Built

APPENDIX I - Construction Flood Emergency Response Plan

WEE WAA HIGH SCHOOL
CONSTRUCTION FLOOD EMERGENCY RESPONSE SUB-PLAN

NOVEMBER 2022

Job No: GC554 File: WWHS_ConstructionFERP_[Final]	Date: November 2022 Rev No: 1.1	Principals: SAB Authors: SAB/GPS

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APPENDICES

LIST OF FIGURES

SSD CONDITIONS MATRIX – SSD 21854025

Condition No.	Description	Reference
B26	The Construction Flood Emergency Response Sub-Plan must address, but not be limited to, the following: (a) be prepared by a suitably qualified and experienced person(s); (b) address the provisions of the *Floodplain Risk Management Guidelines* (EHG); (c) include details of: (i) the flood emergency responses for the construction phase of the development; (ii) predicted flood levels; (iii) flood warning time and flood notification; (iv) assembly points and evacuation routes; (v) evacuation and refuge protocols; and (vi) awareness training for employees and contractors, and users/visitor	Refer to the following sections of the Construction FERP: (a) Appendix E (b) Section 1.1 (c)(i) Chapter 5 and Appendices A and B (c)(ii) Sections 3.1.1 and 3.1.2 (c)(iii) Sections 3.1.1, 3.1.3 and 3.1.4 (c)(iv) Section 1.5 (c)(v) Chapter 5 and Appendix A (c)(vi) Chapter 5 and Appendix B
B27	Prior to the commencement of construction, the Applicant must prepare and implement for the duration of construction: (a) flood warning and notification procedures for construction workers on site; and (b) evacuation and refuge protocols for construction workers	Refer to the following sections of the Construction FERP: (a) Chapter 5 and Appendices A and B (b) Chapter 5 and Appendices A and B

1 INTRODUCTION

1.1 Background

Built Pty Ltd has been engaged by the NSW Government to construct the new Wee Waa High School. The construction site is located on the Kamilaroi Highway (Mitchell Street) between George Street and Charles Street.

The construction site is traversed by drainage swales and the site is subject to flooding when local catchment rainfall runoff volumes exceed the capacity of the drains. More broadly, Wee Waa lies on the Namoi River floodplain. While the township is protected by a ring levee which provides protection from Namoi River flooding, local catchment drainage capacities can be influenced by elevated river levels outside the levee. Flooding of the broader floodplain is also relevant to flood safety and evacuation.

Lyall and Associates has previously investigated the flood risk to the site and provided a comprehensive overview of flood risk in Wee Waa and more specifically at the construction site, the findings of which are set out in the following two documents:

- *Wee Waa Levee Risk Management Study and Plan* (Lyall and Associates, 2019);
- *Wee Waa High School Technical Working Paper: Flooding* (Lyall & Associates, 2021).

Built Pty Ltd engaged Lyall and Associates to prepare this Construction Flood Emergency Response Sub-Plan (**Construction FERP**) for the construction site based on the findings of the levee risk management plan. The Construction FERP is intended to satisfactorily manage flood risks on the site during project construction. The Construction FERP addresses the provisions of the *Floodplain Risk Management Guidelines.*

1.2 Locality

The construction site is located at 105 -1 07 Mitchell Street, Wee Waa and is bounded by:

- George Street to the east
- Charles Street to the west and residential lots to the north.

The township of Wee Waa is located on the Namoi River floodplain about 34 km west (downstream) of Narrabri. **Figure 1** shows the location of Wee Waa on the Namoi River floodplain, while **Figure 2**, sheet 1 shows the location of the construction site within the township.

1.3 Topography

The ground levels in the site range from 190 m AHD to 191.5 m AHD. Drainage of the site slopes gently from east to west. Water draining across the site enters a piped drainage system in the north-western corner of the site.

1.4 Proposed Works

The proposed works comprise the construction of a new high school (**the proposal**) and associated flood mitigation works (**FMW**). The key features of the proposal are shown on **Figure 2**, sheet 2 and comprise the following:

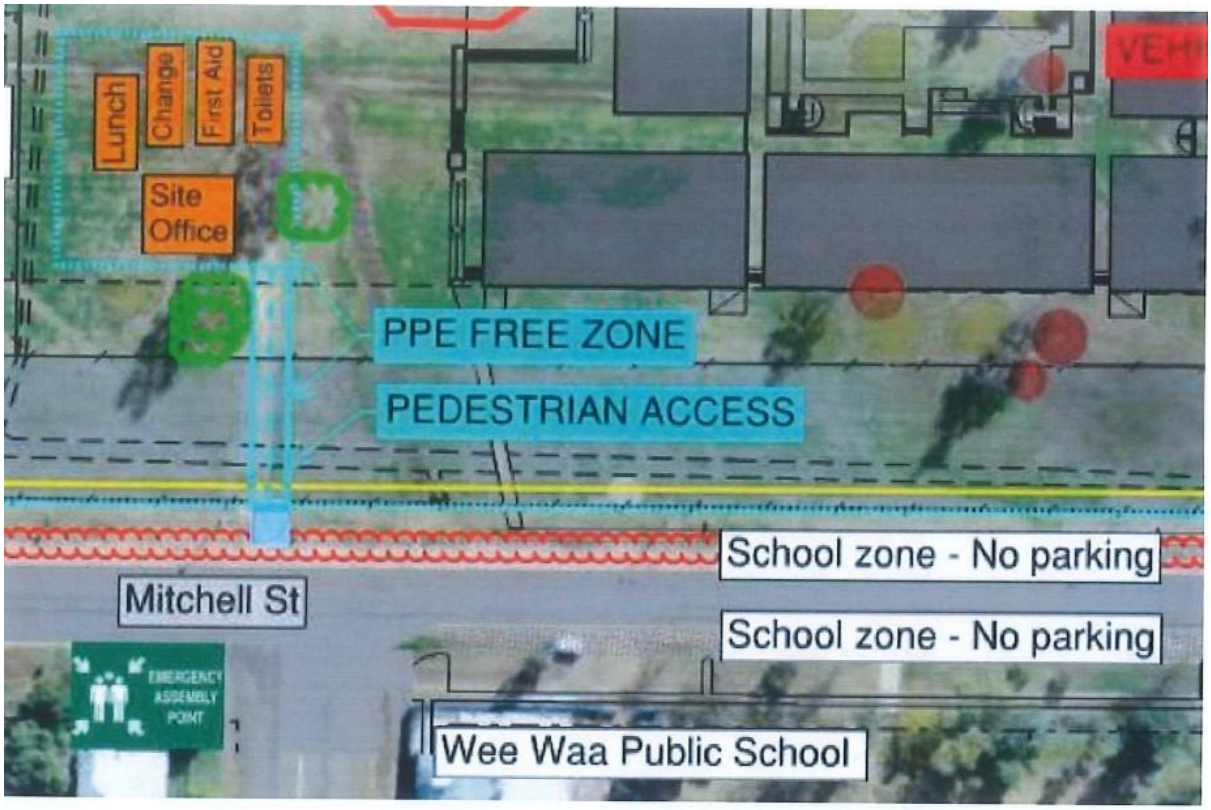
- A new two-storey school building arranged in a U-shape courtyard typology, including teaching spaces, library/admin, staff facilities, and a multi-purpose gymnasium/hall.
- A Covered Outdoor Learning Area (COLA).
- One grass sport field with a perimeter running track and asphalt playing courts.
- A standalone single-storey Agricultural and Environment Centre building.
- A standalone single-storey Aboriginal Education Community and Learning Centre.
- Internal vehicular access from George Street running east-west through the site.
- Augmentations to the road network as required to ensure road safety, including a dedicated drop off/pickup area and bus bay along George Street.
- Removal of trees as required and retention where possible.
- Installation of landscaping, additional tree planting and fencing to integrate with the design of the new school.
- Installation and augmentation of associated services infrastructure to service the new school.

1.5 Site Infrastructure

The site office, lunch room and other site facilities are located onsite and accessed from Mitchell Street by a temporary entrance driveway. As shown on the illustration over, the Emergency Assembly Point is offsite on the corner of Mitchell Street and Church Street.

1.6 Construction Hours

Normal working hours on site are Monday to Friday 7 am to 6 pm and Saturday from 8 am to 1 pm. The site is closed Sundays and for public holidays. All employees and contractors on site are adults and have been inducted to the site. Any visitors to the site are accompanied at all times by the site manager. The maximum number of employees and contractors on site at any time is 60 workers.



1.7 This Construction FERP

This Construction FERP identifies the flood risks at the site and how these should be managed. **Section 2** describes the ways that the site could be affected by flooding. **Section 3** lists the flood forecasts and warnings relevant to the site. **Section 4** provides an overview of the flood emergency response plan and responsibilities. **Section 5** provides an explanation of triggers for applying the Construction FERP and the actions to take for various stages of a flood. **Appendix A** provides a flood actions checklist, **Appendix B** sets out suggested flood emergency messaging, **Appendix C** lists items for a flood emergency kit to be kept on-site and **Appendix D** provides a suggested emergency contact list for onsite use.

2 FLOOD BEHAVIOUR

2.1 Flood Generating Weather

Inland areas of NSW mostly receive flood producing rain when weather systems originating in the tropics move south, forming a series of linked, low pressure troughs over the continent. These trough systems tend to drag moisture laden air from the tropics southward from the Gulf of Carpentaria through inland QLD and NSW. Unstable atmospheric conditions predominate and can produce widespread rainfall and severe thunderstorms.

Such depressions can develop any time of the year but are most likely when sea surface temperatures are high and therefore these events usually occur in the summer months and the first half of the year. Flooding is more prevalent in La Nina years when rainfall is significantly higher than the average annual rainfall.

We are currently in a La Nina cycle and storm activity with heavy rainfalls is likely to occur over the next few months while La Nina conditions persist.

2.2 Flood Probabilities

The relative size of a flood is described in terms of its probability (or frequency) of occurring. The frequency of floods is generally referred to in terms of their Annual Exceedance Probability (**AEP**) or Average Recurrence Interval (**ARI**). For example, for a flood magnitude having ten per cent AEP, there is a ten per cent probability (or 1 in 10 chance) that there would be floods of greater magnitude each year. As another example, for a flood having a 10 year ARI, there would be floods of equal or greater magnitude once in ten years on average. The approximate correspondence between these two naming systems is provided in the table below.

Annual Exceedance Probability (AEP) per cent	Average Recurrence Interval (ARI) years
0.2	500
0.5	200
1	100
5	20
20	5

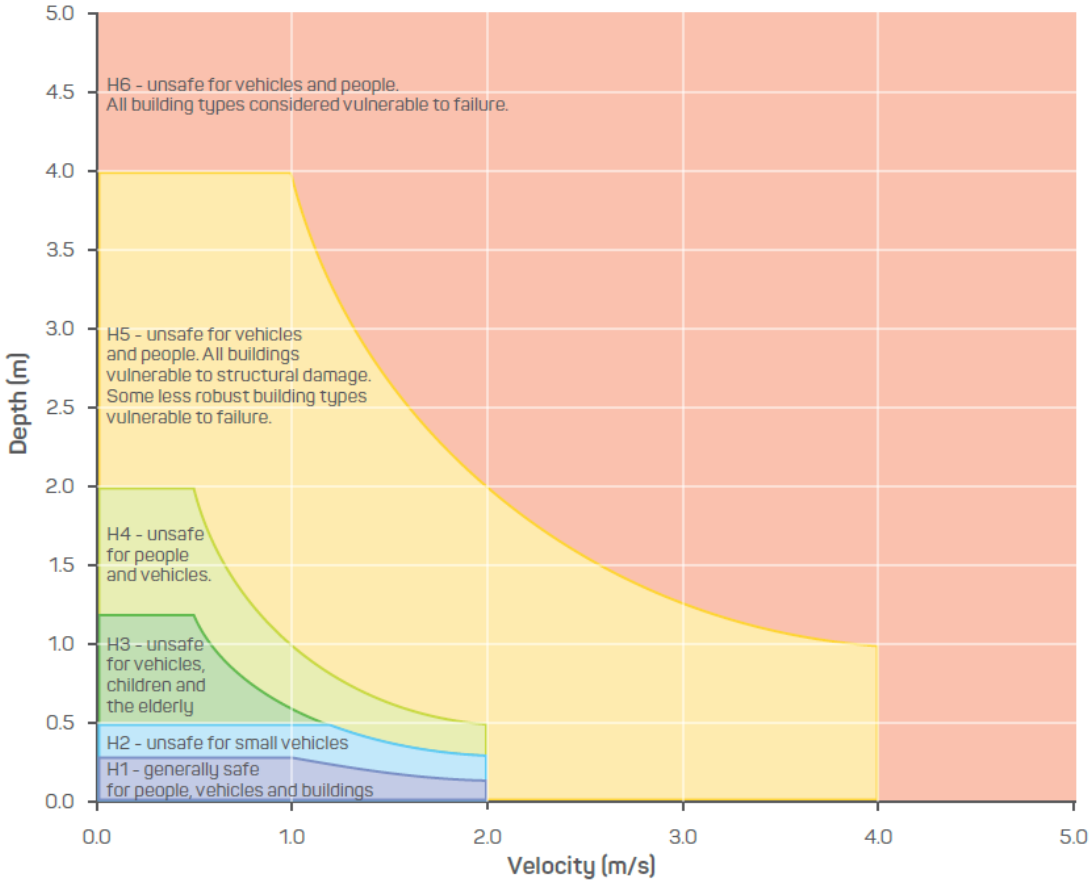
In this Construction FERP, the frequency of floods is referred to in terms of their AEP, for example a 1% AEP flood.

The largest flood that can occur is referred to as the Probable Maximum Flood (**PMF**) which occurs as a result of the Probable Maximum Precipitation (**PMP**) occurring over an area. Although it has a very low probability of occurring in any given year, floods approaching a PMF have been recorded. The PMP is the result of the optimum combination of the available moisture in the atmosphere and the efficiency of the storm mechanism as regards to rainfall production. The PMF is defined as the upper limiting value of floods that could reasonably be expected to occur and defines the extent of flood prone land (i.e. the floodplain).

Reference is also made in this Construction FERP to the Extreme Flood. It approximates the PMF and defines the upper limit of flooding that could reasonably be expected to occur on the broader Namoi River floodplain. The discharge hydrographs of the Extreme Flood were derived by applying a multiplication factor of three (3) to the corresponding 1% AEP discharge hydrographs.

2.3 Flood Hazard

Flood hazard represents the impact that flooding would have on people, vehicles and buildings and is usually represented by a combination of depth and velocity. The illustration below illustrates the current understanding of flood hazard in Australia for various combinations of flood depth and velocity. The illustration is taken from *Handbook 7: Managing the Floodplain: A Guide to Best Practice in Flood Risk Management in Australia* (Handbook 7) (AIDR 2017), noting that the same approach is documented in *Australian Rainfall and Runoff* (Geoscience Australia, 2019). It describes six flood hazard categories according to the stability of people, vehicles and buildings, and shows the relationship between velocity and depth that has been used to define the flood hazard vulnerability of the area internal to the Town Levee for a 1% AEP local catchment flood event.



2.4 Flood Behaviour at the Construction Site

Wee Waa is protected from Namoi River flooding by the Town Levee. Previous investigations found that while the Town Levee would not be overtopped for Namoi River floods up to about 0.2% AEP in magnitude, the construction site would still be subject to relatively frequent inundation as a result of local catchment runoff.

2.4.1 Local Catchment Flooding

Flooding may occur inside the Town Levee due to heavy local rainfall. **Figure 4** shows the layout of the stormwater drainage system internal and external to the Town Levee, while **Figure 5** shows greater detail in the vicinity of the construction site.

Runoff generated by relatively frequent storm events discharges to the construction site via a series of small diameter pipes which cross George Street, Mitchell Street and Charles Street. A network of shallow channels has been built to convey this flow through to the north-west corner of the construction site where twin 600 millimetre diameter pipes run in a northerly direction along the eastern side of Charles Street. The shape, size and location of the drainage of the site is to be upgraded as part of the construction design.

Flow conveyed in the twin 600 millimetre diameter pipes discharges to a short section of channel which is located in the south-east corner of the intersection of Charles Street and Boundary Street, before being conveyed across the latter mentioned road via twin 1050 millimetre diameter pipes.

Flow discharging from the twin 1050 millimetre diameter pipes is conveyed to the Namoi River via an engineered channel which is about 15 metres in width and 1 metre in depth. Flow in the engineered channel is conveyed through the Town Levee via a single 750 millimetre diameter pipe. A penstock gate is fitted to the single 750 millimetre diameter pipe which is closed during periods of elevated water levels on the Namoi River floodplain (**penstock gate**). A pipe(s) of unknown diameter is also located beneath an unsealed access track that crosses the engineered channel a distance of about 60 m to the north of the Town Levee.

The predicted flood depths and extent of flooding for a local catchment 1% AEP flood event internal to the Town Levee is shown in **Figure 3** (2 sheets). The flood hazard at the portion of the construction site that is located internal to the Town Levee is shown in **Figure 4**.

The key features of local catchment flooding in the vicinity of the construction site are as follows:

- An overland flow path develops along Mitchell Street which extends upstream (east) of the construction site as far as the Wee Waa Showground.
- Flooding on the construction site is generally of a ponding nature, with depths of inundation controlled by the capacity of the twin 600 millimetre diameter pipes which extend north from its north-west corner in combination with the elevation of Charles Street which is generally about 0.5 metres higher than natural surface levels internal to the construction site. As a result, depths of inundation remote from the network of low flow channels are a maximum of about 0.4 metres in a 20% AEP local catchment flood event, increasing to a maximum of about 0.5 metres in a 1% AEP local catchment flood event.
- The peak 1% AEP flood level on the construction site is a maximum of RL 191.0 m AHD.
- Peak flows discharging through the construction site increase from about 1 cubic metres per second during a 20% AEP local catchment flood event to about 4 cubic metres per second during a 1% AEP local catchment flood event.

- Flow velocities on the construction site are highest during more frequent local catchment flood events when backwater effects from the twin 600 millimetre diameter pipes are less. For example, maximum flow velocities remote from the network of low flow channels generally reduce from a maximum of about 0.3 metres per second during a 20% AEP event to less than 0.15 metres per second during a 1% AEP event.
- Depths of inundation on the construction site would generally exceed 1 metre during a PMF event, with flow velocities generally not exceeding about 0.4 metres per second.
- The construction site generally functions as a flood storage area during a 1% AEP local catchment flood event, with floodway areas limited to the network of low flow channels which run through it.
- The flood hazard vulnerability classification on the construction site would generally be no higher than H2 (generally safe for people, but unsafe for small vehicles) during a 1% AEP local catchment flood event, with the exception that H3 (unsafe for vehicles, children and the elderly) conditions would be present along the network of low flow channels which run through it. Isolated pockets of H3 type conditions areas are also shown to be present, generally in the north-western portion of construction site. Flood hazard areas would change as earth moving on the site forms the design channels.

2.4.2 Namoi River Flooding

Flooding in the wider Namoi River catchment can isolate Wee Waa for days to weeks at a time. Flooding patterns on the Namoi River at Wee Waa are largely dependent on the source of the flow. For example, floodwater originating from the upper Namoi River catchment commences to spread out across the wider Namoi River floodplain near the Myall Vale homestead which is located about 10 km upstream of the township. At this location major outflows occur from the river, with the largest breakout occurring toward the north.

The floodwater that moves north from Myall Vale inundates large tracts of land on the north-western floodplain, through Spring Plains to the Doreen area and eventually into Pian Creek, while the floodwater which breaks to the south develops a flood runner along the side of the Kamilaroi Highway. The flow which breaks out to the south initially runs alongside the road before entering O'Briens Channel and then Wee Waa Lagoon. Wee Waa is effectively isolated by road once this flow breakout develops.

Immediately upstream and downstream of Wee Waa flood flows leave the Namoi River via a number of effluent streams, the most significant of which are Gunidgera and Pian Creeks. With the exception of 'high' ridges which are located adjacent to and to the north of Pian Creek, virtually all of the land to the west of Wee Waa is inundated during a major flood.

An alternative flood pattern is caused by local catchment runoff from the streams draining the south-western slopes of the Nandewar Ranges to the east of Narrabri. Spring, Bobbiwaa and Galathera Creeks form the main drainage patterns of this region. All have quite small channels and when in flood, spread over wide areas of agricultural land. The majority of the flood flow generated by the local catchment does not join the Namoi River, but rather turns to the northwest where it ultimately joins flow in the Thalaba Creek system.

While the Pilliga Road can be cut by backwater flooding from the Namoi River, runoff from the Pilliga Scrub area can be sufficient to inundate the low level causeway crossing of Wee Waa Lagoon.

The key features of Namoi River flooding at Wee Waa are as follows:

- All major roads out of Wee Waa would be cut by major Namoi River flooding.
- While floodwater would generally not exceed 1.2 m depth along the northern side of the Town Levee during a 5% AEP flood, it would exceed 2 m depth along its southern side. Riverine type flooding will restrict the capacity of local drainage internal to the Town Levee. Pumps will be required to reduce local catchment inundation inside the levee when the Namoi is in flood.
- Namoi River flooding is unlikely to overtop the Town Levee except for the most extreme floods when depths of inundation at the construction site would exceed 2 metres.

Figure 5 (2 sheets) shows the indicative extent and depth of inundation on the Namoi River floodplain in the vicinity of Wee Waa, while **Figure 6** shows the flood hazard at the portion of the construction site that is located external to the Town Levee for a 1% AEP Namoi River flood.

Figure 1 shows the location of the existing network of stream gauges that are located on the Namoi River floodplain in the vicinity of Wee Waa, while **Table 2.1** sets out their period of record.

TABLE 2.1
STREAM GAUGE DATA AT WEE WAA(1)

Station Number	Gauge Name	Period of Record
419002	Namoi River at Narrabri	January 1982 to date
419003	Narrabri Creek at Narrabri	August 1891 to date
419039	Namoi River at Mollee	September 1965 to date
419900	Namoi River at Glencoe	May 1995 to date
419060	Namoi River at Gunidgera Weir – Storage Gauge	November 1975 to date
419059	Namoi River at Downstream Gunidgera Weir	April 1976 to date
419061	Gunudgera Creek at Downstream Regulator	July 1975 to date

1. Refer **Figure 1** for location of stream gauges that are currently in operation at Wee Waa.

Table 2.2 over the page sets out the peak heights on the nearby *Namoi River at Glencoe* stream gauge (GS 419900) (**Glencoe stream gauge**) relative to the elevation of the existing low points in the Town Levee.

2.5 Rate of Rise and Duration

2.5.1 Local Catchment Floods

Flooding inside the Town Levee due to local rainfall runoff could be classified as 'flash flooding'. Flash floods occur in response to intense bursts of rainfall such as that experienced in severe thunderstorms. Local catchment inundation could occur within minutes of an extreme rainfall burst and as a result, there would be no time to issue a warning prior to the rainfall occurring. The Bureau of Meteorology (**the Bureau**) typically provides advanced warning of meteorological conditions that might produce extreme rainfall events. Workers on the construction site should be prepared to evacuate the site in the event of heavy rainfall.

TABLE 2.2
PEAK HEIGHTS ON GLENCOE STREAM GAUGE CORRESPONDING WITH LOW POINTS ALONG TOWN LEVEE(1)

Location	Town Levee Chainage(2)	Peak Height on Glencoe Stream Gauge when Low Point First Overtopped (m)
Narrabri West Walgett Railway	4700	7.40(3)
Narrabri West Walgett Railway	7000	7.89(3)
Kamilaroi Highway	2200	8.70
Vera Leap Road	5600	8.78
Myalla Lane	8600	8.98

1. Source: Lyall & Associates, 2019
2. Refer **Figure 2**, sheet 2 for Town Levee Chainages
3. Gauge level corresponds to the level of the rail line. Concrete flood barriers which are about 1.5 m in height are installed at the location of the rail crossings during a flood event.

Local catchment flooding could also occur in response to an extreme rainfall burst concurrent with Namoi River flooding. Inundation of the site may occur more quickly and for smaller rainfall events due to restrictions to the drainage system when flood levels outside the Town Levee result in the closure of the penstock gate.

For the purposes of flood emergency response planning, it would be reasonable to assume that the site could be isolated by flooding within 15 minutes of extreme rainfall occurring.

2.5.2 Namoi River Floods

Namoi River floods typically occur due to wider spread rainfall in the upper catchment to the east. Since the catchment is large, floodwaters take more time to accumulate and travel downstream to Wee Waa. Namoi River flooding at Wee Waa usually occurs during La Nina wet periods. Flooding in Wee Waa would also typically be associated with releases from Keepit Dam in the upper catchment. As a result, Wee Waa usually has up to three days warning of a peak flood height, as well as up to two days warning of when the town may be isolated by road. Isolation of the town may be ongoing for days to weeks at a time, depending on the duration of the rainfall over the wider catchment.

2.6 Potential Flood Risks at the Construction Site

While the construction of the works would significantly reduce the extent, depth and duration of inundation on the site, especially for the more frequent events, there is still the potential for floodwater to impact construction activities. Without the implementation of appropriate management measures, the inundation of the construction site by floodwater has the potential to:

- Cause damage to the proposal works and delays in construction programming
- Inundate site sheds and limit access to the site
- Pose a safety risk to construction workers
- Detrimentally impact the downstream waterways through the transport of sediments and construction materials by floodwaters
- Obstruct the passage of floodwater and overland flow through the provision of temporary measures such as site sheds and stockpiles, which in turn could exacerbate flooding conditions in existing development located outside the construction footprint.

3 FLOOD FORECASTS AND WARNINGS

3.1 Flood Warning

Monitoring the weather forecasts and warnings is an important step in managing the flood risks at the site.

3.1.1 General Bureau of Meteorology Warnings and Data

The Bureau forecasts rainfall and publishes maps which can be used to estimate the amount of rain expected to fall over the next eight and four days, as well as the next 24 hours. This information is available at: http://www.bom.gov.au/jsp/watl/rainfall/pme.jsp. This provides an indication as to whether significant rainfall is expected in the region and can be used to place workers on alert. New South Wales Weather Warnings are issued by the Bureau and can be found at the following link:

http://www.bom.gov.au/nsw/warnings/

Key warnings which staff will need to look out for include Severe Weather Warnings, Flash Flood Warnings (local catchment) or Flood Warnings for riverine floods.

A **Flood Warning** is issued when the Bureau is more certain that flooding is expected, often when rainfall has started to fall. Flood Warnings are more targeted and are issued for specific catchments or even sub-catchments in some of the larger river basins. Flood Warnings will generally include specific predictions of the severity of expected flooding.

The radar service on the BoM website also shows current rainfall location and intensities. The radar station to be used for the site would be the Namoi (Blackjack Mountain) Radar Loop radar at:

http://www.bom.gov.au/products/IDR693.loop.shtml#skip

The Bureau also provides information on river levels. General information about recent rainfalls and river levels in the Namoi catchment can be observed at the following link:

http://www.bom.gov.au/nsw/flood/northwest.shtml.

It will be the responsibility of the Site Manager to monitor these daily and more frequently when a relevant warning has been issued.

3.1.2 Observed Flood Levels

Flood levels at the Glencoe gauge at Wee Waa and for Narrabri Creek gauge can respectively be observed at the following links:

http://www.bom.gov.au/fwo/IDN60235/IDN60235.053105.plt.shtml

http://www.bom.gov.au/fwo/IDN60235/IDN60235.054152.plt.shtml.

Flood levels at these gauges are related to three flood thresholds: Minor Flooding, Moderate Flooding and Major Flooding. The Bureau definitions for these thresholds are provided below:

Minor flooding

Causes inconvenience. Low-lying areas next to water courses are inundated. Minor roads may be closed and low-level bridges submerged. In rural areas, removal of stock and equipment may be required.

Moderate flooding

In addition to the above, the area of inundation is more substantial. Main traffic routes may be affected. Some buildings may be affected above the floor level. Evacuation of flood affected areas may be required. In rural areas removal of stock is required.

Major flooding

In addition to the above, extensive rural areas and/or urban areas are inundated. Many buildings may be affected above the floor level. Properties and towns are likely to be isolated and major rail and traffic routes closed. Evacuation of flood affected areas may be required. Utility services may be impacted.

Note the following key levels gauge levels at the Glencoe gauge:

- Kamilaroi Highway closes at gauge height 6.5 m
- Yarrie Lake Road closes at gauge height 6.7 m

At flood levels at or above 6.7 m Wee Waa will be isolated to road traffic.

3.1.3 NSW SES

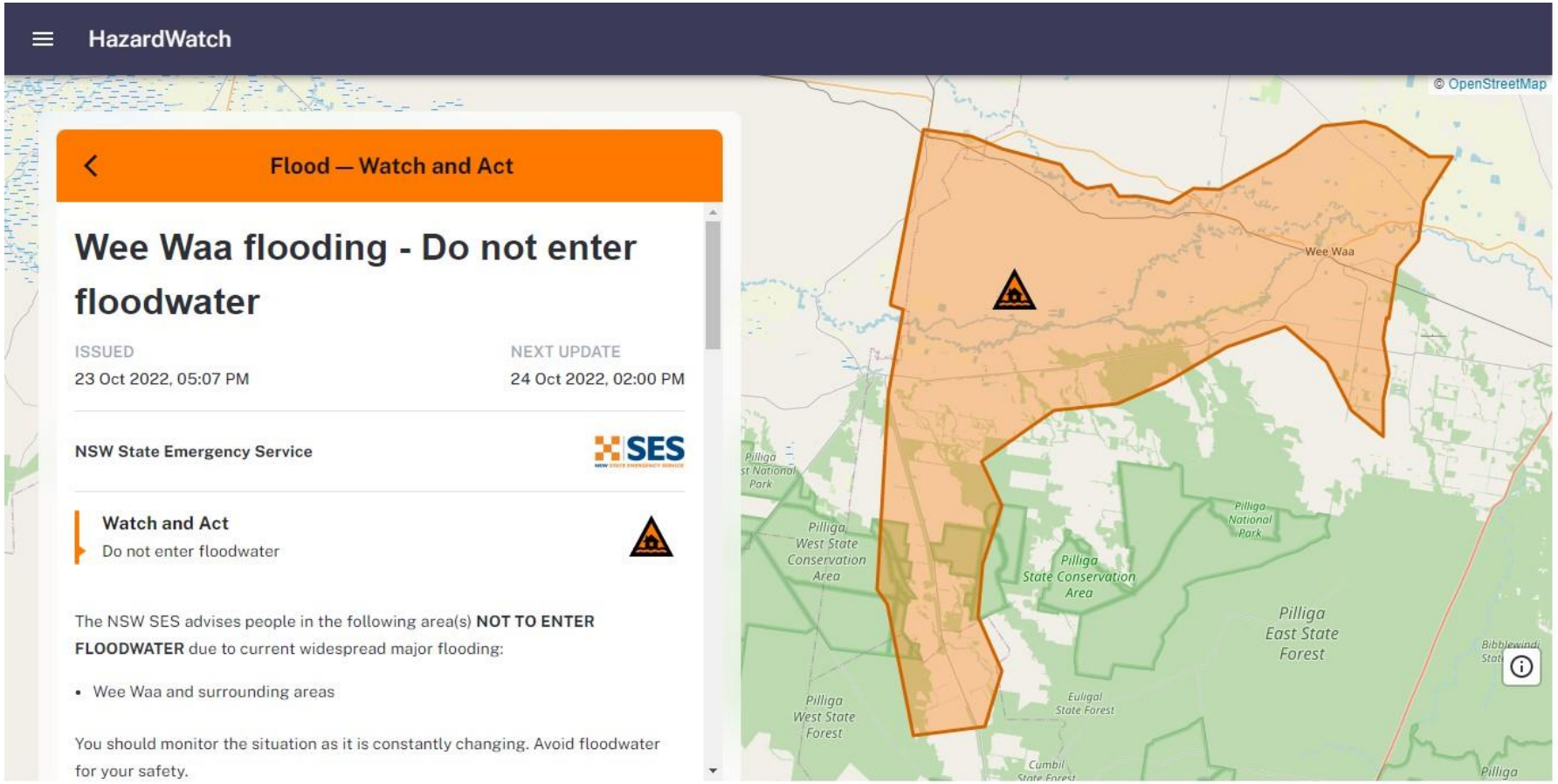
The NSW State Emergency Service (**NSW SES**) provides up to date flood information on its HazardWatch system (https://www.ses.nsw.gov.au/) Hazardwatch provides up to date information and advice for the Wee Waa area. An example of the Hazardwatch site is provided in illustration over. This site provides information on flood preparation, evacuation orders, road closures and more general advice on good practice during floods.

The NSW SES can also be followed on social media @NSWSES

For emergency help in floods and storms call the NSW State Emergency Service on 132 500. In life threatening situations, call Triple Zero (000) immediately.

3.1.4 Live Traffic NSW

Up to date information on traffic and road closures can be found at livetraffic.com.au or 132 701.


HazardWatch
Flood — Watch and Act
Wee Waa flooding - Do not enter floodwater
ISSUED
23 Oct 2022, 05:07 PM
NEXT UPDATE
24 Oct 2022, 02:00 PM
NSW State Emergency Service
SES
Watch and Act
Do not enter floodwater
The NSW SES advises people in the following area(s) NOT TO ENTER FLOODWATER due to current widespread major flooding:
• Wee Waa and surrounding areas
You should monitor the situation as it is constantly changing. Avoid floodwater for your safety.
© OpenStreetMap
Wee Waa
Pilliga National Park
Pilliga West State Conservation Area
Pilliga State Conservation Area
Pilliga East State Forest
Pilliga West State Forest
Euligal State Forest
Cumbil State Forest
Pilliga
For emergency help in floods and storms, call the NSW State Emergency Service: 132 500 · In life threatening situations call triple zero: 000

4 FLOODPLAIN EMERGENCY RESPONSE

4.1 Emergency Response Philosophy

This Construction FERP recognises that protection of life is of critical and primary importance.

Consistent with any emergency protocol, the protection of all lives is the first priority, the comfort of staff and visitors is second, and protection of site property is third.

Whilst there may be financial consequences arising from flood events, the Site Manager has full knowledge that there is a possibility that flooding will enter the site during the expected construction period.

It is incumbent on the owners and operators of the site to take all necessary measures outside of this Construction FERP to manage the financial risks which flooding poses. This Construction FERP is principally concerned with the safety of staff and contractors at the site. All flood emergency responses undertaken by the staff are to recognise the primacy of life and wellbeing over profitability.

The proposed response to a flood is that the site should be evacuated and secured under the guidance of the Site Manager until flooding has receded to a safe level enabling activities to resume.

4.2 Site Management

The construction site will have a clear management structure, comprising a Site Manager and subordinate staff. As such, the Site Manager will be ultimately responsible for ensuring every part of this Construction FERP is implemented. The Site Manager may delegate responsibilities to a designated person who can, when required, monitor weather forecasts, ensure basic measures are in place and issue the necessary warnings and actions when flooding reaches the relevant trigger levels.

5 FLOOD EMERGENCY MANAGEMENT PLAN

5.1 Management Actions

Management actions which are applicable to the entire site are included in the following sections. **Appendix A** summarises all of the following actions as a check list to be used before, during and after a flood. **Appendix B** sets out messages for staff and contractors to be communicated via SMS, by (website/social media?) and by telephone in various situations. **Appendix C** contains items which should always be kept on site in case of flood.

5.1.1 Before a Flood

Trigger for Action:

Always

Actions:

- All staff and contractors will be made aware during staff inductions of the possibility of flooding and the procedures to be followed if a flood were to occur.
- A fully charged and functional mobile phone will be kept in the site office whenever the site is occupied.
- A computer with internet access and at least two hours independent power supply will be kept on site whenever the site is occupied
- An emergency contact sheet will be kept on site. A suggested format for these details and other necessary contact details is provided in Appendix D.
- Management will maintain an emergency kit including a portable radio and torch with spare batteries and a first aid kit on site.
- The weather forecast and warnings will be checked each morning when the site opens.

5.1.2 When a Flood is Possible

Triggers for Action:

The Bureau issues a severe weather warning possibly including a severe thunderstorm warning or flash flood warning for Wee Waa area,

OR

The Bureau issues a Flood Warning for the Namoi River,

OR

Intense rainfall

Actions:

The Site Manager responsible for forecast and observation monitoring will monitor forecasts, severe weather warnings, weather radar, and water levels at the Glencoe Gauge and water levels on site at least every hour to monitor approaching floodwaters.

5.1.3 During a Flood

Triggers for Action:

The Bureau issues a Major Flood Warning for the Namoi River,

OR

Flood water is observed approaching the site

Actions:

Major Flood Warning for the Namoi River

The Site Manager or delegate will contact all staff and contractors including those not on site and inform them that Wee Waa will be isolated. Staff on site should follow the directions of the local NSW SES. Staff outside of Wee Waa should not attempt to come to site until advised that flooding has subsided.

Flood water is observed approaching the site

The Site Manager or delegate will contact all staff and contractors including those not on site to advise that the local streets are flooding and not to come to the site until advised that flooding has subsided. The Site Manager or delegate will evacuate and secure the site. The Site Manager or delegate will start the sump pump at the trash rack and monitor it every hour.

5.1.4 After a Flood

Trigger for Action:

For Namoi River flooding the Bureau advises river levels will recede below the major river level AND emergency services advise roads to Wee Waa are open and safe for traffic

For local catchment flooding floodwaters have receded in the surrounding streets,

OR

When emergency services give the all-clear to return to the site

Actions:

- The Site Manager will notify all staff and contractors that the local flood threat has passed and that main roads are open but that other roads may be affected by flooding or debris and they must not drive or walk through floodwaters.
- No staff will be allowed to return to site until floodwaters have subsided and the emergency services have given the all clear to return
- All flood affected parts of the site will be inspected by the Site Manager and declared safe prior to staff and contractors being given the all-clear to return.

- A hazard assessment will be undertaken for the clean-up, safe work methods statements will be prepared and personal protective equipment supplied consistent with the known hazards which can be associated with floods:
    - Slips, trips and falls
    - Sharp debris
    - Venomous animals
    - Contaminated water and sediments
- Following the re-commencement of site activities, a de-brief will be held with key management staff and may involve Council flood staff. The flood event and response, including the use of this Plan and any emergency procedures will be reviewed.
- Changes may be made to this Construction FERP and the requirements for future emergency response should the review identify any improvements which may be made.

6 REFERENCES

AIDR (Australian Institute for Disaster Resilience), 2017. ***"Managing the Floodplain: A Guide ti best practice in Flood Risk Management in Australia"***

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Geoscience Australia (2019) ***"Australian Rainfall and Runoff – A Guide to Flood Estimation"***