

Preliminary Flood Emergency Response Plan

Bungendore High School

Prepared for NSW Department of Education / 14 March 2025

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Rev	Date	Prepared By	Approved By	Remarks
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2	11/02/2025	LC/MK	MK	Final
3	12/02/2025	LC/MK	MK	Final – client comments update
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1.0 Introduction

This Preliminary Flood Emergency Response Plan (FERP) has been prepared to support a Review of Environmental Factors (REF) for the NSW Department of Education (DoE) for the construction and operation of the new Bungendore High School (the activity).

The purpose of the REF is to assess the potential environmental impacts of the activity prescribed by *State Environmental Planning Policy (Transport and Infrastructure) 2021* (T&I SEPP) as "development permitted without consent" on land carried out by or on behalf of a public authority under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The activity is to be undertaken pursuant to Chapter 3, Part 3.4, Section 3.37A of the T&I SEPP.

This document has been prepared in accordance with the *Guidelines for Division 5.1 assessments* (the Guidelines) by the Department of Planning, Housing and Infrastructure (DPHI). The purpose of this FERP is to summarise the flood risks associated with the site, identify preparation measures that should be undertaken to mitigate such risks, and provide an action plan with steps to be completed during a flood event. The details of this report are based on currently available information and correspondence undertaken at the time of writing.

It should be acknowledged that this FERP is in its preliminary stage and has been prepared to provide the general overall flood emergency responses intent proposed for the activity. This preliminary FERP will need to be updated during the subsequent detailed design phase of the proposed activity, to provide site specific flood emergency responses that are applicable to the activity for finalised design. The final site specific FERP will need to be endorsed prior to the operation phase of the activity.

1.1 Reference Documents

The following documents have been reviewed and referenced in preparing this report:

- Australian Institute of Disaster Resilience (AIDR) Guideline 7-3: Flood Hazard (2017)
- FloodSafe guidelines and the relative FloodSafe Tool Kits
- NSW Department of Environment and Heritage Flood Risk Management Guideline LU01, June 2023
- NSW Department of Planning and Environment (2021) Considering Flooding in Land Use Planning Guideline
- NSW Department of Planning and Environment (2023) Flood Risk Management Manual https://www.environment.nsw.gov.au/topics/water/floodplains/floodplain-manual;
- NSW Department of Planning and Environment (2023) Support for Emergency Management Planning Flood Risk Management Guideline EM01
- NSW Department of Planning and Environment (2025) Shelter-in-place guideline for flash flooding (https://pp.planningportal.nsw.gov.au/draftplans/made-and-finalised/shelter-place-guideline-flash-flooding)
- NSW Department of Planning, Housing and Infrastructure Planning Circular PS 24-001, Update on addressing flood risk in planning decisions, 1st March 2024
- NSW Planning Portal Spatial Viewer https://www.planningportal.nsw.gov.au/spatialviewer/#/find-aproperty/address
- Palerang Council (2014) Bungendore Floodplain Risk Management Study
- Palerang Council (2022) Palerang Development Control Plan 2015 (Updated November 2022)
- School Infrastructure NSW (SINSW) (2020) School Site Selection and Development Guideline for Determining Appropriate School Sites
- TTW (2025) Flood Impact and Risk Assessment Bungendore High School, dated 14 March 2025

1.2 Site Description

The current street address is part of 18 Harp Avenue, Bungendore, NSW, 2621 (the site), and is legally described as part Lot 125 in Deposited Plan 1297613. As shown at Figure 1, the proposed school site forms part of a larger lot which is the subject of a proposed residential subdivision.

The site is located within the North Bungendore Precinct (Elm Grove Estate) in Bungendore. As a result of precinct wide rezonings, the surrounding locality is currently transitioning from a semi-rural residential area to an urbanised area with new low density residential development.

The site is zoned R2 Low Density Residential, with all adjoining land also zoned R2 Low Density Residential.

The site has three frontages:

- Approx 500m southern frontage to Birchfield Drive.
- Approx 500m northern frontage to Bridget Avenue.
- Approx 100m eastern frontage to Winyu Rise.

The site is currently cleared of all vegetation and consists of grassland, having been prepared for the purposes of future low density residential development.



Figure 1: Aerial Photograph of the Site (Source: Urbis, 2024)

1.3 Proposed Activity Description

The proposed activity is for the construction and operation of a new high school in Bungendore at part 18 Harp Avenue, Bungendore (the **site**). The new high school will accommodate 600 students and 68 staff. The school will provide 26 general learning spaces, and three support learning spaces across two buildings. The buildings will be predominantly three-storeys in height and will include permanent and support teaching spaces, specialist learning hubs, a library, administrative areas and a staff hub.

Additional core facilities are also proposed including a standalone school hall with covered outdoor learning area (**COLA**), a car park, a kiss and drop zone along Birchfield Drive, sports courts and a sports field. The new school also features a single storey building with associated paddocks in the far western portion of the site designed for livestock management and hands-on agricultural learning.

Specifically, the proposal involves the following:

- Building A, a three-storey learning hub accommodating general learning spaces, a special education learning unit (SELU), a physical education centre, a performing arts space, and other core facilities including administrative areas, staff hub, library and end of trip facilities.
- Building B, a part three/part four storey learning hub accommodating general learning spaces, specialist workshops for food, textile, wood and metal workshops, as well as visual arts studios, science labs and staff areas.
- Building C, a standalone school hall with COLA.
- Building D, a single-storey agricultural block comprising an animal storage space, a COLA and internal workshop.
- On-site staff car park with 50 spaces with access via Bridget Avenue.
- Kiss and drop zones and bus bays along Birchfield Drive.
- Open play space including a sports courts and sports field.
- Associated utilities and services including a 1000kv padmount substation.
- Main pedestrian entrance to be located off Birchfield Drive.
- Secondary pedestrian access from Bridget Avenue.
- Public domain/off-site works including the removal of street trees.

The design has been masterplanned to allow for an additional future stage. The second stage does not form part of this proposal.

Figure 2 provides an extract of the proposed site plan.



Figure 2: Site Plan (Source: NBRS, Feb 2025)

2.0 Flood Behaviour

Given that the site is not included in the Bungendore Floodplain Risk Management Study model (and the existing flood study does not account for local overland flooding), a new 1D-2D hydraulic model was developed using TUFLOW software to assess flood behaviour at the site.

The methodology is described in detail in the Flood Impact and Risk Assessment (FIRA) (TTW, 21st Feb 2025) and is consistent with latest NSW flood modelling guidelines and Australian Rainfall and Runoff 2019 (ARR2019).

Post-development flood behaviour at the site is described in detail in the FIRA submitted alongside this report. For the Probable Maximum Flood (PMF), a range of storm durations from the 10-minute storm up to the 180-minute storm were run. Although the 10-minute storm is critical for the site, this FERP includes an analysis of longer duration events to determine the maximum potential impact time for the site (i.e. inundation time applicable to the site).

2.1 Flood Type

The site is situated in North Bungendore, approximately 1.5km north-east of the Turallo Creek crossing on McCuscker Drive, and is unaffected by mainstream flooding. A minor creek which is a tributary of the Turallo Creek is located approximately 500m to the east and south-east of the site, but the school site is elevated well above the creek banks and will not be affected by any overbank flows from this tributary.

However, local catchment runoff (i.e. overland flow flooding) impact key access roads to the school site, especially in rare storm events. Some of these access roads are deemed unsafe for traffic.

2.2 Flood Levels, Depths and Extents

The peak flood levels and depths during the critical duration 1% AEP event are shown in Figure 3, while the PMF event is depicted in Figure 4. The modelling results show that floodwaters in the post-development PMF event will be contained within the road corridors, surrounding the school site and will not impact on the school site itself. Any inundation within the school site is due to excess stormwater runoff generated within the school site itself when the capacity of the internal underground stormwater system reaches the design capacity.



Figure 3: Flood levels and depths (1% AEP event) - post-construction conditions



Figure 4: Flood levels and depths (PMF event) – post-construction conditions

2.3 Flood Hazard

A hazard assessment was conducted using the flood hazard vulnerability curves set out in 'Handbook 7 – Managing the Floodplain: A Guide to Best Practice in Flood Risk Management in Australia' of the Australian Disaster Resilience Handbook Collection (2017).

These curves assess the vulnerability of people, vehicles and buildings to flooding based on the velocity and depth of flood flows. The flood hazard categories are outlined in Figure 5, ranging from a level of H1 (generally safe for people, vehicles and buildings) to H6 (unsafe for vehicles and people, with all buildings considered vulnerable to failure).



Figure 5: Flood hazard vulnerability curve (Source: Flood Risk Management Guide FB03 - Flood Hazard, NSW Department of Planning and Environment, 2022)

Figure 6 and Figure 7 present the flood hazard categorisation around the site in post-development conditions in the 1% AEP and PMF events, respectively. Modelling results show that inundation occur on surrounding roads, including Bridget Avenue (north of school), Birchfield Drive (south of school), Winyu Rise (east of school) and Ellen Street (south of school) in the 1% AEP event. However, flood hazards estimated on these inundated roads are generally at H1 which is classified as generally safe for people, vehicles and buildings, based on the flood hazard vulnerability curve shown in Figure 5. Slightly larger flood extents are estimated on these affected roads in the 0.2% AEP event, but the flood hazards generally remain low, at H1, and are safe for traffic.

However, parts of these inundated roads will be subjected to high flood hazards of between H3 (unsafe for vehicles, children and the elderly) and H5 (unsafe for vehicles and people and where all buildings are vulnerable to structural damage) during the PMF event. This means these road areas are not safe for traffic. Nonetheless, these unsafe roads will become flood free again, during the PMF event fairly rapidly (between 30 minutes (for shorter PMF events) and 3 hours (for longer PMF events) after the onset of the storm event.



Figure 6: Peak flood hazard (1% AEP event) - post-development conditions



Figure 7: Peak flood hazard (PMF event) – post-development conditions

2.4 Inundation and Recession Times

2.4.1 Mainstream Flooding

The results of the flood modelling undertaken for the Bungendore Floodplain Risk Management Study (2013) indicates that peak PMF and 1% AEP flood levels along Turallo Creek will occur at Bungendore about 5 hours after the start of flood-producing rainfall in the upstream catchment.

The Tarago Road crossing of Turallo Creek will also be flood free at the peak of the 1% AEP flood. However, the southern and northern approaches to the bridge will be inundated in an event of this magnitude. The southern approach will be inundated due to the flooding of Halfway Creek which will begin to be inundated about 2 hours into the storm and once flood levels reach the 20% AEP event flood level. The Tarago Road / Kings Highway intersection will be cut off by floodwaters within the first hour of a flood due to the magnitude of the PMF event. Therefore, evacuation routes for the school site to the west and south will be cutoff by mainstream flooding of the Turallo Creek catchment. However, the maximum duration of flood inundation in this area would generally be over in less than 9 hours, based on the Bungendore Floodplain Risk Management Study (2013).

2.4.2 Overland Flooding

Table 1 presents a summary of the inundation and recession times due to overland flow flooding, for a range of storm events and durations, including the critical duration 10-minute PMF event. Longer durations, including a 3-hour storm event, have been assessed to consider the possibility of longer isolation periods. It should be noted that these hazards and inundation and recession times will change upon detailed design of the site and when minor onsite flows are directed away from the buildings themselves by detailed stormwater design.

The short critical duration for the catchment indicates that roads are unlikely to be isolated for an extended period of time (i.e. generally less than 60 minutes for storms shorter than 60 minutes). In all modelled events and storm durations, flood hazards are higher on Bridget Avenue (to the north-west of school site) when compared to flood hazards on Birchfield Drive (to the south-west of school site), during the PMF event. Nonetheless, both of these roads return to flood free conditions literally at the same time in the PMF event.

Analysis indicates that across the range of PMF durations assessed, the maximum time the school is isolated for (i.e. evacuation route to the west and south is cutoff) is less than 4 hours, due to overland flow flooding.

Storm	Time to Inundation (minutes)	Recession Time	
0.2% AEP - 15	< 10 minutes until flows reach Bridget	Sag point on Birchfield Drive returns to	
minutes	Avenue, Birchfield Drive and Winyu Rise.	flood free conditions 40-minutes after the	
	Flows across these roads are low hazard	onset of the storm.	
	(H1) for the duration of this event.		
PMF - 10	< 10 minutes until flows reach a H5 hazard	Roads return to flood free or low hazard	
minutes	level along Bridget Ave, north of the site, and	(H1) conditions within 20-minutes of the	
(Critical	H4 on Birchfield Drive, south of the site.	onset of the storm. Sag point on	
duration)		Birchfield Drive returns to flood-free	
	Within the school, flows become hazardous	conditions within 40-minutes.	
	(up to H6) within 10 minutes at the staircase		
	between Building A and C due to the high	Isolation time of approximately 20-40	
	velocity of flows.	minutes.	
		Hazardous area at the staircase between	
		Building A and C returns to flood-free	
		conditions within 30-minutes from onset	
		of storm.	

Table 1:	Time to inundation and	recession at the site in	PMF storm events	due to overland flow flo	ooding
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PMF - 30 minutes	< 10 minutes until flows reach a H5 hazard level along Bridget Ave, north of the site, and H3 on Birchfield Drive, south of the site. Within the school, flows become hazardous (up to H5) within 10 minutes at the staircase between Building A and C due to the high velocity of flows.	Roads return to flood free or low hazard (H1) conditions within 40-minutes of the onset of the storm. Sag point on Birchfield Drive returns to flood-free conditions within 40-minutes. Isolation time of approximately 40 minutes.
		Building A and C returns to flood-free conditions within 40-minutes from onset of storm.
PMF - 90 minutes	< 10 minutes until flows reach a H5 hazard level along Bridget Ave, north of the site, and H3 on Birchfield Drive, south of the site. Within the school, flows become hazardous (up to H5) within 20 minutes at the staircase between Building A and C due to the high velocity of flows.	Roads return to flood free or low hazard (H1) conditions within 40-minutes of the onset of the storm. The sag point on Birchfield Drive returns to flood-free conditions within 40-minutes. Isolation time of approximately 40 minutes.
		The hazardous area at the staircase between Building A and C returns to flood-free conditions within 90-minutes from onset of storm.
PMF - 120 minutes	< 20 minutes until flows reach a H5 hazard level along Bridget Ave, north of the site, and H3 on Birchfield Drive, south of the site. Within the school, flows become hazardous (up to H5) within 20 minutes at the staircase between Building A and C due to the high velocity of flows.	Roads return to flood free or low hazard (H1) conditions within 140-minutes of the onset of the storm. The sag point on Birchfield Drive returns to flood-free conditions within 140-minutes. Isolation time of approximately 140 minutes.
		Hazardous area at the staircase between Building A and C returns to flood-free conditions within 120-minutes from onset of storm.
PMF - 180 minutes	< 30 minutes until flows reach a H2 hazard level along Bridget Ave, north of the site, and H2 on Birchfield Drive, south of the site. Within the school, flows become hazardous	Roads return to flood free or low hazard (H1) conditions within 120-minutes of the onset of the storm. The sag point on Birchfield Drive returns to flood-free conditions within 190-minutes.
	(up to H5) within 20 minutes at the staircase between Building A and C due to the high velocity of flows.	Isolation time of less than 180 minutes. Hazardous area at the staircase between Building A and C returns to flood-free conditions within 150-minutes from onset
		conditions within 150-minutes from or of storm.

3.0 Flood Response Strategy

3.1 **Preferred Strategy**

3.1.1 **Pre-Emptive Closure**

Section 1.6.2 of the Queanbeyan-Palerang City Local Flood Emergency Sub Plan states that evacuation is the primary response strategy for people impacted by flooding. Section 5.8.3 similarly highlights pre-emptive evacuation as a potential flood emergency strategy in the Queanbeyan-Palerang LGA. Pre-emptive closure of the school is the preferred flood emergency strategy for the school site if advanced warning is received outside of school hours, or where a severe event is forecast several hours in advance.

Although overland flow flood events are characterised by minimal warning times, there may be advanced notice of the extreme rainfall experienced in-between the 1% AEP to PMF events. During the operational phase, where there is enough warning prior to school opening hours, the school should be closed in advance of the flood event so children and staff can remain safe at home and parents do not have to drive through roads that could become hazardous due to flooding.

Mainstream Flooding

Safe evacuation from the proposed activity to areas south of Turallo Creek, where the designated existing evacuation centres are located, as roads to the south via Tarago Road (across Turallo Creek), or via the Kings Highway and to the west via Bungendore Road, are deemed unsafe in the 1% AEP and greater flood events.

Nonetheless, the results of the flood modelling indicate that the maximum duration of flood inundation across these impacted areas would be less than 9 hours.

Overland Flooding

Although flash flood events are characterised by minimal warning times, there may be advanced notice of the extreme rainfall experienced in a 1% AEP-PMF event. During the operational phase, where there is enough warning prior to school opening hours, the school should be closed in advance of the flood event so children can be safe at home and parents do not have to drive though roads that could become hazardous.

In this strategy, the Queanbeyan-Palerang Flood Emergency Sub Plan states that School administration offices (Department of Education) will coordinate the evacuation of schools in consultation with the NSW SES and Welfare Services, if not already closed.

An SMS alert message must be sent to staff and parents at the earliest opportunity (once the severe weather warning is issued by BOM) to ensure no site users enter dangerous road conditions.

3.1.2 Shelter-in-Place

While there may be advanced warning time of extreme rainfall events such as those endured in a 1% AEP-PMF event, this cannot be relied upon. Severe weather events may lead to flash flooding with little to no warning time, and pre-emptive closure of the school cannot be accomplished.

Shelter-in-place (SIP) guidance published by the NSW Department of Planning, Housing and Infrastructure (DPHI, 2025) states that SIP is an appropriate emergency management strategy for development proposed in flash flood environments when the flood warning time and flood duration are both less than six hours.

In the critical 10-minute PMF event, there is less than 10 minutes from the onset of the storm until flows over Bridget Avenue and Birchfield Drive become hazardous, cutting off access to the school. NSW SES states that evacuation of a site must not require people to drive or walk through floodwater. The roads return to flood-free conditions after approximately 30 minutes. In longer duration events, flows over these roads take up to 3.5 hrs to fully recede, however the overall risk to the site is lower due to the lower maximum flood hazards on these roads when compared to the shorter duration storms. All buildings are proposed to be set above the PMF level and will not experience above-floor inundation (i.e. to be confirmed in subsequent design phase of the project). Therefore, all buildings will be safe to shelter in from the ground floor and upwards. The proposed activity also has adequate facilities to support SIP, including ambulant toilets and staff and student toilets, as per the design criteria outlined in the DPHI's SIP guideline.

Based on current site plans, the proposed activity has an overall floor area of 6,732m², excluding circulation areas and the agricultural building (taken from NBRS' schedule of accommodation, dated 3rd December 2024). Table 2 summarises the total and usable floor area covered by General Learning Spaces, learning commons, the library hub, and the gym and canteen hub. The DPHI's shelter-in-place guideline recommends a minimum floor space of 2m² per person. These spaces alone can therefore accommodate 1,254 people, far exceeding the projected 1000 students and 99 staff (under a potential future stage of development).

Therefore, where there is not advanced notice of severe weather, and staff and students are already in the school, the secondary flood management strategy for the site is to shelter-in-place. During the shelter-in-place strategy, all staff and students are to remain indoors. The Chief Warden must ensure that there are no site users outdoors.

Table 2: Floor space assessment (Source: area figures taken from NBRS' schedule of accommodation, dated 3rd December 2024)

Hub	Name	Level	Area (m ²)		
HS 101	General Learning Spaces	Bock A Level 1 and 2	1 010		
115 101		Block B Level 2 and 3	1,019		
HS 102	General Learning Spaces (Support)	Block A Ground	387		
	Learning Commons	Block A, Level 1 and 2	190		
		Block B, Level 2 and 3	402		
HS 203	Gymnasium and Canteen	Block C Ground	1,168		
HS 204	Library Hub	Block A Level 1	528		
TOTAL	3,584				
TOTAL US	2,508				

3.2 Secondary Emergency

Although shelter-in-place is the preferred emergency response strategy should a severe event begin without sufficient warning, any decision to shelter-in-place must be accompanied by alternative plans for evacuation in the event of a secondary emergency (e.g. medical or fire) or if some site users refuse to shelter-in-place. While they should be advised to stay in place (at least until the magnitude of the flood is clearer), if they insist on leaving, or if there is a secondary emergency, the preferred route is to the west via Birchfield Drive onto Tarago Road. It should be noted that Tarago Road further south may be safe during an overland flow flooding event in the school site area, but these areas will be **deemed unsafe for traffic if mainstream flooding are imminent at the same time**.

Self-evacuation should only be considered in the event that NSW SES issues evacuation action statements that cover the site, or if the proximity, scope or anticipated duration of the flood emergency poses an immediate threat to the safety of the people present at the school site.

Site users should be reminded not to drive through floodwaters, and in the event that their intended route is cut off by floodwaters, they should return to the site and shelter in place.

4.0 Flood Warnings and Notifications

4.1 Bureau of Meteorology

Severe weather and thunderstorm warnings are issued by the Bureau of Meteorology (BoM). These warnings are continually updated with descriptions of the likely conditions, including predicted extreme rainfall depths. Flood warnings are issued by the BoM when flooding is occurring or is expected to occur in an area. Warnings may include specific predictions of flood depths dependent on real-time rainfall and river level data. These warnings are distributed by BoM to Councils, Police and the relevant local SES, as well as being available on the BoM website.

- A *Flood watch* is issued by the BoM up to four days prior to a flood event. A watch is generally updated daily and may be issued before, during, or after rainfall has occurred.
- *Flood warnings* are issued by the BoM when flooding is occurring or expected to occur in a particular area. Warnings may include specific predictions of flood depths dependent on real-time rainfall and river level data. These warnings are distributed to Council, Police, and the relevant local SES, as well as being available on the BoM website, through telephone weather warnings and radio broadcasts.

4.2 NSW SES Australian Warning System

NSW SES has recently implemented the Australian Warning System (AWS) which replaces their previous evacuation orders and warnings system. The AWS is a new national approach to information and 'Calls to Actions' for hazards including flooding. The System uses a nationally consistent set of icons, with three warning levels: Advice, Watch and Act, and Emergency Warning. The storm warnings are described in Figure 8.



Figure 8: Australian Warning System - Three Warning Levels

The NSW SES utilises a range of sources to build detailed flood intelligence within local communities, including information from flood studies and historical flood data. As part of the transition to the Australian Warning System, the NSW SES has increased flexibility to tailor warnings at the community level, based on the expected consequences of severe weather events.

The Chief Warden is responsible for monitoring information from the AWS. Impacted communities will continue to receive flood warnings through the NSW SES website, NSW SES social media channels and by listening to local ABC radio stations. The NSW SES has also developed an all-hazards warning platform, Hazard Watch, to provide an additional channel for communities to access important warning information.

Each warning has three components:

- 1) Location and hazard: The location and the type of hazard impacting the community.
- 2) **Action statement**: For each warning level there are a range of action statements to guide protective action by the community. These statements evolve as the warning levels increase in severity.

Statements range from 'prepare now' and 'monitor conditions' at the Advice level, to 'stay indoors' at the Watch and Act level, to 'seek shelter now' in the Emergency Warning level. As the situation changes and the threat is reduced, the level of warning will decrease accordingly.

3) **The warning level**: The severity of the natural hazard event based on the consequence to the community.

As the site is affected by flash flooding, little to no warning time is likely to be available, with Severe Storm Warnings and Severe Thunderstorm Warnings likely to be the only trigger warnings available.

It is also important to acknowledge that neither the NSW SES nor the Bureau of Meteorology can provide special individual flood warning services for each affected property or school. The more specific the warning requirement for individuals and sites becomes, the more difficult it is for the NSW SES to deliver warnings in the short time frames that often apply. School operators must be weather aware and act early on publicly broadcast severe weather and flood warnings.

4.3 Council Disaster Dashboard

Queanbeyan Palerang Regional Council has implemented an online dashboard that has information that guide the community to navigate and receive information during disaster/emergency events, including flood event. The Queanbeyan Palerang Regional Council Disaster Dashboard can be accessed via the following link https://queanbeyanpalerang.disasterdashboards.com/dashboard/overview.

4.4 Triggers

The flashy nature of flooding at the site (and the inherently limited warning time associated with this type of flooding) limits the capacity of NSW SES to issue flood notifications and action statements with sufficient lead time. It is important to note that the warnings outlined above may not be available or occur with advanced warning.

To ensure adequate response time, alternative triggers should be monitored, including severe weather warnings, media updates via local radio stations and social media. While the Chief Warden is responsible for monitoring information from the AWS, NSW SES recommend that all site users (namely, all staff members and wardens) refer to the HazardWatch website and the Hazards Near Me app.

4.5 Emergency Signals

The site should have a Public Announcement (PA) system that can be used by the Chief Warden to inform all staff of the chosen response strategy in the event of a flood emergency. This ensures that staff with key responsibilities in the Plan can begin to fulfil their duties without delay.

The PA system should be used alongside SMS and email updates to all staff and students to inform them of any severe weather or flood warnings covering the site.

Any deliveries or other visitors of the site will be warned of any flood alerts and if the FERP has been initiated.

5.0 Flood Response Team

5.1 Staff Responsibilities

In the event of a severe flood, various staff members will be responsible for specific tasks as detailed in Table 3. Before the site is in operation, these roles must be delegated to specific staff members.

Table 3: Staff Flood Responsibilities

Role	Responsibilities
Chief Warden	 Decide if pre-emptive closure can occur if warnings are received prior to school opening hours or with several hours' notice Decide when SIP strategy is to occur and cease any evacuation Monitor flood warnings and notifications from BoM and AWS Monitor BOM radar and weather in the area of the site Inform staff and students/parents of flood risk Coordinate flood SIP drills
First Aid Officer	 Coordinate assistance for less able students and staff Prepare a Flood Emergency Kit that includes a portable radio, torch, spare batteries, first aid materials, emergency contact numbers, candles, waterproof matches, waterproof bags and required medications. Maintain all items in the Flood Emergency Kit
Staff	 Check visitor log and student registers so all site users can be accounted for Report missing students or site visitors to Chief Warden

5.2 Key Contact Details

In the event of a severe flood, key telephone numbers have been listed in Table 4 below.

Table 4: Key Contact Numbers

IMPORTANT TELEPHONE NUMBERS			
Chief Warden Deputy Manager Safety/First Aid Officer School Staff	tba tba tba tba		
External Contacts Police/Ambulance (for life-threatening emergencies) NSW State Emergency Services (SES) Fire & Rescue NSW – Queanbeyan Blacktown Police Station (non 24hrs) Queanbeyan District Hospital Bungendore Medical Centre (non 24hrs)	000 132 500 02 6229 6728 02 6118 1240 02 6150 7000 02 6238 1417		

6.0 **Preparation for Flood Response**

6.1 Education and Signage

As part of the preparation for a flood event, all staff and students will be made aware and advised of the flood risks present on site and the flood protocols & procedures via signage. All staff on site will be made aware of the flood risk (including their management responsibilities) via briefing and signage. This will form part of the mandatory site inductions that all staff must undertake prior to commencing work. A copy of this FERP (i.e. a final version prior to operational phase of the proposed activity) which includes the emergency response procedures will be made available at communal areas within the site as well as the main office. The FERP must be regularly reviewed by the Chief Warden, or in the event of any staff restructure or other significant change, to ensure it is up to date.

6.2 Flood Drills

It is recommended that flood drills be held by staff annually to ensure all staff workers and students are familiar with the sound of the alert and their subsequent flood response actions. It is the responsibility of the Chief Warden to ensure that evacuation drills are organised and that any issues with these drills are attended to, and if necessary, rerun.

These drills are required to test the suitability of the plan, identify gaps and to provide staff the opportunity to put into practice their specific responsibilities. If issues arise, this plan should be reviewed and updated. The Chief Warden will also ensure that all site drills are recorded in an appropriate records book and any non-conformities reported and responded to.

6.3 Flood Emergency Kit

A Flood Emergency Kit should be prepared prior to a flood event taking place and regularly checked to ensure that supplies within the kit are sufficient and in working condition. This check could occur after the evacuation drill takes place to provide a regular schedule. Generally, the Kit should include (at a minimum):

- Radio with spare batteries;
- Torch with spare batteries;
- First aid kit and other medicines;
- Candles and waterproof matches;
- Waterproof bags;
- A copy of the Site Emergency Management Plan; and
- Emergency contact numbers.

This Emergency Kit should be stored in a waterproof container, and it is the responsibility of the Chief Warden to make sure that this kit is maintained and available during an emergency.

7.0 Flood Response Actions

		Flood Emergency Response Plan		
	Flood Warning and Notification Procedures	Protocols		
		The following actions must be undertaken:		
1)	Weather forecast predicts significant rainfall event	 Ensure the emergency kit is ready to use, and there is sufficient drinking water and food in an accessible location. 		
	in the area or severe weather warning or severe thunderstorm warning	2) Listen to the local radio station for updates on forecasted rainfall intensity, flood heights and timings. Check BoM website for weather warnings. Listen to the local radio station for updates on forecasted flood heights and timings. Monitor updates on social media and NSW SES platform Hazard Watch.		
	or BoM issues a FLOOD WATCH	3) Call NSW SES or local police for an update and advice.		
	or NSW SES issue a yellow "ADVICE" warning	 Notify all staff, students and parents of the potential for flash flooding and confirm availability of staff to assist with emergency actions if required. 		
		5) Ensure staff are familiar with the flood emergency strategy		
		If a significant storm is forecast with advanced warning (>6 hrs), the Chief Warden should pre- emptively close the school. Notify parents and staff via SMS and email.		
2)	Flash flooding is reported in the media / via visual	If the flood event is not anticipated to impact the site, the Chief Warden is to continue hourly check-ins and postpone high risk activities (e.g. unnecessary deliveries, outdoor activities).		
	observation or BoM issues a FLOOD	If flood event is anticipated to impact the site, the Chief Warden must undertake the following actions:		
	WARNING or NSW SES issue an	Outside of School Hours:		
	amber "WATCH AND ACT" or red "ACT NOW" warning	Close down the school. If the flood is expected to continue into school hours, notify students and staff of the temporary closure of the school via SMS and email.		
		During School Hours:		
		For life-threatening emergencies phone 000 immediately.		
		Contact NSW SES on 132 500 to confirm response strategy.		
		 A warning message should be broadcast over the PA system confirming a significant flood event, and begin shelter-in-place procedures. Occupants within the proposed building will be advised to remain where they are, and not to leave the building. Within classrooms, teachers should conduct a headcount to ensure all students are accounted for. The Chief Warden should ensure that no one is outdoors. Once everyone is indoors, 		
		access to the exits should be closed off with temporary signage advising site users of the flood risk outside.		
		remind parents not to drive through floodwaters or to try collect their children.		
		shutdown and relocation of assets, prior to the onset of the storm.		
		SES.		
		<u>NOTE</u> : Avoid driving or walking through floodwaters. These are the main causes of death during flooding. Although the school ground may not be flooded, safe travel arrangements for students to go home may be disrupted by flooding and/or road closures.		
3)	Visual observation shows flood is receding or the alert has been downgraded by the	Once it has been confirmed that the water level has reduced to a suitable level, and if determined safe, the Chief Warden may announce that staff and students no longer need to shelter-in-place. Flooded areas are to remain off limits until ponding has cleared.		
	relevant authorities and any flood event that occurred has passed.	Classes can resume as normal. An additional SMS should be sent to parents advising them that they may collect their children if preferred. Staff must review a hard copy of the class list and record student release.		

8.0 Mitigation Measures and Recommendations

Based on the identification of potential issues, and an assessment of the nature and extent of the impacts of the proposed activity, it is determined that:

- The proposed activity is considered to result in low flood risks to people present at the school during a flood event and will not have significant adverse effects on the locality, community and the environment (refer to Flood Impact and Risk Assessment Report completed by TTW and submitted alongside this report);
- Potential residual flood risks/impacts associated with the proposed activity can be appropriately mitigated or managed (refer to Table 5) to ensure that there is minimal effect on the locality and community; and
- The activity is not considered to produce a significant impact on external areas to the site or the environment and surrounding communities.

Mitigation Name	Project Stage	Mitigation Measure	Reason for Mitigation Measure
Operational FERP	During Design Phase and prior to Operation Phase	This FERP is based on the Concept Design information for the proposed site, and must be reviewed following the detailed design stage, and updated with final site design features prior to the site becoming operational.	To provide emergency response guidance in the event of a flood event and further reduce flood risks associated with the activity in the opreational phase.

Table 5: Mitigation Measures

Additional measures recommended for the school to prepare for a flood event are discussed in Section 6 and summarised in Table 6.

Table 6: Additional Measures Recommended

ltem	Project Stage	Measure	Reason for Measure
Staff roles	Prior to Commencement of Operation Phase	Delegate staff responsibilities (as per Section 5.0).	To ensure all staff are aware of their specific roles and flood reponse actions.
Signage	Prior to Commencement of Operation Phase	Education and signage (as per Section 6.1).	To ensure all staff and students are aware of the flood risks present onsite and the flood protocols and procedures via signage.
Drills	During Operation Phase	Flood drills (as per Section 6.2).	To ensure staff and students are familiar with the sound of the alert and their flood reponse actions.
Emergency Kit	During Operation Phase	Flood emergency kit should be prepared and regularly checked (as per Section 6.3).	To ensure that supplies are in working condition.

9.0 Limitations and Revision of the Flood Emergency Response Plan

This FERP only addresses the shelter-in-place strategies during extreme flooding events for students and staff within the school site itself and is considered a guide only. It does not cover students and staff individual safe travel arrangements to the site or when their safe travel arrangements may be disrupted by flooding and/or road closures. This FERP also cannot account for the behaviour of individuals (e.g. site visitors), such as choosing not to remain isolated in a building on a floor above the PMF for an extended flood duration or attempting to enter dangerous areas during a flood.

In addition, this FERP is based on the currently available information for the proposed site (which is in its preliminary design stage), and must be updated following the detailed design stage, prior to the site becoming operational. Flood Emergency Response Plans are 'living documents' which need to be regularly reviewed once the school is operational to ensure they remain appropriate to address the risk to the site, can be practically implemented, and consider changing information and lessons learnt from any floods since the last review.

It is the NSW Department of Education's responsibility to ensure this FERP is current and updated, as necessary, to be in line with the current relevant standards, directorate, legislation, and the Regional's State Emergency Management Plan to ensure the health, safety and welfare of all staff, students and others.

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