Department of Climate Change, Energy, the Environment and Water

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Millewa Forest Supply Project

Addendum Review of Environmental Factors

July 2024

Acknowledgement of Country

The NSW Department of Climate Change, Energy, the Environment and Water acknowledges that it stands on Aboriginal land. We acknowledge the Traditional Custodians of the land and we show our respect for Elders past, present and emerging through thoughtful and collaborative approaches to our work, seeking to demonstrate our ongoing commitment to providing places in which Aboriginal people are included socially, culturally and economically.

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Millewa Forest Supply Project – Addendum REF

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More information

Prepared by 3Rivers on behalf of the NSW Department of Climate Change, Energy, the Environment, and Water

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Document status – Millewa Forest Supply Project Addendum Review of Environmental Factors

Revision	Date	Prepared by	Reviewed by
1	02/07/2024	T. Sinclair, E. Cocks	M. Luger

This addendum review of environmental factors has been prepared based on a template developed by the New South Wales Department of Climate Change, Energy, the Environment and Water and the National Parks and Wildlife Service specifically for use in assessing the potential environmental impacts of works proposed as part of the Murray and Murrumbidgee Valley National Parks Sustainable Diversion Limit Adjustment Supply Measure Project. It combines key elements of the review of environmental factors templates of each respective organisation.

Declaration

This addendum Review of Environmental Factors (REF) has been prepared by 3Rivers, a joint venture between Jacobs Group (Australia) and GHD on behalf of NSW DCCEEW. The addendum REF has been prepared to assess the environmental impacts to satisfy the requirements of Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and considers the factors listed in clause 171 of the Environmental Planning & Assessment Regulation 2021 (EP&A Regulation).

The addendum REF provides a true and fair assessment of the revised proposal sought for the Millewa Forest Supply Project and its likely effects on the environment. It examines and takes into account to the fullest extent possible all matters affecting or likely to affect the environment as a result of the revised proposal.

Based on the information provided in the addendum REF, it is concluded that:

1. the revised proposal is not likely to have a significant impact on the environment, and further Environmental Impact Assessment is not required.
2. the revised proposal will not be carried out in a declared area of outstanding biodiversity value and is not likely to significantly affect threatened species, populations or ecological communities, or their habitats or impact biodiversity values. A Species Impact Statement (SIS) is not required.
3. the revised proposal is not likely to significantly affect any Matters of National Environmental Significance, nor is the activity being carried out on or is it likely to impact Commonwealth land.

Based on the information presented in this addendum REF, it is concluded that by adopting the Safeguards identified in this assessment, it is unlikely that the revised proposal would have significant adverse environmental impacts. Subject to the adoption of the measures to avoid, minimise or manage environmental impacts listed in this addendum REF, the revised proposal is recommended for approval.

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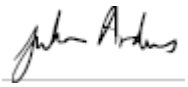
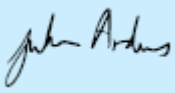
Signature	
Date	07/2024

Certification

I, Julian Ardas, certify that I have reviewed this addendum REF as a representative of the NSW Department of Climate Change, Energy, the Environment and Water and agree that, to the best of my knowledge, it accords with the EP&A Act, the EP&A Regulation and the Guidelines for Division 5.1 assessments (Department of Planning and Environment, 2022) made under clause 170 of the EP&A Regulation.

Signature:



Date:

National Parks and Wildlife Service

I, Tim O'Kelly, certify that I have reviewed this addendum REF as a representative of the National Parks and Wildlife Service, and agree that, to the best of my knowledge, it accords with the EP&A Act, the EP&A Regulation and the Guidelines for Division 5.1 assessments (Department of Planning and Environment, 2022) made under clause 170 of the EP&A Regulation.

Signature:

Endorsed via email

Date: 09/07/2024

Executive Summary

The NSW Department of Climate Change, Energy, the Environment and Water (NSW DCCEEW) proposes to carry out works at four existing environmental regulators and one existing culvert within Millewa Forest in south-western NSW. It seeks to replace the Pinchgut and Nestrons, Moira and Little Edward River offtake regulators, and remove Pigsty culvert (the 'proposed activity'). These works were assessed in the Millewa Forest Supply Project – Review of Environmental Factors (3Rivers 2023) and determined by NSW DCCEEW in April 2024.

The purpose of the proposed activity is to modernise existing ageing infrastructure by providing infrastructure that is safer and more efficient to operate. The fishways installed at the replacement and refurbished environmental regulators would also provide opportunities for the site environmental water managers to improve fish movement past these structures.

This Addendum Review of Environmental Factors proposes changes to the approved regulator refurbishment and replacement works at Pinchgut and Nestrons, Moira and Little Edward River offtake. The revised proposal seeks to extend the footprint and associated temporary works and laydown area around the regulators. It also provides updates to the proposed design of the regulators and fishways to improve fish passage and flow control.

These changes support the objectives of the proposed activity, namely to support smarter use of environmental water by modernising the existing ageing structures and constructing replacement regulators that are safer and more efficient to operate.

Key details of the revised proposal are provided in Table E- 1. A comprehensive description of the revised proposal is provided in Chapter 2.

Table E- 1 Key details of the revised proposal

Description of revised proposal	The revised proposal would extend the existing REF approved construction footprints, in particular the areas proposed for temporary works and laydown. This extension would enable safe access for construction vehicles and provide adequate space for general construction activities. The revised proposal also includes updates to the proposed design of the regulators and fishways to improve fish passage and flow control.
Name of NPWS park or reserve	Murray Valley National Park and Murray Valley Regional Park.

Location of activity **(e.g., precinct name or nearby street)**	The revised proposal would extend the existing REF approved construction footprints, which are located in: • Murray Valley Regional Park (Pinchgut regulator, Nestrons regulator and Little Edward River offtake regulator) • Murray Valley National Park (Moira regulator).
Street address (if available)	Not applicable.
Current and proposed management and ownership authority	Pinchgut, Nestrons and Moira regulators and Little Edward River offtake regulator are jointly owned by WaterNSW and the Murray-Darling Basin Authority. These regulators are operated by the joint operations working group comprising the Murray-Darling Basin Authority, NSW National Parks and Wildlife Services (NPWS) and WaterNSW. This operating arrangement would continue after the proposed works. The existing asset owners will remain in ownership of the assets, pre, during and post construction activities. The NSW DCCEEW is delegated under separate instruments to be the constructing authority for the performance of the construction works. At completion of the construction and commissioning phases, a formal handover transaction will occur with all assets.
Estimated commencement date	The proposed activity, including the revised proposal, would commence within two years of receipt of all approvals. Construction works are expected to start in the summer of 2024-2025 (i.e., December 2024 to February 2025).
Estimated completion date	The construction phase of the proposed activity, including the revised proposal, is expected to conclude in the summer of 2025-2026 (i.e., December 2025 to February 2026).

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1 Introduction

1.1 Project overview

1.1.1 The approved project

The NSW Department of Climate Change, Energy, the Environment and Water (NSW DCCEEW) proposes to carry out a package of five works along waterways within Millewa Forest at the existing:

- Pinchgut regulator
- Nestrons regulator
- Moira regulator
- Little Edward River offtake regulator
- Pigsty culvert.

The proposed activity is to be delivered as part of the broader Millewa Forest Supply Project, a collection of proposed water-savings projects being delivered under the Sustainable Diversion Limit Adjustment Mechanism (SDLAM) Program. The SDLAM Program is delivered through the *Murray-Darling Basin Plan 2012* and aims to achieve similar or improved environmental outcomes for rivers, wetlands and wildlife by improving the supply, efficiency and delivery of water across the river system.

The flow regime through Millewa Forest has been heavily modified by the installation of an extensive network of waterway infrastructure including banks and regulators constructed from the 1930-1990s, largely designed to optimise floodplain forestry. This infrastructure, including the revised proposal, is outdated and in poor condition. As a result, it fails to meet contemporary safety standards and limits fish movement and restricts the delivery of environmental flows into the forest.

The Millewa Forest Supply Project – Review of Environmental Factors (3Rivers 2023) (referred to as the existing REF) assessed the potential environmental impacts of the proposed activity and was approved by NSW DCCEEW as the determining authority in April 2024.

1.1.2 The revised proposal

NSW DCCEEW now proposes to modify the approved activity to extend the work area beyond the area assessed and approved for construction in the existing REF (the revised proposal). The revised proposal is required as following approval of the existing REF, refinements to the proposed

construction methodology have identified the need for additional ground disturbance and temporary works areas, to that described in the previously approved Millewa Forest Supply Project REF. See Section 1.1.1 of the existing REF for a detailed overview of the revised proposal. The revised proposal also includes a replacement, rather than refurbishment, of the Moira regulator, and minor design changes to the fishway, box culvert and regulator arrangements of the Pinchgut, Nestrons and Little Edward River offtake regulators.

1.1.3 Land tenure and project location

As detailed in Section 3.1 of the existing REF, the revised proposal comprises works at five sites in Murray Valley National Park. An overview of the location of the works in relation to the key waterways in Millewa Forest is shown in Figure 1-1.

Pinchgut, Nestrons and Moira regulators and Little Edward River offtake regulators are jointly owned by WaterNSW and the Murray-Darling Basin Authority. These assets were vested to WaterNSW in accordance with *State Water Corporation Act 2004* (Transfer Order No. 1) dated March 2007. Decisions on the operation of Pinchgut, Nestrons and Moira regulators and Little Edward River offtake regulator are made by a joint operations working group comprising the Murray-Darling Basin Authority, NPWS and WaterNSW. Section 2.3 of the existing REF provides an overview of this arrangement and the overall operating regime for the regulators.

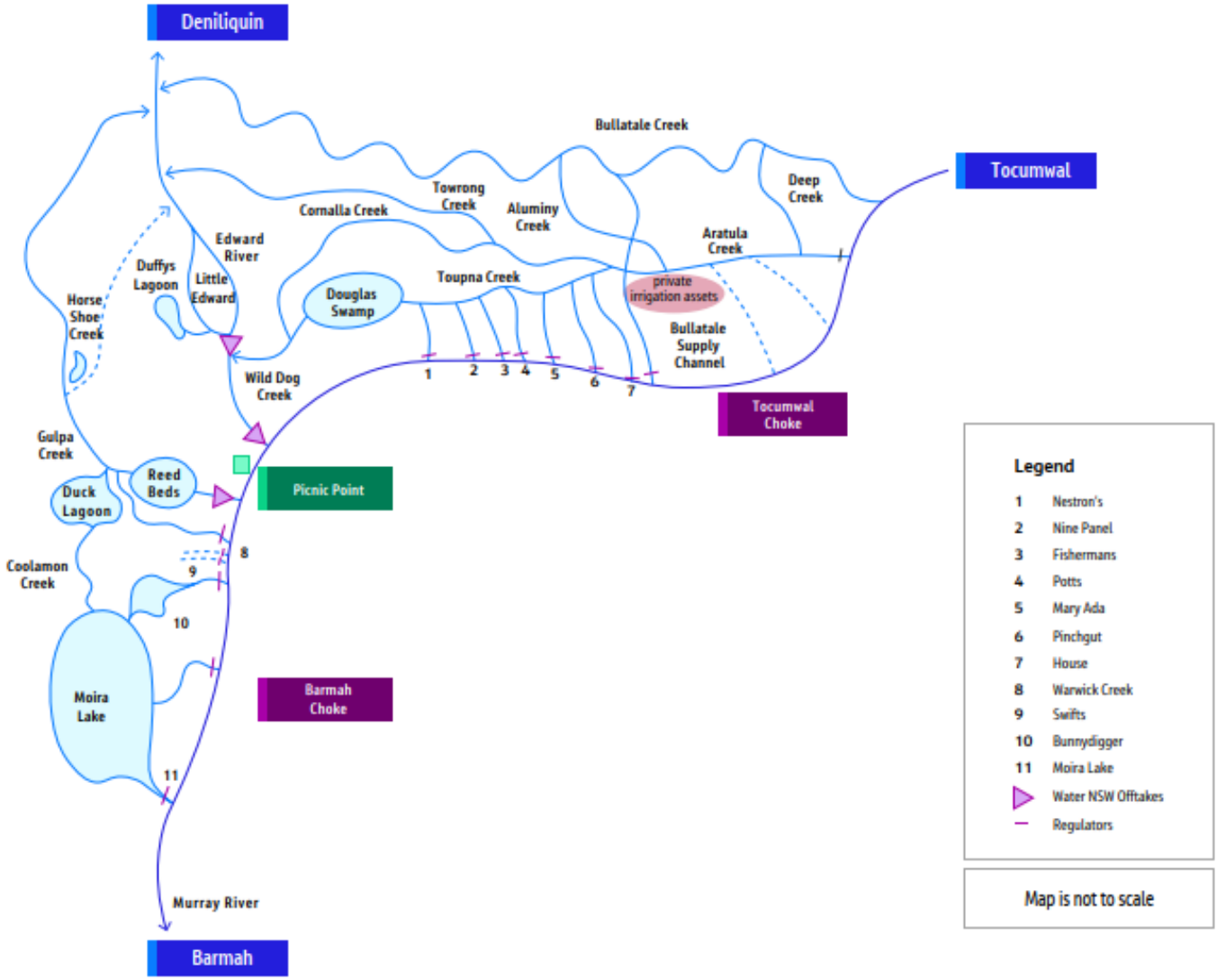

Figure 1-1 Key waterways and regulating structures in Millewa Forest

1.1.4 Background information

The existing REF (3Rivers, 2023) was prepared by 3Rivers (a joint venture between Jacobs Group (Australia) and GHD) on behalf NSW DCCEEW and determined in April 2024. The existing REF is provided in Appendix B Millewa Forest Supply Project Existing REF and associated approval documents). Following determination of the existing REF, it was identified that the construction footprint approved in the existing REF was not sufficient to allow construction of the project to be carried out at all sites except the Pigsty culvert. Additional assessment and environmental approvals are therefore required to extend the proposed work area before construction can commence. Due to this refinement of the proposed construction footprint, addendum biodiversity and Aboriginal cultural heritage assessments have been undertaken which consider the extended proposed work area, and its impact to vegetation clearance and Aboriginal cultural heritage.

The progression of the regulator designs has also been addressed in this Addendum. The existing REF provides the following description of the approved works:

- Demolishing and removing the existing **Pinchgut regulator** and replacing it with a new triple bay box culvert regulator immediately downstream of the existing structure. The replacement regulator would include a fishway
- Demolishing and removing the existing **Nestrons regulator** and replacing it with a new trafficable triple bay box culvert regulator. The replacement regulator would be built at the site of an existing timber log bridge that carries Millewa River Road over Nestrons Creek, about 20 metres downstream of the existing regulator. The existing timber log bridge would be removed and traffic on Millewa River Road would instead drive over the replacement regulator to cross Nestrons Creek. The replacement regulator would include a fishway
- Refurbishing the existing **Moira regulator** to address the poor condition of the existing drop boards and make the structure safer and more efficient to operate. A fishway would be constructed on the western abutment of the refurbished regulator
- Refurbishing the existing **Little Edward River offtake regulator** including constructing a fishway on the left (western) abutment of the structure
- Removal of **Pigsty culvert** and block bank to leave an open channel.

The revised proposal would result in minor amendments to the above description of the approved works as described in Section 1.1.2. The table also shows the additional construction footprint required at each site to allow for safer and easier construction. No changes to the approved works or construction footprint are required for the Pigsty culvert.

Table 1-1 Summary of changes proposed as part of this Addendum REF

Site	Proposed increase in construction footprint	Proposed design changes to the regulators
Pinchgut regulator	0.4 hectares (total area of 0.6 hectares)	• Increase culvert height and width • Use combination gates only • Amend fishway exit to a 90-degree angle
Nestrons regulator	0.8 hectares (total area of 0.9 hectares)	• Increase culvert width • Use combination gates only • Amend fishway exit to a 90-degree angle
Moira regulator	0.5 hectares (total area of 1.0 hectare)	• Remove the existing regulator • Construct a trafficable regulator (6-cell box culvert structure) • Lower the invert level by 100mm
Little Edward River offtake regulator	0.6 hectares (total area of 0.7 hectares)	• Replace existing sheet piling • Install cast in-situ concrete fishway

Approval of the works described in the existing REF was subject to a number of associated conditions and approvals placed on the project across various documents. The revised proposal should be considered in reference to the following associated approval documents, provided in Appendix B Millewa Forest Supply Project Existing REF and associated approval documents:

- Review of Environmental Factors Determination Report – Millewa Forest Supply Project
- NPWS Conditions of Determination – Millewa Forest Supply Project
- NSW DCCEEW Conditions of Determination – Millewa Forest Supply Project
- Notification to Department of Primary Industries Fisheries (DPI (Fisheries)) for dredging/reclamation work (pursuant to section 199 of the *Fisheries Management Act 1994* (FM Act))
- DPI (Fisheries) conditions placed on the existing REF under section 199 of the FM Act.

Safeguards associated with the revised proposal as well as a consolidated set of safeguards from the existing REF are provided in Section 7.3.

1.2 Purpose of this document

The purpose of this Addendum REF is to describe the revised proposal, document the likely impacts of the revised proposal on the environment, and detail any additional safeguards to mitigate impacts associated with the revised proposal that cannot be avoided. This Addendum REF is the key document which NSW DCCEEW would use to discharge its duty under section 5.5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), including taking into account those factors listed under clause 171 of the *Environmental Planning and Assessment Regulation 2021* (EP&A Regulation) (refer to Appendix A).

The findings of this Addendum REF would be considered when assessing:

- Whether the revised proposal is likely to have a significant impact on the environment and therefore the requirement for an environmental impact statement to be prepared and approval sought from the Minister for Planning 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 *Fisheries Management Act 1994* (FM Act) (referred to in section 1.7 of the EP&A Act) and therefore the requirement for a species impact statement or a biodiversity development assessment report.
- The permissibility of the works under the *National Parks and Wildlife 1974 Act* (NPW Act) and the authorisation that would be issued under the NPW Act to construct and operate the new infrastructure.
- The potential for the revised proposal to significantly impact on matters of national environmental significance or Commonwealth land and the requirement to make a referral to the Australian Government Department of Climate Change, Energy, the Environment and Water (DCCEEW) for a decision by the Commonwealth Minister for the Environment and Water on whether assessment and approval is required under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

In the event of any discrepancy between Appendices C to D and this REF, this Addendum REF takes precedence.

2 Project need and justification

2.1 Revised proposal objectives

Section 2.1 of the existing REF identifies the objectives of the project. The existing REF notes that the objective of the Proposal is to enable smarter use of available environmental water and improve associated environmental outcomes through modernising ageing infrastructure.

The existing REF notes that the overall aim of the Proposal is to:

- "*Replace aging environmental regulators with simple structures that comply with contemporary safety standards and have low operational and maintenance costs*
- *Provide fish passage past the replacement and refurbished environmental regulators*
- *Provide for increased flow capacity at the replacement Pinchgut and Nestrons regulators to improve these regulators' potential to provide environmental flows into Millewa Forest*."

The revised proposal is required to extend the approved construction footprint required for the current design of the project to be constructed.

The revised proposal also includes minor design changes which have occurred during the detailed design process to maximise the operational functionality of the proposed regulator. These changes would provide improved fish passage and greater flexibility to site environmental water managers.

The revised proposal is therefore required to achieve the objectives of the project (as described in Section 2.1 of the existing REF) and the broader objectives of the Millewa Forest Supply Project as part of the SDLAM program, as described in Section 1.1.

2.2 Existing infrastructure

Existing infrastructure relevant to the revised proposal is described in Section 2.2 of the existing REF and summarised in Table 2-1 over page. The description of existing infrastructure provided in the existing REF accurately summarises the current conditions.

Table 2-1 Overview of existing infrastructure

Site	Existing Infrastructure	Site photos
Pinchgut regulator	A simple sheet pile structure with raised concrete sills that is at risk of failing due to: • Leaking timber undershot gates • Worn out sheet piles • Concrete cap that does not entirely prevent exposure of sheet piles at the water line The walkway dimensions, walkway approach and rack and pinion do not comply with relevant standards.	 Existing Pinchgut regulator passing flows
Nestrons regulator	A simple sheet pile structure with raised concrete sills that is at risk of failing due to: • Leaking timber undershot gates • Worn out sheet piles • Concrete cap that does not entirely prevent exposure of sheet piles at the water line The walkway dimensions, walkway approach and rack and pinion do not comply with relevant standards.	 Existing Nestrons regulator, downstream
Moira regulator	A cantilever sheet pile wall with drop board regulation. The sheet pile above the bed level exposed to aerated conditions has lost up to 40 percent of its section to corrosion. The steel drop board guides are at risk of failure as they have been completely corroded.	 Existing Moira regulator – upstream

Site	Existing Infrastructure	Site photos
Little Edward River offtake regulator	A sheet pile weir structure fitted with four split leaf gates. The Little Edward River offtake regulator is an obstruction to fish passage except when it is fully opened.	 Existing Little Edward River offtake regulator – upstream

2.3 Options and alternatives considered

The following options were considered for the revised proposal:

Option 1 – The 'do nothing' option. This option would involve carrying out the Project as described in the existing REF. No additional vegetation clearance would be permitted, and the project designs would need to be amended to be consistent with those described in the existing REF and associated approval documents.

Option 2 – The revised proposal. This option would involve extending the footprints approved for construction of the Project beyond the limits identified in the existing REF. This option would involve additional vegetation clearance and ground disturbance to that assessed and approved in the existing REF. This option would also involve some design changes to the regulators including improvements to the fishway and regulator gates to allow for enhanced fish passage and control of flows through the regulators. The changes would also improve the durability and operational functionality of the proposed regulators.

2.4 Preferred option

Option 1 would have unacceptable construction and safety risks, and sub-optimum design and operational outcomes. NSW DCCEEW consider this option unfeasible.

Option 2, carrying out the revised proposal, is the preferred option. The revised proposal would extend the approved construction footprints and improve the operational functionality of the

proposed regulators, allowing the proposed works to be carried out in accordance with the latest designs and enabling the Project objectives to be met. It should also be noted that during development of the detailed design, Aboriginal heritage and ecological constraints have been considered and avoided where practicable to minimise impacts.

3 Revised proposal

3.1 Revised proposal works

NSW DCCEEW proposes to modify the approved project to extend the approved construction footprint and amend the design of the proposed works.

The revised proposal would:

- Extend the construction footprint, in particular the temporary work area approved in the existing REF, to allow for safe and efficient construction of the proposed regulators. The expanded footprint would provide additional area for construction vehicles turning, access along the upstream banks to construct the temporary cofferdam, placement of temporary site office facilities and a buffer for general construction activities.
- Amend the regulator designs proposed in the existing REF to reflect the progression of the concept design. The concept designs that formed the basis of the approved project have been progressed and revised in response to feedback from stakeholders, including WaterNSW, NPWS, Murray Darling Basin Authority (MDBA) and DPI Fisheries. A key change from the existing REF is the decision to replace rather than refurbish the existing Moira regulator and amend the gate/ fishway arrangements to enhance fish passage.

The revised proposals for each site are summarised in Table 3-1 below. There are no changes proposed for Pigsty culvert.

Table 3-1 Summary of changes proposed as part of this Addendum REF

Site	Proposed construction footprint	Proposed design changes to the regulators
Pinchgut regulator	Increased 28 metres by 35 metres (to 83 metres by 70 metres). Area increased 0.4 hectares from 0.2 hectares (total of 0.6 hectares).	• Increase culvert height and width • Use combination gates only • Amend fishway exit to a 90-degree angle

Site	Proposed construction footprint	Proposed design changes to the regulators
Nestrons regulator	Increased 55 metres by 59 metres (to 95 metres by 83 metres). Area increased 0.8 hectares from 0.1 hectares (total of 0.9 hectares).	• Increase culvert width • Use combination gates only • Amend fishway exit to a 90-degree angle
Moira regulator	Increased 33 metres by 30 metres (to 130 metres by 80 metres). Area increased 0.5 hectares from 0.5 hectares (total of 1.0 hectare).	• Remove the existing regulator • Construct a trafficable regulator (6-cell box culvert structure) • Lower the invert level by 100mm
Little Edward River offtake regulator	Increased 53 metres by 42 metres (to 90 metres by 72 metres). Area increased 0.6 hectares from 0.1 hectares (total of 0.7 hectares).	• Replace existing sheet piling • Install cast in-situ concrete fishway

3.1.1 Addendum construction footprint

The revised proposal would expand the construction footprint at each site to provide adequate safe for construction vehicle movements and general construction activities with an associated increase in vegetation clearance and ground disturbance. The revised proposal would expand the construction footprint as follows:

- Pinchgut – 83 metres by 70 metres (from about 55 metres by 35 metres), with a total area of approximately 0.6 hectares (from a total area of about 0.2 hectares).
- Nestrons – 95 metres by 83 metres (from about 40 metres by 24 metres), with a total area of approximately 0.9 hectares (from a total area of about 0.1 hectares).
- Moira – 130 metres by 80 metres (from about 97 metres by 50 metres), with a total area of approximately 1 hectare (from a total area of about 0.5 hectares).
- Little Edwards – 90 metres by 72 metres (from about 37 metres by 30 metres), with a total area of approximately 0.7 hectares (from a total area of about 0.1 hectares).

The key activities relevant to the revised proposal are:

- Additional vegetation clearing and trimming within the addendum construction footprint to provide plant and vehicle access and create space for truck turning, loading and unloading of vehicles, storage of plant and equipment, stockpiling of materials and site office facilities
- If required, additional minor earthworks to enable vehicles and plant to safely operate within the construction footprint.

An overview of the addendum construction footprint at each site is provided in Figure 3-1, Figure 3-2, Figure 3-3 and Figure 3-4.

Please note that the lot boundaries on these figures are not accurate and that no works are being proposed within the Murray Darling River.

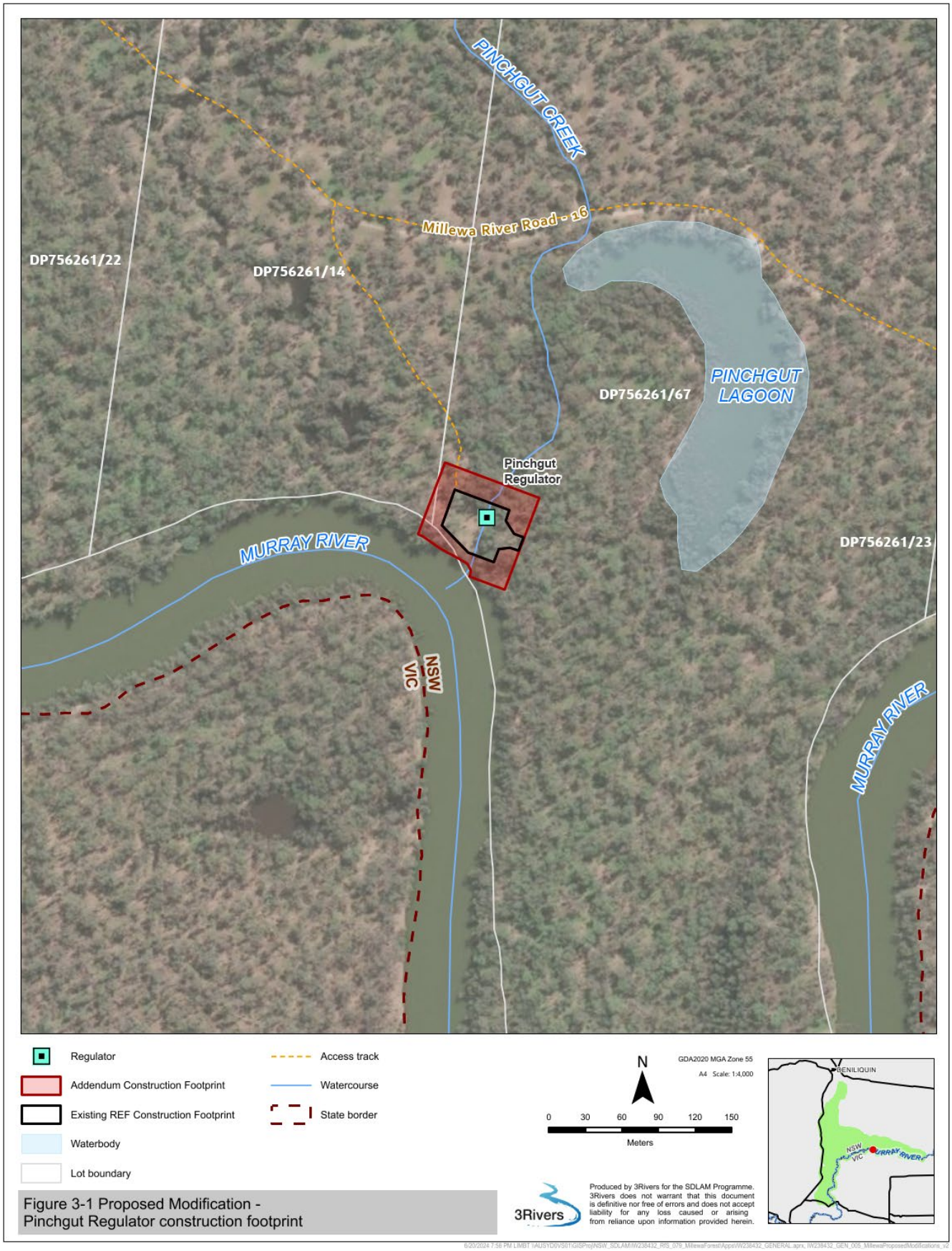

Figure 3-1 Revised Pinchgut regulator construction footprint

Figure 3-2 Proposed Modification - Nestrons Regulator construction footprint

Figure 3-2 Revised Nestrons regulator construction footprint

Figure 3-3 Revised Moira regulator construction footprint

Figure 3-4 Revised Little Edward River offtake regulator construction footprint

3.1.2 Detailed design development

Following the preparation of the existing REF, minor changes to the proposed design of the Pinchgut, Nestrons and Little Edward River offtake regulators have occurred as the detailed design was progressed. The design intent for Moira regulator has changed from a refurbishment design to a replacement design. The proposed changes to the regulators support the objectives and requirements described in the existing REF at Section 2.1. The proposed designs generate minimal additional environmental impacts and provide minor improvements in the operational functionality of the structures.

3.1.2.1 Pinchgut regulator and Nestrons regulator

Similar design changes have been made to both the Pinchgut and Nestrons regulators, except for changes to the height of the Pinchgut regulator. The invert level of both regulators has been maintained (95.40 m AHD for Nestrons and 97.50 m AHD for Pinchgut).

The design changes proposed to both regulators as part of this Addendum REF are:

- Box culvert width increased from 7.2 m to 8.4 m: The increased width will allow for more natural light between the fishway slot and the culvert roof slab. This has the additional safety benefit of moving operators outside of the vehicular travel way.
- Use of three combination gates compared to a single combination gate and two penstock gates: Combination gates allow for increased operational flexibility to control flows and improved fish passage through the regulator gates. This change also allows for safer operation.
- Fishway amended to exit at 90 degrees to the creek flow: After further consultation with DPI Fisheries, the fishway upstream exit was amended to exit at 90 degrees to the creek flow to avoid debris build up. In the concept design the fishway exited to the creek and pointed directly upstream.

The height of the Pinchgut regulator culverts would increase from 1.8 m to 2.4 m to raise the roadway level closer to the existing track elevation and reduce the frequency of water overtopping the roadway.

The addition of a third slot to the Nestrons regulator fishway would provide sufficient water depth and lower flow velocity so fish can move safely between the slots under a greater range of flow conditions. In particular, the third slot will improve fish passage for small-bodied fish, who use burst speed to travel through each slot and require increased water depth and lower flow velocities in the pool to rest between slots.

A section view of the Pinchgut regulator design is provided in Figure 3-5. A section view of the Nestrons regulator design is provided in Figure 3-6.

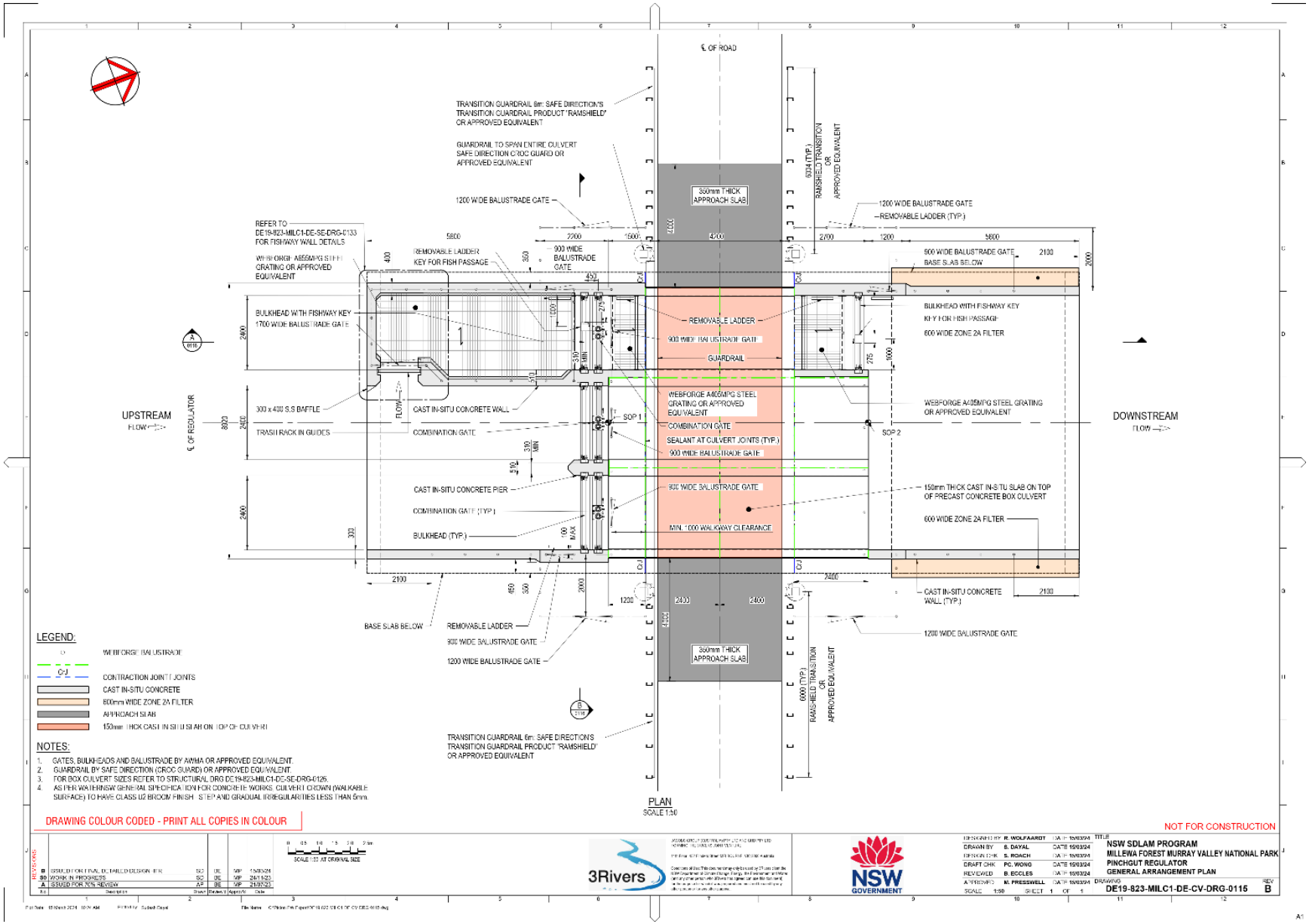

Figure 3-5 Section view of proposed Pinchgut regulator

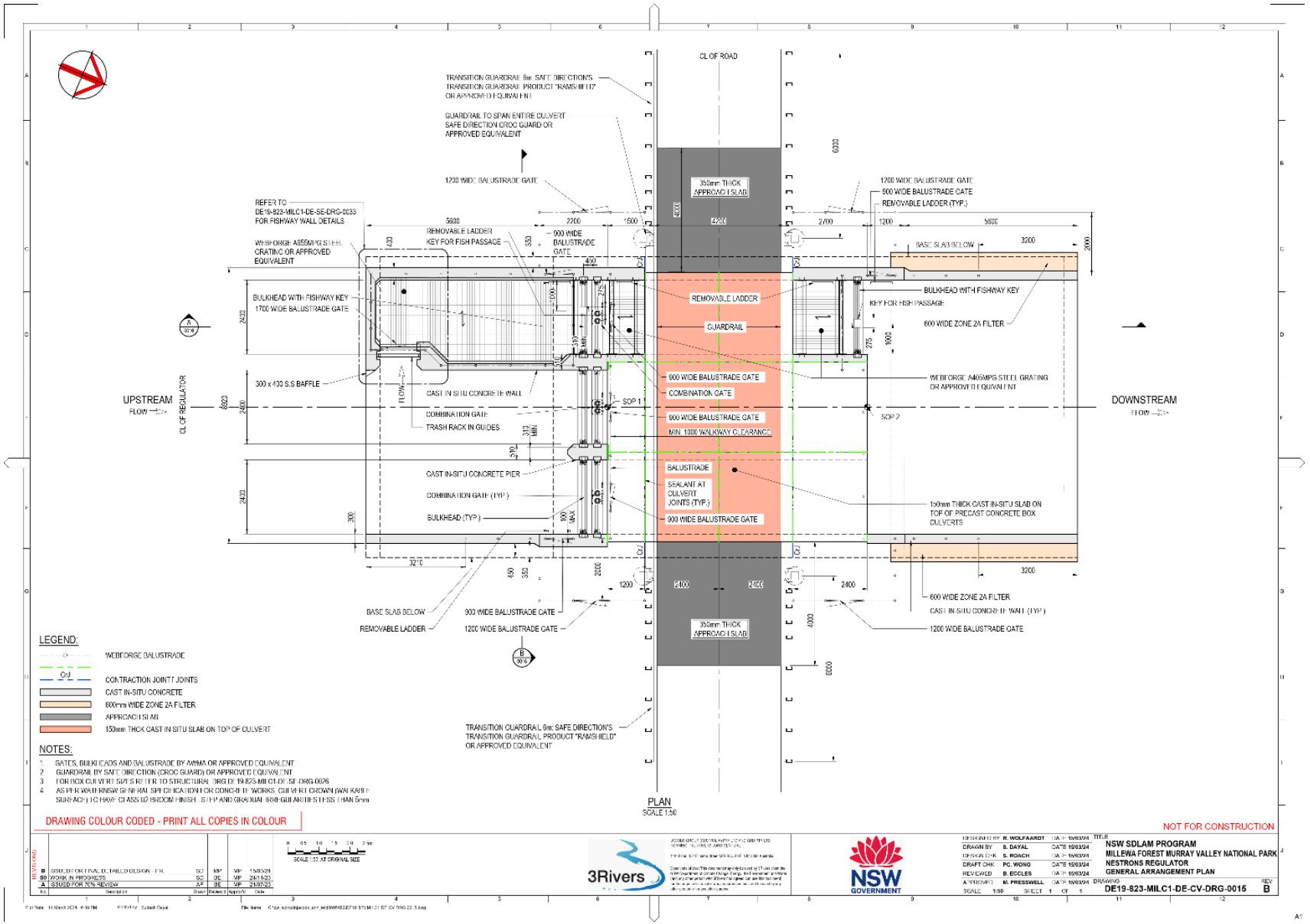

Figure 3-6 Section view of proposed Nestrons regulator

3.1.2.2 Moira regulator

The Moira regulator design has been changed to completely replace the existing regulator. The reasons for replacing rather than refurbishing the existing regulator are that it would:

- Eliminate uncertainties in relation to the condition and remaining asset life of the existing structure
- Eliminate need for ongoing maintenance and inspection of existing sheet piles
- Improve safety in construction and safety in ongoing operations and maintenance of the asset
- Reduce risk of gate failure resulting in unintended emptying of Moira Lake
- Allow the use of lighter maintenance vehicles resulting in quicker, safer, and more reliable maintenance response times
- Eliminate the need for additional access track upgrades to allow access for an 80 tonne mobile crane
- Improve and increase the safety of pedestrians and cyclists crossing the regulator.

The replacement design is substantially similar to the proposed designs for Nestrons and Pinchgut regulators. The design changes proposed as part of this Addendum REF are the removal of the existing regulator and the construction of a trafficable regulator consisting of a 6-cell box culvert structure with steel gates attached to cast in-situ concrete piers on the upstream side. One cell contains a cast in-situ / precast hybrid fishway with two fishway slots and a trash screen to prevent debris from entering and potentially obstructing fish movement. The regulator supports vehicle and pedestrian access with safety elements such as guardrails and walkways.

The invert level of 92.25 m AHD proposed in concept design was lowered 100 mm to 92.15 m to maintain a similar hydraulic capacity to the existing regulator. This was necessary as the addition of the fishway meant the culverts were narrower. The lowered invert level would lower the commence to flow to 2,500 megalitres per day (decreased from 2,800 megalitres per day in the existing REF). Based on available data, the bed of Moira Lake is higher than the Murray River. This would mean that water wouldn't start to fill the lake until the Murray River flowed at 4,500 to 5,000 megalitres per day. The hydraulic capacity of the regulator will remain the same. This means that Moira Lake will not fill earlier than it does with the existing inlet regulator. As discussed in the existing REF, the regulator would be operated in a similar manner to the existing inlet regulator. There will be negligible changes to water quality and frequency of flows unless the operating conditions change.

A section view of the proposed regulator design is provided in Figure 3-7 over page.

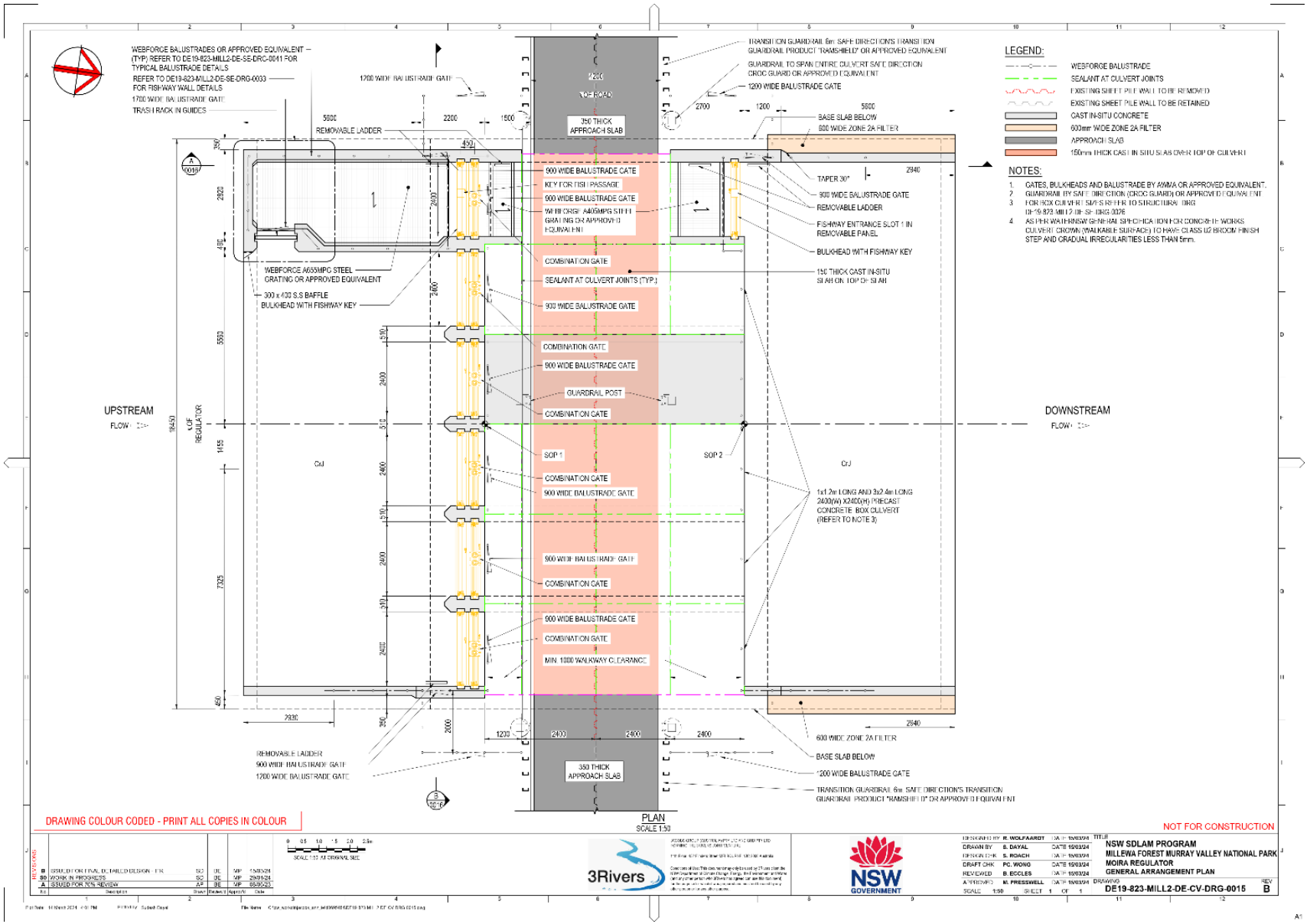

Figure 3-7 Section view of proposed Moira regulator

3.1.2.3 Little Edward River offtake regulator

The Little Edwards design has been changed to install a new sheet pile given the potential for seepage at this structure and the uncertainties regarding the condition and depth of the existing sheet pile. The detailed design also replaces the sheet piling that connects to the concrete regulator with a cast in-situ concrete fishway. This change will improve fish passage and increase the load-bearing capacity of this part of the structure. It also has the benefit of a longer asset life and lower maintenance requirements. The invert level for the regulator has been maintained at 92.80 AHD.

A section view of the proposed Little Edward River offtake regulator design is provided in Figure 3-8 over page.

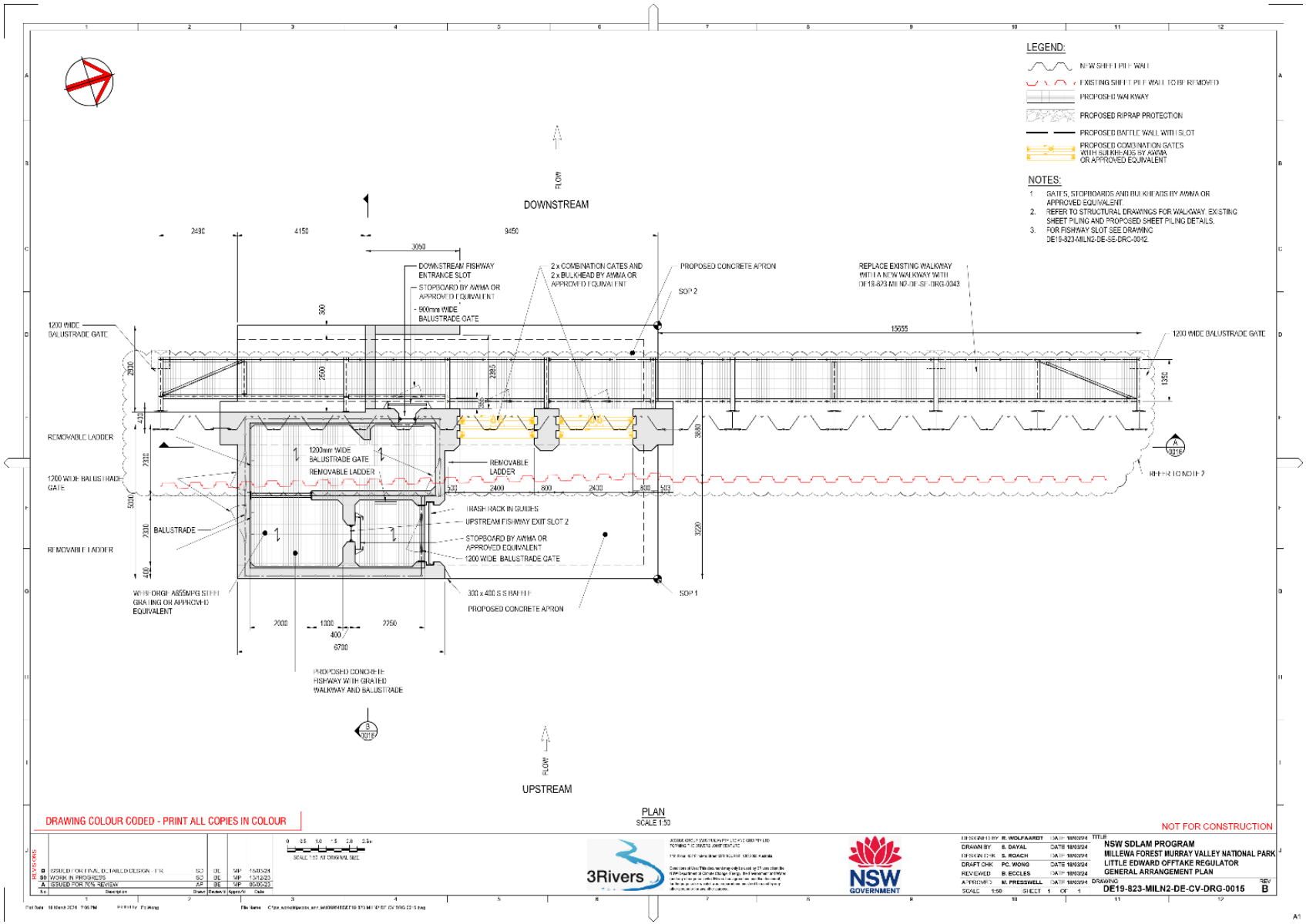

Figure 3-8 Section view of proposed Little Edward River offtake regulator

3.2 Construction methodology

3.2.1 Construction equipment

This revised proposal would not alter the construction equipment required as described in Section 3.3 of the existing REF. The equipment would include an excavator, bulldozer, tipper truck, skid steer, electrical generator, and concrete agitator/pumping truck. Nestrons regulator and Pinchgut regulator would require a Franna crane, whereas Moira regulator and Little Edward River offtake regulator would use a crawler crane. The on-site workforce would be comprised of six personnel per site (with the exception of Moira regulator where 10 personnel are required).

3.2.2 Construction timing and staging

The revised proposal would be carried out during construction of the project as described in the existing REF. It is expected that construction of the project, would commence in late 2024 or early 2025 and be completed in the summer of 2025-2026, conditions permitting. As stated in the existing REF, unless otherwise approved by NSW DCCEEW and NPWS through an out of hours application process, construction hours will be limited to:

- Monday to Friday: 7 am to 6 pm
- Saturday: 8 am to 5 pm
- No construction work on Sundays or public holidays

3.2.3 Waste

As detailed in Section 6.1 of the existing REF, the reuse of clean won site material onsite would minimise disturbance of in-situ soil resources within the construction footprint and avoid the need for borrow pits. The revised proposal has the potential to result in negligible amounts of additional surplus spoil due to additional ground disturbance incurred from the addendum construction footprints. As detailed in the existing REF, surplus spoil would be transported outside of Murray Valley National Park for either reuse (if classified as virgin excavated natural material or excavated natural material) or disposal at a suitably licenced waste facility.

3.2.4 Ancillary facilities

Access and ancillary facility arrangements are generally described in Section 3.4 of the existing REF.

As noted in the existing REF, a temporary construction phase laydown area within each of the construction footprints. The revised proposal would slightly expand these laydown areas to provide adequate safe for construction vehicle movements and general construction activities as shown in Figure 6-1, Figure 6-2, Figure 6-3 and Figure 6-4. The laydown areas would be used to unload and store building materials including prefabricated sections of the new regulators, store plant and equipment, and stockpile spoil and fill materials. A portable ablution and site office facility would be required temporarily at the Pinchgut regulator, Nestrons regulator and Moira regulator work sites.

3.3 Land ownership, tenure, access and acquisition

The revised proposal is located on land owned by the State of NSW through the Minister administering the NPW Act. The revised proposal would not impact land access or acquisition, as the addendum construction footprints would be contained within the existing Lots and DPs and land tenure detailed in section 3.11 of the existing REF. Land access would be carried out in accordance with the existing REF, in consultation with NPWS and WaterNSW.

3.4 Operation

The revised proposal would have minimal impact on the operation of the proposed regulators. As detailed in Section 3.1.2 above, the revised proposal would include minor revisions to the regulator designs to optimise the operational flexibility, safe operation and potential environmental benefits of the structures during operation.

Overall, no substantive changes are anticipated to the proposed operation of the regulators in comparison to the existing REF. Following construction completion, the Project would be operated in accordance with the provisions of the existing REF. A summary of these changes and their potential impact on operations is provided in Table 3-2 below.

Table 3-2 Summary of implications of design changes on operations

Site	Design changes to the regulators	Implications for operation
Pinchgut regulator	Increase culvert height and width	• Reduce the frequency of overtopping of the roadway compared to the original culvert height. • Increased visibility within fishway as design allows for more natural light between the fishway slot and the culvert roof slab. • Reduced flow velocity through the culverts (including the fishway) can decrease the likelihood of fish injury.
	Use of combination gates only	• Allow for simpler operation and increased operational flexibility to control flows when compared to the penstock and split leaf gates originally proposed. • Allows for safer operation as it removes the need for a raised walkway. • Improved ability to operate gates in overshot mode can decrease the likelihood of excessive water flows that can disrupt the downstream ecosystem.
	Amend fishway exit to a 90-degree angle	• Reduce ongoing maintenance for the asset operator. • Improve the operation of the fishway by minimising debris build up at the upstream exit.
Nestrons regulator	Increase culvert width	• Increased visibility within fishway as design allows for more natural light between the fishway slot and the culvert roof slab. • Reduced flow velocity the culverts (including the fishway) can decrease the likelihood of fish injury.
	Use of combination gates only	• Allow for simpler operation and increased operational flexibility to control flows. • Allows for safer operation as it removes the need for a raised walkway. • Improved ability to operate gates in overshot mode can decrease the likelihood of excessive water flows that can disrupt the downstream ecosystem.

Site	Design changes to the regulators	Implications for operation
	Amend fishway exit to a 90-degree angle	• Reduce ongoing maintenance for the asset operator. • Improve the operation of the fishway by minimising debris build up at the upstream exit.
	Add third slot to fishway	• Support safe fish passage by reducing flow velocity and providing sufficient water depth. • Slightly reduce the flow velocity through the regulator.
Moira regulator	Remove the existing regulator and construct a 6-cell box culvert regulator with a trafficable deck	• Reduce ongoing maintenance for the asset operator, in particular, relating to the existing sheet piles. • Allows for use of lighter maintenance vehicles resulting in quicker and more reliable maintenance response. • Improve and increase safety of pedestrians and cyclists crossing the regulator.
	Lower the invert level by 100mm	• Marginally lower the commence to flow to just under 2,500 megalitres per day in the Murray River (decreased from 2,800 megalitres per day in the existing REF). However, this would not impact inflows to Moira Lake because the bed of Moira Lake is higher than the Murray River. This means that as per the design in the existing REF, water wouldn't start to fill the lake until the Murray River flowed at 4,500 to 5,000 megalitres per day. • The replacement regulator has similar hydraulic capacity to the existing regulator and would be operated in a similar manner to the existing inlet regulator. There will be negligible changes to water quality and frequency of flows unless the operating conditions change.

Site	Design changes to the regulators	Implications for operation
Little Edward River offtake regulator	Replace existing sheet piling	• Reduce seepage to ensure the regulator is operated as efficiently as possible. • Increase asset life and reduce ongoing maintenance for the asset operator.
	Install cast in-situ concrete fishway	• Provide greater maintenance access to the regulator by including a walkway with removable grating on top and ladders. • Increase asset life and reduce ongoing maintenance for the asset operator.

3.5 Capital investment value

As detailed in the existing REF, a preliminary estimate of the cost to construct the revised proposal has been prepared by 3Rivers and is about $18 million excluding GST (3Rivers, 2023). The revised proposal would have a negligible impact on this cost.

4 Statutory context

4.1 Permissibility

State Environmental Planning Policy (Transport and Infrastructure) 2021 (the Transport and Infrastructure SEPP) facilitates the effective delivery of infrastructure across NSW.

Clause 2.73(1)(a) of the Transport and Infrastructure SEPP allows development for any purpose to be carried out without consent on land reserved under the NPW Act, or acquired under Part 11 of the NPW Act, if the development is for a use authorised under the NPW Act.

4.1.1 National Parks and Wildlife Act 1974

Section 4.1 of the existing REF considers the potential for the Project to be authorised under the NPW Act with respect to:

- the objects of the NPW Act
- the plan(s) of management (or equivalent management plan) for the land on which the proposed activity would be carried out
- the lease, license and easement provisions under Part 12 of the NPW Act
- The regulations of use of parks under Part 2 of the National Parks and Wildlife Regulation 2019 (NPW Regulation).

The proposed activity is consistent with the NPW Act and plans of management as it would allow for the construction of replacement regulators that prevent the unseasonal inundation of Millewa Forest, thereby maintaining more natural ecosystem processes. The new regulators would also improve fish passage and reduce stranding of native fish in Millewa Forest on a receding high flow event. The proposed activity would support public enjoyment of Millewa Forest by avoiding the potential for degradation associated with unseasonal flows. The proposed activity would not impact places, objects features and landscapes of cultural value (see Section 6.3).

4.1.1.1 Leases, licences and easements under the NPW Act

Part 12 of the NPW Act provides for the granting of a lease, licence or easement for the use of land, buildings or structures within a reserve. NPWS has confirmed that easements for water supply will need to be granted under section 153 of the NPW Act to operate the replacement Pinchgut, Nestrons and Moira regulators and refurbished Little Edward River offtake regulators.

WaterNSW and Murray-Darling Basin Authority will negotiate the terms of the draft easements with NPWS. This will incorporate the changes proposed in this addendum. Once the construction and commissioning works are completed, the replacement and refurbished regulators will be surveyed in accordance with the *Conveyancing Act 1919* prior to the easements being granted.

4.1.1.2 National Parks and Wildlife Regulation 2019

The NPW Regulation regulates the use of national parks and land acquired by the Minister under Part 11 of the NPW Act, which, along with other land types, are collectively referred to as 'parks' in the regulation. The NPW Regulation prohibits the following conduct within a park without the consent of a park authority:

- Sections 9 and 10 prohibit the entry and use of heavy and noisy machinery
- Section 14 prohibits interfering with animals or their nests, eggs, habitation or resting place or any beehive
- Section 20 prohibits the construction, operation or use of any structure, installation, engineering, plant or equipment
- Section 21 prohibits the cutting, felling, removal, damage or destruction of vegetation.

Construction of the proposed activity including the revised proposal will require a consent from NPWS. The construction works will need to be carried out in accordance with the conditions of the consent.

4.1.2 Environmental Planning and Assessment Act 1979

This REF has been prepared in accordance with Part 5 Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The REF examines and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the activity, in accordance with section 5.5 of the EP&A Act.

Section 171(1) of the Environmental Planning and Assessment Regulation 2000 requires that a determining authority must take into account the environmental factors specified in the environmental factors guidelines that apply to the activity. Accordingly, this REF has taken into account the environmental factors specified in the *Guidelines for Division 5.1 Assessments* (Department of Planning and Environment, 2022a).

4.1.3 State Environmental Planning Policies

4.1.3.1 State Environmental Planning Policy (Transport and Infrastructure) 2021

As discussed in Section 4.1, the proposed activity is permissible without consent in accordance with clause 2.73(1)(a) of Division 12 of the Transport and Infrastructure SEPP, which addresses land reserved under the NPW Act or acquired under Part 11 of the Act.

4.1.3.2 State Environmental Planning Policy (Biodiversity and Conservation) 2021

As discussed in Section 4.1.4.2 of the existing REF, the State Environmental Planning Policy (Biodiversity and Conservation) 2021 (Biodiversity and Conservation SEPP) identifies planning principles that a determining authority must take into account when considering a proposed development that may adversely affect the riverine environment of the Murray River.

The proposed activity is consistent with these principles as it allows for the construction of the approved regulators. The proposed activity does not include works on the banks of the Murray River. Design changes to the regulators have been made in response to further consultation with multiple stakeholders, particularly, DPI (Fisheries). These design changes would provide safe and operationally flexible regulators that can more efficiently achieve environmental watering outcomes.

4.1.4 Strategic Plans

The proposed activity aligns with the strategic plans identified in Section 4.1.5 of the existing REF as it will allow for the construction of the replacement and refurbished regulators.

4.1.4.1 NSW Water Strategy

The NSW Water Strategy (Department of Planning, Industry and Environment, 2021) is a 20-year State-wide strategy to improve the security, reliability and quality of NSW's water resources over the coming decades. The Project supports Priority 3, which is to improve river, floodplain and aquifer ecosystem health, and system connectivity.

4.1.4.2 Murray-Lower Darling Long Term Water Plan

The *Murray-Lower Darling Long Term Water Plan* (Department of Planning, Industry and Environment, 2020a) contains ecological objectives and targets for priority environmental assets and ecosystem functions in the Murray-Lower Darling catchment. Implementation of the proposed activity would support these environmental outcomes by improving fish access to habitat at Toupna Creek, Douglas Swamp and Little Edward River, and making it easier to manage bird breeding at Douglas Swamp, as discussed in Section 3.2 of the existing REF.

4.1.4.3 Barmah-Millewa Forest Environmental Water Management Plan

The *Barmah-Millewa Forest Environmental Water Management Plan* (Murray-Darling Basin Authority, 2012) consists of a long-term strategic plan that outlines the environmental water requirements of the Barmah-Millewa Forest and how to broadly achieve them with a combination of environmental water works and measures. This Project would improve the operational flexibility of the regulators and support operators to respond to the changing water resource conditions, opportunities and environmental priorities under this plan.

4.1.5 Murray Local Environmental Plan 2011

As detailed in Section 4.1.6 of the existing REF, the proposed activity and revised proposal would be located within the Murray River Council local government area on land subject to the Murray Local Environmental Plan (LEP) 2011. The proposed activity, including the revised proposal, would be located on land zoned E1 – National Parks and Nature Reserves under the LEP.

The proposed activity is permitted without consent subject to the LEP as it has been deemed authorised under the NPW Act.

The proposed activity is located within the flood planning area identified in clause 5.21 of the LEP. As detailed in section 4.1.6 of the existing REF, the proposed activity including this revised proposal would be consistent with clause 5.21(2) of the LEP.

4.2 Other NSW legislation

Other NSW legislation applicable to the revised proposal is discussed in Table 4-1.

Table 4-1 Other NSW legislation applicable to the revised proposal

Legislation	Relevance to the revised proposal
Heritage Act 1977	The *Heritage Act 1977* aims to ensure that the heritage of NSW is adequately identified and conserved. The 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. Section 60 of the Act requires approval from the Heritage Council of NSW for certain works to items that are listed on the State Heritage Register. The proposed activity including the revised proposal would not impact any items listed on the State Heritage Register (refer to Section 6.3).
Fisheries Management	The FM Act provides for the conservation, protection and management of fisheries, aquatic systems and habitats in NSW.

Legislation	Relevance to the revised proposal
Act 1994 (FM Act)	Section 218(5) of the FM Act requires that a public authority that proposes to construct, alter or modify a reservoir (including a floodgate) on a waterway must notify the Minister for Agriculture administering the FM Act of the proposed action, and, if the Minister so requests, include as part of the works a suitable fishway or fish by-pass. NSW DCCEEW notified the DPI (Fisheries) of the Project and a fishway was included in the concept design for the regulators (see Section 3.2 of the existing REF). NSW DCCEEW has further engaged with the DPI (Fisheries) to inform the detailed design of the fishways. Additionally, the following DPI (Fisheries) guidelines have been considered in the project development and environmental assessment: • Fisheries NSW Policy and Guidelines for Fish Habitat Conservation and Management (2013 update) (DPI (Fisheries), 2013) • Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings (Fairfull and Witheridge, 2003) • Policy and Guidelines for Fish Friendly Waterway Crossings (DPI (Fisheries), undated)
Biodiversity Conservation Act 2016 (BC Act)	The BC Act provides for listing of threatened species, populations and ecological communities as well as critical habitat and key threatening processes. An assessment of the expected impacts of the revised proposal on biodiversity is provided in Section 6.1. The revised proposal is not expected to have a significant impact on threatened species, populations and ecological communities, critical habitat, or key threatening processes listed under the BC Act. The revised proposal would not trigger the Biodiversity Offset Scheme, and a species impact statement or a biodiversity development assessment report is not required.
Water Management Act 2000 (WM Act)	Section 89 of the WM Act requires a water use approval for the use of water for a particular purpose at a particular location. A water use approval would be required to extract water for use during the construction phase of the proposed activity. Section 90 of the WM Act requires an approval to undertake a water management work, which includes construction and use of water supply works. The existing Pinchgut, Nestrons, Moira and Little Edward River offtake regulators are all subjects of the NSW Murray Lower Darling Water Supply Work Approval (approval number 50WA511767). New water supply work approvals would be required to construct and operate the regulators. Section 91 of the WM Act requires an 'activity approval' to carry out a 'controlled activity' in, on or under waterfront land or to carry out an aquifer interference activity. Section 41 of the Water Management (General) Regulation 2018 provides that a public authority is exempt from requiring a controlled activity approval to carry out a controlled activity in, on or under

Legislation	Relevance to the revised proposal
	waterfront land. Therefore, as NSW DCCEEW is the proponent of the proposed activity, a controlled activity approval is not required.
Protection of the Environment Operations Act 1997 (POEO Act)	The POEO Act provides for the issuance of an environment protection licence for scheduled activities (being activities listed in Schedule 1 of the POEO Act), and generally the control of water, air and noise pollution and the management of wastes. The revised proposal is not considered a scheduled activity under the POEO Act. Under the POEO Act, the construction contractor and NSW DCCEEW are obliged to notify the NSW Environment Protection Authority if a pollution incident occurs that causes or threatens material harm to the environment.

4.3 Commonwealth legislation

Commonwealth legislation applicable to the revised proposal is discussed in Table 4-2 over page.

Table 4-2 Commonwealth legislation relevant to the revised proposal

Legislation	Relevance to the revised proposal
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)	The EPBC Act prescribes the Commonwealth's role in environmental assessment, biodiversity conservation and the management of protected areas and species, populations and communities and heritage items. The approval of the Commonwealth Minister for the Environment and Water is required for an action which has, would have, or is likely to have, a significant impact on 'matters of national environmental significance'. Any potential to significantly impact on these matters is likely to require a referral to the C'wealth DCCEEW, for a decision as to whether it is a controlled action requiring approval under the EPBC Act. The impact of the Millewa Forest Supply Project on matters of national environmental significance is discussed in Section 7 of the existing REF. The assessment provided in the existing REF applies to the revised proposal. The revised proposal is not expected to impact on matters of national environmental significance.
Native Title Act 1993 (NT Act)	Native title is the recognition that Aboriginal and Torres Strait Islander people have rights and interests to land and waters according to their traditional law and customs as set out in Australian Law. Native title is governed by the NT Act. An indigenous land use agreement, established under the NT Act, is a voluntary agreement between native title parties and other people or bodies about the use and management of areas of land and/or waters. There are no current native title claims lodged in relation to land within or adjacent to the proposed activity sites and no indigenous land use agreements cover the proposed activity site.

4.4 Summary of licences and approvals

NSW DCCEEW is the proponent and determining authority for the revised proposal. This Addendum REF fulfils NSW DCCEEW's obligations under section 5.5 of the EP&A Act, including to examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment as a result of the revised proposal.

A summary of the licences and approvals required for the revised proposal is provided in Table 4-3 over page.

Table 4-3 summary of licences and approvals

Legislation	Approval / permit / notification	Responsibility
EP&A Act	Planning approval under Part 5 Division 5.1 of the EP&A Act is required. This Addendum REF has been prepared to fulfil the requirements of section 5.5 of the EP&A Act.	NSW DCCEEW
WM Act	A water use approval under section 89 of the WM Act would be obtained if it is proposed to extract water for use during the construction phase of the proposed activity. An amendment or renewal of WaterNSW's existing water supply work approval number 50WA511767 may be required to construct and/or operate the replacement and refurbished regulators.	NSW DCCEEW
NPW Act	Approval from NPWS is required to construct and operate the proposed activity: • NSW DCCEEW will seek consent from NPWS to carry out the proposed construction works • WaterNSW will negotiate with NPWS for the establishment of an easement to operate the replacement and refurbished regulators under section 153 of the NPW Act.	NSW DCCEEW
NPW Regulation	Consent is required from NPWS to construct the proposed activity. Specifically, consent is required for construction plant and equipment to enter, drive through, and operate within Murray Valley National Park and Regional Park, and to carry out the construction works.	NSW DCCEEW
FM Act	Notification of dredging or reclamation work under section 199 of the FM Act would occur prior to construction beginning. The following approvals and permits would be obtained prior to construction starting: • A permit to translocate fish and aquatic vegetation under section 37 of the FM Act • Approval of the fishway design from DPI Fisheries under section 218 of the FM Act • A permit to block fish passage during construction under section 219 of the FM Act.	NSW DCCEEW

4.4.1 REF publishing

The existing REF will be published on NSW DCCEEW's website as it required an approval or permit identified in clause 171(4) of the EP&A Regulation. This Addendum REF will therefore also be published on NSW DCCEEW's website for transparency. The published Addendum REF will conform with the Web Content Accessibility Guidelines (WCAG) 2.0 Level AA.

5 Consultation

5.1 Community and stakeholder consultation

Consultation carried out for the project is described in Section 4 and Section 5 of the existing REF.

Since the determination of the existing REF, NSW DCCEEW have undertaken further consultation with NPWS, WaterNSW and DPI Fisheries regarding the detailed design and operation of the proposed regulators.

NSW DCCEEW will continue to consult with NPWS, WaterNSW and other relevant stakeholders during design and construction including notification in writing at least two weeks before construction work begins as detailed in the existing REF.

5.2 Transport and Infrastructure SEPP consultation

Part 2.2, Division 1 of the Transport and Infrastructure SEPP contains provisions for consultation with public authorities prior to the commencement of certain types of development. The revised proposal would not alter the consultation requirements under the Transport and Infrastructure SEPP as detailed in Section 5.2 of the existing REF.

6 Environmental assessment

6.1 Approach to the assessment of impacts

6.1.1 Assessment of impacts

As mentioned in Section 1.2, the purpose of this Addendum REF is to consider the incremental impacts associated with the revised proposal, namely the increase in construction footprint and detailed design refinements at the four regulators as described in Section 3.1.

According, the impact assessment in the following sections considers only the incremental or additional impacts associated with the revised proposal, rather than the total impacts of the approved project and revised proposal combined. However, in order to contextualise the revised proposal, the existing environment section includes a description of the total project.

6.1.2 Safeguards

The safeguards in the existing REF will apply to the revised proposal impacts. In some instances, additional safeguards have been developed to apply specifically to the addendum construction footprint. In order to avoid misunderstanding, a consolidated list of safeguards for the project is provided in Table 7-1. The intention of this consolidated list is to supersede the list of safeguards in the existing REF.

6.2 Terrestrial biodiversity

The vegetation impacts assessed in the existing REF and associated biodiversity assessment are not sufficient to allow for the construction of the current design, and further ground disturbance is required. The Addendum Biodiversity Assessment Report has therefore assessed the revised total amount of vegetation removal required for the project, including the revised proposal, and supersedes the terrestrial biodiversity construction impact assessment in the existing REF. The following sections provide a summary of the assessment provided in Appendix C . Note that Section 6.2.2 describes the impacts associated with only the revised proposal.

The assessment is supported by field surveys of the:

- original construction footprint undertaken in March 2022 (see Section 6.4.1.1 of the existing REF)

- proposed addendum construction footprint conducted in March 2024 (see Figure 6-1 (Nestrons) Figure 6-2 (Pinchgut), Figure 6-3 (Moira) and Figure 6-4 (Little Edwards) below).

The field survey carried out in 2022 to support approval of the existing REF identified the vegetation type and condition relevant to the existing REF, including the presence of PCTs. Where suitable, vegetation mapping produced for the existing REF has been reviewed and applied to the additional assessment provided in Appendix C and this Addendum REF. An approximately 40-metre buffer was applied around the original construction footprint and used as the study area for the 2024 field survey and Addendum biodiversity assessment. The revised study area has been used to assess potential impacts within the addendum construction footprint and any surrounding areas which may be subject to indirect impacts during construction.

6.2.1 Existing environment

As discussed in Section 6.4.1 of the existing REF, the condition of the Barmah-Millewa Forest ecosystem is in decline due to historical degradation of the Millewa wetland system (Ecological Associates and SKM, 2011). Millewa Forest has been heavily modified to accommodate River Red Gum timber harvesting and grazing (Harrington and Hale, 2011). Many of the waterways are regulated and large areas of the ecosystem are now dominated by River Red Gums. The altered water regimes have significantly impacted water-dependant flora and fauna, particularly colonial nesting waterbirds (Leslie, 2001), native fish (King et al., 2009) and frog species (Howard et al., 2021). There is also increased pressure from introduced plant and animal species in the system. The area around the site is heavily disturbed due to historical timber harvesting of the surrounding forest and the construction and operation of the existing regulators and access tracks. Despite this decline in ecological condition, Millewa Forest remains a vital ecological refuge for a number of threatened flora and fauna species and is recognised for its significant international contribution to biodiversity as a Ramsar-listed wetland.

Native vegetation and flora species

There are no areas of outstanding biodiversity value within or near the addendum construction footprints. The field surveys confirmed the presence of two plant community types (PCTs) of varying condition at the construction footprints:

- *River Red Gum-sedge dominated very tall open forest in frequently flooded forest wetland along major rivers and floodplains in south-western NSW* (PCT 2)
- *River Red Gum herbaceous-grassy very tall open forest wetland on inner floodplains in the lower slopes sub-region of the NSW South Western Slopes Bioregion and the eastern Riverina Bioregion* (PCT 5)

- *Shallow marsh wetland of regularly flooded depressions on floodplains mainly in the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)* (PCT 12).

PCT 2 and PCT 5 are potentially representative of terrestrial groundwater dependent ecosystems, however these PCTs may not be entirely dependent on groundwater.

No threatened flora species under the EPBC Act or BC Act are considered likely to occur within the construction footprint. Floating Swamp Wallaby-grass (*Amphibromus fluitans*) is listed as vulnerable under the EPBC Act and BC Act. This species is known to occur in swamp margins within Murray Valley National Park and Regional Park. Only small portions of the Moira construction footprint had suitable habitat for this species. No Floating Swamp Wallaby-grass plants were identified in a dedicated search.

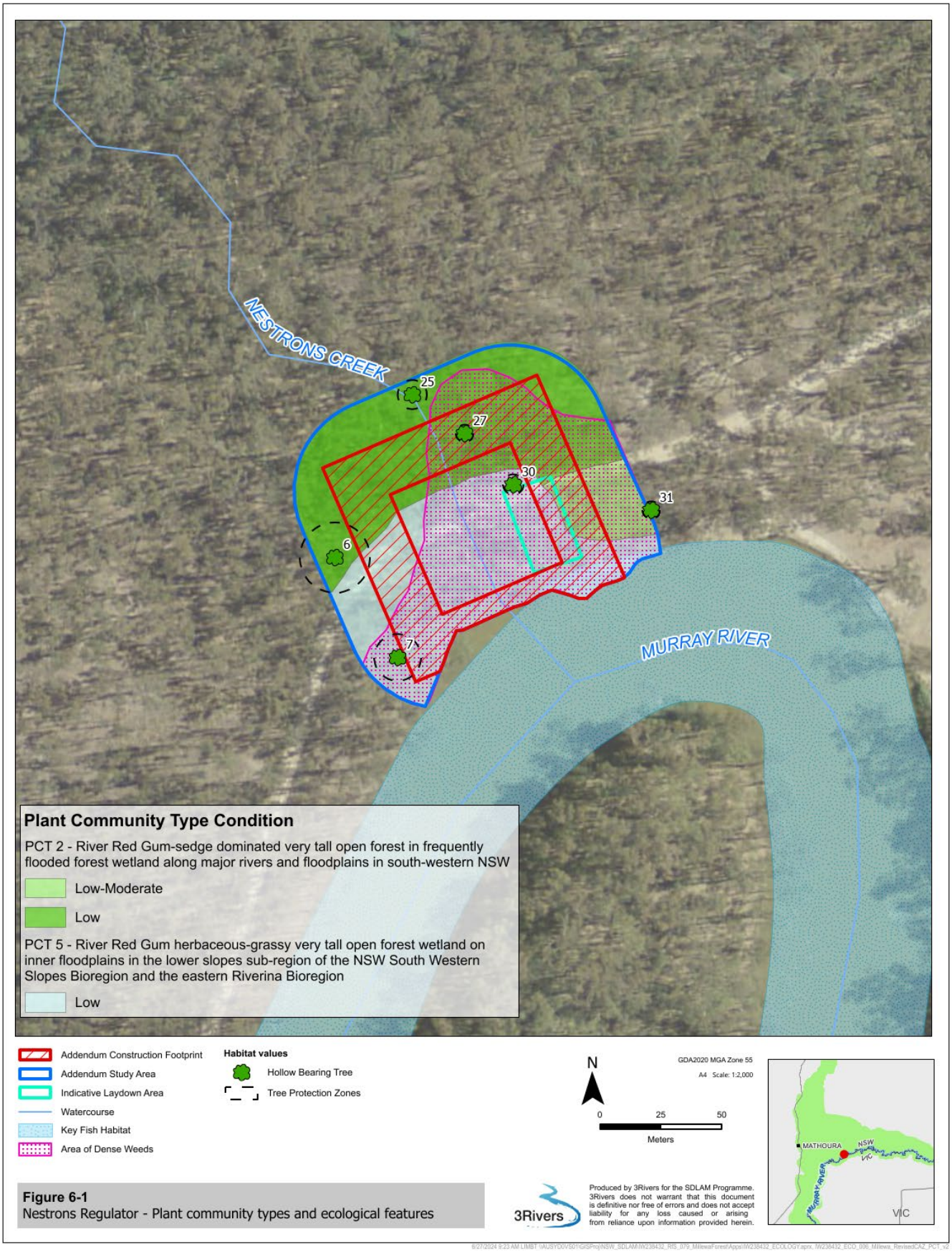

Figure 6-1 Nestrons regulator – Plant community types and ecological features

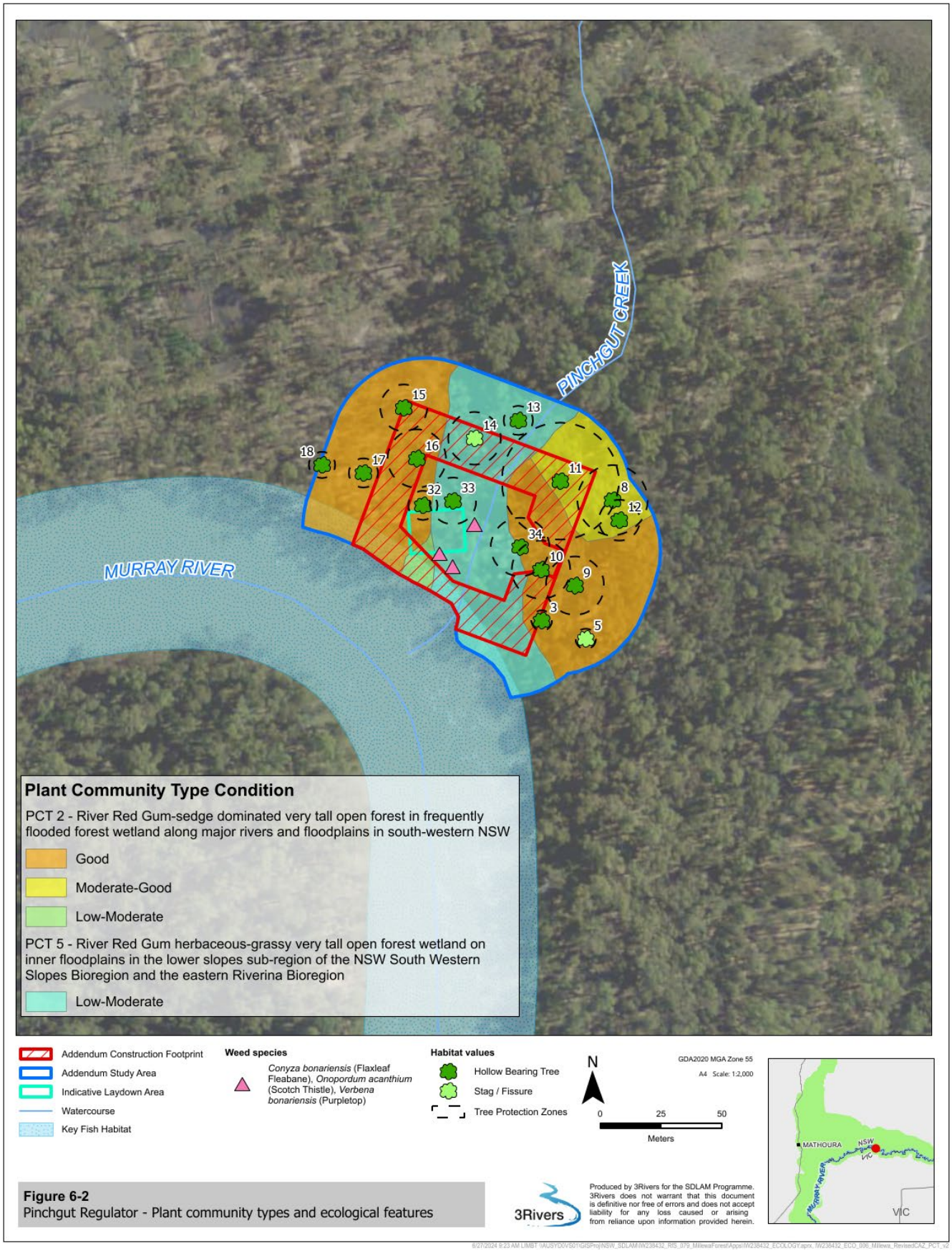

Figure 6-2 Pinchgut regulator – Plant community types and ecological features

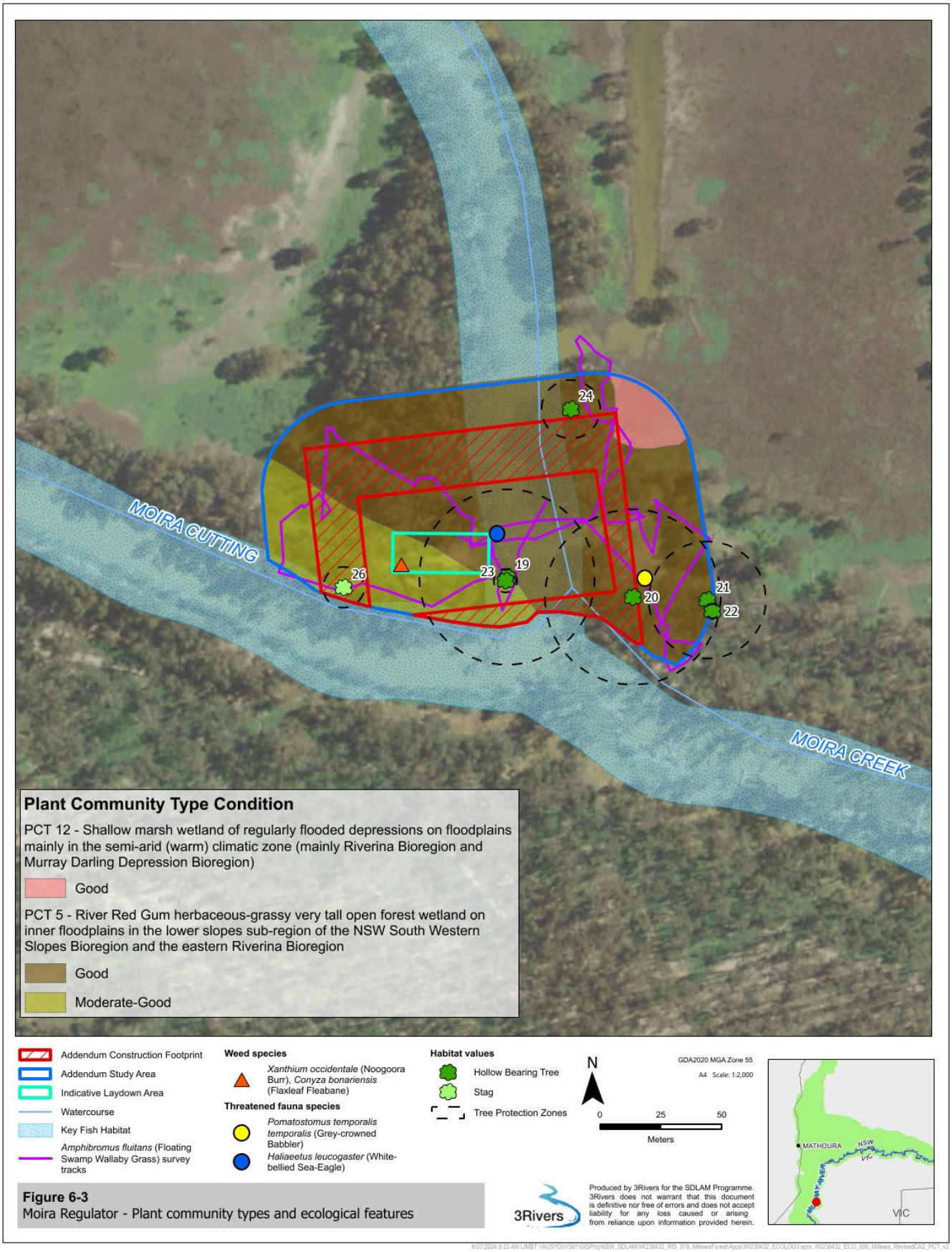

Figure 6-3
Moira Regulator - Plant community types and ecological features

Figure 6-3 Moira regulator – Plant community types and ecological features

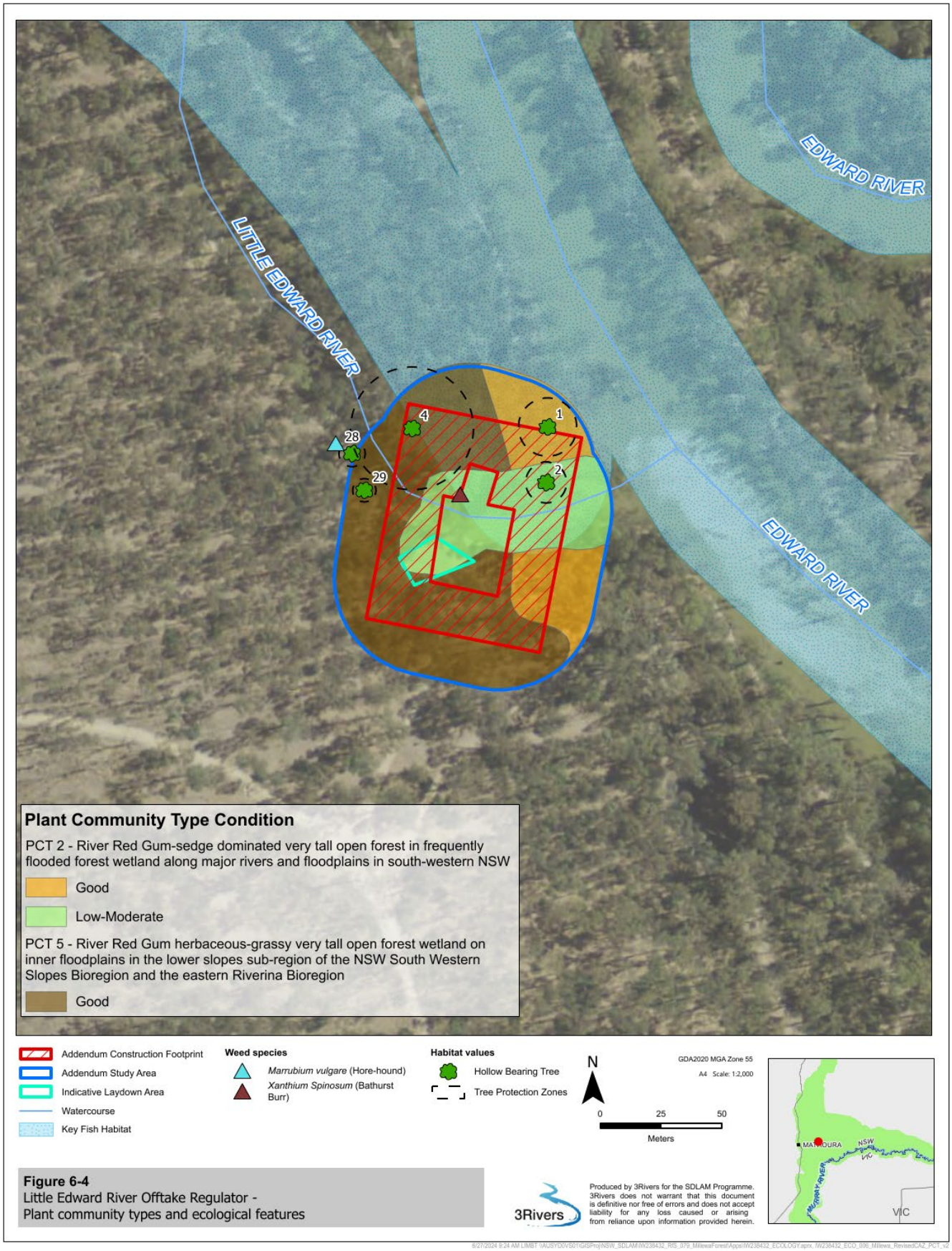

Figure 6-4
Little Edward River Offtake Regulator -
Plant community types and ecological features

Figure 6-4 Little Edwards River offtake regulator – Plant community types and ecological features

A summary of the native vegetation at each site is provided in Table 6-1 below.

Table 6-1 Summary of native vegetation at sites

Site	PCT ID	PCT condition	Hollow-bearing trees (HBTs)	Native vegetation
Nestrons	PCT 2	Low–moderate	• 4 within addendum construction footprint (inclusive of Tree Protection Zone (TPZ)) • 2 within original construction footprint	• River Red Gum (*Eucalyptus camaldulensis*) • Common Reed (*Phragmites australis*)
	PCT 5	Low		
Pinchgut	PCT 2	Low-good	• 12 within addendum construction footprint (inclusive of TPZ) • 3 within original construction footprint	• River Red Gum (*Eucalyptus camaldulensis*) • Common Reed (*Phragmites australis*) • Cotton Fireweed (*Senecio quadridentatus*) • Swamp Dock (*Rumex brownii*) • Common Rush (*Juncus amabilis*) • Yellow Rush (*Juncus flavidus*) • River Cooba (*Acacia stenophylla*) • Mountain Cedar Wattle (*Acacia dealbata*)
	PCT 5	Low-moderate		
Moira	PCT 5	Moderate-good	• 5 within addendum construction footprint (inclusive of TPZ) • 1 within original construction footprint	
	PCT 12	Good		
Little Edward	PCT 2	Low- good	• 3 within addendum construction footprint • 0 within original construction footprint	
	PCT 5	Good		

Threatened ecological communities

No threatened ecological communities under the EPBC Act and the BC Act occur within the addendum study areas. No threatened ecological communities were detected during the field surveys.

Threatened fauna species

As per Section 6.4.1.2 Table 6-4 of the existing REF, 17 threatened fauna species listed under the EPBC Act and BC Act were assessed as having either a moderate or high likelihood of occurrence within 500 metres of the construction footprints. Four additional threatened fauna species comprising Diamond Firetail (*Stagonopleura guttata*), Flame Robin (*Petroica phoenicea*), South-eastern Hooded Robin (*Melanodryas cucullata cucullata*) and Southern Myotis (*Myotis macropus*), were identified as having a moderate potential to occur within the addendum study areas. Two threatened fauna species were observed during surveys at Moira Regulator, the species included Grey-crowned Babbler (*Pomatostomus temporalis temporalis*) and White-bellied Sea-Eagle (*Haliaeetus leucogaster*) (refer to Figure 4-1). However, no nests or large stick nests were recorded during the surveys.

The 34 additional hollow-bearing trees over the addendum study areas identified during the supplementary surveys, would provide roosting and foraging opportunities for hollow-dependent fauna, including threatened species. For example, the Superb Parrot (*Polytelis swainsonii*), requires hollows greater than five centimetres in diameter and trees that have a diameter at breast height (DBH) greater than 30 centimetres or at least four metres from the ground, which are present within the addendum study areas. Bat species, such as the Southern Myotis (*Myotis macropus*) and Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris*), may roost in hollow bearing trees within the addendum study areas. Direct impacts to hollow-bearing trees, stags and hollow-bearing logs are required to be avoided if possible. Additionally, there were no culverts present within the addendum study areas suitable for roosting bat species. Woodland birds such as the Diamond Firetail (*Stagonopleura guttata*), Flame Robin (*Petroica phoenicea*) and South-eastern Hooded Robin (*Melanodryas cucullata cucullata*) may forage and breed across the addendum study areas. In addition, stags or live trees and tree stumps are essential resources for nesting, roosting and foraging woodland birds.

Threatened flora species

No additional threatened flora species were identified within the addendum study areas. Dedicated searches were carried out for Floating Swamp Wallaby-grass (*Amphibromus fluitans*) within the addendum study areas. Additionally, targeted flora searches were recorded at Moira Regulator due to previous survey inaccessibility at this site. This species was not identified during field surveys. No threatened flora species are considered likely to occur, and no threatened flora species were detected during the field surveys.

Weeds of National Significance, Priority Weeds and High Threat Weeds

Exotic plant species were recorded at Moira Regulator, Pinchgut Regulator and Nestrons Regulator.

A summary of the additional weed species identified within the addendum study areas is provided in Table 6-2 below.

Table 6-2 Summary of additional weed species recorded in the addendum study areas

Weed species	Weed category	Site occurrence		
		Nestrons	Pinchgut	Moira
Conyza bonariensis (Flaxleaf Fleabane)	• Species of concern (LLS, 2023)	-	✓	✓
Echium plantagineum (Paterson's Curse)	• Local Priority Weed (LLS, 2023)	✓	-	-
Onopordum acanthium (Scotch Thistle)	• Local Priority Weed (LLS, 2023)	-	✓	-
Rubus fruticosus sp. Aggregate (Blackberry)	• Weed of National Significance • High Threat Weed • State Priority Weed (LLS, 2023)	✓	✓	✓
Xanthium occidentale (Noogoora Burr)	• High Threat Weed • Local Priority Weed (LLS, 2023)	-	-	✓

6.2.2 Impacts

Impacts associated with the original construction footprint are addressed in Section 6.4.2 of the existing REF. Additional impacts associated with this revised proposal are identified below.

6.2.2.1 Loss of vegetation and habitat

There is considerable scope to avoid and minimise vegetation removal within the addendum construction footprints. The Addendum Biodiversity Assessment Report assumes a conservative worst-case scenario, where vegetation removal cannot be avoided or mitigated. As a conservative worst-case scenario, the revised proposal would impact upon up to 3.09 hectares of additional vegetation and up to an additional twenty four (24) hollow bearing trees. However, vegetation removal within the addendum construction footprint would be avoided as much as practicable

through refinements to the site layouts and footprint during the detailed design process, with hollow-bearing trees and hollow-bearing logs prioritised for retention.

The extent of additional possible vegetation and habitat feature removal under the revised proposal is summarised in Table 6-3 below.

Table 6-3 PCT extent within the addendum construction footprints

PCT and condition	Extent within addendum construction footprint (ha)
PCT 2 – Low	0.31
PCT 2 – Low-Moderate	0.30
PCT 2 – Moderate-Good	0.04
PCT 2 – Good	0.35
PCT 5 – Low	0.49
PCT 5 – Low-Moderate	0.29
PCT 5 – Moderate-Good	0.26
PCT 5 – Good	1.05
PCT 12 – Good	<0.01
Total	3.09

6.2.2.2 Proliferation of weed species

Proliferation of weed species is likely to occur as vegetation is removed and soil disturbed and stockpiled during earthworks. Recommended control methods for the additional weed species identified in the addendum construction footprints are summarised in Table 6-4 below.

Table 6-4 Additional weed species recorded in the addendum construction footprints and their recommended control methods

Species	Weed category	Recommended control methods
Conyza bonariensis (Flaxleaf Fleabane)	Species of concern within the Riverina region (LLS, 2023)	• Hand removal has been suggested for the control of single plants and small patches. Removed weeds should be removed to prevent them from propagating or spreading seeds in the ground. • Various herbicides have been found to be effective in controlling Flaxleaf Fleabane.
Echium plantagineum (Paterson's Curse)	Species of concern within the Riverina region (LLS, 2023)	• Hand removal and cutting have been suggested for the control of single plants and small patches. • Many chemicals have been found to be effective in controlling Paterson's Curse. Multiple applications

Species	Weed category	Recommended control methods
		of herbicide may be required to control repeated germinations. Directions specified on the labels and material safety data sheets must be adhered to.
Onopordum acanthium (Scotch Thistle)	Species of concern within the Riverina region (LLS, 2023)	• Herbicide control can be very effective and is an essential part of the overall management of these thistles. When there is a low density of thistles spot spraying or chipping is preferred. • Isolated plants should be removed using a hoe or mattock (chipping or grubbing). Remove as much of the taproot as possible so that regrowth does not occur.
Rubus fruticosus sp. Aggregate (Blackberry)	Weed of national significance listed in the Australian Weeds Strategy 2017 to 2027 (Invasive Plants and Animals Committee, 2016) Species of concern within the Riverina region (LLS, 2023)	• Herbicides are the most reliable blackberry control method. • There are many herbicides registered for use on blackberry. A mixture of triclopyr + picloram used with or without aminopyralid gives the best long-term control. • Spray healthy, actively growing plants with new leaves on the cane tips. Apply to both the outer and inner leaves. • First year plants are easier to kill with herbicide. Well-established thickets may need more treatments. • After slashing or burning, wait until plants have up to 1 metre of regrowth before applying herbicide. • Some blackberry species are more resistant to certain herbicides than others. Identify the species before choosing a herbicide.
Xanthium occidentale (Noogoora Burr)	Species of concern within the Riverina region (LLS, 2023)	• Susceptible to some herbicides, particularly on young plants. Directions specified on the labels and material safety data sheets must be adhered to. • Cultivation is an effective method of controlling the seedlings of these weeds. Successive flushes

Species	Weed category	Recommended control methods
		of seedlings during the summer may require follow up control. • Slashing or mowing are useful in clean-up operations after spraying with herbicide or if infestations are small and scattered. Any burrs from the plant should be removed from the equipment to prevent spread.

The infestation of weeds at the Nestrons, Moira and Pinchgut regulators increases the risk of spreading weeds to other sites within Murray River National Park and Murray River Regional Park.

The following measures may be implemented where practical, to minimise the risk of trucks, equipment and people that move between the sites spreading weeds:

- Installation and use of wash-down bays
- Cleaning of equipment used on these sites
- Boot scrub stations.

6.2.3 Safeguards

Safeguards to minimise the impacts of the revised proposal on terrestrial ecology are provided in Table 6-5. The safeguards in the existing REF will be applied to the biodiversity values in the addendum construction footprint as detailed in Section 7.3. Additional safeguards have been developed to apply specifically to the addendum construction footprint, to minimise any further impact on vegetation, particularly, hollow-bearing trees. A consolidated list of safeguards for the project is provided in Table 7-1.

Table 6-5 Additional environmental safeguards for terrestrial ecology

Impact	Safeguard	Responsibility	Timing
Impact to native plants and animals including threatened species	The Contractor will prepare a pre-clearing plan to identify areas that will be cleared for construction. This will be submitted to NPWS and NSW DCCEEW for approval. Clearing will be conducted in stages to ensure land is cleared on an as needed basis.	Contractor	Construction
	All identified hollow-bearing trees within the addendum construction footprint will be prioritised for retainment with all potential impacts (including pruning and loping of branches) to be avoided where practicable. Pruning	Contractor	Construction

Impact	Safeguard	Responsibility	Timing
	and/or lopping of branches will be preferred to removal where possible.		
	Any vegetation clearing is to be undertaken to the minimum extent necessary, with brush cutting of low-lying vegetation to be undertaken in preference to complete removal and pruning or removal of selected branches to be undertaken in preference to whole tree removal.	Contractor	Construction
Impacts from introduction and spread of weeds	Implement appropriate hygiene practices to prevent the spread of weed species, including regular cleaning of equipment used on-site, wash-down bays for vehicles and boot scrub stations.	Contractor	Construction
	Eradicate the small infestation of Arrowhead (*Sagittaria calycina var. calycina*) from the waterway at Nestrons regulator in accordance with the *Australian Weeds Strategy 2017 to 2027* (Invasive Plants and Animals Committee, 2016) and NSW WeedWise (DPI, 2023). This will involve: • Physically removing the infestation in spring/summer before seeds are produced • Checking and controlling the treated area for regrowth and new seedlings throughout construction	Contractor	Construction

6.3 Aboriginal heritage

An Aboriginal Cultural Heritage Assessment Report (ACHAR) was prepared with the existing REF. The study areas in the existing REF are no longer sufficient to allow construction of the project to be carried out. As such, the need for an ACHAR addendum was identified to assess the proposed expanded design footprint. An ACHAR addendum has been prepared and is provided in Appendix D Revised Aboriginal Cultural Heritage Assessment Report (Austral Archaeology, 2024).

A summary of the ACHAR addendum findings is included below.

6.3.1 Existing environment

The revised proposal is located within the traditional lands of the Yorta Yorta and Bangerang Aboriginal groups (Tindale, 1974). As described in Section 6.6.1.2 of the existing REF, the Murray River catchment has an extensive history of human habitation. There are a number of Aboriginal sites within the Central Murray Region, including archaeologically sensitive landforms, scarred trees and burials. These are further described in Section 6.6.1.3 of the existing REF.

A search of the Heritage NSW Aboriginal Heritage Information Management System (AHIMS) database on 4 April 2024 identified 155 previously recorded sites within a 5-kilometre radius of each of the sites in the revised proposal. Section 6.6.1.4 of the existing REF describes the general location of these sites. None of the AHIMS sites were located within the addendum construction footprints of the revised proposal and the nearest AHIMS site is approximately 300 metres from the addendum construction footprint for the works proposed to Little Edward River offtake regulator. No additional sites have been identified since expanding the construction footprint.

Archaeological investigations

Archaeological surveys were conducted by qualified archaeologists who were accompanied by registered Aboriginal parties for the:

- original construction footprint in June 2022
- proposed addendum construction footprint in March 2024

Neither survey identified any Aboriginal cultural heritage within the construction footprint and it was determined that there was low archaeological potential based on the significant ground disturbance by previous works associated with the development of water infrastructure as well as ongoing maintenance works.

As noted in Section 6.6.1.6 of the existing REF, the construction and operational footprints are considered to have moderate historical and high educational, social and spiritual significance due to their proximity to the Murray River. The heavy disturbance to these areas means they present low research value and aesthetic significance.

6.3.2 Impacts

No impacts to identified Aboriginal cultural heritage items are anticipated from the revised proposal. The revised proposal would not alter any existing Aboriginal cultural heritage or values due to the existing disturbance of the original landscape during previous works within the construction footprint.

6.3.3 Safeguards

Safeguards to minimise the impacts of the revised proposal on Aboriginal cultural heritage are provided in Section 6.6 of the existing REF. These have been included in the consolidated list of safeguards provided in Table 7-1.

6.4 Other impacts

The existing environment of other environment factors, in addition to an assessment of the expected impact of the revised proposal on these factors, is described in Table 6-6. It is considered that no additional environmental safeguards to those outlined in the existing REF and associated approval documents are required for the factors listed in Table 6-6 as a result of the revised proposal.

Table 6-6 Assessment of other environmental impacts

Environmental factor	Existing environment	Impacts of the revised proposal	Safeguards
Topography, geology and soils	A description of the existing environment relevant to the revised proposal, including a description of topography, geology and soils, is provided in Section 6.1 of the existing REF. The description provided in the existing REF accurately summarises the current conditions.	**Construction** The likely impacts of the revised proposal on topography, geology and soils are expected to be similar to those outlined and assessed in the existing REF. While the revised proposal may require a larger amount of earthworks than identified in the existing REF, this is not considered to represent more than a minor additional impact on topography, geology and soils. **Operation** Operation of the Proposal would be in accordance with the assessment provided and approved conditions of the existing REF.	No additional safeguards proposed as a result of the revised proposal.
Surface water and drainage	A description of the existing environment relevant to the revised proposal, including a description of surface water and drainage, is provided in Section 6.2 of the existing REF. The description provided in the existing REF accurately summarises the current conditions.	**Construction** The likely impacts of the revised proposal on surface water and drainage are similar to those outlined and assessed in the existing REF. The revised proposal generally involves extending the REF construction footprints and additional ground disturbance when compared with the existing REF. This could potentially increase run-off into the surrounding waterways. However, with the implementation of	No additional safeguards proposed as a result of the revised proposal.

Environmental factor	Existing environment	Impacts of the revised proposal	Safeguards
		drainage control measures as described in Table 7-1, the revised proposal is only considered to represent a very small increase in impact on surface water run-off when compared with the existing REF. No additional impacts on surface water and drainage are expected as a result of the revised proposal. **Operation** The revised proposal design changes to the Nestrons, Pinchgut and Little Edward River offtake regulators would not impact operational impacts. The lower invert level (92.25 m AHD to 92.15 m AHD) would decrease the Moira regulator's commence to flow to about 2,500 megalitres per day in the Murray River (decreased from 2,800 megalitres per day in the existing REF). This decrease under the revised proposal is likely to improve fish passage and provide greater operational flexibility by allowing the regulator to pass flows during low flow conditions. However, as the proposed regulator would be operated in a similar manner to the existing regulator, negligible changes to flow regimes are anticipated during operation.	

Environmental factor	Existing environment	Impacts of the revised proposal	Safeguards
		Operation of the Proposal would be in accordance with the assessment provided and approved conditions of the existing REF.	
Groundwater	A description of the existing environment relevant to the revised proposal, including a description of groundwater, is provided in Section 6.3 of the existing REF. The description provided in the existing REF accurately summarises the current conditions.	**Construction** The likely impacts of the revised proposal on groundwater are similar to those outlined and assessed in the existing REF. No additional impacts on groundwater are expected as a result of the revised proposal. **Operation** Operation of the Proposal would be in accordance with the assessment provided and approved conditions of the existing REF.	No additional safeguards proposed as a result of the revised proposal.
Aquatic biodiversity	A description of the existing environment relevant to the revised proposal, including a description of aquatic biodiversity, is provided in Section 6.5 of the existing REF. The description provided in the existing REF accurately summarises the current conditions.	**Construction** The revised proposal may result in a negligible, localised increase in erosion and surface runoff along with potential impacts to aquatic habitat due to additional vegetation clearing and ground disturbance. Additional minor impacts to aquatic biodiversity due to the revised proposal would be temporary and incremental to those assessed in the existing REF.	No additional safeguards proposed as a result of the revised proposal.

Environmental factor	Existing environment	Impacts of the revised proposal	Safeguards
		Operation The revised proposal would potentially result in additional benefits to the aquatic ecosystem, with minimal adverse impacts to aquatic habitat values. It is expected that changes to the fishways and invert levels would provide marginally longer flow duration in low flow conditions. The use of combination gates (when operated in over-shot mode) across the structures and revised culvert design would improve fish passage in and out of Millewa Forest by reducing shear stress and pressure changes through the gates and improving natural light through the fishway. Overall, operation of the Proposal would be in accordance with the assessment provided and approved conditions of the existing REF.	
Air quality	A description of the existing environment relevant to the revised proposal, including a description of air quality, is provided in Section 6.8 of the existing REF. The description provided in the existing REF accurately summarises the current conditions.	**Construction** The revised proposal may result in a negligible, localised increase in machinery emissions and the generation of dust during vegetation removal. These impacts are similar to those outlined and assessed in the existing REF.	No additional safeguards proposed as a result of the revised proposal.

Environmental factor	Existing environment	Impacts of the revised proposal	Safeguards
		Operation The revised proposal would not impact on operational air quality. Operation of the Proposal would be in accordance with the assessment provided and approved conditions of the existing REF.	
Waste, contamination and hazardous materials	A description of the existing environment relevant to the revised proposal, including a description of waste contamination and hazardous materials, is provided in Section 6.14 of the existing REF. The description provided in the existing REF accurately summarises the current conditions.	**Construction** Additional minor impacts on waste due to the revised proposal would be incremental to those assessed in the existing REF. **Operation** No impacts to waste and contamination are anticipated from the revised proposal during operation. Operation of the Proposal would be in accordance with the assessment provided and approved conditions of the existing REF.	No additional safeguards proposed as a result of the revised proposal.
Historic heritage	A description of the existing environment relevant to the revised proposal, including a description of historic heritage, is provided in Section 6.7 of the existing REF. The description provided in the existing REF accurately summarises the current conditions.	**Construction** The likely impacts of the revised proposal on historic heritage are similar to those outlined and assessed in the existing REF. **Operation**	No additional safeguards proposed as a result of the revised proposal.

Environmental factor	Existing environment	Impacts of the revised proposal	Safeguards
		No previously identified items of historic heritage significance are located near the revised proposal. The revised proposal is therefore not expected to impact on any items of historic heritage significance.	
Noise and vibration	A description of the existing environment relevant to the revised proposal, including a description of noise and vibration, is provided in Section 6.9 of the existing REF. The description provided in the existing REF accurately summarises the current conditions.	**Construction** The revised proposal may result in a negligible, localised increase in noise and vibration from machinery during vegetation removal and concrete production when compared with the assessment provided in the existing REF. While the need for additional vegetation removal and concrete production may extend the duration of noise and vibration impacts, the overall level of impact is similar to that outlined and assessed in the existing REF. **Operation** The revised proposal would not impact operational noise and vibration. Operation of the Proposal would be in accordance with the assessment provided and approved conditions of the existing REF.	No additional safeguards proposed as a result of the revised proposal.
Traffic and access	A description of the existing environment relevant to the revised proposal, including a description of traffic and access, is provided in Section 6.10 of the existing REF. The	**Construction**	No additional safeguards proposed as a result of the revised proposal.

Environmental factor	Existing environment	Impacts of the revised proposal	Safeguards
	description provided in the existing REF accurately summarises the current conditions.	The revised proposal may result a negligible, localised increase in the amount of traffic to site due to the need for increased materials. The revised proposal would be carried out in accordance with the traffic and access provisions of the existing REF. **Operation** Operation of the Proposal would be in accordance with the assessment provided and approved conditions of the existing REF.	
Visual amenity	A description of the existing environment relevant to the revised proposal, including a description of visual amenity, is provided in Section 6.11 of the existing REF. The description provided in the existing REF accurately summarises the current conditions.	**Construction** The revised proposal is expected to result in minor, localised impacts on visual amenity at the sites through the removal of additional vegetation to that assessed in the existing REF. However, there would be negligible public visibility of the construction work sites during the construction phase because Millewa River Road would be temporarily closed to through traffic for Nestrons and Pinchgut regulators. Little Edwards Road and the picnic area would be closed to the public for Little Edward River offtake regulator. Moira regulator is not publicly accessible.	No additional safeguards proposed as a result of the revised proposal.

Environmental factor	Existing environment	Impacts of the revised proposal	Safeguards
		Operation The revised proposal is expected to result in a small additional impact on visual amenity during operation due to the increased area of vegetation removal (which would reduce over time) as well as a minor increase in the scale of the regulators, especially Moira.	
Hazard	A description of the existing environment relevant to the revised proposal, including a description of potential hazards, is provided in Section 6.12 of the existing REF. The description provided in the existing REF accurately summarises the current conditions.	**Construction** Hazards arising from the revised proposal are similar to those outlined in the existing REF. The revised proposal would not increase hazardous conditions or result in a reduction in safety when compared with the assessment provided in the existing REF. **Operation** Operation of the Proposal would be in accordance with the assessment provided and approved conditions of the existing REF.	No additional safeguards proposed as a result of the revised proposal.
Socio-economic	A description of the existing environment relevant to the revised proposal, including a description of socio-economic factors, is provided in Section 6.13 of the existing REF.	**Construction**	No additional safeguards proposed as a result of the revised proposal.

Environmental factor	Existing environment	Impacts of the revised proposal	Safeguards
	The description provided in the existing REF accurately summarises the current conditions.	The likely impacts of the revised proposal on socio-economic factors are similar to those outlined and assessed in the existing REF. The revised proposal is not expected to impact on socio-economic factors. **Operation** Operation of the Proposal would be in accordance with the assessment provided and approved conditions of the existing REF.	
Land use	A description of the existing land use is provided in Section 3.1 of the existing REF. The description provided in the existing REF accurately summarises the current conditions.	**Construction** The revised proposal is not expected to impact on existing land use. Construction will be concentrated at the site of the existing regulators. Temporary closure of Millewa River Road is provided in the existing REF. This would limit the public's ability to access the Murray River in a vehicle, however, these sections of the river foreshore would remain accessible on foot or from the river. The Little Edward River camp ground would also be temporarily closed. The revised proposal is not expected to further impact existing land use.	

Environmental factor	Existing environment	Impacts of the revised proposal	Safeguards
		Operation No impacts to existing land use are anticipated from the revised proposal during operation. Operation of the refurbished and replacement regulators has not been subject to change. The existing REF does not propose to change the way the regulators are operated.	
Cumulative	A description of the existing environment relevant to the revised proposal, including a description of cumulative impacts, is provided in Section 6.15 of the existing REF. The description provided in the existing REF accurately summarises the current conditions.	**Construction** The likelihood of the revised proposal to result in cumulative impacts is similar to the assessment provided in the existing REF. **Operation** Operation of the Proposal would be in accordance with the assessment provided and approved conditions of the existing REF.	No additional safeguards proposed as a result of the revised proposal.

7 Environmental management

7.1 Construction environmental management

A construction environmental management plan (CEMP) is to be prepared by the successful construction contractor for the Millewa Forest Supply Project prior to commencement. The CEMP will detail effective, site-specific Safeguards (based on the existing REF and this Addendum REF) to monitor and control environmental impacts throughout the construction phase of the project and to ensure compliance with all legislation approval requirements.

7.2 Operational environmental management

The revised proposal would result in minor changes to the operational functionality of the proposed regulators. However, following construction completion, the Project would be operated in accordance with the provisions of the existing REF. A suite of operational management documents including an overarching operational management framework and site-specific operational and maintenance manuals are currently being developed for the Project in consultation with key stakeholders including WaterNSW and NPWS, however, is not available at the time of preparing this Addendum REF.

7.3 Summary of safeguards

Site-specific safeguards have been developed in consultation with NPWS and NSW DCCEEW and in reference *to the* NSW Government's environmental management guidelines *EMS-WG-TEM-04-10 – environmental management measures.*

Environmental safeguards identified in the existing REF are reproduced Table 7-1. Additions or revisions to these safeguards, or new safeguards as a result of the revised proposal are identified in **bold underlined** text. The relevant final NPWS conditions of consent for the existing REF have also been included and are identified in underlined text. Environmental safeguards identified in the existing REF which are either considered to be redundant or no longer applicable to the Project are identified in ~~strikethrough~~ text. As a result, Table 7-1 represents the final consolidated list of safeguards for the project.

Table 7-1 Consolidated list of safeguards

Impacts	Safeguards	Responsibility	Timing
Topography, geology and soils			
Erosion and sediment	An erosion and sediment control plan will be prepared as part of the contractor's CEMP. Site specific erosion and sediment control measures will be designed, implemented and maintained in accordance with relevant sections of *Managing Urban Stormwater: Soil and Construction Volume 1* (Landcom, 2004) (the Blue Book). The erosion and sediment control plan will provide details of the cofferdams to be installed upstream and downstream of instream work sites and the strategies that will be implemented to stabilise soils during the construction phase.	Contractor	Construction
Surface water and drainage			
Impact of construction activities and mobilising sediment	Erosion and sediment control measures will be implemented to stabilise ground surfaces disturbed during the construction phase and will include but not be limited to: • Sediment fences along the clearing boundaries • Stockpiling materials on site for the shortest time feasible • Contouring disturbed areas of waterway beds and banks to reinstate natural contours or otherwise in accordance with the design drawings • Covers on truck loads when transporting loose material • Covers on (or watering of) stockpiles. Where feasible, these control measures will be in place before any vegetation clearing or earthwork starts and will remain in place	Contractor	Detailed design Construction

Impacts	Safeguards	Responsibility	Timing
	throughout the construction phase until the site rehabilitation plan has been fully implemented.		
Instream works	The construction soil and water management plan will include contingency measures in the event of high flows in the Murray River during the construction works.	Contractor	Construction
	Control measures to manage potential pollution or sedimentation impacts from instream works will include but not be limited to: • Floating silt fences • Cofferdams to create dry sites for instream works • Undertake work when flows are low/dry for a suitable duration to complete work • Develop contingencies for unexpected moderate to high flows in the Murray River during instream works. Control measures will be in place prior to commencement of any instream works.	Contractor	Detailed design Construction
Spills and leaks	An emergency spill response procedure will be prepared in accordance with the NSW DCCEEW's incident management protocols to minimise the impact of accidental spillages of fuels, chemicals and fluids during construction Hazardous materials such as oils, chemicals and refuelling activities will occur in bunded areas and as far from waterways as feasible.	Contractor	Detailed design Construction

Impacts	Safeguards	Responsibility	Timing
Concrete works	Bunded receptacles for concrete waste including concrete slurries and washout water will be provided at the work sites to capture, contain and appropriately dispose of any concrete waste at a suitably licensed waste facility. These will be located as far from waterways as feasible Concrete elements of the replacement and refurbished regulators will be prefabricated, where practicable.	Contractor	Detailed design Construction
Dewatering of in-stream work areas	A construction soil and water management plan will be prepared as part of the CEMP and will outline procedures and water quality standards (ANZG, 2018) to be achieved prior to dewatering within the cofferdam areas (dry work areas), if required.	Contractor	Detailed design Construction
Water release from water quality controls during construction	The construction soil and water management plan will outline procedures (as per the Blue Book) and water quality standards (ANZG, 2018) to be achieved prior to discharging water to waterways.	Contractor	Detailed design Construction
Water quality monitoring	Visual monitoring of local water quality (e.g. turbidity, hydrocarbon spills/slicks) will be carried out daily during construction to identify any potential spills or deficient erosion and sediment controls. Should a change in water quality appear evident samples will be collected and analysed.	Contactor	Construction

Impacts	Safeguards	Responsibility	Timing
Groundwater			
Groundwater ingress into the work site during construction	Any groundwater that enters excavations within the work sites will be tested and, if suitable, pumped into nearby waterways or otherwise pumped into a treatment pond and treated before being discharged into nearby waterways. If treatment ponds are proposed they must be located within the construction footprints and their location, size and proposed uses must be documented in the construction soil and water management plan. The construction soil and water management plan will include water quality criteria for any water to be discharged into nearby waterways.	Contractor	Construction
Terrestrial biodiversity			
Impact to surrounding vegetation	The approved construction footprints will be accurately and clearly marked out by a surveyor using flagging tape and signage prior to the start of works. The signage will prohibit any access or construction work outside the construction footprints. The biodiversity management plan will specify the type of flagging and signage required to delineate the approved construction footprints.	Contractor	Prior to construction
	The vegetation clearing boundary at each work site will be accurately and clearly marked out using flagging tape prior to the start of works. The clearing boundaries must not extend outside the approved construction footprints. The biodiversity management plan will specify the type of flagging required to delineate the clearing boundaries.	Contractor	Prior to construction

Impacts	Safeguards	Responsibility	Timing
	If there are opportunities to not clear the entire approved construction footprints, preference should be given to avoiding clearing of areas containing established trees (including hollow-bearing trees) and good quality native vegetation and instead concentrate clearing to areas of the footprints that are subject to previous disturbance. To assist in this process, the biodiversity management plan will include figures of the approved construction footprints showing the locations of hollow-bearing trees, vegetation communities; important flora and fauna habitat areas; and locations where threatened species, populations or ecological communities have been recorded.		
	Materials, plant, equipment, work vehicles and stockpiles will be stored, parked or placed as applicable within the clearing boundaries or on existing access tracks at or leading to the works sites that are temporarily closed to traffic and as a result are available for the sole use of the contractor.	Contractor	Construction
	Where feasible, materials, plant, equipment, work vehicles and stockpiles will be stored, parked or placed as applicable away from the driplines of trees that are outside the clearing boundaries or that are within the clearing boundaries but proposed for retention.	Contractor	Construction
	If any damage occurs to vegetation outside the approved construction footprints it is to be reported and managed as an environmental incident in accordance with the environmental incident management procedure contained in the CEMP. The NSW DCCEEW and NPWS will be notified so	Contractor, NSW DCCEEW	Construction

Impacts	Safeguards	Responsibility	Timing
	that appropriate remediation strategies can be developed and implemented.		
	Construction personnel will be informed of the environmentally sensitive aspects of the construction footprints, including being shown plans of directly impacted and adjoining areas that identify vegetation communities; important flora and fauna habitat areas; and locations where threatened species, populations or ecological communities have been recorded.	Contractor	Construction
Impact to native plants and animals including threatened species	A pre-clearing inspection will be undertaken 48 hours prior to any native vegetation clearing by a suitably qualified ecologist and the Contractor's Environmental Manager (or delegate). The pre-clearing inspection at each work site will include, as a minimum: • A check of the physical demarcation of the clearing boundary and construction footprint • Identification of trees that are just outside the marked clearing boundary that require protection to avoid unintended damage during the clearing and subsequent construction works • Identification of hollow bearing trees that need to be removed in accordance with the hollow-bearing tree removal procedure (see below) • Identification of other habitat features that may need to be relocated outside the clearing boundary • Identification of any threatened flora and fauna	Contractor	Construction

Impacts	Safeguards	Responsibility	Timing
	• Implementation of the erosion and sediment control plan for the work site, including erosion control structures. • The completion of the pre-clearing inspection will form a hold point requiring sign-off from the NSW DCCEEW.		
	The Contractor will prepare a pre-clearing plan to identify areas that will be cleared for construction. This will be submitted to NPWS and NSW DCCEEW for approval. Clearing will be conducted in stages to ensure land is cleared on an as needed basis.		
	All identified hollow-bearing trees within the addendum construction footprint will be prioritised for retainment with all potential impacts (including pruning and loping of branches) to be avoided where practicable. Pruning and/or lopping of branches will be preferred to removal where possible.	Contractor	Construction
	Any vegetation clearing is to be undertaken to the minimum extent necessary, with brush cutting of low-lying vegetation to be undertaken in preference to complete removal and pruning or removal of selected branches to be undertaken in preference to whole tree removal.	Contractor	Construction
	Trees within the construction footprints that do not require felling will be protected during the construction phase in accordance with Australian Standard 4970-2009 *Protection of Trees on Development Sites*.	Contractor	Construction

Impacts	Safeguards	Responsibility	Timing
	If hollow-bearing trees require removal the following procedure will be followed: • Non-hollow bearing trees and vegetation surround a hollow-bearing tree will be removed first. Trees should be felled into the construction footprint to avoid damaging adjacent vegetation • Leave the hollow-bearing tree standing for at least one night after other clearing to allow any fauna using the hollows to leave • An NPWS ranger or suitably qualified ecologist is to be present during felling of hollow-bearing trees • Before felling a hollow-bearing tree, tap along the trunk using an excavator or loader to scare fauna from the hollows. Repeat several times • After felling a hollow-bearing tree check its hollows and surrounds to ensure no fauna have become trapped or injured. Any fauna found should be safely located to nearby habitat by the attending NPWS ranger or ecologist • If a hollow-bearing tree is removed in stages the non-hollow-bearing branches should be removed before the hollow-bearing branches are removed. In consultation with NPWS, felled hollow-bearing trees should be cut into sections and the sections with hollows prioritised for placement into the	Contractor	Construction

Impacts	Safeguards	Responsibility	Timing
	surround forest to provide additional potential habitat for ground dwelling fauna such as reptiles and small mammals.		
	The biodiversity management plan will include a procedure for dealing with the presence of native fauna species within the construction footprints during the construction works. The procedure will require construction work at the site of the find to immediately cease and the subject animal allowed to leave the construction footprint without being harassed. If an animal needs to be relocated to outside a construction footprint, the contractor is to notify the NSW DCCEEW and they will in turn notify NPWS to agree on appropriate mitigation measures (including relocation measures). The contractor will only restart work at the subject site when authorised by the NSW DCCEEW.	Contractor	Construction
	Construction and worker vehicles and machinery will be checked at the start and end of each workday to ensure fauna are not entrapped.	Contractor	Construction
	Construction during the Superb Parrot breeding period (September to January) will be avoided if possible. If this cannot be achieved, this species will be considered during pre-clearing surveys to ensure that no impacts will occur.	Contractor	Construction
Impacts to habitat features	Relocation of habitat features (e.g., fallen timber, hollow logs) from within the clearing boundary will occur in accordance with an approved project-specific procedure to be included in the biodiversity management plan.	Contractor	Construction

Impacts	Safeguards	Responsibility	Timing
Impacts from introduction and spread of weeds	Weed management will be undertaken in consultation with NPWS in areas affected by construction prior to any clearing works in accordance with the *Biosecurity Act 2015* to minimise the risk of weeds being spread to the surrounding environment; including during transport of waste off-site to a licensed waste disposal facility.	Contractor	Construction
	All weeds, propagules, other plant parts and/or excavated topsoil material that is likely to be infested with weed propagules will be treated on site or bagged, removed from site, and disposed of at a suitably licensed waste facility. If pesticide use is proposed it must occur in accordance with NPWS's requirements including the *Pesticide Use Notification Plan* (NPWS, 2022).	Contractor	Construction
	Implement appropriate hygiene practices to prevent the spread of weed species, including regular cleaning of equipment used on-site, wash-down bays for vehicles and boot scrub stations.	Contractor	Construction
	Eradicate the small infestation of Arrowhead (Sagittaria calycina var. calycina) from the waterway at Nestrons regulator in accordance with the Australian Weeds Strategy 2017 to 2027 (Invasive Plants and Animals Committee, 2016) and NSW WeedWise (DPI, 2023). This will involve: • Physically removing the infestation in spring/summer before seeds are produced • Checking and controlling the treated area for regrowth and new seedlings throughout construction	Contractor	Construction

Impacts	Safeguards	Responsibility	Timing
Impacts from introduction and spread of plant pathogens	All vehicles and machinery engaged in earthworks and vegetation clearance activities will follow the Myrtle Rust hygiene protocol for vehicles and heavy machinery in Table 5 of the *Hygiene Guidelines* (Department of Planning, Industry and Environment, 2020).	Contractor	Construction
Wildlife impacts from vehicle strike	Drivers must stay vigilant for fauna during machinery operation and vehicle movements.	Contractor	Construction
Aquatic biodiversity			
Interactions with fauna during construction	A pre-construction survey will be undertaken in areas that will be enclosed by cofferdams.	Contractor	Prior to construction
	A fish screen will be installed on pumps to prevent entrainment of fish into pumps during dewatering.	Contractor	Construction
	The biodiversity management plan will include a procedure for dealing with the presence of native fauna species within the construction footprints during the construction works. The procedure will require construction work at the site of the find to immediately cease and the subject animal allowed to leave the construction footprint without being harassed. Where assistance is required to relocate an animal, the contractor is to notify the NSW DCCEEW and they will in turn notify NPWS to agree on appropriate mitigation measures (including relocation measures). The	Contractor	Prior to construction

Impacts	Safeguards	Responsibility	Timing
	contractor will only restart work at the subject site when authorised by the NSW DCCEEW.		
Removal of snags, riparian and instream vegetation	Large woody debris, snags and native aquatic vegetation will be relocated (where possible outside the breeding season of spring and summer) from instream work sites (including at cofferdams if required) to suitable locations upstream and/or downstream in consultation with a qualified ecologist, NPWS and WaterNSW. Relocation of these aquatic habitat features from dry in-stream work sites will occur after aquatic fauna salvage and dewatering.	Contractor	Construction
	Rehabilitation of disturbed areas of riparian and instream vegetation will be undertaken as soon as practicable, progressively and in accordance with a site rehabilitation plan prepared as part of the CEMP and in consultation with NPWS and WaterNSW. Where possible, woody debris, snags and native instream vegetation that was removed to make way for instream work sites will be used in the rehabilitation works.	Contractor	Construction
	Rehabilitation of the construction footprints will involve replacing and stabilising topsoil and re-planting native trees and plants.	Contractor	Construction
Sediment build-up in the fishways	Inspections and maintenance of the fishways will be carried out on a regular basis to ensure that fish passage is not obstructed.	WaterNSW	Operation
Ongoing monitoring of fishways and	Existing aquatic species monitoring at Millewa Forest as part of The Living Murray initiative will document impacts/benefits on the aquatic ecosystem due to the replacement and refurbished regulators.	NPWS, in liaison with Arthur Rylah Institute for	Operation

Impacts	Safeguards	Responsibility	Timing
nearby waterways		Environmental Research	
Invasive species	An ongoing management response should be adopted to mitigate movement and proliferation of invasive aquatic species in the floodplain environments.	NPWS	Operation
Aboriginal heritage			
Unexpected finds	Unexpected Aboriginal cultural heritage finds will be managed in accordance with NPWS's Unexpected Finds Protocol – Aboriginal Cultural Heritage, which is provided as an appendix to the Existing REF and summarised below. **Aboriginal objects** If an Aboriginal object is discovered during construction, all works in this location must stop and no further harm must occur to the area. The find must be left in place and protected from any further harm. Notify the NSW DCCEEW Project Manager of the find, who in turn will notify NPWS, WaterNSW's heritage officer, Heritage NSW, and the Environment Line (13 15 55) and arrange for a qualified archaeologist and representatives of the registered Aboriginal parties to inspect the find. If they confirm that the find is an Aboriginal object, the item will be recorded on AHIMS, agreement reached on its management, and an application made for an Aboriginal heritage impact permit. **Aboriginal human/ancestral skeletal remains**	Contractor, NSW DCCEEW	Construction

Impacts	Safeguards	Responsibility	Timing
	If Aboriginal human/ancestral skeletal remains are discovered, all work in the vicinity of the remains must stop. Notify the NSW DCCEEW Project Manager of the find, who in turn will notify NSW Police if the material is determined to be of human origin and less than 100 years old, or NPWS Aboriginal Partnerships and Heritage Unit, WaterNSW's heritage officer, and Heritage NSW if the remains are believed to be Aboriginal. If in doubt or required by NSW Police, the NSW DCCEEW will obtain specialist advice from a forensic anthropologist or bioarchaeologist to confirm that the bones are human, their age and whether they are Aboriginal or not. The remains must be left in place and protected from further harm or damage or unauthorised access until further advice states otherwise. If the remains are confirmed to be Aboriginal, the NSW DCCEEW will notify the RAPs. Aboriginal ancestral remains will be recorded in a culturally appropriate manner in collaboration with Heritage NSW and the registered Aboriginal parties. Work will not recommence at the location until authorised in writing by Heritage NSW if the remains are considered by the NSW Police and Heritage NSW to be Aboriginal.		
Historic heritage			
Unexpected finds	If historical archaeological relics are discovered during construction, all work will cease in the area. The contractor will notify the NSW DCCEEW Project Manager, who in turn will notify NPWS and WaterNSW's heritage officer. A historical archaeologist will be engaged to assess the item's significance.	Contractor, NSW DCCEEW	Construction

Impacts	Safeguards	Responsibility	Timing
Air quality			
Dust generation during construction	Work methods will be modified during high wind conditions if excessive dust is generated.	Contractor	Construction
	All vehicles on site will be confined to designated routes.	Contractor	Construction
	Reduce vehicle speeds to minimise dust emissions.	Contractor	Construction
	Visual monitoring for dust will be implemented during the works. Where required, a hose or water cart would be used to regularly wet down haulage access tracks, work sites and laydown areas.	Contractor	Construction
Vehicle emissions	Trips and trip distances will be controlled and reduced where possible, for example by coordinating delivery and removal of materials to avoid unnecessary trips.	Contractor	Construction
	Minimise engine idling and ensure vehicle engines are switched off when stationary or parked within ancillary facilities or construction zones.	Contractor	Construction
Noise and vibration			
Construction noise and vibration	Inform the local community of the potential impact of increased heavy vehicle traffic during the construction phase, including potential noise impacts.	NSW DCCEEW	Construction
	Unless otherwise approved by the NSW DCCEEW through an out of hours application process, construction hours will be limited to: • Monday to Friday: 7 am to 6 pm • Saturday: 8 am to 5 pm	Contractor	Construction

Impacts	Safeguards	Responsibility	Timing
	• No construction work on Sundays or public holidays.		
	All site personnel will be made aware of noise issues and mitigation measures through induction processes.	Contractor	Construction
	All machinery will be well maintained and in good working order. All vehicles and equipment will be fitted with silencing devices, where applicable.	Contractor	Construction
Traffic and access			
Construction traffic	A construction traffic management plan will be prepared as part of the CEMP. The plan will include: • A driver code of conduct • Confirmation of haulage routes and access locations • Measures to maintain access and capacity to existing roads where possible • Traffic control measures including signage at appropriate locations to notify road users of increased traffic volumes and construction vehicles • Management of oversized vehicles • A response plan for any construction-related traffic incidents.	Contractor	Construction
	Consultation with NPWS and Murray River Council will be undertaken to minimise the impacts to the surrounding road network during construction including temporary access tracks or road closures. Any	Contractor	Construction

Impacts	Safeguards	Responsibility	Timing
	agreed traffic management measures will be incorporated into the construction traffic management plan.		
Visual			
Visibility of construction works	During construction, all equipment, materials and temporary facilities, such as site offices and portable toilets, will be located within the designated construction footprints for the works.	Contractor	Construction
	The construction work sites will be clearly demarcated and maintained in an orderly manner.	Contractor	Construction
	All construction equipment will be removed from the park as soon as it is not required, including any material and refuse related to the works.	Contractor	Construction
Revegetation	A site rehabilitation plan will be prepared as part of the CEMP. The site rehabilitation plan will detail how the work sites will be stabilised and revegetated once the new infrastructure is built. A draft site rehabilitation plan will be provided to NPWS and WaterNSW for comment and any comments provided will be addressed in the final version of the plan. Rehabilitation of the construction footprints including revegetation will be carried out as soon as practicable.	NSW DCCEEW, Contractor	Construction
Hazards			
	The following controls will be implemented to mitigate potential for fires and increased bush fire risk during construction:	Contractor	Construction

Impacts	Safeguards	Responsibility	Timing
Bushfire risk during construction	• No stockpiling or burning of waste vegetation to occur onsite • Daily weather checks will be undertaken during the pre-start meeting to note for potential fire danger • Any notices erected, displayed or issued by NPWS regulating the use of fire in the park will be complied with • Hot works and machinery which may result in sparking or ignition must not be used on a Total Fire Ban Day without an exemption from the NSW Rural Fire Service • Fuel and other similar flammable materials, such as gas cylinders and paint, will be stored in appropriate fire-resistant storage containers • Appropriate firefighting equipment (e.g., water pump, extinguisher and hand tools) should be available on site along with trained staff • Stationary plant will be parked in cleared areas • No smoking on site in accordance with section 19 of the NPW Regulation.		
	All works will be undertaken in accordance with the operational guidelines under the *Murray Valley National and Regional Parks (Millewa, Moira and Gulpa Islands Precincts) Fire Management Strategy* which includes provisions pertaining to operation of earthmoving equipment and visitor management.	Contractor	Construction
Emergency response	Emergency contacts and response procedures will form part of the CEMP and site inductions.	Contractor	Construction

Impacts	Safeguards	Responsibility	Timing
Socio-economic			
Irrigation flows in the Murray and Edward Rivers	The construction soil and water management plan will include contingency measures in the event of the construction works being carried out during the irrigation season when irrigation water deliveries are being made via the Murray and Edward Rivers.	Contractor	Construction
Waste, contamination and hazardous materials			
Spoil generation	Where feasible, suitable excavated spoil material will be reused onsite as backfill and/or for construction of cofferdams.	Contractor	Construction
Beneficial reuse onsite	Cleared vegetation suitable for use in the rehabilitation works (e.g. fallen logs that could provide habitat) will be retained on site for later reuse in accordance with the site rehabilitation plan. Other cleared vegetation will be mulched and either disposed off-site at a suitably licensed waste facility or, if requested by and agreed with NPWS, made available for NPWS to reuse within Murray Valley National Park and Regional Park.	Contractor	Construction
	Earth removed that is surplus to the requirements of the site where it was excavated and which can be classified as virgin excavated natural material or excavated natural material could be used for other works proposed in Millewa Forest as part of the Millewa Forest Supply Project, or otherwise disposed off-site at an appropriately licensed waste facility.	Contractor	Construction
Hazardous materials	All hazardous materials will be stored in accordance with existing or agreed NPWS procedures.	Contractor	Construction

Impacts	Safeguards	Responsibility	Timing
Accidental spills	All contractors and staff will be appropriately trained through a site induction and toolbox talks to prevent, minimise and manage accidental spills.	Contractor	Construction
	Machinery will be inspected daily to ensure no oil, fuel or lubricants are leaking from the machinery. Machines will be maintained as per manufacturers specifications.	Contractor	Construction
	To avoid release to the environment, all waste hazardous materials (fuels, lubricants, herbicides, etc.) will be disposed off-site in accordance with Environment Protection Authority guidelines.	Contractor	Construction
	Spill response procedures will follow existing or agreed NPWS procedures.	Contractor	Construction
	Mobile spill kits fully stocked with adequate spill prevention and absorbent materials (including absorbent pads, granular absorbent and disposal bags) will be maintained onsite and on construction vehicles carting hazardous materials.	Contractor	Construction
	Refuelling of all vehicles and mobile equipment will occur at least 20 metres away from any drainage lines or waterways and with suitable bunding/controls.	Contractor	Construction
Soil contamination	If suspected soil contamination is encountered, the suspect materials should be segregated and placed in a designated bunded stockpile covered in plastic sheeting to prevent rainfall infiltration and/or soil migration during windy conditions.	Contractor	Construction

Impacts	Safeguards	Responsibility	Timing
Generation of construction waste	All waste material generated will be handled and disposed of carefully to minimise the risk of pollution.	Contractor	Construction
	All construction and demolition materials able to be recycled shall be separated and recycled at approved facilities or reused onsite.	Contractor	Construction
	All demolition material and waste materials will be classified in accordance with the *Waste Classification Guidelines* (Environment Protection Authority, 2014), removed from the site in a timely manner, and disposed of at a suitability-licensed waste disposal facility.	Contractor	Construction
	Records of waste classification and disposal dockets will be maintained.	Contractor	Construction
Material usage	Preferential use of fabricated and precast materials will be integrated into the detailed design to minimise onsite construction waste and optimise material usage.	NSW DCCEEW	Detailed design

8 Conclusion

8.1 Justification

An revised proposal to the approved Millewa Forest Supply Project is required to enable construction of the project and incorporate design changes from DPI (Fisheries). The revised proposal extends the proposed construction footprints. It also includes a replacement, rather than refurbishment, of the Moira regulator, and minor design changes to the fishway, box culvert and regulator arrangements of the Pinchgut, Nestrons and Little Edward River offtake regulators. The revised proposal will allow the objectives of the Millewa Forest Supply Project as described in Section 2.1 of the existing REF to be achieved.

The revised proposal would result in minor additional impacts to the environment to those approved in the existing REF. Most notably, as a conservative worst-case scenario the revised proposal would require the removal of up to around 3.09 hectares of native vegetation (increased from 0.95 hectares) as described in Chapter 6 of this Addendum REF.

The revised proposal is considered justified as it is required to achieve the objectives of the Millewa Forest Supply Project and would have only a minor additional impact on the environment when compared with the existing REF.

8.2 Ecological sustainable development

Ecologically sustainable development is development that improves the total quality of life, both now and in the future. Achieving ecologically sustainable development is guided by four main principles. The principles, and how the revised proposal relates to them, are discussed below.

8.2.1 The precautionary principle

The precautionary principle deals with reconciling scientific uncertainty about environmental impacts with certainty in decision-making. It provides that where there is a threat of serious or irreversible environmental damage, the absence of full scientific certainty should not be used as a reason to postpone measures to prevent environmental degradation.

This Addendum REF has assessed the potential environmental impacts of the revised proposal and identified additional environmental safeguards to control these impacts. The revised proposal is not considered to present a threat of serious or irreversible environmental damage. Scientific

uncertainty would not postpone the implementation of any safeguards identified in this Addendum REF.

8.2.2 Inter-generational equity

Social equity is concerned with the distribution of economic, social and environmental costs and benefits. Inter-generational equity introduces a temporal element with a focus on minimising the distribution of costs to future generations.

The revised proposal is not expected to adversely impact on the health, diversity or productivity of the environment for future generations. The Millewa Forest Supply Project (and consequently the revised proposal) and broader Millewa Forest Supply Project aim to improve the ecosystem health of Millewa Forest and is therefore considered to represent a positive impact on intergenerational equity by maintaining ecosystem health for future generations.

8.2.3 Conservation of biological diversity and ecological integrity

The conservation of biological diversity and ecological integrity provides that the diversity of genes, species, populations and communities, as well as the ecosystems and habitats to which they belong, must be maintained and improved to ensure their survival.

An assessment of the existing ecological conditions of the proposed construction footprint has been carried out to identify and manage any potential impact of the revised proposal on local biodiversity and ecological integrity. The potential impacts of the revised proposal on biodiversity would be limited to the construction phase and would involve the removal of up to 24 additional hollow bearing trees and around 2.14 hectares of additional native vegetation. The revised proposal is not considered to represent a significant impact on a threatened or migratory species listed under the EPBC Act, or any threatened species listed under the BC Act.

In the long term, the revised proposal is expected to improve the ecological integrity of Millewa Forest and surrounding biodiversity by supporting the objectives of the Millewa Forest Supply Project.

8.2.4 Improved valuation and pricing of environmental resources

The principle of internalising environmental costs into decision making requires consideration of all environmental resources which may be affected by the carrying out of a project, including air, water, land and living things.

This Addendum REF has examined the potential environmental impacts of the revised proposal (including on air, water, land and living things) and identified safeguards where there is the potential for adverse impacts. The implementation of safeguards to protect environmental resources is

considered to represent the internalisation of environmental costs by NSW DCCEEW as a result of the revised proposal.

8.3 Conclusion

Currently, construction of the Millewa Forest Supply Project is constrained by an approved construction footprint that is too small to construction the proposed infrastructure as designed. The revised proposal would extend the proposed construction footprint and allow for minor design changes that improve fish passage, operational flexibility and asset life of the regulators. The most notable change is the replacement, rather than refurbishment of the Moira regulator.

The revised proposal meets the objectives of the Millewa Forest Supply Project by allowing the works described in the existing REF to be carried out with the current design and construction methodology.

The revised proposal would result in a minor increase in the amount of vegetation clearance and ground disturbance carried out for the project, clearing of up to 2.14 hectares of additional native vegetation and minor additional ground disturbance impacts during the construction phase. Environmental safeguards provided in this Addendum REF would ameliorate or minimise these expected impacts.

This Addendum REF has examined and considered all relevant location, state and commonwealth legislation and policies, and all matters affecting and likely to affect the environment as a result of the revised proposal.

This Addendum REF has been prepared in accordance with section 5.5 of the EP&A Act. It has concluded that the revised proposal is unlikely to have a significant impact on the environment, therefore an environmental impact statement under section 5.7 of the EP&A Act is not required.

This Addendum REF has considered whether there is likely to be a significant impact on State listed threatened species, ecological communities and their habitats and concluded that a significant impact is not likely.

In addition, the revised proposal is unlikely to have a significant impact on matters of national environmental significance or Commonwealth land within the meaning of the EPBC Act, therefore a referral to the Commonwealth DCCEEW is not required.

9 References

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10 Terms and abbreviations

Term	Description
AHD	Australian height datum
AHIP	Aboriginal Heritage Impact Permit
AHIMS	Aboriginal Heritage Information Management System
BC Act	*Biodiversity Conservation Act 2016*
Biodiversity and Conservation SEPP	State Environmental Planning Policy (Biodiversity and Conservation) 2021
CEMP	Construction environmental management plan
C'wealth DCCEEW	Commonwealth Department of Climate Change, Energy, the Environment and Water
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EP&A Act	*Environmental Planning and Assessment Act 1979*
EP&A Regulation	*Environmental Planning and Assessment Regulation 2021*
FM Act	*Fisheries Management Act 1994*
IBRA	Interim Biogeographic Regionalisation for Australia
Murray Valley SoMI	*Statement of Management Intent: Murray Valley National Park and Murray Valley Regional Park (NPWS, 2014)*
NPW Act	*National Parks and Wildlife Act 1974*
NPWS	National Parks and Wildlife Service
NSW	New South Wales
NSW DCCEEW	NSW Department of Climate Change, Energy, the Environment and Water
OEH	Office of Environment and Heritage
PCT	Plant community type
POEO Act	*Protection of the Environment Operations Act 1997*

Term	Description
Project	The Millewa Forest Supply Project
Revised proposal	Additional changes to the approved Millewa Forest Supply project
Addendum REF	Addendum Review of environmental factors
SDL	Sustainable diversion limit
SDLAM	NSW Sustainable Diversion Limit Adjustment Mechanism Program
SEPP	State environmental planning policy
Site environmental water managers	Stakeholders with an interest in and/or responsibility to carry out environmental watering of Millewa Forest are: • NPWS, as the icon site manager for The Living Murray • The Biodiversity and Conservation Division of the Environment and Heritage Group of the Department of Climate Change, Energy, the Environment and Water, which manages the Barmah-Millewa water account • The Commonwealth Environmental Water Office and the Murray-Darling Basin Authority, which hold the water entitlement for The Living Murray. While all these stakeholders are involved in the management of environmental watering of Millewa Forest, for practical reasons NPWS has assumed day-to-day responsibility for carrying out environmental watering of the forest. For simplicity, environmental watering of the forest is discussed in this REF as the responsibility of 'the site environmental water manager.'
Transport and Infrastructure SEPP	State Environmental Planning Policy (Transport and Infrastructure) 2021
WM Act	*Water Management Act 2000*

Appendix A Clause 171 Environmental Factors Checklist

The following factors listed in clause 171(2) of the EP&A Regulation, have been considered in assessing the likely impacts of the revised proposal on the environment. These are provided in the table below.

Table A- 1 Clause 171(2) factors

Environmental Factor	Impact	Details / Where addressed in REF
(a) the environmental impact on the community	yes	Minor. The revised proposal would have only a minor environmental impact on the community, limited to an increased requirement for vegetation clearing, ground disturbance, and impacts of items of Aboriginal cultural heritage significance.
(b) the transformation of the locality	no	Nil. The revised proposal would not transform the locality.
(c) the environmental impact on the ecosystems of the locality	yes	Minor. The revised proposal would require the removal of up to 24 hollow bearing trees and up to 2.14 hectares of additional native vegetation (3.09 in total). Despite the requirement for vegetation removal, the revised proposal is expected have no more than a minor impact on the ecosystems of the locality, as described in Section 6.2.2 of this Addendum REF.

Environmental Factor	Impact	Details / Where addressed in REF
(d) reduction of the aesthetic, recreational, scientific or other environmental quality or value of the locality	no	Nil. The revised proposal would not reduce the aesthetic, recreation, scientific or other environmental quality or value of the locality.
(e) the effects on any locality, place or building that has— (i) aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance, or (ii) other special value for present or future generations	no	Nil. The revised proposal would not impact on a place that has archaeological, cultural, historical and social significance.
(f) the impact on the habitat of protected animals, within the meaning of the *Biodiversity Conservation Act 2016*	yes	Minor. The revised proposal would require the removal of up to 24 hollow bearing trees and up to 2.14 hectares of additional native vegetation (3.09 in total). Despite the requirement for vegetation removal, the revised proposal is expected have no more than a minor impact on threatened flora and fauna, as described in Section 6.2.2 of this Addendum REF.
(g) the endangering of a species of animal, plant or other form of life, whether living on land, in water or in the air	no	The revised proposal would not endanger a species of animal, plant or other form of life.
(h) long-term effects on the environment	yes	The revised proposal is expected to have a long-term positive effect on the environment of Millewa Forest by enabling the removal of existing constraints to water and fish passage through the forest and floodplain channels .

Environmental Factor	Impact	Details / Where addressed in REF
(i) degradation of the quality of the environment	no	The revised proposal would not degrade the quality of the environment of Millewa Forest. The revised proposal is expected to improve the quality of the environment by enabling the removal of existing constraints to water and fish passage through the forest and floodplain channels.
(j) risk to the safety of the environment	no	The revised proposal would not risk the safety of the environment.
(k) reduction in the range of beneficial uses of the environment	no	The revised proposal would not reduce the range of beneficial uses of the environment.
(l) pollution of the environment	no	The revised proposal would not pollute the environment.
(m) environmental problems associated with the disposal of waste	no	The revised proposal would not result in any environmental problems associated with the disposal of waste.
(n) increased demands on natural or other resources that are, or are likely to become, in short supply	no	The revised proposal would not increase demands on natural or other resources that are, or likely to become, in short supply.
(o) the cumulative environmental effect with other existing or likely future activities	no	The revised proposal would not have a cumulative effect with other existing of likely future activities.
(p) the impact on coastal processes and coastal hazards, including those under projected climate change conditions	no	The revised proposal would not impact on coastal processes or coastal hazards.
(q) applicable local strategic planning statements, regional strategic plans or district strategic plans made under the Act, Division 3.1	n/a	The revised proposal would not impact local strategic planning statements, regional strategic plans or district strategic plans.

Environmental Factor	Impact	Details / Where addressed in REF
(r) other relevant environmental factors.	n/a	The expected impacts of the revised proposal on environmental factors are described and assessed in Section 6.4 of this Addendum REF.

Appendix B Millewa Forest Supply Project Existing REF and associated approval documents

Appendix C Revised Biodiversity Assessment Report

Appendix D Revised Aboriginal Cultural Heritage Assessment Report