

Ethos Urban acknowledges the Traditional Custodians of Country throughout Australia and recognises their continuing connection to land, waters and culture.

We acknowledge the Gadigal people, of the Eora Nation, the Traditional Custodians of the land where this document was prepared, and all peoples and nations from lands affected.

We pay our respects to their Elders past, present and emerging.

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13 May 2022

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13 May 2022

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Declaration and Determination

This Review of Environmental Factors has been prepared for School Infrastructure NSW to assess the potential environmental impacts which could arise from the proposal to construct flood mitigation works within Wee Waa, NSW.

The REF has been prepared in accordance with the relevant provisions of the *Environmental Planning and Assessment Act 1979* (EP&A Act), the *Environmental Planning and Assessment Regulation 2021* (EP&A Regs) and its associated State Environmental Planning Policies.

On the basis of the consideration of key environmental aspects and the information presented in this Review of Environmental Factors, it is concluded that by adopting the mitigation measures identified in this assessment it is unlikely that there would be any significant environmental impacts associated with the Proposal and that an Environmental Impact Statement is not needed and the proposal is not required to be assessed as State Significant Infrastructure by the NSW Department of Planning and Environment (DPE).

This Review of Environmental Factors provides a true and fair review of the Proposal in relation to its potential effects on the environment. It addresses to the fullest extent possible, all matters affecting or likely to affect the environment as a result of the Proposal. The information contained in this Review of Environmental Factors in neither false nor misleading and on balance, although some impacts would occur, the proposal is recommended to proceed given its stated need and justification.

Person(s) who prepared the REF:	
Name	Jacob Dwyer (B.E. Hons, BSc, MCP)
Position	Senior Urbanist
<i>I confirm I have prepared this Review of Environmental Factors and it neither false or misleading information</i>	
Signature:	
Date:	13 May 2022
Reviewer:	
Name	Daniel West
Position	Director
<i>I confirm I have examined this Review of Environmental Factors and satisfied it addresses to the fullest extent possible, all matters affecting or likely to affect the environment</i>	
Signature:	
Date:	13 May 2022
Determination	
<i>I have delegation to accept this Review of Environmental Factors on behalf of School Infrastructure NSW as the determining authority and determine that the Proposal can proceed subject to the mitigation measures identified being implemented.</i>	
Name:	Anthony Manning
Position:	Chief Executive, School Infrastructure NSW
Signature:	
Date:	

1.0 Introduction

This Review of Environmental Factors (REF) has been prepared for NSW Department of Education to assess the potential environmental impacts that could arise from flood mitigation works to 105-107 Mitchell Street and the surrounding road network, Wee Waa.

The proposed works are designed to improve the flood characteristics of the site at 105-107 Mitchell Street to enable its safe future redevelopment, as well as improving the flood characteristics of surrounding sites throughout the Wee Waa township. The proposed works include the following:

- Excavation, construction and landscaping of a flood conveyance channel along the southern and western boundaries of 105-107 Mitchell Street.
- Associated vegetation removal and stockpiling of spoil.
- Construction of minor stormwater channels in the vicinity of the stockpile area.
- Installation of two new 1350mm diameter pipes along Charles Street to the northern side of Boundary Street with a debris control structure at the inlet.
- Lowering of the existing stormwater channel which runs from the northern side of Boundary Street to the Namoi River by approximately 1m.
- Replacement of existing pipes and penstock gates beneath the levee.
- Replacement of existing pipes beneath the access track to the north of the levee.
- Installation of two new duty and standby flood evacuation pumps with 1m³/s lift capacity internal to the levee.
- Placement of riprap in the base of the existing channel's confluence with the Namoi River.
- Installation of temporary and permanent fencing around the perimeter of the flood conveyance channel as well as appropriate safety signage.

This REF identifies that the proposed activities can be carried out under Chapter 2, Division 7 of *State Environmental Planning Policy (Transport and Infrastructure) 2021* (the T&I SEPP) as 'Development without Consent'. It considers the requirements of Part 5A and section 111 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), as well as clause 171(2) of the *Environmental Planning and Assessment Regulation 2021*. This REF also sets out a range of mitigation measures to manage any environmental impacts arising from the proposal.

1.1 Background

While the township of Wee Waa is encircled by an earthen ring levee to protect it from riverine flooding, localised overland flooding within the levee also affects the town. In particular, the site at 105-107 Mitchell Street and many of the surrounding properties and road verges become inundated with water on a relatively frequent basis.

For this reason, flood mitigation works are proposed to render the site at 105-107 Mitchell Street safe for future development, as well as to reduce flood impacts to occupants of the surrounding the sites and road reserves, and more broadly throughout the township of Wee Waa.

The proposed works will minimise potential flood impacts, rendering several sites within the township flood-free for certain flood events. This will minimise any expenditure to repair potential flood damage and will improve the potential for future development at these sites. The proposed works will also generate design and construction jobs, resulting in a positive economic impact.

2.0 Site Analysis

2.1 Regional and Local Context

The site is located at 105-107 Mitchell Street, Wee Waa within the Narrabri Shire Council LGA. Wee Waa is located in the New England Region of Upper Central NSW and sits adjacent to the Namoi River, approximately 42km north-west of Narrabri and 570km north-west of Sydney.

The site is adjacent to the Kamilaroi Highway which is a key transport connection to the town and runs north-east through the centre of Wee Waa, providing connection to western NSW and Narrabri in the east. The site's regional locational context is shown in **Figure 1**.



Figure 1 Site context NSW (left) and local (right)

Source: SHAC

2.2 Site Description

A legal description of the lots and land ownership of the site is provided in **Table 1**. The site of the flood mitigation works contains several parcels of land owned by the NSW Department of Education, as well works within the road reserves of Mitchell Street, Charles Street, Boundary Street and the existing flood channel and levee to the north-west of Boundary Street.

Table 1 Legal Description of the Site

Allotment	Owner
Lot 2, DP 550633	NSW Department of Education
Lot 1, DP 577294	NSW Department of Education
Lot 124, DP 757125	NSW Department of Education
Lot 125, DP 757125	NSW Department of Education
Charles Street Road Reserve	Narrabri Shire Council
Boundary Street Road Reserve	Narrabri Shire Council
Existing flood channel and levee	Narrabri Shire Council
Mitchell Street	State Road

The main portion of DoE land is located at 105-107 Mitchell Street, which is L-shaped and has an approximate area of 6.03 hectares. The site has a frontage of approximately 390m to Mitchell Street along the southern boundary (which is part of the Kamilaroi Highway), a 190m frontage to Charles Street along the western boundary and a 100m frontage to George Street along the eastern boundary. Mitchell Street, as part of Kamilaroi Highway, is a key movement corridor. A detailed site survey has been provided at **Appendix A**.

An aerial photograph of the site is provided at **Figure 2**.

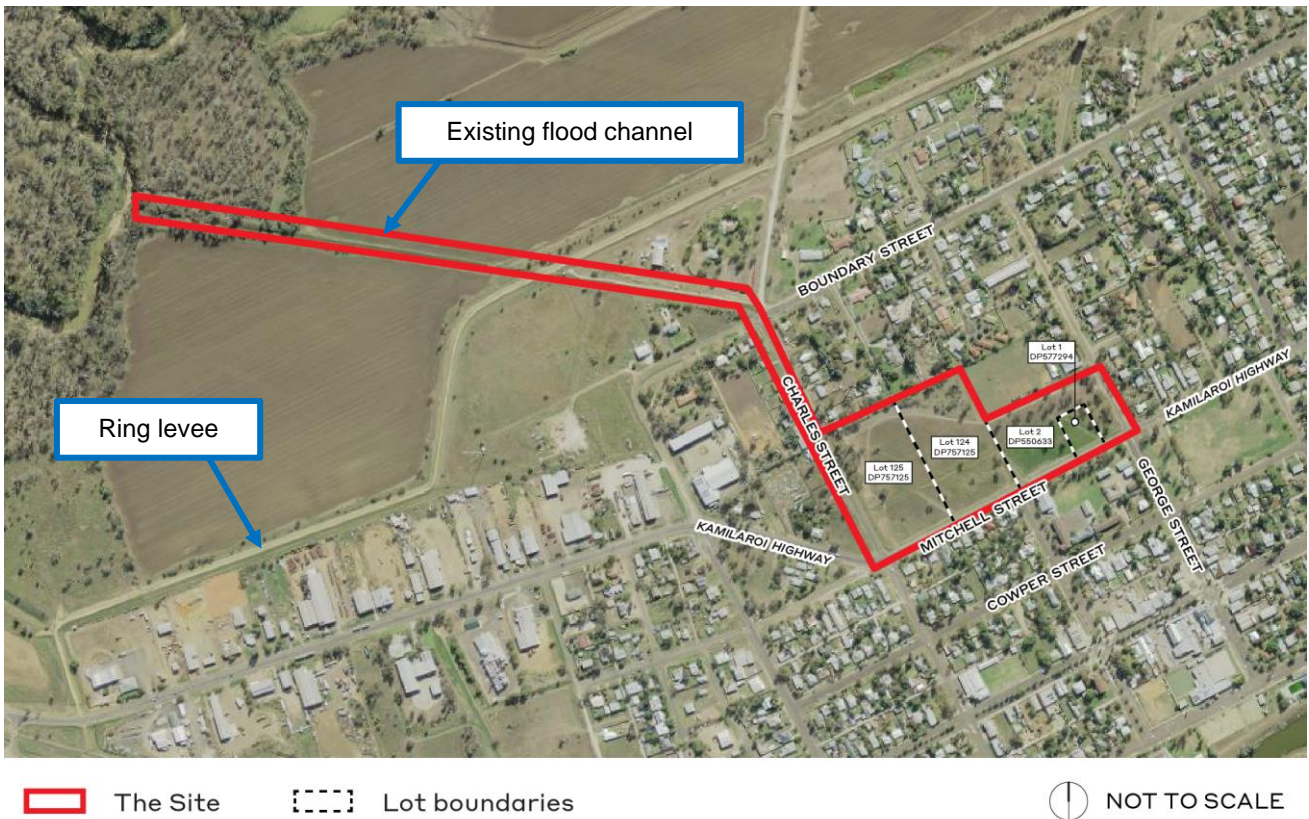


Figure 2 Aerial photograph showing site of proposed flood mitigation works

Source: Six Maps, Ethos Urban

2.2.1 Existing Development, Infrastructure and Site Conditions

The Mitchell Street Site is currently undeveloped with a range of sparsely scattered trees and grassland throughout the site. There is an established stand of mature Eucalypt trees in the north-east portion and small dense trees along the north-western corner of the site. The remainder of the Mitchell Street Site is flat grassland. The site contains existing natural, open stormwater drainage channels which convey storm and flood water across the block. The primary channel is located through the centre of the block and runs from a box culvert on George Street to Charles Street. This primary channel is fed by three smaller channels from Mitchell Street, which is at a higher level than the block itself. A photograph of the Mitchell Street site is provided at **Figure 3** and a Survey Plan at **Appendix A**.

The site also includes a number of surrounding road reserves, including the local streets of George Street, Charles Street and Boundary Street, as well as state road Mitchell Street. The site also includes the existing flood conveyance channel to the north-west of Boundary Street and the levee, as well as a portion of the levee itself, which are all located within the Council road reserve.

Currently, downstream flood and stormwater runs away from the Mitchell Street site through twin 600mm stormwater pipes within the Charles Street road reserve (beneath the northern verge). These pipes discharge into an open channel then into 750mm pipe beneath the levee (fitted with penstock gates) which feeds a single existing

levee pump. The pump expels water to beyond the levee, into a downstream open channel (with a 900mm pipe beneath the levee access road) which conveys water to the Namoi River.

Other in-ground services also exist within the northern verge of the Charles Street road reserve. Refer to the Survey provided at **Appendix A** for further detail. A range of native and non-native vegetation is present within the site. Refer to the Arboricultural Assessment (**Appendix F**) and Flora and Fauna Assessment (**Appendix G**) for further description.

Photographs of the site are provided at **Figure 3** to **Figure 5**.



Figure 3 Photograph of the Mitchell Street site

Source: Douglas Partners



Figure 4 Photograph of the Charles Street verge (looking north towards Boundary Street)

Source: Douglas Partners



Figure 5 Photograph looking north-west towards the downstream open conveyance channel
Source: Douglas Partners

3.0 Scope of Works

3.1 Description and Justification of the Activity

The proposal seeks approval for flood mitigation works to 105-107 Mitchell Street and within the surrounding road reserve, Wee Waa. The proposed works are designed to improve the flood characteristics of the Mitchell Street Site to enable its safe future redevelopment for education purposes, as well as improving the flood characteristics of surrounding sites. Specifically, the proposed works include the following:

- Excavation, construction and landscaping of a flood conveyance channel along the southern and western boundaries of 105-107 Mitchell Street.
- Associated vegetation removal and stockpiling of spoil.
- Construction of minor stormwater channels in the vicinity of the stockpile area.
- Installation of two new 1350mm diameter pipes along Charles Street to the northern side of Boundary Street with a debris control structure at the inlet.
- Lowering of the existing stormwater channel which runs from the northern side of Boundary Street to the Namoi River by approximately 1m.
- Replacement of existing pipes and penstock gates beneath the levee.
- Replacement of existing pipes beneath the access track to the north of the levee.
- Installation of two new duty and standby flood evacuation pumps with 1m³/s lift capacity internal to the levee.
- Placement of riprap in the base of the existing channel's confluence with the Namoi River.
- Installation of temporary and permanent fencing around the perimeter of the flood conveyance channel as well as appropriate safety signage.

The proposed works are shown at **Figure 6** and **Figure 7** and are described in the following sections.



Figure 6 Key features of proposed flood mitigation works (1 of 2)

Source: Lyall and Associates

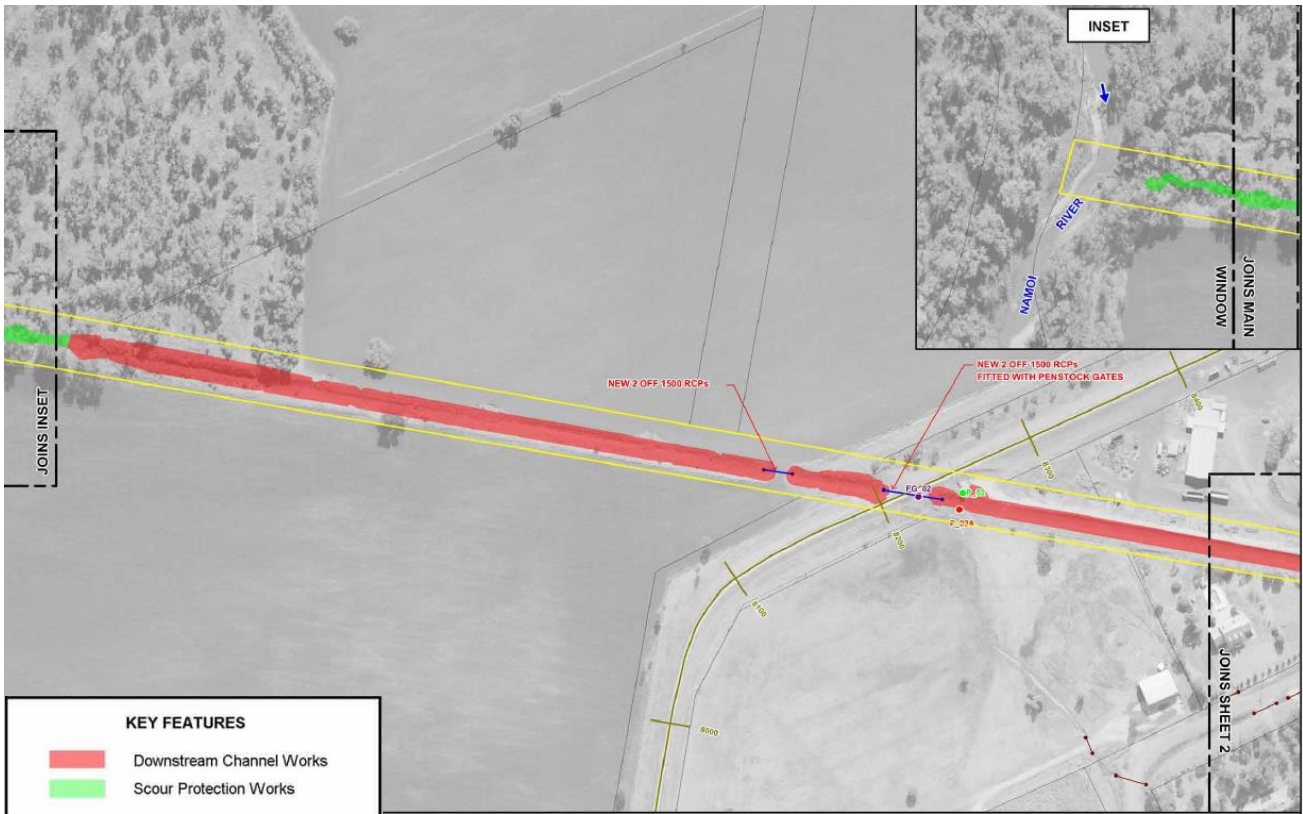


Figure 7 Key features of proposed flood mitigation works (2 of 2)

Source: Lyall and Associates

3.1.1 Civil Works

Flood conveyance channel

To render most of the site at 105-107 Mitchell Street appropriate for future development, an overland flood conveyance channel is proposed along the southern and western boundaries of the site. The channel comprises a high-flow conveyance/flood storage area of up to 30m in width (shown in green at **Figure 6**), with a 1.2m wide V-drain low flow channel at its centre (shown in orange at **Figure 6**). During frequent rain events, water will be conveyed within the low flow channel, with the high-flow conveyance/flood storage area being inundated only for more extreme flood events.

The proposed civil works include excavation, grading and construction of the channel as detailed in the Civil Engineering Drawings provided at **Appendix B**.

Stockpiling

Excavation of the flood conveyance channel and other areas within the project boundaries will result in excess spoil. It is proposed that this spoil be temporarily stockpiled within the 105-107 Mitchell Street site, in the area shown by yellow fill at **Figure 6**. Details of the stockpile layout and proposed grading is provided in the Civil Engineering Drawings provided at **Appendix B**. The material will be stockpiled until it is required for future development at the site (subject to separate approval), where it will then be used for fill on-site. The site is expected to be developed in the second half of 2022, so temporary stockpiles will remain for only a short period of time.

On-site stormwater upgrades

To ensure the 105-107 Mitchell Street Site has appropriate flood characteristics before it is developed in the future, some minor on-site stormwater upgrades are required. This includes several small, open-air catch drains running north-west through the centre of the site and along the northern boundary of the western part of the site (shown as blue arrows at **Figure 6**). These catch drains will direct localised rainfall and stormwater into the primary flood conveyance channel. In addition, localised connections to the existing stormwater drainage network are proposed

along George Street, Mitchell Street and Charles Street (shown as blue lines at **Figure 6**). Headwalls, junction pits and other required stormwater infrastructure will be constructed with these connections.

Excavation, grading and construction of these stormwater system elements is proposed as shown in the Civil Engineering Drawings provided at **Appendix B**.

New pipes in Charles Street and Boundary Street Road Reserve

To convey floodwaters from the flood-conveyance channel at 105-107 Mitchell Street downstream to the levee pumps, two 1350mm class 3 concrete stormwater pipes are proposed within the Charles Street Road Reserve, crossing Boundary Street in the north to discharge into the existing channel leading to the levee pump (shown as blue lines at **Figure 6**). The pipes will be installed with a minimum of 0.6m cover and the road/pavement above will be made good. No changes to the existing kerb and gutter arrangement is required. The existing twin 600mm pipes within the northern verge will remain operational during construction to provide flood protection, then will be capped and remain in place.

An option to provide box culverts along the southern side of Charles Street, with the same capacity as the 1350mm pipes (instead of pipes) is also being explored. Subject to final detailed design and agreement with Narrabri Shire Council, box culverts may be implemented in place of the 1350mm pipes. Since the box culverts would be located within the Charles Street road reserve and of the same capacity of the 1350mm pipes, the environmental impacts associated with a change to box culverts would remain essentially unchanged from those assessed under this REF. Detailed design documentation will be updated accordingly if the change to box culverts is made and agreed with Narrabri Shire Council.

Detailed Civil Engineering Drawings are provided at **Appendix B**.

Replacement levee pump and pipes

To enable additional volumes of water to be pumped over the levee and downstream to the Namoi River, it is proposed that the existing 750mm diameter pipe beneath the levee and its associated penstock gate be replaced with two new 1500mm diameter pipes which will be fitted with new penstock gates. The replacement of an existing 900mm diameter pipe located beneath the existing access track external to the levee with two new 1500mm diameter pipes is also proposed. New duty and standby flood evacuation pumps will be installed at the levee, each with a 1m³/s lift capacity internal to the levee. Associated infrastructure for access and servicing will also be installed. Refer to the Civil Engineering Drawings at **Appendix B** for further detail.

Channel deepening and scour protection

To accommodate the increased volume of water being conveyed downstream to the Namoi River, it is proposed to deepen the existing channel to the north-west of Boundary Street by up to 1m, within the existing footprint (shown as red at **Figure 6**). Scour protection works are also proposed at the discharge point to the Namoi River, which comprise of the placement of riprap at the base of the channel, at its confluence with the Namoi River (shown indicatively as green at **Figure 6**). Refer to the Civil Engineering Drawings at **Appendix B** for further detail.

3.1.2 Vegetation Removal

To facilitate the proposed works, tree and vegetation removal is proposed. A total of 40 trees are proposed to be removed, as described in the Arboricultural Impact Assessment at **Appendix F**. The remainder of the trees will be retained and protected. Replacement tree planting is proposed as described in **Section 3.1.3**. Refer to the Arboricultural Impact Assessment at **Appendix F** for further information.

3.1.3 Landscaping and Make-Good Works

Landscaping works are also proposed as follows:

- Sedge and grass planting within the high flow conveyance/flood storage channel and deepened downstream channel.
- Planting of 62 Eucalyptus microthea (Coolibah) trees throughout the project area.
- Concrete V-drain of 1.2m width within the low flow channel.

- Riprap planting at the levee and Charles Street discharge points.
- Seeding of the spoil stockpiles.
- Make good and rectification works to roads and footpaths as required.

Refer to the Landscape Drawings at **Appendix C** for further detail on the proposed landscaping.

3.1.4 Safety Fencing and Signage

Since the proposed activity includes the creation of a new flood conveyance channel and deepening of the existing downstream channel, appropriate safety fencing and signage is required to be installed. The following devices are proposed:

- A permanent 1.2m fence along the external boundary of the flood conveyance channel located at 105-107 Mitchell Street, internal to the site boundaries with no encroachment into the road reserve (shown as purple dashed line at **Figure 6**).
- Temporary 1.8m cyclone fencing along the internal boundary of the flood conveyance channel located at 105-107 Mitchell Street (shown as red dashed line at **Figure 6**). To be removed when site is redeveloped (subject to separate approval).
- Erection of signage affixed to the perimeter fencing alerting of the potential for these areas to be subject to flash flooding and for people not to enter the floodwater.
- Installation of a crash barrier along the edge of the access road between Boundary Street and the levee, as well on the edge of the access road on top of the levee near the pumps.

Refer to the Flood Impact Assessment at **Appendix D** and the Civil Engineering Drawings at **Appendix B** for further detail. The proposed fencing has been considered in the flood modelling and will not obstruct the flow of flood waters.

3.2 Evaluation of Alternatives

The proposed works will minimise potential flood impacts both within the 105-107 Mitchell Street site and the surrounding areas of the township.

A number of alternative options were considered by DoE and the project team. These alternatives included retaining the existing open channels within site and no downstream upgrades, which would result in no improvement to the flood conditions at the site or in the surrounding areas and would leave the site unsafe for future development.

Alternative configurations of the flood conveyance channel, localised stormwater channels and downstream works (including potential box culverts) were also considered as part of the design.

Each option was assessed against the consequent flood impacts to determine the most appropriate solution for the site and the surrounding areas. The proposed design was selected as it is able to appropriately mitigate flood impacts and will result in a suitable outcome for the site and the broader township.

Failure to undertake the proposed works could result in potentially harmful impacts in the event of a flood.

4.0 Planning Context

4.1 Environmental Protection and Biodiversity Conservation Act 1999

The provisions of the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) do not affect the proposed development as it is not development that takes place on or affects Commonwealth land or waters. Further, it is not development carried out by a Commonwealth agency, nor does the proposed development affect any matters of national environmental significance. An assessment against the EPBC Act checklist is provided at **Table 2**.

Table 2 EPBC Checklist

Factor	Impact Assessment
Any significant impact on a declared World Heritage Property?	N/A
Any significant impact on a National Heritage place?	N/A
Any significant impact on a declared Ramsar wetland?	N/A
Any significant impact on Commonwealth listed threatened species or endangered community?	N/A – refer to Section 5.4 .
Does any part of the proposal involve nuclear actions?	N/A
Any significant impact on Commonwealth marine areas?	N/A
Any significant impact on Commonwealth land?	N/A

4.2 Environmental Planning and Assessment Act 1979

Duty to Consider Environmental Factors

This REF considers the requirements of Part 5A and section 111 of the EP&A Act, as well as clause 171(2) of the *Environmental Planning and Assessment Regulation 2021* (EP&A Regs).

A determining authority is required to take into account all matters affecting or likely to affect the environment as a result of the proposed activity, in accordance with Section 111 of the Act. This REF addresses the provisions of Section 111, which relates to any conservation agreement entered into under the *National Parks and Wildlife Act 1974*. There is no conservation agreement made under this Act which applies to the site. Prior to the repeal of the *Threatened Species Conservation Act 1995*, Section 111 also set out matters to consider in assessing whether a proposal is likely to have a significant environmental impact. These considerations are now incorporated into the *Biodiversity Conservation Act 2016* and are considered at **Section 5.4** below.

4.3 State Environmental Planning Policy (Transport and Infrastructure) 2021

The proposed development can be carried out without development consent in accordance with two clauses set out under Chapter 2 of the T&I SEPP, being Division 7 and Division 20.

Division 7- Flood Mitigation Work

The proposed development can be carried out under clause 2.55 (Chapter 3, Division 7) of the T&I SEPP as development without consent. Under clause 2.55, development for flood mitigation work may be carried out by or on behalf of a public authority without consent on any land. NSW Department of Education is a public authority as defined by clause 1.4 of the EP&A Act 1979, and therefore is a public authority for the purpose of the T&I SEPP.

Flood mitigation works are defined as ‘work designed and constructed for the express purpose of mitigating flood impacts’ and may include ‘changing the characteristics of flood behaviour to alter the level, location, volume, speed or timing of flood waters to mitigate flood impacts. Types of works may include excavation, construction or enlargement of any fill, wall or levee that will alter riverine flood behaviour, local overland flooding, or tidal action so as to mitigate flood impacts.’ Clause 2.55 specifies that development for the purpose of flood mitigation works includes development for construction, routine maintenance, and environmental management works.

Clause 2.3(3) of the T&I SEPP also states that the following are taken to be '*construction works*' if they are carried out for the permitted purpose:

- (a) *accessways,*
- (b) *temporary construction yards,*
- (c) *temporary lay-down areas for materials or equipment,*
- (d) *temporary structures,*
- (e) *investigations (including geotechnical and other testing, surveying and the placement of survey marks, and sampling),*
- (f) *clearing of vegetation (including any necessary cutting, pruning, ringbarking or removal of trees) and associated rectification and landscaping,*
- (g) *demolition,*
- (h) *relocation or removal of infrastructure,*
- (i) *extraction of extractive materials at the construction site solely for the purpose of the construction.*

Division 20 – Stormwater Management Systems

Division 20, clause 2.136 of the T&I SEPP also permits stormwater management systems to be developed by a public authority without consent on any land. Stormwater management systems include works for the collection, detention, distribution or discharge of stormwater, stormwater quality control devices and stormwater reuse schemes. Accordingly, the proposed works are consistent with the above provisions. In accordance with clause 2.136(1), the works are being carried out on behalf of DoE. DoE is a public authority as defined by the EP&A Regs, and therefore is a public authority for the purpose of the T&I SEPP.

Consultation

There are no specific consultation requirements under Division 7 or Division 20, however general consultation requirements are identified in Division 1 of the T&I SEPP. Clause 2.10 requires consultation with the local Council for any development that would have a substantial impact on stormwater management services provided by Council. Clause 2.13 requires consultation with the NSW State Emergency Services (SES) for development undertaken in accordance with Division 20 that is on flood liable land. Clause 2.15 requires consultation with the Director of the Siding Springs Observatory for works that may change the sky brightness and are within 200km of the observatory.

In accordance with Division 1 of the T&I SEPP, consultation was undertaken as follows:

- Narrabri Shire Council were notified of the intent to carry out works and their scope for 21 days commencing in November 2021. No response was received within the 21 days. Non-statutory consultation with Council has been ongoing throughout the design process, since the proposed works impact Council assets.
- SES were notified of the intent to carry out works and their scope for 21 days commencing in November 2021. SES responded stating that they had no comments on the proposal.
- Siding Springs Observatory were notified of the intent to carry out works and their scope for 21 days commencing in November 2021. Acknowledgement of the notification was received but no comments were made on the proposal.

No comments were provided from the notified agencies for DoE to consider. As described above, consultation with Narrabri Shire Council has been ongoing during the design process since works will take place within local road reserves and will impact infrastructure assets managed by Council.

4.4 Other State Environmental Planning Policies

State Environmental Planning Policy (Resilience and Hazards) 2021

Chapter 4 Remediation of Land within SEPP (Resilience and Hazards) aims to promote the remediation of contaminated land for the purposes of reducing the risk of harm to human health or any other aspect of the environment. The SEPP specifies when consent is required for the remediation of land.

A Detailed Site Investigation has been completed by JBS&G (**Appendix E**) which concludes that:

- Desktop assessment and inspection of the site did not identify the potential for gross and/or widespread contamination at the site.
- Potential contamination impacts were assessed by the analysis at 16 sample locations. No contaminants were identified within site media samples analysed which exceeded relevant site screening assessment criteria for the proposed land use.
- A Construction Environmental Management Plan (CEMP), including an unexpected finds protocol, should be developed for the site to ensure that typical site management strategies are implemented, and no contamination is introduced to the site during redevelopment.

Therefore, the site is considered to be suitable for the proposed development pending implementation of the above in accordance with SEPP (Resilience and Hazards).

State Environmental Planning Policy (Biodiversity and Conservation) 2021

The Narrabri LGA or land zoned within the proposed site boundary is not listed under Chapter 2 'Vegetation in non rural areas'. Therefore Chapter 2 does not apply.

Chapter 4 of SEPP (Biodiversity and Conservation) incorporates the former SEPP Koala habitat protection 2021. The Koala SEPP 2021 commenced on 17 March 2021. The aim of this policy is "to encourage the conservation and management of areas of natural vegetation that provide habitat for koalas to support a permanent free-living population over their present range and reverse the current trend of koala population decline." The Koala SEPP 2021 applies to 'development' under Part 4 of the NSW Environmental Planning and Assessment Act 1979 (EP&A Act), specifically excluding Part 5 'activities. As such the SEPP does not apply to this assessment.

4.5 Narrabri Local Environmental Plan 2012

The key development standards for the site are contained within the *Narrabri Local Environmental Plan 2012* (NLEP 2012). **Table 3** provides an overview of the relevant clauses in the NLEP 2012 that would apply.

Table 3 Summary of Compliance with NLEP 2012

Clause	Provision	Compliance
Clause 2.3 Zoning	Part R1 General Residential Part RU1 Primary Production	Flood mitigation works are permissible in both zones.
Clause 5.10 Heritage Conservation	There are no heritage items in the vicinity of the site.	There will be no impacts to, or near, any mapped heritage items.
Clause 5.21 Flood planning	Council must consider if development within the flood planning area must be compatible with the flood function and behaviour of the land, as well as other flood-related provisions, before granting development consent.	Under the T&I SEPP, flood mitigation works are permitted to be carried out without development consent by a public authority on any land. Therefore, no consent is required and the considerations under clause 5.21 are not relevant. Nonetheless, the proposal has been designed to improve the flood characteristics of the land to which it relates and is therefore consistent with the intent of this clause.
Clause 6.1 Earthworks	Development consent is required for earthworks.	Earthworks are permitted without development consent under Chapter 2 of the T&I SEPP which is a higher order environmental planning instrument than the LEP. Therefore, development consent is not required for the proposed earthworks.
Clause 6.8 Active street frontages	Active frontages to be provided where mapped	The proposed development is not located in the vicinity of any mapped active frontages.

4.6 Other Relevant Legislation

4.6.1 Rural Fires Act 1997

The proposed works do not trigger the requirement to obtain a Bushfire Safety Authority under s100B of the *Rural Fires Act 1997* as the works are not located on land that is identified as being bushfire prone.

4.6.2 Biodiversity Conservation Act 2016

The *Biodiversity Conservation Act 2016* (BC Act) provides for the conservation of threatened species, populations and ecological communities. The Act is integrated with the EP&A Act and requires consideration of whether a development or an activity is likely to significantly affect threatened species, populations and ecological communities or their habitat.

There is one plant community type on the site that is identified as threatened ecological community under the BC Act (PCT 40: *Coolabah open woodland wetland with chenopod/grassy ground cover on grey and brown clay floodplains*). A complete assessment against the BC Act is provided in the Flora and Fauna Assessment prepared by EcoLogical Australia and provided at **Appendix G** (and summarised further in **Section 5.4**). The assessment finds that the Biodiversity Offset Scheme under the BC Act would not be triggered and that there will be no 'significant impact' to threatened species, populations, or ecological communities under section 7.3 of the BC Act.

4.6.3 Heritage Act 1977

The site is not a State or locally listed heritage item and the proposal will have no adverse impact on surrounding items of heritage significance. Therefore, the provisions of the Heritage Act 1977 do not apply to the proposed development.

4.6.4 Water Management Act 2000

There are three types of approval under the *Water Management Act 2000* (WM Act):

- Water use approval.
- Activity approval.
- Water management work approval.

Water use is not proposed and therefore a water use approval is not relevant.

There are two different types of activity approvals:

- Aquifer interference approvals
- Controlled activities approvals

Aquifer interference approvals relate to the disturbance of aquifers and are not applicable for the proposed flood mitigation works.

A controlled activity is the carrying out of works within 'waterfront land', which is defined as land within the boundaries of a body of water and up to 40m from its banks. Since the proposal includes works within 40m from the Namoi River, it is considered a controlled activity. Notwithstanding this, clause 41 of the *Water Management (General) Regulation 2018* states that 'A public authority is exempt from section 91E(1) of the Act in relation to all controlled activities that it carries out in, on or under waterfront land.' Since DoE is a public authority, it is exempt from requiring a controlled activity approval for the proposed flood mitigation works.

A flood work approval relates to construction of flood works such as barrages, causeways, cuttings, levees etc in the vicinity of a river/water body or floodplain. Flood works are proposed within the floodplain of the Namoi River. A flood work approval would therefore typically be required for the proposed works. However, clause 47 of the *Water Management (General) Regulation 2018* states that:

(1) A determining authority is exempt from section 91D(1) of the Act in relation to the construction or use of a flood work if—

- (a) the construction or use of the work is permitted to be carried out by the determining authority under the *Environmental Planning and Assessment Act 1979* (whether or not under a development authorisation), and
- (b) the work is situated in or on—
- (i) a place that is located within a managed designated high risk flood area, or
 - (ii) any other place (unless it is located within an unmanaged designated high risk flood area).

...

“managed designated high risk flood area” means a designated high risk flood area to which a floodplain risk management plan or floodplain risk management study applies (being a plan or study that has been developed and implemented by a local council in accordance with the *Floodplain Development Manual 2005*, or a replacement manual, notified under section 733 of the *Local Government Act 1993*).

Since DoE is the determining authority under Part 5 of the EP&A Act for the works, and there is a flood management plan for the area on which the works are proposed (and therefore the land is situated in a managed designated high risk flood area), then DoE are considered exempt from requiring a flood work approval for the proposed works.

4.6.5 Fisheries Management Act 1994

The provisions of the *Fisheries Management Act 1994* apply to development which involves dredging or reclamation work, obstruct fish passage, use explosives or harm marine vegetation. As the proposed works will not result in any of the activities or impacts described, a permit under the *Fisheries Management Act 1994* is not required.

4.6.6 Contaminated Land Management Act 1997

The relevant object of the *Contaminated Land Management Act 1997* to the proposed works is ‘to ensure that contaminated land is managed with regard to the principles of ecologically sustainable development.’

The public authority (in this case DoE) must ensure that the potential for land to be contaminated is taken into account for any Part 5 development and is adequately addressed in any Review of Environmental Factors. Further discussion with respect to contamination is provided at **Section 5.6**.

4.6.7 National Parks and Wildlife Act 1974

The *National Parks and Wildlife Act 1974* (NPW Act) relates to the establishment, preservation and management of national parks, historic sites and the protection of certain fauna, native plants and Aboriginal objects.

There are no national parks, historic sites, Aboriginal objects or other such sites or objects protected by the NPW Act that are located on or in the vicinity of the subject site. Therefore, the provisions of the NPW Act do not apply.

4.6.8 Roads Act 1993

Since the proposed works will be carried out within the reserve of public roads and involve connections to existing water infrastructure within the road reserves, an approval is required under Section 138 of the *Roads Act 1993*. An approval will be required from Narrabri Shire Council for any works in the local road reserves and an approval from TfNSW will be required for any works in the Mitchell Street road reserve given its classified road status.

4.7 Other Approvals

As described above, a section 138 approval under the *Roads Act 1993* (from Narrabri Shire Council for all local roads and TfNSW for Mitchell Street/Kamilaroi Highway) is required prior to the carrying out of any works located within the road reserve. Council as the ultimate owner and manager of any flood and stormwater infrastructure located in the local road reserves may be required to give non-statutory authorisation of acceptance of the assets (however this is not any kind of formal approval and is only subject to agreement between DoE and Council).

No separate approvals are required under the WM Act since DoE as a public authority is granted exemptions under the *Water Management (General) Regulation 2018* as described above.

5.0 Environmental Impact Assessment

The following section provides an outline of the potential impacts of the activity on the environment and how these potential impacts will be managed.

5.1 Environmental Planning and Assessment Regulations 2021 Checklist

Table 4 Summary checklist of matters to be considered

Factor	Impact
<p>(a) the environmental impact on the community The proposed works will minimise flood impacts on the affected portion of the 105-107 Mitchell Street site and many surrounding properties, resulting in a positive environmental impact. While some vegetation removal is proposed, the positive impacts associated with new land being rendered flood-free is considered to outweigh the negative impacts of vegetation removal. Compensatory tree-planting is also proposed to minimise the impacts of tree removal.</p>	-ve <input type="checkbox"/> Nil <input type="checkbox"/> +ve <input checked="" type="checkbox"/>
<p>(b) the transformation of the locality The proposed works are to improve the flood characteristics of the site and the broader township and will result in a neutral impact on the transformation of the locality.</p>	-ve <input type="checkbox"/> Nil <input checked="" type="checkbox"/> +ve <input type="checkbox"/>
<p>(c) the environmental impact on the ecosystems of the locality While some vegetation removal is proposed, compensatory tree-planting is proposed to minimise the impacts of the tree removal. The Flora and Fauna Assessment also finds that there will be no significant impact on any threatened species.</p>	-ve <input type="checkbox"/> Nil <input checked="" type="checkbox"/> +ve <input type="checkbox"/>
<p>(d) reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality The proposed works will improve the aesthetic, recreational and environmental qualities of the locality, and will not detrimentally impact any scientific qualities of the locality.</p>	-ve <input type="checkbox"/> Nil <input type="checkbox"/> +ve <input checked="" type="checkbox"/>
<p>(e) any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations The proposed activity will have a positive impact on the significance of the site for present and future generations by rendering areas within the township flood-free.</p>	-ve <input type="checkbox"/> Nil <input type="checkbox"/> +ve <input checked="" type="checkbox"/>
<p>(f) the impact on the habitat of protected animals, within the meaning of the <i>Biodiversity Conservation Act 2016</i> The Flora and Fauna Assessment concludes that there will be no significant impacts to any protected animals under the BC Act.</p>	-ve <input type="checkbox"/> Nil <input checked="" type="checkbox"/> +ve <input type="checkbox"/>
<p>(g) the endangering of a species of animal, plant or other form of life, whether living on land, in water or in the air The proposed works will not endanger any species of animal, plant or other forms of life.</p>	-ve <input type="checkbox"/> Nil <input checked="" type="checkbox"/> +ve <input type="checkbox"/>
<p>(h) long-term effects on the environment Long-term impacts associated with the proposal will generally be positive, with areas that are currently inundated during flood events being rendered flood-free. Short-term construction impacts are capable of being appropriately managed so as to not have any long-term impacts.</p>	-ve <input type="checkbox"/> Nil <input type="checkbox"/> +ve <input checked="" type="checkbox"/>
<p>(i) degradation of the quality of the environment The works will not impact on environmental quality. Mitigation measures will be put in place to reduce any impacts on air and water quality.</p>	-ve <input type="checkbox"/> Nil <input checked="" type="checkbox"/> +ve <input type="checkbox"/>
<p>(j) risk to the safety of the environment The proposed works include safety features such as fencing, signage and grates at the entrances to large pipes. The proposal will also direct floodwaters to dedicated a flood conveyance channel/storage area that will be fenced off and signposted, instead of inundating the existing unimproved site and neighbouring properties.</p>	-ve <input type="checkbox"/> Nil <input type="checkbox"/> +ve <input checked="" type="checkbox"/>

Factor	Impact
<p>(k) reduction in the range of beneficial uses of the environment By rendering land suitable for development (from a flooding perspective), the proposed activity will increase the range of beneficial uses of the environment.</p>	-ve <input type="checkbox"/> Nil <input type="checkbox"/> +ve <input checked="" type="checkbox"/>
<p>(l) pollution of the environment Minor air, noise, and water quality impacts from construction activities may be generated during construction. Mitigation measures are proposed to minimise pollution to the environment.</p>	-ve <input type="checkbox"/> Nil <input checked="" type="checkbox"/> +ve <input type="checkbox"/>
<p>(m) environmental problems associated with the disposal of waste No issues will arise from the disposal of waste generated during construction.</p>	-ve <input type="checkbox"/> Nil <input checked="" type="checkbox"/> +ve <input type="checkbox"/>
<p>(n) increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply No increased demands will be placed on resources which are, or are likely to be, in short supply.</p>	-ve <input type="checkbox"/> Nil <input checked="" type="checkbox"/> +ve <input type="checkbox"/>
<p>(o) cumulative environmental effect with other existing or likely future activities The environmental impacts during the construction works will be temporary, and appropriate mitigation measures will be put in place to reduce the temporary impacts on air, water and noise. The proposed works are considered to have positive cumulative effects in the long term.</p>	-ve <input type="checkbox"/> Nil <input checked="" type="checkbox"/> +ve <input type="checkbox"/>
<p>(p) the impact on coastal processes and coastal hazards, including those under projected climate change conditions The proposed activity is not located near a coastal area. Therefore there will be no impact to coastal process or hazards.</p>	-ve <input type="checkbox"/> Nil <input checked="" type="checkbox"/> +ve <input type="checkbox"/>
<p>(q) applicable local strategic planning statements, regional strategic plans or district strategic plans made under the Act, Division 3.1 The proposed activity does not alter the ability of the relevant local strategic planning statement, regional strategic plans or district plans being implemented.</p>	-ve <input type="checkbox"/> Nil <input checked="" type="checkbox"/> +ve <input type="checkbox"/>
<p>(r) other relevant environmental factors The proposal will result in improved flood characteristics for the Mitchell Street site and many surrounding properties throughout the township. Therefore, the proposed activity is considered to have a positive impact on other relevant environmental factors (of which flooding is the primary factor).</p>	-ve <input type="checkbox"/> Nil <input type="checkbox"/> +ve <input checked="" type="checkbox"/>

5.2 Flooding

A Flood Impact Assessment has been prepared by Lyall and Associates and is provided at **Appendix D**. As described in **Section 1.1**, while the township is protected by the ring levee for events up to approximately the 0.2% AEP riverine flood, the Mitchell Street site and surrounding areas within the levee are inundated during relatively frequent, localised flooding events.

The definition of flood behaviour conditions was based on the findings of the Wee Waa Levee Risk Management Study and Plan (Lyall & Associates, 2019), with some adjustments made and additional detail added to more accurately define flood behaviour internal to the levee. Flood behaviour was modelled using the TUFLOW model for storm events with AEPs of between 20% and 1% in intensity, as well as the Probably Maximum Flood (PMF). A comparison was made between the pre- and post-development conditions. The flood model included an assessment of the effect of blockages, climate change, a 'gates closed' scenario and a qualitative assessment of flood impacts during the construction stage.

A comparison between the inundation levels pre- and post-development is provided at **Figure 8** (for the 20% AEP event) and **Figure 9** (for the 1% AEP event). As can be seen, for the 20% AEP event, the Mitchell Street site is rendered entirely flood-free (outside of the flood conveyance area and stormwater channels). Properties to the north along Charles Street and Boundary Street are also rendered partially flood free, where they were previously inundated. Similarly, during a 1% AEP event, a majority of the Mitchell Street site is rendered flood-free, while

properties to the north experience significantly lower levels of inundation. **Figure 10** shows the areas rendered flood-free (in pink) for the 20% AEP and 1% AEP events. As can be seen, many properties (including the Mitchell Street site) will be rendered flood-free, particularly for more frequent localised flooding events.

The flood modelling was discussed with Narrabri Shire Council’s external flood consultant on 9 May 2022. Clarifications were made regarding the modelling used and the safety devices to be implemented. It was discussed that any future assessment for development at the site should consider the final layout and design of the flood mitigation works subject to this Part 5 approval.

In light of the above and detailed assessment provided at **Appendix D**, the flood mitigation works are considered appropriate to be implemented without further operational mitigation measures. A discussion of flood impacts during construction and construction mitigations measures is provided at **Section 8.0**.

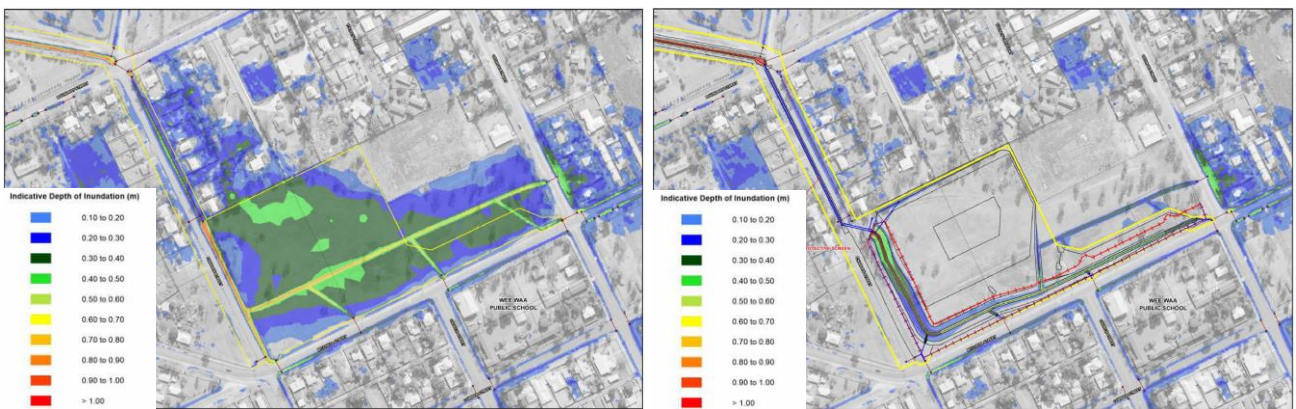


Figure 8 Flood inundation levels during a 20% AEP event pre-development (left) and post-development (right)

Source: Lyall and Associates

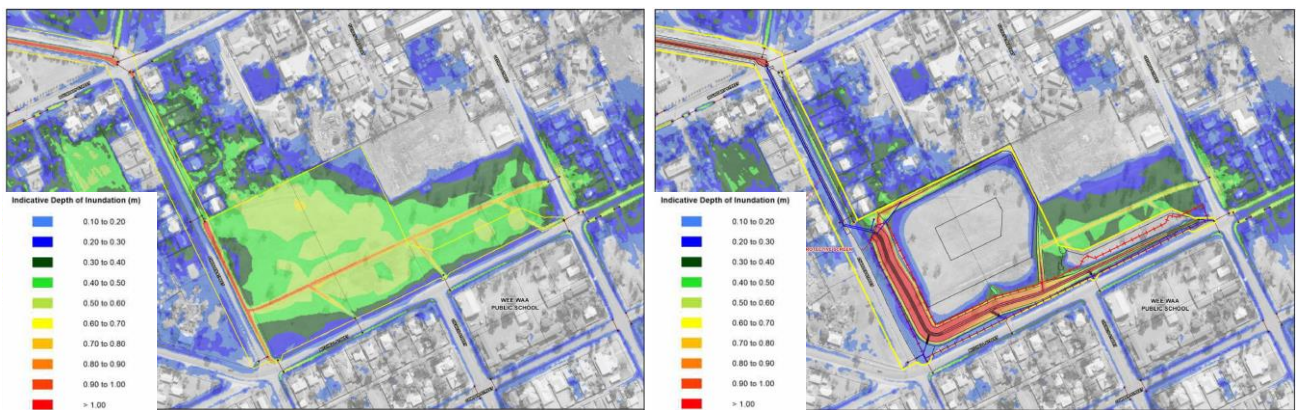


Figure 9 Flood inundation levels during a 1% AEP event pre-development (left) and post-development (right)

Source: Lyall and Associates

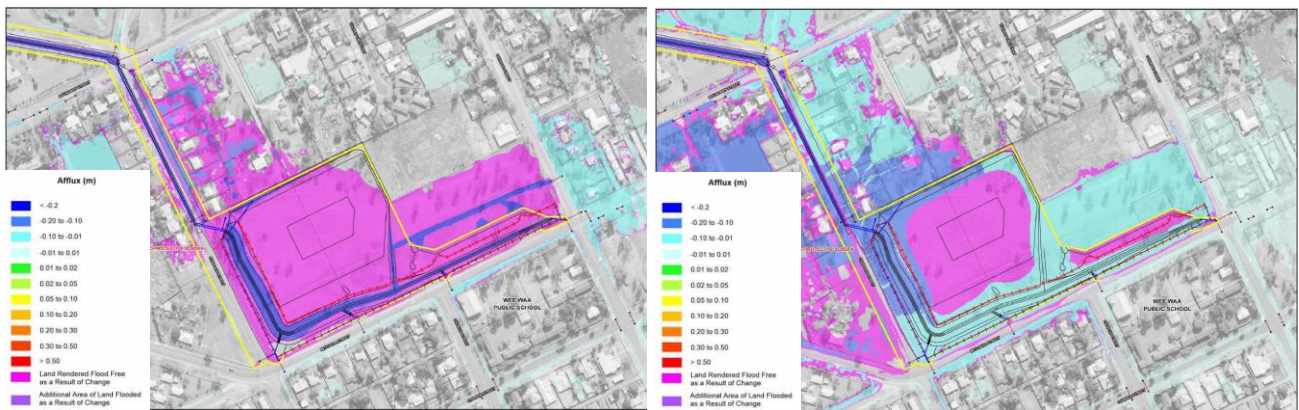


Figure 10 Afflux and land rendered flood-free (pink) post-development for 20% AEP (left) and 1% AEP (right)

Source: Lyall and Associates

5.3 Tree Removal

As described in **Section 3.1.2**, 40 trees are proposed to be removed. Compensatory planting of 62 trees is proposed as described in the Landscape Plans at **Appendix C** which is a significant increase on the number of existing trees. The biodiversity impact of proposed tree removal is assessed at **Section 5.4**.

5.4 Biodiversity

A Flora and Fauna Assessment prepared by EcoLogical Australia is provided at **Appendix G**. The assessment includes a 5-Part Test (Test of Significance) under the BC Act to assess the potential environmental impacts of the flood mitigation works in accordance with the requirements of Part 5 of the EP&A Act.

EcoLogical undertook a database review and site inspection to determine the extent of native vegetation, presence of any Threatened Ecological Communities (TECs), and to inform an assessment of potential impacts to threatened species or their habitat.

Plant Community Types (PCTs) present within the study area were identified as:

- PCT 36: River Red Gum tall to very tall open forest/woodland wetland on rivers on floodplains mainly in the Darling Riverine Plains Bioregion
- PCT 40: Coolabah open woodland wetland with chenopod/grassy ground cover on grey and brown clay floodplains. PCT 40 occurred in two condition zones: 'Grassland' and 'Moderate'.

As described in **Section 2.2.1**, both conditions zones of PCT 40 were identified as a listed TEC under the BC Act. However, the 'Grassland' condition zone did not meet the condition thresholds for the equivalent EPBC listed TEC.

Potential habitat for threatened species, communities and populations was assessed during the field survey and a species likelihood assessment is provided at **Appendix G**. The assessment indicated that two threatened flora species and four threatened fauna species had the potential to occur on site on occasion. Impact assessments using the 'test of significance' under section 7.3 of the BC Act determined no significant impact on threatened species, population or communities was likely to result from the proposed activity.

Following the site inspection, it was determined that the Biodiversity Offset Scheme (BOS) under the BC Act would not be triggered since:

- There is no significant impact to threatened species, populations or ecological communities.
- There are no Areas of Outstanding Biodiversity Value onsite.

Since the BOS thresholds were not triggered, a Flora and Fauna Assessment has been prepared to assess the impacts on biodiversity.

An assessment for species listed under the EPBC Act has also been undertaken in accordance with Significant Impact Criteria in the Significant Impact Guidelines 1.1. These concluded that a significant impact is not likely to result and therefore a referral to the Commonwealth Department of Environment and Energy is not recommended.

Mitigation measures and recommendations have been provided to reduce impacts to threatened species and ecological communities within and adjacent to the study area.

Impacts to the remainder of the Mitchell Street allotments (i.e. outside the study area) have not been assessed since no works or vegetation removal are proposed in this area. At the time of writing, a BDAR associated with a separate State Significant Development Application at the Mitchell Street site was under assessment by DPE, which assessed biodiversity impacts to the area on the remainder of the Mitchell Street allotments outside the Flora and Fauna Assessment study area.

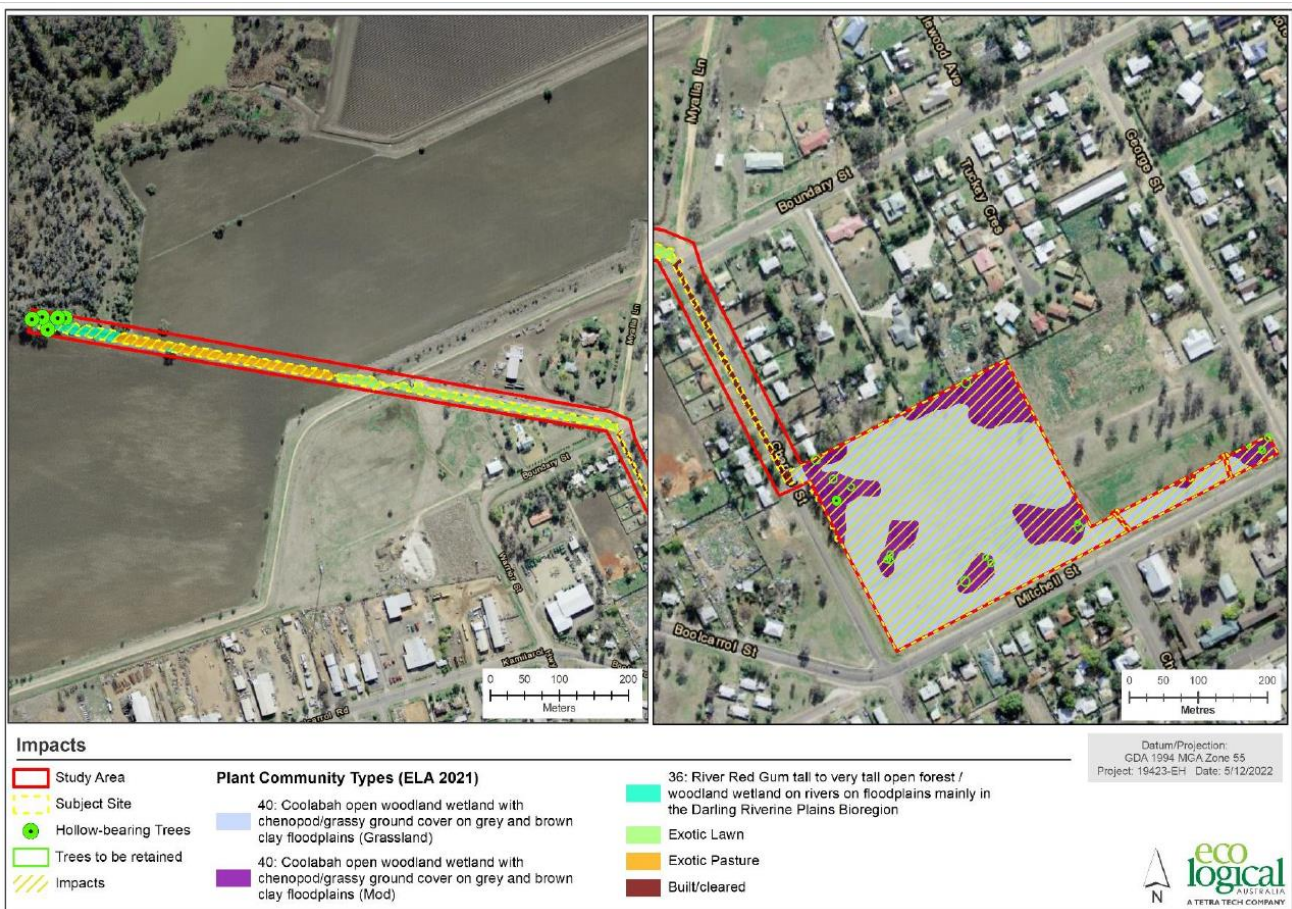


Figure 11 Aerial image showing impact of proposed development footprint on plant type communities

Source: EcoLogical Australia

5.5 Heritage

The proposal will not impact any built European heritage items. There are no listed items in the vicinity of the proposed activity.

An Aboriginal Heritage Due Diligence Assessment Report prepared by OzArk is provided at **Appendix I**. The assessment finds that no additional Aboriginal sites were recorded during the field inspection and all landforms were assessed as having low potential to contain Aboriginal objects in subsurface archaeological deposits. The due diligence process resulted in the conclusion that the proposed works will have an impact on the ground surface, however, no Aboriginal objects or intact archaeological deposits will be harmed by the proposal. As such, no AHIP application is necessary, and the activity may proceed with caution. If any Aboriginal objects are found, stop work and notify Heritage NSW. If human remains are found, stop work, secure the site, and notify NSW Police and Heritage NSW. Additional mitigation measures are proposed at **Appendix I** and are outlined at **Section 8.0**.

5.6 Contamination

A Detailed Site Investigation has been completed by JBS&G (**Appendix E**) which concludes that:

- Desktop assessment and inspection of the site did not identify the potential for gross and/or widespread contamination at the site.
- Potential contamination impacts were assessed by the analysis at 16 sample locations. No contaminants were identified within site media samples analysed which exceeded relevant site screening assessment criteria for the proposed land use.
- A Construction Environmental Management Plan (CEMP), including an unexpected finds protocol, should be developed for the site to ensure that typical site management strategies are implemented, and no contamination is introduced to the site during redevelopment.

Therefore, the site is considered to be suitable for the proposed development pending implementation of the above.

5.7 Geotechnical

A Geotechnical Assessment has been prepared by Douglas Partners and is provided at **Appendix H**. The assessment is based on the results of fieldwork undertaken on-site in February 2022 and found that the bores typically encountered stiff to hard silty clay for the depth of investigation with the exception of the following:

- Bore 4 encountered fill (gravelly clayey sand and clayey sand) to 1.3 m depth.
- Bore 5 encountered fill (gravelly clay) to 0.18 m depth.
- Bore 7 encountered firm to stiff silty clay at 0.5 m to 0.8 m depth.
- Groundwater seepage was observed at 1.3 m depth in Bore 4 whilst drilling.

The assessment provides a range of recommendations and mitigation measures for excavation and batters, subgrade preparation for areas to be filled, and the re-use of material. These measures are described at **Section 8.0**.

The assessment also concludes that based on the conditions encountered in the bores, material won from on-site excavation could be re-used for structural fill purposes on the site for its potential future redevelopment.

5.8 Traffic and Transport

A Traffic and Transport Impact Assessment has been prepared by TTW and is provided at **Appendix L**. The assessment outlines that the existing traffic conditions will be retained upon completion of the flood mitigation works. This includes the reinstatement of on-street parking, re-opening of partial or closed roadways, and no change to trip generation. However, the completed works may impact informal existing pedestrian route across the site to access grassed paths within the road reserves of Charles Street, Mitchell Street and George Street may become restricted due to the new high flow conveyance channel. Alternative pedestrian routes are available on the opposite side of these streets. Specifically, the southern side of Mitchell Street has an existing footpath with kerb and guttering so is suitable for pedestrian activity. The western side of Charles Street is wide, with kerb and guttering and an absence of open stormwater channels and is therefore more suitable for pedestrians than the site frontage. George Street has comparable pedestrian conditions on both sides of the street and is appropriate for alternative pedestrian routes. Therefore, the proposal is expected to provide a satisfactory level of operation regarding traffic and transport. Construction related traffic and transport impacts are discussed at **Section 5.11.4**.

5.9 Visual Impact

The proposal will have minimal visual impacts to the locality. Landscaping as proposed in **Appendix C** will ensure the infrastructure has a pleasant visual presence and will integrate with the surrounding area, particularly through the use of native planting. There will be some visual impacts associated with fencing, but these are considered appropriate given the context of the proposed activity. Maintenance of the primary flood conveyance channel has been considered, with access points provided in the fencing so that a mower/slasher can enter and cut any long grass that may grow within the channel. The slope of the channel is such that it can be mowed/slashed and the concrete V-drain at the centre will not require mowing or slashing. Therefore, visual impacts can be managed and mitigated.

5.10 Bushfire

The site is not located on bushfire prone land. The proposal will not significantly increase the risk of bushfire at the site. Therefore, there are not expected to be any adverse bushfire impacts associated with the proposal.

5.11 Construction Management

A preliminary Construction Management Plan has been prepared by Built and is provided at **Appendix M**. A summary of the key construction impacts to be managed is provided below. Construction will be undertaken during the following standard hours:

- Monday to Friday: 7:00am to 6:00pm.
- Saturday: 8:00am to 1:00pm.
- Sunday's and public holidays: no works.

5.11.1 Waste Management

Waste Management shall be in accordance with the Preliminary Construction Management Plan provided at **Appendix M**. The plan states that a detailed Waste Management Plan will be prepared as part of the Construction Environmental Management Plan (to be prepared prior to commencement of construction). At a minimum, the contractor will ensure that all generation, storage, treatment and disposal of waste as a result of this project are conducted in accordance with all relevant waste legislation administered by the NSW EPA and work, health and safety requirements under WorkCover NSW. The main legislative requirements and guidelines that will govern the management of waste for this development are the *Waste Avoidance and Recovery Act 2001*, *Protection of the Environment Operations Act, 1997*, and Narrabri Shire Council's Waste Management policies.

The contractor will employ the services of a waste management sub-contractor to ensure that all rubbish is collected in an appropriate receptacle and is removed from site regularly. The contractor shall ensure the engaged sub-contractor operates in compliance with the Waste Management Plan and all applicable codes & statutes.

Spoil will be stockpiled on-site for future reuse in accordance with the recommendations of the Geotechnical Assessment provided at **Appendix H**.

5.11.2 Air Quality

Appropriate air quality during construction will be managed through implementation of the Preliminary Construction Management Plan (**Appendix M**). In particular, detailed dust management procedures will be implemented as part of the Construction Environmental Management Plan (to be prepared prior to commencement of construction). The Sediment and Erosion Control Plan will also be implemented (as shown at **Appendix B**) and inspected on a regular basis by the contractor.

Work on site will be monitored in conditions of high wind to mitigate high levels of dust being created. Any material stockpiled for an extended duration on site will be covered to prevent the material becoming airborne in adverse weather conditions. Work on site will also be monitored in conditions of high wind to ensure unacceptable levels of dust are not created. In such circumstances, the works creating the dust shall cease until more suitable conditions prevail. Areas subject to dust creation will be 'watered down' on a regular basis, where continued periods of high wind exist.

5.11.3 Noise and Vibration

A Noise and Vibration Impact Assessment has been prepared by Day Design and is provided at **Appendix J**. The assessment considers the noise and vibration impacts associated with construction activities and their impacts on surrounding receivers.

The assessment established background noise levels by undertaking on-site noise monitoring at the site. Based on the background noise monitoring and the NSW EPA Interim Construction Noise Guidelines, the following noise management levels were set for each type of property surrounding the site:

- Residential dwellings along Mitchell Street: 50dBA.

- All other surrounding residential dwellings: 49dBA.
- Highly noise affected dwellings: 75dBA.
- Classrooms at existing public school: 45dBA (internal noise level) or 55dBA external (windows open).

Based on the anticipated construction activities associated with the proposal, the noise management levels are expected to be exceeded during certain activities at all receivers. The highly affected noise levels may also be approached for works carried out close to affected locations. Therefore, a range of mitigation measures are proposed to limit the impact of construction noise on the surrounding sensitive receives, as described in **Section 8.0** and **Appendix J**.

Mitigation measures are also proposed to minimise any potential vibration impacts, such as vibration monitoring. These are also described in **Section 8.0** and **Appendix J**.

5.11.4 Pedestrian and Traffic Management

Construction pedestrian and traffic management has been assessed at **Appendix L**. A summary of the assessment in relation to vehicle movements is provided as follows:

- Construction works are expected to generate an increased volume of vehicles to the site. These may include worker vehicles, trucks and movement of plant and equipment.
- Public access to the site will be restricted during construction. Members of the public will be prohibited from entering the construction site. However, any residential properties or important access points located within construction zones will have their access retained.
- The works adjacent to Mitchell Street are expected to be accessed from within the undeveloped block of land without impacting traffic on Mitchell Street. This is the preferred arrangement because Mitchell Street serves as a connection through Wee Waa for the Kamilaroi Highway and is used by oversized road trains which pass the site approximately every 10 to 15 minutes during peak hour.
- The works occurring on Charles Street may require a partial road closure arrangement during certain stages of construction because the existing and proposed drainage line is located within the road reserve, and access from the roadway may be necessary. This may also be required as the proposed works traverse Boundary Street further to the north (subject to separate approval under the *Roads Act 1993* as required). Options to access the drainage line from within the road reserve without impacting Charles Street may be explored to minimise traffic impacts.
- Access to the drainage pipe system at the northern end of Charles Street will require some level of road closure as the drainage line runs directly below the roadway at the intersection of Boundary Street with Myalla Lane and Charles Street. Arrangements will be made to provide access to properties accessible via Myalla Lane.
- Access to the floodwater channel leading to the Namoi River is not expected to generate any traffic impacts, as this channel is located away from the roadway.
- Where possible, off-street construction vehicle parking is encouraged to minimise the impacts to on-street parking on the local road network. The 105-107 Mitchell Street site has sufficient space to accommodate the estimated number of construction vehicles per day.
- Due to the widely available on-street parking in the surrounding road network, the demand for on-street parking during construction is expected to be suitably accommodated in other areas. Furthermore, the encouragement of off-street construction vehicle parking will minimise the impacts to on-street parking.

An assessment of the construction impacts on pedestrian and cyclist routes was also undertaken and is summarised as follows:

- No growth in pedestrian or cyclist demand for the development site is anticipated during the construction phase. However, the existing pedestrian and cyclist movements around the site may be impacted by road or road reserve closures.
- The most affected pedestrian route due to the proposed works is along Charles Street, George Street and a portion of Boundary Street. Most pedestrian attracting sites such as schools, parks and the town centre are located to the south of the site, meaning pedestrians residing to the north of the site will pass by the development site to reach these places.

- The possibility of a full or partial closure of the southbound Charles Street and northbound George Street road reserves would require pedestrians to travel on the opposite side of the road. This arrangement will suitably accommodate all pedestrian traffic, but measures to ensure pedestrian safety when navigating around construction works must be implemented.
- Cyclist movements in the area are very low and the impacts to cyclists during construction are minimal. Any closures of the southbound lane on Charles Street or northbound lane on George Street would require cyclists to use a detour route such as along Warrior Street or Cormie Avenue.

A Preliminary Construction Management Plan is also provided at **Appendix M** which outlines the traffic procedures to be implemented in accordance with the above recommendations. A detailed Construction Pedestrian and Traffic Management Plan will also be prepared and implemented prior to the works commencing. The Construction Pedestrian and Traffic Management Plan will consider the following:

- Ensuring safe vehicle and pedestrian access at George St, Charles St, Boundary St and Myall Lane.
- Maintaining safe access to all adjacent neighbouring driveways and pedestrian thoroughfares.
- Existing traffic flow and effects on surrounding road network.
- Truck routes TfNSW requirements.
- Authority Permits and approvals (including approvals under Section 138 of the *Roads Act 1993*).
- Existing services and infrastructure within and surrounding the site (i.e Telstra and Stormwater Pits).

5.11.5 Flooding

An assessment of the potential flooding impacts during construction has been provided at **Appendix D**. The assessment finds that without appropriate management measures, the site may be inundated causing:

- Potential damage to the flood mitigation works and delays in construction programming.
- Potential inundation of site sheds, limiting access to works areas.
- Potential safety risks to construction workers.
- Potential impacts to the downstream waterways through the transport of sediments and construction materials by floodwater.
- Possibly obstruction of 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.

A range of mitigation measures are proposed to manage these potential construction impacts, as described in **Section 8.0** and at **Appendix D**.

5.11.6 Sediment and Erosion Control

A sediment and erosion control plan has been prepared by Warren Smith and Partners and is provided at **Appendix B**. The plan will be implemented during construction to manage any potential sediment and erosion impacts. Further discussion regarding air quality and dust is provided at **Section 5.11.2**.

5.12 Impact on the Community

Temporary impacts to the community during construction such as traffic, noise and dust will be for a short period of time and will be managed in accordance with the Preliminary Construction Management Plan provided at **Appendix M**. The proposed works will have positive ongoing impacts on the community since they will result in land being rendered flood-free during certain flood events.

5.13 Cumulative Environmental Impacts

The cumulative environmental impacts from the proposed development are considered to be temporary and minimal. Mitigation measures outlined in **Section 8.0** aim to mitigate those impacts on the community resulting from the construction of the development.

Currently there is an SSD Application under assessment by the NSW Department of Planning for the future construction of a new primary school on the site at 105-107 Mitchell Street. The environmental assessment provided with the Environmental Impact Statement for this separate project includes consideration of the flood mitigation works proposed in this Part 5 activity. There are no other major projects in the vicinity of the site that may contribute to cumulative environmental impacts.

The proposed flood mitigation works are likely to have a positive environmental impact, as they will minimise potential flood risks. The landscaping scheme will provide a visually pleasing and appropriate space for students and staff. The proposal is considered to have positive effects in the long term as the works will reduce the impact of localised flood events.

6.0 Summary of Impacts

The objective of the development is to implement flood mitigation works to minimise potential future flood impacts on the Mitchell Street site and the surrounding sites within the township. The preceding sections of this REF have assessed the impacts of the proposal and have found that impacts resulting from the proposed works can be appropriately mitigated and do not represent a significant impact on the environment. Therefore, an EIS is not required. These impacts are summarised below.

Biophysical Impacts

Potential impacts on the biophysical environment as a result of the proposed works are manageable through the implementation of the mitigation measures described in **Section 8.0**. Impacts include short-term impacts during construction such as localised flooding, sediment, dust and erosion, noise and vibration. A construction management plan will also be implemented to manage these impacts.

The proposed works will result in the following positive biophysical impacts once complete:

- Improving the conveyance of storm and flood water through the Mitchell Street site and the broader Wee Waa township.
- Rendering some sites flood-free under certain flood events, which would have previously been inundated.
- Impacts to biodiversity associated with vegetation removal that have been assessed as not significant.
- Providing new native tree and grass planting.

Social Impacts

The proposed construction works will result in minor negative temporary impacts to surrounding residents and students of the Wee Waa Public School. A range of mitigation measures are proposed to be implemented to minimise construction related impacts as described in **Section 8.0**.

The proposal will result in positive social impacts once complete, including increased awareness of flood safety procedures through installation of signage and safety fencing. The proposed works also include landscaping that will result in a positive social and amenity impact.

Economic Impacts

The proposed works will minimise potential flood impacts, rendering several sites within the township flood-free for certain flood events. This will minimise any expenditure to repair potential flood damage and will improve the potential for future development at these sites. The proposed works will also generate design and construction jobs, resulting in a positive economic impact.

7.0 Conclusion and Recommendations

This REF has been prepared for authorisation by NSW Department of Education. The report describes the proposed flood mitigation works and assesses the works against the relevant environmental planning instruments, social and environmental impacts.

This REF has been prepared in accordance with the *Environmental Planning and Assessment Act 1979*, the *Environmental Planning and Assessment Regulation 2021*, *State Environmental Planning Policy (Transport and Infrastructure) 2021* and other applicable Commonwealth and State legislation.

It is considered that the proposed works warrant authorisation for the following reasons:

- The works comply with all relevant planning controls.
- The potential impacts of the construction and ongoing use of the development are minor and can be appropriately managed.
- The works will improve the conveyance of flood and storm water throughout the Wee Waa township, minimising the impact of future localized flood events and rendering some sites flood-free in some flood events that would have previously inundated them.
- The works will provide a new landscape setting for the site.
- There will be positive social and economic impacts for the township of Wee Waa.

As a result of the planning merits describe above, and the associated biophysical, social and economic impacts, it is recommended that NSW Department of Education authorise the proposed activity.

8.0 Mitigation Measures

This REF applies to flood mitigation works within the Wee Waa township outlined above and is consistent with the provisions of the T&I SEPP. Activities undertaken during construction would require environmental safeguards to a suitable standard to be implemented through the project methodology, to reduce any potential adverse impacts arising from the proposed works on the surrounding environment.

The following identified requirements have been imposed to ensure that the development activity is carried out in accordance with the plans/documents and any amendments approved under Part 5 of the *Environmental Planning & Assessment Act 1979*.

1. Details of the Activity

- The activity must be carried out substantially in accordance with the following plans / documents as modified below except where the mitigation measures expressly require otherwise:

Identified requirements			
Civil Engineering Drawings prepared by Warren Smith			
Number	Rev	Name of Plan	Date
C1.01	4	Cover Sheet	12/05/22
C1.02	2	Specification Notes	12/05/22
C1.03	3	Existing Survey	12/05/22
C1.04	2	Key Plan	12/05/22
C2.01	3	Sediment & Erosion Control Plan	12/05/22
C2.02	2	Sediment & Erosion Control Details	12/05/22
C3.01	3	Bulk Earthworks Plan - Sheet 1	12/05/22
C3.02	3	Bulk Earthworks Plan - Sheet 2	12/05/22
C3.03	3	Bulk Earthworks Plan - Sheet 3	12/05/22
C3.04	4	Bulk Earthworks Cut & Fill Plan - Sheet 1	12/05/22
C3.05	4	Bulk Earthworks Cut & Fill Plan - Sheet 2	12/05/22
C3.06	4	Bulk Earthworks Cut & Fill Plan - Sheet 3	12/05/22
C4.01	4	Siteworks Plan - Sheet 1	12/05/22
C4.02	4	Siteworks Plan - Sheet 2	12/05/22
C4.03	4	Siteworks Plan - Sheet 3	12/05/22
C4.04	5	Siteworks Plan - Sheet 4	12/05/22
C4.05	4	Siteworks Plan - Sheet 5	12/05/22
C4.06	4	Siteworks Plan - Sheet 6	12/05/22
C4.07	5	Siteworks Plan - Sheet 7	12/05/22
C4.24	2	Pavement Plan - Sheet 1	12/05/22
C6.01	3	Stormwater Plan - Sheet 1	12/05/22
C6.02	3	Stormwater Plan - Sheet 2	12/05/22
C6.03	4	Stormwater Plan - Sheet 3	12/05/22
C6.04	5	Stormwater Plan - Sheet 4	12/05/22
C6.05	4	Stormwater Plan - Sheet 5	12/05/22
C6.06	3	Stormwater Plan - Sheet 6	12/05/22
C6.07	4	Stormwater Plan - Sheet 7	12/05/22
C6.31	3	Stormwater Channel 1 Longitudinal Section - Sheet 1	12/05/22
C6.32	3	Stormwater Channel 1 Longitudinal Section - Sheet 2	12/05/22
C6.33	3	Stormwater Channel 2 Longitudinal Section - Sheet 1	12/05/22

C6.34	3	Stormwater Channel 3 Longitudinal Section - Sheet 1	12/05/22
C6.35	3	Stormwater Channel 3 Longitudinal Section - Sheet 2	12/05/22
C6.41	2	Stormwater Channel 1 Cross Section - Sheet 1	12/05/22
C6.42	2	Stormwater Channel 1 Cross Section - Sheet 2	12/05/22
C6.43	2	Stormwater Channel 1 Cross Section - Sheet 3	12/05/22
C6.44	2	Stormwater Channel 3 Cross Section - Sheet 1	12/05/22
C6.45	2	Stormwater Channel 3 Cross Section - Sheet 2	12/05/22
C6.46	2	Stormwater Channel 3 Cross Section - Sheet 3	12/05/22
C6.51	3	Stormwater Drainage Details	12/05/22
C6.61	2	Pump Station Layout - Sheet 1	12/05/22
C6.52	2	Pump Station Layout - Sheet 2	12/05/22
Survey Plan prepared by Monteath and Powys			
Number	Rev	Name of Plan	Date
1	1	Detail Survey Sheet 1/12	16/02/2022
2	1	Detail Survey Sheet 2/12	16/02/2022
3	1	Detail Survey Sheet 3/12	16/02/2022
4	1	Detail Survey Sheet 4/12	16/02/2022
5	1	Detail Survey Sheet 5/12	16/02/2022
6	1	Detail Survey Sheet 6/12	16/02/2022
7	1	Detail Survey Sheet 7/12	16/02/2022
8	1	Detail Survey Sheet 8/12	16/02/2022
9	1	Detail Survey Sheet 9/12	16/02/2022
10	1	Detail Survey Sheet 10/12	16/02/2022
11	1	Detail Survey Sheet 11/12	16/02/2022
12	1	Detail Survey Sheet 12/12	16/02/2022
Landscape Plans prepared by Moir			
Number	Rev	Name of Plan	Date
LP01	D	COVER SHEET	13/05/2022
LP02	D	OVERALL SITE PLAN	13/05/2022
LP03	D	SITE PLAN - PART A	13/05/2022
LP04	D	PART A - LANDSCAPE PLAN 01 & 02	13/05/2022
LP05	D	PART A - LANDSCAPE PLAN 03 & 04	13/05/2022
LP06	D	PART A - LANDSCAPE PLAN 05 & 06	13/05/2022
LP07	D	PART A - LANDSCAPE PLAN 07 & 08	13/05/2022
LP08	D	SITE PLAN - PART B	13/05/2022
LP09	D	PART B - LANDSCAPE PLAN 01 & 02	13/05/2022
LP10	D	PART B - LANDSCAPE PLAN 03 & 04	13/05/2022
LP11	D	PART B - LANDSCAPE PLAN 05 & 06	13/05/2022
LP12	D	PART B - LANDSCAPE PLAN 07 & 08	13/05/2022
LP13	D	PART B - LANDSCAPE PLAN 09	13/05/2022
LP14	D	DETAILS	13/05/2022
LP15	D	SPECIFICATION	13/05/2022
Flooding Technical Working Paper Rev No: 1.1 dated April 2022 prepared by Lyall and Associates			
Detailed Site Assessment: Flood Mitigation Material Reuse Mitchell & Charles Streets, Wee Waa, NSW (Rev 0) dated 11 May 2022 prepared by JBS&G			

Arborist Assessment Report dated 13/5/22 prepared by McArdle and Sons
Wee Waa Drainage Works Flora and Fauna Assessment V3 dated 12 May 2022 prepared by EcoLogical Australia
Report on Geotechnical Investigation Rev1 dated 11 May 2022 prepared by Douglas Partners
Aboriginal Due Diligence Assessment Report V3 dated 10 May 2022 prepared by OzArk
Construction Noise Assessment FINAL dated 11 May 2022 prepared by Day Design
Structural REF Concept Design Report Revision B dated 12.05.22 prepared by Northrop
Traffic Impact Assessment Rev 1 dated 11 May 2022 prepared by TTW
Construction Management Plan – Preliminary dated May 2022 prepared by Built

- In the event of any inconsistency between the approved plans and supporting documentation, the approved plans prevail. In the event of any inconsistency between the approved plans and a mitigation measure/condition, the mitigation measures/condition prevails.

2. Amendment Tracking

- Where amendments to the approved plans are required, an amendments register is required which demonstrates the proposed changes and how these are considered to be substantially the same or not. The register can include any commentary from the principal certifying authority and each change is required to be endorsed by Statutory Planning prior to the change being implemented.

3. Compliance with the Building Code of Australia and Australian Standard

- All building work must be undertaken in accordance with the Building Code of Australia and referenced Australian Standards.

4. Access for People with Disabilities

- The works must be designed and constructed to provide access and facilities for people with a disability in accordance with the BCA. Prior to the issue of a Crown Certificate for any building works, the Certifying Authority must ensure that evidence of compliance with this condition from an appropriately qualified person is provided and that the requirements are referenced on any certified plans.

5. Crown Certificate

- If a Crown Certificate is required for any proposed building works, construction must not commence until a Crown Certificate has been issued by a Certifying Authority.

6. Long Service Levy

- A levy payable under Section 34 of the *Building and Construction Industry Long Service Payments Act 1986* is to be paid. The levy must be paid by the person liable, as specified in Section 38 of the Building and Construction Industry Long Service Payments Act 1986.

7. Council Notification

- The local council for the area shall be advised in writing of the date it is intended to commence work, including demolition, prior to construction commencing. A minimum period of seven (7) days notification shall be given.

8. Notification to occupiers of adjoining land

- The adjacent and surrounding neighbouring properties shall be advised in writing, of the date it is intended to commence work, including demolition, prior to construction commencing. A minimum period of seven (7) days notification shall be given.

9. Management of flood mitigation assets and stormwater infrastructure

- The flood mitigation works will be managed and maintained by DoE for a period of 12 months after completion. Beyond this 12-month maintenance period, Narrabri Shire Council will be responsible for the management of

the flood mitigation works and associated stormwater infrastructure constructed under this Part 5 approval (subject to a separate agreement with DoE).

- The design may be amended to include box culverts in place of the 1350mm stormwater pipes proposed in the Charles Street Road Reserve, subject to agreement with Narrabri Shire Council.

10. Design

- Design flood mitigation works and stormwater management infrastructure in accordance with the Civil Engineering Drawings prepared by Warren Smith.
- Deliver landscaping works generally in accordance with the Landscape Plans prepared by Moir.

11. Construction Management

- All relevant legislation and associated regulations would be complied with.
- The hours of demolition or construction, including delivery of materials to and from the site, shall be restricted as follows:
 - Monday to Friday: 7:00am to 6:00pm.
 - Saturday: 8:00am to 1:00pm.
 - Sunday's and public holidays: no works.
- Demolition and construction may be undertaken outside of the hours listed above if required:
 - By the police or public authority for the delivery of vehicles or materials;
 - In an emergency to avoid the loss of life, damage to property or to prevent environmental harm; or
 - Where the works are inaudible at the nearest sensitive receivers.
- A Construction Environmental Management Plan (CEMP) will be prepared prior to the commencement of construction. The CEMP will be implemented for the duration of construction. Prior to the commencement of work, the CEMP is to be submitted for review to SINSW Statutory Planning Compliance Team (StatutoryPlanning@det.nsw.edu.au) prior to being submitted to the Certifying Authority for approval.
- The CEMP must be consistent with the Guidelines for the Preparation of Environmental Management Plans 2004 prepared by the Department of Planning and Environment.
- The recommended mitigation measures within the Preliminary Construction Management prepared by Built dated May 2022 are to be implemented.
- The CEMP must satisfy:
 - Legislative requirements and relevant non-statutory policies;
 - Specific environmental construction mitigation measures described in this REF; and
 - Requirements outlined in any relevant approvals, permits or licences.
- The CEMP must include, but not be limited to, the following:
 - Details of:
 - hours of work;
 - 24-hour contact details of site manager;
 - management of dust and odour to protect the amenity of the neighbourhood;
 - stormwater control and discharge;
 - measures to ensure that sediment and other materials are not tracked onto the roadway by vehicles leaving the site;
 - groundwater management plan including measures to prevent groundwater contamination;
 - acid sulfate soils management;
 - audit schedule for the duration of activities;

- external lighting in compliance with AS 4282-2019 Control of the obtrusive effects of outdoor lighting; and
- community consultation and complaints handling.
- Site Plan diagram showing environmental mitigation controls (i.e. sediment-controlled devices, parking and traffic direction, tree protection zones, stockpiles, waste bins and any other environmental mitigation measures);
- Construction traffic and pedestrian management plan and construction access. This should include identification of traffic management measures to mitigate potential conflicts with vehicles and pedestrians associated with the school
- Construction noise and vibration management
- Construction waste management, including contaminated waste
- Construction soil and water management
- Flood management
- Erosion and sediment control
- Tree management and protection
- Air quality
- Demolition work plans
- Aboriginal cultural heritage management including an unexpected finds protocol for Aboriginal cultural heritage
- An unexpected finds protocol for non-Aboriginal heritage and associated communications procedure
- An unexpected finds protocol for contamination and associated communications procedure
- Waste classification (for materials to be removed) and validation (for materials to remain) be undertaken to confirm the contamination status in these areas of the site
- Disposal of seepage and stormwater details
- Emergency Management Plan

12. Works in the road reserve

- Any works within the road reserve requires approval under Section 138 of the *Roads Act 1993*. This includes a road opening permit for a temporary construction access.

13. Protection of Public Infrastructure

- Prior to the commencement of construction, the following must be carried out:
 - (a) consult with the relevant service owners and providers that are likely to be affected by the development to make suitable arrangements for access to, diversion, protection and support of the affected infrastructure;
 - (b) prepare a dilapidation report identifying the condition of all public infrastructure in the vicinity of the site (including roads, gutters and footpaths); and
 - (c) submit a copy of the dilapidation report to the Certifier and the council.

14. Pre-Construction Dilapidation Report

- Prior to the commencement of construction, a pre-commencement dilapidation report must be submitted to the council and the Certifier. The report must provide an accurate record of the existing condition of adjoining private properties as well as Council assets that are likely to be impacted by the proposed works.

15. Site Notice

- A site notice must be prominently displayed in a prominent position at the site during construction to inform the public of project details, and must satisfy the following requirements:

- (a) the site notice(s) must be durable and weatherproof and must be displayed throughout the works period;
- (b) the approved hours of work, the name of the builder, Certifier, structural engineer, site/project manager, the responsible managing company (if any), its address and 24-hour contact phone number for any inquiries must be displayed on the site notice(s); and
- (c) the site notice(s) must be mounted at eye level on the perimeter hoardings/fencing and must state that unauthorised entry to the site is not permitted.

16. No Obstruction of Public Way

- Building materials, machinery, vehicles, refuse, skip bins or the like must not be stored or placed in the public way (outside of any approved construction works zone) under any circumstances.

17. Implementation of CEMP and Sub Plans

- The demolition and construction works are to be undertaken in accordance with the approved CEMP referred to in Condition 9.

18. Demolition

- Demolition work must comply with the demolition work plans required by Australian Standard AS 2601-2001 The demolition of structures (Standards Australia, 2001) and endorsed by a suitably qualified person.

19. Presence of Asbestos

- On demolition sites where buildings to be demolished contain asbestos or asbestos-containing material, risk control measures are to be enforced to ensure compliance with Clause 259 of the Occupational Health and Safety Regulation 2001.

20. Construction Vehicles Entering the Site

- The Certifying Authority must ensure construction vehicles (including concrete agitator trucks) do not arrive at the site or surrounding residential properties outside of the construction hours of work outlined above.

21. Groundwater

- Should any groundwater be encountered during the excavation, works are to cease immediately. Where groundwater needs to be removed, an approval will be required under the Water Management Act 2000. This will require an application for a water supply works approval to be submitted to the NSW Natural Resources Access Regulator (NRAR) for assessment and determination. SINSW Statutory Planning Compliance Team (StatutoryPlanning@det.nsw.edu.au) and the council are to be contacted to determine the appropriate measures for the management and disposal of the groundwater.

22. Tree Removal

- Engage a Project Arborist to oversee the site prior to excavation works for the duration of construction.
- Install the tree protection fencing prior to any construction activity. All fencing must comply with AS 4970 2009 (Protection of Tree on Development Sites) and AS 4687 (Temporary fencing and hoarding). Tree Protection Zone measurements are noted in the Tree Survey Table. (Signs must be erected on the fences "NO ENTRY" with the Project Arborist phone number) Given the terrain in the Namoi Channel this may pose fencing problems this can be cordoned off with bunting and reviewed by the project Arborist.
- Remove only the (40) trees specified in the Tree Survey Table impacted by the flood mitigation works.
- A suitable qualified licenced AQF 3 Arborist contractor must be engaged to complete the works and all pruning work to the Australia Standards AS 4373 2007 Pruning of Amenity Trees. Also (see Safe work NSW engaging a contractor)
- All tree waste can be mulched and stockpiled on site as per Environment Protection Authority (EPA) Raw mulch Order 2016. The generated mulch is to be used on site.
- Excavations or entry within the tree protection must be undertaken with the AQF 5 Consulting Arborist on site and or consult with the AQF 5 Arborist prior to any attempt to enter the enclosed TPZ's.

- Tree planting to replace trees of the same species that are being removed is to be carried out in accordance with the approved Landscape Plans, to maintain the biodiversity of the area.

23. Flooding

- A “Construction Soil and Water Management Plan” (or similar) will be developed as part of a Construction Environmental Management Plan for the flood mitigation works. The former document would set out the measures that are to be implemented to manage erosion and sediment, as well as stormwater runoff during the construction of the flood mitigation works, while the latter would identify the existing flood risk and include measures that are aimed at mitigating the impact that flooding would otherwise have on site personnel, equipment and work areas.
- While flooding internal to the Town Levee is generally of a low hazard nature, it will be important to locate site sheds in areas that lie above an elevation of RL 191.0 m AHD, noting that this is equal to the peak 1% AEP flood level on the vacant land.
- Spoil stockpiles will be located in areas which are not subject to frequent inundation by floodwater, ideally outside the 5% AEP flood extent. The exact level of flood risk accepted at stockpile sites will depend on the duration of stockpiling operations and the type of material stored.

24. Erosion and Sediment Control

- The Erosion and Sediment Control Plan prepared by Warren Smith (7490000 C2.01 rev 2) is to be implemented.

25. Geotechnical

The following geotechnical matters should be considered in design and construction for temporary batters on the site:

- Short term stability of the soil profile. The soils are generally stiff to hard consistency. The soil would be expected to stand unsupported in the short term for excavations of up to 2 m, subject to appropriate battering. However, there would be the possibility of localised dry friable lumps dislodging. This may be exacerbated by prolonged exposure and adverse weather. The risk could be reduced by ensuring a short exposure period.
- Temporary batter slopes in the very stiff clay should be battered no steeper than 0.75H:1V in the short term for cuts up to 2 m height. Loose material/blocks encountered during bulk excavations should be removed prior to entering excavations. The ground surface should be shaped to direct any seepage and surface runoff away from the slope and batter. Temporary drains should be installed at the crest of the excavation as well as the toe of each slope to direct water away from the excavation. Flatter batters may be required if excessive groundwater seepage or fissured clay is encountered.
- Permanent cut and fill batter slopes in stiff or stronger clay material or controlled filling up to 2 m high should be battered at 1.5H:1V or flatter and revegetated to prevent erosion. Flatter slopes should be adopted if access is required for maintenance purposes. The suitability of a vegetated slope to protect against erosion is somewhat dependent on the design water velocities within the channel, which have not been made known to DP.

The following procedure is recommended for subgrade preparation prior to placement of fill:

- Excavate to design subgrade level.
- Remove any additional topsoil, uncontrolled fill or deleterious materials including tree stumps / tree roots and backfill with approved select subgrade material compacted to the project specifications.
- Roll the exposed subgrade with at least six passes with a 10 tonne roller or heavier, then test roll the exposed surface to assess for areas of soft/unsuitable material. If wet / unsuitable subgrade conditions are encountered the material should either be tined and allowed to dry or removed and replaced with a select subgrade (CBR>15%) compacted to the project specifications. The depth of any excavation should be confirmed by geotechnical inspection. Subgrade stabilisation could also be considered. Additional geotechnical testing (e.g. lime stabilisation trials) should be performed if the subgrade stabilisation option is to be considered further.
- Compact the natural subgrade to a minimum dry density ratio of 100% Standard (AS 1289.5.1.1). The compacted silty clay subgrade should be left exposed for a minimum amount of time to minimise the occurrence of desiccation cracking in dry weather, or softening in wet weather.

- If raising of the subgrade level is required, all deleterious materials should be removed. Approved fill should then be placed in layers not exceeding 250 mm loose thickness and compacted to a minimum dry density ratio of 100% Standard at the moisture content described above.
- Geotechnical inspections and testing should be undertaken during construction in accordance with AS 3798-2007.

In regard to material re-use:

- Based on the conditions encountered in the bores, it is anticipated that the material won from on-site excavation could be re-used for structural fill purposes for the proposed sports oval provided that it is appropriately sized and moisture conditioned.
- Consideration should be given to shrink-swell effects if clay material is used as structural fill and the filled site should be re-classified for footing design.
- Moisture contents should be in the range -4% (dry) to -1% (dry) OMC for pavements and $\pm 2\%$ OMC for buildings where OMC is the optimum moisture content at standard compaction.

26. Flora and Fauna

- Produce an Environmental Management Plan for the scope of works.
- Ensure all staff are aware of environmental values of the site.
- Site boundary and no-go-areas to be demarcated prior to construction.
- No vegetation would be removed other than that described in section 5.2.1 without further approval.
- Works must be stopped if any previously undiscovered threatened species or communities are discovered during works. An assessment of the impact and any required approvals must be obtained.
- Pre-clearance surveys and clearance supervision should be undertaken by a suitably qualified ecologist.
- Adhere to the Stormwater Management Plan prepared Warren Smith Consulting Engineers.
- Wash down equipment and vehicles prior to and after leaving site, to manage the introduction and spread of weed propagules.
- Weed management should be undertaken in retained native vegetation under the management of the quarry.

27. Noise and Vibration

- The mitigation measures detailed in Chapter 6 of the Construction Noise Assessment prepared by Day Design (as referenced in the table above) will be implemented.

28. Waste Management

- The contractor will employ the services of a waste management sub-contractor to ensure that all rubbish is collected in an appropriate receptacle and is removed from site regularly.
- The contractor will ensure the engaged sub-contractor operates in compliance with the Waste Management Plan (as part of the Construction Environmental Management Plan) and all applicable codes & statutes.

29. Heritage

- The proposed work may proceed at Wee Waa without further archaeological investigation under the following conditions:
 - All land and ground disturbance activities must be confined to within the study area, as this will eliminate the risk of harm to Aboriginal objects in adjacent landforms. Should the parameters of the proposal extend beyond the assessed areas, then further archaeological assessment may be required.
 - All staff and contractors involved in the proposed work should be made aware of the legislative protection requirements for all Aboriginal sites and objects.
- There is a low likelihood that the proposed work will adversely harm Aboriginal cultural heritage items or sites. If during works, however, Aboriginal artefacts or skeletal material are noted, all work should cease and the

procedures in the Unanticipated Finds Protocol (Appendix 2) of the Aboriginal Due Diligence Assessment Report prepared by OzArk dated March 2022 should be followed.

- Inductions for work crews should include a cultural heritage awareness procedure to ensure they recognise Aboriginal artefacts (see Appendix 3 of the Aboriginal Due Diligence Assessment Report prepared by OzArk dated March 2022) and are aware of the legislative protection of Aboriginal objects under the National Parks and Wildlife Act 1974 and the contents of the Unanticipated Finds Protocol.
- The information presented in the Aboriginal Due Diligence Assessment Report prepared by OzArk dated March 2022 meets the requirements of the Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales. It should be retained as shelf documentation for five years as it may be used to support a defence against prosecution in the event of unanticipated harm to Aboriginal objects.

30. Contamination

- A Construction Environmental Management Plan (CEMP), including an unexpected finds protocol, should be developed for the site to ensure that typical site management strategies are implemented, and no contamination is introduced to the site during redevelopment.

31. Completion Certificate

- If required for any proposed building works, a Completion Certificate is to be issued prior to the occupation of the building/works.

32. Utilities and Services

- If required, prior to completion a Compliance Certificate under section 307 of the Water Management Act 2000 must be obtained from Council and submitted to the Certifier.

33. Post-construction Dilapidation Report

- Prior to the operation commencing, a suitably qualified person must be engaged to prepare a post-construction dilapidation report at the completion of construction. This report is:
 - (a) to ascertain whether the works created any structural damage to adjoining buildings or infrastructure;
 - (b) to be submitted to the Certifier. In ascertaining whether adverse structural damage has occurred to adjoining buildings or infrastructure, the Certifier must:
 - i. compare the post-construction dilapidation report with the pre-construction dilapidation report required (Condition 12); and
 - ii. have written confirmation from the relevant authority that there is no adverse structural damage to their infrastructure and roads.
 - (c) to be forwarded to the council for information.

34. Maintenance of Landscaping

- The landscaping and vegetation on the site must be maintained for the duration of occupation of the development in accordance with the approved Landscape Plans, subject to any management agreements with Council.

35. Definitions used in Section 8.0:

Aboriginal object	Has the same meaning as the definition of the term in section 5 of the <i>National Parks and Wildlife Act 1974</i>
Aboriginal place	Has the same meaning as the definition of the term in section 5 of the <i>National Parks and Wildlife Act 1974</i>
Certifier	In the case of Crown development, a person qualified and accredited to issue a Certification of Crown work
Construction	All physical work to enable operation including (unless specifically excluded by a condition) but not limited to the demolition and removal of buildings, the carrying out of works for the purposes of the development, including bulk

	<p>earthworks, and erection of buildings and other infrastructure permitted by this consent, but excluding the following:</p> <ul style="list-style-type: none"> • building and road dilapidation surveys; • investigative drilling or investigative excavation; • Archaeological Salvage; • establishing temporary site offices (in locations identified by the conditions of this consent); • installation of environmental impact mitigation measures, fencing, enabling works; and • minor adjustments to services or utilities
Demolition	The deconstruction and removal of buildings, sheds and other structures on the site
Environment	Includes all aspects of the surroundings of humans, whether affecting any human as an individual or in his or her social groupings
Reasonable	Means applying judgement in arriving at a decision, taking into account mitigation, benefits, costs of mitigation versus benefits provided, community views, and the nature and extent of potential improvements
REF	Review of Environmental Factors
SINSW	School Infrastructure NSW
Suitably qualified person	A professional with the necessary qualifications having regard to the nature of their services.