REVIEW OF ENVIRONMENTAL FACTORS

Melville Ford Bridge Upgrade



Prepared by EDM Ecological



On behalf of Maitland City Council



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Glossary

ACHAR	Aboriginal Cultural Heritage Assessment Report	
AEP	Annual Exceedance Probability	
AHD	Australian Height Datum	
AHIMS	Aboriginal Heritage Information System	
AHIP	Aboriginal Heritage Impact Permit	
AQC	Air Quality Categories	
BC Act	NSW Biodiversity Conservation Act 2016	
BDAR	Biodiversity Development Assessment Report	
ВМР	Biodiversity Management Plan	
Biosecurity Act	NSW Biosecurity Act 2015	
СЕМР	Construction Environmental Management Plan	
CEP	Community Engagement Plan	
CLM Act	NSW Crown Land Management Act 2016	
CNVG	Roads and Maritime Services' Construction Noise and Vibration Guideline	
dB	decibel	
dB(A)	a-weighted decibel	
DCCEEW	Commonwealth Department of Climate Change Energy the Environment and Water	
DPE	NSW Department of Planning and Environment	
 DPI	NSW Department of Primary Industries	
FIS	Environmental Impact Statement	
FP&A Act	NSW Environmental Planning & Assessment Act 1979	
EP&A Regulation	NSW Environmental Planning and Assessment Regulation 2021	
EPA	Environment Protection Authority	
EPBC Act	Commonwealth Environment Protection and Biodiversity Conservation Act 1999	
FM Act	NSW Fisheries Management Act 1994	
GDE	DE Groundwater Dependent Ecosystem	
ha	hectare	
leritage Act NSW Heritage Act 1977		
CNG The Interim Construction Noise Guideline		
km	kilometre	
L _{Aeq}	Equivalent Continuous Sound Pressure Level	
LEP	Local Environmental Plan	
LGA	Local Government Area	
m	metre	
m³	cubic metre	
МСС	Maitland City Council	
MNES	Matters of National Environmental Significance	
NPW Act	NSW National Parks and Wildlife Act 1974	
NSW	New South Wales	
NVMP	Noise and Vibration Management Plan	
РСТ	Plant Community Type	
POEO Act	NSW Protection of the Environment Operations Act 1997	
RAPs	Registered Aboriginal Parties	
RBL	Rating Background Level	
REF Review of Environmental Factors		
SEPP	State Environmental Planning Policy	
SIS	Species Impact Statement	
SoHI	HI Statement of Heritage Impact	
SRP	RP Spill Response Plan	
Study area	area The area assessed by this REF, which is likely to be affected by the proposal.	
TEC	Threatened Ecological Community	
ТМР	Traffic Management Plan	
WARR Act	NSW Waste Avoidance and Resource Recovery Act 2001	
WBMP	Weed Biosecurity Management Plan	
WM Act	NSW Water Management Act 2000	
WINIACC	NSW Water Management Act 2000	

Executive Summary

The proposed project

Maitland City Council proposes to replace the existing bridge known as Melville Ford Bridge, in the Maitland local government area (LGA) of New South Wales. The proposed project site is located on the Hunter River, where the bridge spans the river to adjoin Aberglasslyn Road to the south with Melville Ford Road to the north. The project site is located approximately 5 km from Maitland central business district (CBD). Maitland City Council is proposing to replace the existing timber bridge with a 6.5 metre higher concrete bridge to reduce the frequency and duration of closure due to flood events.

Need for the project

The current Melville Ford Bridge crossing is low-lying and is frequently closed due to overtopping flows in the Hunter River. Records from 1968 to 2021 show that the bridge has required closure as a result of inundation an average of 29.5 days per year. The timber bridge was built in 1952 and requires ongoing maintenance including debris removal and repair following flooding. The local community have voiced their desire for a higher, safer, and more modern crossing at the Melville Ford Bridge location for many years.

Project objectives

The main objective of the proposed project is to:

• Improve serviceability of the river crossing by reducing the frequency and length of closure due to overtopping.

Secondary objectives of the project are to:

- Minimise disruptions to road users and the community.
- Minimise environmental, cultural, and social impacts.

Options considered

Several options have been considered for this project and are outlined below:

- Option 1 The 'do nothing' option
- Option 2 Refurbish the current timber bridge
- Option 3 Construct a new concrete bridge

Option 3 is the preferred option. This option was selected for the following reasons:

- Meets the main project objective of improving the serviceability of the river crossing as it will be built 6.5 metres higher and will reduce the frequency and length of closures due to overtopping.
- The proposed alignment of the new bridge requires minimal removal of native vegetation, therefore reducing potential environmental impacts.

• The proposed alignment of the new bridge reduces the amount of time that the current bridge crossing will need to be closed during construction, therefore minimising disruptions to road users and the community.

Statutory and planning framework

The Environmental Planning and Assessment Act 1979 (EP&A Act) and the associated Environmental Planning and Assessment Regulation 2021 provide the framework for assessing the potential environmental impacts associated with proposed developments in NSW. Part 5 of the EP&A Act specifies the environmental impact assessment requirements for activities undertaken by public authorities which do not require development consent under the EP&A Act.

Given that development consent is not required by a public authority for roads or road infrastructure as outlined by Division 17, Subdivision 1 of the *State Environmental Planning Policy (Transport and Infrastructure) 2021* (T&I SEPP), the environmental impacts of the proposal will need to be assessed according to Part 5 of the EP&A Act.

Part 5, Division 5.1 of the EP&A Act allows for a determining authority (a Minister or a public authority) to assess the environmental impact of certain activities that they are either carrying out themselves or approving. Therefore, Maitland City Council is both the determining authority and the proponent of this proposal.

Environmental impacts

Inspections and surveys of the study area were completed in August 2023 and August 2024 to assess the existing environment and identify the potential environmental impacts of the proposed project.

A number of potential environmental impacts from the proposed project have been avoided or reduced during the options assessment and concept design stage.

The proposed project would have long-term positive impacts for the community including improvements to the bridge crossing by:

- reducing the frequency and duration of closures due to inundation.
- improving traffic flow with a new dual-lane bridge.
- modernising the bridge crossing and improving safety.

The proposed project would have a long-term positive impact on amenity via revegetating already disturbed areas with native trees, shrubs, and grasses.

Key potential adverse effects include:

- removal of the timber bridge which is habitat for the Southern Myotis (*Myotis macropus*). A test of significance under the *Biodiversity Conservation Act 2016* was completed which determined that there would be no significant impact on the Southern Myotis.
- minor impacts on traffic, air quality, biodiversity, amenity, noise and vibration, and potentially on Aboriginal heritage.

The environmental safeguards and mitigation measures outlined in this REF would avoid, minimise, or manage any potential adverse impacts arising from the project on the environment.

Conclusion

This REF has examined and taken into account to the fullest extent possible all matters affecting or likely to affect the environment as a result of the proposed project. On balance and having regard to the safeguards and mitigation measures proposed, the project is considered justified, and the following conclusions are made:

- The proposed project is not likely to significantly affect the environment, therefore no environmental impact statement (EIS) is required, and no approval is needed to be sought from the Minister for Planning and Public Spaces under Division 5.2 of the EP&A Act.
- The proposed project is not likely to significantly impact a matter of national environmental significance or Commonwealth land, therefore no referral to DCCEEW for a decision by the Minister for the Environment and Water under the EPBC Act is required.
- Assessments of the significance of the impact of the proposed project on threatened entities under the BC Act concluded that the project will not significantly impact the Southern Myotis.
- The proposed project is not likely to significantly affect threatened species, ecological communities, or their habitats therefore no species impact statement (SIS) or biodiversity development assessment report (BDAR) is required.

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1. Introduction

EDM Ecological was engaged by Maitland City Council (MCC) to prepare a Review of Environmental Factors (REF) for the proposed upgrade of Melville Ford Bridge.

1.1 Background

Maitland City Council proposes to replace the existing bridge known as Melville Ford Bridge, in the Maitland local government area (LGA) of New South Wales. The proposed project site is located on the Hunter River, where the bridge spans the river to adjoin Aberglasslyn Road to the south with Melville Ford Road to the north. The project site is located approximately 5 km from Maitland central business district (CBD).

The existing bridge is a single-lane, six span, timber girder bridge which is 62 metres long. The surface of the bridge deck is 5 metres wide between barriers and has a level of approximately 4 m Australian Height Datum (AHD). The deck is up to 2.7 m above the riverbed, but typically only 1.5 m. Decking is cross plank only and piers are low height unbraced trestles. The barrier is a 200 mm high timber kerb on either side of the bridge (**Plate 1-1**).

It is believed that the current Melville Ford Bridge was constructed in 1952 (Virtus Heritage, 2022b). The low-lying, timber bridge is regularly inundated during flood events, requiring repairs and ongoing maintenance. Overtopping of the bridge of several metres occurs in moderate to large flooding events on the Hunter River (WMA Water, 2022).

The local community have voiced their desire for a higher, safer, and more modern crossing at the Melville Ford Bridge location for many years. In 2020 a major refurbishment and upgrading of the bridge was put to tender. Responses to this tender included the proposed full replacement of the structure. It was identified through this process that the cost of replacement of the bridge was comparable to the cost of refurbishment.

Consequently, Maitland City Council is proposing to replace the existing timber bridge with a 6.5 metre higher concrete bridge to reduce the frequency and duration of closure due to flood events. As part of the upgrade, safety and structural improvements are also intended to bring the bridge up to modern standards. The new concrete bridge would be situated over the existing bridge on an east-west alignment (**Plate 1-1**). Works will include the realignment of the existing roads and re-grading of the batter. It is intended that the existing timber bridge will be demolished and removed once the new bridge is operational.

The extent of the project is approximately 1.1 ha (see **Figure 4.1** and **Appendix A** for full concept design).

It should be noted that if the proposed activity needs to be altered or modified, the REF document will need to be revised to incorporate the amendments and be reassessed.



Plate 1-1. Existing timber bridge and approximate east-west alignment of proposed bridge. View from the east on Aberglasslyn Road.

1.2 Purpose

The purpose of this REF is to describe the proposal, document the likely impacts of the proposed project on the environment and to detail mitigation measures to be implemented. In doing so, the REF fulfils the requirements of:

- Part 5, Division 5.1 of the Environmental Planning & Assessment Act 1979 (EP&A Act)
- Section 1.3, Section 5.5 and Section 5.7 of the EP&A Act
- Clause 171 of the Environmental Planning and Assessment Regulation 2021 (EP&A Regulation)
- other relevant Commonwealth and State legislative instruments.

The findings of this REF have been considered when assessing:

- Whether the proposal is likely to have a significant impact on the environment and therefore the necessity for an Environmental Impact Statement (EIS) to be prepared and approval to be sought from the Minister for Planning and Public Spaces under Division 5.2 of the EP&A Act.
- The significance of any impact on threatened species as defined by the *Biodiversity Conservation Act 2016* (BC Act) and/or *Fisheries Management Act 1994* (FM Act), and whether a Species Impact Statement (SIS) or Biodiversity Development Assessment Report (BDAR) is required.

 The potential for the proposal to significantly impact a matter of national environmental significance or Commonwealth land and the need to make a referral to the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) for a decision by the Minister for the Environment and Water on whether assessment and approval is required under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).

1.3 Proponent

EDM Ecological has prepared this REF on behalf of the proponent, Maitland City Council. Maitland City Council is both the proponent and determining authority for this project. Contact details for the proponent are listed in **Table 1.1**.

Table 1.1. Proponent details.

Project	Melville Ford Bridge Upgrade
Proponent	Maitland City Council
Project Manager	Michael Leong
Position	Civil Engineer
Contact Details	t 02 4939 1079
	e Michael.Leong@maitland.nsw.gov.au

1.4 Limitations and assumptions

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. EDM Ecological has no responsibility or obligation to update this report to account for events or changes occurring after the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by EDM Ecological described in this report (see assumptions below). EDM Ecological disclaims liability arising from any of the assumptions being incorrect.

Assumptions made by EDM Ecological when preparing this REF include (but are not limited to):

- The proposal has been assessed based on the information, plans, reports, and other documents provided by Maitland City Council and its consultants.
- The proposal is limited to the works described in **Section 4** of this report
- The proposal has been assessed assuming the implementation of the safeguards and mitigation measures detailed in **Section 9** of this report.

2. Project site

2.1 Location

The proposed project site is in the Maitland local government area approximately 5 km from Maitland CBD. It is situated on the Hunter River between the suburbs of Aberglasslyn to the south and Melville to the north. Refer **Figure 2.1** for locality.

2.2 Project area

The project area includes an approximately 70 m section of the Hunter River and the southern and northern riverbanks. The site also includes the approaches on Aberglasslyn Road (to the south) and Melville Ford Road (to the north) which meet at the existing bridge crossing. The extent of the project is approximately 1.1 ha and the study area for this REF is approximately 3.1 ha, refer **Figure 2.2**.

2.3 Project works

The project would involve construction activities within and directly adjacent to the Hunter River including the construction of a 102 m long and 11 m wide four-span concrete bridge, realignment of the existing roads and re-grading of the batter. A temporary site compound would be established nearby, however the exact location for this is yet to be confirmed by Maitland City Council. It is likely to be located on private property due to limited Council owned land in the area. The site compound will be subject to an internal Council environmental assessment separate to this REF once the location is confirmed. Key features of the project are shown in **Figure 2.3**. More details of the project can be found in **Section 4**.



Figure 2.1. Locality of the proposed project.



Figure 2.2. Location of study area and extent of the proposed project.



Figure 2.3. Key features of the proposed project.



2.4 Land use

The entirety of the study area is zoned as RU1 – Primary Production land. Immediately surrounding the study area is also RU1 zoned land. To the south, south-east and south-west (approximately 250 m – 350 m) is RU5 – Large Lot Residential land. Beyond this (approximately 800 m – 1200 m) is R1 – General Residential land. Approximately 800 m to the west of the study area is a large section of RU2 - Rural Landscape land. There are also small pockets of land zoned as C2 – Environmental Conservation, C3 – Environmental Management, and C4 Environmental Living in the general locality of the study area (see **Figure 2.4**). Land use in the vicinity of the study area is primarily agriculture (including stock grazing, horse breeding, and farming), as well as rural-residential.

2.5 Ownership

A proportion of the study area is the riverbed itself which is listed as Crown Land. Consultation with Crown Lands will be required for this project. The remaining land within the study area including the riverbanks, roads and roadside is owned by Maitland City Council. There is no private property within the study area however it is bounded to the south and north by privately owned properties.

3. Project justification

3.1 Need for the project

The current Melville Ford Bridge crossing is low-lying and is frequently closed due to overtopping flows in the Hunter River. Records from 1968 to 2021 show that the bridge has required closure as a result of inundation an average of 29.5 days per year over this 53-year period (WMA Water, 2022). The timber bridge was built in 1952 and requires ongoing maintenance including debris removal and repair following flooding.

Despite being a minor road the traffic volumes over the bridge are significant, particularly for a single lane crossing. In March 2021, a traffic count revealed a 7-day average of 1,654 vehicles per day with 13 % heavy vehicles (Bridge Design Pty Ltd, 2021). The current trend seen in the Maitland LGA indicates that the number of vehicles crossing the bridge will only increase over time, with an annual population growth rate consistently above 2 % (Maitland City Council, 2020). The anticipated increase in the level of traffic supports the need for an upgraded two-lane bridge.

The local community have appealed for a higher, safer, and more modern crossing at the Melville Ford Bridge location for many years. The proposed upgrade of the bridge will allow for these community requests to be met.

3.2 Project objectives

The main objective of the proposed project is to:

• Improve serviceability of the river crossing by reducing the frequency and length of closure due to overtopping.

Secondary objectives of the project are to:

- Minimise disruptions to road users and the community.
- Minimise environmental, cultural, and social impacts.

3.3 Options considered

Several options have been considered for this project and are outlined below.

3.3.1 Option 1 – Do nothing

The 'do nothing' option involves leaving the existing timber bridge in use. This does not meet the main project objective of improving the serviceability of the river crossing.

3.3.2 Option 2 – Refurbish the current timber bridge

The cost of refurbishing the current timber bridge is comparable to full replacement with a new concrete structure. This option is not cost-effective and does not meet the main project objective of improving the serviceability of the river crossing.

3.3.3 Option 3 – Construct a new concrete bridge

Option 3 is the preferred option. Constructing a new concrete bridge meets the main project objective of improving the serviceability of the river crossing, as the height will be increased by 6.5 metres. This has been projected to significantly reduce the number of days per year the crossing is closed due to inundation and the number of overtopping events (WMA Water, 2022).

This option also fulfills the secondary objectives of the project. The proposed alignment of the new bridge requires minimal removal of native vegetation. This will help to minimise potential environmental impacts of the proposal. The preferred alignment also reduces the amount of time that the current bridge crossing will need to be closed during construction, therefore reducing disruptions to road users and the community.

4. Construction

The project is a design and construct proposal which is planned to be put to tender by Maitland City Council in October 2023. The successful contractor will determine the exact construction methodology in consultation with Council. However, it is anticipated that construction of the new bridge will include the scope of works (Section 4.1) and proposed construction methodology (Table 4.1) and is unlikely to deviate from the concept plan due to geotechnical, hydrological, and structural requirements. The proposed new bridge is a four-span concrete bridge comprising concrete deck beams supported on piles. See Figure 4.1 and Appendix A for full concept design.

4.1 Scope of works

The scope of works for this project are:

- Undertake service location
- Site establishment including traffic control and signage
- Installation of erosion and sediment controls
- Establishment of temporary site compound (including erosion and sediment controls)
- Removal of 4 trees on the southern approach
- Removal of 12 trees on the northern approach
- Removal of non-native vegetation
- Excavation works
- Earthworks (cut and fill) on the northern approach
- Earthworks (cut and fill) on the southern approach
- Regrading of the batters
- Realignment of the roads
- Establishment of temporary piling pads
- Installation of driven or bored steel or concrete piles
- Construction of a new 102 m long and 11 m wide four-span concrete bridge
- Construction of new bridge abutments
- Installation of scour protection
- Construction of new approach embankments
- Reconstruction of existing approach pavements
- Installation of concrete stair access and handrail
- Construction of 6 car parking spaces
- Installation of drainage
- Installation of bollards
- Demolition and disposal of the existing timber bridge
- Treatment of priority weeds
- Landscaping and revegetation of disturbed areas
- Removal of all construction equipment, materials, and waste at completion of works
- Decommissioning of temporary site compound
- Removal of erosion and sediment controls



Figure 4.1. Concept design for the proposed new concrete bridge.

Table 4.1. Proposed construction methodology and estimated duration.

Stage	Description	Plant	Materials	Duration (estimate)
1	Site and compound establishment	Truck/tipper Excavator Positrack Vac Truck	Site shed and amenities Hardstand material	2 weeks
2	Tree and vegetation removal Earthworks: Cut and fill Regrading batters	30t excavator FE loader Positrack Grader Roller	Select fill Gabion rock	4 weeks
3	Piling works: Establishment of temporary piling pad Driven or bored piles	100t piling rig (TBC) Crane 20t excavator	Pile casings Pile reinforcement Concrete Gravel/hard rock piling pad	6 weeks
4	Concreting works: Abutments Pile caps and piers	Concrete pump Crane	Concrete Formwork Reinforcement	4 weeks
5	Bridge construction	Crane Semitrailer	Concrete deck beams (precast) Barriers Steel guardrail	4 weeks
6	Road works: Pavement reconstruction Car parking construction Drainage installation (subsoil and table drains)	Grader Roller Asphalter Front loader Watercart	Ashphalt Roadbase	8 weeks
7	Demobilisation: Removal of all materials Landscaping and revegetation works	Watercart Truck/Tipper Excavator Positrack	Plants Topsoil Turf	2 weeks

4.2 Timing

The design and construct proposal would be put to tender in October 2023 with an indicative date for the commencement of works on site being August 2024. Weather permitting, the period of works would be approximately 8 months, and it is anticipated that the project would be completed by April 2025.

4.3 Compound

A temporary compound area will be required for this project however, the location has not yet been confirmed by Council. The compound would consist of site shed, amenities, equipment laydown area, waste receptacles and storage areas for materials. The compound should not be established under the dripline of any trees (generally 5 metres).

The compound is likely to be located on a nearby private property due to limited Council owned land in the area. The site compound will be subject to an internal Council environmental assessment separate to this REF once the location is confirmed.

4.4 Machinery and equipment

The machinery and equipment required for this project are identified in Table 4.1.

4.5 Access

Access to the project site will be via Aberglasslyn Road from the south and Melville Ford Road from the north. Access to the existing bridge crossing by the public will continue during the proposed works when possible. There will be periodic closures of the existing bridge during construction; approximately 6 weeks for pier construction and 12 weeks for construction of bridge deck and road approaches.

5. Statutory and planning framework

The Environmental Planning and Assessment Act 1979 (EP&A Act) and the associated Environmental Planning and Assessment Regulation 2021 provide the framework for assessing the potential environmental impacts associated with proposed developments in NSW. Part 5 of the EP&A Act specifies the environmental impact assessment requirements for activities undertaken by public authorities which do not require development consent under the EP&A Act.

Given that development consent is not required by a public authority for roads or road infrastructure as outlined by Division 17, Subdivision 1 of the *State Environmental Planning Policy (Transport and Infrastructure) 2021* (T&I SEPP), the environmental impacts of the proposal will need to be assessed according to Part 5 of the EP&A Act.

Part 5, Division 5.1 of the EP&A Act allows for a determining authority (a Minister or a public authority) to assess the environmental impact of certain activities that they are either carrying out themselves or approving. Therefore, Maitland City Council is both the determining authority and the proponent of this proposal.

This REF has been prepared in accordance with the Department of Planning and Environment *Guidelines for Division 5.1 Assessments* (DPE, 2022).

Table 5.1 outlines how the proposal has been considered under other relevant Commonwealth andState environmental legislation. Section 5.1 relates to local plans and strategies.

Legislation	Significance to the proposed project		
Commonwealth Legislation	Commonwealth Legislation		
Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act)	The EPBC Act protects matters of national environmental significance (MNES) including nationally threatened species and ecological communities, migratory species, wetlands of international importance, Commonwealth marine areas, world heritage properties and national heritage places. Other matters include actions proposed on or that will affect the environment of Commonwealth land. The EPBC Act regulates the assessment and approval of activities that have or are likely to significantly impact MNES or the environment of Commonwealth land. A referral to the Department of Climate Change, Energy the Environment and Water (DCCEEW) is required for proposals that may have a significant impact on these matters.		
	Consideration of the impact of the proposal on MNES has been provided in Table 8.2. It is anticipated that the proposal is unlikely to impact on any MNES or on the environment of Commonwealth land. Accordingly, the proposal		
	has not been referred to DCCEEW under the EPBC Act.		
State Legislation			
State Environmental	The T&I SEPP aims to facilitate the effective delivery of infrastructure		
Planning Policy	across the state, including for roads and road infrastructure facilities.		
(Transport and	Section 2.109 of the T&I SEPP permits development on any land for the		
Infrastructure) 2021 (T&I SEPP)	purpose of a road or road infrastructure facilities to be carried out by or on behalf of a public authority without consent.		

Table 5.1. Environmental legislation.

	As the proposal is appropriately characterised as development for the purposes of a road or road infrastructure facilities and is to be carried out by or on behalf of Maitland City Council, it can be assessed under Division 5.1 of the EP&A Act.
	Additionally, the proposal is not located on land reserved under the <i>National Parks and Wildlife Act 1974</i> and does not require development consent or approval under State Environmental Planning Policy (Resilience and Hazards) 2021, State Environmental Planning Policy (Precincts – Eastern Harbour City) 2021, State Environmental Planning Policy (Precincts – Central River City) 2021, State Environmental Planning Policy (Precincts – Central River City) 2021, State Environmental Planning Policy (State Environmental Planning Policy (Precincts – Central River City) 2021, State Environmental Planning Policy (Precincts – Western Park City) 2021, State Environmental Planning Policy (Precincts – Regional) 2021 or State Environmental Planning Policy (Planning Systems) 2021.
State Environmental	The R&H SEPP aims to promote an integrated and co-ordinated
Planning Policy (Resilience and Hazards) 2021 (R&H SEPP)	approach to land use planning in the coastal zone in a manner consistent with the objectives of the <i>Coastal Management Act 2016</i> . The objectives of the R&H SEPP are to manage development in the coastal zone and establish a framework for land use planning and decision making in the coastal zone.
	The study area is not mapped in Coastal Wetlands or Littoral Rainforests or within their proximity areas. The site is also not located within the Coastal Vulnerability Area, Coastal Environment Area or Coastal Use Area. It is anticipated that the proposal is unlikely to impact on matters relating to the R&H SEPP.
State Environmental Planning Policy (Biodiversity and Conservation) 2021 (B&C SEPP)	 Chapter 4 of the B&C SEPP aims to encourage the conservation and management of areas of natural vegetation that provide habitat for koalas to ensure a permanent free-living population over their present range and reverse the current trend of koala population decline by: Identifying land to which an approved Koala plan of management applies.
	 Encouraging the identification of areas of core Koala habitat.
	Koala habitat is not considered to be found within or adjacent to the study area. Biodiversity is discussed in Section 7.4 and in more detail in Appendix B .
<i>Biodiversity Conservation</i> <i>Act 2016</i> (BC Act)	The purpose of the BC Act is to maintain a healthy, productive and resilient environment for the greatest well-being of the community, now and into the future, consistent with the principles of ecologically sustainable development. It provides for listing and protection of threatened species and threatened ecological communities, biodiversity conservation, identifying area of outstanding biodiversity value and for biodiversity offset schemes and biodiversity certification of land.
	If an activity potentially affects any threatened flora or fauna species, populations or ecological communities listed by the BC Act, a test of significance is required. The test of significance, referred to in Section 7.3 of the BC Act, determines whether the project under Part 5 is likely

	to have a significant impact. It is applied as part of the Biodiversity Offsets Scheme entry requirements for Part 5 activities under the EP&A Act. If the activity is likely to have a significant impact or will be carried out in a declared area of outstanding biodiversity value, a proponent must either apply the Biodiversity Offsets Scheme (Division 4) or prepare a species impact statement (SIS) (Division 5). Note: If the likely significant effect on threatened species is the only likely significant effect on the environment, an environmental impact statement (and associated development consent under Part 4 of the EP&A Act) may be dispensed with and a species impact statement or biodiversity development assessment report prepared with an REF under Part 5 of the EP&A Act.
	A biodiversity assessment was undertaken by EDM Ecological (Appendix B). The study area was assessed for the potential presence of threatened species, populations and ecological communities listed under the BC Act and concluded that the proposed works may impact the Southern Myotis (<i>Myotis Macropus</i>). A Test of Significance was conducted for this species (Appendix C) which determined that the proposal would not have a significant impact on the Southern Myotis.
	As part of the revision of this REF, an assessment of trees now proposed for removal was conducted by Corymbia Ecology (Appendix L). This report did not identify any threatened species utilising the trees as habitat.
Fisheries Management Act 1994 (FM Act)	 The FM Act aims to conserve, develop, and share the fishery resources of the State for the benefit of present and future generations. The FM Act establishes mechanisms for: the listing of threatened species, populations and ecological communities or key threatening processes the declaration of critical habitat consideration and assessment of threatened species impacts in the development assessment process. Section 200 of the FM Act provides that: A local government authority must not carry out dredging work or
	reclamation work except under the authority of a permit issued by the Minister. Section 219 of the FM Act includes a prohibition on the blocking of fish passage. A permit is required from the NSW Department of Primary Industries (DPI) if a proposal would permanently or temporarily block fish passage.
	Permits under section 200 and section 219 are generally required in relation to Key Fish Habitat. The Hunter River is identified as Key Fish Habitat therefore Maitland City Council will consult with DPI to determine whether permits under the FM Act are required.

Maitland Local	The project site is leasted within the Maitland I CA where the Maitland
Fruite and entry Dian 2011	The project site is located within the Mananu LGA where the Mananu
Environmental Plan 2011	LEP is the local environmental plan under the <i>Environmental Planning</i>
(Maltiana LEP)	and Assessment Act 1979. The alm of the LEP is to make local
	environmental planning provisions for land in Maltiand in accordance
	with the relevant standard environmental planning instrument under
	section 3.20 of the EP&A Act.
	In accordance with the Maitland LEP the study area is located within
	the land use zone RU1 Primary Production. In land zone RU1, roads are
	permitted with consent. Consent is not required in this case as per
	section 2.109 of the T&I SEPP (see above). This permits development
	on any land for the purpose of a road or road infrastructure facilities
	to be carried out by or on behalf of a public authority without consent.
National Parks and	The NPW Act aims to conserve nature, objects, places or features of
Wildlife Act 1974	cultural value within the landscape. The NPW Act also aims to foster
(NPW Act)	public appreciation, understanding and enjoyment of nature and
	cultural heritage, and provides for the preservation and management
	of national parks, historic sites and certain other areas identified under
	the Act. The NPW Act is the primary legislation regulating Aboriginal
	cultural heritage in NSW.
	Items of Aboriginal cultural heritage (Aboriginal objects) or Aboriginal
	places (declared under Section 84) are protected and regulated under
	the NPW Act. Aboriginal objects are protected under Section 86 of the
	NPW Act. Under Section 90 of the NPW Act, the Secretary may issue
	an Aboriginal Heritage Impact Permit (AHIP) for an activity that would
	harm an Aboriginal object. Note: in relation to a relic or moveable
	object, <i>harm</i> is defined in the NPW Act as <i>damage, despoil, move or</i>
	alter.
	An Aboriginal Archaeology Due Diligence Assessment (Virtus Heritage,
	2022a) was prepared for the proposed project which identified one
	Aboriginal object on site. Subsequently, an Aboriginal Cultural Heritage
	Assessment Report (ACHAR) was completed (AMAC, 2023a). This
	report (Appendix J) determined that an AHIP will be required for this
	project (Appendix K). Note: Maitland City Council has applied to
	Heritage NSW for a variation to the AHIP to reflect minor changes to
	the area of land subject to the permit.
Heritage Act 1977	The Heritage Act 1977 (Heritage Act) aims to provide for the
(Heritage Act)	identification, registration and conservation of items of State heritage
(significance. The Heritage Act provides protection to items such as
	places buildings works relics moveable objects precincts or land
	that have been identified assessed and listed on the State Heritage
	Register If an item is the subject of an interim listing or is listed on
	the State Heritage Register, a person must obtain approval under
	Section 58 of the Heritage Act for works or activities that may impact
	on these items
	The proposed works do not involve an item or place listed on the
	NSW State Heritage Register or the subject of an interim heritage

	order or listing. Therefore, the proposed works will not require an application of approval of works under Part 4 of the Heritage Act.	
	Note: A Statement of Heritage Impact (SoHI) was completed to assess the heritage significance of the existing timber bridge which is proposed to be demolished as part of this project (Virtus Heritage, 2022b).	
Water Management Act 2000 (WM Act)	The objects of the WM Act are to provide for the sustainable and integrated management of the water sources of the State for the benefit of both present and future generations including protecting, enhancing and restoring water sources, their associated ecosystems, ecological processes and biological diversity and their water quality.	
	The key regulation made under the WM Act is the Water Management (General) Regulation 2018. The regulation specifies important procedural and technical matters related to the administration of the Act, and also specifies exemptions from licence and approval requirements under the Act.	
	Controlled activities refer to work, or action undertaken on waterfront land, as defined by the WM Act. A controlled activity approval is required before undertaking any work or development on waterfront land. Waterfront land includes the bed of rivers as well as land within 40 metres of a riverbank. As a public authority, Maitland City Council is exempt from controlled activity approval requirements (under Clause 41 of the Regulation).	
	Whilst the project will not extract water from the Hunter River, there is potential for interface with groundwater during piling works that may require dewatering. As a public authority Maitland City Council has exemptions from water access licence requirements under Clause 21 and Part 1 of Schedule 4 of the Regulation and subsequently from water use approval requirements (under Clause 34 of the Regulation). However, a water supply work approval will be needed if dewatering is required.	
Protection of the Environment Operations Act 1997 (POEO Act)	The POEO Act is administered by the NSW Environment Protection Authority (EPA). It provides an integrated system of licenses to set out protection of the environment policies and to adopt more innovative approaches to reduce pollution in the environment, having regard to the need to maintain ecologically sustainable development (ESD). Measures to address potential pollution as a result of the proposal have been prescribed in this REF and are included in Sections 7 and 9.	
	The POEO Act requires an Environmental Protection Licence (EPL) for scheduled development work and the carrying out of scheduled activities. The proposal does not involve undertaking a scheduled activity and therefore an EPL would not be required.	

Roads Act 1993	The Roads Act sets out the requirements for the management and use
(Roads Act)	of public roads in NSW. As per section 71 of the Roads Act, a roads
	authority may carry out road work on any public road for which it is
	the roads authority and on any other land under its control. Maitland
	City Council is the roads authority in this instance and may carry out
	the proposed work according to the Roads Act as a result.
Crown Land	The object of the CLM Act is to provide direction in regard to the
Management Act 2016	ownership, use and management of Crown land of NSW. This includes
(CLM Act)	considering environmental, social, cultural heritage and economic
	factors, with the intent of providing consistent efficient, fair and
	transparent management of Crown land for the benefit of the people
	of NSW, including the use and co-management by Aboriginal people.
	The bed of the Hunter River within the study area is listed as Crown
	land. Consultation with Crown Lands will be required for this
	proposed project.
Waste Avoidance and	The WARR Act is intended to encourage the most efficient use of
Resource Recovery Act	resources and to reduce environmental harm in accordance with the
<i>2001</i> (WARR Act)	principles of ecologically sustainable development. Objectives of the
	Act also include to ensure resource management options are
	considered against the hierarchy of avoidance, re-use, and recycle
	before disposal and to achieve integrated waste and resource
	management planning, programs and service delivery on a State-wide basis.
	The reporting of waste generation and waste disposal would be
	undertaken as part of the proposed project during the construction
	phase. Procedures would be implemented during construction to
	promote the objectives of the WARR Act, refer to Section 7.9 .
Biosecurity Act 2015	The primary object of the Biosecurity Act is to provide a framework for
(Biosecurity Act)	the prevention, elimination and minimisation of biosecurity risks
	posed by biosecurity matter, dealing with biosecurity matter, carriers
	and potential carriers, and other activities that involve biosecurity
	matter, carriers or potential carriers.
	The act aims to promote biosecurity as a shared responsibility between
	government, industry and communities. It also provides a framework
	for the timely and effective management of pests, weeds, diseases and
	other biosecurity matter that may impact the environment, the
	community and/or the economy.
	Several 'Priority Weeds' which are managed according to the
	Biosecurity Act were identified in the study area (see Appendix B) and
	Section 7.4 for more details.

5.1 Local plans and strategies

Maitland City Council has adopted the following environmental plans and strategies that relate to the proposed project:

Maitland Greening Plan Maitland +10 Community Strategic Plan

The Environmental Sustainability Strategy 2030

The *Maitland Greening Plan* (Maitland City Council, 2002) was developed to provide a strategic framework for future vegetation management in Maitland. The aim of the strategy is to address widespread land degradation, loss of biodiversity and habitat through the protection of remnant vegetation, habitat enhancement and community-based revegetation programs.

The *Maitland* +10 *Community Strategic Plan* (Maitland City Council, 2022) aligns with current community goals and includes the theme – 'Let's live sustainably'. The Plan identifies what the community would like for the city over the next ten years, which in terms of environmental sustainability includes to:

- Love and look after the great outdoors
- Protect our native plants and animals
- Improve the quality of our waterways and wetlands

The Environmental Sustainability Strategy 2030 (Maitland City Council, 2023) responds to community feedback on environmental priorities received over recent years. It aligns with the Maitland Local Strategic Planning Statement 2040+ and Maitland +10 Community Strategic Plan and builds upon the 'Let's live sustainably' theme. Key targets of one of the Strategy's theme areas 'Green and Blue Maitland' are:

- Deliver functional biodiversity corridors
- Protect important natural spaces
- Improve waterway health
- Increase community participation in environmental events and volunteering

Implementing the environmental safeguards and mitigation measures summarised in **Section 9** will ensure that the proposed project remains consistent with the aims, goals and targets of the local plans and strategies listed above. Those mitigation measures listed under Biodiversity; Soil, landform and geology; and Waterways, water quality and hydrology are particularly important in achieving this.

6. Stakeholder consultation

Maitland City Council has and will continue to undertake consultation with potentially affected property owners, relevant government agencies and other stakeholders as part of this proposed project. Key stakeholders identified for consultation include:

- Local residents
- Road users
- State Emergency Services (SES)
- Utility providers
- Registered Aboriginal Parties (RAPs)
- Crown Lands NSW Department of Planning and Environment (DPE)
- Environment and Heritage NSW Department of Planning and Environment (DPE)
- Fisheries NSW Department of Primary Industries (DPI)
- Water NSW Department of Planning and Environment (DPE)

6.1 Community consultation

There is widespread community support for the proposed upgrade of the bridge which is evident on Maitland City Council's social media posts relating to this project. Although there has been no specific community consultation carried out, there is a considerable history of community desire for a higher, safer, and more modern bridge which this project will fulfil (Virtus Heritage, 2022b).

Potentially impacted residents would be notified prior to any works commencing and prior to impacts such as noise generating activities (as per **Section 7.7.3**), or traffic impacts (as per **Section 7.10.3**). Community consultation regarding any significant noise, vibration, dust or traffic impacts will be incorporated into the Construction Environmental Management Plan (**Section 9.1**) via a Community Engagement Plan (CEP).

6.2 State Environmental Planning Policy (Transport and Infrastructure) 2021 consultation

Part 2.2 of the SEPP (Transport and Infrastructure) 2021 contains provisions for public authorities to consult with local councils and other public authorities prior to the commencement of certain types of development. Although Maitland City Council is both the proponent and determining authority of this project, internal consultation between different Council departments may still be required. Consultation with Council and other public authorities is detailed in **Table 6.1**, **Table 6.2**, and **Table 6.3** in relation to the proposed project.

Table 6.1. Consultation	with Council required	l under SEPP (Transport	& Infrastructure) 2021.

Is consultation with Council required under sections 2.10, 2.11, 2.12 and 2.14 of the SEPP (Transport and Infrastructure)?	Response
Are the works likely to have a substantial impact on the stormwater management services which are provided by council?	Yes □ No ⊠
Are the works likely to generate traffic to an extent that will strain the capacity of the existing road system in a local government area?	Yes □ No ⊠
The works will involve the closure of the existing bridge crossing at some stage during construction, however this is expected to be for a minimal time only. No significant strain on the capacity of the existing road system is expected.	
Will the works involve connection to a council owned sewerage system? If so, will this connection have a substantial impact on the capacity of the system?	Yes □ No ⊠
Will the works involve connection to a council owned water supply system? If so, will this require the use of a substantial volume of water?	Yes □ No ⊠
Will the works involve the installation of a temporary structure on, or the enclosing of, a public place which is under local council management or control? If so, will this cause more than a minor or inconsequential disruption to pedestrian or vehicular flow? The works will involve the closure of the existing bridge crossing at some stage during construction, however this is expected to be for a minimal time only. No	Yes □ No ⊠
significant disruption to pedestrians or vehicular flow is expected.	
Will the works involve more than a minor or inconsequential excavation of a road or adjacent footpath for which council is the roads authority and responsible for maintenance? The proposed works include the rehabilitation of the road pavement on the approaches on either side of the bridge. Internal Council consultation may be required.	Yes ⊠ No □
Is there a local heritage item (that is not also a state heritage item) or a heritage conservation area in the study area for the works?	Yes □ No ⊠
Is the proposal within the coastal vulnerability area and is inconsistent with a certified coastal management program applying to that land?	Yes 🗆 No 🖂
Are the works located on flood liable land? If so, will the works change flooding patterns to more than a minor extent?	Yes □ No ⊠
While the proposed project is located on flood prone land, it would not significantly change flood affectation as per hydrological modelling completed WMA Water, 2022). See summary of this report in Section 7.3.2 .	

Is consultation with a public authority (other than Council) required under sections 2.13, 2.15 and 2.16 of the SEPP (Transport and Infrastructure)?	Response
Are the works located on flood liable land?	Yes ⊠ No □
 Section 2.13 of the SEPP (Transport & Infrastructure) 2021 states that: public authority, or a person acting on behalf of a public authority, must not carry out development on flood liable land that may be carried out without development consent under a relevant provision unless the authority or person has (a) given written notice of the intention to carry out the development (together with a scope of works) to the State Emergency Service, and (b) taken into consideration any response to the notice that is received from the State Emergency Service within 21 days after the notice is given. 	
Note: <i>flood liable land</i> means land that is susceptible to flooding by the probable maximum flood event, identified in accordance with the principles set out in the manual entitled <i>Floodplain Development Manual: the management of flood liable land</i> published by the New South Wales Government and as in force from time to time.	
Are the works adjacent to a national park nature reserve or other area reserved	
under the National Parks and Wildlife Act 1974, or on land acquired under that Act?	No 🖾
Are the works on land in Zone C1 National Parks and Nature Reserves or in a land use zone equivalent to that zone?	Yes □ No ⊠
Do the works include a fixed or floating structure in or over navigable waters?	Yes 🗆 No 🗵
Are the works for the purpose of residential development, an educational establishment, a health services facility, a correctional facility or group home in bush fire prone land?	Yes □ No ⊠
Would the works increase the amount of artificial light in the night sky and that is on land within the dark sky region as identified on the dark sky region map? (Note: the dark sky region is within 200 kilometres of the Siding Spring Observatory).	Yes □ No ⊠
Are the works on buffer land around the defence communications facility near Morundah? (Note: refer to Defence Communications Facility Buffer Map referred to in clause 5.15 of Lockhart LEP 2012, Narrandera LEP 2013 and Urana LEP 2011).	Yes □ No ⊠
Are the works on land in a mine subsidence district within the meaning of the Mine Subsidence Compensation Act 1961?	Yes □ No ⊠

Table 6.2. Consultation with other public authorities required under SEPP (Transport & Infrastructure) 2021.

 Table 6.3. Notification of Council and occupiers of land under SEPP (Transport & Infrastructure) 2021.

Do Council and occupiers of adjoining land need to be notified under section 2.110 of the SEPP (Transport and Infrastructure)?	Response
Does the proposal include a car park intended for the use by commuters using regular bus services?	Yes □ No ⊠
Does the proposal include a bus depot?	Yes □ No ⊠
Does the proposal include a permanent road maintenance depot or associated infrastructure, such as garages, sheds, tool houses, storage yards, training facilities and workers amenities?	Yes □ No ⊠

6.3 Approvals, licences and permits

The licences, permits and approvals required for the proposed project are listed in **Table 6.4**.

Table 6.4.	Summary of	licences, approva	Is and permits.
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Requirement	Timing
Aboriginal Heritage Impact Permit (AHIP) under Section 90 of the National Parks and Wildlife Act 1974.	Prior to construction works commencing.
Maitland City Council will lodge an application with Heritage	
NSW for an AHIP as per the ACHAR (Appendix J).	
Dredging and reclamation work permit under Section 200 of	Prior to construction works
the Fisheries Management Act 1994.	commencing.
Maitland City Council will consult with NSW Department of	
Primary Industries to determine if a Part 7 permit is required.	
Blockage of passage of fish under Section 219 of the Fisheries	Prior to construction works
Management Act 1994.	commencing.
Maitland City Council will consult with NSW Department of	
Primary Industries to determine if a Part 7 permit is required.	
A water supply work approval will be needed if dewatering is	Prior to construction works
required during pile works.	commencing.
Maitland City Council will consult with NSW Department of	
Planning and Environment if dewatering is required.	
The bed of the Hunter River is listed as Crown Land.	Prior to construction works
	commencing.
Maitland City Council will consult with Crown Lands in	
relation to the proposed project.	
Written notice to the State Emergency Service under Section	Prior to construction works
2.13 of the SEPP (Transport & Infrastructure) 2021.	commencing.
Maitland City Council will give written notice (including a	
scope of works) to the State Emergency Service of the	
intention to carry out the development (see Table 6.2).	

7. Environmental assessment

This section provides a detailed description of the existing environment, and potential environmental impacts associated with the construction and operation of the proposed project. All aspects of the environment potentially impacted upon by the project are considered. This includes consideration of the factors specified in Section 171 of the Environmental Planning and Assessment Regulation 2021 as summarised in **Table 8.1**. Impacts on matters of national environmental significance under the *Environment Protection and Biodiversity Conservation Act 1999* are also considered and summarised in **Table 8.2**.

Site-specific environmental mitigation and management measures are provided to mitigate the identified potential impacts.

7.1 Soil, landform and geology

7.1.1 Existing environment

Topography of the study area is typical of the Hunter River with elevation ranging from approximately 13 m AHD on the northern bank and 12 m AHD on the southern bank down to 4 m AHD on the existing bridge. The riverbed lies at between 1 m - 2.5 m AHD.

The study area is highly modified and has been subject to extreme flooding during 2022 which has caused erosion in some areas including the riverbanks and along the approaches to the bridge. It appears that unauthorised access by vehicles onto the riverbed has also caused some erosion directly downstream of the existing timber bridge on both sides of the river. The recent flooding has resulted in Maitland City Council undertaking short-term stabilisation works using rock fill on areas of instability.

A review of eSPADE v2.2 (DPIE, 2023) on 22 August 2023 identified that the study area is located within the Paterson River (pa) soil landscape. This soil landscape is associated with level to gently undulating narrow alluvial plains along the Paterson and Allyn Rivers. At the time of inspection, much of the riverbed was exposed revealing a combination of fine to coarse sand with some gravels and cobbles. The study area is mapped as being underlain by Quaternary aged alluvial sediments which typically comprise fluvially deposited sand, gravel, silt and clay. This is consistent with the results of geotechnical investigations, which encountered alluvial sediments underlain by sandstone (Douglas Partners, 2023).

There is no known occurrence of acid sulfate soils at or near the study area. The site is not mapped as containing saline soils.

7.1.2 Potential impacts

The proposed construction activities, including ground disturbance, removal of vegetation and excavation, would temporarily expose soils to erosion risks. Erosion can lead to the degradation of soil substrates and reduction in soil stability (slumping and gully erosion). Erosion and sedimentation risks would be elevated in areas with steeper slopes. Construction activities would be staged to minimise the extent of soil disturbance and disturbed areas would be stabilised and reinstated as soon as practical. Erosion impacts as a result of the project would be minor and temporary considering the staged approach to construction and the installation of erosion and sediment controls.
The works will result in minor alterations to the land surface due to excavation and backfilling activities from the construction of the new bridge structure and road alignment. However, it is not expected or intended for the works to substantially alter the topography within the study area.

The operation of the project would have no change to topography or soils. However, continued access by unauthorised vehicles to the riverbed once the new bridge is operational will likely result in further erosion.

7.1.3 Mitigation and management measures

- A site-specific Soil and Water Management Plan (SWMP) incorporating an Erosion and Sediment Control Plan (ESCP) will be developed in accordance with The Blue Book - Managing Urban Stormwater: Soils and Construction (Landcom, 2004). This will form part of the CEMP and will be implemented throughout the construction period and will remain implemented until all disturbed areas are suitably stabilised and revegetated. The SWMP will include an emergency procedure for flood event, site demobilisation and minimisation of excessive erosion and sedimentation, in the event of heavy rain or flooding.
- The ESCP will include erosion and sediment control plans for all stages of construction, consider soil erodibility, include at source controls, provide for the protection of waterways and stockpile management, include monitoring and reporting checklists and detailed consideration of measures to prevent (wherever possible) or minimise any potential erosion and sedimentation impacts. The ESCP will include the following environmental management measures:
 - Install sediment controls on the downslope side of any disturbed areas including excavated, graded, and stockpile sites where erosion may result in impact to the surrounding area.
 - Regularly check erosion and sediment controls to ensure they are in place, in good condition and continue to be effective.
 - Locate stockpiles of construction materials a suitable distance from Hunter River, drainage lines, and culverts and provide appropriate containment measures around the stockpiles, to prevent impact from any contaminated runoff.
 - Work areas, stockpile sites and access tracks to be established on already disturbed, un-vegetated areas.
 - Temporary stockpiles shall be stabilised to prevent wind and water erosion where they are located.
 - Restrict works during and after periods of high rainfall to minimise site disturbance and sedimentation.
 - Stabilisation of disturbed areas is to be staged progressively during the construction works.
- Scour protection will be installed at the abutments and piers of the new bridge.
- Disturbed areas will be revegetated with suitable local provenance native trees, shrubs and grasses.
- Bollards will be installed (where necessary) to prevent unauthorised vehicle access to the riverbed and revegetated areas.

7.2 Contaminated land and acid sulfate soils

7.2.1 Existing environment

A search of the Environment Protection Authority (EPA) list of notified contaminated sites (EPA, 2023a) and record of notices (EPA, 2023b) was undertaken on 23 August 2023 (**Appendix D**). No contaminated land is recorded within or adjacent to the study area.

The acid sulfate soil risk mapping accessed via eSPADE v2.2 (DPIE, 2023) on 22 August 2023 identified that there is no known occurrence of acid sulfate soils within or adjacent to the study area.

7.2.2 Potential impacts

The proposed project is not expected to uncover, disturb, or interact with contaminated land or acid sulfate soils. The operation of the project would have no change to contaminated lands or acid sulfate soils.

7.2.3 Mitigation and management measures

• If suspected contaminated soils are uncovered during the construction works, the soils would be covered and segregated for further testing and analysis. All works within the vicinity must cease immediately and Maitland City Council must be notified immediately.

7.3 Waterways, water quality and hydrology

7.3.1 Existing environment

The study area is located in the Hunter catchment, which is the largest coastal catchment in NSW, covering an area of approximately 21,500 km². The current Melville Ford Bridge spans the Hunter River approximately 20 km upstream of the Paterson River. The study area is in a flood prone area within the 1 % annual exceedance probability (1 % AEP) zone. The Hunter River has historically been negatively impacted by land clearing, agriculture, and urbanisation in the region. Impacts to the river include erosion and sedimentation, turbidity, and poor water quality.

The closest located groundwater monitoring bore is GW201738 located approximately 700 m northwest of the study area. A review of the groundwater summary report for this monitoring bore identified a standing water level of 20 m below the ground level. However, geotechnical investigations identified observed groundwater at <2 m across the proposed bridge location (Douglas Partners, 2023).

At the time of the site inspection, water level was low, but still flowing in the deepest channels of the river. The water was relatively clear with no odour present. Much of the riverbed was exposed which consisted of sand and gravel.

7.3.2 Potential impacts

Construction

There is a potential risk to personnel on site and the local community if a flooding event occurs during the proposed works. The proposed construction works would include several activities that would disturb the existing ground surface including excavation, vegetation removal, and piling works required for the installation of the new bridge. The earthworks and stockpiling associated with construction of the project have the potential to temporarily expose soils increasing the risk of erosion. This may lead to increased sedimentation of downstream environments, either directly via stormwater run-off or deposition of soils. Run-off containing sediment from stockpiles may result in increased turbidity and enhanced sedimentation in the river.

Works could result in a direct impact on the edge of the riverbanks through construction of temporary piling pads on either side of the river. This may require placement of inert material (gravel/hard rock) at the edge of the bank near the existing bridge.

A floating boom/silt curtain would be installed downstream of the new bridge within the Hunter River to contain and control silt during excavation and to prevent sediment migration downstream from the study area.

During construction, the potential exists for spills of fuels and oils from machinery or vehicles.

The proposed works have the potential to intercept groundwater during construction works such as piling works. Prior to construction a CEMP will be prepared that will include a groundwater management plan (GMP) in the event that groundwater is intercepted during construction works, including measures to manage the groundwater and ensure discharge has a minimal impact on receiving water quality.

Potential cumulative impacts to the river could include increased erosion and sedimentation, increased turbidity, and a reduction in water quality.

Operation

The concept design stage has included hydraulic modelling for the proposed design of the new bridge. While the proposed project is located on flood prone land, the operating bridge would not significantly change flood affectation as per modelling completed (WMA Water, 2022). A summary of this report, *Melville Ford Bridge Upgrade – Concept Design Flood Assessment* is listed below:

- Raising the bridge will significantly reduce the closure times due to overtopping, both in terms of the total number of days per year and the number of separate overtopping events.
- The modelling demonstrates that the proposed concept design would not significantly change flood affectation for existing development in the vicinity of the bridge.
- The change in peak flood levels compared to the existing bridge would generally be within 0.01 m for a range of design events including the 1% AEP event.
 - $\circ~$ This difference is within the tolerance of the hydraulic modelling to estimate with reasonable accuracy.
 - This result is to be expected given the low level of the bridge and the minor influence on flow during floods when it is overtopped by several metres.
- The design of the new bridge will need to include:
 - Structural and geotechnical considerations to prevent failure, even when overtopped by depths of 20 m or more
 - Scour protection at the abutments and piers
 - Construction methods, and the potential for delays if any proposed temporary rock platforms are overtopped for lengthy periods which could disrupt the new bridge construction.

The risk of sediment-laden run-off during operation would be minimal as all areas temporarily impacted during construction would be sealed or rehabilitated to prevent soil erosion from occurring.

The Project would result in a minor increase in the amount of impermeable surfaces. However, it is anticipated that this increase would result in minimal excess run-off and surface water volume in the

study area would continue to be diverted into the existing drainage system with all water reporting to the same catchments as present.

There is no operational impact anticipated to groundwater or flooding as a result of the Project.

7.3.3 Mitigation and management measures

- All personnel will be inducted on site and made aware of flooding risks, mitigation measures and emergency procedures including evacuation of site.
- The worksite will be closed, and all materials and equipment will be secured prior to the start of the working day if there is a risk of riverine flooding, on receipt of BOM advice, or when other evidence leads to an expectation of flooding.
- Weather will be monitored via the Bureau of Meteorology (BOM) website prior to the start of the workday for any flood warnings. Weather and water levels will be monitored throughout each day and work will be reassessed where there may be a safety or environmental risk due to weather events.
- A SWMP and ESCP will be implemented during the proposed project as per **Section 7.1.3**. The SWMP will include an emergency procedure for site demobilisation and minimisation of excessive erosion and sedimentation, in the event of heavy rain or flooding.
- Install floating boom/silt curtain downstream of the new bridge location.
- Do not perform maintenance of equipment or vehicles on site. If unavoidable carry out away from watercourses and drainage lines and use drip or catch trays beneath equipment/vehicles being maintained.
- Refuelling of minor plant and equipment is to occur in impervious bunded areas located a minimum of 40 metres from drainage lines or waterways.
- An emergency spill kit will be kept on site at all times. All persons on site are to be made aware of the location of the spill kit and trained in its use.
- A spill response plan will be developed for the project. This plan would detail measures including spill prevention, containment and clean-up of accidental spills of oils, fuels and chemicals.
- The storage and handling of fuels and chemicals would comply with Australian Standards and safety data sheets.
- Any spills with the potential for material harm to the community or environment will be notified to the EPA by Maitland City Council immediately.
- Vehicle movements will be restricted to designated roadways and access points wherever possible.
- Do not store equipment and materials within 40 m of watercourses.

- If dewatering is required, the activity is to be monitored to ensure existing receiving water quality is maintained.
- Drilling water or fluid is to be contained within a recirculating system and disposed of to a waste tanker or cleaned up with a sucker truck. There is to be no release of drilling water or fluid to the environment.
- Controls may include dewatering onto a vegetated area or filtering through sediment controls such as sediment fence, straw bales or sandbags. If visual impacts i.e. discolouration is observed, cease dewatering activity.
- The contractor is to develop a groundwater management plan (GMP) as part of the CEMP detailing methodologies and management measures (including obtaining approvals) in case of groundwater interception during construction works.

7.4 Biodiversity

7.4.1 Existing environment

A review of available literature and online databases was completed to identify biodiversity values and potential for threatened species, communities and populations listed under the *Biodiversity Conservation Act 2016* (BC Act), *Fisheries Management Act 1994* (FM Act) and the EPBC Act to occur in the study area. The following database searches were undertaken:

- EPBC Act Protected Matters Search Tool (DCCEEW, 2023a) on 19 July 2023 (**Appendix E**). The EPBC Act Protected Matters Report lists the following Matters of National Environmental Significance that may occur in, or may relate to the project site (10 km buffer area):
 - One Wetland of International Importance (Ramsar Wetlands)
 - o Eight Listed Threatened Ecological Communities
 - 53 Listed Threatened Species
 - 18 Listed Migratory Species
- A NSW BioNet Atlas Search (DPE, 2023a) on 20 July (**Appendix F**) identified 31 records of threatened species, populations or communities previously recorded within a 10km buffer of the project site.
- A search of the NSW State Vegetation Type Map (DPE 2023b) on 20 July 2023 identified one plant community type (PCT) as occurring in the study area. The PCT is:

PCT 3083 – Lower Hunter Tuckeroo Riparian Rainforest

- Listed as vulnerable under the BC Act associated with Lower Hunter Valley Dry Rainforest in the Sydney Basin and NSW North Coast Bioregions.
- Listed as endangered under the BC Act associated with Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions.
- Listed as critically endangered under the EPBC Act associated with Lowland Rainforest of Subtropical Australia.

• A search of the Greater Hunter Native Vegetation Mapping (DPE, 2012) on 20 July 2023 identified one vegetation community occurring within the study area:

PCT 1714 – River Oak - White Cedar Grassy Riparian Forest of the Dungog Area and Liverpool Ranges

- This community is not listed as an endangered ecological community.
- A search of the Department of Primary Industries Fisheries NSW Spatial Data Portal on 30 July 2023 indicated that the study area contains:
 - Key Fish Habitat Central Rivers
 - Good freshwater fish community status

Note: The study area is not mapped as habitat for any threatened aquatic species.

- A search of the Atlas of Groundwater Dependent Ecosystems (GDE) (BOM, 2023) on 30 July identified the Hunter River as a high potential GDE. Vegetation along the banks of the river is mapped as a high potential terrestrial GDE.
- A search of NSW WeedWise (DPI, 2023) identified all priority weeds listed for the Hunter region and associated measures needed to fulfil the requirements of the Biosecurity Act (Appendix G).

An inspection of the study area was undertaken on 5 August 2023 by EDM Ecological to:

- Assess and describe the existing environment in relation to terrestrial and aquatic flora and fauna species and communities.
- Identify threatened species or key ecological features (such as hollow-bearing trees and fallen timber) with the potential to provide habitat for threatened species.
- Identify if the study area supports or has potential habitat for threatened and migratory species, endangered populations or TECs listed under the BC Act and/or the EPBC Act.

Survey of the study area involved foot traverses of the areas with potential to be disturbed by the proposed works. Vegetation assessment was undertaken to record dominant plant species in the canopy, mid-storey and groundcover. Fauna habitat assessment targeted nests, hollow-bearing trees, logs, and feed trees. Further details can be found in **Appendix B.** Following changes to the proposed bridge alignment, several trees are now proposed for removal. As a result, an assessment of the trees was undertaken by Corymbia Ecology on 11 & 16 August 2024 (**Appendix L**).

Vegetation

The vegetation on site is heavily infested with introduced weed species. Some native trees are present along the riverbanks, particularly on the southern side of the river adjacent to Aberglasslyn Road. However, the northern riverbank is all but devoid of native vegetation with the exception of one small patch of isolated trees. Native trees on the southern riverbank are predominantly *Casuarina cunninghamiana subsp. cunninghamiana* (River Oak). Many introduced willows (*Salix sp.*) and black locust (*Robinia pseudoacacia*) trees are present throughout the study area, which were both in dormancy at the time of inspection. The shrub and ground layers are dominated by introduced species, particularly green cestrum, lantana, African olive, balloon vine, African lovegrass, castor oil plant and wild mustard.

The riparian vegetation in the study area is not identified as representative of **PCT 3083 – Lower Hunter Tuckeroo Riparian Rainforest** based upon the absence of canopy species (only *Casuarina cunninghamiana* subsp. cunninghamiana is present) and other expected species across all strata being absent. Further details can be found in **Appendix B**.

PCT 1714 – River Oak - White Cedar Grassy Riparian Forest of the Dungog Area and Liverpool Ranges is found on the southern bank of the river within the study area, although it is in poor condition and lacks several species which are diagnostic of this community.

Most of the vegetation in the study area is non-native vegetation. There are two small patches of isolated native trees consisting of seven trees on the northern bank and four trees on the southern bank. All remaining land within the study area is classified as Disturbed Land, which includes the river, roads, and bridge. The spatial distribution of the vegetation identified in the study area is shown in **Figure 7.1**.

Terrestrial habitat

The existing timber bridge is potential roosting and/or breeding habitat for microbat species. A microbat specialist ecologist was engaged to assess the timber bridge for microbat habitat. Cavities were identified in the bridge structure that could be suitable for roosting. Southern Myotis (also known as the Large-footed Myotis) *Myotis Macropus* calls were recorded during the dusk period. It was determined that the threatened Southern Myotis could be roosting in the bridge structure (Fauna Field Ecology, 2023). Current noise and vibration from vehicles crossing the timber bridge is unlikely to disturb the bats as this species is known to be relatively tolerant to disturbances when roosting.

Small hollows were identified in 3 of the willow trees proposed for removal on the south abutment (**Plate 7-1**). Four dead trees (proposed for removal) were identified on the northern bank. No hollows were identified in any trees on the northern abutment however, two of the dead trees have large sheets of exfoliating bark that may provide habitat for bat or reptile species (**Plate 7-2**). One dead tree was identified on the southern bank.

There are several fallen trees located downstream and upstream of the study area in the river itself. Most of these were laying on the exposed riverbed at the time of inspection due to low water levels in the river. These appear to have been uprooted by previous flood events. No nests, dreys, or significant feed trees were identified on site.

Aquatic habitat

The water was relatively clear at the time of inspection with no odours present. There was very little overhanging riparian vegetation present with the exception of the River Oaks on the southern bank. Several fallen trees were identified in the river. Fallen trees have the potential to provide aquatic habitat when the water level in the river is higher.

Wildlife corridors

Considerable clearing in the vicinity of the study area for rural land use and urbanisation has resulted in disturbed and fragmented vegetation with reduced habitat connectivity. Despite this, the Hunter River and associated riparian vegetation provides a wildlife corridor with linkages to local and regional areas of habitat. Consequently, the Hunter River and the vegetation within and surrounding the study area has been mapped as part of Council's 'Green Blue Grid' which has been established to provide strategic direction for biodiversity corridors and preservation and enhancement of bushland, wetlands and waterways within Maitland (Maitland City Council, 2023).



Plate 7-1. Willow trees proposed for removal on the southern approach.



Plate 7-2. Trees proposed for removal on the northern approach.

7.4.2 Potential impacts

Vegetation

The proposed works will involve the removal of 4 willow trees on the southern approach to the bridge (**Plate 7-1**). On the northern approach, 12 trees (including 4 dead trees) are proposed for removal (**Plate 7-2**). Clearing of non-native vegetation will be required on the northern and southern approaches to the bridge which is approximately 0.17 ha in total.

The study area and surroundings are heavily infested with weeds which have the potential to spread further during construction works and following the disturbance of soils.

Terrestrial habitat

Removal of the existing timber bridge has the potential to impact on the threatened Southern Myotis (Fauna Field Ecology, 2023). A Test of Significance was conducted for this species (**Appendix C**) which determined that the proposal would not have a significant impact on the Southern Myotis. Noise and vibration from the construction activities have the potential to disturb microbats roosting in the existing timber bridge. However, the Southern Myotis is known to be relatively tolerant of disturbances including the noise and vibration from vehicles crossing timber bridges where they are roosting.

Three of the willows proposed for removal on the southern approach contain hollows that may be providing habitat for bats, small reptiles and frogs. Most of the hollow entrances are cluttered with small twigs which suggests they are less suitable for bats. No bats were observed exiting the trees on dusk during inspections. It is unlikely that the Southern Myotis is using the habitat available in the trees to be removed.

Fallen trees on the currently exposed areas of the riverbed have the potential to provide habitat. However, their current locations suggest that they are unlikely to be disturbed during construction.

Aquatic habitat

Construction activities associated with the proposal have the potential to impact on water quality of the Hunter River via spills and leaks from machinery or soils and construction materials entering the waterway. This could result in contamination or increased turbidity of the waterway and reduce the quality of habitat for aquatic species.

Fallen trees laying in the riverbed could provide habitat for aquatic species when the water level of the river is higher. However, their current locations suggest that they are unlikely to be disturbed during construction.

Wildlife corridors

The removal of 0.17 ha of non-native vegetation and 7 native trees will further impact on the fragmentation of wildlife corridors along the Hunter River and potentially reduce connectivity with other areas of habitat. However, removing this vegetation provides an opportunity to revegetate these areas with local provenance native species to restore this connectivity.

7.4.3 Mitigation and management measures

A Biodiversity Management Plan (BMP) will be developed to ensure that at a minimum, all mitigation measures listed below under vegetation, terrestrial habitat, aquatic habitat and wildlife corridors are implemented. This will form part of the CEMP and will be implemented throughout the construction period.

Vegetation

- All 16 trees proposed for removal will be clearly marked prior to removal.
- All removed trees will be offset according to Maitland City Council's tree replacement requirement of a 3:1 ratio. Forty-eight (48) advanced (minimum 45L) locally native trees will be planted in a suitable location determined by MCC (preferably along the riverbanks adjacent to the study area).
- All offset trees will be maintained for a minimum of 12 months after planting. Maintenance will include watering, mulching, weed management and tree replacement if they do not survive this period. Further details will be included in the BMP.
- Disturbance of non-native vegetation is limited to the minimum areas required for the project to be completed.
- Revegetation will be undertaken with suitable, local provenance native trees, shrubs and grasses in the disturbed areas surrounding the new bridge. Location of the revegetation areas and details of the plant species, planting density, and maintenance requirements will be included in the BMP.
- Native vegetation areas mapped as **River Oak White Cedar Grassy Riparian Forest** and **Isolated Native Trees** in **Figure 7.1** will be marked as 'No Access' zones using para-webbing or similar with no access allowed for vehicles, machinery, or workers and no materials to be stored in these areas.
- Native vegetation areas mapped as **River Oak White Cedar Grassy Riparian Forest** and **Isolated Native Trees** in **Figure 7.1** are not disturbed or removed.
- Spoil from clearing works is to be stockpiled outside of any native vegetation areas and outside of the dripline (usually 5 metres) of any trees.
- Weed Biosecurity Management Plan (WBMP) to be developed as part of the BMP. Targeted priority weed management will be undertaken prior to, during and post construction where required, with a particular focus on revegetated areas.
- Remove and dispose of weed waste materials including any fruit or seed do not mulch on site.
- Keep weed infested soils separate from clean fill and only re-use on site under 1 m from final ground level.

• Parking vehicles, storing materials or placing stockpiles within the dripline of trees (usually 5 metres) will be avoided.

Terrestrial habitat

- Implement safeguards determined by microbat specialist in Microbat Habitat Assessment Report (**Appendix H**) which include:
 - Microbat specialist to determine the requirements and location of baffles/shields to minimise disturbance to microbats roosting on the timber bridge during construction of new concrete bridge.
 - Install minimum of 2 microbat boxes under the new concrete bridge as soon as possible once constructed.
 - Microbat specialist to carry out two more visual inspections and dusk watches within two to three weeks prior to timber bridge removal.
 - Existing timber bridge is removed outside of Southern Myotis breeding period.
 Breeding period is late September to early April. Preferable removal would be in April /May or August to avoid overwintering period.
 - \circ Exclusion barriers put in place on both sides of the entire length of the timber bridge, 4 – 5 nights prior to scheduled removal.
 - Microbat specialist to be present during the removal of the existing timber bridge.
 Note: Some sections of the dismantled timber bridge may need to remain on site overnight to allow for bats to leave the structure, depending on conditions.
- An ecologist will be present during the removal of all trees to ensure the following:
 - All trees are inspected for nests prior to removal.
 - Any nests, birds or other fauna are relocated or provided to a wildlife carer.
 - The 3 willow trees containing hollows on the southern approach (**Plate 7-1**) are gently lowered and hollows are inspected for fauna.
 - The 3 willow trees containing hollows on the southern approach (**Plate 7-1**) (once removed) are placed outside of the construction zone to allow any resident fauna to relocate.
 - The 2 dead trees with exfoliating bark on the northern approach are gently shaken with machinery prior to removal with a pause of 3 minutes. This process is repeated twice prior to felling.
 - After felling, the 2 dead trees with exfoliating bark are inspected for fauna.
 - Any injured wildlife is taken to a local wildlife carer.
- Do not remove or disturb any fallen trees on site. If fallen trees are required to be moved, then they will be placed back in a location as close to the original position as possible.
- Do not remove any dead trees except for the 4 dead trees identified for removal on the northern approach.
- Removed trees containing hollows (3 willows) (Plate 7-1) and exfoliating bark (2 dead trees) (Plate 7-2) will be placed on the ground outside of the construction zone as potential fauna habitat.

- All removed hollows will be offset according to Maitland City Council's hollow replacement requirement of a 2:1 ratio. **Six (6)** artificial nestboxes suitable for microbats will be installed at least 2 weeks prior to the removal of the hollows (willow trees). Further details of the nestboxes will be included in the BMP.
- Do not disturb or harm any fauna found on site. If native fauna is injured or trapped on site, contact the local National Parks & Wildlife office or a licensed wildlife rescue and rehabilitation group in the local area to arrange for collection/removal from site.

Aquatic habitat

- A floating boom/silt curtain would be installed downstream of the new bridge within the Hunter River. Silt curtains will be installed so that they do not block fish passage.
- A site-specific Soil and Water Management Plan (SWMP) incorporating an Erosion and Sediment Control Plan (ESCP) will be developed in accordance with The Blue Book Managing Urban Stormwater: Soils and Construction (Landcom, 2004). This will form part of the CEMP and will be implemented throughout the construction period.

Wildlife corridors

- Native vegetation areas mapped as River Oak White Cedar Grassy Riparian Forest and Isolated Native Trees in Figure 7.1 will be marked as 'No Access' zones using para-webbing or similar with no access allowed for vehicles, machinery, or workers and no materials to be stored in these areas.
- Native vegetation areas mapped as **River Oak White Cedar Grassy Riparian Forest** and **Isolated Native Trees** in **Figure 7.1** are not disturbed or removed.
- Disturbance of non-native vegetation is limited to the minimum areas required for the project to be completed.
- Revegetation will be undertaken with suitable, local provenance native trees, shrubs and grasses in the disturbed areas surrounding the new bridge. Location of the revegetation areas and details of the plant species, planting density, and maintenance requirements will be included in the BMP.
- All removed trees will be offset according to Maitland City Council's tree replacement requirement of a 3:1 ratio. **Forty-eight (48)** advanced (minimum 45L) locally native trees will be planted in a suitable location determined by MCC (preferably along the riverbanks adjacent to the study area).
- All offset trees will be maintained for a minimum of 12 months after planting. Maintenance will include watering, mulching, weed management and tree replacement if they do not survive this period. Further details will be included in the BMP.

Figure 7.1. Vegetation identified in the study area.

7.5 Aboriginal heritage

7.5.1 Existing environment

A search of the Heritage NSW Aboriginal Heritage Information System (AHIMS) (DPE, 2023c) on 24 August 2023 identified no Aboriginal sites, places or objects located within or directly adjacent to the study site (**Appendix I**). However, during an Aboriginal archaeological due diligence assessment conducted on behalf of Maitland City Council (Virtus Heritage, 2022a), an isolated Aboriginal artefact (Melville Bridge IF1) was discovered on site. Subsequently, an Aboriginal Cultural Heritage Assessment Report (ACHAR) was completed (AMAC, 2023a) (**Appendix J**). This report determined that an AHIP will be required for this project. Maitland City Council's application for an Aboriginal Heritage Impact Permit has been approved, and the AHIP is included as **Appendix K**. **Note:** Maitland City Council has since applied to Heritage NSW for a variation to the AHIP to reflect minor changes to the area of land subject to the permit.

Melville Bridge IF1, now registered as AHIMS Site 46-6-0060 was found within the study area on the riverbank to the south-east of the current timber bridge. Due to the location of the Aboriginal site, the study area holds potential for Aboriginal objects/deposits with conservation value to be present.

7.5.2 Potential impacts

The proposal will disturb areas of the ground surface within the study area during construction of the new bridge, road re-alignment, and re-grading batter works. The study area currently contains one registered Aboriginal site (AHIMS Site 46-6-0060) consisting of an isolated artefact - Melville Bridge IF1. Due to the location of the Aboriginal site, the study area holds potential for Aboriginal objects/deposits with conservation value to be present. The proposed works have the potential to harm any objects and/or deposits of Aboriginal and/or archaeological significance that may be present (AMAC, 2023a).

7.5.3 Mitigation and management measures

- Maitland City Council will apply for an Aboriginal Heritage Impact Permit (AHIP) for this proposal as per the Aboriginal Cultural Heritage Assessment Report (ACHAR) completed by AMAC (2023a). This includes:
 - A community collection should be conducted with the registered Aboriginal stakeholders prior to works proceeding.
 - If proposed works encounter natural soils further assessment is required and the appropriate mitigation should take place as outlined in the ACHAR.
 - The artefact (Melville Bridge IF1) should be removed during the proposed works and reburied as close as possible to the artefact's current location.
- All conditions of the AHIP (**Appendix K**) will be complied with throughout the proposed project.
- All persons working on site will be briefed prior to works commencing as to the conditions of the AHIP and their responsibilities in ensuring the preservation of Aboriginal archaeological deposits and objects that may be located on site.
- All vehicles and machinery will use the existing roads and avoid the riverbed wherever possible.

- If any Aboriginal archaeological deposits and/or objects are located during the development, then the following should take place:
 - All work is to cease in the immediate vicinity of the deposits and/or objects.
 - \circ $\;$ The area is to be demarcated.
 - Heritage NSW, a qualified archaeologist and the participating RAPs are to be notified.
- Should any human remains be located during the proposed works, then the following will take place:
 - \circ $\;$ All excavation in the immediate vicinity of any objects shall cease immediately.
 - The NSW police and Heritage NSW will be informed as soon as possible.
 - If it is established that the human remains are Aboriginal ancestral remains, Heritage NSW and the relevant Registered Aboriginal Parties will identify the appropriate course of action.

7.6 Non-Aboriginal heritage

7.6.1 Existing environment

A search of the following online heritage database searches was undertaken on 31 August 2023 to identify any Commonwealth, State or local heritage significance items:

- NSW State Heritage Inventory (DPE, 2023d)
- Commonwealth EPBC heritage list (DCCEEW, 2023b)

There are no listed heritage items within or directly adjacent to the study area.

There are 3 heritage listings within approximately 1500 m of the study area which include:

- Aberglasslyn House (State and local heritage significance)
- Aberglasslyn Cottage (Local heritage significance)
- Eeelah (Local heritage significance)

Melville Ford Bridge is not listed as a local, State or Commonwealth heritage item. However, a Statement of Heritage Impact (SoHI) was prepared on behalf of Maitland City Council to assess the heritage significance of the bridge (Virtus Heritage, 2022b). There are visible remains of two previous timber bridges, with piers located directly upstream (**Plate 7-1**) and within the study area downstream (**Plate 7-2**) of the current bridge. These timber remains are not listed as heritage items, however, they will be retained and will not be impacted by the proposal.

Plate 7-3. Remains of a previous timber bridge located upstream from the current bridge.

Plate 7-4. Remains of a previous timber bridge located downstream from the current bridge.

7.6.2 Potential impacts

The proposal is anticipated to have no impact on listed heritage items.

The SoHI identified that the proposed upgrade of the Melville Ford Bridge will have a negative impact on its identified local heritage significance (particularly its social and aesthetic value) as the existing timber bridge will be removed.

7.6.3 Mitigation and management measures

- The existing timber bridge will be subject to an archival photographic recording as per the advice provided in the SoHI. This report has already been completed on behalf of MCC by AMAC (2023b).
- Remains of the previous two timber bridges found upstream and downstream of the currently standing Melville Ford Bridge will be preserved. Should the remains need to be removed, then archival photographic recording should be conducted prior to removal as per the advice provided in the SoHI.
- Should any suspected archaeological remains be uncovered during the proposed works (e.g. infrastructure, sandstone or bricks, conduits, kerbing, culverts, retaining walls, or scattered artefacts such as bottles, ceramics, animal bones, clay pipes) then the following will take place:
 - Work will cease in the area and remains/artefacts will be left in situ and fenced off with para-webbing or similar.
 - A qualified archaeologist will be consulted for advice on the next steps.

7.7 Noise and vibration

7.7.1 Existing environment

The existing noise environment is typical of a rural/rural residential area consisting of traffic noise and natural sounds. The closest residences are located approximately 250 m north, 290 m east, 300 m south, 300 m south-west, and 600 m west of the project area. These residences are located on Dickenson Road, Aberglasslyn Lane, Aberglasslyn Road, Rivergum Drive, and Melville Ford Road respectively. The suburb of Aberglasslyn (to the south) is the closest residential suburb consisting primarily of R1 – General Residential and R5 – Large Lot Residential land.

Besides residential dwellings, there are no other sensitive noise receivers within the locality of the study area. The closest sensitive receivers are:

- Golden Whistler Park approximately 1100 m south-east of the study area
- Kids Cave Early Education approximately 1450 m south-west of the study area

7.7.2 Potential impacts

Noise

The EPA recognises that construction activities could potentially generate higher noise levels than those of an industrial operation. The Interim Construction Noise Guideline (ICNG) (DECC, 2009) provides noise management criteria for construction activities which are intended to guide the need for, and the selection of, feasible and reasonable work practices to minimise construction noise impacts. The ICNG notes that a residential receiver is 'noise affected' if the LAeq (15 min) construction noise level exceeds the rating background level (RBL) by more than 10 dB and is 'highly noise affected' at 75 dB(A) during recommended standard hours.

The proposed construction activities will generate noise from the operation of plant, machinery and equipment (**Table 4.1**) during standard work hours. Piling activities associated with the construction of the new bridge are anticipated to generate the greatest noise and vibration during construction. This phase of the project is anticipated to take 6 weeks to complete. Although expected construction noise has not been quantified, considering the distance from the closest residence is 250 m, it is unlikely that noise from the proposed project will have a significant impact on residential receivers. Noise minimisation strategies will be used during construction – see Section 7.7.3 below.

Vibration

Piling activities have the potential to generate vibration at a distance from the project area. The Roads and Maritime Services Construction Noise and Vibration Guideline (CNVG) (RMS, 2016) recommends typical minimum working distances for these types of equipment (**Table 7.1**). This guideline was developed to manage construction noise and vibration for all Roads and Maritime projects, however is applicable to other similar construction projects.

Plant Item	Rating / Description	Minimum working distance	
		Cosmetic damage (BS 7385)	Human response (OH&E vibration guideline)
	< 50 kN (Typically 1-2 tonnes)	5m	15m to 20m
	< 100 kN (Typically 2-4 tonnes)	6m	20m
Vibratory Roller	< 200 kN (Typically 4-6 tonnes)	12m	40m
	< 300 kN (Typically 7-13 tonnes)	15m	100m
	> 300 kN (Typically 13-18 tonnes)	20m	100m
	> 300 kN (> 18 tonnes)	25m	100m
Small Hydraulic Hammer	(300 kg - 5 to 12t excavator)	2m	7m
Medium Hydraulic Hammer	(900 kg – 12 to 18t excavator)	7m 23m	
Large Hydraulic Hammer	(1600 kg – 18 to 34t excavator) 22n		73m
Vibratory Pile Driver	Sheet piles	2m to 20m	20m
Pile Boring	≤ 800 mm	2m (nominal)	4m
Jackhammer	Hand held	1m (nominal)	2m

Table 7.1.	Recommended	minimum	working	distances f	for vibration	intensive pla	ant (RMS. 7	2016).
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The CNVG states that these minimum working distances are indicative and will vary depending upon the item of plant and local geotechnical conditions. They apply to cosmetic damage of typical buildings under typical geotechnical conditions. Vibration monitoring is recommended to confirm the minimum working distances at specific sites.

No receivers are anticipated to be within the recommended safe minimum working distances for the proposed piling works on site. The study area is not located in the vicinity of any heritage listed buildings that may be impacted by vibration from the proposal.

The proposal will not have any impact on the existing current noise and vibration environment during operation.

7.7.3 Mitigation and management measures

- A Noise and Vibration Management Plan (NVMP) will be prepared and implemented as part of the CEMP. The NVMP will follow the approach in the Interim Construction Noise Guideline (ICNG) (DECC, 2009) and identify:
 - All potential significant noise and vibration generating activities associated with the activity.
 - \circ $\;$ Feasible and reasonable mitigation measures to be implemented.
 - Arrangements for consultation with affected residents and sensitive receivers, including notification and complaint handling procedures.
 - Contingency measures to be implemented in the event of non-compliance with noise and vibration criteria.
- Works will be carried out during standard work hours only (i.e. Monday-Friday: 7:00am to 6.00pm; Saturday: 8.00am to 1.00pm; Sunday and Public Holidays: no work).
- Notify all potential noise affected residents as follows:
 - Prior to the commencement of the construction project, provide a general update to the local community including all potential noise affected residents. Notification to advise on general project information such as scope of works, duration of the works, and any perceived impacts to the community.
 - If out of hours works are essential provide notification to noise affected residents a minimum of 5 business days prior to the works. Notification to advise on details of works, details of any noisy type works, details of any changes to river crossing access and details of measures implemented to mitigate noise impacts.
- Workers on site will minimise noise during construction as follows:
 - $\circ\quad$ Use equipment in ways to minimise noise.
 - Avoid the use of radios or stereos outdoors.
 - Avoid shouting, and minimise talking loudly and slamming vehicle doors.
 - Avoid dropping materials from a height.
 - Avoid reversing machinery whererever possible.
 - Avoid leaving vehicles in idling for extended periods.
 - Ensure plant and machinery is maintained and in good working order.

- Site Managers will minimise noise during construction as follows:
 - Schedule material deliveries to be delivered during standard working hours.
 - Examine and implement, where feasible and reasonable, alternatives to noisy work methods.
 - \circ $\;$ Where practical establish the worksite to minimise vehicle reversing.
- To manage potential noise complaints:
 - Ensure site managers periodically check the site and nearby residences and other sensitive land uses for noise problems so that solutions can be quickly applied.
 - Provide a quick response to complaints, with complaint handling staff having both a good knowledge of the project and access to information.
 - Keep a register of any complaints, including details of the complaint such as date, time, person receiving complaint, complainant's contact number and address, description of the complaint, and timeframe for response. These complaints would be provided to Maitland City Council for record keeping same day as received.

7.8 Air quality

7.8.1 Existing environment

The study area is in a rural-residential area and air quality is likely to be influenced from emissions from local traffic, local rural industries, and residential housing. There are no industrial activities located near the site. Approximately 4 km to the south-west is the closest industrial area which provides sources of emissions from the manufacturing of various materials.

A search of the National Pollution Inventory 2021/2022 data (DCCEEW, 2023c) on 24 August 2023 indicated that air quality in the Maitland LGA is influenced by various diffuse source emissions including most commonly:

- Total Phosphorus
- Total Volatile Organic Compounds
- Total Nitrogen
- Toluene (methylbenzene)
- Xylenes (individual or mixed isomers)

The NSW Department of Planning and Environment report on air quality in near real-time using upto-date, accurate concentration data on an hourly and daily basis (DPE, 2023e). Air quality is presented as air quality categories (AQCs) derived from concentration data. The AQC is determined by measurements of the following key air pollutants at monitoring locations:

- particles less than 2.5 micrometres diameter (PM2.5)
- particles less than 10 micrometres diameter (PM10)
- ozone
- nitrogen dioxide
- carbon monoxide
- sulfur dioxide
- visibility

The National Environment Protection Measure (NEPM) sets maximum goals or standards for each pollutant type, except for visibility. When these goals are exceeded, they are recorded including the number of days per year that each of the pollutants exceeded the goals and standards.

The closest air quality monitoring site is 'Beresfield' which is located approximately 17 km south-east at Francis Greenway High School on Lawson Avenue, Woodberry. A search of the AQC data determined that no air quality annual exceedances occurred in the Lower Hunter during 2021/2022 (DPE, 2023e).

7.8.2 Potential impacts

Potential impacts to air quality during construction include dust generation and engine emissions from vehicles, plant and machinery being used on site. The proposed project will involve ground disturbance including excavation, vegetation clearing and stockpiling of soil which will generate dust, however with the mitigation measures listed below in place this is expected to be minimal.

Vehicle exhaust emissions during construction works have the potential to impact on air quality but the impacts are likely to negligible considering the vehicular movements already associated with the area. No increase in air quality impacts is anticipated during operation.

7.8.3 Mitigation and management measures

- Implement SWMP and ESC Plan.
- Implement control measures such as water sprays or water carts as required during excavation or disturbance of soils or vegetation to prevent or minimise the generation of dust.
- Cover excavated materials and stockpiles when not in use.
- Cover vehicles and trailers when transporting soil or other construction materials.
- Regularly service vehicles and machinery to ensure exhaust emissions generated are within the specified plant and equipment standards.
- Turn off idling plant and equipment when not in use.
- Review work site and planned works if windy conditions are predicted to minimise excessive dust generation occurring.

7.9 Waste and chemical management

7.9.1 Existing environment

The study area is not associated with contaminated land and is not expected to uncover, disturb, or interact with buried waste. The locality is frequently subjected to illegal dumping of green waste and rubbish within and adjacent to the study area.

Waste generated by the project is expected to be primarily vegetation and excavated material (spoil). Small amounts of domestic waste, liquid waste and packaging may also be generated by the project. No hazardous waste is expected to be produced. Wastes will be classified and reused on site where possible.

7.9.2 Potential impacts

The construction works associated with the proposal would result in the generation of waste materials. The following wastes are expected:

- Spoil generated from excavation.
- Green waste from vegetation removal.
- General construction waste such as packaging, off cuts and excess materials.
- Piling pad materials (gravel/hard rock).
- Timber from the existing bridge when demolished
- Liquid wastes such as oils, lubricants, chemicals etc. used by plant equipment.
- Portable amenity waste (if established in compound site once location is determined)
- General waste including food scraps, aluminium cans, glass bottles, plastic and paper containers and other waste generated by site construction personnel.

The exact quantities of waste are unknown at this stage and would be detailed in the contractor's waste management plan (WMP). The waste management plan would be prepared in accordance with the Waste Classification Guidelines (EPA, 2014) in that all waste removed from the site is to be classified and disposed of appropriately.

The waste associated with the existing environment would not be expected to change during operation of the proposal.

7.9.3 Mitigation and management measures

- Develop and implement a Waste Management Plan for inclusion in the CEMP.
- All site waste will be managed in accordance with the waste reduction hierarchy of avoid, reduce, re-use and recycle as per the *Waste Avoidance and Resource Recovery Act 2001*.
- All excavated natural, non-contaminated soil, aggregate or rock should be stockpiled separately and reused onsite where possible.
- Unsuitable fill material will be classified in accordance with the Waste Classification Guidelines (EPA, 2014) and disposed of at an approved materials recycling or waste disposal facility.
- All surplus material, off cuts, and other debris resulting from the work shall be removed from site and disposed of by a licenced contractor to a licenced waste management facility.
- Waste material is to be removed from site as soon as practical and not left on site once the works have been completed.
- Liquid waste is to be contained in suitable sealed containers and disposed of appropriately.
- Work areas are to be maintained, kept free of rubbish, and cleaned up at the end of each working day.
- Cover receptacles to prevent the loss of waste from the receptacle.
- Provide portable toilets for construction workers (at compound area once location is determined) and ensure the appropriate disposal by a licensed supplier.

7.10 Traffic and transport

7.10.1 Existing environment

The study area includes the existing Melville Ford Bridge which is a single lane vehicular crossing that spans the Hunter River. The bridge crossing adjoins Aberglasslyn Road to the south-east with Melville Ford Road to the north-west. A traffic count in 2021 revealed a 7-day average of 1,654 vehicles per day with 13 % heavy vehicles (Bridge Design Pty Ltd, 2021).

7.10.2 Potential impacts

Construction of the project would generate a small increase in the number of vehicle movements for the delivery of materials and movement of equipment, plant and construction workers to and from the site. There will be limited space within the study area during construction and only the essential vehicles and machinery should be permitted on site at any time.

The bridge crossing will be periodically closed during construction which will impact on local traffic. Closures are likely to be approximately 6 weeks for pier construction and 12 weeks for the construction of bridge deck and road approaches. Bridge closures will be minimised as much as possible to reduce impacts on traffic and access for local residents.

No public transport services will be disrupted by the proposed works.

The operation of the proposed project will reduce the frequency and length of bridge closure due to inundation and will improve traffic flow with an additional lane on the new bridge.

7.10.3 Mitigation and management measures

- A Traffic Management Plan (TMP) will be prepared and implemented for the project as part of the CEMP. The TMP will include:
 - Requirements for any changes to local access (e.g. during bridge closure). Timing of bridge closures will be confirmed during detailed design phase in consultation with Maitland City Council and local affected residents.
 - Provisions for access by emergency services and residents evacuating in the event of an emergency.
 - \circ $\;$ An emergency response plan for any construction traffic incident.
 - Site specific traffic control plans (TCPs) to manage the safe movement of traffic through the site.
 - Community notification process incorporating timely, accurate, relevant and accessible information to the community regarding changed traffic arrangements and delays owing to construction activities.
 - Access to construction sites including entry and exit locations and measures to prevent construction vehicles queuing on or blocking public roads.
 - Parking plan with suitable car parking areas provided for construction workers and visitors to the site (outside of the study area).
 - Compliance with Maitland City Council requirements regarding traffic control, access and road/pedestrian access.
- Only the essential vehicles and/or machinery should be permitted on site at any time due to limited space in the project area.

7.11 Visual amenity and landscape character

7.11.1 Existing environment

The study area is not visible from any residences however, the project site would be seen by road users on Dickenson Road, Melville Ford Road and Aberglasslyn Road, particularly for those using the existing bridge crossing. The existing timber bridge is considered to have local aesthetic value (Virtus Heritage, 2022b) however is not listed as a heritage item. Timber piers of two previous bridges located directly upstream and downstream of the current bridge location are also visible from the study area. Although the riverbanks are highly disturbed and the study area contains the roads and approaches to the bridge, the natural landscape of the Hunter River is aesthetically pleasing.

7.11.2 Potential impacts

Construction

During the construction phase of the project there would be minor, temporary visual amenity impacts which include:

- The presence of construction vehicles, machinery, plant, and equipment.
- Stockpiled materials including spoil from excavations and other materials.
- Vegetation and tree removal.
- Earthworks exposing bare soils.
- Traffic control, temporary signage and safety barriers.
- Compound area (once location is determined) which will likely include amenities.

Permanent removal of the existing timber bridge will have an impact on the landscape character of the study area.

No night work lighting would be required during the construction works as it will be carried out in standard work hours.

Operation

The removal of the existing timber bridge and replacement with a more modern concrete bridge will result in a different visual landscape in the study area. The higher bridge, realigned roads and regraded batters will also make changes to the aesthetics of the river crossing. Revegetation with suitable native trees, shrubs and grasses in the disturbed areas surrounding the new bridge will minimise these visual impacts and will assist with blending the modern bridge into the natural landscape.

The remains of the visible two previous timber bridges upstream and downstream will not be removed or impacted as a result of the proposal.

7.11.3 Mitigation and management measures

- Proposed project site including construction area and compound site (once location is determined) will be managed to minimise visual impacts including the location of equipment storage, vehicle parking locations, stockpile locations, and amenities.
- All temporary structures, equipment and waste will be removed as soon as possible or at the completion of works.
- All work areas will be returned to as close to their original condition as possible.
- All work areas will be maintained, kept free of rubbish and cleaned up at the end of each working day.

- Works will incorporate the staged stabilisation of bare, disturbed or unstable areas.
- Revegetation will be undertaken with suitable, local provenance native trees, shrubs and grasses in the disturbed areas surrounding the new bridge. Location of the revegetation areas and details of the plant species, planting density, and maintenance requirements will be included in the BMP.
- The remains of the visible two previous timber bridges upstream and downstream will not be removed or disturbed.

7.12 Socio-economic

7.12.1 Existing environment

A search of the demographics, social, and economic data from the 2021 Census (ABS, 2021) for the Maitland LGA are outlined in **Table 7.2**.

Demographic information	Maitland LGA
Population	90,226
Median age	36
Average number of people per household	2.7
Employment	45,403 people reported being in the labour force in the week prior to Census night in 2021. Of these, 57% worked full time, 31.4% worked part-time, and 4.7% were unemployed.
Education	Of people aged 15 years and over, 24.7% reported completing a Certificate III or IV as their highest level of educational attainment. 15.6% reported Year 10, 15.4 Bachelor Degree level and above, 11.8% Year 12, and 9.4% reported completing Advanced Diploma or Diploma as their highest level of completed education.
Travel to work	On the day of the Census in 2021, the most common methods of travel to work were 'Car as a driver' (59%), 'Worked from home' (17%), 'Did not go to work' (15.9%), and "Car as a passenger" (3.6%). 1% of employed people used public transport and 63.3% used a car (either as a driver or passenger) as at least one of their methods of travel to work on Census day.
Median weekly household income	\$1,766
Average number of motor vehicles per dwelling	2

Table 7.2. Community profile of the Maitland LGA.

The community profile (**Table 7.2**) indicates a high reliance on private vehicles for travel to work. This is likely even greater for local residents crossing the bridge at Melville Ford as no public transport is available in the vicinity of the study area. The nearest bus stop is over 2 km to the south-east in Aberglasslyn and the nearest railway station is 5 km south in Telarah.

The study area is known to provide a location for families to swim and have social gatherings close to the river. Access to the river is generally via the lower sandy riverbanks directly downstream of the current timber bridge.

7.12.2 Potential impacts

Construction works would require the current bridge crossing to be closed periodically before the new bridge is operational. This will cause disruption to motorists travelling to work and local businesses, as most of the construction activities would be carried out Monday to Friday during standard work hours. Closures are likely to be approximately 6 weeks for pier construction and 12 weeks for the construction of bridge deck and road approaches.

Access to the river via the study area will be impacted for the duration of the construction period and during the demolition and removal of the timber bridge. Following this, the community's ability to access the river via the same means may be reduced. However, the proposed project includes the addition of 6 new car parking spaces and concrete stair access down to the river.

The proposed project would provide positive changes to the area by providing a higher, safer, and more modern river crossing. The new concrete bridge will have fewer closures and shorter periods of closure due to inundation.

7.12.3 Mitigation and management measures

- A Community Engagement Plan (CEP) would be prepared and implemented to help provide timely and accurate information to the community before and during construction. The CEP will include:
 - The mechanisms to provide details and timing of proposed activities to affected residents, businesses and other key stakeholders of any changed traffic conditions including access to the bridge crossing.
 - A complaint handling procedure and register.
 - Maitland City Council will be advised of all community complaints received and any actions taken for record keeping purposes.
- The final project design will include public car parking spaces and concrete stair access down to the river.

8. Consideration of State and Commonwealth Environmental factors

8.1 Environmental Planning and Assessment Regulation 2021 factors

The following factors, listed in Section 171(2) of the Environmental Planning and Assessment Regulation 2021, have been considered to assess the likely impacts of the proposal on the natural and built environment. This consideration is required to comply with Sections 5.5 and 5.7 of the EP&A Act.

Table 8.1. Consideration of Section 171(2) of the EP&A Regulation environmental factors.

Environmental factor	Impact
a) Any environmental impact on a community?	
The proposed project would improve the serviceability of the vehicular bridge crossing by reducing the frequency and duration of closures due to inundation.	Long-term, positive, minor
Some environmental impacts are anticipated during construction such as noise, air quality, visual amenity and traffic. These would be minimised via the safeguards and mitigation measures listed in Table 9.1 .	Short-term, negative, minor
The project would have long term visual amenity impacts with the replacement of the existing timber bridge with a new concrete bridge.	Long-term, negative, minor
b) Any transformation of a locality?	
The removal of the timber bridge will change the area however, the end use of the locality will remain the same.	Long-term, negative, minor
c) Any environmental impact on the ecosystems of a locality?	
The project would impact temporarily on 0.17 ha of non-native vegetation. The proposed location of the new bridge has been selected to avoid native vegetation as much as possible, however 8 native trees require removal. Areas cleared of vegetation would be revegetated with native trees, shrubs and grasses.	Short-term, negative, minor
An assessment of the significance of impact of the proposal on the Southern Myotis concluded that the project is unlikely to significantly impact this species.	Short-term, negative, minor
d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality?	
During the construction phase of the project there would be minor, temporary visual amenity impacts which include the presence of construction vehicles and machinery, stockpiles, exposed soils, traffic control and signage, and compound area.	Short-term, negative, minor

Permanent removal of the existing timber bridge will have an impact on the aesthetics of the study area. However, the area is already disturbed with minimal native vegetation present.	Long-term, negative, minor
Revegetation with native species in the areas surrounding the new concrete bridge will improve the visual amenity in the area once established.	Long-term, positive, minor
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 existing timber bridge is not listed as a heritage item (state or local significance). However, it does have some historical and aesthetic value to the local community. Implementing mitigation measures including an archival photographic recording of the bridge as recommended in the SoHI will help to mitigate this impact.	Long-term, negative, minor
The study area holds potential for Aboriginal objects/deposits with conservation value to be present. The proposed works have the potential to harm any objects and/or deposits of Aboriginal and/or archaeological significance that may be present. Maitland City Council's application for an Aboriginal Heritage Impact Permit (AHIP) as per the ACHAR (Appendix J) has been approved and all conditions of the AHIP (Appendix K) will be complied with.	Long-term, negative, minor
f) Any impact on habitat of any protected animals (within the meaning of the Biodiversity Conservation Act 2016)?	
An assessment of the significance of the impact of the proposal on the Southern Myotis concluded that the project would be unlikely to significantly impact on this species. Some temporary impact would occur but this is expected to be short-term and minor, providing that the safeguards and mitigation measure listed in Table 9.1 are implemented.	Short-term, negative, minor
g) Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air?	
The proposed project would not endanger any species of animal, plant or other form of life, whether living on land, in water or in the air. Implementing the safeguards and mitigation measures listed in Table 9.1 will ensure that the Southern Myotis is not significantly impacted.	Nil
h) Any long-term effects on the environment?	
The project would have visual amenity impacts associated with the removal of the timber bridge.	Long-term, negative, minor
The project would improve the serviceability of the vehicular bridge crossing by reducing the frequency and duration of closures due to inundation.	Long-term, positive, minor

Revegetation with native species in the areas surrounding the new concrete bridge will improve the visual amenity in the area once established.	Long-term, positive, minor
i) Any degradation of the quality of the environment?	
During construction, the project has the potential for negative impacts associated with traffic, air quality, visual, erosion and sediment, and noise. These impacts would be minimised through the implementation of safeguards summarised in Table 9.1 .	Short-term, negative, minor
j) Any risk to the safety of the environment?	
The construction phase has the potential to temporarily increase the risk of incidences occurring (as with any construction works) due to the vehicles, machinery and equipment being used on site. A Construction Environmental Management Plan (CEMP) will be developed and implemented which will include a Traffic Management Plan (TMP). This would address any safety issues associated with construction plant on site.	Short-term, negative, minor
k) Any reduction in the range of beneficial uses of the environment?	
The proposed project would be consistent with future uses and there would be no reduction in the range of beneficial uses of the environment that do not currently exist.	Nil
I) Any pollution of the environment?	
During construction there is potential for accidental spills of fuels and oils from machinery or vehicles that may impact the land or water in the project area. There is also potential for minor noise or air pollution. However, pollution of the environment is not expected to be significant with the implementation of appropriate safeguards.	Short-term, negative, minor
m) Any environmental problems associated with the disposal of waste?	
Waste generated by the project is expected to be primarily vegetation and excavated material (spoil). All excavated natural, non-contaminated soil, aggregate or rock would be stockpiled separately and reused onsite wherever possible. All materials that cannot be reused or recycled would be disposed of appropriately. A Waste Management Plan (WMP) would be developed and implemented as part of the CEMP.	Short-term, negative, minor
n) Any increased demands on resources, natural or otherwise which are, or are likely to become, in short supply?	Nil
All resources required for the project are readily available and are not in short supply.	
o) Any cumulative environmental effect with other existing or likely future activities?	
The Hunter River has historically been negatively impacted by land clearing, agriculture, and urbanisation in the region. Cumulative impacts to the river include increased erosion and sedimentation, increased turbidity, and a reduction in water quality. The proposed project could potentially add to these issues on a very localised scale and to a minor	Long-term, negative, minor

degree. However, this is expected to be negated by the safeguards and mitigation measures listed in Table 9.1 .	
Revegetation with native species in the disturbed areas surrounding the new concrete bridge will improve erosion and sedimentation once established.	Long-term, positive, minor
Bollards will be installed (where necessary) to prevent unauthorised vehicle access to the riverbed and revegetated areas, thus minimising further erosion and sedimentation.	Long-term, positive, minor
p) Any impact on coastal processes and coastal hazards, including those under projected climate change conditions?	
The project is not located in a coastal area and is not expected to have any impacts to coastal processes and coastal hazards, including those under projected climate change conditions.	Nil
q) Any impact on applicable local strategic planning statements, regional strategic plans or district strategic plans made under the Act, Division 3.1?	
The relevant regional strategic plan is the Hunter Regional Plan 2041. The relevant local strategic planning statement is the Maitland Local Strategic Planning Statement 2040+.	Nil
The REF has identified minor environmental impacts associated with the proposal. It would result in no land use changes. In this context, the proposal would not affect the aims and objectives of the strategic plans identified above.	
r) Any other relevant environmental factors?	
In considering the potential impacts of this proposal all relevant environmental factors have been considered. Refer to Section 7 of this REF.	Nil

8.2 Matters of National Environmental Significance & Other Protected Matters

A search of the EPBC Protected Matters Search Tool (DCCEEW, 2023a) was completed and a report has been included as **Appendix E**. **Table 8.2** contains a summary of an assessment of potential impacts to Matters of National Environmental Significance (MNES).

MNES	Applicability to the proposal			
World Heritage Properties	Not applicable			
National Heritage Places	Not applicable			
Wetlands of International Importance (Ramsar Wetlands)	The Hunter Estuary Wetlands Ramsar listed site is located approximately 25 km south-east (straight line distance) from the study area. The distance to the wetland via the Hunter River is approximately 50 km downstream. The proposal would not result in any impact on this Ramsar site.			
Threatened species and ecological communities	The Protected Matters Report identified 32 threatened fauna species and 21 threatened flora species that could potentially occur within a 10 km radius of the proposed project. Likelihood of these occurring in the study area (via examining records held by DPE (2023a) and availability of habitat) is provided in Appendix B . No threatened species were recorded or determined as likely to occur in the study area.			
Migratory species	The Protected Matters Report identified 18 listed migratory species that could potentially occur within a 10 km radius of the study area. Likelihood of these occurring in the study area (via examining records held by DPE (2023a) and availability of habitat) is provided in Appendix B . No listed migratory species were recorded or determined as likely to occur in the study area.			
Commonwealth marine areas	Not applicable			
Great Barrier Reef Marine Park	Not applicable			
Nuclear actions (including uranium mines)	Not applicable			
Water resources (concerning coal seam gas and large coal mining development).	Not applicable			
Commonwealth land	Not applicable			

Table 8.2. Consideration of Matters of National Environmental Significance and Other Protected Matters.

9. Environmental Management

9.1 Construction environmental management plan (CEMP)

A CEMP would be prepared prior to the commencement of any works on site. The CEMP will address (as a minimum) the following:

- Details of how the project will implement the identified safeguards and mitigation measures outlined in the REF (**Table 9.1**).
- Any requirements associated with approvals, licences or permits (Table 6.4).
- Include site-specific environmental management plans including:
 - Soil and Water Management Plan (SWMP) incorporating an Erosion and Sediment Control Plan (ESCP)
 - Biodiversity Management Plan (BMP)
 - Traffic Management Plan (TMP)
 - Noise and Vibration Management Plan (NVMP)
 - Spill Response Plan (SRP)
 - Waste Management Plan (WMP)
 - Community Engagement Plan (CEP)
 - Groundwater Management Plan (GMP)
- Roles and responsibilities.
- Communication requirements.
- Induction and training requirements.
- Procedures for monitoring and evaluating environmental performance, and for corrective action.
- Reporting requirements and record-keeping.
- Procedures for emergency and incident management.
- Procedures for audit and review.

An environmental site induction will be conducted prior to any construction activities commencing for all personnel working on the site. Discussion on specific mitigation measures required for management of key environmental aspects must be included as part of the induction. Records of the induction including content and personnel inducted must be kept.

9.2 Summary of environmental safeguards and mitigation measures

The site-specific environmental safeguards and mitigation measures identified and described in sections 7 and 8 will be incorporated into the detailed design phase of the project and during the construction and operation of the project, if approved to proceed. The environmental mitigation measures would minimise any potential adverse impacts arising from the project on the environment. A summary of the environmental safeguards and mitigation measures is outlined in **Table 9.1**.

Factor	ID	Safeguard/mitigation measure	Responsibility	Timing
General				
General design	G1	All safeguards and mitigation measures identified in this REF are to be considered and addressed during the detailed design phase.	Contractor	Detailed design phase
General construction	G2	A Construction Environmental Management Plan (CEMP) will be prepared which will incorporate all relevant safeguards and mitigation measures identified in this REF.	Contractor	Prior to construction
General construction	G3	An environmental site induction will be conducted for all persons working on site. Site-specific mitigation measures required for management of environmental factors must be included as part of the induction. Records of the induction including content and persons inducted must be kept.	Contractor	Prior to construction & During construction
General construction	G4	All safeguards and mitigation measures identified in this REF will be implemented in accordance with the CEMP.	Contractor	During construction
Soil, landform and	l geolo	ву		
Erosion and sediment	E1	A site-specific Soil and Water Management Plan (SWMP) incorporating an Erosion and Sediment Control Plan (ESCP) will be developed in accordance with The Blue Book - Managing Urban Stormwater: Soils and Construction (Landcom, 2004). This will form part of the CEMP and will be implemented throughout the construction period and will remain implemented until all disturbed areas are suitably stabilised and revegetated. The SWMP will include an emergency procedure for flood	Contractor	Prior to construction & During construction

Table 9.1. Summary of site-specific environmental safeguards and mitigation measures.

Factor	ID	Safeguard/mitigation measure	Responsibility	Timing
		event, site demobilisation and minimisation of excessive erosion and sedimentation, in the event of heavy rain or flooding.		
Erosion and sediment	E2	 The ESCP will include erosion and sediment control plans for all stages of construction, consider soil erodibility, include at source controls, provide for the protection of waterways and stockpile management, include monitoring and reporting checklists and detailed consideration of measures to prevent (where possible) or minimise any potential erosion and sedimentation impacts. The ESCP will include the following environmental management measures: Install sediment controls on the downslope side of any disturbed areas including excavated, graded and stockpile sites where erosion may result in impact to the surrounding area. Locate stockpiles of construction materials a suitable distance from Hunter River, drainage lines, and culverts and provide appropriate containment measures around the stockpiles, to prevent impact from any contaminated runoff. Work areas, stockpile sites and access tracks to be established on already disturbed, un-vegetated areas. Temporary stockpiles shall be stabilised to prevent wind and water erosion where they are located. Restrict works during and after periods of high rainfall to minimise site disturbance and sedimentation. Stabilisation of disturbed areas is to be staged progressively during the construction works. 	Contractor	Prior to construction & During construction
Erosion and sediment	E3	Scour protection will be installed at the abutments and piers of the new bridge.	Contractor	During construction
Erosion and sediment	E4	Bollards will be installed (where necessary) to prevent unauthorised vehicle access to the riverbed and revegetated areas.	Contractor	During construction & Post construction

Factor	ID	Safeguard/mitigation measure	Responsibility	Timing
Erosion and sediment	E5	Revegetation will be undertaken with suitable, local provenance native trees, shrubs and grasses in the disturbed areas surrounding the new bridge. Location of the revegetation areas and details of the plant species, planting density, and maintenance requirements will be included in the BMP.	Contractor	During construction & Post construction
Contaminated lan	d and a	acid sulfate soils		
Contamination	C1	If suspected contaminated soils are uncovered during the construction works, the soils would be covered and segregated for further testing and analysis. All works within the vicinity must cease immediately and Maitland City Council must be notified immediately.	Contractor	During construction
Waterways, water	r qualit	y and hydrology		
Hydrology	H1	The design and alignment of the bridge will not significantly change flood affectation as per hydrological modelling completed.	Contractor	Detailed design phase
Groundwater	GW1	 A groundwater management plan (GMP) will be developed and implemented as part of the CEMP. This will detail methodologies and management measures if dewatering is required. Dewatering is to be managed and monitored to ensure existing receiving water quality is maintained. Controls may include: dewatering onto a vegetated area. filtering through sediment controls such as sediment fence, straw bales and/or sandbags. If visual impacts (i.e. discolouration, increased turbidity) is observed, dewatering activity must cease immediately. The appropriate approvals (Table 6.4) must be obtained in case of groundwater interception during construction works. 	Contractor	Prior to construction & During construction
Waterways and water quality	WQ1	Implement SWMP and ESCP during construction (as per E1 and E2 above).	Contractor	Prior to construction &

Factor	ID	Safeguard/mitigation measure	Responsibility	Timing	
				During construction	
Waterways and water quality	WQ2	All personnel will be inducted on site and made aware of flooding risks, mitigation measures and emergency procedures including evacuation of site.	Contractor	Prior to construction & During construction	
Waterways and water quality	WQ3	The worksite will be closed, and all materials and equipment will be secured prior to the start of the working day if there is a risk of riverine flooding, on receipt of BOM advice, or when other evidence leads to an expectation of flooding.	Contractor	Prior to construction & During construction	
Waterways and water quality	WQ4	Weather will be monitored via the Bureau of Meteorology (BOM) website prior to the start of the workday for any flood warnings. Weather and water levels will be monitored throughout each day and work will be reassessed where there may be a safety or environmental risk due to weather events.	Contractor	Prior to construction & During construction	
Waterways and water quality	WQ5	A floating boom/silt curtain will be installed downstream of the new bridge within the Hunter River. Silt curtains will be installed so that they do not block fish passage.	Contractor	Prior to construction & During construction	
Waterways and water quality	WQ6	A spill response plan will be developed for the project. This plan will detail measures including spill prevention, containment, and clean-up of accidental spills of oils, fuels and chemicals.	Contractor	Prior to construction & During construction	
Waterways and water quality	WQ7	Any spills with the potential for material harm to the community or environment will be notified to the EPA immediately.	Contractor	During construction	
Waterways and water quality	WQ8	An emergency spill kit will be kept on site at all times. All persons on site are to be made aware of the location of the spill kit and trained in its use.	Contractor	During construction	
Waterways and water quality	WQ9	The storage and handling of fuels and chemicals will comply with Australian Standards and the associated safety data sheet.	Contractor	During construction	
Factor	ID	Safeguard/mitigation measure	Responsibility	Timing	
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Waterways and water quality	WQ10	Refuelling of minor plant and equipment is to occur in bunded areas located a minimum of 40 metres from the Hunter River, drainage lines or other waterways.	Contractor	During construction	
Waterways and water quality	WQ11	No maintenance of equipment or vehicles on site. If unavoidable carry out away from watercourses and drainage lines and use drip/catch trays beneath equipment/vehicles being maintained.	Contractor	During construction	
Waterways and water quality	WQ12	Vehicle movements will be restricted to designated roadways and access points wherever possible.	Contractor	During construction	
Waterways and water quality	WQ13	Do not store equipment and materials within 40m of watercourses.	Contractor	During construction	
Waterways and water quality	WQ14	Any drilling water or fluid is to be contained within a recirculating system and disposed of to a waste tanker or sucker truck. There is to be no release of drilling water or fluid to the environment.	Contractor	During construction	
Biodiversity					
Biodiversity	B1	A Biodiversity Management Plan (BMP) will be developed to ensure that at a minimum, all mitigation measures listed below are implemented. This will form part of the CEMP and will need to be implemented prior to, during and post construction.	Contractor	Prior to construction, During construction & Post construction	
Biodiversity	B2	All 16 trees proposed for removal will be clearly marked prior to removal.	Contractor	Prior to construction	
Biodiversity	B3	Native vegetation areas mapped as River Oak - White Cedar Grassy Riparian Forest and Isolated Native Trees in Figure 7.1 will be marked as 'No Access' zones using para-webbing or similar with no access allowed for vehicles, machinery, or workers and no materials to be stored in these areas.	Contractor	Prior to construction & During construction	
Biodiversity	B4	 An ecologist will be present during the removal of all trees to ensure the following: All trees are inspected for nests prior to removal. Any nests, birds or other fauna are relocated or provided to a wildlife carer. 	Contractor	During tree removal	

Factor	ID	Safeguard/mitigation measure	Responsibility	Timing
		 The 3 willow trees containing hollows on the southern approach (Plate 7-1) are gently lowered and hollows are inspected for fauna. The 3 willow trees containing hollows on the southern approach (Plate 7-1) once removed, are placed outside of the construction zone to allow any resident fauna to relocate. The 2 dead trees with exfoliating bark on the northern approach (Plate 7-2) are gently shaken with machinery prior to removal with a pause of 3 minutes. This process is repeated twice prior to felling. After felling, the 2 dead trees with exfoliating bark (Plate 7-2) are inspected for fauna. Any injured wildlife is taken to a local wildlife carer. 		
Biodiversity	B5	Removed trees containing hollows (3 willows) (Plate 7-1) and exfoliating bark (2 dead trees) (Plate 7-2) will be placed on the ground outside of the construction zone as potential fauna habitat.	Contractor	Following tree removal
Biodiversity	B6	All removed hollows will be offset according to Maitland City Council's hollow replacement requirement of a 2:1 ratio. Six (6) artificial nestboxes suitable for microbats will be installed at least 2 weeks prior to the removal of the hollows (willow trees). Further details of the nestboxes will be included in the BMP.	Contractor	Prior to construction
Biodiversity	B7	Do not remove any dead trees except for the 4 dead trees identified for removal on the northern approach (Plate 7-2).	Contractor	Prior to construction & During construction
Biodiversity	B8	Native vegetation areas mapped as River Oak - White Cedar Grassy Riparian Forest and Isolated Native Trees in Figure 7.1 are not disturbed or removed.	Contractor	During construction
Biodiversity	B9	Disturbance of non-native vegetation is limited to the minimum areas required for the project to be completed.	Contractor	During construction
Biodiversity	B10	Revegetation will be undertaken with suitable, local provenance native trees, shrubs and grasses in the disturbed areas surrounding the new	Contractor	During construction &

Factor	ID	Safeguard/mitigation measure	Responsibility	Timing
		bridge. Location of the revegetation areas and details of the plant species, planting density, and maintenance requirements will be included in the BMP.		Post construction
Biodiversity	B11	All removed trees will be offset according to Maitland City Council's tree replacement requirement of a 3:1 ratio. Forty-eight (48) advanced (minimum 45L) locally native trees will be planted in a suitable location determined by MCC (preferably along the riverbanks adjacent to the study area).	Contractor	During construction & Post construction
Biodiversity	B12	All offset trees will be maintained for a minimum of 12 months after planting. Maintenance will include watering, mulching, weed management and tree replacement if they do not survive this period. Further details will be included in the BMP.	Contractor	During construction & Post construction
Biodiversity	B13	Spoil from clearing works is to be stockpiled outside of any native vegetation areas and outside of the dripline (usually 5 metres) of any trees.	Contractor	During construction
Biodiversity	B14	 Weed Biosecurity Management Plan (WBMP) to be developed as part of the BMP including: Targeted priority weed management to be undertaken prior to, during and post construction where required, with a particular focus on revegetated areas. Remove and dispose of weed waste materials including any fruit or seed – do not mulch on site. Keep weed infested soils separate from clean fill and only reuse on site under 1 m from final ground level. 	Contractor	Prior to construction, During construction & Post construction
Biodiversity	B15	Parking vehicles, storing materials or placing stockpiles within the dripline of trees (usually 5 metres) will be avoided.	Contractor	During construction
Biodiversity	B16	Implement measures determined by microbat specialist in Microbat Habitat Assessment Report (Appendix H) which include:	Maitland City Council, Microbat Specialist & Contractor	Prior to construction, During construction & Post construction

Factor	ID	Safeguard/mitigation measure	Responsibility	Timing
		 Microbat specialist to determine requirements and location of baffles/shields to minimise disturbance to microbats roosting on the timber bridge during construction of new concrete bridge. Install minimum of 2 microbat boxes under the new concrete bridge as soon as possible once constructed. Microbat specialist to carry out two more visual inspections and dusk watches within two to three weeks prior to timber bridge removal. Existing timber bridge is removed outside of Southern Myotis breeding period. Breeding period is late September to early April. Preferable removal would be in April /May or August to avoid overwintering period. Exclusion barriers put in place on both sides of the entire length of the timber bridge, 4 – 5 nights prior to scheduled removal. Microbat specialist to be present during the removal of the existing timber bridge. Note: Some sections of the dismantled timber bridge may need to remain on site overnight to allow for bats to leave the structure, depending on conditions. 		
Biodiversity	B17	Do not remove or disturb any fallen trees on site. If fallen trees are required to be moved, then they will be placed back in a location as close to the original position as possible.	Contractor	During construction
Biodiversity	B18	Do not disturb or harm any fauna found on site. If native fauna is injured or trapped on site, contact the local National Parks & Wildlife office or a licensed wildlife rescue and rehabilitation group in the local area to arrange for collection/removal from site.	Contractor	During construction
Biodiversity	B19	A floating boom/silt curtain will be installed downstream of the new bridge within the Hunter River. Silt curtains will be installed so that they do not block fish passage.	Contractor	Prior to construction & During construction

Factor	ID	Safeguard/mitigation measure	Responsibility	Timing
Biodiversity	B20	Implement SWMP and ESCP during construction (as per E1 and E2 above).	Contractor	Prior to construction & During construction
Aboriginal heritag	е			
Aboriginal heritage	AH1	 Maitland City Council will apply for an Aboriginal Heritage Impact Permit (AHIP) for this proposal as per the Aboriginal Cultural Heritage Assessment Report (ACHAR) completed by AMAC (2023a) (Appendix J). This includes: A community collection should be conducted with the registered Aboriginal stakeholders prior to works proceeding. If proposed works encounter natural soils further assessment is required and the appropriate mitigation should take place as outlined in the ACHAR. The artefact (Melville Bridge IF1) should be removed during the proposed works and reburied as close as possible to the artefact's current location. 	Maitland City Council	Prior to construction.
Aboriginal heritage	AH2	All conditions of the AHIP (Appendix K) will be complied with throughout the proposed project.	Contractor	Prior to construction & During construction
Aboriginal heritage	AH3	All persons working on site will be briefed prior to works commencing as to the conditions of the AHIP and their responsibilities in ensuring the preservation of Aboriginal archaeological deposits and objects that may be located on site.	Contractor	Prior to construction & During construction
Aboriginal heritage	AH4	All vehicles and machinery will use the existing roads and avoid the riverbed and other exposed areas wherever possible.	Contractor	During construction
Aboriginal heritage	AH5	 If any Aboriginal archaeological deposits and/or objects are located during the development, then the following should take place: All work is to cease in the immediate vicinity of the deposits and/or objects. The area is to be demarcated. 	Contractor	During construction

Factor	ID	Safeguard/mitigation measure	Responsibility	Timing
		• Heritage NSW, a qualified archaeologist and the participating RAPs are to be notified.		
Aboriginal heritage	AH6	 Should any human remains be located during the proposed works, then the following will take place: All excavation in the immediate vicinity of any objects shall cease immediately. The NSW police and Heritage NSW will be informed as soon as possible. If it is established that the human remains are Aboriginal ancestral remains, Heritage NSW and the relevant Registered Aboriginal Parties will identify the appropriate course of action. 	Contractor	During construction
Non-Aboriginal he	eritage			
Non-Aboriginal heritage	H1	The existing timber bridge will be subject to an archival photographic recording as per the advice provided in the SoHI.	Maitland City Council	Prior to construction
Non-Aboriginal heritage	H2	Remains of the previous two timber bridges found upstream and downstream of the currently standing Melville Ford Bridge will be preserved. Should the remains need to be removed, then archival photographic recording should be conducted prior to removal as per the advice provided in the SoHI.	Maitland City Council & Contractor	During construction
Non-Aboriginal heritage	НЗ	 Should any suspected archaeological remains be uncovered during the proposed works (e.g. infrastructure, sandstone or bricks, conduits, kerbing, culverts, retaining walls, or scattered artefacts such as bottles, ceramics, animal bones, clay pipes) then the following will take place: Work will cease in the area and remains/artefacts will be left in situ and fenced off with para-webbing or similar. A qualified archaeologist will be consulted for advice on the next steps. 	Contractor	During construction

Factor	ID	Safeguard/mitigation measure	Responsibility	Timing
Noise and vibration	on		·	
Noise and vibration	NV1	 A Noise and Vibration Management Plan (NVMP) will be prepared and implemented as part of the CEMP. The NVMP will follow the approach in the Interim Construction Noise Guideline (ICNG) (DECC, 2009) and identify: All potential significant noise and vibration generating activities associated with the activity. Feasible and reasonable mitigation measures to be implemented. Arrangements for consultation with affected residents and sensitive receivers, including notification and complaint handling procedures. Contingency measures to be implemented in the event of noncompliance with noise and vibration criteria 	Contractor	Prior to construction
Noise and vibration	NV2	Works will be carried out during standard work hours only: Monday-Friday: 7:00am to 6.00pm Saturday: 8.00am to 1.00pm Sunday and Public Holidays: no work	Contractor	During construction
Noise and vibration	NV3	 Notify all potential noise affected residents as follows: Prior to the commencement of the construction project, provide a general update to the local community including all potential noise affected residents. Notification to advise on general project information such as scope of works, duration of the works, and any perceived impacts to the community. If out of hours works are essential – provide notification to noise affected residents a minimum of 5 business days prior to the works. Notification to advise on details of works, details of any noisy type works, details of any changes to river crossing access and details of measures implemented to mitigate noise impacts. 	Contractor	Prior to construction & During construction

Factor	ID	Safeguard/mitigation measure	Responsibility	Timing
Noise and vibration	NV4	 Workers on site will minimise noise during construction as follows: Use equipment in ways to minimise noise. Avoid the use of radios or stereos outdoors. Avoid shouting, minimise talking loudly and slamming vehicle doors. Avoid dropping materials from a height. Avoid reversing machinery wherever possible. Avoid leaving vehicles in idling for extended periods. Ensure plant and machinery is maintained and in good working order. 	Contractor	During construction
Noise and vibration	NV5	 Site Managers will minimise noise during construction as follows: Schedule material deliveries to be delivered during standard working hours. Examine and implement, where feasible and reasonable, alternatives to noisy work methods. Where practical establish the worksite to minimise vehicle reversing. 	Contractor	During construction
Noise and vibration	NV6	 To manage potential noise complaints: Ensure site managers periodically check the site and nearby residences and other sensitive land uses for noise problems so that solutions can be quickly applied. Provide a quick response to complaints, with complaint handling staff having both a good knowledge of the project and access to information. Keep a register of any complaints, including details of the complaint such as date, time, person receiving complaint, complainant's contact number and address, description of the complaint, and timeframe for response. These complaints would be provided to Maitland City Council for record keeping same day as received. 	Contractor	During construction

Factor	ID	Safeguard/mitigation measure	Responsibility	Timing		
Air quality						
Air quality	AQ1	Implement SWMP and ESC Plan.	Contractor	During construction		
Air quality	AQ2	Implement control measures such as water sprays or water carts as required during excavation or disturbance of soils or vegetation to prevent or minimise the generation of dust.	Contractor	During construction		
Air quality	AQ3	Cover excavated materials and stockpiles when not in use.	Contractor	During construction		
Air quality	AQ4	Cover vehicles and trailers when transporting soil or other construction materials.	Contractor	During construction		
Air quality	AQ5	Regularly service vehicles and machinery to ensure exhaust emissions generated are within the specified plant and equipment standards.	Contractor	During construction		
Air quality	AQ6	Turn off idling plant and equipment when not in use.	Contractor	During construction		
Air quality	AQ7	Review work site and planned works if windy conditions are predicted to minimise excessive dust generation occurring.	Contractor	During construction		
Waste and chemical management						
Waste and chemicals	WC1	Develop and implement a Waste Management Plan for inclusion in the CEMP.	Contractor	Prior to construction		
Waste and chemicals	WC2	All site waste will be managed in accordance with the waste reduction hierarchy of avoid, reduce, re-use and recycle as per the <i>Waste Avoidance and Resource Recovery Act 2001</i> .	Contractor	During construction		
Waste and chemicals	WC3	All excavated natural, non-contaminated soil, aggregate or rock should be stockpiled separately and reused onsite where possible.	Contractor	During construction		
Waste and chemicals	WC4	Unsuitable fill material will be classified in accordance with the Waste Classification Guidelines (EPA, 2014) and disposed of at an approved materials recycling or waste disposal facility.	Contractor	During construction		
Waste and chemicals	WC5	All surplus material, off cuts, and other debris resulting from the work shall be removed from site and disposed of by a licenced contractor to a licenced waste management facility.	Contractor	During construction		
Waste and chemicals	WC6	Waste material is to be removed from site as soon as practical and not left on site once the works have been completed.	Contractor	During construction		

Factor	ID	Safeguard/mitigation measure	Responsibility	Timing
Waste and chemicals	WC7	Liquid waste is to be contained in suitable sealed containers and disposed of appropriately.	Contractor	During construction
Waste and chemicals	WC8	Work areas are to be maintained, kept free of rubbish, and cleaned up at the end of each working day.	Contractor	During construction
Waste and chemicals	WC9	Cover receptacles to prevent the loss of waste from the receptacle.	Contractor	During construction
Waste and chemicals	WC10	Provide portable toilets for construction workers (at compound area once location is determined) and ensure the appropriate disposal by a licensed supplier.	Contractor	During construction
Traffic and transp	ort			
Traffic	T1	 A Traffic Management Plan (TMP) will be prepared and implemented for the project as part of the CEMP. The TMP will include: Requirements for any changes to local access (e.g. during bridge closure). Timing of bridge closures will be confirmed during detailed design phase in consultation with Maitland City Council and local affected residents. Provisions for access by emergency services and residents evacuating in the event of an emergency. An emergency response plan for any construction traffic incident. Site specific traffic control plans (TCPs) to manage the safe movement of traffic through the site. Community notification process incorporating timely, accurate, relevant and accessible information to the community regarding changed traffic arrangements and delays owing to construction activities. Access to construction sites including entry and exit locations and measures to prevent construction vehicles queuing on or blocking public roads. 	Contractor	Prior to construction

Factor	ID	Safeguard/mitigation measure	Responsibility	Timing
		 Parking plan with suitable car parking areas provided for construction workers and visitors to the site (outside of the study area). Compliance with Maitland City Council requirements regarding traffic control, access and road/pedestrian access. 		
Traffic	T2	Only the essential vehicles and/or machinery should be permitted on site at any time due to limited space in the project area.	Contractor	During construction
Visual amenity				
Visual amenity	V1	Proposed project site including construction area and compound site (once location is determined) will be managed to minimise visual impacts including the location of equipment storage, vehicle parking locations, stockpile locations, and amenities.	Contractor	Prior to construction & During construction
Visual amenity	V2	All temporary structures, equipment and waste will be removed as soon as possible or at the completion of works.	Contractor	During construction
Visual amenity	V3	All work areas will be returned to as close to their original condition as possible.	Contractor	During construction
Visual amenity	V4	All work areas will be maintained, kept free of rubbish and cleaned up at the end of each working day.	Contractor	During construction
Visual amenity	V5	Works will incorporate the staged stabilisation of bare, disturbed or unstable areas.	Contractor	During construction
Visual amenity	V6	Revegetation will be undertaken with suitable, local provenance native trees, shrubs and grasses in the disturbed areas surrounding the new bridge. Location of the revegetation areas and details of the plant species, planting density, and maintenance requirements will be included in the BMP.	Contractor	During construction & Post construction
Visual amenity	V7	The remains of the visible two previous timber bridges upstream and downstream will not be removed or disturbed.	Contractor	During construction
Socio-economic				
Socio-economic	SE1	The final project design will include public car parking spaces and concrete stair access down to the river.	Maitland City Council &	Detailed design stage

Factor	ID	Safeguard/mitigation measure	Responsibility	Timing
			Contractor	
Socio-economic	SE1	 A Community Engagement Plan (CEP) will be prepared and implemented to help provide timely and accurate information to the community before and during construction. The CEP will include: The mechanisms to provide details and timing of proposed activities to affected residents, businesses and other key stakeholders of any changed traffic conditions including access to the bridge crossing. A complaint handling procedure and register. Maitland City Council will be advised of all community complaints received and any actions taken for record keeping purposes. 	Maitland City Council & Contractor	Prior to construction & During construction

10. Conclusion

The proposed project described in this REF is subject to assessment under Division 5.1 of the EP&A Act. This REF has examined and taken into account to the fullest extent possible all matters affecting or likely to affect the environment as a result of the proposed project.

The REF has determined that:

- A number of potential environmental impacts from the proposed project have been avoided or reduced during the options assessment and concept design stage.
- The proposed project would result in short-term minor impacts on traffic, air quality, biodiversity, amenity, and noise and vibration.
- The proposed project would result in some long-term minor impacts on amenity and potentially on Aboriginal heritage.
- The proposed project would have long-term positive impacts for the community including improvements to the bridge crossing by:
 - reducing the frequency and duration of closures due to inundation.
 - improving traffic flow with a new dual-lane bridge.
 - modernising the bridge crossing and improving safety.
- The proposed project would have long-term positive impact on amenity via revegetating already disturbed areas with native trees, shrubs, and grasses.

On balance and having regard to the safeguards and mitigation measure proposed, the project is considered justified, and the following conclusions are made:

- The proposed project is not likely to significantly affect the environment, therefore no environmental impact statement (EIS) is required, and no approval is needed to be sought from the Minister for Planning and Public Spaces under Division 5.2 of the EP&A Act.
- The proposed project is not likely to significantly impact a matter of national environmental significance or Commonwealth land, therefore no referral to DCCEEW for a decision by the Minister for the Environment and Water under the EPBC Act is required.
- Assessments of the significance of the impact of the proposed project on threatened entities under state legislation (the BC Act) concluded that the project will not significantly impact the Southern Myotis.
- The proposed project is not likely to significantly affect threatened species, ecological communities, or their habitats therefore no species impact statement (SIS) or biodiversity development assessment report (BDAR) is required.

11. Certification, review and determination

11.1 Certification

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 project.

I have considered all environmental impacts and mitigation measures to the best of my knowledge and have sought advice where required. The information contained in this REF is neither false nor misleading.

Prepared by:

Name: Terry Bignell

Position: Principal Consultant

Company: EDM Ecological

in MI Signed.....

11.2 Review

This REF has been reviewed by the following person:

Reviewed by:

Name: Will Brown

Position: Coordinator Natural Environment & Resilience

Company: Maitland City Council

Whow Signed.....

11.3 Determination

In accordance with the above recommendations, I certify that I have reviewed and endorsed the contents of this REF, and to the best of my knowledge, it is in accordance with the EP&A Act, the EP&A Regulation and the Guidelines approved under Section 170 of the EP&A Regulation, and the information is neither false nor misleading.

I determine that Maitland City Council may proceed with the proposal, providing the safeguards and mitigation measures listed in this REF are implemented.

Name: Catherine Pepper

Position: Manager, Environment & Sustainability

Company: Maitland City Council

L Puper Signed (Sep 20, 2024 07:23 GMT+10)Date:

12. Publication requirement

Section 171(4) of the EP&A Regulation states that the review of environmental factors must be published on the determining authority's website or the NSW planning portal if:

- (a) the activity has a capital investment value of more than \$5 million
- (b) the activity requires an approval or permit as referred to in any of the following provisions before it may be carried out—
 - (i) Fisheries Management Act 1994, sections 144, 200, 205 or 219,
 - (ii) Heritage Act 1977, section 57,
 - (iii) National Parks and Wildlife Act 1974, section 90,
 - (iv) Protection of the Environment Operations Act 1997, sections 47-49 or 122, or
- (c) the determining authority considers that it is in the public interest to publish the review.

This REF is required to be published on the determining authority's website or the NSW planning portal under section 171(4)(a) and (b)(i) of the EP&A Regulation.

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