



Roads &
Maritime

BARHAM-KOONDROOK BRIDGE – TRUSS AND VICTORIAN APPROACH SPAN RESTORATION

Submissions report

May 2016

BARHAM-KOONDROOK BRIDGE – TRUSS AND VICTORIAN APPROACH SPAN RESTORATION

Submissions report

May 2016

Prepared by NGH Environmental
RMS 16.212
ISBN: 978-1-925507-29-4

Executive summary

Roads and Maritime Services propose to restore part of the Barham-Koondrook Bridge, located on the NSW Victorian border over the Murray River. Some parts of the bridge have already been restored under earlier stages of work. It is now proposed to carry out stages three, four and five of the restoration. The key features of the proposal include:

- Replacing pier four timber piles and timber pier with concrete piles, concrete pile caps and timber pier, similar to what has been completed on the NSW side
- Constructing a new concrete Victorian abutment, abutment B, about three metres behind the existing timber abutment. This would provide a spill through abutment
- Replacing the Victorian timber approach span, also known as span five, with a steel and concrete composite deck structure
- Replace timber traffic barriers with steel traffic barriers on all spans except for the lift span
- Reconstructing the approach roads to suit new abutment location and height
- Installing scour protection of the Victorian river bank both upstream and downstream of the existing bridge
- Replacing the two De Burgh timber truss spans over the river, being spans two and four. Timber elements would be replaced like for like. Cast iron tension rods would be replaced with steel tension rods with a bigger diameter
- Replacing timber decking and sheeting with a stress laminated timber deck. The deck would be surfaced with asphalt or spray seal
- Replacing corroded webbing in both the iron pylons under the lift span
- Upgrading and replacing the removable mechanical components of the lift span, including the sheaves and shafts
- Removing existing lead paint by grit blasting and repainting of lift span towers. This would be done either where it stands with scaffolding and containment to prevent lead exposure to the environment or off-site by a qualified and authorised subcontractor
- Constructing a temporary bridge upstream of the existing bridge. The temporary bridge is proposed to be about one metre away from the bridge on the NSW bank and about 18 metres from the bridge on the Victorian bank. It would be open for use by vehicles, cyclists and pedestrians
- Carrying out any required landscaping and tree planting
- Building a pedestrian boardwalk underneath the bridge on the NSW side of the river in consultation with Wakool Shire Council
- Restoring parks and reserves near the Barham-Koondrook Bridge in consultation with Wakool and Gannawarra councils.

In accordance with the requirements of the *Environmental Planning and Assessment Act 1979*, an environmental impact assessment was prepared to assess the potential impact of the proposal.

The environmental impact assessment was documented in a review of environmental factors, which was publicly displayed between 29 February 2016 and 18 March 2016. During the display of the review of environmental factors, 14 submissions were received, consisting of four from government agencies and 10 from the community.

Submissions generally raised issues relating to:

- Effect of cofferdam on flood water
- Impact on a Murray River streamflow gauging station
- Proposal description
- Design of the bridge

- Traffic delays
- River access
- Biodiversity impact
- Impact on the local economy
- Future or on-going consultation.

Two safeguards have been added to the list of environmental management measures in response to submissions made.

Contents

Executive summary	iii
1 Introduction and background.....	1
1.1 Purpose	1
1.2 The proposal.....	1
1.3 REF display	2
2 Response to issues.....	3
2.1 Overview of issues raised	3
2.2 Alternatives and options considered	4
2.3 Project description	5
2.4 Traffic and access.....	6
2.5 Biodiversity	7
2.6 Flooding.....	9
2.7 Socio-economic	9
2.8 Consultation.....	10
2.9 Non-Aboriginal heritage	11
2.10 Aboriginal heritage.....	12
3 Environmental management	13
3.1 Environmental management plans (or system)	13
3.2 Summary of safeguards and management measures.....	13
3.3 Licensing and approvals	43
4 References.....	44

1 Introduction and background

1.1 Purpose

This submissions report relates to the review of environmental factors (REF) prepared for the Barham-Koondrook Bridge – Truss and Victorian approach span restoration, and should be read in conjunction with that document.

The REF was placed on public display and submissions relating to the proposal and the REF were received by Roads and Maritime Services. This submissions report summarises the issues raised and provides responses to each issue (Chapter 2) and identifies new or revised environmental management measures (Chapter 3).

1.2 The proposal

Roads and Maritime Services propose to restore part of Barham-Koondrook Bridge, located on the NSW Victorian border over the Murray River. Some parts of the bridge have already been restored under earlier stages of work. It is now proposed to carry out stages three, four and five of the restoration. The key features of the proposal include:

- Replacing pier four timber piles and timber pier with concrete piles, concrete pile caps and timber pier, similar to what has been completed on the NSW side
- Constructing a new concrete Victorian abutment, abutment B, about three metres behind the existing timber abutment. This would provide a spill through abutment
- Replacing the Victorian timber approach span, also known as span five, with a steel and concrete composite deck structure
- Replace timber traffic barriers with steel traffic barriers on all spans except for the lift span
- Reconstructing the approach roads to suit new abutment location and height
- Installing scour protection of the Victorian river bank both upstream and downstream of the existing bridge
- Replacing the two De Burgh timber truss spans over the river, being spans two and four. Timber elements would be replaced like for like. Cast iron tension rods would be replaced with steel tension rods with a bigger diameter
- Replacing timber decking and sheeting with a stress laminated timber deck. The deck would be surfaced with asphalt or spray seal
- Replacing corroded webbing in both the iron pylons under the lift span
- Upgrading and replacing the removable mechanical components of the lift span, including the sheaves and shafts
- Removing existing lead paint by grit blasting and repainting of lift span towers. This would be done either where it stands with scaffolding and containment to prevent lead exposure to the environment or off-site by a qualified and authorised subcontractor
- Constructing a temporary bridge upstream of the existing bridge. The temporary bridge is proposed to be about one metre away from the bridge on the NSW bank and about 18 metres from the bridge on the Victorian bank. It would be open for use by vehicles, cyclists and pedestrians
- Carrying out any required landscaping and tree planting
- Building a pedestrian boardwalk underneath the bridge on the NSW side of the river in consultation with Wakool Shire Council
- Restoring parks and reserves near the Barham-Koondrook Bridge in consultation with Wakool and Gannawarra councils.

1.3 REF display

Roads and Maritime Services prepared a review of environmental factors (REF) to assess the environmental impact of the proposed work. The REF was publically displayed between 29 February 2016 and 18 March 2016 at four locations, as detailed in Table 1.1. The REF was placed on the Roads and Maritime Services internet website and made available for download. The display locations and website link were advertised in the Swan Hill Guardian and the Koondrook Barham Bridge Times.

In addition to the above public display, an invitation to comment with a link to the public exhibition website page was emailed directly to the following authorities:

- NSW Department of Primary Industries (DPI), Fisheries
- NSW Department of Primary Industries (DPI), Agriculture
- NSW Department of Primary Industries (DPI), Office of Water
- NSW Office of Environment and Heritage (OEH)
- NSW Office of Environment and Heritage – Heritage Branch
- NSW Environmental Protection Authority (EPA)
- NSW Trade and Investment – Crown Lands
- NSW Department of Planning and Environment
- NSW Roads and Maritime Services - Maritime
- Murray Local Land Service
- Murray Darling Basin Authority
- Wakool Shire Council
- Victorian Aboriginal Heritage Office
- VicRoads
- EPA Victoria
- Victorian Department of Environment, Land, Water & Planning
- Regional Development Victoria
- Aboriginal Affairs Victoria
- North Central Catchment Management Authority
- Gannawarra Shire Council.

Table 1.1: Display locations

Location	Address
Wakool Shire Council	15 Murray Street, Barham
Gannawarra Shire Council	Patchell Plaza, 47 Victoria Street, Kerang
Barham Bakery	8 Mellool Street, Barham
Barham Riverside Café	22 Murray Street, Barham

2 Response to issues

Roads and Maritime Services received fourteen submissions, accepted up until the 29 March 2016. Table 1.2 lists the respondents and each respondent's allocated submission number. The table also indicates where the issues from each submission have been addressed in Chapter 3 of this report.

Table 2.1: Respondents

Respondent	Submission No.	Section number where issues are addressed
Murray Darling Basin Authority	1	2.3.1, 2.6, 2.8.1
Individual submission	2	2.8.3, 2.9.3
Individual submission	3	2.2.2
Individual submission	4	2.2.2, 2.4.1, 2.7, 2.9.1
Individual submission	5	2.4.2
Individual submission	6	2.2.2, 2.3.2, 2.8.2
Individual submission	7	2.2.2, 2.3.2, 2.7
Individual submission	8	2.4.2
Individual submission	9	2.2.2
Barham Consolidated Inc.	10	2.2.1, 2.3.2, 2.5.4, 2.8.2
Individual submission	11	2.5.5
NSW DPI Agriculture	12	No issues
NSW Office of Environment and Heritage	13	2.5.1, 2.5.2, 2.5.3, 2.10
Heritage Branch of NSW Office of Environment and Heritage	14	2.9.2

2.1 Overview of issues raised

A total of 14 submissions were received in response to the display of the environmental assessment comprising four government agencies and 10 from the community.

Each submission has been examined individually to understand the issues being raised. The issues raised in each submission have been extracted and collated, and corresponding responses to the issues have been provided. Where similar issues have been raised in different submissions,

only one response has been provided. The issues raised and Roads and Maritime Services response to these issues forms the basis of this chapter.

Overall, 36 per cent raised objections, 14 per cent offered support and 50 per cent offered no general position on the proposal.

Submissions were received from four government agencies, being the Murray Darling Basin Authority, NSW Office of Environment and Heritage, NSW Office of Environment and Heritage – Heritage Branch and NSW Department of Primary Industries – Agriculture. The following issues were raised:

- Effect of cofferdam on flood water
- Impact on a Murray River streamflow gauging station
- Proposal description
- NSW biodiversity assessment.

The main issues raised by the public include:

- Proposal description
- Design of the bridge
- Traffic delays
- River access
- Biodiversity impact
- Impact on the local economy
- Future or on-going consultation.

No form letters were received with each submission being an original submission.

2.2 Alternatives and options considered

2.2.1 Temporary bridge

Submission number(s)

Submission number 10 (Barham Consolidated Inc)

Issue description

The respondent stated that the group supports the construction of a temporary bridge.

Response

This comment is noted.

2.2.2 Existing bridge

Submission number(s)

Submission numbers 3, 4 (Club Barham), 6, 7 (Wakool Landholders Association) and 9

Issue description

Five respondents raised concerns about the existing bridge design. Three of the respondents would like the Barham-Koondrook Bridge to be replaced with a new bridge. The remaining two suggested the bridge should be altered to be either two lanes or to allow heavy/wide loads.

The reasons for the respondents concerns include:

- The restored bridge would not meet the needs of the community relating to pedestrian safety and suitability for vehicles

- The restored bridge would need continual maintenance in the future which would cause more disruption to the community
- The restored bridge would not meet current and future demands to accommodate heavy/wide loads
- It would be better value for money to upgrade the existing bridge to a two lane structure or build a new two lane structure.

Response

The existing Barham-Koondrook Bridge is one of the oldest lift span bridges on the Murray River and was added to the NSW state heritage register in 2000. Given its heritage listing, the bridge must be retained and maintaining its heritage values is an objective of the proposal. Alternatives and options considered, including replacing the existing bridge, were assessed against the objectives of the proposal in section 4.2 of the REF.

The description of the restoration work, detailed in section 3 of the REF, is to replace deteriorated parts of the bridge like for like. While widening the lift span would make more space for two vehicles to pass on the bridge, the current design strength of the structure is only sufficient to carry one B double truck at a time. Roads and Maritime and VicRoads are currently prioritising investment for Murray River crossings and the option to widen the bridge would be considered as part of this process. Investigations into the possibility of widening the river crossing is also discussed in section 2.7 of this report.

To achieve the objectives of the proposal the preferred option to restore the bridge with a temporary bridge in place is considered the preferred option. While the cost of the proposal may appear relatively high, the preferred option has taken into account protecting the local economy and minimising disruption to the community.

Alternatives and options for the proposal were also assessed against the objective to design for low maintenance in section 4.2 of the REF. Section 2.1 of the REF states that the proposal would minimise maintenance into the future with most components expected to last 25 years.

Pedestrian safety is also discussed in section 2.3.2 of this submissions report. Roads and Maritime are investigating options to improve pedestrian access and safety on the existing bridge.

2.3 Project description

2.3.1 Temporary bridge piers

Submission number(s)

Submission number 1 (Murray Darling Basin Authority)

Issue description

The respondent stated an expectation for the temporary bridge piers to be removed from the river when the temporary bridge is taken away.

Response

The temporary bridge piers would be removed from the river as part of the removal of the temporary bridge. Further details for the description of the work and work methodology can be found in section 3 of the REF.

2.3.2 Pedestrian access

Submission number(s)

Submission numbers 6, 7 (Wakool Landholders Association) and 10 (Barham Consolidated Inc)

Issue description

In summary, the respondents raised the following issues:

1. Safety of pedestrians crossing the existing bridge
2. Safety of pedestrians crossing Grigg Road to get to the existing bridge's pedestrian walkway.

The respondents raised the issue of the safety of pedestrians crossing the existing bridge. There is a separate pedestrian walkway for four of the five bridge spans. To cross the centre lift span pedestrians must leave the separate walkway and enter the vehicular traffic lane.

The communities of Barham and Koondrook rely heavily on the bridge for daily activities. The bridge walkway is used by school children, cyclists, mobility scooters, and families with prams. The respondents would like to keep all users of the bridge safe and suggested the provision of a new walkway either along the outside of the entire bridge or along the outside of the centre lift span.

One respondent also raised the pedestrian safety issue for pedestrians approaching the bridge along Murray Parade from the north-west. Pedestrians need to stand at give way signs with vehicular traffic to cross Grigg Road to access the bridge walkway. The respondent suggested a pedestrian underpass on the Victorian side of the river be included in the proposal.

Response

The current project scope does not include pedestrian access under the new Victorian approach span. In addition to these submissions, Gannawarra Shire Council also raised concerns about pedestrian safety during the preparation of the REF. In response, Roads and Maritime are investigating options to improve pedestrian access and safety on the existing bridge, including the possibility of a new walkway supported from the existing bridge. This will be done in consultation with Gannawarra Shire Council.

2.4 Traffic and access

2.4.1 Traffic delays

Submission number(s)

Submission number 4 (Club Barham)

Issue description

The respondent is tired of traffic delays when crossing the bridge. The respondent requested that the temporary bridge be put in place before further work is carried out to prevent further delays.

Response

The temporary bridge would be installed prior to the closure of the existing bridge and would remain open for the duration of the restoration works. This is addressed in section 3.3.1 of the REF.

While the temporary bridge and approach roads are being built, some delays for pedestrian, cyclist and vehicular traffic are expected. This is discussed in section 6.2 of the REF. There may also be some closures of the temporary bridge for particular restoration tasks where there is a safety risk to bridge users. Overall, the use of a temporary bridge would significantly reduce traffic delays and bridge closures during the work.

2.4.2 River access

Submission number(s)

Submission numbers 5 and 8 (Spirit of Australia)

Issue description

Two river boat cruises are scheduled to pass under the Barham-Koondrook Bridge during November 2016. Depending on the height of the river at the time, the temporary bridge may be too low for the boats to pass under.

The boats only travel downstream along the Murray River. A trailer is normally used to transport the boats back to the starting point in Echuca.

One respondent is investigating options to remove the boat from the river and relaunch on the downstream side of the bridge. A boat ramp or the use of a crane would be needed to relaunch the boat.

Response

The potential impact of the proposal on river traffic was identified in section 6.2.2 of the REF. The minimal clearance of the temporary bridge was discussed and limitations for tall river boat traffic were noted.

Roads and Maritime consulted with river boat operators and Roads and Maritime Services - Maritime during the preparation of the REF. Table 7.1 of the REF outlines the requirements for further consultation with affected groups. Water levels in the river and the timing of events would influence appropriate mitigation measures.

2.5 Biodiversity

2.5.1 Biodiversity off-sets

Submission number(s)

Submission number 13 (NSW Office of Environment and Heritage)

Issue description

The respondent supports the proposed biodiversity offsets if the relevant Victorian agency (Victorian Department of Environment, Land, Water and Planning) considers it appropriate.

Response

An application, which includes a proposed biodiversity offset, has been lodged with Gannawarra Council for the removal of vegetation in Victoria. The application has been referred to the Department of Environment, Land, Water and Planning (DELWP). The approval process ensures that DELWP agrees with the proposed offsets.

2.5.2 NSW tree removal

Submission number(s)

Submission number 13 (NSW Office of Environment and Heritage)

Issue description

The respondent noted the tree canopy for some trees to be removed from the Victorian side of the river are technically located in NSW and the REF does not provide information needed to assess impacts to biodiversity and threatened species in NSW.

Response

The impact to Biodiversity has been assessed under the respective legislative requirements for New South Wales and Victoria. The impacts to Biodiversity, including an assessment of cumulative impacts, is addressed in Section 6.3 of the REF. The assessment has concluded the proposal would not result in a significant impact to biodiversity in New South Wales.

2.5.3 Assessments of significance

Submission number(s)

Submission number 13 (NSW Office of Environment and Heritage)

Issue description

The respondent commented it is usually recommended that the determining authority consider whether an assessment of significance is required for the development. The respondent further commented that in this instance it is unlikely that the proposal would result in a significant impact on threatened species or their habitat.

Response

The impact of the proposed work on biodiversity is assessed in section 6.3 of the REF. Assessments of Significance were prepared for:

- Southern Myotis (TSC Act)
- Lower Murray River aquatic Endangered Ecological Community (FM Act)
- Eel-tailed Catfish endangered population in the Murray Darling Basin (FM Act)
- Silver Perch (FM Act).

All Assessments of Significance concluded that a significant impact is not likely and Species Impact Statements would not be required.

2.5.4 Work site rehabilitation

Submission number(s)

Submission number 10 (Barham Consolidated Inc)

Issue description

The respondent trusts that the impact of the work on vegetation would be minimised and the rehabilitation of parks and gardens would be carried out as stated in the REF.

Response

Roads and Maritime would rehabilitate the site in accordance with Section 6.2 (Biodiversity) and Section 6.8 (Landscape character and visual amenity) of the REF. An Urban Design and Landscape Plan would be prepared and implemented as part of the Construction Environmental Management Plan (CEMP).

2.5.5 Natural revegetation

Submission number(s)

Submission number 11

Issue description

The respondent stated the bridge desperately needs to be closed permanently until work is complete and that environmental factors shouldn't hold up the work. The respondent stated the work area would regenerate naturally when work is complete.

Response

To progress the proposal, the potential impacts of the proposal on the environment, New South Wales, Victorian and Commonwealth legislation must be followed. Section 4 of the REF outlines the legislative requirements for the proposed work.

2.6 Flooding

Submission number(s)

Submission number 1 (Murray Darling Basin Authority)

Issue description

The respondent noted that consideration should be given to the effect of the coffer dam on flood levels. The proposal includes the installation of a coffer dam around pier four and the Victorian abutment while the restoration work is being carried out.

Response

The detailed design and construction of the coffer dam would take into consideration the potential for temporary impact on flood water during construction. Ongoing management of the potential flooding impact of the coffer dam would be included in the Construction Environmental Management Plan (CEMP).

In response to the Murray Darling Basin Authority's concern, this has been added as a safeguard to Table 3.1 of this submissions report.

2.7 Socio-economic

Submission number(s)

Submission number 4 (Club Barham), Submission number 7 (Wakool Landholders Association)

Issue description

In summary, the respondents raised the following issues:

1. Bridge closures and traffic delays would harm local communities and businesses
2. Impact on the local economy caused by contractors finding alternate routes for heavy/wide loads.

One respondent raised the issue of bridge closures and traffic delays harming the community and businesses, stating access across the river is vital. The respondent questioned whether the temporary bridge would be in place before there is any more disruption for the towns of Barham and Koondrook.

One respondent stated it is essential that the existing bridge is upgraded to facilitate heavy/wide machinery as the local economy would suffer if contractors find alternate routes.

Response

The potential socio-economic impact caused by bridge closures and traffic delays were identified in section 6.11.2 of the REF. The section describes how early community consultation identified the potential for financial loss if there were extensive closures of the existing bridge. As part of the proposed works, Roads and Maritime is planning to install a temporary bridge by late 2016, prior to the closure of the existing bridge and would remain in place for the duration of the restoration work. The proposal includes a temporary bridge to address the potential cost to the community.

Roads and Maritime may still need to carry out maintenance on the existing bridge before the temporary bridge is in place. In this case Roads and Maritime would liaise with the community to minimise disruption.

2.8 Consultation

2.8.1 Stream gauging station

Submission number(s)

Submission number 1 (Murray Darling Basin Authority)

Issue description

The respondent stated there is a streamflow gauging station about 50 metres downstream of the bridge. Consultation with the manager of the station was suggested and contact details were provided.

Response

In response to the Murray Darling Basin Authority's concern, the manager of the Murray River streamflow gauging station at Barham has been contacted and is aware of the proposal. Construction work would not be carried out near the gauge. The area would be marked as an exclusion zone for construction purposes. This has been added as a safeguard to Table 3.1 of this submissions report. Safeguards would be implemented through the Construction Environmental Management Plan (CEMP).

2.8.2 Future or on-going consultation

Submission number(s)

Submission numbers 6 and 10 (Barham Consolidated Inc)

Issue description

One respondent suggested alterations to the design of the existing bridge and requested continued community consultation to be kept informed of any design changes.

One respondent commented that the ongoing communication with the community is valued.

Response

The community would continue to be consulted as the work progresses. Section 5.6 of the REF outlines the communication that would be carried out.

2.8.3 Red Gum Statue

Submission number(s)

Submission number 2

Issue description

One respondent suggested a contact to discuss the temporary relocation of the Herbert Keck Red Gum statue located on the Victorian side of the river.

Response

Roads and Maritime would liaise with the community and Gannawarra Shire Council about an appropriate temporary location for the Herbert Keck statue, as required by safeguard NAH2 in Table 3.1.

2.9 Non-Aboriginal heritage

2.9.1 Heritage value

Submission number(s)

Submission number 4 (Club Barham)

Issue description

The respondent stated that the belief that the community would like to keep the existing bridge is incorrect.

The respondent also raised the issue that the existing bridge would have little historic value when the proposed work is complete. It was stated that there would be little of the original bridge left given the bridge would have two new concrete abutments and other parts have been progressively replaced.

Response

The Timber Truss Bridge Conservation Strategy was advertised for public comment in 2011. Fourteen submissions relating to the Barham-Koondrook Bridge were received with 12 supporting the retention of the bridge.

The heritage significance of the bridge and its elements is assessed in the Statement of Heritage Impact for capacity upgrade work, provided as Appendix J in the REF. This report identifies the timber truss spans and the lift span as having exceptional significance. The timber abutments and timber approach spans were both assessed as having moderate heritage significance, defined as having “altered or modified elements, or elements with little historic value that contribute to the overall significance of the working place”. All work would be conducted in accordance with the Approval received by OEHL Heritage Branch under section 60 of the Heritage Act 1977.

2.9.2 Section 60 approval

Submission number(s)

Submission number 14 (OEHL Heritage Branch)

Issue description

The respondent noted the approval for the proposed work under section 60 of the Heritage Act 1977. This approval was issued by OEHL Heritage Branch on 11 March 2015. The respondent noted that the conditions of this approval should be incorporated into any future development consent.

Response

The section 60 conditions of approval have been included in the environmental safeguards listed in section 7 of the REF. Further information about the section 60 approval process is provided in section 6.6 of the REF.

2.9.3 Heritage interpretation

Submission number(s)

Submission number 2

Issue description

The respondent suggested a local group that may be able to take ownership and display parts of the lift span that would be removed from the bridge.

Response

Roads and Maritime would liaise with the community and Wakool and Gannawarra shire councils about appropriate heritage interpretation, including potential display of components from the bridge. Section 6.6 of the REF addresses the impact to Non-Aboriginal Heritage which includes relevant safeguards.

2.10 Aboriginal heritage

Submission number(s)

Submission number 13 (NSW Office of Environment and Heritage)

Issue description

The respondent supports the site specific environmental safeguards for Aboriginal cultural heritage including on-site cultural heritage training and unexpected finds protocol.

Response

This comment is noted.

3 Environmental management

The REF for the Barham-Koondrook Bridge – Truss and Victorian approach span restoration identified the framework for environmental management, including management and mitigation measures that would be adopted to avoid or reduce environmental impacts (section 7.2 of the review of environmental factors).

After consideration of the issues raised in the public submissions, these management and mitigation measures have been revised. Safeguards have been added for the coffer dam (SW15) and for the stream gauging station (TT12).

Should the proposal proceed, environmental management will be guided by the framework and measures outlined below.

3.1 Environmental management plans (or system)

A number of safeguards and management measures have been identified in order to minimise adverse environmental impacts, including social impacts, which could potentially arise as a result of the proposal. Should the proposal proceed, these management measures would be incorporated into the detailed design and applied during the construction and operation of the proposal.

A Project Environmental Management Plan (PEMP) and a Construction Environmental Management Plan (CEMP) would be prepared to describe safeguards and management measures identified. These plans will provide a framework for establishing how these measures will be implemented and who would be responsible for their implementation.

The plans would be prepared prior to construction of the proposal and must be reviewed and certified by environment staff, South West Region, prior to the commencement of any on-site works. The CEMP would be a working document, subject to ongoing change and updated as necessary to respond to specific requirements. The CEMP and PEMP would be developed in accordance with the specifications set out in the QA Specification G36 – Environmental Protection (Management System) and the QA Specification G38 – Soil and Water Management (Soil and Water Plan).

3.2 Summary of safeguards and management measures

Environmental safeguards outlined in this document would be incorporated into the detailed design phase of the proposal and during construction and operation of the proposal, should it proceed. These safeguards would minimise any potential adverse impacts arising from the proposed works on the surrounding environment. The safeguards and management measures are summarised in Table 3.1.

Table 3.1: Summary of site specific environmental safeguards

No.	Impact	Environmental safeguards	Responsibility	Timing
G1	General	<p>All environmental safeguards must be incorporated within the following:</p> <ul style="list-style-type: none"> • Project Environmental Management Plan • Detailed design stage • Contract specifications for the proposal • Contractor's Environmental Management Plan 	Project manager	Pre-construction
G2	General	<ul style="list-style-type: none"> • A risk assessment must be carried out on the proposal in accordance with the Roads and Maritime Services Project Pack and PMS risk assessment procedures to determine an audit and inspection program for the works. The recommendations of the risk assessment are to be implemented. • A review of the risk assessment must be undertaken after the initial audit or inspection to evaluate if the level of risk chosen for the project is appropriate. • Any works resulting from the proposal and as covered by the REF may be subject to environmental audit(s) and/or inspection(s) at any time during their duration. 	Project manager and regional environmental staff	<p>Pre-construction</p> <p>After first audit</p>
G3	General	<ul style="list-style-type: none"> • The environmental contract specification G36 must be forwarded to the Roads and Maritime Services Environment Manager South West Region for review at least 10 working days prior to the commencement of construction. • A contractual hold point must be maintained until the CEMP is reviewed by the Roads 	Project manager	Pre-construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		and Maritime Services Environment Manager South West Region.		
G4	General	The Roads and Maritime Services Project Manager must notify the Roads and Maritime Services Environmental Officer South-West Region at least five working days prior to work commencing.	Project manager	Pre-construction
G5	General	All businesses and residences likely to be affected by the proposed works must be notified at least five working days prior to the commencement of the proposed activities.	Project manager	Pre-construction
G6	General	Environmental awareness training must be provided, by the contractor, to all field personnel and subcontractors.	Contractor	Pre-construction and during construction as required.
SW1	Soil and Water	<u>Soil and Water Management Plan</u> A Soil and Water Management Plan will be prepared in accordance with QA Specification G38 and implemented as part of the CEMP. The Plan will identify all reasonably foreseeable risks relating to soil erosion and water pollution associated with undertaking the activity, and describe how these risks will be managed and minimised during construction. That will include arrangements for managing pollution risks associated with spillage or contamination on the site and adjoining areas, and monitoring during construction.	Project Manager	Pre-construction
SW2	Soil and Water	<u>Install erosion, sediment and water quality controls</u> Consistent with any specific requirements of the approved Soil and Water Management Plan, control measures will be implemented to	Project Manager, Contractor	Pre-construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		<p>minimise risks associated with erosion and sedimentation and entry of materials to drainage lines and waterways. That will include, but not necessarily be limited to:</p> <ul style="list-style-type: none"> - sediment management devices, such as fencing, hay bales or sand bags - measures to divert or capture and filter water prior to discharge, such as drainage channels and first flush and sediment basins - scour protection and energy dissipaters at locations of high erosion risk - installation of measures at work entry and exit points to minimise movement of material onto adjoining roads, such as rumble grids or wheel wash bays - appropriate location and storage of construction materials, fuels and chemicals, including bunding where appropriate. 		
SW3	Soil and Water	<p><u>Stockpile management</u> Stockpiles will be designed, established, operated and decommissioned in accordance with the RTA Stockpile Site Management Guideline 2015.</p>	Project Manager, Contractor	Pre-construction, During construction, Post construction
SW4	Soil and Water	<p><u>Dewatering</u> Any dewatering activities will be undertaken in accordance with the RTA Technical Guideline: Environmental management of construction site dewatering in a manner that prevents pollution of waters.</p>	Project Manager, Contractor	During construction

No.	Impact	Environmental safeguards	Responsibility	Timing
SW5	Soil and Water	<p><u>Work in waterways</u> A detailed Environmental Work Method Statement (EWMS) will be prepared and implemented for all works undertaken within waterways. The EWMS will detail measures to avoid or minimise risks from erosion and sedimentation to water quality and biodiversity. It will be prepared in accordance with relevant guidelines including, but not limited to:</p> <ul style="list-style-type: none"> - RMS Biodiversity Guidelines - Protecting and managing biodiversity on RTA projects - NSW DPI (Fisheries) guidelines Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings. 	Project Manager, Contractor	Pre-construction, During construction
SW6	Soil and Water	<p><u>Monitor</u> Consistent with any specific requirements of the approved Soil and Water Management Plan a monitoring program will be implemented during construction to ensure effective implementation of all temporary and permanent soil, erosion and water pollution safeguards. The timing and frequency of monitoring inspections will be set out in the SWMP. The inspections will assess implementation and success of the controls, actions required to ensure on-going effective operation, and compliance with any statutory approvals. A register of inspections will be established.</p>	Project Manager, Contractor	During construction

No.	Impact	Environmental safeguards	Responsibility	Timing
SW7	Soil and Water	<p><u>Efficient use of water</u> Work practices will be implemented during construction to support efficient water use and minimise waste. That will include, but not necessarily be limited to, measures to reuse and recycle water where practicable for use in road construction (such as dust suppression and concreting) and irrigation or revegetated areas.</p>	Project Manager, Contractor	During construction
SW8	Soil and Water	<p><u>Rehabilitation</u> All areas disturbed during construction, including areas for stockpiles compound sites, temporary access roads and temporary work areas, would be stabilised and rehabilitated to prevent future erosion.</p>	Project Manager	Post construction
SW9	Soil and Water	<p><u>Hazardous materials storage</u> All fuels, chemicals and other hazardous materials must be stored in a roofed, fire-protected and impervious bunded area at least 20 metres from waterways, drainage lines, basins, flood-affected areas or slopes above 10%. Bunding design must comply with relevant Australian Standards, and should generally be in accordance with guidelines provided in the EPA Authorised Officers Manual.</p> <p>Appropriate on-site signage must be provided to identify the materials stored.</p>	Project Manager, Contractor	During construction
SW10	Soil and Water	<p><u>Emergency equipment</u> Appropriate emergency equipment will be provided on-site and located at strategic, accessible locations. This will include:</p> <ul style="list-style-type: none"> - fire response measures, including fire extinguishers, fire blankets and accessible 	Project Manager, Contractor	During construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		<ul style="list-style-type: none"> water - spill kits - first aid kits - external showers. 		
SW11	Soil and Water	<u>Refuelling</u> Refuelling will occur in impervious bunded areas at least 20 metres from drainage lines and waterways. Refuelling on barges will occur within a double-bunded area.	Project Manager, Contractor	During construction
SW12	Soil and Water	<u>Cleaning and washing</u> Cleaning of equipment and vehicles will only occur in areas where water pollution will not occur. Wash-down or wash-out will only occur in bunded areas.	Project Manager, Contractor	During construction
SW13	Soil and Water	<u>Incident reporting and response</u> Environmental incidents, such as pollution spills and unauthorised vegetation clearing, will be reported and managed in accordance with the RMS Environmental Incident Classification and Reporting Procedure.	Project Manager, Contractor	During construction
SW14	Soil and Water	<u>Garnet</u> Controls would be established during sand blasting of bridge elements to prevent garnet being released to the environment.	Project Manager, Contractor	During construction
SW15	Soil and Water	Fill imported onto the proposal site for the construction of the in-stream working platforms will be clean, inert rock spoil with a minimum grade of 50mm.	Contractor	Construction, Operation
<u>SW16</u>	<u>Flooding</u>	The detailed design and construction of the coffer dam will take into consideration potential flooding impacts during construction. Ongoing management of the coffer-dam will be included in the Construction Environmental Management	<u>Project Manager</u>	<u>Pre-construction</u>

No.	Impact	Environmental safeguards	Responsibility	Timing
		Plan (CEMP).		
TT1	Minimise impacts to existing traffic	<p><u>Local community notification</u></p> <p>Consultation will be undertaken with potentially affected residences prior to the commencement of and during works in accordance with the RTA's Community Involvement and Communications Resource Manual. Consultation would include but not limited to door knocks, newsletters or letter box drops providing information on the proposed works, working hours and a contact name and number for more information or to register complaints</p>	Project Manager	Pre-construction, During construction
TT2	Minimise traffic related risks during construction	<p><u>Traffic Management Plan</u></p> <p>A Traffic Management Plan (TMP) will be prepared and implemented as part of the CEMP. The TMP will be prepared in accordance with the RMS Traffic Control at Work Sites Manual and the worksite manual RMS Specification G10. The TMP will include:</p> <ul style="list-style-type: none"> - confirmation of haulage routes - measures to maintain access to local roads and properties - site specific traffic control measures (including signage) to manage and regulate traffic movement - measures to maintain pedestrian and cyclist access - requirements and methods to consult and inform the local community of impacts on the local road network 	Project Manager	Pre-construction,

No.	Impact	Environmental safeguards	Responsibility	Timing
		<ul style="list-style-type: none"> - access to construction sites including entry and exit locations and measures to prevent construction vehicles queuing on public roads. - a response plan for any construction traffic incident - consideration of other developments that may be under construction to minimise traffic conflict and congestion that may occur due to the cumulative increase in construction vehicle traffic - monitoring, review and amendment mechanisms. 		
TT3	Access	<u>Notifications to landowners</u> Disruptions to property access and traffic will be notified to landowners at least five days prior in accordance with the relevant community consultation processes outlined in the TMP.	Project Manager	Pre-construction, During construction
TT4	Access	<u>Wide Loads</u> Consultation and notification of the transport industry and road freight providers would occur in relation to the reduced width capability of the temporary bridge.	Project Manager	Pre-construction, During construction
TT7	Reduce speeds, traffic delays and disruptions during construction	<u>Community information</u> Road users and local communities will be provided with timely, accurate, relevant and accessible information about changed traffic arrangements and delays owing to construction activities.	Roads and Maritime	Pre-construction, During construction
TT8	Local road dilapidation	<u>Dilapidation reports</u> Pre-construction and post construction road dilapidation reports for local roads likely to be	Project Manager	Pre-construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		used for construction will be prepared. Any damage resulting from construction (not normal wear and tear) will be repaired unless alternative arrangements are made with the relevant road authority. Copies of road dilapidation reports will be provided to the local roads authority.		
TT9	Water Traffic	Four knot speed limit and no wash within construction zone will be implemented from 600 metres upstream and 900 metres downstream of the bridge.	Roads and Maritime	During construction
TT10	Water Traffic	Work schedule must give consideration to vessels that would need passage. It is noted that a higher number of vessels require passage during summer and peak holiday periods.	Roads and Maritime	Pre-construction
TT11	Water Traffic	Roads and Maritime will consult with boat owners along the river regarding any changes to river traffic arrangements, including but limited to: <ul style="list-style-type: none"> • Murray River Paddle steamers, Echuca • Port of Echuca Paddle Boats • Echuca-Moama River Watch and User Group • Sunraysia User Group. 	Roads and Maritime	Pre-construction
<u>TT12</u>	<u>Water Traffic</u>	<u>“No Anchorage” signs would be installed near the streamflow gauge located about 50 metres downstream of the bridge on the Victorian bank of the Murray River.</u>	<u>Roads and Maritime</u>	<u>During construction</u>
B1	Pre-clearing	Obtain a planning permit from Gannawarra Shire Council to remove or prune native vegetation on the Victorian side of the Murray River.	Project Manager	Pre-construction, During construction
B2	Minimise risks to native flora and fauna during construction	<u>Flora and Fauna Management Plan</u> A Flora and Fauna Management Plan will be prepared and implemented as part of the CEMP.	Project Manager	Pre-construction, During construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		<p>It will address terrestrial and aquatic matters and include, but not necessarily be limited to:</p> <ul style="list-style-type: none"> a) plans for the construction site and adjoining area showing native vegetation, flora and fauna habitat, threatened species and endangered ecological communities b) plans showing areas to be cleared and areas to be protected, including exclusion zones and protected habitat features (eg. hollow-bearing trees), and areas for rehabilitation or re-establishment of native vegetation c) requirements set out in the RTA Landscape Guideline d) procedures addressing relevant matters specified in the Biodiversity Guidelines - Protecting and managing biodiversity on RTA projects (RTA 2011) including but not limited to: <ul style="list-style-type: none"> - pre-clearing, including the outcomes of final flora and fauna species checks, establishment of exclusion zones and on-ground identification of specific habitat features to be retained (such as hollow-bearing trees) - vegetation clearing and bushrock removal, including staged habitat removal and any specified seasonal limits on clearing activities - fauna handling and unexpected threatened species finds - rehabilitation, revegetation, re-use of soils, woody debris and bushrock, and other habitat management actions 		

No.	Impact	Environmental safeguards	Responsibility	Timing
		<ul style="list-style-type: none"> - weed and pathogen management e) procedures addressing relevant matters specified in the NSW DPI (Fisheries) Policy and guidelines for fish habitat conservation and management f) monitoring during construction and post-construction g) adaptive management measures to be applied if monitoring indicates unexpected adverse impact. 		
B3	Minimise risks to native flora and fauna during construction	<u>Pre-construction check</u> Pre-clearing surveys will be undertaken in accordance with Guide 1: Pre-clearing process of the Biodiversity Guidelines - Protecting and managing biodiversity on RTA projects (RTA 2011).	Project Manager, Contractor	Pre-construction, During construction
B4	Minimise risks to native flora and fauna during construction	<u>Detailed design</u> Measures to further avoid and minimise the construction footprint and native vegetation or habitat removal will be considered during the detailed design stage and implemented where practicable and feasible.	Project Manager, Contractor	Pre-construction, During construction
B5	Protect native flora and fauna and avoid inadvertent impacts	<u>Unexpected threatened species</u> Consistent with the Biodiversity Guidelines - Protecting and managing biodiversity on RTA projects, and any specific requirements of the approved Flora and Fauna Management Plan, an unexpected finds procedure will be implemented in the event that a threatened species or ecological community that had not been identified and assessed by the REF is unexpectedly encountered during the construction process.	Project Manager	Post construction
B6	Protect native flora and fauna, minimise edge	<u>Exclusion zones and protected habitat features</u> Consistent with the approved Flora and Fauna	Project Manager, Contractor	Pre-construction, During construction

No.	Impact	Environmental safeguards	Responsibility	Timing
	effects and avoid inadvertent impacts	<p>Management Plan:</p> <ul style="list-style-type: none"> - the limits of clearing within the construction site will be delineated using appropriate signage and barriers, identified on site construction drawings and during construction staff induction - vegetation and habitat features to be retained, such as hollow-bearing trees, will be clearly identified and protected by suitable fencing, signage or markings - identified areas containing habitat for microchiropterean bats, arboreal birds and woodland species will not be cleared during the breeding season between September and January, where practicable. 		
B7	Protect native flora and fauna and avoid inadvertent impacts	<p><u>Stockpiles, plant and ancillary sites</u> Vehicle parking, machinery, construction compounds, material stockpiles and the like, will be located in cleared or disturbed areas, not within the drip-zone of vegetation to be retained or within other protected or exclusion zones identified in the Flora and Fauna Management Plan.</p>	Project Manager, Contractor	
B8	Protect native flora and fauna	<p><u>Fauna handling</u> Fauna handling will be managed in accordance with Guide 9: Fauna handling of the Biodiversity Guidelines - Protecting and managing biodiversity on RTA projects, and any specific requirements of the approved Flora and Fauna Management Plan.</p>	Project Manager	Post construction
B9	Rehabilitation	<p><u>Rehabilitation</u> All areas disturbed during construction, including areas for stockpiles compound sites, temporary access roads and temporary work areas, would</p>	Project Manager, Contractor	During construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		be stabilised and rehabilitated to prevent future erosion.		
B10	Minimise weed, pest species and pathogen risks	<u>Weed, Pest Species and Pathogen Management</u> Weed species will be managed in accordance with Guide 6: Weed Management of the Biodiversity Guidelines - Protecting and managing biodiversity on RTA projects, and any specific requirements of the approved Flora and Fauna Management Plan.	Project Manager, Contractor	Pre-construction, During construction
B11	Support future rehabilitation or revegetation	<u>Topsoil management - future re-use</u> Consistent with the Biodiversity Guidelines - Protecting and managing biodiversity on RTA projects, topsoil removed during construction, which has been assessed as low-risk for weeds and with good potential for containing indigenous flora seed material, will be stockpiled in cleared or disturbed areas for re-use in post-construction rehabilitation or revegetation. Until re-use occurs the stockpile will be managed in accordance with the RTA Stockpile Site Management Guideline.	Project Manager, Contractor	Construction
B12	Restore and rehabilitate habitat	<u>Habitat management - species selection</u> Consistent with the Biodiversity Guidelines - Protecting and managing biodiversity on RTA projects, and any specific requirements of the approved Flora and Fauna Management Plan, locally indigenous plant species will be used during rehabilitation and revegetation.	Project Manager, Contractor	During construction
B13	Clearing of native vegetation	<ul style="list-style-type: none"> Clearing of vegetation will be restricted to that assessed in the project REF and includes trees located within 30 metres east of the bridge along the southern riverbank. The limit of clearing would be delineated (eg temporary site fencing, flagging, earth bunding) along 	Project Manager, Contractor	During construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		<p>the river and at the stockpile and compound site. Clearing limits would be discussed in the site induction to ensure staff and contractors are made aware of limits of clearing</p> <ul style="list-style-type: none"> • Trees will be removed in such a way as not to cause damage to surrounding vegetation. This will ensure groundcover disturbance is kept to a minimum • Areas already impacted by previous clearing or disturbance will be used to minimise clearing where feasible. Trimming is preferred over removal where feasible. 		
B14	Fauna and habitat impact Microchiropteran bat species	<ul style="list-style-type: none"> • A bat management plan will be developed for the proposed work and must include the following: <ul style="list-style-type: none"> ○ Staff should be educated about microchiropteran bats, their ecological role, conservations significance, and the risk of disease with certain species ○ Undertake final inspection of the bridge components to be removed to locate any bat roost sites prior to the commencement of removing each component ○ If evidence of roost sites are identified, implement exclusion techniques such as the use of spotlights on the bridge at night, installing netting/ plastic sheeting once bats have left, starting an oxy-torch (to cut bolts) ○ If bats are observed emerging from the bridge components to be removed, work must cease and an experienced ecologist with bat handling experience be consulted. 	Project Manager, Contractor	During construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		<ul style="list-style-type: none"> ○ If roost sites in the form of hollow bearing trees have to be removed an experienced ecologist must be on hand to inspect each hollow prior to the destruction so bats can be excluded and or have time to relocate. ○ Timing of deck removal must avoid bat breeding and lactating periods (September-November). 		
B15	Disturbance to fallen timber and dead wood	<ul style="list-style-type: none"> ● Any snags located within the study area would be relocated to nearby areas of habitat, if necessary ● DPI Fisheries will be contacted regarding the re-use of CWD as aquatic habitat ● Coarse Woody Debris will be placed within the nearby river bank and will be managed in accordance with the requirements the Roads and Maritime Biodiversity Guidelines (RTA, 2011) - Guide 5 (CWD). 	Project Manager,	Pre-construction, During construction
B16	Temporary bridge construction – Barge for crane in river.	<ul style="list-style-type: none"> ● Ensure the height of the river is sufficient to avoid contact with the stream bed ● Ensure that the barge has a sufficient bund to prevent and spills entering the waterway. ● Timing of work to occur outside of spawning of native fish species. 	Project Manager	Pre-construction, During construction
B17	Temporary bridge construction – Rock platform for crane in the river.	<ul style="list-style-type: none"> ● Fish passage will be maintained throughout the site during the length of the work ● Any snags located within the study area will be relocated to nearby areas of habitat, if necessary. ● DPI Fisheries will be contacted regarding the 	Project Manager	Pre-construction, During construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		re-use of CWD as aquatic habitat.		
B18	Crane pads on the river banks (1 in NSW and 1 in VIC)	DPI Fisheries will be contacted regarding the re-use of CWD as aquatic habitat.	Project Manager, Contractor	Pre-construction, During construction
B19	Extra coffer dams may need to be built in the river for removal of piles, depending on design of temporary bridge	<ul style="list-style-type: none"> Notify DPI Fisheries prior to any work within water land not included in the scope of this Biodiversity Assessment. Any snags located within the study area will be relocated to nearby areas of habitat, if necessary DPI Fisheries will be contacted regarding the re-use of CWD as aquatic habitat. 	Project Manager, Contractor	Pre-construction, During construction
AH1	Unexpected finds	<u>Unexpected finds</u> The Standard Management Procedure - Unexpected Heritage Items must be followed in the event that a known or potential Aboriginal object(s), including skeletal remains, is found during construction. This applies where RMS does not have approval to disturb the object(s) or where a specific safeguard for managing the disturbance (apart from the Procedure) is not in place. Work may only re-commence once the requirements of that Procedure have been satisfied.	Project Manager, Contractor	Pre-construction, During construction
AH2	Accidental discovery of items of Aboriginal cultural significance	<ul style="list-style-type: none"> All contractors and/or employees of contractors who are supervising work during the activity in relation to earthmoving or ground disturbance will attend an on-site cultural heritage induction. The on-site cultural heritage induction must cover: 	Pre-construction, During construction	Pre-construction, During construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		<ul style="list-style-type: none"> a. The specific requirements of this CHMP; b. The contingency plans contained in this CHMP; and c. Cultural awareness training. 		
NAH1	Unexpected finds	<p><u>Unexpected finds</u> Should any heritage items, archaeological remains or potential relics of Non-Aboriginal origin be encountered, then construction work that might affect or damage the material must cease and notification provided to the relevant RMS officer identified in the RMS Standard Management Procedure - Unexpected Archaeological Finds. Work may only recommence once the requirements of that Procedure have been satisfied.</p>	Project Manager, Contractor	Pre-construction, During construction
NAH2	Enhancing public understanding and awareness	<p><u>Heritage interpretation</u> A Non-Aboriginal Heritage Interpretation Strategy will be prepared and implemented to promote community understanding and awareness of the site's heritage values. The Strategy will be prepared in accordance with guidelines published by the Office of Environment and Heritage.</p>	Project Manager	Pre-operation
NAH3	Legislative requirement	<p>Roads and Maritime have obtained a Section 60 Approval for the proposal. All conditions of the approval must be followed as listed below.</p> <p><u>Nominated heritage consultant</u></p> <ul style="list-style-type: none"> • A heritage consultant shall be nominated for the project. Their name is to be submitted to the Heritage Council of NSW and approved prior to the commencement of work • The nominated heritage consultant is to provide advice on the detailed design, 	Project Manager	Pre-construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		<p>undertake on-site heritage inductions and inspect the demolition and removal of material to ensure that no significant fabric or elements are damaged or removed</p> <ul style="list-style-type: none"> • All work shall be carried out by suitably qualified tradespeople with practical experience in conservation and restoration of similar heritage items. The nominated heritage consultant shall be consulted prior to the selection of appropriate tradespeople. <p><u>Site protection and work</u></p> <ul style="list-style-type: none"> • Significant building fabric and elements are to be protected during the works from potential damage. Protection systems must ensure historic fabric is not damaged or removed • The installation of new services shall be carried out in such a manner as to minimise damage to or removal of historic fabric and shall not obscure historic features. <p><u>Archival recording</u></p> <p>A report must be provided to the Heritage Division at the completion of work that includes:</p> <ul style="list-style-type: none"> • An archival photographic recording of the bridge undertaken prior to and during the work, in accordance with the Heritage Council document, Photographic Recording of Heritage Items using Film or Digital Capture • A summary of the work, up to 5 pages, including a description of the work undertaken, the methodology and any other relevant matters. 		

No.	Impact	Environmental safeguards	Responsibility	Timing
NAH4	Changes to the heritage values of the bridge	An archival recording be prepared for Barham-Koondrook Bridge. This should follow the guidelines for Items of State Heritage Significance as outlined in the NSW Heritage Branch publication How to Prepare Archival Records of Heritage Items.	Project Manager	Pre-construction
NAH5	Changes to the heritage values of the bridge	Methodology for painting the lift span will be finalised during detailed design in consultation with the NSW Office of Environment and Heritage - Heritage branch.	Project Manager	Pre-construction
NOISE1	Minimise noise and vibration risks during construction	<p><u>Noise and Vibration Management Plan</u></p> <p>A Noise and Vibration Management Plan will be prepared and implemented as part of the CEMP. The Plan should generally follow the approach in Practice Note VI of the RTA Environmental Noise Management Manual and identify:</p> <ul style="list-style-type: none"> - all potential significant noise and vibration generating activities associated with the activity - measures to be implemented during construction to minimise noise and vibration impacts, such as restrictions on working hours, staging, placement and operation of work compounds, parking and storage areas, temporary noise barriers, haul road maintenance, and controlling the location and use of vibration generating equipment - feasible and reasonable mitigation measures to be implemented, determined in accordance with OEH's Interim Construction Noise Guideline and taking into account the RMS Beyond the Pavement urban design policy, 	NOISE1	Minimise noise and vibration risks during construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		<p>process and principles</p> <ul style="list-style-type: none"> - a monitoring program to assess performance against relevant noise and vibration criteria - arrangements for consultation with affected neighbours 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. 		
NOISE2	Minimise risks to local and sensitive receivers	<p><u>Standard construction hours</u></p> <ul style="list-style-type: none"> • Monday to Friday 7.00 am to 6.00 pm • Saturdays 8.00 am to 1.00 pm • No construction on Sundays or Public Holidays. 	NOISE2	Minimise risks to local and sensitive receivers
NOISE3	Community notification	<p><u>Local community notification - sensitive receivers</u></p> <p>All sensitive receivers (eg. schools, local councils) likely to be affected must be notified at least five days prior to commencement of any works associated with the activity that may have an adverse noise or vibration impact. The notification must include details of: the project; construction period and construction hours; contact information for project management staff; complaint and incident reporting; and how to obtain further information.</p>	NOISE3	Community notification
NOISE4	Working hours	If possible, restrict the hours that noisy activities such as the use of rock breakers, jack hammers and piling rigs will occur, taking into account times identified by the community when they are less sensitive to noise (such as mid-morning or mid-afternoon for work near residences) and	NOISE5	Working hours

No.	Impact	Environmental safeguards	Responsibility	Timing
		whether the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.		
NOISE5	Noise during the removal of the temporary bridge	If the temporary piles are broken by rock hammer, attended noise monitoring should occur with a focus on the 'Recommended Area' identified in Figure 9 of the Noise and Vibration Impact Assessment (Appendix K)	NOISE6	Noise during the removal of the temporary bridge
NOISE6	Noise monitoring	Attended noise monitoring will be undertaken during the pile driving work to confirm the predicted noise levels	NOISE7	Noise monitoring
NOISE7	Staff training	Briefing of the work team in order to create awareness of the locality of sensitive receivers and the importance of minimising noise emissions.	NOISE8	Staff training
NOISE8	Community information	Prior to piling activities commencing, a letterbox drop will be conducted to all occupants of buildings within the 'Recommended Area' highlighted in Figure 8 of the Noise and Vibration Impact Assessment (Appendix K) to inform them of the proposed works ahead of time. This letter will outline the proposed timing and duration of work as well as provide the community with a contact number or liaison officer available to adequately respond to all project related enquiries	NOISE9	Community information
NOISE9	Vibration impacts	<ul style="list-style-type: none"> All construction works should be carried out Monday to Friday, 7:00 am to 6:00 pm, where possible When working close to sensitive receivers, use lower vibration generating items of plant and equipment where possible eg smaller 	NOISE10	Vibration impacts

No.	Impact	Environmental safeguards	Responsibility	Timing
		vibratory rollers and hydraulic hammers <ul style="list-style-type: none"> • Minimise consecutive vibration intensive works in the same locality (if applicable) 		
UD1	Pre-construction / detailed design	<p><u>Urban Design and Landscape Plan</u></p> <p>An Urban Design and Landscape Plan will be prepared in consultation with Gannawarra Shire Council to support the final detailed project design and implemented as part of the CEMP.</p> <p>The Plan will present an integrated urban design for the project, providing practical detail on the application of design principles and objectives identified in the environmental assessment. The Plan will include design treatments for:</p> <ul style="list-style-type: none"> - Location and identification of existing vegetation and proposed landscaped areas, including species to be used (cross-referencing any relevant specified biodiversity safeguards) - Built elements including retaining walls, bridges and noise walls - Pedestrian and cyclist elements including footpath location, paving types and pedestrian crossings - Fixtures such as seating, lighting, fencing and signs - Details of the staging of landscape works taking account of related environmental controls such as erosion and sedimentation controls and drainage - - Procedures for monitoring and maintaining 	Project Manager	Post construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		landscaped or rehabilitated areas.		
UD2	Minimise visual and landscape impacts during construction	<u>Work sites</u> Project work sites, including construction areas and supporting facilities (such as storage compounds and offices) will be managed to minimise visual impacts, including appropriate storage of equipment, parking, stockpile screening and arrangements for the storage and removal of rubbish and waste materials.	Project Manager, Contractor	During construction
UD3	Visual amenity	Mature trees will be used for revegetation as much as possible and practical.	Project Manager	Post Construction
AIR1	Community notification	<u>Local community notification - sensitive receivers</u> All sensitive receivers (eg. schools, local councils) likely to be affected must be notified at least five days prior to commencement of any works associated with the activity that may have an adverse impact on local air quality. The notification must include details of: the project; construction period and construction hours; any recommended measures that can be implemented (eg. window closure, staying indoors, etc), contact information for project management staff; complaint and incident reporting; and how to obtain further information.	Project Manager	Pre-construction, During Construction
AIR2	Protect local air quality and avoid inadvertent impacts	<u>Protecting air quality</u> Dust suppression measures will be implemented to protect local air quality.	Project Manager, Contractor	During Construction
AIR3	General air quality impact	Construction activities are to be managed to minimise dust and fuel emissions.	Project Manager, Contractor	During Construction
AIR4	Dust	Stockpiles or areas that may generate dust are to be managed to suppress dust emissions in accordance with the Stockpile Site Management Guideline (Roads and Maritime, 2015).	Project Manager, Contractor	During Construction

No.	Impact	Environmental safeguards	Responsibility	Timing
WASTE1	Avoid, minimise and sustainably manage waste	<p><u>Waste Management Plan</u></p> <p>A Waste Management Plan will be prepared and implemented as part of the CEMP. It will provide specific guidance on measures and controls to be implemented to support minimising the amount of waste produced and appropriately handle and dispose of unavoidable waste. It will also address the importation of waste to the site for use in undertaking the project.</p> <p>The Plan will give effect to any management measures contained in any waste assessment undertaken for the project and include, but not necessarily be limited to:</p> <ul style="list-style-type: none"> - Measures to avoid and minimise waste associated with the project - Classification of wastes generated by the project and management options (re-use, recycle, stockpile, disposal) - Classification of wastes received from off-site for use in the project and management options - Identifying any statutory approvals required for managing both on and off-site waste, or application of any relevant resource recovery exemptions - Procedures for storage, transport and disposal - Monitoring, record keeping and reporting, including any documentation management obligations arising from resource recovery exemptions. 	Project Manager	Pre-construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		The Plan will be prepared taking into account the RMS Environmental Procedure - Management of Wastes on Roads and Maritime Services Land and relevant RMS Waste Fact Sheets.		
WASTE2	Pre-construction / detailed design	<p><u>Pre-construction assessment</u></p> <p>Prior to land being used for ancillary construction purposes (compounds, storage, parking, etc) a pre-construction land assessment must be undertaken to identify the presence of any pre-existing wastes.</p> <p>The assessment is to be prepared in accordance with the RMS Environmental Procedure - Management of Wastes on Roads and Maritime Services Land. Where the land is privately owned, a copy of the assessment will be provided to the landowner.</p>	Project Manager	Pre-construction
WASTE3	Avoid, minimise and sustainably manage waste	<p><u>Sampling of waste materials - to be exported off-site</u></p> <p>Waste materials (such as soils and aggregates) obtained from the project and to be exported to a non-road construction site or project must be sampled and managed in accordance with relevant Roads and Maritime Waste Fact Sheets.</p>	Project Manager	Pre-construction, During construction
WASTE4	Avoid, minimise and sustainably manage waste	<p><u>Vegetated waste</u></p> <p>Any trees to be removed shall be reused as millable timber wherever practicable. Other vegetated material from native species shall be mulched and re-use on-site for landscaping or rehabilitation purposes if consistent with the approved Flora and Fauna Plan for the project. Weed species, or vegetation not considered appropriate for re-use on-site, will be removed</p>	Project Manager, Contractor	Pre-construction, During construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		and disposed of to an appropriately licenced facility.		
WASTE5	Compliance monitoring of waste management	<p><u>Monitor implementation of safeguards - construction phase</u></p> <p>Consistent with any specific requirements of the approved Waste Management Plan a monitoring plan will be implemented during construction for {insert time-frame} to assess effective implementation of waste safeguards, identify any unexpected or inadvertent impacts, and identify recommended revisions or improvements.</p>	Project Manager	Pre-construction, During construction
WASTE6	Compliance monitoring of waste management	<p><u>Adaptive management - during construction</u></p> <p>After considering the outcomes and recommendations arising from the monitoring program, and any other relevant information that becomes available during construction, appropriate measures will be implemented to address identified deficiencies or undertake actions needed to address waste related impacts. If necessary, the Waste Management Plan will be reviewed and updated to include any additional measures.</p>	Project Manager	Pre-construction, During construction
WASTE7	Final condition of ancillary sites	<p><u>Post-construction assessment</u></p> <p>A post-construction land assessment must be undertaken of land that was used for ancillary construction purposes (compounds, storage, parking, etc) to determine the suitability for hand-back to the landowner.</p> <p>The assessment is to be prepared in accordance with the RMS Environmental Procedure - Management of Wastes on Roads and Maritime</p>	Project Manager	Post construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		Services Land. Where the land is privately owned, a copy of the assessment will be provided to the landowner.		
SE1	Pre-construction / detailed design	<p><u>Communication Plan</u> A Communication Plan (CP) will be prepared and implemented as part of the CEMP to ensure provision of timely and accurate information to the community during construction. The CP will include (as a minimum):</p> <ul style="list-style-type: none"> - Mechanisms to provide details and timing of proposed activities to affected residents, including changed traffic and access conditions - Contact name and number for complaints. <p>The CP will be prepared in accordance with the Roads and Maritime Services Stakeholder Engagement Toolkit.</p>	Project Manager	Pre-construction
SE2	Construction	<p><u>Emergency access</u> Access for emergency vehicles will be maintained at all times during construction. Any site-specific requirements will be determined in consultation with the relevant emergency services agency.</p>	Project Manager, Contractor	During construction
SE3	Impacts to residents	<p><u>Local community notification</u> Stakeholder engagement will be undertaken with potentially affected residences prior to the commencement of and during works in accordance with the Roads and Maritime Services Stakeholder Engagement Toolkit. Communication activities may include door knocks, newsletters or letter box drops providing information on the proposed works, working</p>	Project Manager	Pre-construction, During construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		hours and a contact name and number for more information or to register complaints.		
SE4	Property impacts	<u>Consultation - property owners</u> Consultation will be undertaken with all affected property owners during detailed design and construction to develop and implement measures to mitigate impacts on land use viability, infrastructure and severance.	Project Manager	Pre-construction, During construction
SE5	Impacts on viability of businesses	<u>Consultation - businesses</u> Consultation will occur with Koondrook and Barham businesses to identify appropriate management strategies to avoid or minimise impacts on access and operations. This will include consideration of measures such as additional signage and alternative access arrangements	Project Manager	Pre-construction, During construction
SE6	Impacts to community	<u>Complaints</u> A complaints handling procedure and register will be included in the CEMP.	Project Manager	Pre-construction, During construction
SE7	Impacts to residents and general community	<u>Community information</u> Road users and local communities will be provided with timely, accurate, relevant and accessible information about changed traffic arrangements and delays owing to construction activities.	Project Manager	Pre-construction, During construction
CC1	Climate change	The construction contractor will consider: <ul style="list-style-type: none"> • The life cycle environmental impact of materials and plant used in the construction process (this will be considered during procurement) • Establishing operating procedures for site vehicles to increase the efficiency of vehicle fuel use 	Project Manager	Pre-construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		<ul style="list-style-type: none"> • Reducing vegetation clearing as much as feasible, and re-establishing vegetation in suitable areas when construction is completed • Reducing site wastage by re-using and recycling waste materials as a preference before disposing to landfill. 		

3.3 Licensing and approvals

The approvals listed in Table 3.2 would be needed for the proposal.

Table 3.2: Summary of licensing and approval required

Requirement	Timing
A planning permit from Gannawarra Shire Council would be required to remove vegetation and to carry out work in land subject to inundation on the Victorian side of the river	Pre-construction
Approval to carry out work in the road reserve in Victoria would be required from VicRoads.	Pre-construction

The following approvals may be needed to carry out the work:

- If the list span is to be blasted and repainted off-site, application to the Office of Environment and Heritage to amend the existing Section 60 approval conditions would be needed
- Should water need to be extracted from the Murray River, a Water Works Approval would be required from the NSW Office of Water
- If the work would inhibit, block or obstruct the passage of fish, a permit under Part 7 of *Fisheries Management Act 1994* is required.

4 References

Roads and Maritime Services 2012 *Timber Truss Bridge Conservation Strategy: Submissions Report and Revised Conservation Strategy*.



rms.nsw.gov.au



barhambidge@rms.nsw.gov.au



Customer feedback
Roads and Maritime
PO Box 484,
Wagga Wagga NSW 2650