 1% AEP flood event) and flood waters close Alpha Street and the low level crossing of Queen Charlottes (Vale) Creek at Lloyds Road.

2.2.66 St Vincent's Hospital, MacKillop College and the Macquarie Care Centre can become isolated by road, causing commuting problems for workers, outpatients and school students.

Characteristics of flooding

2.2.67 This area is subject to riverine flooding from both the Macquarie River and the Queens Charlottes (Vale) Creek. Flooding from these systems can occur simultaneously or separately.

Flood Mitigation Systems

Dams

2.2.68 Consequences in Gormans Hill of Chifley dam failure include inundation of the majority of Gormans Hill in a Sunny Day Failure and PMF with dam failure, causing it to become a high flood island around the intersection of Dees Cl and Gormans Hill Rd.

Other Considerations

2.2.69 Bathurst 1000 is an annual touring car race held at mount Panorama, held on the first or second Sunday of October. This event attracts over 187 000 people to the area over the four day period (4).

2.2.70 The other top 10 festivals in the Bathurst LGA are the Royal Bathurst Show, Bathurst Spring Spectacular, B2B Cyclo Challenge, Gold Crown Festival, Party in the park, Edgell Jog, Rockey Road and Bathurst Esteddfod (4).

SOUTH BATHURST (INCLUDING CARLINGFORD STREET)

2.2.71 South Bathurst (Carlingford Street) is located on the western side of the Queen Charlottes (Vale) Creek. There are 1835 persons living within the South Bathurst area.

2.2.72 This area is bounded by the Queen Charlottes (Vale) Creek to the east and the Main Western Railway line to the west and includes Carlingford, Pye, Beresford, Alpha, Lea, Kirkcaldy and the western half of Russell Streets and Vale and Lloyds Roads.

Schools and childcare centres

2.2.73 There are no schools or childcare centres identified as at risk of flooding and/or isolation.

Facilities for the aged and/or infirm

2.2.74 There are no facilities identified as at risk of flooding and/or isolation.

Utilities and Infrastructure

2.2.75 A number of utilities and infrastructure are identified as at risk of flooding, including railway yards, workshops, livestock saleyards and the local Dog Pound Reserve.

Cultural and Linguistic Diversity

2.2.76 The South Bathurst area has an indigenous population of approximately 100, and three residents identifying that they do not have proficiency in English.

Classification of Floodplain

2.2.77 Rising Road access to Bathurst Central, becoming a Low Flood Island in a 1% AEP flood (7.38m on Bathurst Stanley St gauge) as the flood height approaches the design height of the levees.

Inundation

2.2.78 South Bathurst utilises the warnings provided by The Bureau for the Stanley Street gauge (AWRC 421908).

2.2.79 This area can be flooded by overbank flows from the Queen Charlottes (Vale) Creek due to rainfall in the Queen Charlottes (Vale) Creek catchment or from flooding in the Macquarie River causing back flows in the Queen Charlottes (Vale) Creek.

2.2.80 Moderate floods (4.9m) can inundate houses in Carlingford St, Church Lane and Pye Sts from Raglan Ck.

2.2.81 In a Major flood (5.7m) Carlingford and Pye St become inundated.

2.2.82 From 6.9m on the Stanley St gauge 42 houses in the south Bathurst area may be inundated, in Upfold St (6), Lyall St (4), Russell St (15), Pye St (3), and Carlingford St (14).

2.2.83 Approximately 14 residences are located in this area, most of which would suffer over floor inundation in a 1% AEP flood (7.38m on the Stanley Street gauge) and a small number of commercial properties plus railway yards, workshops, livestock saleyards and the local Dog Pound Reserve. This includes properties along Upfold St, Lyall St, Russell St, Acheron St, Pye St, Alpha St, Carlingford St, Lee St and Beresford St (10).

Isolation

2.2.84 It is expected that access to Bathurst will still be available from this area in a 1% AEP (7.38m on the Stanley Street gauge) event via Vale Road.

Characteristics of flooding

2.2.85 Floodwaters on the Macquarie River at Bathurst tend to rise quickly and warning times are short; however floods have historically been of short duration.

Flood Mitigation Systems

2.2.86 Levees within this area (known as the "Carlingford Levee") are predominately of an earth embankment type of trapezoidal section approximately 2.5 metres high and 700 metres in length. A small section of the levee is constructed using reinforced concrete and is approximately 100 metres in length and it is located at the end of Beresford Street. The levee is Horse-shoe in shape and runs from the railway land adjacent to Alpha Street, runs east to Queen Charlotte's Vale Creek and returns to the south around properties before terminating into high ground behind the Vale Road. The levee has been designed to protect properties along Gilmour Street from riparian flooding to a height of 1% AEP (7.38m on the Stanley Street gauge) plus 1 metre.

Dams

2.2.87 Consequences in South Bathurst of Chifley dam failure include flooding of access routes and properties to the eastern side of South Bathurst including Rocket St, the Railway line and bridge, and Russell St in a Sunny Day dam break with the addition of Vale Road in a PMF dambreak.

Other Considerations

2.2.88 Bathurst 1000 is an annual touring car race held at mount Panorama, held on the first or second Sunday of October. This event attracts over 187 000 people over the four day period (4).

2.2.89 The other top 10 festivals in the Bathurst LGA are the Royal Bathurst Show, Bathurst Spring Spectacular, B2B Cyclo Challenge, Gold Crown Festival, Party in the park, Edgell Jog, Rockey Road and Bathurst Esteddfod (4).

EGLINTON AND ABERCROMBIE

2.2.90 The villages of Eglinton and Abercrombie are located to the north of Bathurst on either side of the Macquarie River, approximately eight kilometres downstream of Bathurst.

2.2.91 The population of the villages are approximately 200 and 100 respectively.

Cultural and Linguistic Diversity

2.2.92 Abercrombie and Eglinton have an indigenous population of approximately 90, and no residents identifying they have a lack of English proficiency (11).

Schools and childcare centres

2.2.93 The following schools and childcare centres are at risk of isolation from Bathurst as the bridge access gets cut at 8.7m.

a. Schools

- Eglinton Public School, Alexander St, Eglinton

b. Childcare centres

- Wooly-bah Childcare Centre, 25 Alexander St, Eglinton

Facilities for the aged and/or infirm

2.2.94 There are no facilities identified at risk of flooding and/or isolation:

Utilities and Infrastructure

2.2.95 No utilities or infrastructure are identified as at risk of flooding.

2.2.96 Caravan Parks are listed in Volume 3, Chapter 4 of this Local Flood Plan (SES Caravan Park Arrangements).

Classification of Floodplain

2.2.97 Eglinton and Abercrombie have rising road access to Bathurst until major flooding when Eglinton has rising road access to a high flood island. Access between Abercrombie and Bathurst remains.

Inundation

2.2.98 Eglinton and Abercrombie utilise the warnings provided by The Bureau for the Stanley Street gauge (AWRC 421908).

2.2.99 Only one dwelling upstream of Rankins Bridge is subject to over floor flooding in a 1% AEP flood event (7.38m on the Stanley Street gauge) with road closures in the area causing the most inconvenience to residents.

2.2.100 Low-lying parts of Eleven Mile Drive and Logan Street can be inundated during times of flooding and Freemantle Road outside the village is also inundated.

2.2.101 Properties in Abercrombie Dr, Bayliss St, Hastings Pl, Hicks Cl, Pryce Pde, Logan St, Hamilton St and Hobson Cl are flood prone.

Isolation

2.2.102 In a major flood (for predictions to reach or exceed 8.7m at the Bathurst Stanley Street gauge) Eglinton may become isolated if the approach to the Rankins bridge between the roundabout (at Logan and Hamilton St intersection) and the bridge. No alternative access to Bathurst is available.

2.2.103 The Great Western Highway, east from Bathurst across the Macquarie River to Kelso can be closed during periods of moderate to major flooding. Local flooding may close the Vale Road at Orton Park.

Characteristics of flooding

2.2.104 Floodwaters tend to rise quickly and warning times are short; however floods have historically been of short duration.

Flood Mitigation Systems

2.2.105 No flood mitigation systems are identified for this area; however a number of mitigation systems are located upstream and can have implications for the size and behaviour of flooding downstream.

Dams

2.2.106 Consequences of Chifley dam failure include flooding of the approach to the bridge over the Macquarie River isolating the Eglinton residents. In a PMF dam break, residences on the river-side of Eglington Road in Abercrombie and the majority of Eglinton will become inundated, including the Public School and Child Care Centre.

Other Considerations

2.2.107 Bathurst 1000 is an annual touring car race held at mount Panorama, held on the first or second Sunday of October. This event attracts over 187 000 people to the area over the four day period (4).

2.2.108 The other top 10 festivals in the Bathurst LGA are the Royal Bathurst Show, Bathurst Spring Spectacular, B2B Cyclo Challenge, Gold Crown Festival, Party in the park, Edgell Jog, Rockey Road and Bathurst Esteddfod (4).

PERTHVILLE AND GEORGES PLAINS

2.2.109 Perthville and Georges Plains are located approximately 10 and 14 kilometres south of Bathurst, upstream of the confluence of the Queen Charlottes (Vale) Creek with the Macquarie River.

2.2.110 The total population of Perthville and Georges Plains, as at the 2011 Census, was 1,179 persons, with Georges Plains having a population of less than 100 (8).

Cultural and Linguistic Diversity

2.2.111 There are approximately 55 persons of indigenous origin and no persons identified as having a lack of proficiency in English (9).

Schools and childcare centres

2.2.112 The following school is at risk of flooding and/or isolation.

a. Perthville Public School, Rockley St, Perthville

2.2.113 The following child care centres may be at risk to flooding or isolation in floods exceeding the 1% AEP (3.32m on the Perthville Bridge gauge):

a. Galloping Gumnut Mobile Children's Services Van, 24-25 Rockley St, Perthville.

Facilities for the aged and/or infirm

2.2.114 The following facilities may be at risk of flooding in floods exceeding the 1% AEP (3.32m on the Perthville Bridge gauge):

a. St Annes Home, Tenison Woods Avenue

Utilities and Infrastructure

2.2.115 The following utilities and infrastructure are at risk of flooding:

a. Perthville Bridge

b. The Vale Road industrial area (in a moderate flood)

Classification of Floodplain

2.2.116 Rising Road Access to a high flood island up to the PMF.

Inundation

2.2.117 The village of **Perthville** is subject to flooding from the Queen Charlottes (Vale) Creek and during past events, properties in Perth, Bridge, Apsley and Bathurst Streets have been inundated by flood waters to varying degrees.

2.2.118 Perthville utilises the warnings provided by The Bureau for the Stanley Street gauge (AWRC 421908). Perthville and Georges Plains also utilise the Perthville Charlotte Vale (AWRC 421910), Cow Flat Bridge (AWRC 421053) and Kables Bridge (AWRC 421092) gauges; however The Bureau does not provide a warning service to these gauges.

2.2.119 24 dwellings on the southern (right) bank of the Queen Charlottes (Vale) Creek and one on the left bank would be inundated above floor level in a 1% AEP event, 3.32m on the Perthville (Charlotte Vale) Gauge (2). This was experienced in August 1990.

2.2.120 In the major flood of August 1990 (6.50 metres on the Stanley Street gauge), some 60 people out of a total of fewer than 400 had to be evacuated from the village of Perthville and surrounds. In the flood event of August 1998, 5 houses were inundated and 10 people evacuated.

2.2.121 Three properties are at risk of overfloor flooding in a 10% AEP, 11 in a 5% AEP, 15 in a 2% AEP, 27 in a 1% AEP and >50 in an extreme flood (3). These properties are located mostly in Apsley St, Bathurst St, Bridge St, Perth St, Prince St, Rockley St and Vale Rd (3).

2.2.122 The village of **Georges Plains** is at risk of significant flooding from Georges Plains and Queen Charlottes (Vale) Creeks. In the flood event of August 1990 (5.8m on the Cow Flat Bridge) approximately 4 houses were flooded overfloor and 10 yards were inundated (50% of the village) along Victoria Street, Cow Flat Road and adjacent to the bridge. In the flood event of August 1998 approximately 8 yards were inundated with no houses experiencing over floor flooding.

2.2.123 Six properties in **Georges Plains** would be inundated overfloor in a 10% AEP flood, nine (9) properties are at risk of inundation in a 1% AEP flood (some exceeding 0.6m), 19 would be inundated in a 0.05% AEP flood, and 36 in a PMF (8).

Isolation

2.2.124 The Perthville Bridge, Vale Road and Trunkey Road may become inundated from floods exceeding the 1% AEP, isolating the communities from Bathurst, with rising road access to the south and east along rural roads.

2.2.125 The Great Western Railway Line may also be cut at **Georges Plains** in major flood events.

Characteristics of flooding

2.2.126 Flooding in **Perthville** cam occur from Queen Charlottes (Vale) Creek.

2.2.127 **Georges Plains** is affected by flooding of the Georges Plains Creek, which runs through the village before joining the Vale Creek. It is also potentially affected by back up flood water from Vale Creek creating a damming effect upstream of the junction. Although Vale Creek is a tributary of the Macquarie River, the flood levels in Vale Creek at Georges Plains are not affected by the Macquarie River (7). Flows bypass the road bridge to enter the village, southeast along Tracey St toward the low corner of Victoria St. The area at the southern end of Victoria St is subject to deep inundation. 10% AEP floods do not enter the village, but inundate low areas either side of the road bridge. In larger floods, 0.5% AEP, the flows enter the town and flow along Rockley Road toward the railway line.

2.2.128 Most of the flood liable areas have portions where flow velocity and flood depths may be considerable, leading to severe difficulties of evacuation by foot or by vehicle once flooding is well advanced.

Flood Mitigation Systems

2.2.129 Perthville received funding in 2014 to widen the bridge and clear the channel at Vale Creek (3). Additional culverts are also planned along the 1.5km section of the creek to increase the capacity of the creek as it previously is unable to withstand a 1% AEP flood volume. A 1.5km x 2.5m earth and concrete levee at the back of the old nursery around North Street is also planned (7). It should be noted that this would still only mitigate floods below the 1% AEP flood (3.32m on the Perthville Bridge gauge).

Dams

2.2.130 There are no identified consequences of Chifley dam failure in Georges Plains and Perthville.

Other Considerations

2.2.131 Flooding can be exacerbated by flood debris collecting on the road bridge (8).

THE LAGOON

2.2.132 This community is located on the Campbells River, about five kilometres below Chifley Dam and 14 kilometres south of Bathurst.

2.2.133 The total population of The Lagoon is approximately was 250 persons (9).

Cultural and Linguistic Diversity

2.2.134 There are no identified CALD communities.

Schools and childcare centres

2.2.135 There are no schools and childcare centres at known risk of flooding and/or isolation.

Facilities for the aged and/or infirm

2.2.136 There are no facilities at known risk of flooding and/or isolation.

Utilities and Infrastructure

a. There are no utilities or infrastructure at risk of inundation.

2.2.137 Caravan Parks are listed in Volume 3, Chapter 4 of this Local Flood Plan (SES Caravan Park Arrangements).

Classification of Floodplain

2.2.138 Rising Road access to a high flood island up to the PMF.

Inundation

2.2.139 The Lagoon utilises the Chifley Dam gauge (AWRC 10020); however The Bureau does not provide a warning service for this gauge.

2.2.140 During large flood events The Lagoon is subject to flooding from the Campbells River which has resulted in some self-evacuations in previous flood events. A small number of residential properties are located in the floodplain area of The Lagoon and may become inundated in large floods. These are generally located on small rises and historically may have become isolated but not inundated by flood water.

Isolation

2.2.141 During large flood events The Lagoon may become cut into four distinct areas by the following road closures. They are as follows:

a. Lagoon Road at Young Street; immediately north of Ryans Road; north of Chifley Dam Road at Davys Creek.

b. Ryans Road immediately west of Lagoon Road

c. O'Connell Plains Road at The Lagoon, across the river flats to just east of the bridge over the Campbells River.

2.2.142 The Consequences of the above road closures in large flood events are:

a. The area to the west, south-west and the north of The Lagoon retains road access to Perthville.

b. The area east of The Lagoon may become isolated with access to O'Connell, to the east, being lost for some hours due to flooded creeks and longer if the Fish River is in flood at O'Connell.

c. The area to the south of Davys Creek and/or north of Peppers Creek (near Rockley) can also become isolated due to water over the road.

Characteristics of flooding

2.2.143 Floodwaters tend to rise quickly and warning times are short; however floods have historically been of short duration. Flood magnitudes and behaviour are influenced by Chifley Dam flows.

Flood Mitigation Systems

2.2.144 No flood mitigation systems have been identified in The Lagoon.

Dams

2.2.145 The Lagoon would become inundated during Chifley dam failure (after fuse plug 5 triggering) would be within 30 minutes, to a depth exceeding 4m and velocities exceeding 4m/s for a sunny day failure. In a PMF dambreak the flood wave arrival time would be 16 minutes, depth exceeding 10m and velocities of up to 12m/s. Access to the dam is cut in times of flooding when one or more fuse plugs are operational.

2.2.146 Access routes, in particular, Lagoon Road, which is an evacuation route for the residents living in the village of The Lagoon could be cut off from a failure of Chiefly Dam. These access routes could potentially be cut very quickly as the travel time to the community of The Lagoon can be within a minute of the dam failing.

Other Considerations

2.2.147 No other considerations are identified as specific to this area.

SOFALA

2.2.148 Sofala is a village of 120 people located 40 kilometres north of Bathurst. It is situated on the Turon River, a tributary of the Macquarie River on a low terrace.

2.2.149 It is a component of the Wattle Flat Statistical district, with an approximate population of 360 persons (2).

Cultural and Linguistic Diversity

2.2.150 There are approximately 20 persons of indigenous origin and no persons with an identified lack of proficiency in English.

Schools and childcare centres

2.2.151 The following school is at risk of isolation.

a. Sofala Public School

2.2.152 There are no Child Care Centres at known risk of flooding or isolation.

Facilities for the aged and/or infirm

2.2.153 There are no facilities at known risk of flooding and/or isolation.

Utilities and Infrastructure

2.2.154 There are no utilities and infrastructure at known risk of flooding.

Classification of Floodplain

2.2.155 Rising Road access to a high flood island up to the PMF.

Inundation

2.2.156 Sofala utilises the Sofala gauge (AWRC 421026); however The Bureau does not provide a warning service to this gauge.

2.2.157 Inundation of properties generally does not begin until the major flood level (6.0 metres on the Sofala gauge) is reached.

a. During a severe event, water may rise up to depths of 1 metre in several dwellings and commercial premises in Denison Street, and closes this street to traffic. In August 1986 (estimated to have reached 9.20 metres on the Sofala gauge), approximately 10 residential and commercial properties, as well as a number of sheds and garages in Denison Street were inundated.

b. Three low-lying properties on Upper Turon Road can also be inundated to depths of up to one metre.

c. Evacuation of three or four families from residences in Sofala has been required in past events. Flooding in Sofala and along the Turon River is

d. In a PMF, the flood is estimated to encroach the entirety of Bowen Street, further south on Sofala Road and east on Denison St, and the lower halves of Hargraves St and Barkly St (12).

Isolation

2.2.158 Upper Turon Road closes just east of the village in a minor flood, affecting local traffic with no other alternative routes are available (4).

2.2.159 The community of Sofala can become isolated as a result of major. The likely duration of isolation from the above areas is generally less than 24 hours, based on average duration and will vary depending upon infrastructure damage and flood magnitude.

2.2.160 Road access to Ilford is lost with the closure of Crossley Bridge over the Turon River at Sofala. Access to Bathurst can also be lost for several hours due to crossings at Cheshire Creek at Limekilns and between Peel and Wiagdon, and over Winburndale Rivulet at Peel and Duramana. Flooding of Coles Bridge on Turandale Road and Hill End Road at Little River may become flooded in a major flood, and alternative routes via Mudgee Road and Crudine and Peel and Turondale may become unavailable due to localised flooding

2.2.161 Up to twenty properties along Upper Turon Road may become isolated from Sofala by road for a number of hours.

2.2.162 Rural properties along Crudine and Hill End Roads can be isolated by moderate level or flash flooding along the Crudine River which joins the Turon River downstream of Sofala.

Characteristics of flooding

2.2.163 Flooding that can occur in the Sofala is characterised by high flow velocity and flash flooding with very limited warning times. The potential for property damage is considerable

Flood Mitigation Systems

2.2.164 There are no known flood mitigation systems within the Sofala area.

Dams

2.2.165 There are no known consequences in Sofala of dam failure.

Other Considerations

2.2.166 No other considerations are identified as specific to this area.

RURAL AREAS

2.2.167 **Abercrombie Caves**: Evacuations may be required from a camping ground located across the Grove Creek, which flows through the caves. Local arrangements exist where Abercrombie Caves staff monitor the creek and close the low-level causeway to campers during heavy rain events when the creek is rising. In October 2000, up to 500 people were stranded in the camping grounds for a 2 day period after heavy rain in the catchment. The area is also prone to landslips, which could potentially close the main access road to the caves.

2.2.168 **Trunkey Creek**: The school and two houses can be isolated in major floods by Trunkey Creek.

2.2.169 **Rockley (Peppers Creek):** Some houses could be inundated and access to the sportsground cut after heavy rain.

2.2.170 **Fish River** (northern floodplain between Tarana and the confluence with the Campbells River): Farm buildings and stock could be affected.

2.2.171 **Macquarie River below Bathurst**: Normal road access is cut during floods and local residents and campers become isolated. This area is known for its poor communications.

2.2.172 **Peel (Clear Creek):** Two houses could experience inundation.

2.2.173 **Turon River**: Campers and small numbers of residents could become stranded and isolated.

2.2.174 There are a number of areas that have consequences associated with the failure of **Winburndale Dam**, which are detailed in Volume 3, Chapter 3. In summary:

a. Consequences in Peel of dam failure. Up to 9 properties along Rivulet Road will be inundated as a result of a Dambreak of Winburndale Dam. Arrival time can range from 1hr 28 minutes at the first property to 2hrs 58 minutes at the last property depending on the type of Dambreak Flood.

b. Consequences in Duramana of dam failure. Up to 4 properties along Turondale Road will be inundated as a result of a Dambreak of Winburndale Dam. Arrival time can range from 1hr 40 minutes at the first property to 3hrs 30 minutes at the last property depending on the type of Dambreak Flood.

c. Consequences in Glanmire of dam failure. Up to 3 properties along Turondale Road will be inundated as a result of a Dambreak of Winburndale Dam. Arrival time can range from 19 minutes at the first property to 32 minutes at the last property depending on the type of Dambreak Flood.

d. Consequences in Yarras of dam failure. One property along Yarras Lane will be inundated as a result of a Dambreak of Winburndale Dam. Arrival

time can range from 19 minutes at the first property to 32 minutes at the last property depending on the type of Dambreak Flood.

2.3 ROAD CLOSURES

2.3.1 Table 6 lists roads liable to flooding in the Bathurst Regional area, (Map 3).

2.3.2 Road closures can also occur in the following locations caused by flash flooding after heavy rain:

a. In the vicinity of Wisemans Creek from Campbells River.

b. The Lagoon from the Campbells River.

c. In the Glanmire area from St Anthonys Creek.

d. Various locations east and west of Sofala on the road along the Turon River (including the Hill End and Upper Turon roads as occurred during the 1986 flood).

Table 7: Roads liable to flooding in Bathurst Regional LGA.

TOWN or LOCALITY	ROAD NAME	CLOSES AT	POSSIBLE DURATION OF CLOSURE	GAUGE HEIGHT	ALTERNATIVE ROUTE/S	REMARKS
Bathurst	Limekilns Road (between Wattle Flat and Bathurst)	Winburndale Rivulet and Clear Creek	Up to 24 hours	None Available		Caused by flash flooding after heavy rain
	Limekilns Road/Redhills Road Junction	Blackfellows Creek at causeway	Up to 24 hours	None Available		Caused by flash flooding after heavy rain
	Lloyds Road	Causeway over Queen Charlottes (Vale) Creek	Up to 24 hours			Caused by flooding from Queen Charlottes (Vale) Creek
	Russell Street	Railway underpass under the Main Western Railway Line	Up to 24 hours	5.7 metres*	Rocket Street Railway Bridge	*Stanley Street gauge in Bathurst
	Great Western Highway (Bathurst to Kelso)	East and West approaches on the Evans Bridge (Macquarie River)	Up to 24 hours	6.30 metres*	Gilmour Street, Kelso and Eleven Mile Drive at Eglinton	*Stanley Street gauge in Bathurst
	Eleven Mile Drive	May be closed by local flooding on Saltram Creek	Up to 24 hours	None Available	None Available	Caused by localised flooding after heavy rain
	Hereford Street, Kelso	Cut at Gordon Edgell Bridge (Macquarie River)	Up to 24 hours	3.15 metres*	Great Western Highway to Gilmour Street	*Stanley Street gauge in Bathurst
	Gilmour Street, Kelso	Road may be cut in various places by Macquarie River	Up to 24 hours	6.5 metres*	Lithgow to Wellington via Mudgee	*Stanley Street gauge in Bathurst
	Vale Road	Orton Park	Up to 24 hours	4.20 metres* (Queen Charlottes (Vale) Creek)	Hen and Chicken Lane	* Cow Flat Bridge Gauge. Goulburn Road closed.

TOWN or LOCALITY	ROAD NAME	CLOSES AT	POSSIBLE DURATION OF CLOSURE	GAUGE HEIGHT	ALTERNATIVE ROUTE/S	REMARKS
Bathurst Cont.	Vale Road (between Bathurst and Perthville)	Queen Charlottes (Vale) Creek	Up to 24 hours	2.80 metres* (Queen Charlottes (Vale) Creek)	Hen and Chicken Lane	* Kables Bridge gauge. Road closed in various places
	Fremantle Road (Eglinton – Gowan Road)	Freemantle Bridge (Macquarie River)	Up to 24 hours	3.5 metres*	Via Lewis Ponds	*Stanley Street gauge at Bathurst
O'Connell	Bathurst - O'Connell Road	In the vicinity of Bosworth Falls Road	Up to 24 hours	None Available		Caused by flash flooding after heavy rain
Rockley	Trunkey Creek Road	Grove Creek	Up to 24 hours	None Available		Caused by flash flooding after heavy rain
	Oberon Road	Closed at several causeways	Up to 24 hours	None Available		Caused by flash flooding after heavy rain
	Sewells Creek Road	Charlton Crossing (Campbells River)	Up to 24 hours	None Available		Caused by flash flooding after heavy rain
	The Lagoon Road	Peppers Creek	Up to 24 hours	None Available		Caused by flash flooding after heavy rain
	Rockley-Newbridge Road	Peppers Creek at Dunns Plains	Up to 24 hours	None Available		Caused by flash flooding after heavy rain
Sofala	Sofala Road	May be closed by local flooding near Peel at Winburndale Rivulet and Clear Creek	Up to 24 hours	None Available		Caused by flash flooding after heavy rain
	Mudgee Road	At Sofala on the bridge crossing the Turon River	Up to 24 hours	9.20 metres* Estimate only	None Available	*Turon River gauge.
	Hill End Road	Between Sofala and Hill End	Up to 24 hours	6.40 metres*	None Available	* Sofala gauge. Closes at 2.5 kilometres west of Sofala at Little River.

TOWN or LOCALITY	ROAD NAME	CLOSES AT	POSSIBLE DURATION OF CLOSURE	GAUGE HEIGHT	ALTERNATIVE ROUTE/S	REMARKS
Sofala cont.	Turondale Road	Coles Bridge at Crudine River	Up to 24 hours	6.40 metres*	None Available	* Sofala gauge. Depends on amount of water in Crudine River and Turon River
	The Bridle Track	Howards Bridge over the Macquarie River and along the northern bank between Root Hog Hole and Bruinbun.	Up to 24 hours	None Available		Caused by flash flooding after heavy rain
		Various crossings on/near the Turon River.	Up to 24 hours	None Available		Caused by flash flooding after heavy rain
Trunkey Creek	Abercrombie Caves Access Road	Grove Creek	Up to 24 hours	None Available		Caused by flash flooding after heavy rain
	Bald Ridge Road	Crossings over Bald Ridge Creek	Up to 24 hours	None Available		Caused by flash flooding after heavy rain
	Grove Creek Road	Mulgunnia Creek	Up to 24 hours	None Available		Caused by flash flooding after heavy rain
	Matchetts Road	Grove Creek	Up to 24 hours	None Available		Caused by flash flooding after heavy rain
Not Listed	Crudine Road	Various road crossings of Crudine River	Up to 24 hours	None Available		Caused by flash flooding after heavy rain
	Garthowen Road	From Reedy's Creek	Up to 24 hours	None Available		Caused by flash flooding after heavy rain
	Goulburn Road	At Caloola between Old Lachlan Road and Burges Road	Up to 24 hours	None Available		Caused by flash flooding after heavy rain

TOWN or LOCALITY	ROAD NAME	CLOSES AT	POSSIBLE DURATION OF CLOSURE	GAUGE HEIGHT	ALTERNATIVE ROUTE/S	REMARKS
Not Listed Cont.	Mid Western Highway (Bathurst - Blayney Road)	Evans Plains Creek	Up to 24 hours	None Available		Caused by flash flooding after heavy rain
	Oberon Road	O'Connell (Fish River)	Up to 24 hours	None Available		Caused by flash flooding after heavy rain
	Old Goulburn Road	Arkell	Up to 24 hours	None Available		Caused by flash flooding after heavy rain

2.4 SUMMARY OF ISOLATED COMMUNITIES AND PROPERTIES

2.4.1 Table 8 lists communities liable to isolation and potential periods of isolation. Information presented here is based on historical and design events and does not reflect the duration of isolation expected in larger and extreme events.

Table 8: Potential Periods of Isolation for communities in the Bathurst Regional LGA during a Major flood.

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
Gormans Hill	196 dwellings	Flood islands	1-2 days										Resupply generally not required
The Lagoon	246pp	Rising Road access to a High Flood Island	1-2 days										Resupply generally not required
Sofala	120pp	Rising Road access to a High Flood Island	1-2 days										Resupply generally not required

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.

MAP 1 - MACQUARIE RIVER BASIN

MAP 2 - LACHLAN RIVER BASIN

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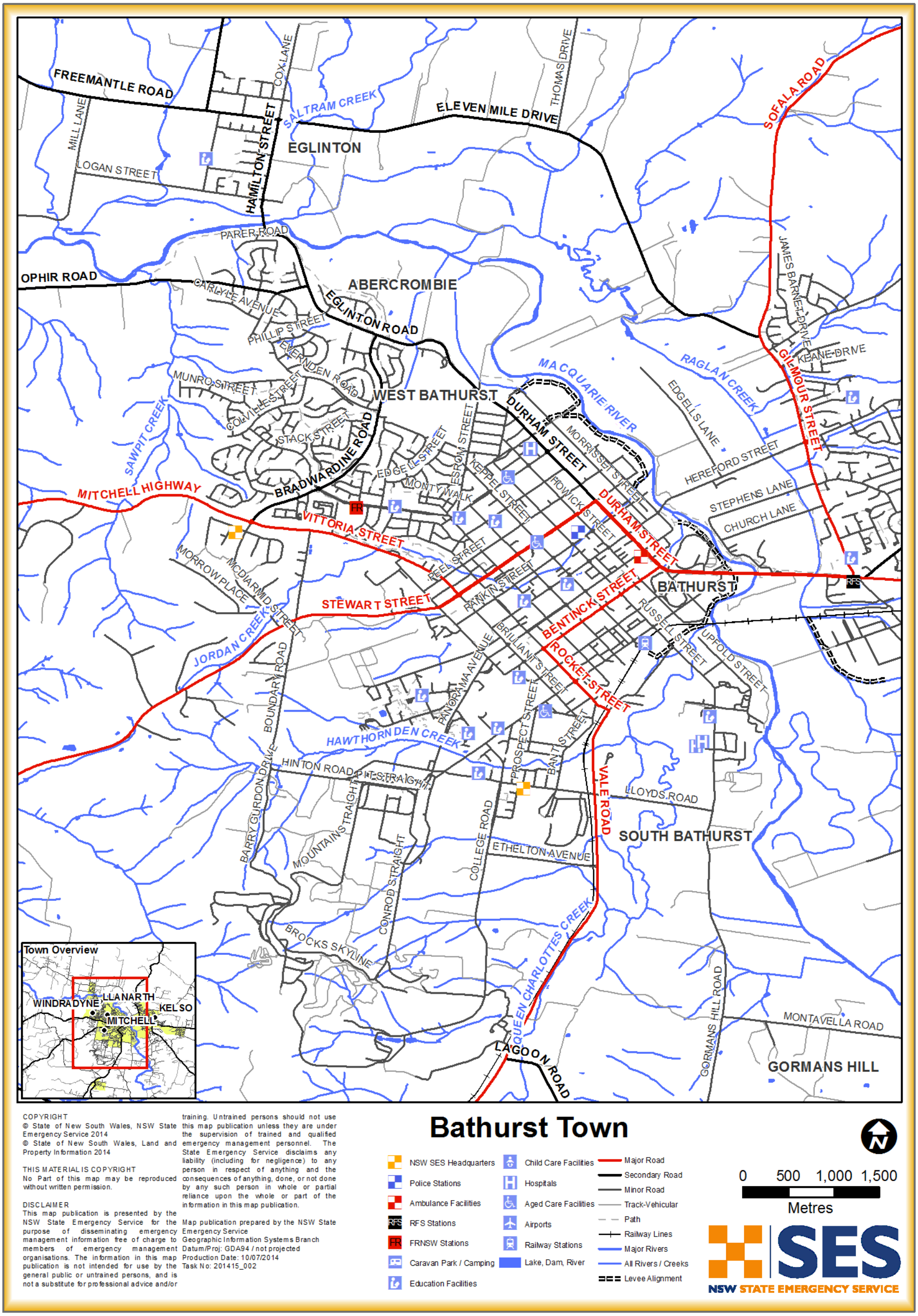
SES State Headquarters
gis@ses.nsw.gov.au
Datum/Proj: GDA94 / NSW Lamberts Conic Conformal

MAP 3 - BATHURST TOWN MAP



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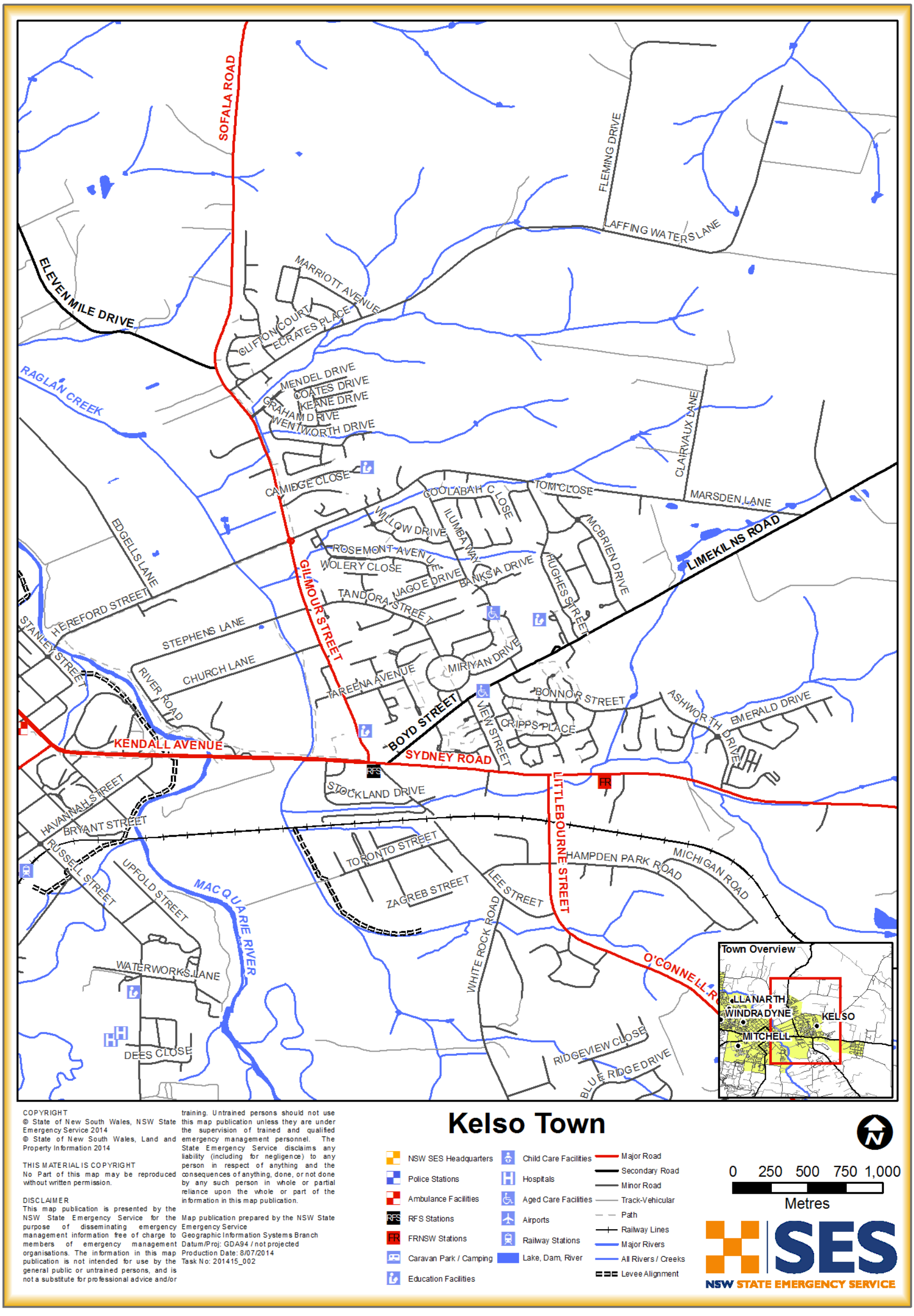
Bathurst Town

- NSW SES Headquarters
- Police Stations
- Ambulance Facilities
- RFS Stations
- FRNSW Stations
- Caravan Park / Camping
- Education Facilities
- Child Care Facilities
- Hospitals
- Aged Care Facilities
- Airports
- Railway Stations
- Lake, Dam, River
- Major Road
- Secondary Road
- Minor Road
- Track-Vehicular
- Path
- Railway Lines
- Major Rivers
- All Rivers / Creeks
- Levee Alignment

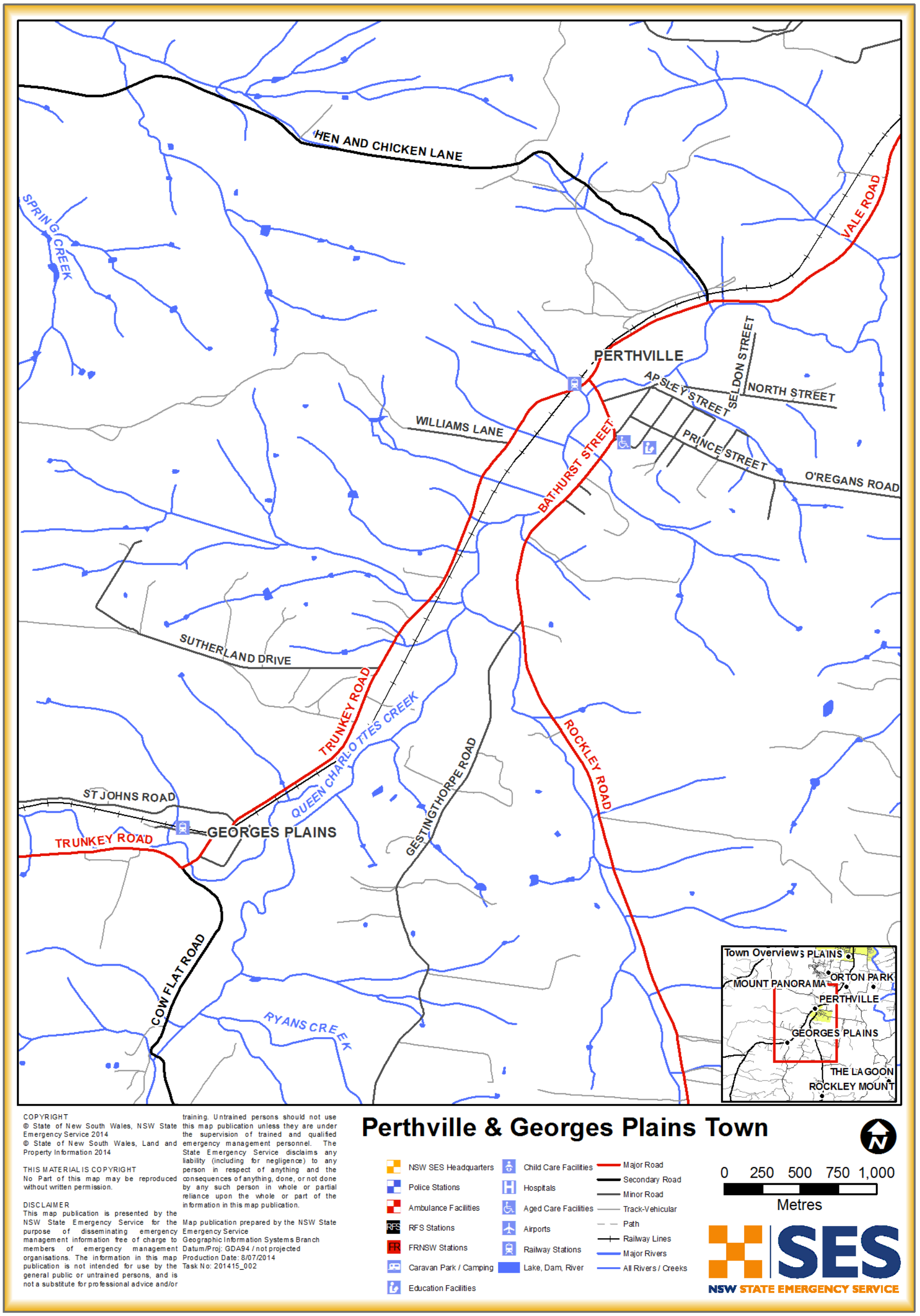
0 500 1,000 1,500
Metres

NSW STATE EMERGENCY SERVICE

MAP 4 - KELSO TOWN MAP



MAP 5 - PERTHVILLE AND GEORGES PLAINS TOWN MAP



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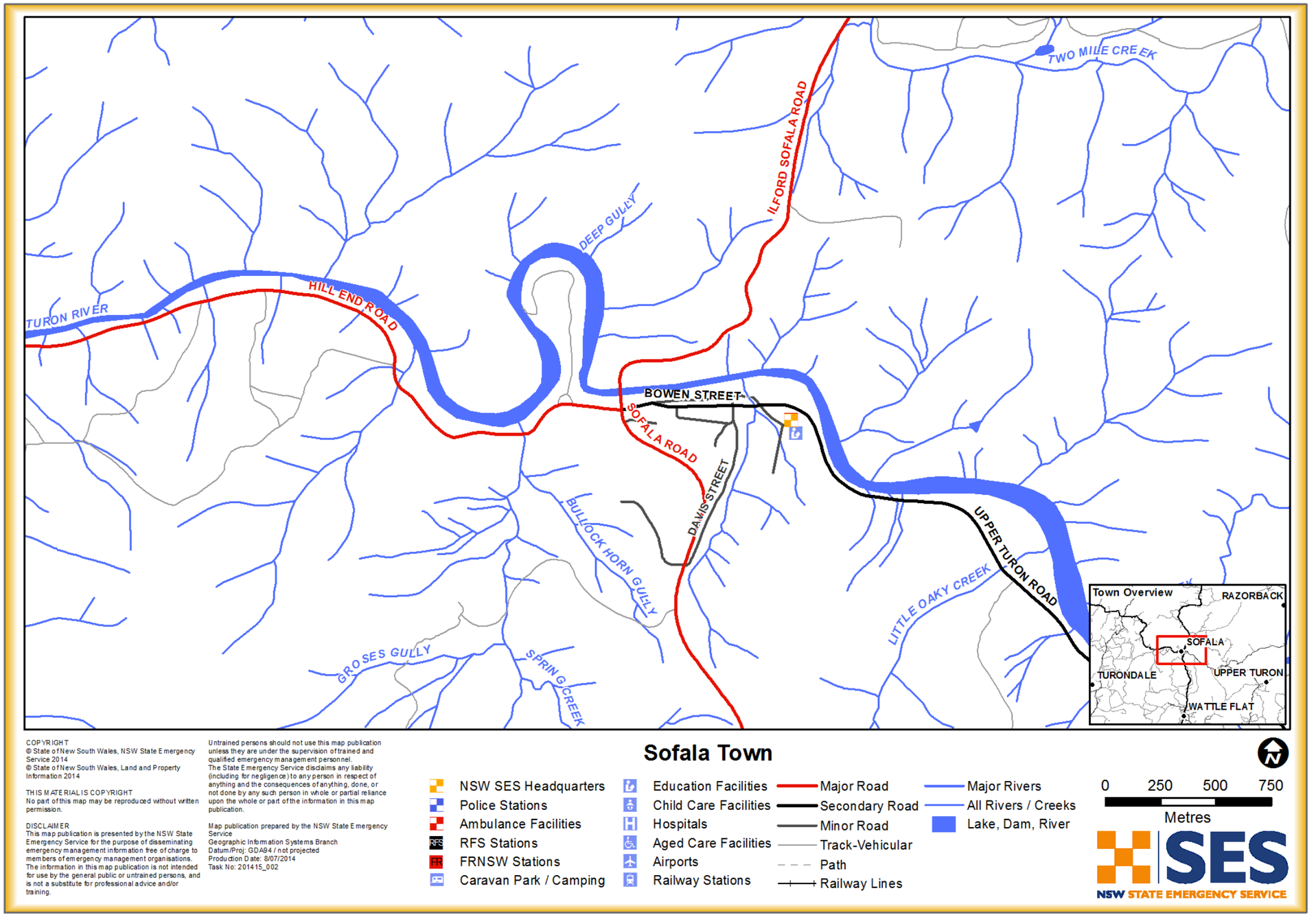
Perthville & Georges Plains Town

NSW SES Headquarters
Police Stations
Ambulance Facilities
RFS Stations
FRNSW Stations
Caravan Park / Camping
Education Facilities
Child Care Facilities
Hospitals
Aged Care Facilities
Airports
Railway Stations
Lake, Dam, River
Major Road
Secondary Road
Minor Road
Track-Vehicular
Path
Railway Lines
Major Rivers
All Rivers / Creeks

0 250 500 750 1,000
Metres

NSW STATE EMERGENCY SERVICE

MAP 6 - SOFALA TOWN MAP



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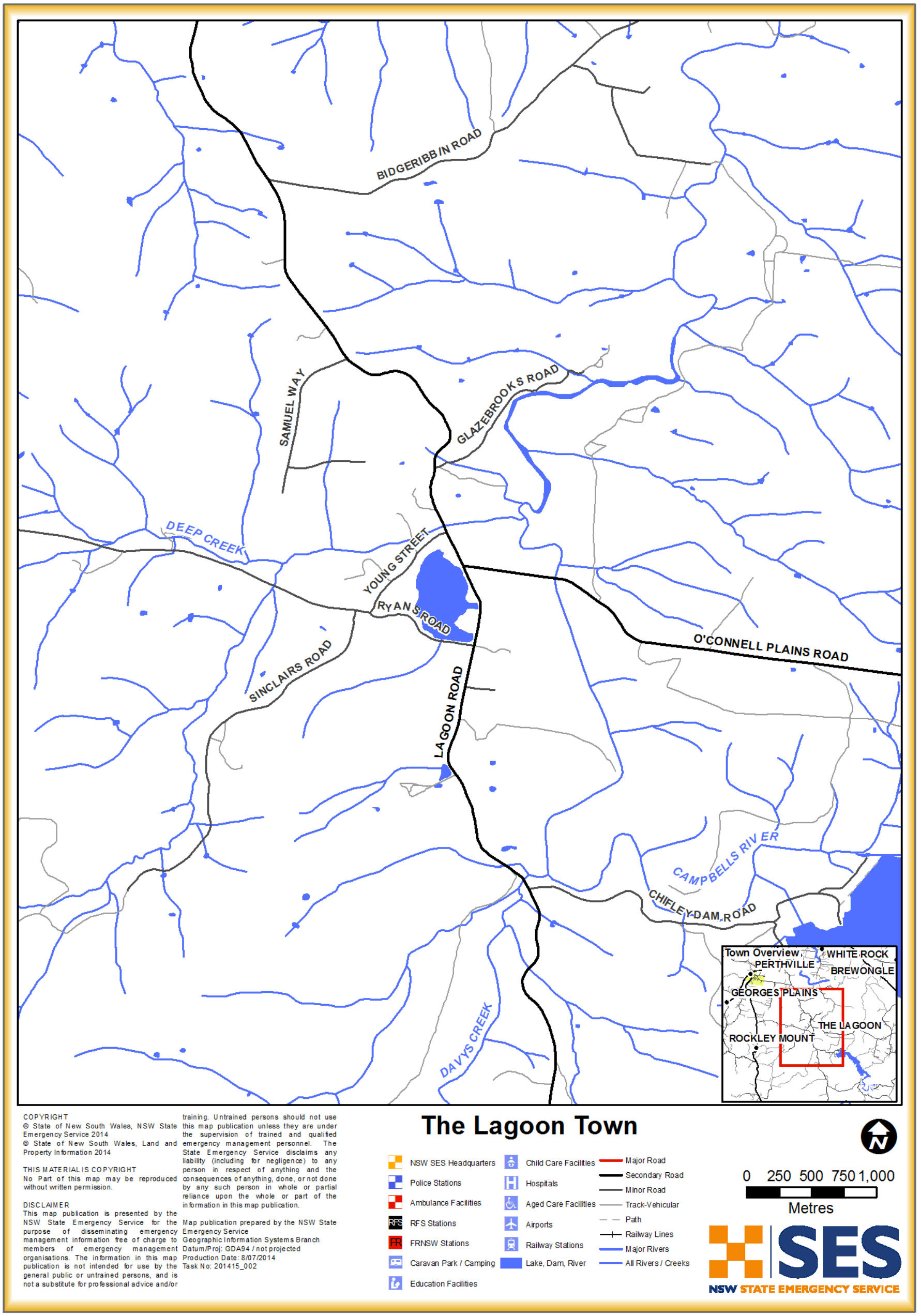
MAP 7 - THE LAGOON TOWN MAP



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SES RESPONSE ARRANGEMENTS FOR BATHURST

Volume 3 of the Bathurst Local Flood Plan

CONTENTS

VERSION LIST

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

Description	Date
Bathurst Regional Local Flood Plan	Feb 2008

AMENDMENT LISTS

Suggestions for amendments to this Volume should be forwarded to:

The Bathurst Local Controller

NSW State Emergency Service

C/- Central West Region Headquarters

79 Corporation Avenue

BATHURST NSW 2795

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

Amendment Number	Description	Updated by	Date

BATHURST REGIONAL: FLOOD WARNING SYSTEMS AND ARRANGEMENTS

Chapter 1 of Volume 3 (NSW SES Response Arrangements for Bathurst Regional) of the Bathurst Regional Local Flood Plan

Last Update: May 2017

AUTHORISATION

Bathurst Regional: Flood Warning Systems and Arrangements has been prepared by the NSW State Emergency Service (NSW SES) as part of a comprehensive planning process.

Approved

Manager Emergency Risk Management

Date: 8 May 2017

Approved

NSW SES Central West Region Controller

Date: 13 APRIL 2017.

Tabled at LEMC

Date: 16/5/17

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1. GAUGES MONITORED BY THE NSW SES BATHURST REGIONAL LOCAL HEADQUARTERS

Table 1: Gauges monitored by the NSW SES Bathurst Regional Local Headquarters

Gauge Name	Type	AWRC No.	Bureau Gauge No.	Stream	Flood level classification			Special Reading Arrangements	Owner
					MIN	MOD	MAJ		
Edith ‡	Manual	10133	-	Duckmaloi River					DWE
Oberon Dam	Manual	10145 421189	-	Fish River					NOW
Hazelgrove ‡	Manual	10176	-	Fish River					SES
Duckmaloi Junction ‡	Manual	10125 421188	-	Fish River / Duckmaloi River					NOW
Tarana	Manual	421035	063297	Fish River					DWE
Tarana	ENVIROMON	10365	-	Fish River					BRC
O'Connell Bridge ‡	Manual	10279	-	Fish River					DWE
Bosworth Falls ‡	Manual	10038	-	Fish River					SES
Upstream Ben Chifley Dam	ALERT	421101	063298	Campbells River					BRC
Ben Chifley Dam ‡	ENVIROMON	10020	-	Campbells River					BRC

Gauge Name	Type	AWRC No.	Bureau Gauge No.	Stream	Flood level classification			Special Reading Arrangements	Owner
					MIN	MOD	MAJ		
Perthville‡	Manual	421910	-	Queen Charlottes (Vale) Creek					SES
Dennis Island	Manual	10121	-	Queen Charlottes (Vale) Creek					SES
Cow Flat Bridge (Georges Plains) ‡	Manual	421053	563061	Queen Charlottes (Vale) Creek					DWE
Perthville	Manual	10292	-	Queen Charlottes (Vale) Creek					DWE
Perthville	Manual	10293	-	Queen Charlottes (Vale) Creek					DWE
Kables Bridge (Orton Park) ‡	Manual	421092	-	Queen Charlottes (Vale) Creek	2.00	2.50	2.85		DWE
White Rock	Manual	421105	563080	Macquarie River					DWE
Bathurst (Stanley Street) * ‡	Telemeter	421908	063287	Macquarie River	3.0	4.5	5.7		BoM
Bathurst (Denison Street)	Manual	421007	-	Macquarie River					DWE

Gauge Name	Type	AWRC No.	Bureau Gauge No.	Stream	Flood level classification			Special Reading Arrangements	Owner
					MIN	MOD	MAJ		
Bruinbun ‡	Telemeter	421025	-	Macquarie River					DWE
Winburndale Dam	SCADA	10424	-	Winburndale Rivulet					BRC
Oakbrook	Manual	421091	-	Winburndale Rivulet					DWE
Turon Gates‡	Manual	10389	-	Turon River					SES
Sofala ‡	Telemeter	421026	-	Turon River	4.0	5.5	6.0		NOW
Crudine‡	Manual	421041	-	Crudine River					DWE

Notes: The Bureau of Meteorology provides flood warnings for the gauges marked with an asterisk (*). SES Local Flood Advices are provided for the gauges marked with a single cross (†). The SES holds a Flood Intelligence Card for the gauges marked with a double cross (‡).

1.1 RAINFALL GAUGES

1.1.1 The Bureau of Meteorology also monitors the following rainfall gauges which use the ENVIROMON system to notify the NSW SES of high intensity rainfall affecting the Bathurst Regional Council area:

a. Rockley

b. Newbridge

c. Mt David

d. Tarana

e. Upstream of Ben Chifley Dam

f. Oberon

g. Stanley Street

h. Hampton

i. Shooters Hill

1.1.2 The Bathurst Regional Council monitors the stream gauge at Winburndale Dam. This uses the SCADA system.

2. DISSEMINATION OPTIONS FOR NSW SES FLOOD INFORMATION AND WARNING PRODUCTS

The NSW SES Central West Region Headquarters distributes NSW SES Flood Bulletins, NSW SES Evacuation Warnings and NSW SES Evacuation Orders to the following regional media outlets and agencies:

Television Stations:

Station	Location
Prime TV	Orange
WIN TV	Orange
Southern Cross Ten	Orange

Radio Stations:

Station	Location	Frequency	Modulation
2CR (ABC)	Orange	549	AM
Easy Listening (Ten-89)	Orange	1089	AM
2BS	Bathurst	1503	AM
2LF	Cowra	1350	AM
2LT	Lithgow	900	AM
Star FM	Orange	105.9	FM
2MCE –FM	Bathurst	92.3	FM
2MCE –FM	Orange	94.7	FM
B-Rock	Bathurst	99.3	FM
2GZ-FM	Orange	105.1	FM
Move – FM	Lithgow	107.9	FM
Star FM	Cowra	93.9	FM

Newspapers:

Name	Location
Western Advocate	Bathurst
Central Western Daily	Orange
Lithgow Mercury	Lithgow
Lyndhurst Shire Chronicle	Blayney
Oberon Review	Oberon

BATHURST REGIONAL: NSW SES LOCALITY RESPONSE ARRANGEMENTS

Chapter 2 of Volume 3 (NSW SES Response Arrangements for Bathurst Regional) of the Bathurst Regional Local Flood Plan

Last Update: May 2017

AUTHORISATION

NSW SES Locality Response Arrangements in Bathurst Regional has been prepared by the NSW State Emergency Service (NSW SES) as part of a comprehensive planning process.

Approved

Manager Emergency Risk Management

Date: 8 May 2017

Approved

NSW SES Central West Region Controller

Date: 24 March 2017.

Tabled at LEMC

16/5/17

Date:

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1. SECTOR OVERVIEW

Table 1: Overview of Sectors in the Bathurst Regional LGA.

Sector Name	Community	Sector Basis	Approximate Total Number of Properties within Sector	No. of Properties Potentially at Risk
Kelso	Eastern side of the Macquarie River at Bathurst.	Operational response	95 residential properties	Approximately 41 properties are affected by over-floor flooding
Gormans Hill	Western side of the Macquarie River at Bathurst.	Operational response	170 residential properties, 17 rural properties and 9 businesses.	15 residential, 10 commercial properties at risk of over-floor flooding.
South Bathurst (Carlingford Street)	South Bathurst – western side of the Queen Charlottes (Vale) Creek.	Operational response	808 properties	Approximately 76 properties are affected by over-floor flooding
Havannah / Morrisset Streets	Western side of the Macquarie River and to the eastern side of the Great Western Highway	Operational response	480 residential properties	There are approximately 158 residential and commercial properties that are subject to over floor flooding in a major flood.
Eglinton / Abercrombie	Eglinton, Abercrombie	Operational response	1072 properties	One dwelling upstream of Rankins Bridge is subject to over-floor flooding
Perthville / Georges Plains	Perthville, Georges Plains	Operational response	439 properties	Approximately 80 residential properties in Perthville are subject to isolation. Approximately 20 residential properties in the Georges Plains area are subject to potential isolation.

Sector Name	Community	Sector Basis	Approximate Total Number of Properties within Sector	No. of Properties Potentially at Risk
The Lagoon	The Lagoon	Operational response	101 properties	A small number of residential properties are potentially at risk of over floor flooding and isolation.
Sofala	Sofala	Operational response	171 properties	10 residential and commercial properties are subject to over floor flooding.

These Sectors provide further detail of the planned response strategies within Communities in the Bathurst Regional LGA. It is important to note that this information reflects information currently available based on historical and design floods, and does not represent the full magnitudes of floods possible.

2. KELSO SECTOR

2.1. KELSO SECTOR RESPONSE ARRANGEMENTS

Refer to Volume 2: Hazard and Risk in Bathurst Regional for more information about this Sector/Community.

Sector Description	The Kelso Sector is located on the eastern side of the Macquarie River at Bathurst and includes part of the Raglan Creek floodplain. There are approximately 95 residential houses in the sector located on Hereford and Gilmour streets, Church, First, Edgells and Stephens Lanes, Lions Club and Eleven Mile Drives and River Road. The majority of these properties are located west of Raglan Creek, although others are situated between Raglan Creek and Gilmour Street. A small number of commercial properties are located in Church Lane and Hereford Street. There is also an Industrial Estate located off Littlebourne Street in Kelso which comprises Whyalla Circuit, Cardiff, Newcastle, Sheffield, and Wembley Place, Hampden Park Road, Bradford, Coventry, Kobe Lee, Toronto and Zagreb Streets. In events exceeding a 1% AEP flood (7.38 metres on the Stanley Street gauge), the industrial area may experience inundation. Up to that level these areas are protected by levees. The total residential population in this area is approximately 470 people; however properties located east of Gilmour Street are rarely affected by flooding.		
Hazard	The Kelso floodplain is subject to flooding from both the Macquarie River and Raglan Creek and this has been the zone of major evacuations during past floods in Bathurst, particularly if both water courses are in flood at the same time. A number of flood prone dwellings have been removed from the flood plain through Council's voluntary purchase scheme. According to Council 21 dwellings remain in this area. South of the Great Western Highway, properties fronting Lee Street can also be inundated by flooding from the Macquarie River and Raglan Creek. In floods greater than a 1% AEP, the industrial area either side of Lee Street may also experience inundation. Up to this level, these areas are protected by levees located in Stockland Drive and the Kelso Industrial area.		
Flood Affect Classification	Rising Road Access		
At risk properties	41	**Total number of properties within Sector**	95

<table>
<tr><td>Sector Control</td><td colspan="3">Control- The NSW SES Incident Controller will control operations in this sector.

In larger events incident control may be escalated.

Command – NSW SES and other agencies remain in command of their own resources. Command operates vertically within an organisation.

Coordination- The coordination of other organisations and resource to support an emergency management response will occur at the EOC where established. Operations command can assist in supporting and coordinating incident management teams as required.

Operations Centre. The Sector Operations Centre will be established at the NSW Rural Fire Service Chifley Zone Operations Centre located at Lee Street, Kelso.</td></tr>
<tr><td>Key Warning Gauge: 421908 Bathurst (Stanley Street)</td><td>Minor: 3.00 m</td><td>Moderate: 4.50 m</td><td>Major: 5.70 m</td></tr>
<tr><td>General Strategy</td><td colspan="3">Property protection where time and resources permit.

Evacuation:
Evacuation of at risk properties from a gauge height of 4.9m.
Self-evacuation to friends/family outside of the impact area.
Establishment of an Assembly area at Denison College, (Kelso High Campus), where evacuees are able to gather while flood situation is monitored.
Where a major levee overtopping and/or failure occurs, evacuees will remain at the Denison College, (Kelso High Campus).
Flood rescue in circumstances where people have failed to evacuate and other persons/domestic animals trapped in floodwater in accordance with the Flood rescue Policy.

Resupply of isolated properties.</td></tr>
<tr><td>Key Risks / Consequences</td><td colspan="3">Potential loss of life from rapid and potentially high velocity flooding inundation.

Inundation of dwellings and vulnerable facilities.

Hereford Street (23).</td></tr>
</table>

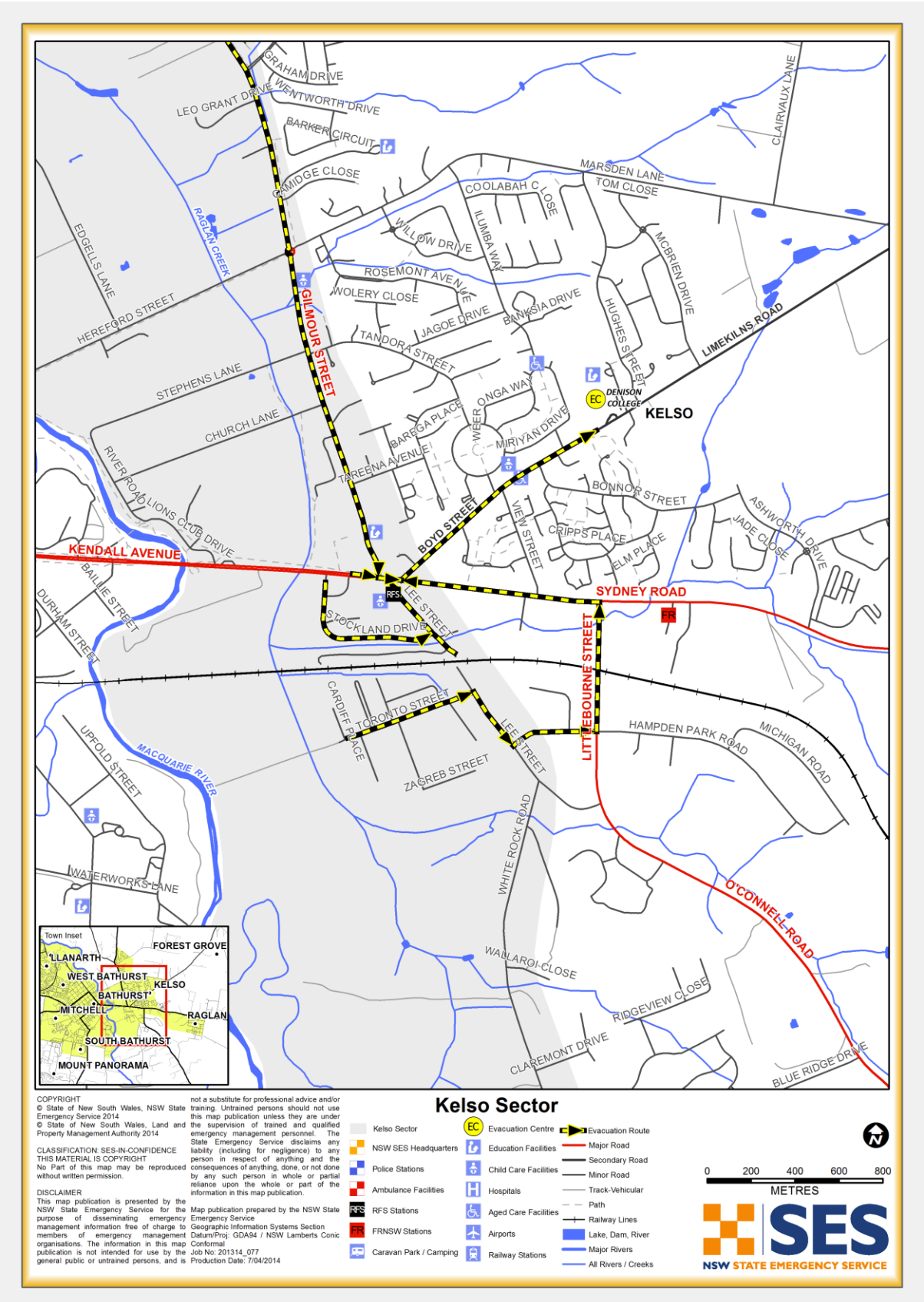
	Edgells Lane (3). Church Lane (10). Stephens Lane (3). River Road (1). Gilmore Street (1). These facilities include: • Schools ▪ Kelso Public School, 19 Gilmour St • Childcare centres ▪ ABC Development Learning Centre, Kelso West, 151 Gilmour St ▪ Early Start Kelso Preschool, 7 Lee St • Facilities for the aged and/or infirm ▪ Ilumba Gardens, Ilumba Way, Kelso ▪ Bathurst Nursing Home, 61 Boyd St, Kelso Potential isolation could occur to many people and could last for a number of days.
Information and Warnings	A number of methods will be used by the Central West Region Headquarters to assist the Bathurst Unit to inform the community regarding the potential impacts of a flood and what actions to undertake in preparation for a flood. They include: • Flood Bulletins (includes Flood Watches and Flood Warnings issued by the BOM) • Evacuation Warnings • Evacuation Orders • Sequenced door knocking of evacuation sectors • Media announcements (including Social Media) • Emergency Alert (SMS, Landlines) • Standard Emergency Warning Signal (SEWS)
Property Protection	**Specific property protection measures:** • Monitoring rising flood waters. • Relocation of livestock. • Relocation of farm machinery and valuable goods • Control of surface water through sandbagging measures.

	• Assist in the lifting of furniture to residents in need. • Monitoring integrity of dwellings surrounded by flood waters.
	Assistance with property protection: Assistance may be provided to affected properties through the distribution of sandbags / sandbagging of properties that are at threat of inundation. Where time permits and resource is available assistance will be given to the lifting or transporting of furniture, personal effects, commercial stock and caravans
	Protection of essential infrastructure: The pump station off Gilmour Street may require monitoring and protection. Evacuations may be required in rural areas for sanitary reasons if septic systems overflow. Council address procedures for sewerage system. Council regularly monitor this pump station during a flood event. When a flood warning is received from the Bureau of Meteorology for a height of, or exceeding 6.9 metres for Bathurst (Stanley Street) gauge, the Bathurst SES Unit and Central West Region Headquarters will immediately advise Bathurst Regional Council and discuss evacuation strategies for residents and businesses at risk of flooding by the overtopping of the levee. This strategy will include the filling of sandbags and the construction of a temporary levee (fuse plug) at Russell Street near the Essential Energy electricity substation.
	Levees: The levees are designed to protect properties up to 1% AEP flood events (refer to Volume 2 of this Local Flood Plan). During major flooding (5.70 metres or greater on the Stanley Street Bathurst gauge Hereford Street and Edgells Lane will close. A levee has been constructed to protect the Great Western Highway from closure to a 5% AEP flood of Raglan Creek. Bathurst Regional Council (as the levee owners) has a system in place to monitor the levee during flood events, and have Standing Operating Procedures that detail what to do if there is the potential for levee failure below the design level. If there is the potential for the failure of any levee then Bathurst Regional Council will immediately advise the Bathurst SES Unit and Central West Region Headquarters.
Evacuation Triggers	Evacuation will be considered when: • **Gauge Height at the Bathurst (Stanley Street) Gauge predicted to reach/exceed 4.90 metres.** If the Raglan Creek and the Macquarie River are both in flood the first evacuations in the Kelso Sector will be required if a peak

	height of 4.90 metres (moderate level flooding) or more is predicted on the Bathurst (Stanley Street gauge). • **Gauge Height at the Bathurst (Stanley Street) Gauge predicted to reach/exceed 5.70 metres.** During major flooding (5.70 metres or greater at the Bathurst gauge) road access to Edgells Lane and the western end of Hereford Street will be lost. People living in these areas should be evacuated before this height is reached if further river rises are predicted. • **Gauge Height at the Bathurst (Stanley Street) Gauge predicted to reach/exceed 6.90 metres.** If a peak height of 6.90 metres or greater is predicted at the Bathurst (Stanley Street) gauge the majority of properties in the Kelso Sector will need to be evacuated by this height.
Sequencing of evacuation	• Evacuation of residents in low lying properties in Kelso (Edgells Lane and Hereford Street). • Evacuation of vulnerable facilities such as (E.g. Aged care facilities, schools, and child care facilities) will require a higher priority. • Outside the identified sequenced evacuation areas, a number of residences and properties may need to be evacuated during periods of significant flooding. In most floods, the evacuation tasks will only involve a small number of people. These properties would be dealt with on a case by case situation in conjunction with the Family and Community Services.
Evacuation Routes	Local roads should be used as evacuation routes to Boyd Street where the evacuation centre is located at Denison College, (Kelso High Campus) (including residents along River Road and the western end of Church Lane). Access to low-lying properties located in the remainder of the Kelso Sector is limited, during major flooding (5.70 metres or greater on the Stanley Street Bathurst gauge). Residents in these areas will need to evacuate before this height is reached.
Evacuation Route Closure	Hereford Street and Edgells Lane will close to traffic during major flooding (5.70 metres or greater on the Stanley Street Bathurst gauge). The Great Western Highway may close to all traffic due to inundation by the Raglan Creek during major flooding, cutting access between Kelso and Bathurst. Bathurst residents may also be cut off from Lithgow and Sydney.
Method of Evacuation	Primarily self-evacuation by private transport to family and friends outside the flood affected area.

	Primarily self-evacuation by private transport to nominated assembly areas. At risk residents will be door knocked where possible by SES, RFS and other emergency personnel and advised on the evacuation details.
Evacuation Centre/Assembly Point	The Evacuation Centre for Kelso is located in the gymnasium at Denison College, (Kelso High Campus) located in Boyd Street, Kelso (access can also be obtained from Miriyan Drive at the back of the school).
Large scale evacuations	Large scale evacuations are not expected within the Kelso sector unless the Stanley Street Gauge reaches 6.9m.
Rescue	The Bathurst SES Unit will undertake all Flood Rescue operations as per the Flood Rescue Operations Policy.
Resupply	Resupply will be provided by the NSW SES through the 132500 call out system.
	Table 2, in Volume 2 provides information about isolated communities in the Bathurst Regional LGA and potential periods of isolation.
	A flowchart illustrating the Resupply process is shown in Volume 1 of the Local Flood Plan, Attachment 1.
Aircraft Management	**Helicopter Landing Points:** Suitable landing points are located at: • Bathurst Airport located on the Sydney Road at Raglan. • Sports Oval at the back of Denison College, Kelso High Campus (in emergency situations) S 33^{o} 25’ S 149^{o} 36.5’E
	Airports: Bathurst Airport located on the Sydney Road at Raglan.
Other	Special considerations relating to the evacuation: • Closure of Schools - coordinated through the Department of Education and Training. • Evacuation of residential institutions, nursing homes and age care facilities will occur where these are threatened by predicted flood waters. • Security. Police patrols to be established to maintain law and order after evacuation has occurred. • The NSW SES may use flood boats and helicopters to monitor safety of individuals. These arrangements will stay in place until the ALL CLEAR is provided by the NSW SES to residents to return to their premises.

2.2. KELSO SECTOR MAP



3. GORMANS HILL SECTOR

3.1. GORMANS HILL SECTOR RESPONSE ARRANGEMENTS

Refer to Volume 2: Hazard and Risk in Bathurst Regional for more information about this Sector/Community.

Sector Description	The Gormans Hill Sector is located on the western side of the Macquarie River at Bathurst and includes part of the catchment of the Queen Charlottes (Vale) Creek. There are approximately 170 residential houses in the sector located on Fish Parade, McPhillamy Avenue, Dees Close and Gormans Hill Road. A further 17 rural properties are located in the southern part of this sector. Also, there are approximately 9 businesses located around the Upfold Street area.		
Hazard	The Gormans Hill Sector is subject to flooding from both the Macquarie River and the Queens Charlottes (Vale) Creek. These systems can flood simultaneously or separately.		
Flood Affect Classification	Within the Gormans Hill area the floodplain can be classified as high flood islands.		
At risk properties	15 residential, 10 commercial properties.	**Total number of properties within Sector/Community**	196
Sector Control	**Control**- The NSW SES Incident Controller will control operations in this sector. In larger events incident control may be escalated. **Command** – NSW SES and other agencies remain in command of their own resources. Command operates vertically within an organisation. **Coordination**- The coordination of other organisations and resource to support an emergency management response will occur at the EOC where established. Operations command can assist in supporting and coordinating incident management teams as required. **Operations Centre**. The Sector Operations Centre will be established at MacKillop College located on the Gormans Hill Road.		
Key Warning Gauges: **1) 421908 Bathurst (Stanley Street)** **2) 412053 Cow Flat**	**Minor:** 3.00 m	**Moderate:** 4.50 m	**Major:** 5.70 m

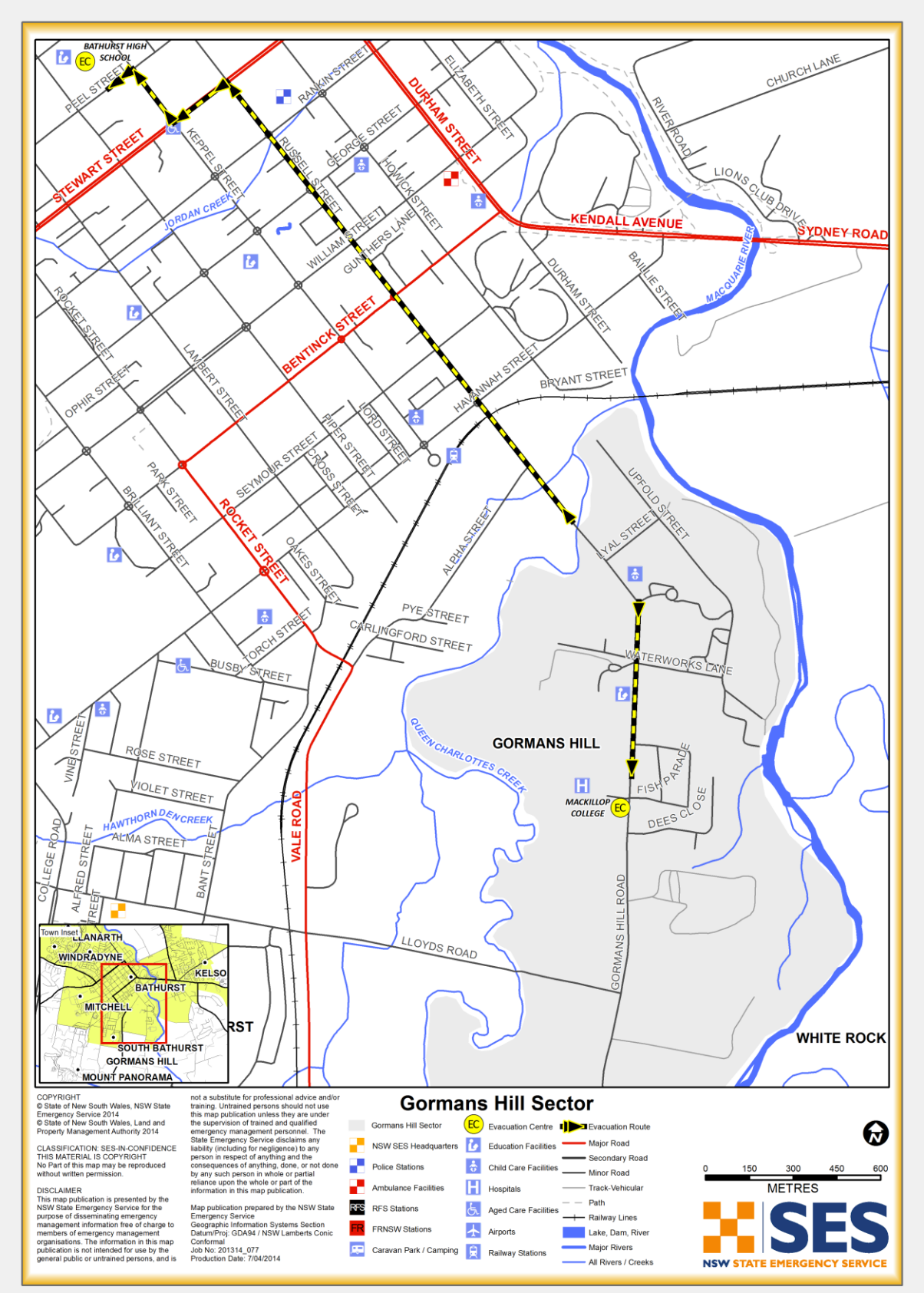
Bridge.			
General Strategy	The impact on this sector will depend on a number of variables, including on the peak height of the Macquarie River or the Vale Creek. Property protection where time and resources permit. Evacuation of at risk population: • Self-evacuation to friends/family outside of the impact area. • Until Gormans Hill sector becomes isolated establishment of an Assembly area at Denison College, (Bathurst High Campus), where evacuees are able to gather while flood situation is monitored. • Once access is lost to Gormans Hill establish a secondary assembly area at MacKillop College on the Gormans Hill Road. Flood rescue in circumstances where people have failed to evacuate and other persons/domestic animals trapped in floodwater in accordance with the Flood rescue Policy. Resupply to isolated properties.		
Key Risks / Consequences	The sector becomes isolated when access roads close quite early. In previous flood events the Russell Street underpass has been closed due to storm water. This has resulted in the loss of the main access to the Gormans Hill sector from Bathurst. Flooding from both the Macquarie River and the Queens Charlottes (Vale) Creek causes this Sector to become isolated with access to both MacKillop College and St Vincent's Hospital cut.		
Information and Warnings	A number of methods will be used by the Central West Region Headquarters to assist the Bathurst Unit to inform the community regarding potential impacts of a flood and what actions to undertake in preparation for a flood. They include: • Flood Bulletins (includes Flood Watches and Flood Warnings issued by the BOM) • Evacuation Warnings • Evacuation Orders • Sequenced door knocking of evacuation sectors • Media announcements (including Social Media) • Emergency Alert (SMS, Landlines) • SEWS		

Property Protection	**Specific property protection measures:** • Monitoring rising flood waters. • Relocation of livestock. • Relocation of farm machinery and valuable goods • Control of surface water through sandbagging measures. • Assist in the lifting of furniture to residents in need. • Monitoring integrity of dwellings surrounded by flood waters.
	Protection of essential infrastructure: The Bathurst Electrical Substation is located at the corner of Russell and Alpha Street. This substation has been designed and built to withstand a 1%AEP flood. • The construction of a temporary levee (fuse plug) at Russell Street near the Essential Energy electricity substation for predictions to exceed 6.9m at Stanley Street gauge.
Evacuation Triggers	The key evacuation triggers based on Bureau of Meteorology flood height predictions at the Stanley Street gauge: **Prediction to reach and/or exceed 4.9 metres**. This means that when water from Queen Charlottes (Vale) Creek is unable to drain freely into the Macquarie River. As a result owners of residential and business properties need to be evacuated prior to this height being reached. In the light of levee and other development, the historical information held for flood events is likely to be no longer accurate. Flood intelligence needs to be captured for this area during future flood events.
Sequencing of evacuation	• Evacuation of residents in low lying properties in the Gormans Hill area (Upfold Street, Russell Street and Lyal Street). • Evacuation of vulnerable facilities such as (e.g. Aged Care facilities, schools, child care facilities) will require a higher priority. • Outside the identified sequenced evacuation areas, a number of residences and properties may need to be evacuated during periods of significant flooding. In most floods, the evacuation tasks will only involve a small number of people. These properties would be dealt with on a case by case basis in conjunction with the Family and

	Community Services.
Evacuation Routes	The evacuation route for Gormans Hill Sector is: Gormans Hill Road to Russell St to Peel St until the sector becomes isolated at 5.70 metres.
Evacuation Route Closure	Gormans Hill Road may close in a major flood event, as historically the Russell Street underpass floods. Road access to Lloyds Road will be lost early causing the sector to become isolated. Local roads will then be used by evacuees to get to the secondary Evacuation Centre located at MacKillop College.
Method of Evacuation	Primarily self-evacuation by private transport to family and friends outside the flood affected area. Primarily self-evacuation by private transport to nominated assembly areas. At risk residents will be door knocked where possible by SES, RFS and other emergency personnel and advised on the evacuation details.
Evacuation Centre/Assembly Point	**Primary**: Until Gormans Hill sector becomes isolated, the primary Sector Evacuation Centre is located at Denison College (Bathurst High Campus), Peel Street in Bathurst. **Secondary**: Once access is lost then the secondary Sector Evacuation Centre will be located at MacKillop College on the Gormans Hill Road.
Large scale evacuations	Large scale evacuations would be unlikely in this sector but if the required additional locations will be identified.
Rescue	The Bathurst SES Unit will undertake all Flood Rescue operations as per the Flood Rescue Operations Policy.
Resupply	Resupply will be provided by the NSW SES through the 132500 call out system. During periods of flooding, Gormans Hill can become isolated. The likely duration of is generally less than 24 hours. This is assumed on average durations and will vary depending upon infrastructure damage and flood magnitude.
	Table 2, in Volume 2 provides information about isolated communities in the Bathurst Regional LGA and potential periods of isolation.
	A flowchart illustrating the Resupply process is shown in Volume 1 of the Local Flood Plan, Attachment 1.
Aircraft Management	**Helicopter Landing Points:** Suitable landing points are located at:

	• Sports Oval located in the grounds of MacKillop College, Bathurst.
	Airports: Bathurst Airport located on the Sydney Road at Raglan.
Other	Special consideration relating to the evacuation: • Closure of schools – coordinated through the Department of Education and Training. • Evacuation of residential institutions, nursing homes and aged care facilities will occur where these are threatened by predicted flood waters. • The NSW SES may use flood boats and helicopters to monitor safety of individuals. These arrangements will stay in place until the ALL CLEAR is provided by the NSW SES to residents to return to their premises.

3.2. GORMANS HILL SECTOR MAP



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Map publication prepared by the NSW State Emergency Service
Geographic Information Systems Section
Datum/Proj: GDA94 / NSW Lamberts Conic Conformal
Job No: 201314_077
Production Date: 7/04/2014

4. SOUTH BATHURST (CARLINGFORD STREET) SECTOR

4.1. SOUTH BATHURST (CARLINGFORD STREET) SECTOR RESPONSE ARRANGEMENTS

Refer to Volume 2: Hazard and Risk in Bathurst Regional for more information about this Sector/Community.

Sector Description	The Carlingford Street Sector is located on the western side of the Queen Charlottes (Vale) Creek. There are approximately 15 residential houses affected by flooding in the Alpha, Pye, Carlingford, Lee and Beresford Streets area. A small number of commercial properties are located in Alpha, Pye, and Carlingford Streets. More commercial properties are located along both sides of the Vale Road, including a small industrial estate located in Kirkcaldy Street.		
Hazard	The Carlingford Street Sector is subject to flooding from Queen Charlottes (Vale) Creek and has been the zone of major evacuations in the past. Approximately 76 houses which are potentially prone to flooding are located in this sector depending on the event. Many businesses are located in this Sector which may experience flooding. These are located in Carlingford, Pye, Alpha, Russell and Kircaldy Streets as well as along the Vale Road.		
Flood Affect Classification	Low Flood Island, being cut off from 6.69 m on Bathurst Stanley St gauge, as the flood height approaches the design height of the levees.		
At risk properties	76	**Total number of properties within Sector/Community**	808
Sector Control	**Control**. Evacuation Operations will be controlled by the Bathurst SES Unit Controller. **Coordination**. The Bathurst SES Unit Controller will nominate a Sector Controller to coordinate evacuation operations from the Carlingford Street Sector. **Conduct**. Evacuation operations in the Carlingford Street Sector will be carried out by the Bathurst SES Unit with the assistance of other NSW SES Units, NSW Police Force, NSW Rural Fire Service and Fire and Rescue NSW personnel. **Operations Centre**. The Sector Operations Centre will be		

<table>
<tr><td></td><td colspan="3">established at Bathurst Unit Headquarters located in Lloyds Road.</td></tr>
<tr><td>Key Warning Gauges:
1) 421908 Bathurst (Stanley Street) and
2) 421053 Cow Flat Bridge.</td><td>Minor: 3.00 m</td><td>Moderate: 4.50 m</td><td>Major: 5.70 m</td></tr>
<tr><td>General Strategy</td><td colspan="3">Property protection where time and resources permit.

Evacuation of at risk population:

• Evacuation of at risk properties from a gauge height of 4.5m.

• Self-evacuation to friends/family outside of the impact area.

Establishment of an Assembly Areas at the Dennison College (Bathurst Campus), where evacuees are able to gather while flood situation is monitored.

Flood rescue in circumstances where people have failed to evacuate and other persons/domestic animals trapped in floodwater in accordance with the Flood rescue Policy.

Resupply to isolated properties.</td></tr>
<tr><td>Key Risks / Consequences</td><td colspan="3">Approximately 76 houses which are prone to flooding are located in this sector.

Many businesses are located in this Sector which may experience flooding. These are located in Carlingford, Pye, Alpha, Russell and Kircaldy Streets as well as along the Vale Road.

Overtopping of levee resulting in inundation behind the levee.</td></tr>
<tr><td>Information and Warnings</td><td colspan="3">A number of methods will be used by the Central West Region Headquarters to assist the Bathurst Unit to inform the community regarding the potential impacts of a flood and what actions to undertake in preparation for a flood. They include:

• Flood Bulletins (includes Flood Watches and Flood Warnings issued by the BOM)

• Evacuation Warnings

• Evacuation Orders

• Sequenced door knocking of evacuation sectors

• Media announcements (including Social Media)

• Emergency Alert (SMS, Landlines)

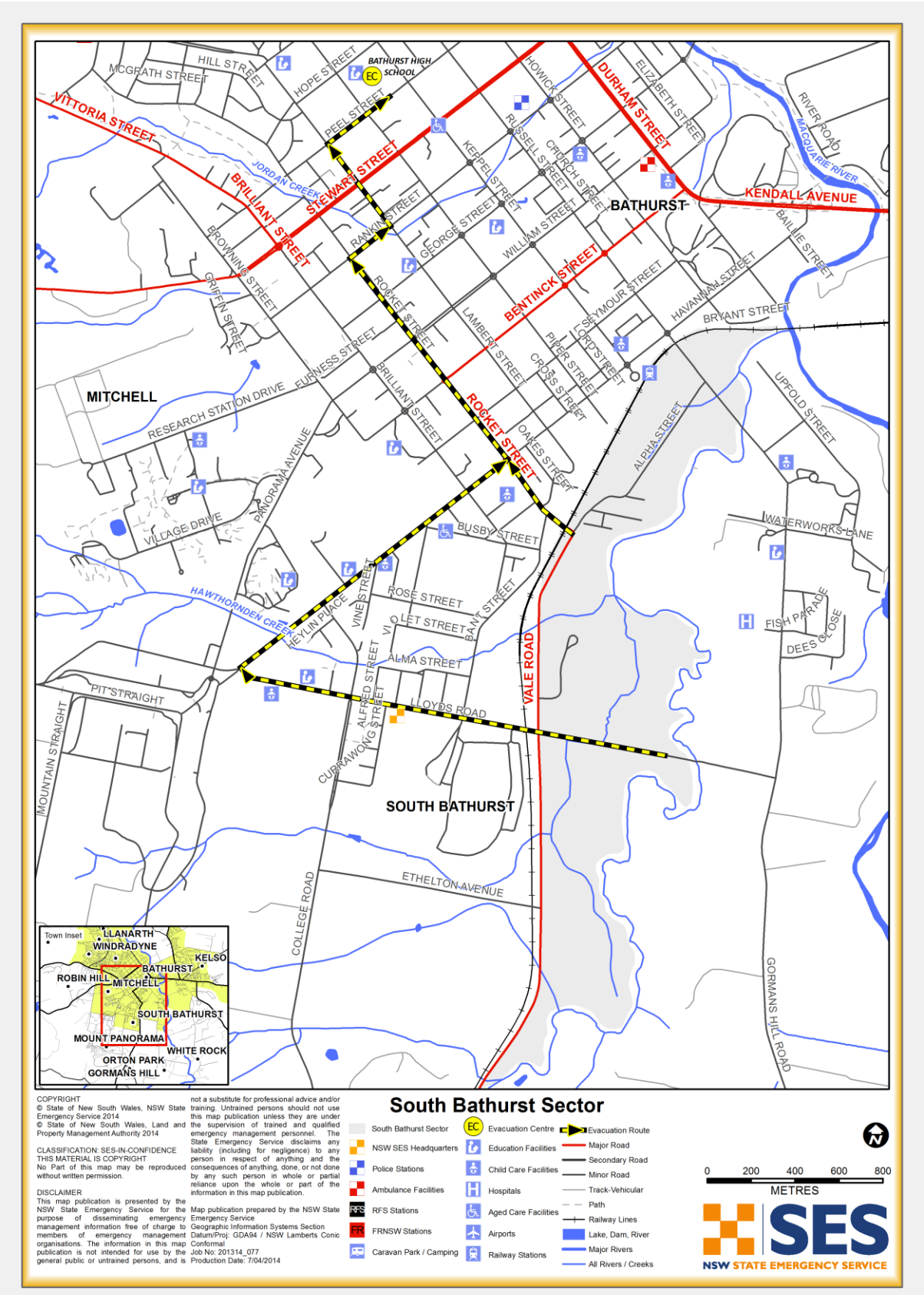
• Standard Emergency Warning Signal (SEWS)</td></tr>
</table>

Property Protection	**Specific property protection measures:** • Monitoring rising flood waters. • Relocation of farm machinery and valuable goods • Control of surface water through sandbagging measures. • Assist in the lifting of furniture to residents in need. • Monitoring integrity of dwellings surrounded by flood waters.
	Levees: The levees (known as the "Carlingford Levee") are designed to protect properties up to 7.3 m at the Bathurst gauge (refer to Volume 2 of this Local Flood Plan). Bathurst Regional Council (as the levee owners) has a system in place to monitor the levee during flood events, and have Standing Operation Procedures that detail what to do if there is the potential for levee failure below the design height. If there is the potential for the failure of any levee then Bathurst Regional Council will immediately advise the Bathurst SES Unit and Central West Region Headquarters.
Evacuation Triggers	Evacuations (see key risks/consequences section) should commence in this sector when: • **The Queen Charlottes (Vale) Creek reaches and is expected to exceed 4 metres on the Perthville gauge (located on the Perthville Bridge),** historically this has occurred around 4.5 metres at the Bathurst (Stanley Street) gauge on the Macquarie River. Evacuation of areas behind the levee located in Carlingford Street will be considered when: • There is a Major Flood Warning for Bathurst (Stanley Street) gauge (AWRC No. 421908) **predicted to reach and/or exceed 6.9 metres**. The design height of the levee is 6.9 metres as related to the Stanley Street Bathurst gauge.
Sequencing of evacuation	• Evacuation of residents in low lying properties (see key risks/consequences section). • Outside the identified sequenced evacuation areas, a number of residences and properties may need to be evacuated during periods of significant flooding. In most floods, the evacuation tasks will only involve a small number of people. These properties would be dealt with on a case by case basis in conjunction with Family and Community Services. • Evacuation of vulnerable facilities such as child care

	facilities will require a higher priority.
Evacuation Routes	The Evacuation Routes for the Carlingford Street sector include: • Lloyds Road, Havannah and Rocket Streets (to Denison College (Bathurst High Campus)).
Evacuation Route Closure	No Evacuation Routes are likely to close in this sector.
Method of Evacuation	Primarily self-evacuation by private transport to family and friends outside the flood affected area. Primarily self-evacuation by private transport to nominated assembly areas. At risk residents will be door knocked where possible by SES, RFS and other emergency personnel and advised on the evacuation details.
Evacuation Centre/Assembly Point	The Evacuation Centre for the Carlingford Street sector is the Denison College (Bathurst High Campus), Peel Street, Bathurst.
Large scale evacuations	Large scale evacuations would be unlikely in this sector, but if required additional locations will be identified.
Rescue	The Bathurst SES Unit will undertake all Flood Rescue operations as per the Flood Rescue Operations Policy.
Resupply	Resupply will be provided by the NSW SES through the 132500 call out system.
	Table 2, in Volume 2 provides information about isolated communities in the Bathurst Regional LGA and potential periods of isolation.
	A flowchart illustrating the Resupply process is shown in Volume 1 of the Local Flood Plan, Attachment 1.
Aircraft Management	**Helicopter Landing Points:** Suitable landing points are located at: • Sports oval in the grounds of George Park located on the corner of Brilliant and Rankin Streets, Bathurst.
	Airports: Bathurst Airport located on the Sydney Road at Raglan.
Other	During the year there are two main sporting events that could affect this sector. They are the “Bathurst 12 Hour” which is an endurance race for GT and production cars held at the Mount Panorama Circuit, in Bathurst, Australia in February each year. Secondly, the “Supercheap Auto Bathurst 1000” held at the Mount Panorama Circuit, in Bathurst, Australia in October each year. Special considerations relating to the evacuation:

	• Closure of Schools – coordinated through the Department of Education and Training. • The NSW SES may use flood boats and helicopters to monitor the safety of individuals. These arrangements will stay in place until the ALL CLEAR is provided by the NSW SES to residents to return to their premises.

4.2. SOUTH BATHURST (CARLINGFORD STREET) SECTOR/COMMUNITY MAP



5. HAVANNAH / MORRISSET STREETS SECTOR

5.1. HAVANNAH / MORRISSET STREETS SECTOR RESPONSE ARRANGEMENTS

Refer to Volume 2: Hazard and Risk in Bathurst Regional for more information about this Sector/Community.

Sector Description	The Havannah/Morrisset Streets Sector is located on the western side of the Macquarie River and to the eastern side of the Great Western Highway/Durham Street opposite All Saints' College. There are approximately 480 residential houses in the sector located at Russell, Havannah, Durham, Baillie, Seymour, Howick, Bryant, Morrisset, Hope, Stanley, Peel, Kefford, lower Stewart Streets along with the Great Western Highway, Zante Lane and Kendall Avenue. A number of commercial properties are located in Morrisset Street between Peel and Commonwealth Streets and between the Great Western Highway and Morrisset Street.		
Hazard	The Havannah/Morrisset Streets Sector historically has been subject to flooding from the Macquarie River and this has been the zone of major evacuations during past floods in Bathurst. Residential houses and some small businesses have been affected in the past by flooding. In the light of levee and other development, the historical information held for flood events in this area is no longer relevant. Flood intelligence will be captured for this area during future flood events.		
Flood Affect Classification	Rising Road Access		
At risk properties	158	**Total number of properties within Sector/Community**	480
Sector Control	**Control**- The NSW SES Incident Controller will control operations in this sector. In larger events incident control may be escalated. **Command** – NSW SES and other agencies remain in command of their own resources. Command operates vertically within an organisation. **Coordination**- The coordination of other organisations and resource to support an emergency management response will occur at the EOC where established. Operations command can assist in supporting and coordinating incident management teams as required.		

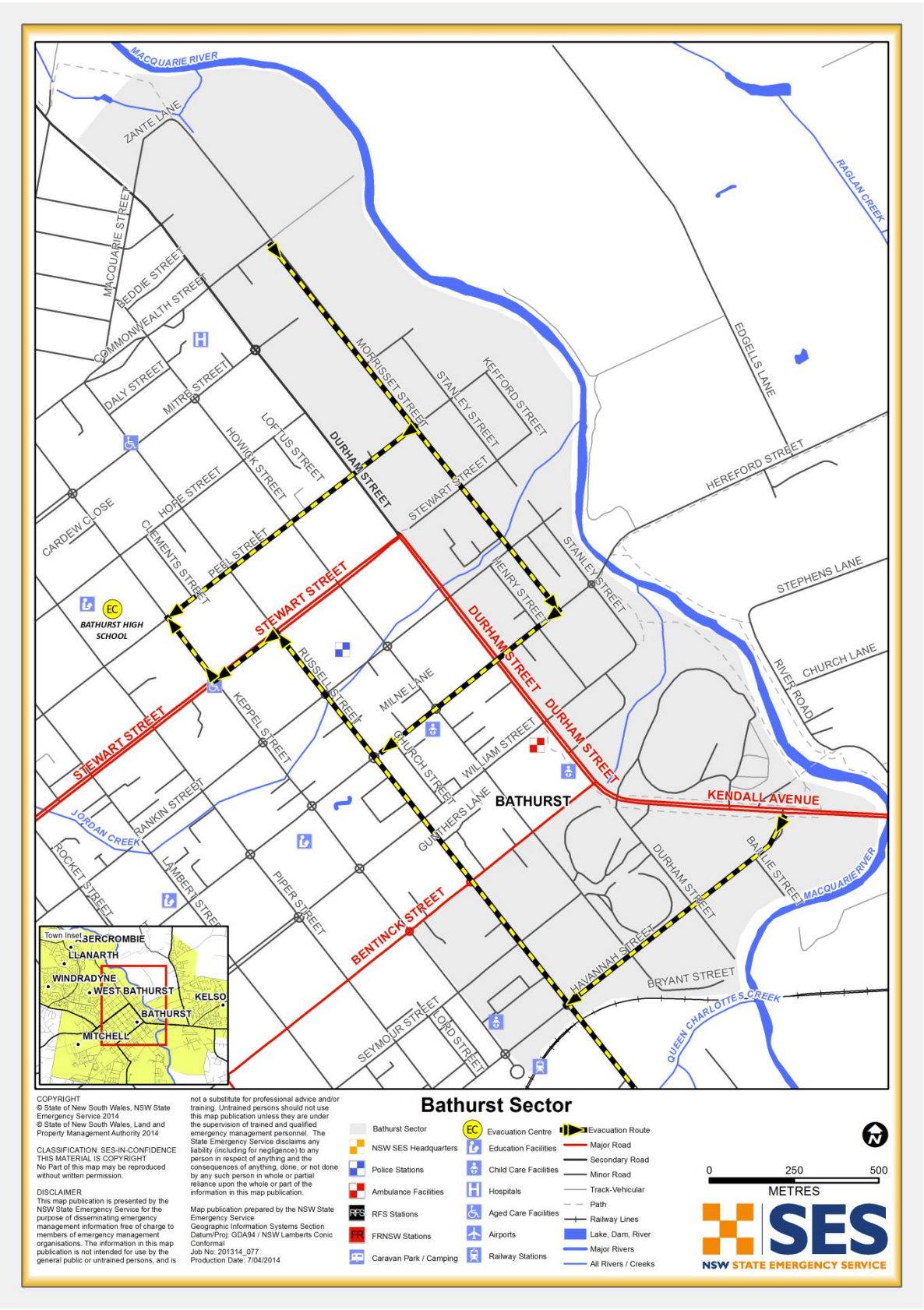
	Operations Centre. The Sector Operations Centre will be established at the Bathurst SES Unit Headquarters located in Lloyds Road.		
Key Warning Gauge: 421908 Bathurst (Stanley Street) gauge	**Minor:** 3.00 m	**Moderate:** 4.50 m	**Major:** 5.70 m
General Strategy	Property protection where time and resources permit. Evacuation of at risk population: • Self-evacuation to friends/family outside of the impact area. • Evacuation of areas behind the levee will be considered when there is a Major Flood Warning for Bathurst – Stanley Street gauge (AWRC No. 421908) predicted to reach and/or exceed 6.90 metres. Flood rescue in circumstances where people have failed to evacuate and other persons/domestic animals trapped in floodwater in accordance with the Flood rescue Policy. Resupply to isolated properties.		
Key Risks / Consequences	In the event that the peak reaches or exceeds 6.9 metres as related to the Stanley Street Bathurst gauge the levees within this sector will be exceeded and inundation of dwellings will occur.		
Information and Warnings	A number of methods will be used by the Central West Region Headquarters to assist the Bathurst Unit to inform the community regarding the potential impacts of a flood and what actions to undertake in preparation for a flood. They include: • Flood Bulletins (includes Flood Watches and Flood Warnings issued by the BOM) • Evacuation Warnings • Evacuation Orders • Sequenced door knocking of evacuation sectors • Media announcements (including Social Media) • Emergency Alert (SMS, Landlines) • Standard Emergency Warning Signal (SEWS)		
Property Protection	**Specific property protection measures:** • Monitoring rising flood waters. • Relocation of livestock. • Relocation of farm machinery and valuable goods		

	• Control of surface water through sandbagging measures. • Assist in the lifting of furniture to residents in need. Monitoring integrity of dwellings surrounded by flood waters.
	Assistance with Property protection: Assistance maybe provided to affected properties through the distribution of sandbags / sandbagging of properties that are at threat of inundation. Where time and available resources permits assistance will be given to the lifting or transporting of furniture, personnel affects, commercial stock and caravans.
	Protection of essential infrastructure: Bathurst Regional Council Sewer Pumping Station, which is located at the Bathurst Showground. Bathurst Regional Council will monitor the Sewer Pumping Station in the event of a flood.
	Levees: Bathurst Regional Council has constructed levees from the western bank of the Macquarie River northwards of the Main Western Railway Line in a generally north-westerly direction to the vicinity of the northern end of the Showground. A further levee bank has been constructed from along the northern bank of Jordan Creek along the western bank of the Macquarie River to Commonwealth Street. The middle section is protected by natural river terraces with some protective earthworks in place. These levees will be monitored by Bathurst Regional Council staff and members of Bathurst SES Unit during flood events. The **design height of the levee is 6.90 metres** as related to the Stanley Street Bathurst gauge. Bathurst Regional Council is responsible for managing the 'controlled' flooding measures in levees located at Hope, Peel and Russell Streets near the Essential Energy electricity substation on roadway in Russell Street (1% AEP – weak point in levees). In the case of Russell Street, this includes the filling of sandbags and construction of a temporary fuse plug.
Evacuation Triggers	The key evacuation triggers based on Bureau of Meteorology flood height predictions at the Bathurst (Stanley Street) Gauge (421908): **1. Prediction to reach and/or exceed 6.90 metres on the Bathurst (Stanley Street) gauge** Evacuations required for the Havannah / Morrisset Street areas. The area consists of 158 'at risk' residential properties.

Sequencing of evacuation	• Evacuation of residents could occur in low lying properties in this sector. • Evacuation of vulnerable facilities such as child care facilities will require a higher priority.
Evacuation Routes	The Evacuation Routes for the Havannah/Morrisset Streets Sector include: • Local Streets to Havannah Street, Russell Street and Peel Streets (Denison College (Bathurst High Campus)). • Local Streets to Morrisset Street, Russell Street, and Peel Streets (Denison College (Bathurst High Campus)).
Evacuation Route Closure	No evacuation routes are likely to close in this sector.
Method of Evacuation	Primarily self-evacuation by private transport to family and friends outside the flood affected area. Primarily self-evacuation by private transport to nominated assembly areas. At risk residents will be door knocked where possible by NSW SES, NSW RFS and other emergency personnel and advised on the evacuation details.
Evacuation Centre/Assembly Point	People should be encouraged to stay with friends/relatives outside the flood affected areas of Havannah / Morrisset Streets. The Evacuation Centre for the Havannah/Morrisset Streets Sector is the Denison College (Bathurst High Campus) located in Hope Street, Bathurst.
Large scale evacuations	Large scale evacuations would be unlikely in this sector.
Rescue	The Bathurst SES Unit will undertake all Flood Rescue operations as per the Flood Rescue Operations Policy
Resupply	Resupply will be provided by the NSW SES through the 132500 call out system
	Table 2, in Volume 2 provides information about isolated communities in the Bathurst Regional LGA and potential periods of isolation.
	A flowchart illustrating the Resupply process is shown in Volume 1 of the Local Flood Plan, Attachment 1.
Aircraft Management	**Helicopter Landing Points:** Suitable landing points are located at: • Victoria Park (opposite Bathurst base Hospital) Sports oval in the grounds of George Park located on the corner of Brilliant and Rankin Streets, Bathurst.

	Lat/Long: 33° 25' S / 149° 34' E
	Airports: Bathurst Airport located on the Sydney Road at Raglan.
Other	Special consideration relating to the evacuation: • Closure of schools – coordinated through the Department of Education and Training. • Evacuation of residential institutions, nursing homes and aged care facilities will occur where these are threatened by predicted flood waters. • The NSW SES may use flood boats and helicopters to monitor safety of individuals. These arrangements will stay in place until the ALL CLEAR is provided by the NSW SES to residents to return to their premises.

5.2. HAVANNAH / MORRISSET STREETS SECTOR/COMMUNITY MAP



6. EGLINTON / ABERCROMBIE SECTOR

6.1. EGLINTON / ABERCROMBIE SECTOR RESPONSE ARRANGEMENTS

Refer to Volume 2: Hazard and Risk in Bathurst Regional for more information about this Sector/Community.

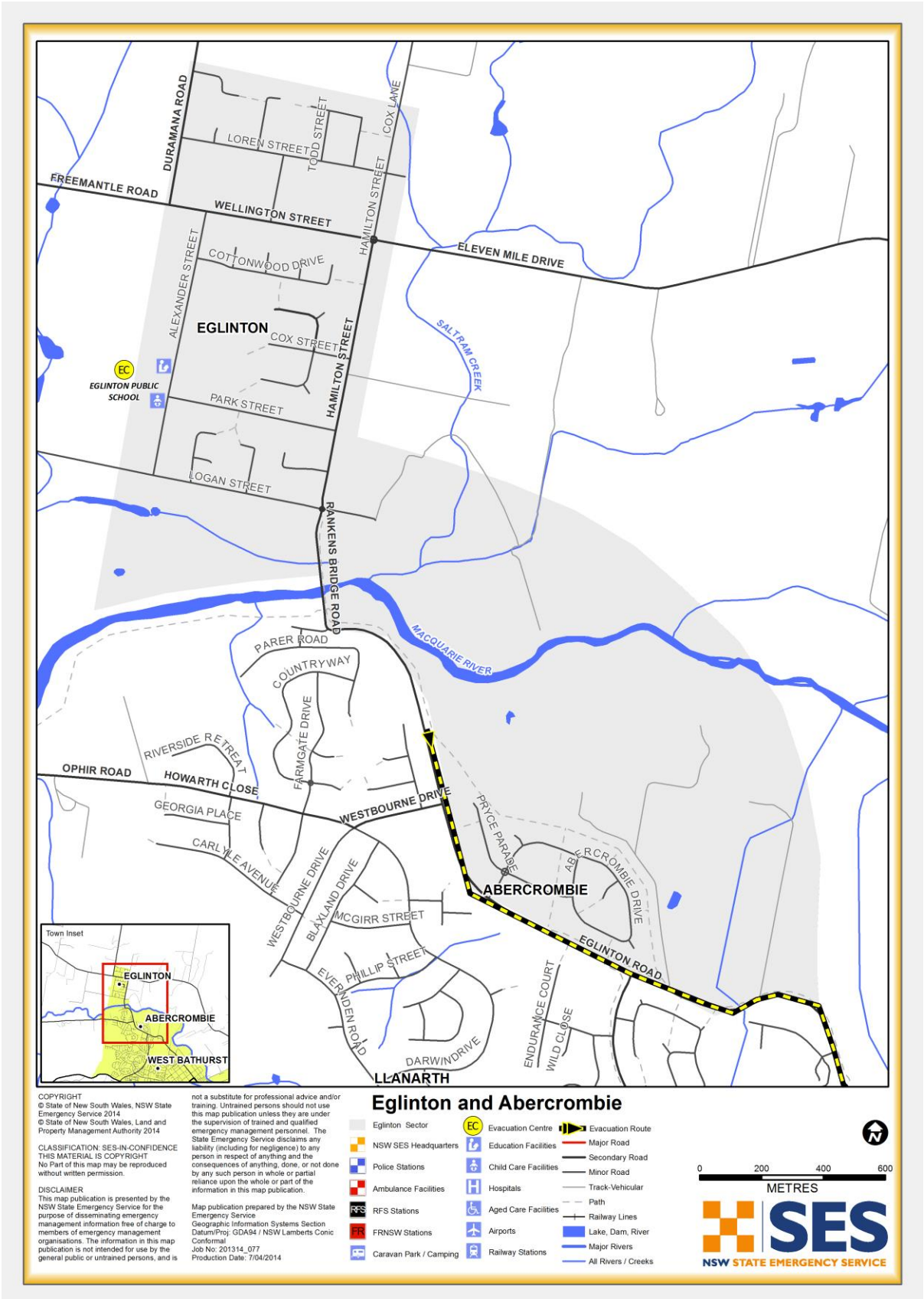
Sector Description	The Eglinton/Abercrombie Sector is located from opposite All Saints' College between the southern side of the Macquarie River and Eglinton Road. This sector includes the suburb of Eglinton located north west of Bathurst on the northern side of the Macquarie River. This sector could become isolated in an extreme flood event.		
Hazard	Abercrombie and Eglinton are subject to flooding from the Macquarie River.		
Flood Affect Classification	Rising Road Access		
At risk properties	At least one	**Total number of properties within Sector/Community**	1072
Sector Control	**Control**- The NSW SES Incident Controller will control operations in this sector. In larger events incident control may be escalated. **Command** – NSW SES and other agencies remain in command of their own resources. Command operates vertically within an organisation. **Coordination**- The coordination of other organisations and resource to support an emergency management response will occur at the EOC where established. Operations command can assist in supporting and coordinating incident management teams as required. **Operations Centre**. The Sector Operations Centre will be established at the Eglinton Rural Fire Service Brigade Station (RFS) located on Freemantle Road, Eglinton.		
Key Warning Gauge: 421908 Bathurst (Stanley Street)	**Minor:** 3.00 m	**Moderate:** 4.50 m	**Major:** 5.70 m
General Strategy	Property protection where time and resources permit. Evacuation of at risk population:		

	• Self-evacuation to friends/family outside of the impact area. • Establishment of an Assembly area at Eglinton Public School, where evacuees from the Eglinton area are able to gather while flood situation is monitored. • Establishment of an Assembly area at Denison College (Bathurst High Campus), where evacuees from the Abercrombie area are able to gather while flood situation is monitored. Flood rescue in circumstances where people have failed to evacuate and other persons/domestic animals trapped in floodwater in accordance with the Flood rescue Policy. Resupply to isolated properties.
Key Risks / Consequences	Due to the nature of flooding within the area there has been no inundation of properties historically. The main issue for this sector is the potential for isolation of the Eglinton sector. This could occur in the event that flood waters reach 8.70m on the Stanley Street gauge. Areas potentially subject to inundation include Abercrombie Drive, Bayliss Street, Hastings Place, Hicks Close and Pryce Parade in Abercrombie; Logan and Hamilton Streets and Hobson Close in Eglinton. Potential inundation of properties within these streets are estimated to be for a few hours. During past flood events, there has been no inundation of residential property in this sector. In 1998, (peak height of 6.69m at the Stanley Street Gauge) flood waters did, however, almost reach the back fences of properties located near Rankins Bridge on the southern side of Logan Street. The design height of the levee is 7.38 metres as related to the Stanley Street Bathurst gauge.
Information and Warnings	A number of methods will be used by the Central West Region Headquarters to assist the Bathurst Unit to inform the community regarding the potential impacts of a flood and what actions to undertake in preparation for a flood. They include: • Flood Bulletins (includes Flood Watches and Flood Warnings issued by the BOM) • Evacuation Warnings • Evacuation Orders • Sequenced door knocking of evacuation sectors • Media announcements (including Social Media)

	• Emergency Alert (SMS, Landlines) • Standard Emergency Warning Signal (SEWS)
Property Protection	**Specific property protection measures:** • Monitoring rising flood waters. • Relocation of livestock. • Relocation of farm machinery and valuable goods • Control of surface water through sandbagging measures. • Assist in the lifting of furniture to residents in need. • Monitoring integrity of dwellings surrounded by flood waters.
Evacuation Triggers	Evacuation will be considered with a: **Prediction to reach or exceed 6.7 metres on the Stanley Street gauge (in Bathurst)** Flooding is only likely to occur in extreme flood events. At 6.7 metres on the Stanley Street gauge (in Bathurst) some residential properties may be inundated. Consideration should be given to evacuating residents in low lying areas if flooding is likely to occur.
Sequencing of evacuation	• Evacuation of residents in low lying properties in this sector. • Evacuation of small business in low lying properties in this sector • Outside the identified sequenced evacuation areas, a number of residences and properties may need to be evacuated during periods of significant flooding. • Evacuation of vulnerable facilities such as schools, child care centres and aged care facilities will require a higher priority.
Evacuation Routes	Evacuees in the Eglinton sector use Hamilton Street, Park Street and Alexander Street as evacuation routes. Evacuees in the Abercrombie sector use Eglinton Road, Esrom Street and Keppel Street as evacuation routes.
Evacuation Route Closure	Significant roadworks have occurred at the crossing at Saltram Creek since the August 1998 flood event which may give access to Kelso in the east via Eleven Mile Drive. However, the flood event in March 2012 resulted in the closure of Eleven Mile Drive. Access to Rankins Bridge remains open until an extreme flood event, where the northern approach could be closed between the bridge and the roundabout located on the intersection of Logan

	and Hamilton Streets. In this circumstance, evacuees from Abercrombie would be directed to the evacuation centre located at Bathurst High School.
Method of Evacuation	Primarily self-evacuation by private transport to family and friends outside the flood affected area. Primarily self-evacuation by private transport to nominated assembly areas. At risk residents will be door knocked where possible by the NSW SES and NSW RFS and other emergency personnel and advised the evacuation details.
Evacuation Centre/Assembly Point	In the event of evacuations becoming necessary in Eglinton, the Eglinton Public School Hall, located in Alexander Street Eglinton will be used as an evacuation centre. Evacuees from Abercrombie should be directed to the evacuation centre at Bathurst High School, located in Peel Street Bathurst.
Large scale evacuations	Large scale evacuations would be unlikely in this sector but if required additional locations will be identified.
Rescue	The Bathurst SES Unit will undertake all Flood Rescue Operations as per the Flood Rescue Operations Policy.
Resupply	Resupply will be provided by the NSW SES through the 132500 call out system.
	Table 2, in Volume 2 provides information about isolated communities in the Bathurst Regional LGA and potential periods of isolation.
	A flowchart illustrating the Resupply process is shown in Volume 1 of the Local Flood Plan, Attachment 1.
Aircraft Management	**Helicopter Landing Points:** Suitable landing points are located at: Eglinton Showground adjacent to the Eglinton Hall located in Alexander Street, Eglinton. Lat/Long: 33° 22' S / 149° 32' E
	Airports: Bathurst Airport located on the Sydney Road at Raglan.
Other	Special consideration relating to the evacuation: • Closure of schools • The NSW SES may us flood boats and helicopters to monitor the safety of individuals These arrangements will stay in place until the ALL CLEAR is provided by the NSW SES to residents to return to their premises.

6.2. EGLINTON / ABERCROMBIE SECTOR/COMMUNITY MAP



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7. PERTHVILLE / GEORGES PLAINS SECTOR

7.1. PERTHVILLE / GEORGES PLAINS SECTOR RESPONSE ARRANGEMENTS

Refer to Volume 2: Hazard and Risk in Bathurst Regional for more information about this Sector/Community.

Sector Description	Perthville is a village located 10 kilometres south west of Bathurst on the Queen Charlottes (Vale) Creek. Georges Plains is a small village located 14 kilometres south west of Bathurst on the Goulburn Road.		
Hazard	Perthville is subject to flooding from the Queens Charlottes (Vale) Creek which has caused evacuations in previous flood events. Approximately 80 residential properties are located in Perthville in Bridge, Perth, Bathurst, Apsley and North Streets. Perthville becomes isolated when the Vale Road between Bathurst and Perthville is cut by flood water. Georges Plains is subject to flooding from the Queens Charlottes (Vale) Creek. Approximately 20 residential properties including the former hotel have been inundated in previous flood events. The Goulburn Road between Georges Plains and Perthville can be cut by the flooding caused by the Queens Charlottes (Vale) Creek. There is a small rural levee around a property on the Rockley Road (114 Rockley Road) in Perthville which has been breached in previous rainfall events.		
Flood Affect Classification	Rising Road Access to a high flood island up to the PMF.		
At risk properties	100 (80 residential properties in Perthville, 20 in Georges Plains)	**Total number of properties within Sector/Community**	439
Sector Control	**Control**. Evacuation operations will be controlled by the Bathurst SES Unit Controller. **Coordination**. The Bathurst SES Unit Controller will nominate a Sector Controller to coordinate evacuation operations within the Perthville/Georges Plains Sector. **Conduct**. Evacuation operations within the Perthville/Georges Plains Sector will be carried out by the Bathurst Regional SES Unit with the assistance of other SES Units, NSW Police Force and the members of the Perthville/Georges Plains Rural Fire Service. **Sector Operations Centre**. The Sector Operations Centre will be established at the Perthville Rural Fire Service Brigade Station (RFS) located on the former Perthville railway platform on Vale		

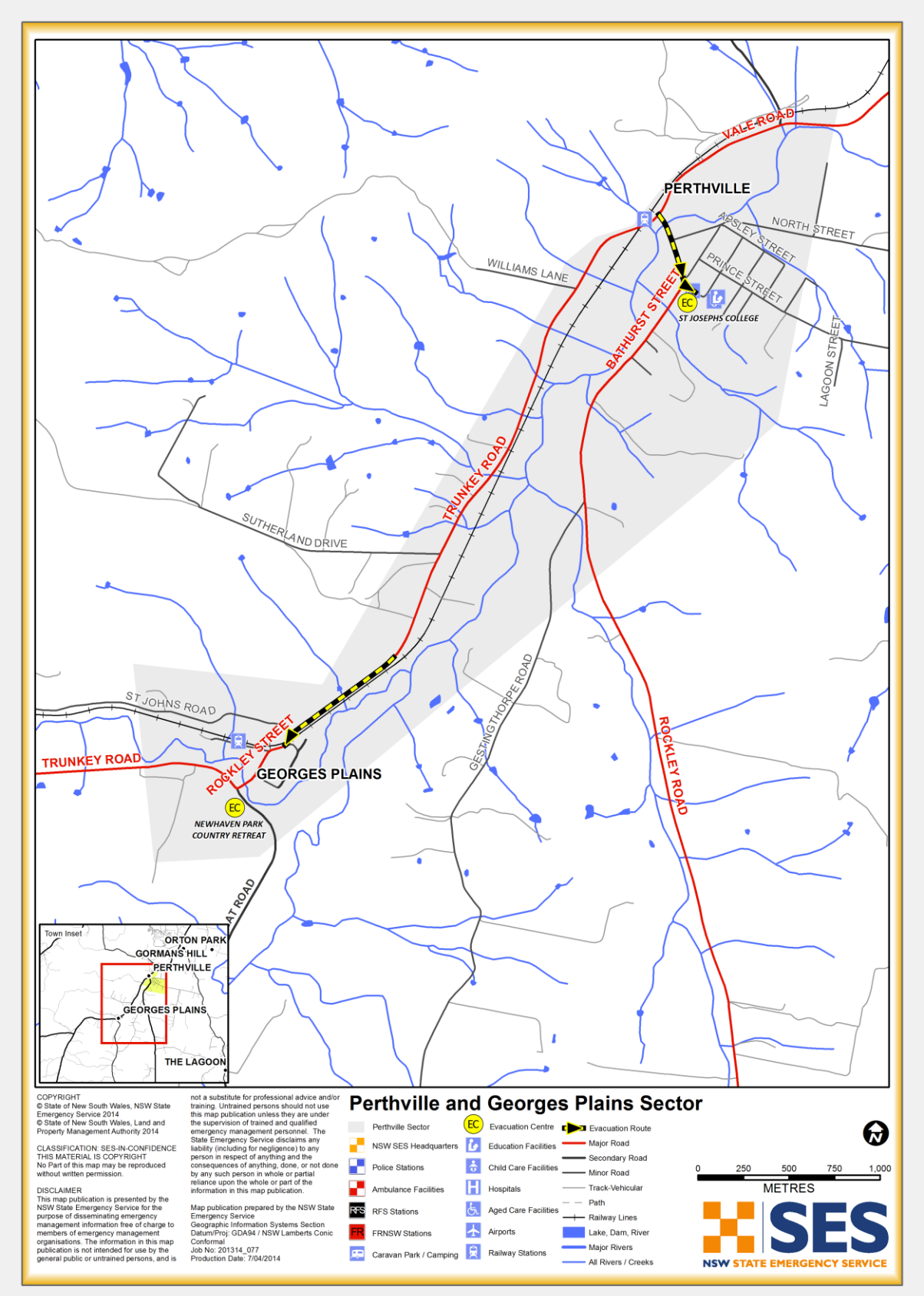
	Road (across the road from the Bridge Hotel).		
Key Warning Gauge: 421053 Cow Flat Bridge (Georges Plains)	**Minor:** N/A	**Moderate:** N/A	**Major:** N/A
General Strategy	Property protection where time and resources permit. Evacuation of residents would need to occur in the event that the Queens Charlotte (Vale) Creek is in flood. Evacuations would occur, for residents in the Georges Plains area when the gauge height at the Cow Flat Bridge reaches 3.00metres and for residents in the Perthville area when the gauge height at the Cow Flat Bridge reaches 2.50 metres. Evacuation of at risk population: • Evacuation of at risk properties • Self-evacuation to friends/family outside of the impact area. • Establishment of an Assembly area at Saint Josephs College, where evacuees from the Perthville area are able to gather while flood situation is monitored. • Establishment of an Assembly area at Newhaven Park Country Retreat on Cow Flat Road, where evacuees from the Abercrombie area are able to gather while flood situation is monitored. • Where a major levee overtopping and/or failure occurs, evacuees will remain at the Saint Josephs College. Flood rescue in circumstances where people have failed to evacuate and other persons/domestic animals trapped in floodwater in accordance with the Flood rescue Policy. Resupply to isolated properties.		
Key Risks / Consequences	Potential inundation from Queen Charlottes (Vale Creek) could occur. Isolation may occur to a number of people if the Vale Road between Perthville and Bathurst is cut. Due to the nature of flooding there is limited warning time for both Perthville and Georges Plains residents.		
Information and Warnings	A number of methods will be used by the Central West Region Headquarters to assist the Bathurst Unit to inform the community regarding the potential impacts of a flood and what actions to undertake in preparation for a flood. They include: • Flood Bulletins (includes Flood Watches and Flood Warnings issued by the BOM) • Evacuation Warnings		

	• Evacuation Orders • Sequenced door knocking of evacuation sectors • Media announcements (including Social Media) • Emergency Alert (SMS, Landlines) • Standard Emergency Warning Signal (SEWS)
Property Protection	**Specific property protection measures:** • Monitoring rising flood waters. • Relocation of livestock. • Relocation of farm machinery and valuable goods • Control of surface water through sandbagging measures. • Assist in the lifting of furniture to residents in need. • Monitoring integrity of dwellings surrounded by flood waters.
	Assistance with property protection: Assistance maybe provided to affected communities through the distribution of sandbags / sandbagging of properties that are at threat of inundation. Where time permits and available resources assistance will be given to the lifting or transporting of furniture, personal effects, commercial stock and caravans
	Protection of essential infrastructure: • No identified essential infrastructure requiring protection below 1% flood height of 3.32 metres.
Evacuation Triggers	Evacuation will be considered when: **Cow Flat Bridge Gauge (Georges Plains)** • **The gauge height at the Cow Flat Bridge gauge to reach/exceed 3.0 metres.** Residents in low lying areas at risk of potential flooding and subsequent need for evacuation. • **The gauge height at the Cow Flat Bridge gauge to reach/exceed 3.6 metres.** Residents in low lying areas at risk of flooding and should be evacuated to the Newhaven Park Country Retreat prior to this height being reached. **Perthville Bridge Gauge (Perthville)** • **The gauge height at the Perthville Bridge gauge to reach/exceed 3.3 metres.** Residents in low lying areas at risk of potential flooding and subsequent need for evacuation. • **The gauge height at the Perthville Bridge gauge to**

	reach/exceed 4.0 metres. Residents in low lying areas at risk of flooding and should be evacuated prior to this height being reached.
Sequencing of evacuation	• Evacuation of residents in low lying properties in the Perthville (Bridge, Perth, Bathurst, Apsley and North Streets) and Georges Plains (Vale Road and Victoria Street). • Evacuation of vulnerable facilities such as schools, child care centres and aged care facilities will require a higher priority.
Evacuation Routes	Perthville: Local roads to Bridge Road to Tenison Woods Avenue Georges Plains: Local roads to Cow Flat Road.
Evacuation Route Closure	Both Perthville and Georges Plains become isolated during large flood events with access roads being cut (Vale Road).
Method of Evacuation	Primarily self-evacuation by private transport to family and friends outside the flood affected area. Primarily self-evacuation by private transport to nominated assembly areas. At risk residents will be door knocked where possible by the NSW SES and NSW RFS and other emergency personnel and advised on the evacuation details.
Evacuation Centre/Assembly Point	The Evacuation Centre for Perthville is located at Saint Josephs College located in Tenison Woods Avenue. The Evacuation Centre for Georges Plains is located at Newhaven Park Country Retreat on the Cow Flat Road.
Large scale evacuations	Large scale evacuations would be unlikely in this sector.
Rescue	The Bathurst SES Unit will undertake all Flood Rescue operations as per the Flood Rescue Operations Policy.
Resupply	Resupply will be provided by the NSW SES through the 132500 call out system.
	Table 2, in Volume 2 provides information about isolated communities in the Bathurst Regional LGA and potential periods of isolation.
	A flowchart illustrating the Resupply process is shown in Volume 1 of the Local Flood Plan, Attachment 1.
Aircraft Management	**Helicopter Landing Points:** Suitable landing points are located at: • Sports oval in the grounds of George Park located on the corner of Brilliant and Rankin Streets, Bathurst.

	• The vacant block of land located on the corner of Prince and Bathurst Streets, Perthville (in an emergency).
	Airports: Bathurst Airport located on the Sydney Road at Raglan.
Other	Special considerations relating to the evacuation: • The NSW SES may use flood boats and helicopters to monitor the safety of individuals. These arrangements will stay in place until the ALL CLEAR is provided by the NSW SES to all residents to return to their homes.

7.2. PERTHVILLE SECTOR/COMMUNITY MAP



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8. THE LAGOON SECTOR

8.1. THE LAGOON SECTOR RESPONSE ARRANGEMENTS

Refer to Volume 2: Hazard and Risk in Bathurst Regional for more information about this Sector/Community.

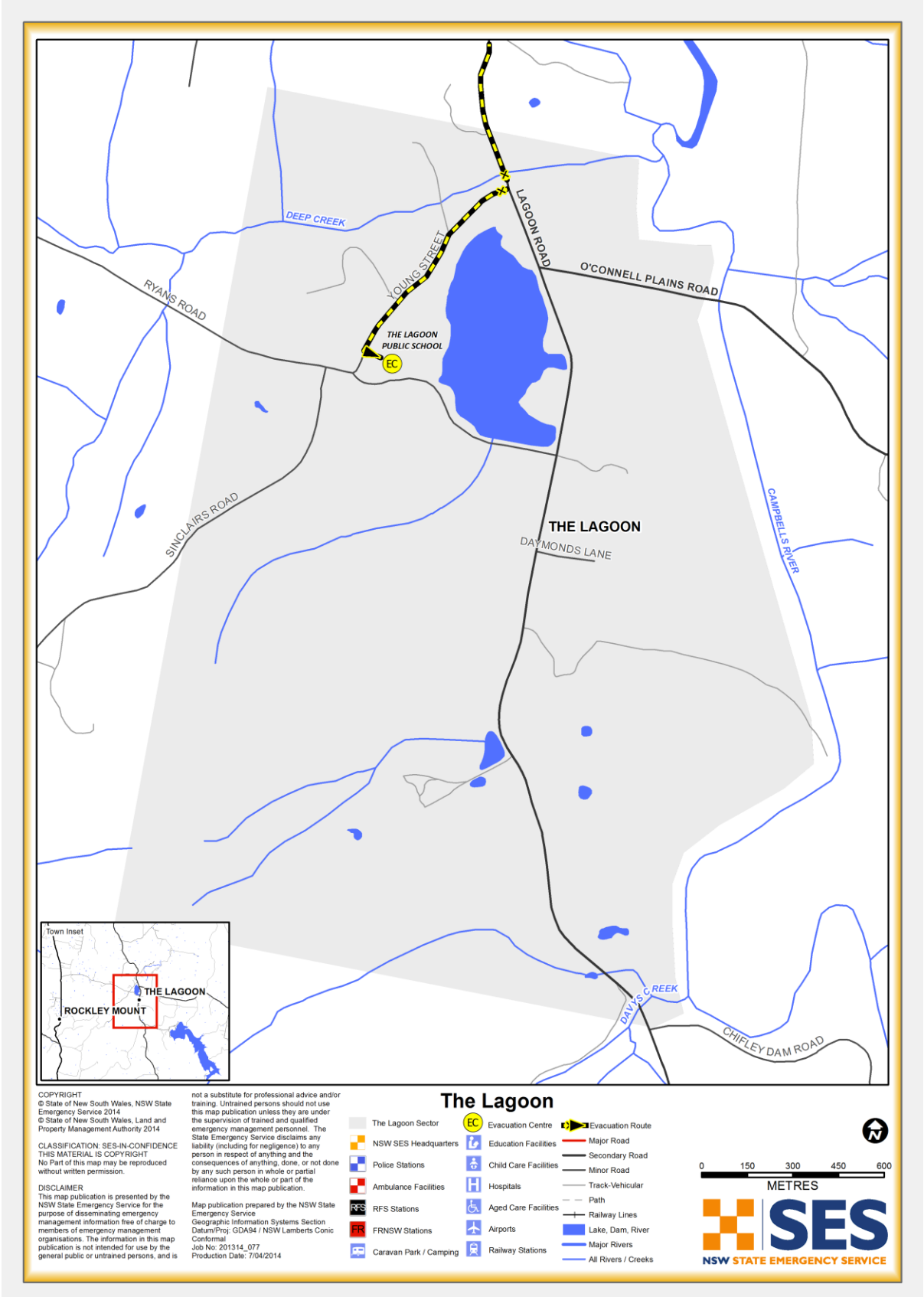
Sector Description	The Lagoon is a village located 14 kilometres south of Bathurst on the Campbell's River about 5 kilometres downstream of Chifley Dam.		
Hazard	The Lagoon is subject to flooding from the Campbell's River which has resulted in some self-evacuations in previous flood events. During large flood events The Lagoon may become cut into distinct areas by the following road closures: • Lagoon Road at Young Street; immediately north of Ryan's Road; north of Chifley Dam Road at Davys Creek. • Ryan's Road immediately west of Lagoon Road. • O'Connell Plains Road at The Lagoon: across the river flats to just east of the bridge over the Campbell's River.		
Flood Affect Classification	Rising Road access to a high flood island up to the PMF.		
At risk properties	n/a	**Total number of properties within Sector/Community**	101
Sector Control	**Control**- The NSW SES Incident Controller will control operations in this sector. In larger events incident control may be escalated. **Command** – NSW SES and other agencies remain in command of their own resources. Command operates vertically within an organisation. **Coordination**- The coordination of other organisations and resource to support an emergency management response will occur at the EOC where established. Operations command can assist in supporting and coordinating incident management teams as required. **Sector Operations Centre**. The Sector Operations Centre will be established at The Lagoon Public School located in Young Street, The Lagoon.		

Key Warning Gauge Name	**Minor:** n/a	**Moderate:** n/a	**Major:** n/a
General Strategy	Property protection where time and resources permit. Warning and evacuation of at-risk residents. Flood rescue in circumstances where people have failed to evacuate and other persons/domestic animals trapped in floodwater in accordance with the Flood rescue Policy. Resupply to isolated properties.		
Key Risks / Consequences	A small number of residential properties are located in the floodplain area of The Lagoon. These are generally located on small rises and historically may have become isolated but not inundated by flood water. The consequences of the above road closures in large flood events are: • The area to the west, south-west and north of The Lagoon retains road access to Perthville; • The area to the east of The Lagoon may become isolated with access to O'Connell, to the east, being lost for some hours due to flooded creeks and longer if the Fish River is in flood at O'Connell; • The area to the south of The Lagoon and north of Davys Creek may become isolated; and • The area to the south of Davys Creek and/or north of Peppers Creek (near Rockley) can also become isolated due to water over the road.		
Information and Warnings	A number of methods will be used by the Central West Region Headquarters to assist the Bathurst Unit to inform the community regarding the potential impacts of a flood and what actions to undertake in preparation for a flood. They include: • Flood Bulletins (includes Flood Watches and Flood Warnings issued by the BOM) • Evacuation Warnings • Evacuation Orders • Sequenced door knocking of evacuation sectors • Media announcements (including Social Media) • Emergency Alert (SMS, Landlines) • Standard Emergency Warning Signal (SEWS)		

Property Protection	**Specific property protection measures:** • Monitoring rising flood waters • Relocation of livestock • Relocation of farm machinery and valuable goods • Control of surface water through sandbagging measures • Assist in the lifting of furniture to residents in need • Monitoring the integrity of dwellings surrounded by flood waters
	Assistance with property protection: Assistance may be provided to affected properties through the distribution of sandbags / sandbagging of properties that are at threat of inundation. Where time permits and available resources assistance will be given.
Evacuation Triggers	Evacuation warning will be issued upon receipt of an "Amber Alert" (713.22m AHD). An Evacuation Order will be issued immediately upon receipt of a "Red Alert" (714.12m AHD). • Residents in low lying areas at risk of flooding to evacuate to the evacuation centre located at The Lagoon Public School. Access to the evacuation centre will be cut early due to road closures for residents to the east and south of The Lagoon.
Evacuation Routes	Local roads to the appropriate evacuation centre (Lagoon Road).
Evacuation Route Closure	The Lagoon can become isolated during large flood events with some access roads to the evacuation centre cut. These road closures are detailed in Volume 2 of this Local Flood Plan.
Method of Evacuation	Primarily self-evacuation by private transport to family and friends outside the flood affected area. Primarily self-evacuation by private transport to nominated assembly areas. At risk residents will be door knocked where possible by the NSW SES and NSW RFS and other emergency personnel and advised on the evacuation details.
Evacuation Centre/Assembly Point	The Evacuation Centre for The Lagoon is located at The Lagoon Public School. Generally, during large flood events, residents to the north and west of The Lagoon will be able to access the Evacuation Centre even though flooding has closed the Lagoon Road and O'Connell Plains Road intersection. If access to the Evacuation Centre is lost from the north, an alternate Evacuation Centre will be Saint Joseph's College at Perthville.

Large scale evacuations	Large scale evacuations would be unlikely in this sector, but if required additional locations will be identified.
Rescue	The Bathurst SES Unit will undertake all Flood Rescue operations as per the Flood Rescue Operations Policy.
Resupply	Resupply will be provided by the NSW SES through the 132500 call out system. During periods of flooding, Gormans Hill can become isolated. The likely duration of is generally less than 24 hours. This is assumed on average durations and will vary depending upon infrastructure damage and flood magnitude.
	Table 2, in Volume 2 provides information about isolated communities in the Bathurst Regional LGA and potential periods of isolation.
	A flowchart illustrating the Resupply process is shown in Volume 1 of the Local Flood Plan, Attachment 1.
Aircraft Management	**Helicopter Landing Points:** Suitable landing points are located at: • Sports ovals in the grounds of George Park located on the corner of Brilliant and Rankin Streets, Bathurst. • The vacant and fenced block of land located on Young Street between The Lagoon RFS Station and The Lagoon Public School, adjacent to the fire station (in emergencies only). • The bitumen and lighted carpark located at Ben Chifley Dam (adjacent to the main boat launching ramp) in emergencies only).
	Airports: Bathurst Airport located on the Sydney Road at Raglan.
Other	Special considerations relating to the evacuation: • The NSW SES may use flood boats and helicopters to monitor the safety of individuals. These arrangements will stay in place until the ALL CLEAR is provided by the NSW SES to residents to return to their premises.

8.2. THE LAGOON SECTOR/COMMUNITY MAP



9. SOFALA SECTOR

9.1. SOFALA SECTOR RESPONSE ARRANGEMENTS

Refer to Volume 2: Hazard and Risk in Bathurst Regional for more information about this Sector/Community.

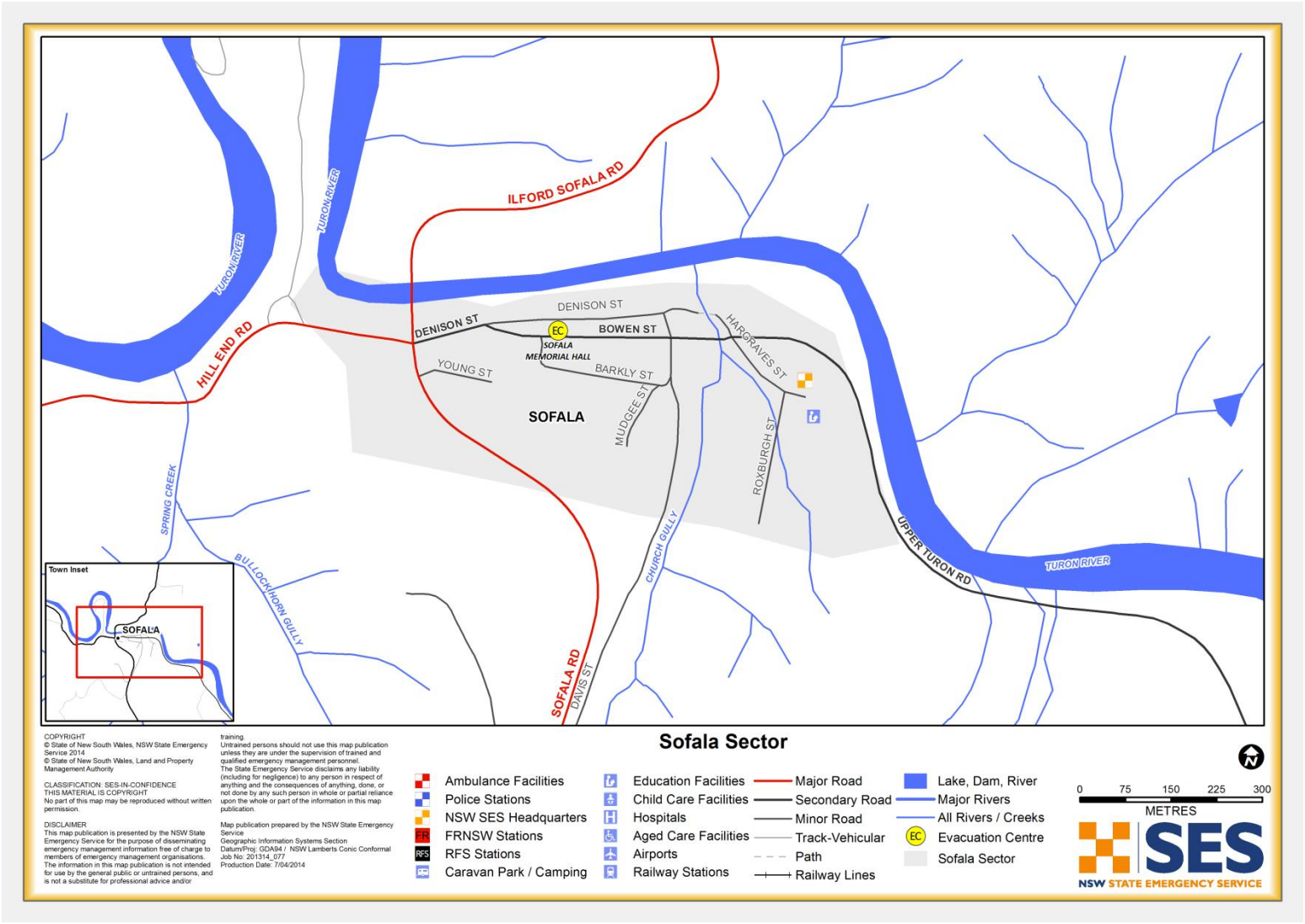
Sector Description	This sector is located in the village of Sofala located 40 kilometres north of Bathurst on the Turon River. There are a number of camping locations within the town of Sofala and along Bells Creek.		
Hazard	Sofala is subject to flooding from the Turon River. This village of 120 people on the Turon River is located on a low terrace. Inundation of properties generally does not begin until the major flood level (6.0 metres on the Sofala gauge) is reached. During a severe event, water may rise to a depth of 1 metre in several dwellings and commercial premises in Denison Street, and closes this street to traffic. In the August 1986 flood (estimated to have reached 9.20 metres on the Sofala gauge), approximately 10 residential and commercial properties, as well as a number of sheds and garages in Denison Street were inundated. Three low-lying properties on Upper Turon Road can also be inundated to depths of up to one metre with up to twenty other properties becoming isolated from Sofala by road for a number of hours. Evacuation of three or four families from residences in Sofala has been required in past events. Flooding in Sofala and along the Turon River is characterised by high flow velocity and very limited warning times and the potential for property damage is considerable. Houses can also be isolated by flooding along Crudine River which joins the Turon River downstream of Sofala. A number of road closures can also occur in this vicinity, including Coles Bridge on the Turondale Road.		
Flood Affect Classification	Rising Road access to a high flood island up to the PMF.		
At risk properties	10	**Total number of properties within Sector/Community**	171
Sector Control	**Control**- The NSW SES Incident Controller will control operations in this sector. In larger events incident control may be escalated. **Command** – NSW SES and other agencies remain in command of		

	their own resources. Command operates vertically within an organisation. **Coordination**- The coordination of other organisations and resource to support an emergency management response will occur at the EOC where established. Operations command can assist in supporting and coordinating incident management teams as required. **Sector Operations Centre**. The Sector Operations Centre will be established at the Turon SES Unit Headquarters, Turon Terrace, Sofala.		
Key Warning Gauge Name	**Minor:** 4.00 m	**Moderate:** 5.50 m	**Major:** 6.00 m
General Strategy	Property protection where time and resources permit. Warn residents in low lying areas at risk of potential flooding. Self-evacuation to friends /family outside of the impact area. Evacuate at-risk residents to Evacuation Centre at the Sofala Memorial Hall in Denison Street. Flood rescue in circumstances where people have failed to evacuate and other persons/domestic animals trapped in floodwater in accordance with the Flood rescue Policy. Resupply to isolated properties.		
Key Risks / Consequences	During a major flood Denison Street can be shut to traffic. Sofala can be isolated in a major flood. The likely duration of the isolation is generally less than 24 hours. Estimated levels of 9.20 metres (Sofala gauge) inundate approximately 10 residential and commercial properties, as well as a number of sheds and garages in Denison Street. In a PMF, Bowen Street, Sofala Road, Denison Street, Hargraves Street and Barkly Streets are at risk of flooding.		
Information and Warnings	A number of methods will be used by the Central West Region Headquarters to assist the Sofala Unit to inform the community regarding the potential impacts of a flood and what actions to undertake in preparation for a flood. They include: • Flood Bulletins (includes Flood Watches and Flood Warnings issued by the BOM) • Evacuation Warnings • Evacuation Orders		

	• Sequenced door knocking of evacuation sectors • Media announcements (including Social Media) • Emergency Alert (SMS, Landlines) • Standard Emergency Warning Signal (SEWS)
Property Protection	**Specific property protection measures:** • Monitoring rising flood waters • Relocation of livestock • Relocation of farm machinery and valuable goods • Control of surface water through sandbagging measures • Assist in the lifting of furniture to residents in need. • Monitoring integrity of dwellings surrounded by flood waters.
	Protection of essential infrastructure: No essential infrastructure has been identified to require protection.
Evacuation Triggers	Note: that the Bureau of Meteorology does not issue flood warnings for the Turon River. Evacuation (refer to key risks/consequences) will be considered when: • **The gauge height at the Sofala (Turon) gauge (421026) to reach/exceed 6.0 metres**. Residents in low lying areas at risk of potential flooding and subsequent need to be evacuated by this height and therefore need to be warned approximately 6 hours prior to this height being reached if possible. Note: first house is affected at 6 metres with another house affected soon after. • **The gauge height at the Sofala (Turon) gauge (421026) to reach/exceed 8.0 metres.** Residents in low lying areas at risk of flooding to evacuate. Note in 1986 (9.2 metres) 10 residential and commercial properties were inundated by the 9.2 metre height being reached.
Evacuation Routes	Local Roads to Denison Street.
Method of Evacuation	Primarily self-evacuation by private transport to the evacuation centre in Denison Street.
Evacuation Centre/Assembly Point	The Evacuation Centre for Sofala is located at Sofala Memorial Hall: Denison Street, Sofala.
Large scale evacuations	Large scale evacuations would be unlikely in this sector.

Rescue	The Sofala SES Unit, with the assistance of Bathurst SES Unit will undertake all Flood Rescue operations as per the Flood Rescue Operations Policy.
Resupply	Resupply will be provided by the NSW SES through the 132500 call out system.
	Table 2, in Volume 2 provides information about isolated communities in the Bathurst Regional LGA and potential periods of isolation.
Aircraft Management	A flowchart illustrating the Resupply process is shown in Volume 1 of the Local Flood Plan, Attachment.
	Helicopter Landing Points: Suitable landing points are located at Sofala Showground.
	Airports: Bathurst Airport located on the Sydney Road at Raglan.
Other	Special considerations relating to the evacuation: • Closure of Schools – coordinated through the Department of Education and Training. • Closure of Licensed Premises. • The NSW SES may use flood boats and helicopters to monitor safety of individuals. • These arrangements will stay in place until the ALL CLEAR is provided by the NSW SES to residents to return to their premises.

9.2. SOFALA SECTOR/COMMUNITY MAP



NSW SES BATHURST REGIONAL: DAM FAILURE ARRANGEMENTS

Chapter 3 of Volume 3 (NSW SES Response Arrangements for Bathurst Regional) of the Bathurst Regional Local Flood Plan

Last Update: May 2017

AUTHORISATION

NSW SES Dam Failure Arrangements in Bathurst Regional 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 and Dam Safety Emergency Plan.

Approved

Manager Emergency Risk Management

Date: 8 May 2017

Approved

NSW SES Central West Region Controller

Date: 07 APRIL 2017

Tabled at LEMC

Date: 16 / 5 / 17

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1 DETAILS OF THE DAM FAILURE WARNING SYSTEM FOR WINBURNDALE DAM

This Section describes the downstream consequences and specific notification and warning arrangements for the failure of Winburndale Dam and should be read in conjunction with the response arrangements detailed in the Bathurst Regional Flood Emergency Sub Plan, Volume 1 of the Bathurst Regional Local Flood Plan.

1.1 INTRODUCTION

1.1.1 Winburndale Dam is a water supply dam located 19 kilometres east of Bathurst. It is a concrete gravity dam which was built in 1936 (1). Details of the dam are summarised in Table 1.

Table 1. Winburndale Dam description summary (1)

Location	Material	Owner	Capacity at FSL	Dam crest	Spillway level (FSL)
158 Russell Street, Bathurst 2795 NSW (33.45˚S, 149.575˚E)	Concrete Gravity Dam	Bathurst Regional Council	1700 ML	RL 799.95 metres AHD	Overfall RL 796.87 metres AHD

1.1.2 The two most likely causes of dam failure are:

a. Failure due to flood levels overtopping the embankment

b. Failure due to rapidly deteriorating structural deficiency induced by an extreme earthquake, impact damage, deterioration of construction material, internal erosion, piping, landslide or sabotage. This is referred to as the “Sunny Day” failure, i.e. not induced by an inflow flood.

1.1.3 Although the dam is currently in good condition, an unsafe or emergency condition could occur at any time due to extreme natural events. Failure from a cause not related to extreme natural events is always a possibility although the probability of occurrence is extremely low. It is currently undergoing a dam upgrade which includes strengthening of the dam wall and upgrading the access road anticipated .

1.1.4 The structure is currently rated as being able to withstand a 1 in 100 000 AEP flood (0.0001) (2).

1.1.5 The Winburndale Dam is estimated to be able to withstand an inflow flood volume up to 2168 cubic metres a second and an outflow volume of 2140 m3/sec. It should be noted that the flood of record (6.69 metres at Stanley Street Gauge in August 1998) and PMF (with a Probable Maximum Precipitation of 440 millimetres for 2.5 hours) exceeds these volumes and the spillway level by over 1.5 metres (1).

1.1.6 The dam crest is 1.68 metres higher than the spillway, providing an additional minimum of 60 minutes to reach the crest level for the PMF. This equates to 90 minutes for the dam crest flood conditions (1).

1.2 CONSEQUENCES OF FAILURE

1.2.1 Dam failure could result in the following:

a. Minor damage and environmental losses in the Winburndale Rivulet and Clear Creek, downstream of the dam (1).

b. Approximately 13 dwellings could be inundated by failure of Winburndale Dam in PMF dam break conditions (1).

Table 2: Number of houses at risk of inundation (1)

Modelled Event	Number of Houses	Population at Risk
Sunny Day Dam break	0	0
Dam Crest Flood (DCF), formerly referred to as Probable Failure Flood (PFF) - equivalent to 0.0001 AEP.	0	0
DCF with dam break	7	18
Probable Maximum Flood (PMF)	13	33
PMF with Dam Break	13	33

1.2.2 The number of houses at risk of inundation in five (5) modelled scenarios is shown in Table 2. The study area of the model extends from the dam 42 kilometres downstream to Miandelta, and 20.1 kilometres further downstream Winburndale Rivulet to its confluence with Macquarie River. Beyond this location, the incremental water depths for DCF and PMF flooding will be less than 0.3 metres due to the relatively large flow from the Macquarie River (1).

1.2.3 A total of 13 properties at risk of inundation, equating to approximately 33 persons. In the event of an Alert being issued to SES for Winburndale Dam, some or all of these properties may require evacuation (1).

1.2.4 A total of 6 bridges could potentially be inundated limiting access in the area, as summarised in Table 3.

1.2.5 Maximum flood peak flows are estimated to be 8.0 metres a second at the dam for sunny day failure, 6.6 metres a second 2.8 kilometres downstream of the dam for DCF dam break, and 7.7 metres a second at Miandelta (42 kilometres downstream) for PMF conditions (1).

Table 3: Bridges inundated for each dam break scenario (1)

Modelled Event	Bridges inundated
Sunny Day dam break	Kelso-Limeklins Rd Bridge Kelso-Peel Rd Bridge Bridge at Lynside on Peel-Duramana Rd Bathurst-Turondale Rd Bridge
DCF with dam break; and PMF with dam break	Kelso-Limeklins Rd Bridge Kelso-Peel Rd Bridge Bridge at Lynside on Peel-Duramana Rd Bathurst-Turondale Rd Bridge Bathurst-Peel Rd Bridge Peel-Duramana Rd Bridge

1.3 FLOW TRAVEL TIMES

1.3.1 Flood wave travel time is estimated at 3 minutes to the first residence on Winburndale Rivulet for all dam break scenarios. The flood wave travel time to Miandelta (42 kilometres downstream of the dam), varies from 3 hours 40 minutes for Sunny Day Dam break, 2 hours 50 minutes for DCF Dam break and 1 hour 54 minutes for PMF Dam break. Travel times are summarised for some locations in Table 4 (1).

Table 4: Travel times of flood wave for dam break cases

Distance downstream of dam (km)	Sunny Day travel time (hr:mm)	DCF travel time (hr:mm)	PMF travel time (hr:mm)
4.45	0.20	0.10	0.10
13.99	0.55	0.41	0.35
19.55	1.38	1.09	1.02
21.13	1.45	1.18	1.03
24.07	2.10	1.45	1.16
31.93	3.00	2.15	1.32
34.93	3.22	2.30	1.40
42.00	3.40	2.50	1.54

1.3.2 It should be noted that the travel times listed relate to only one component of the lead-up time before downstream flooding commences, and should be considered indicative only.

1.4 INUNDATION AREA

1.4.1 Downstream flood inundation could occur as the result of a dam failure due to a 'Flood' or a 'Sunny Day' failure.

Flood Failure

1.4.2 Seven houses and two bridges would be inundated in a dam break under the DCF conditions (AEP of 1 in 100 000). The flow velocity may result in the bridges being endangered as a consequence of scouring or if debris was significant. These houses would not be affected without the dam break under the DCF scenario (1).

1.4.3 In PMF conditions, 13 houses and 6 bridges would be inundated with or without dam failure. The dam failure would increase the depth and velocity of the flooding (1).

Sunny Day Failure

1.4.4 In the unlikely event of the dam failing under normal inflow conditions, downstream flood inundation would result from water held in the storage.

1.4.5 Other conditions identified for potential failure include the occurrence of an earthquake above MM04, blocked spillways, blocked outlet system, terrorism or sabotage, leakage, impact damage, deterioration of construction materials, signs of movement or other structural damage that will lead to imminent, probable or possible failure (1).

1.4.6 In the sunny day failure scenario, the dam break flood would pass the downstream area causing minor damage and losses, but no houses would be inundated (1).

1.4.7 Nevertheless, the non-flood failure is considered to have the most potential for loss of life as it is likely to occur when there are no flood warnings and hence emergency services are not on standby and the public is unprepared.

1.4.8 Emergency dewatering procedures are identified in the DSEP, and should consider the maximum possible releases and the flooding impacts downstream (1).

1.5 INUNDATION MAPPING

1.5.1 Dam break flood inundation mapping has been prepared for Winburndale Dam and is contained in the Winburndale Dam Safety Emergency Plan (1).

1.6 MONITORING

1.6.1 The dam owner/operator is responsible for monitoring and managing any potential emergency at the dam site.

1.6.2 Council monitors the level of Winburndale Dam via telemetry and has a ranger resident for surveillance during rain events. Telemetry and mobile reception

are limited in the area; therefore the most reliable communication with the dam is via land line (1).

1.7 NOTIFICATION PROCEDURES

1.7.1 The primary contact for dam failure warning notification by the dam owner to the NSW SES is the NSW SES 24hr Operations Centre. The NSW SES Operations Centre will subsequently notify the NSW SES Central West Region Headquarters duty officer who will contact the NSW SES Bathurst Local Controller. An alternate NSW State Emergency Operations Centre (SEOC) contact is available if this notification procedure was to fail.

1.7.2 A flow chart illustrating the notification arrangements for potential dam failure is shown in Attachment 2 of Volume 1 of the Bathurst Regional Local Flood Plan.

1.8 WARNING

1.8.1 Dam failure alerts are issued to NSW SES and are used to trigger appropriate response actions. Alert levels from the DSEP for flood failure have been reproduced in Table 6 against NSW SES responses. Responses escalate as the alert level migrates from white to red. The conditions that define each of the alert levels (as identified in the DSEP) are listed in Table. The meaning of each alert level is as follows:

a. **White:** Preliminary alert to assist the NSW SES in its preparation. This is not a public alert. It indicates a potential issue/condition has been observed at the dam and is being investigated.

b. **Amber:** Alert level necessitating the warning of the population at risk to prepare for evacuation and issue an evacuation warning.

c. **Red:** Alert level requiring the immediate evacuation of the downstream population at risk and issue an evacuation order.

1.8.2 Actions indicated as occurring at particular Alert Levels may be brought forward if the development of a flood warrants.

1.8.3 Bathurst Regional Council will activate emergency alerts, which will initiate warning, evacuation and flood response operations by NSW SES (1).

1.8.4 Bathurst Regional Council Staff will keep the NSW SES informed of the alert levels according to the storage levels. The dam alerts will be activated in sequence as the storage level rises during the course of a major flood event and will be sent to the NSW SES as they occur.

1.8.5 The following table outlines the notification, warning and evacuation arrangements for a potential failure of Winburndale Dam.

Table 5: Winburndale Dam Flood Failure Alert levels (1)

Alert	Defining Conditions	Min Time to Reach Alert Levels for PMF from FSL (mins approx.)	Time to reach level for PMF (mins)	Min Time to Reach Alert Levels for DCF from FSL (mins approx.)	Time to reach level for DCF (mins)
White Alert	RL 797.17 m AHD	12	12	24	24
Amber Alert	RL 797.67 m AHD	20	8	36	12
Red Alert	RL 798.27 m AHD	28	8	48	12

Table 6: Notification, Warning and Evacuation Arrangements for a potential failure of Winburndale Dam

WHITE ALERT	
Defining Conditions: RL 797.17 m AHD (0.3m above FSL)	
Stakeholder	**Arrangements and Actions**
Dam Owner	▪ Advise NSW SES Operations Communications Centre of White Alert Level being reached and provide regular updates on the situation at the dam.
SES OCC	▪ Receive notification from dam operator. ▪ Advise NSW SES Region Incident Controller. ▪ Advise SEOC.
NSW SES Region Controller	▪ Receive notification from NSW SES SHQ. ▪ Advise NSW SES Local Incident Controller, NSW SES Units and NSW SES Local Headquarters. ▪ Advise the Regional Emergency Management Officer (REMO). ▪ Consider need for OOAA for warning and evacuation operations.
NSW SES Local Controller	▪ Confirm NSW SES RHQ has been notified. ▪ Activate Local Flood Plan. ▪ Refer to Local Flood Plan for agencies to notify that the White Alert Level has been reached. (See Volume 1, Attachment 2, Dam Failure Alert Notification Arrangements Flowchart).
LEOCON/Other Agencies	▪ When requested by NSW SES Local Incident Controller, coordinate support.
People at Risk	▪ No action required. ▪ Some evacuations may be necessary due to mainstream riverine flooding.

AMBER ALERT	
Defining Conditions: RL 797.67 m AHD (0.8m above FSL)	
Stakeholder	**Arrangements and Actions**
Dam Owner	▪ Advise NSW SES Operations Communications Centre of Amber Alert Level being reached and provide regular updates on the situation at the dam. ▪ Follow internal notification procedures. ▪ Closely monitor the condition of Winburndale Dam and implement preventative measures to return it to a safe condition as soon as possible.
NSW SES OCC	▪ Receive notification from dam operator. ▪ Advise NSW SES Region Incident Controller. ▪ Advise SEOC.
NSW SES Region Controller	▪ Notify NSW SES Local Incident Controller, NSW SES units and NSW SES LHQ. ▪ Provide NSW SES Flood Bulletins and Evacuation Warnings to the media organisations listed in Volume 3: Chapter 1, of this Local Flood Plan. ▪ Coordinate provision of out of area assistance for warning and evacuation operations.
NSW SES Local Controller	▪ Confirm NSW SES RHQ has been notified. ▪ Coordinate the delivery of Evacuation Warning to at-risk residents. ▪ Coordinate the notification of other agencies as listed in Bathurst Regional Flood Emergency Sub Plan.
LEOCON/Other Agencies	▪ When requested by the NSW SES Local Incident Controller, coordinate support.
People at Risk	▪ Prepare homes for inundation, pack valuables, mementos and pets and prepare to evacuate. ▪ Notify NSW SES doorknockers if transport to evacuation centres will be required. ▪ Some evacuations may be necessary due to mainstream riverine flooding.

RED ALERT	
Defining Conditions: RL 798.27 m AHD (1.4m above FSL; 1.68m below Dam Crest level), or Major visible damage to structure causing probable, imminent or progressing failure.	
Stakeholder	**Arrangements and Actions**
Dam Owner	▪ Advise NSW SES Operations Communications Centre of Red Alert Level being reached and provide regular updates on the situation at the dam. ▪ Follow internal notification procedures. ▪ Closely monitor the condition of Winburndale Dam and implement preventative measures to return it to a safe condition as soon as possible.
SES OCC	▪ Receive notification from dam operator. ▪ Advise NSW SES Region Incident Controller. ▪ Advise SEOC.
NSW SES Region Controller	▪ Notify NSW SES Local Incident Controller, NSW SES Units and NSW SES LHQ. ▪ Advise the REMO. ▪ Confirm that residents immediately downstream of the dam have been notified of Red Alert Level being reached. ▪ Activate the Standard Emergency Warning Signal (SEWS) and ensure that Evacuation Orders are broadcast over the radio stations listed in Volume 3: Chapter 1 of this Local Flood Plan. ▪ Coordinate provision of out of area assistance for evacuation operations.
NSW SES Local Controller	▪ Confirm NSW SES RHQ has been notified. ▪ Evacuate at-risk residents. ▪ Coordinate the notification of other agencies as per the Local Flood Plan. ▪ Ensure that evacuation centres are ready to receive evacuees. ▪ Conduct Evacuation of downstream residents by doorknock and public address systems from emergency service vehicles. ▪ Coordinate transport of evacuees without their own vehicles.
LEOCON/Other Agencies	▪ When requested by the NSW SES Local Incident Controller, coordinate support.
People at Risk	▪ Evacuate to nearest evacuation centre or assembly area.

*Note: Potentially impacted downstream residents have prearranged evacuation points where they should assemble and await further information or rescue due to the lack of time and difficulty of travel outside of the Winburndale Rivulet valley to evacuation centres (3).

DAM FAILURE ALERT CANCELLATION	
Defining Conditions:	Dam owner assesses threat and advises whether the risk to the dam structure has passed.
Stakeholder	**Arrangements and Actions**
Dam Owner	▪ Advise NSW SES OCC of the outcome of the risk assessment. ▪ Follow internal notification procedures, including notification to Dam Safety Committee (4). ▪ Closely monitor the condition of Winburndale Dam and implement preventative measures to return it to a safe condition as soon as possible.
SES OCC	▪ Receive notification from dam operator. ▪ Advise NSW SES Region Incident Controller. ▪ Advise SEOC.
NSW SES Region Controller	▪ Following risk assessment of the dam, decide in consultation with NSW SES Local and State Incident Controller whether to issue an 'All Clear'. ▪ Issue 'All Clear' message to NSW SES Local Incident Controller, NSW SES units, NSW SES Local HQ and NSW SES State HQ. ▪ Advise the REMO that 'All Clear' has been issued. ▪ Issue 'All Clear' message over radio stations listed in Volume 3: Chapter 1, of this Local Flood Plan.
NSW SES Local Controller	▪ Coordinate issue of 'All Clear' message at evacuation centres or by phone/doorknock. ▪ Deliver 'All Clear' message to other agencies as necessary.
LEOCON/Other Agencies	▪ When requested by the NSW SES Local Incident Controller, coordinate support.
People at Risk	▪ Stay home, return home or await further advice.

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