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Flood Emergency Response Plan

for

Richmond Agricultural Centre, Richmond

for Richard Crookes Construction



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Richmond

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Flood Response Summary

Flood Response Preparation

TRIGGER	RESPONSE	BY WHO
Upon occupation and check every six months	Assemble Emergency Kit and conduct routine checks.	Chief Flood Warden / First Aid Officer
Every six months	Coordinate Evacuation Drills.	All Flood Wardens
Upon occupation and	Sign up to Hazard Near Me / Hazard Watch apps and portals.	All Flood Wardens
continuous	Secure access to a livestock transport vehicle	Chief Flood Warden
Daily	Monitor weather and hazard situation.	Chief Flood Warden
New staff and contractors	Inductions for new staff to include flood risk associated with the subject site and evacuation procedure	Chief Flood Warden

Flood Response Actions

TRIGGER	RESPONSE	BY WHO
BoM Weather Warnings	Monitor as needed.	Chief Flood Warden
BoM Flood Watch / Flood Warnings	Monitor, assess, and communicate as needed.	Chief Flood Warden
Advice	Monitor, assess, and communicate as needed.	Chief Flood Warden
Watch and Act	School to remain operational Hourly check in with NSW DoE Emergency Response Team.	Chief Flood Warden NSW DoE Emergency Response Team
24-hour rainfall greater than 200mm predicted	Check in with NSW DoE Emergency Response Team.	Chief Flood Warden NSW DoE Emergency Response Team
North Richmond gauge above 16m in six hours	Check in with NSW DoE Emergency Response Team.	Chief Flood Warden NSW DoE Emergency Response Team
North Richmond gauge above 18m in 15 hours	Check in with NSW DoE Emergency Response Team.	Chief Flood Warden NSW DoE Emergency Response Team
Watch and Act with Evacuate By Action Statement	Close School and Evacuate prior to time specified.	All
Emergency Warning with Evacuate Now Action Statement	Evacuate Now and follow directions.	All



Flood Recovery

TRIGGER	RESPONSE	BY WHO
All Clear received from SES Rapid damage assessment undertaken and site handed back to Education		Qualified persons
Clearance Certificate Issued by AMU / SI NSW. Return to normal operation.		Chief Flood Warden
As required Access state government flood recovery services.		All

Key Personnel

Internal emergency Contacts

Emergency Coordinator	Phone Contact
Education EM Liaison	
Chief Flood Warden	
Deputy Principal – Deputy Flood Warden	
Deputy Principal – Deputy Flood Warden	

External Contacts

Organisation	For	Phone Contact
Police / Ambulance / Fire	Life threatening situations	000
Education EM Duty Officer	Confirm response actions for closure or evacuations	1300 086 866
NSW DoE Emergency Response Team	Assistance with response actions for closure or evacuations	Nick Jennings - 0448 282 124
Department of Education	Administrative assistance	1300 679 332
Hospital – Westmead	Health enquires	(02) 8890 5555
Police – Riverstone Station	Road closures and general enquires	(02) 9838 2199
Endeavour Energy	Fallen power lines	131 003
Australian Livestock and Rural Transporters Association	Livestock transport	(02) 6247 5434
Department of Primary Industry – Rural Assistance Authority	Assistance during emergencies	1800 678 593
Department of Primary Industry – Animal Services Hotline	Assistance with livestock disease and injury	1800 814 647
Local Land Services	Assistance if directed by other authorities	1300 795 299
SES	Assistance if fallen trees are blocking access	132 500



Organisation	For	Phone Contact
Vet – Ironmines Veterinary Clinic	Assistance with livestock disease and injury	(02) 4871 3833
Vet – McGraths Hill Veterinary Centre	Assistance with livestock disease and injury	(02) 4587 9000



1 Introduction

This Flood Impact and Risk Assessment has been prepared by Northrop Consulting Engineers on behalf of the Department of Education (DoE) (the Proponent) to assess the potential environmental impacts that could arise from the activities associated with the Richmond Agricultural Centre development at 2 College Street Richmond (Part Lot 2 DP1051798) (the site).

The report has been prepared to outline the existing flood behaviour at the site, determine whether the flood behaviour is affected by the development, identify flood risks and mitigation measures to reduce those risks to a tolerable level.

This report accompanies a Review of Environmental Factors (REF) that seeks approval for the construction and operation of a secondary school with a specialist agricultural curriculum at the site. The activities associated with establishing the Richmond Agricultural Centre involves the following works:

- · The removal of trees and fencing
- · Construction of a general learning hub
- Construction of a science hub
- · Construction of a multipurpose hall
- Construction of an administration building
- Construction of canteen and amenities building
- Construction of a new parking area (including accessible spaces) driveway and kiss and drop facilities
- The provision of outdoor agricultural learning areas comprising:
 - Agricultural plots
 - Aboriginal enterprise
 - Agricultural shed and greenhouse
 - Animal plots with associated stock yard, animal shelters, troughs and stock lane
 - Gravel access road with wash bay
- Landscaping including new trees, entry forecourt, village green and kitchen garden
- Ancillary services and infrastructure upgrades including new substation and HV Works, sewer pump station, water booster, dual carriage vehicle access and pedestrian paths
- · Wayfinding and school identification signage

For a detailed project description, please refer to the Review of Environmental Factors (REF) prepared by EPM Projects.

2 Subject Site

The Site is located on 2 College Street, Richmond (Part Lot 2 DP 1051798). The site is located within the Hawkesbury City Council area and is zoned SP1 Special Activities (the SP1 zone) by the Hawkesbury Local Environmental Plan 2012 (the LEP). Figure 1 is a site plan showing the location of the proposed Richmond Agricultural Centre within its regional context. Figure 2 is an aerial image of the site and its immediate surrounds.

The boundary of the REF works is shown in Figure 3 and comprises:

- Leased area: This is the area of land leased by the Department of Education from Western Sydney University (WSU) for the proposed Richmond Agricultural Centre. This area comprises 14.25 ha of land with frontage to College Drive of 480 meters. The school site comprises existing agricultural land within the WSU campus bound by College Drive to the east, Londonderry Road to the west, WSU facilities to the south and vacant WSU agricultural land to the north.
- WSU Campus: This the area of land between the leased area and College Drive

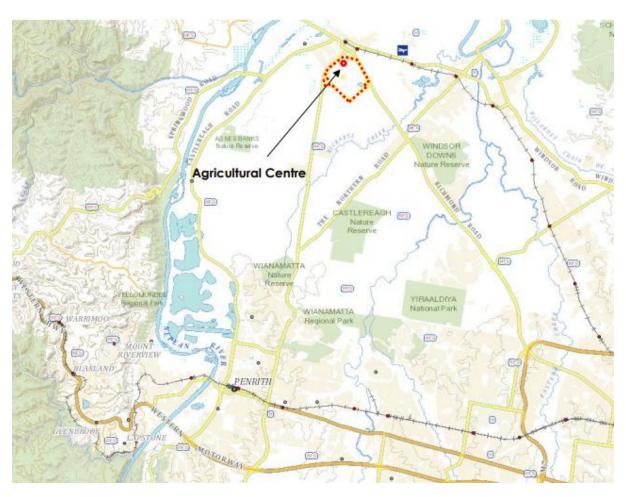


Figure 1 - Location of the proposed Richmond Agricultural Centre (source: ePlanning Spatial Viewer)



Figure 2 - Aerial image of the site showing the location of the proposed Richmond Agricultural Centre (source: Nearmap, dated 27 October 2024)

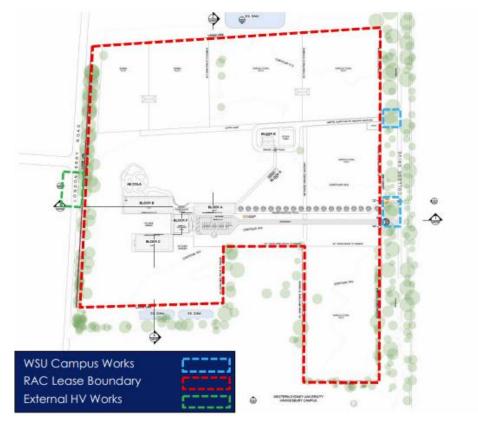


Figure 3 - Extent of proposed works at Richmond Agricultural Centre (source: NBRS Architecture)



3 Flood Behaviour and Finished Floor Levels

The subject site is impacted by both local catchment flooding (with a short warning time) and regional flooding from the Hawkesbury-Nepean River (with a long warning time). Flood levels are reproduced below in **Table 1** with a relationship to site and finished floor levels.

The **target warning time** for inundation of the subject site is **15 hours**, and the **rate of rise** has been estimated at **1m/hour**. Once the site is inundated by flooding, it is expected to be under for greater than **24 hours**.

The local catchment event is expected to peak within three hours once rainfall has commenced. This mechanism is not expected to compromise the regional road network for a significant period of time. Compensatory cut has been provided on-site to minimise the flooding impacts of the development on the surrounding community.

Table 1 - Flood levels

Event	Regional Catchment Level (m AHD)	Local Catchment Level (m AHD)	Relationship to Floor Level / Access
1% AEP	17.4	17.95 – 18.08	Floor levels above current flood level
1 in 200 AEP	18.6	17.96 – 18.09	Floor levels above current flood level
1 in 500 AEP	20.2	18.02 – 18.11	Inundated by regional event only
1 in 1000 AEP	21.4	-	Inundated by regional event only
1 in 2000 AEP	22.9	18.08 – 18.33	Inundated by regional event only
1 in 5000 AEP	24.4	-	Inundated by regional event only
PMF	30.6	19.24 – 19.28	Inundated by regional event only



4 Communication Protocol and Emergency Contacts

4.1 Communication Summary

Parents and students will receive updates through the NSW Education Parent App or Seesaw, Sentral and other third-party apps as well as SMS.

The order of responsibility is outlined below.

- 1. Chief Flood Warden to determine actions. If a trigger is activated, Chief Flood Warden to notify Education EM Team and confirm actions.
- **2. Education EM Team to direct actions.** In the event of widespread extreme weather and flooding, the EM team may direct school closures or evacuation.
- 3. SES directions. SES directions must be adhered to.

4.2 School Based Chief Flood Warden

Warnings will be disseminated by BoM and SES through the Hazards Near Me NSW app which is also available via the web https://www.hazardwatch.gov.au/. The application filters BoM and SES warnings relevant to the user and may be used by responders to monitor flood events. An area of interest can be specified in the app.

It is the responsibility of the Chief Flood Warden to register for this service and make themselves aware of evolving hazards. In addition, assistance may also be provided by the Education EM Team or directed by the SES or emergency services.

4.3 Education EM Team

The Education EM Team attends weekly briefings with the SES and BoM so will be aware of developing weather situations. They may direct school closure or evacuation independently of the Chief Flood Warden.

4.4 SES or Emergency Services

SES is the lead combat agency for flood response in NSW. Should they (or other emergency services) attend site, or issue a warning product, their directions must be adhered to.

4.5 Contacts

Emergency contacts are presented below in Table 2 and Table 3.

Table 2 - Internal emergency Contacts

Emergency Coordinator	Phone Contact
Education EM Liaison	
Chief Flood Warden	
Deputy Flood Warden	

Table 3 - External Contacts

Organisation	For	Phone Contact
Police / Ambulance / Fire	Life threatening situations	000
Education EM Duty Officer	Confirm response actions for closure or evacuations	1300 086 866



Organisation	For	Phone Contact
NSW DoE Emergency Response Team	Assistance with response actions for closure or evacuations	Nick Jennings - 0448 282 124
Department of Education	Administrative assistance	1300 679 332
Hospital – Westmead	Health enquires	(02) 8890 5555
Police – Riverstone Station	Road closures and general enquires	(02) 9838 2199
Endeavour Energy	Fallen power lines	131 003
Australian Livestock and Rural Transporters Association	Livestock transport	(02) 6247 5434
Department of Primary Industry – Rural Assistance Authority	Assistance during emergencies	1800 678 593
Department of Primary Industry – Animal Services Hotline	Assistance with livestock disease and injury	1800 814 647
Local Land Services	Assistance if directed by other authorities	1300 795 299
SES	Assistance if fallen trees are blocking access	132 500
Vet – Ironmines Veterinary Clinic	Assistance with livestock disease and injury	(02) 4871 3833
Vet – McGraths Hill Veterinary Centre	Assistance with livestock disease and injury	(02) 4587 9000



5 Flood and Evacuation Warnings

Rainfall and river gauge stations are maintained within the Hawkesbury Nepean basin and provide information to the Bureau of Meteorology (BoM) to inform their flood warning systems. These warnings are passed on to the SES to issue one of the following.

5.1 Triggers

The following triggers are specified for the Chief Flood Warden to contact the Education EM Team if no advice has been received from them They reflect situations where the school should be closed if the school day hasn't commenced, or evacuation should occur if the school is operational.

These include a rainfall based trigger for local catchment flooding, <u>OR</u> a predicted river level for riverine flooding.

Rainfall for Local Catchment Flooding

In order to minimise the risk to life, it is recommended the facility be closed if there is a 50% chance or greater of 24-hour rainfall, or a **Severe Weather Warning** with nominated rainfall depth equivalent to a 1% AEP local flood event, as presented in the following **Table 4**.

Rainfall Depth (mm)

Rainfall over the following timescale

50

30-mins

65

1-hour

75

2-hours

90

3-hours

200

24-hours

Table 4 - Rainfall Triggers for Closure

River Flood Levels

Similarly, it is recommended that the facility be closed in the event of a **Generalised Flood Warning** with nominated riverine depths at the North Richmond Pump Station gauge as presented in the following **Table 5**. These represent the estimated peak level and the time to peak height from current river conditions. The gauge levels have a m AHD datum with normal levels tidally influenced.

Table 5 - Riverine Triggers for Closure

Trigger Height (m)	Peak expected in the following time
16.0	6 hrs
18.0	15 hrs



5.2 Bureau of Meteorology Warnings

The warning types issued by the BoM are as follows:

Severe Weather Warning

Issued by the Bureau for potentially dangerous weather conditions. A description of the threat will be included in the warning along with the time for next issue. It is noted that a severe weather warning does not imply that flooding will eventuate. Warnings are generally updated every six hours, or as the event dictates.

This type of warning should be accompanied by a predicted rainfall depth and storm period as discussed in the Flood Response section. They are also accompanied by observed rainfall values from rainfall that has already occurred across the state.

Severe Thunderstorm Warning

Issued if there is strong evidence that a severe thunderstorm will develop, or if a severe thunderstorm is reported. Flash flooding may occur during severe thunderstorms. Warnings are generally updated every three hours or shorter as required.

Flood Alert/ Watch/ Advice

Issued if flood producing rain is expected. This provides an early warning that flooding may occur.

Generalised Flood Warning

Issued when flooding is expected to occur in a given area. Three hours warning time is expected from issue of warning to peak flood level as per the "Service Level Specification for Flood Forecasting and Warning Services for New South Wales – Version 3.13" (Bureau of Meteorology, 2020).

5.3 SES Warnings, Hazard Watch and Hazards Near Me App

Recently the NSW SES and NSW Public Works have created an app called Hazards Near Me NSW which is also available via the web https://www.hazardwatch.gov.au/. The application filters BoM and SES warnings relevant to the user and may be used by responders to monitor flood events. An area of interest can be specified in the app.

The SES uses a nationally consistent set of icons from the Australian Warning System (AWS). These are presented below in Figure 4.



















Advice

There is a heightened level of threat. Stay up to date as the situation changes.

Watch and Act

Conditions are changing and you need to start taking action now to protect you and your family. NSW SES does not issue a Watch and Act level warning for tsunami.

Emergency Warnings

The highest level of warning. You may be in danger and need to take action immediately.

Figure 4 - SES Warning icons

Each warning message has three components.

• Location and hazard. Describing the area and type of hazard.



- Action statement. These may include "Stay Informed", "Prepare to Evacuate", "Evacuate By", or "Evacuate Now".
- Warning level. The severity of the natural hazard based on consequence to the community.

Advice

This is typically the first alert that will be issued by the SES and indicates a flood or severe weather event may develop. Stay up to date with SES / BoM warnings and monitor conditions in case the situation changes. An action statement of "Stay Informed" may accompany this warning type.

Watch and Act

The SES will issue a Watch and Act warning when flood conditions are changing, and the purpose of this warning is to prepare for evacuation or avoid the area that is expected to be impacted by flooding. This may include cancellation of operations. Action statements of "Prepare to Evacuate" or "Evacuate By" may accompany this warning type.

Emergency Warnings

Emergency warnings issued by the SES indicate the highest level of warning. These are issued typically if evacuation is required immediately. An action statement of "Evacuate Now" will typically accompany this warning type.

5.4 Other Warning Types / Resources

Other warning and communication products are described below.

On-Site Emergency Communication

An air horn and handheld loudspeaker is located within the Flood Emergency Kit and is to be used for broadcasting warnings on-site.

NSW Education Parent App / Third Party Alternative

This app can be downloaded through Google and Apple app stores and is intended to be used as a tool to disseminate warnings and notifications around impending extreme weather, or around temporary shelter within school buildings during events in progress.

This may be substituted for other tools that are utilised by schools, such as Seesaw, Sentral and other third-party apps as well as SMS.



6 Flood Response Preparation

It is the responsibility of the Chief Flood Warden to prepare the facility for a flood event. This will be achieved through; Induction Training provided by the Chief Flood Warden, nomination of Flood Wardens amongst staff, education of flood risks and behaviour, and the preparation and maintenance of a Floodsafe Emergency Kit.

The information presented above is a summary of the flood behaviour and considered key to understanding the risks associated with flooding. This should be displayed in conjunction with other emergency information (such as fire, etc.) throughout the facility.

Flood preparation measures have been summarised in Table 6.

Table 6 - Preparation measures prior to flooding

TRIGGER	RESPONSE	BY WHO
Upon occupation and check every six months	Assemble Emergency Kit and conduct routine checks.	Chief Flood Warden / First Aid Officer
Every six months	Coordinate Evacuation Drills.	All Flood Wardens
Upon occupation and continuous	Sign up to Hazard Near Me / Hazard Watch apps and portals.	All Flood Wardens
	Secure access to a livestock transport vehicle	Chief Flood Warden
Daily	Monitor weather and hazard situation.	Chief Flood Warden
New staff and contractors	Inductions for new staff to include flood risk associated with the subject site and evacuation procedure	Chief Flood Warden

6.1 Commentary

Emergency Kit

An emergency kit is expected to be contain items required for Individual Health Care Plans. Other items for a flood emergency kit are outlined at; https://www.ses.nsw.gov.au/floodsafe/prepare-your-home/emergency-kit/. Items outlined on the SES website and some additional items are presented below:

- Air horn and hand-held loudspeaker.
- Portable radio with spare batteries.
- Torches with spare batteries.
- A first aid kit.
- Items from Individual Health Care Plans.

This kit should be kept in the administration building in a roll trolley suitable for easy deployment in the event of an evacuation. The contents of the kits and management during a flood event will be the responsibility of the **First Aid Officer**.



Site Signage

Flood warning and response signage must be displayed throughout the subject site.

Induction Material

Inductions for new staff and contractors is to include the predicted flood behaviour outlined in Section 3 - Flood Behaviour and Finished Floor Levels, the emergency contact details outlined in Section 4 - Communication Protocol and Emergency Contacts, and response actions outlined in Section 7 - Flood Response Actions.

Warning Products

Warning tools are outlined in Section 5 - Flood and Evacuation Warnings. This includes warning products and communication tools for caregivers.

Monitoring of Weather Situation

It is the responsibility of the Chief Flood Warden to monitor the weather situation and be aware if a warning has been issued. This will be achieved through flood wardens receiving push notifications from the Hazards Near Me and BoM apps. The decision to make the school non-operational will be made based on the receipt of this warnings.



7 Flood Response Actions

Following the receipt of a severe weather warden, the Chief Flood Warden is required to commence procedures to manage the risk to life within the subject site. Flood response actions are presented below in Table 7.

Table 7 – Flood response actions

TRIGGER	RESPONSE	BY WHO
BoM Weather Warnings	Monitor as needed.	Chief Flood Warden
BoM Flood Watch / Flood Warnings	Monitor, assess, and communicate as needed.	Chief Flood Warden
Advice	Monitor, assess, and communicate as needed.	Chief Flood Warden
Watch and Act	School to remain operational Hourly check in with NSW DoE Emergency Response Team.	Chief Flood Warden NSW DoE Emergency Response Team
24-hour rainfall greater than 200mm predicted	Check in with NSW DoE Emergency Response Team.	Chief Flood Warden NSW DoE Emergency Response Team
North Richmond gauge above 16m in six hours	Check in with NSW DoE Emergency Response Team.	Chief Flood Warden NSW DoE Emergency Response Team
North Richmond gauge above 18m in 15 hours	Check in with NSW DoE Emergency Response Team.	Chief Flood Warden NSW DoE Emergency Response Team
Watch and Act with Evacuate By Action Statement	Close School and Evacuate prior to time specified.	All
Emergency Warning with Evacuate Now Action Statement	Evacuate Now and follow directions.	AII



7.1 Commentary

School Closure

When the **Close School** response is required, follow the ceasing operations guideline located https://education.nsw.gov.au/inside-the-department/health-and-safety/incident-emergency-management/respond-report/temporarily-ceasing-school-operations

Warning Products

The primary emergency response strategy is to exclude the school community from the flood hazard. This means closing the school the day prior to an extreme event occurring. This is the responsibility of the Chief Flood Warden, and the trigger determined is based on the notifications received from the BoM and/or Hazard Watch.

Warning tools are outlined in Section 5 - Flood and Evacuation Warnings.

Compliance with SES Directions

SES is the lead combat agency for flood response in NSW. Should they attend site, or issue a warning product, their directions must be adhered to.

Evacuation of Livestock

Evacuation of livestock via vehicular transport to Yarramundi is to be undertaken following the receipt of a severe weather warning. The evacuation of any livestock which are likely to be affected by floodwaters is to be in accordance with the Department of Primary Industries guidelines for emergency management. This is detailed on the following website: https://www.nsw.gov.au/emergency/prepare/pets-and-livestock



8 Flood Recovery

Flood recovery actions are presented below in Table 8.

Table 8 - Flood recovery measures

TRIGGER	RESPONSE	BY WHO
All Clear received from SES	Rapid damage assessment undertaken and site handed back to Education	Qualified persons
Clearance Certificate Issued by AMU / SI NSW.	Return to normal operation.	Chief Flood Warden
As required	Access state government flood recovery services.	All

8.1 Commentary

The NSW Government provides a number of resources for recovering after a flood event. This includes the following.

- Clean up advice.
- Advice for staying healthy.
- Accessing financial assistance and grants.
- Mental health services.

These are outlined at https://www.nsw.gov.au/emergency/floods/recover.



9 Assembly Points and Evacuation Routes

The draft Hawkesbury Nepean Floodplain Risk Management Study and Plan (WMAwater, 2025) details that the site falls within the Rising Road Flood Emergency Response Classification as per the Flood Risk Management Guideline (EM01).

College Drive to the east of the site and Londonderry Road to the west have access above the PMF level to higher ground. In the event an evacuation must occur, all persons on site must meet at the **Carpark** as indicated in Figure 5 below prior to evacuation.

The Draft Hawkesbury Nepean Floodplain Risk Management Study and Plan (WMAwater, 2025) recommends evacuating from the site via Londonderry Road, travelling south towards higher ground. This is presented in Figure 6 overleaf.

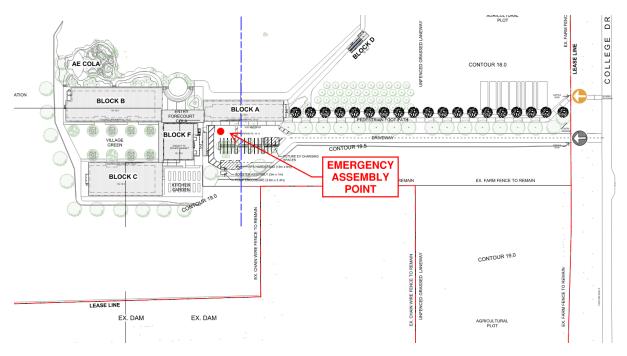


Figure 5 - Emergency Assembly Point

Livestock are to be relocated to the Yarramundi Main Campus, presented overleaf in Figure 7, in riverine events greater than the 1% AEP flood. This area has flood free land up to the 1 in 5000 AEP. A pre-arranged flood free alternative will be required for events greater than the 1 in 5000 AEP.

Evacuation of livestock in an emergency is to be undertaken in accordance with the Emergency Management guideline, available from the NSW Department of Primary Industries.



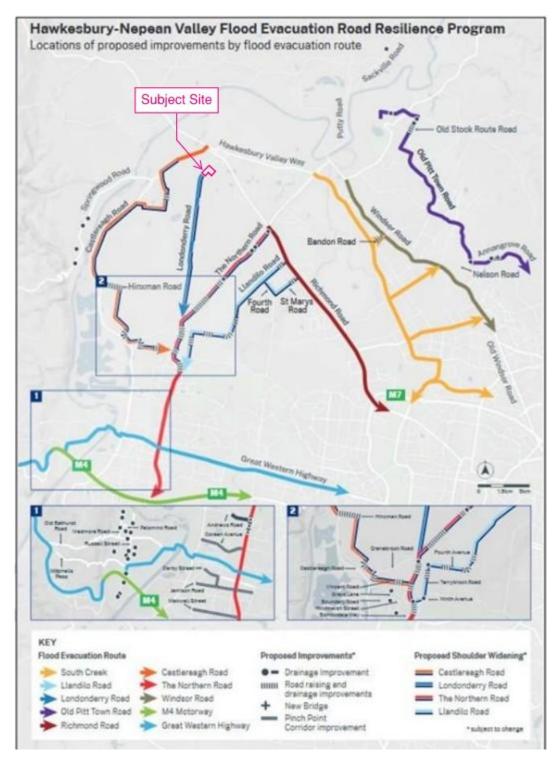


Figure 6 - Flood Evacuation Routes (WMAwater, 2024)





Figure 7 - Location of WSU Main Campus Paddocks



10 Development and Revision of this Flood Evacuation Plan

This plan has been prepared as a preliminary plan for the purposes of the approval. It is anticipated this plan will be updated prior to an Occupational Certificate being issued to incorporate additional available information such as more detailed floor plans and the standard emergency procedures.

Consideration has been given during the preparation of this document to consultation and recommendations made by SES and the NSW Reconstruction Authority. A summary of the mitigation measures is presented below in , and copies of the advice received is presented in Appendix B of the accompanying Flood Impact and Risk Assessment (Northrop, May 2025).

This plan should be revised if a **new flood study or any additional flood information for the site is available**, amendments are made to Australian Rainfall and Runoff (2019) guidelines, or there is an **updated regional flood warning system**.

Notwithstanding the above, this plan shall be **revised every three years** or when there is a **major operational change or an evacuation event.**

Revisions should be undertaken by a suitably qualified flood emergency response consultant.

Table 9 - Mitigation measures

Project Stage Design (D) Construction (C) Operation (O)	Mitigation Measures	Relevant Section of Report
D	The finished floor level of Block A, B and C has been set above the riverine 1 in 200 AEP to consider the impact of climate change.	3 - Flood Behaviour and Finished Floor Levels
D	Compensatory cut has been included in the civil design to minimise the flood impacts of the development on surrounding property.	3 - Flood Behaviour and Finished Floor Levels
0	Users are made aware of flood risks through the preparation of this FERP.	6 - Flood Response Preparation
0	Flood response actions are designed to prioritise evacuation and closing the school and eliminating staff, students, and visitors from the hazard.	7 - Flood Response Actions
0	The nomination of a Chief Flood Warden and cooperation with the NSW DoE Emergency Response Team reduces reliance directly from the SES Incident Controller.	4 - Communication Protocol and Emergency Contacts
0	Continual revision of the plan will consider the most up to date flood information and response arrangements.	10 - Development and Revision of this Flood Evacuation Plan



11 Conclusion

A Flood Emergency Response Plan (FERP) has been developed for the proposed Richmond Agricultural Centre.

Through adoption of this plan, the proposed development adequately minimises the flood risks associated with the subject site. The recommendations contained herein assist in managing the risk to life of the staff, students and visitors to the subject site.

We commend our findings to SINSW for their review.