Watercourse Crossing Management Plan

Stage 1 – North West Transmission Developments Project

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Document history

Current document authoriser

Title	Name
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Revision history

Rev	Date	Author	Authoriser	Details of Amendment
1	27/4/26	Pinion Advisory, GHD and Genus	Craig Gosney	First Revision in response to EPBC provisional conditions
2	04/05/2026	Genus	Craig Gosney	Responding to TN comments, removing declaration of accuracy as directed by TN
3	11/06/2026	GHD, Pinion, Genus	Craig Gosney	Responding to regulator comments (TPC/DCCEEW), adding declaration of accuracy
4	29/06/2026	GHD, Genus, Pinion	Craig Gosney	Responding to further regulator comments (TPC/DCCEEW)

Declaration of accuracy

I Richard Sheather in my position at TasNetworks as Project Director designate Genus Infrastructure (NSW) Pty Ltd (Genus) to prepare, manage and implement the Watercourse Crossing Management Plan on my behalf.

In making this declaration, I am aware that section 491 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) makes it an offence in certain circumstances to knowingly provide false or misleading information or documents to specified persons who are known to be performing a duty or carrying out a function under the EPBC Act or the Environment Protection and Biodiversity Conservation Regulations 2000 (Cth). The offence is punishable on conviction by imprisonment or a fine, or both. I am authorised to bind the approval holder to this declaration and that I have no knowledge of that authorisation being revoked at the time of making this declaration.

Signed:	
Full name:	Richard Sheather
Position:	Project Director
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Date:	

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1. Introduction

1.1 Purpose

This document is the Watercourse Crossing Management Plan (WCMP), prepared as an appendix to the Flora and Fauna Management Subplan (FFMSP) of the Construction Environmental Management Plan (CEMP) for Stage 1 of the North West Transmission Developments (NWTD) Project. This WCMP also operates in conjunction with the Soil and Water Management Subplan (SWMSP) and provides additional detail on watercourse crossing-specific management measures. This WCMP provides the framework for the planning, construction, operation and rehabilitation of watercourse crossings associated with the NWTD Project.

The purpose of this WCMP is to avoid, minimise and manage impacts to watercourses, aquatic habitat, riparian vegetation, and protected aquatic species, during project activities - including:

- Matters of National Environmental Significance (MNES) — the Giant Freshwater Crayfish (*Astacopsis gouldi*) and Burnie Burrowing Crayfish (*Engaeus yabbimunna*); and
- State-listed aquatic species, including freshwater snails (e.g. Beddomeia species),

This WCMP sets out the site-specific management measures, controls, monitoring and adaptive management processes required to:

- protect water quality and maintain natural hydrological regimes;
- minimise disturbance to instream and riparian habitat and maintain aquatic connectivity;
- avoid impacts to EPBC-listed aquatic species (MNES), in particular the Giant Freshwater Crayfish and Burnie Burrowing Crayfish;
- avoid or minimise impacts to State-listed aquatic species, including freshwater snails, through the management of sedimentation, habitat disturbance and hydrological change; and
- ensure compliance with EPBC approval conditions, State approval conditions, and relevant best-practice guidance.

1.2 Project description

The Project involves upgrades and augmentation of the existing electricity transmission network in north west Tasmania. The Project is being delivered to support increased renewable energy generation and improve network capacity, including enabling connection to the proposed Marinus Link.

This Den Management Plan applies to Stage 1 of the NWTD, which includes works between Palmerston, Sheffield and Burnie, and the Heybridge spur.

The Project description is set out in detail in Section 2 of the CEMP and summarised from Section 1.1 of the CEMP as follows:

- Construction of new double-circuit 220 kV OHTLs, from PM Substation to SH Substation and from SH Substation to BU Substation.
- Construction of a new double circuit 220 kV OHTL from the new SH to BU OHTL in the Stowport area to a new switching station at Heybridge (HB), also referred to as HB Spur East or HB Spur.
- Upgrading existing access tracks, and construction of new access tracks.
- Establishing winch and brake sites, laydown areas, tower assembly areas and associated site facilities.
- Upgrades to the existing Palmerston, Sheffield and Burnie substations.
- Dismantling and removal of the existing single-circuit 220 kV OHTLs between PM and SH substations and SH and BU substations.
- Modification of two sections of the existing 110 kV OHTL between Sheffield and Burnie, including relocating and replacing towers with poles.

- Undergrounding sections of the 22 kV overhead distribution network where the proposed 220 kV OHTLs cross 22kV distribution lines.

Construction activities will include pre-construction surveys and site establishment, vegetation clearing, earthworks, tower foundation construction, tower erection, conductor stringing (including helicopter use), and site rehabilitation.

The Project is located across multiple local government areas in north west Tasmania, including the Northern Midlands, Meander Valley, Kentish, Central Coast and Burnie municipalities.

This WCMP applies to construction-phase activities only and is implemented in conjunction with the CEMP, FFMSP and the SWMSP, which provide the overarching environmental management framework for the Project.

1.3 Regulatory framework and approvals

This Watercourse Crossing Management Plan has been prepared in accordance with the following regulations and permits:

- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) approval conditions (water quality, MNES)
- *Major Infrastructure Development Approvals Act 1999* (MIDA Act) Major Infrastructure Project Permit (MIPP)-2026-01 conditions (stream crossings, erosion, water quality)
- Forest Practices Code 2020 – Sections B6, C7, D2
- *Inland Fisheries Act 1995*
- *Threatened Species Protection Act 1995*
- *Nature Conservation Act 2002*
- *Water Management Act 1999*

1.4 Condition and requirement mapping

The following tables detail the EPBC Act and MIDA Act permit conditions and their requirements, noting where in this plan they are addressed.

Table 1 Conditions and requirements of the EPBC Act approval

EPBC Act Condition no.	Requirement	WCMP section condition is addressed
5	All commitments made in plans, including environmental outcomes, management measures, corrective measures, trigger values and performance indicators must be SMART and based on referenced or included evidence of effectiveness. All plans must be consistent with the Environment Management Plan Guidelines, and must include: a) Details of the relevant protected matters and a reference to the EPBC Act approval condition(s) to which the plan refers; b) A table of commitments made in the plan to achieve measurable environmental outcomes, and a reference to exactly where these commitments are detailed in the plan; c) Commitments capable of ensuring that the environmental outcomes are achieved;	a) Section 5.2 (Protected matters). b) Section 7.2 (Commitments), Table 12 (Commitments to achieve environmental outcomes for MNES and state listed aquatic species and habitat). c) Section 7.3 (Design and planning framework), Section 7.4 (Pre-construction requirements); Section 7.5 (Construction management measures); 7.6 (Rehabilitation and decommissioning); Table 14 (Management Controls), Table 16

EPBC Act Condition no.	Requirement	WCMP section condition is addressed
	d) Reporting and review mechanisms to demonstrate compliance with the commitments made in the plan; e) An assessment of risks relating to achieving the environmental outcomes and risk management strategies and/or mitigation measures that will be applied to address identified risks; f) Impact avoidance, mitigation and repair measures, and the timing of those measures; g) A monitoring programs, which must include: 1. Performance indicators; 2. Trigger values for corrective measures; 3. The timing and frequency of monitoring, ensuring monitoring is capable of detecting trigger values and changes in the performance indicators; 4. Proposed corrective measures if trigger values are reached; and h) References to other relevant plans or conditions of approval (including Tasmanian Approval conditions).	(Watercourse crossing management plan reporting requirements); Table 15 (Summary of environmental monitoring and corrective actions) d) Section 6, Table 10 (Risk assessment summary). e) Section 7.3 (Design and planning framework), Section 7.4 (Pre-construction requirements); Section 7.5 (Construction management measures); 7.6 (Rehabilitation and decommissioning); Table 14 (Management Controls) f) Section 7.1, Table 11 (Performance Criteria for Watercourse Crossing Management); Section 8.1, Table 15 (Summary of environmental monitoring and corrective actions); Table 16 (Watercourse crossing management plan reporting requirements), see also Appendix D – Surface Water Monitoring Program g) This table and Section 9 (Reference documents)
19	To mitigate harm to the Giant Freshwater Crayfish and the Burnie Burrowing Crayfish the approval holder must submit to the department, for the Minister's approval, a version of the Watercourse Crossing Management Plan required under condition 31 of the Tasmanian Approval. The approval holder must not commence the Action unless the Minister has approved the Watercourse Crossing Management Plan in writing. The approval holder must implement the version of the Watercourse Crossing Management Plan approved by the Minister in writing.	This document

Table 2 Conditions and requirements of the MIDA Act approval

MIDAA Act Condition no.	Requirement	WCMP section condition is addressed
31	Watercourse Crossing Management Plan	This document.

MIDAA Act Condition no.	Requirement	WCMP section condition is addressed
31. a.	Must be consistent with Clause D2.1 of the Forest Practices Code 2020 and associated planning tools including the Forest Practices Authority Fauna Technical Note No. 15 (2014)	Section 7.5 and Table 14 (Management Controls)
31. b.	The environmental design requirements for bridges, culverts, causeways and fords in Guideline 5: Siting and Design Stream Crossings, of the Waterways and Wetlands Works Manual – Environmental Best Practice Guidelines when Undertaking Works on Waterways and Wetlands in Tasmania (Department of Primary Industries Water and Environment, 2003)	Section 7.5
31. 1.	No removal of vegetation in streamside reserves, instream snags, and wood outside the crossing alignment	Section 7.5.1
31. 2.	Where a Giant Freshwater Crayfish is within 10m of a crossing alignment, no watercourse crossings must be constructed, in accordance with condition 32	Table 14 (Management Controls)
31. 3.	Within 10m of a chimney/burrow of a Burnie Burrowing Crayfish there must be no works that disturb the soil or operation of machinery, unless for minor upgrading of existing tracks or in accordance with a Burnie Burrowing Crayfish impact management plan, in accordance with conditions 33 and 34	Table 14 (Management Controls)
31. 4.	Works at watercourse crossings and in streamside reserves along class 1-3 streams should be avoided where there are known platypus burrows during December to April.	Table 14 (Management Controls)
31. 5.	Identify new watercourse crossings on the tributaries of the Cam River, the Dasher River, Claytons Rivulet and Little Claytons Rivulet where instream disturbance could impact on threatened freshwater snails	Table 14 (Management Controls)
31. 6.	Require the first two access track watercourse crossings and headwater vegetation clearance operations to be independently overseen by a certified Forest Practices Officer trained in compliance and auditing and audited for the effectiveness of sediment minimisation actions 3 months after the works	Section 7.4.1
31. 7.	Improvements identified in the audit to be employed at subsequent watercourse crossings and headwater vegetation clearances	Section 8.1
31. 8	Requires 10% of all new watercourse crossings in native vegetation to be audited until completion of the development.	Section 8.1
32	Where a Giant Freshwater Crayfish is within 10m of crossing alignment, no watercourse crossings must be constructed. A survey for Giant Freshwater Crayfish must be undertaken prior to commencement of watercourse crossing construction works.	Table 14 (Management Controls)
33	Within 10m of a chimney/burrow of a Burnie Burrowing	Section 7.2, Table 12

MIDAA Act Condition no.	Requirement	WCMP section condition is addressed
	Crayfish there must be no works that disturb the soil or the operation of machinery, unless for:	
33. 1.	Minor upgrading of existing tracks, including re-shaping/grading, re-gravelling, clearing existing batters and drains, managing adjoining native vegetation.	Table 14 (Management Controls)
32. 2.	Works approved under a Burnie Burrowing Crayfish Impact Management Plan (under condition 34). A survey for Burnie Burrowing Crayfish burrows/chimneys must be undertaken prior to the commencement of works or operation of machinery in known or potential habitat.	Table 14 (Management Controls)
34	Prior to the commencement of works (excluding minor upgrading of access tracks), a plan for any works or operation of machinery within 10m of a Burnie Burrowing Crayfish burrow/chimney must be submitted to and approved by the Commission. The plan must be consistent with the Burnie Burrowing Crayfish (*Engaeus yabbimunna):* Species Management Profile for Tasmania's Threatened Species Link, (NRE Tas, 2026) and must include:	Table 14 (Management Controls)
34. 1.	Identification of burrows/chimneys in a survey conducted in accordance with Condition 33	Table 14 (Management Controls)
34. 2.	The extent of proposed works/operations and exclusion areas	Table 14 (Management Controls)
34. 3.	The extent of works that may impact on hydrology/drainage patterns, including installation or upgrade of culverts and drains	Table 14 (Management Controls)
34. 4.	The measures to be implemented to avoid compaction and dewatering of burrows	Table 14 (Management Controls)
34. 5	A requirement for ongoing monitoring	Section 8
35	Ramps must be installed on open excavations to allow fauna to escape. Works at open excavations must not commence while trapped fauna is present.	Table 14 (Management Controls)

1.5 Objectives

The primary objectives of this WCMP is to comply with:

- Commitments in the Development Application (DA) and Environmental Impact Statement (EIS)
- Conditions of approval in Permit number MIPP-2026-01 issued under the MIDA Act (focus is on conditions 31, 32, 33, 34, 35)
- Conditions of approval in the Permit issued for referral EPBC 2022/09247 under the EPBC Act (focus is on condition 19)
- All relevant TasNetworks standards and procedures.

1.6 Sensitive receptors

Table 3 details the sensitive receptors.

Table 3 Sensitive receptors

Sensitive receptor	Description
EPBC-listed aquatic species	Giant Freshwater Crayfish and Burnie Burrowing Crayfish that may occur within or adjacent to watercourse crossings.
TSP-listed aquatic species	Threatened freshwater snail species associated with specified catchments and tributaries.
Aquatic habitat	Instream habitat, channel beds, banks, pools, riffles and aquatic connectivity pathways at crossing locations.
Riparian vegetation	Streamside reserves, bank vegetation and riparian zones providing habitat, stability and shading.
Water quality	Surface water quality upstream and downstream of crossings, including turbidity and sediment loads.
Hydrology and geomorphology	Natural flow regimes, channel stability and sediment transport processes.
Downstream environments	Aquatic ecosystems and environmental values downstream of crossing locations.

2. Environmental Management Roles and Responsibilities

Responsibilities in relation to the implementation of this plan are presented in Table 4.

Table 4 Responsibility for the implementation of the Watercourse Crossing Management Plan

Role	Responsibility
Environmental Manager	– Oversight of the implementation of the Water Crossing Management Plan. – Ensure there are adequate resources and infrastructure to implement water crossing management measures. – Oversight of implementation of this plan in coordination with

Role	Responsibility
	the Construction Manager.
Construction Manager	– Implementation of the management measures related to construction activities. – Be familiar with this Water Crossing Management Plan and the requirements during any demolition and construction works to avoid and minimise disturbance of contaminated soil.
Site supervisor	– Implementation of the management measures related to site controls.
Suitably qualified aquatic ecologist (if required)	– Water crossings potentially identified to contain EPBC and/or TSP listed threatened species or potential habitat, confirmed and management actions recommended by suitably qualified aquatic ecologist prior to design and construction.
Forest Practices Officer	– Overseeing construction of the first two access track watercourse crossings and headwater vegetation clearance activities. – Auditing 10% of all new watercourse crossings in native vegetation.
All workers	– Are responsible for implementing strategies and procedures prescribed in this plan, as applicable to their work activities.

3. Environmental Training and Communication

3.1 Training

Training and communication for the WCMP will be undertaken in accordance with the training and awareness requirements outlined in the CEMP and SWMSP. This approach ensures a consistent understanding of environmental obligations, controls and response procedures across the project workforce.

All personnel involved in activities associated with watercourse crossings, including access track construction, instream works, plant operation and rehabilitation, will receive project induction training that includes watercourse crossing management requirements, delivered as part of the CEMP and SWMSP induction process.

Targeted environmental awareness training will be provided to relevant personnel (including supervisors, plant operators, environmental staff and subcontractors) and will include:

- identification of watercourses, riparian zones and aquatic habitats
- watercourse-specific erosion and sediment control requirements
- protection of aquatic habitat and aquatic connectivity
- pollution prevention measures, including fuel, chemical and concrete management near waterways
- inspection, maintenance and escalation requirements for erosion and sediment controls at crossings
- stop-work, notification and incident response procedures under the CEMP
- roles and responsibilities under this WCMP, the SWMSP and the CEMP.

Toolbox talks or targeted briefings may be undertaken prior to works at high-risk or environmentally sensitive watercourse crossings to reinforce site-specific controls, exclusion zones and approval requirements.

3.2 Communication

Watercourse crossing management requirements will be communicated through established CEMP and SWMSP communication mechanisms, including:

- site inductions
- pre-start meetings and toolbox talks
- environmental alerts or notices
- signage at watercourse crossings and associated exclusion zones.

Any updates to watercourse crossing controls, approved methodologies, exclusion zones or monitoring requirements will be communicated to relevant personnel in a timely manner via site supervision and the Environmental Manager, consistent with the CEMP communication framework.

3.3 Training records

Records of inductions, toolbox talks and targeted training relevant to watercourse crossing management will be maintained in accordance with the CEMP record-keeping requirements.

Training records will be retained as evidence of compliance and made available for audit, inspection and regulatory reporting purposes.

4. Emergency Contacts and Procedures

Emergency contacts, incident response arrangements and escalation procedures for the Project are defined in the CEMP.

In the event of an environmental incident, emergency situation or unanticipated impact associated with watercourse crossing activities (including sediment release, water quality degradation, bank instability, spill events or unexpected impacts to aquatic habitat), works will be immediately stopped, and the response procedures outlined in the Emergency Response and Incident Management framework of the CEMP will be implemented.

This includes:

- immediate notification to the Site Supervisor and Environmental Manager
- implementation of site controls to stabilise the situation and prevent further impacts (e.g. isolation of the watercourse, deployment of spill response or temporary erosion controls)
- engagement of suitably qualified personnel (e.g. aquatic ecologist or water quality specialist
- classification, recording and investigation of the incident in accordance with the CEMP
- implementation of corrective actions and adaptive management measures
- regulatory notification in accordance with EPBC Act approval conditions, MIDAA approval conditions and relevant Tasmanian legislation.

Where an incident has the potential to affect MNES or regulated waterways, notification to DCCEEW and relevant Tasmanian regulators will be undertaken in accordance with the CEMP notification and reporting procedures.

Project-specific emergency contact details, including emergency services, key project personnel and spill response contacts, will be maintained and made available to all personnel through the CEMP, site inductions and toolbox talks.

5. Scope of this management plan

The WCMP applies to all activities associated with the planning, construction, decommissioning and rehabilitation of temporary and permanent watercourse crossings for the Project.

5.1 Waterways covered

This WCMP applies to watercourse crossings within the Burnie to Sheffield (BU-SH) substage of Stage 1, including the Heybridge Spur (HB) corridor. Watercourse crossings associated with the Sheffield to Palmerston (SH-PM) substage (including all crossings of the Dasher River and its tributaries) are not addressed by this version of the WCMP. A separate revision covering SH-PM watercourses will be prepared and submitted for approval prior to commencement of construction works on the SH-PM substage, in accordance with MIDAA Permit Condition 31 and EPBC Approval Condition 19.

All waterways mapped by LIST Hydrographic Lines data (1:25,000) that intersect existing and new access tracks within the BU-SH and HB construction footprint are addressed by this Plan. The waterways and watercourse crossings included in this WCMP are listed in

Table 5, and shown on the *Remaining NWTD Detailed Development Plans (with vegetation clearance*), prepared by Tetra Tech Coffey (dated 30/04/2026). All watercourse crossings addressed by this WCMP are spatially defined by, and must be read in conjunction with, the relevant Detailed Development Plan drawings, which provide the definitive location, extent of works, and associated vegetation clearance limits.

MIDAA Permit Condition 31.5 requires the identification of new watercourse crossings on the tributaries of the Cam River, Dasher River, Claytons Rivulet and Little Claytons Rivulet where instream disturbance could impact on threatened freshwater snails. The status of crossings on these waterways within the BU-SH and HB substages

is set out in Table 5 below. No watercourse crossings are proposed on the Cam River or its tributaries within the BU-SH or HB substages. Crossings on the Dasher River and its tributaries are not addressed in this WCMP and will be included in the SH-PM substage WCMP revision.

Table 5 Waterways included in this plan (Burnie to Sheffield only)

Watercourse/ Hydrology Class	Name	Watercourse Origin/Stem	Crossing Number	*Crossing type	Potential Impact
Minor Tributary	N/A	Blythe River	42	A	Crossing included in this Plan for completeness as a watercourse crossing within the BU-SH construction footprint. No instream construction works proposed, managed in accordance with WC11 Table 14 (Management Controls)
Minor tributary	N/A	Claytons Rivulet	14	C	Potential impact – managed in accordance with WC1, WC6, WC7, WC11 in Table 14 (Management Controls), and the SWMP
Minor tributary	N/A	Claytons Rivulet	15	C	Potential impact – managed in accordance with WC1, WC6, WC7, WC11 in Table 14 (Management Controls)
Minor tributary	N/A	Little Claytons Rivulet	16	B	Potential impact – managed in accordance with WC1, WC6, WC7, WC11 in Table 14 (Management Controls) and the SWMP
Minor tributary	N/A	Little Claytons Rivulet	17	A	No potential impact – no instream construction works proposed, managed in accordance with WC11 Table 14 (Management Controls) and the SWMP (Appendix D)

*Crossing type defined as:

A Existing water crossing, no significant construction upgrade required

B Existing water crossing, potential construction upgrade required

C New water crossing required

Of the watercourse crossings listed in

Table 5, two are proposed as new crossings on tributaries of Claytons Rivulet (crossing numbers 14 and 15, both Type C, shown on DDP Map 169 of 283). One is proposed as an upgrade to an existing crossing on a tributary of Little Claytons Rivulet (crossing number 16, Type B, DDP Map 173 of 283), and one is an existing crossing on a tributary of Little Claytons Rivulet that does not require upgrade (crossing number 17, Type A, DDP Map 174 of 283) and will not involve any instream construction works. Crossing numbers 16 and 17 are not visibly marked on the relevant DDP sheets and have been identified from LIST Hydrographic Lines (1:25,000) data and confirmed through site survey. These crossings sit outside the notified corridor.

Pre-construction surveys, EPZ identification, erosion and sediment controls, and crossing design controls applicable to each crossing are set out in Table 14 (Management Controls) and the Surface Water Monitoring

Program (Appendix D). The new crossings on Claytons Rivulet tributaries (crossing numbers 14 and 15) will be subject to the additional design and construction requirements set out in Section 7.5 and management control WC11 in Table 14 (Management Controls), including compliance with FPC 2020, FPA Technical Note 15, and the Waterways and Wetlands Works Manual.

5.2 Protected matters

This WCMP is relevant to protected aquatic species and habitats that may occur within or downstream of proposed watercourse crossings. For the purposes of EPBC approval conditions, the relevant MNES addressed by this Plan are the Giant Freshwater Crayfish (*Astacopsis gouldi*) and Burnie Burrowing Crayfish (*Engaeus yabbimunna*). This Plan also addresses other listed aquatic receptors relevant to watercourse crossing design and construction, including State-listed freshwater snails, where these may be affected by sedimentation, hydrological change or habitat disturbance.

5.2.1 Giant Freshwater Crayfish (*Astacopsis gouldi*)

The Giant Freshwater Crayfish is listed as a protected matter under the EPBC Act and occurs in rivers and streams of northern Tasmania. The species is dependent on well-shaded streams with good water quality, low sediment loads, stable thermal conditions, instream woody material, pools and undercut banks, with associated riparian vegetation forming part of habitat critical to the survival of the species[1]. The recovery plan also recognises that habitat within the known or likely distribution of the species may be critical where it supports breeding populations or contributes to long-term population persistence.

For the purposes of this Plan, Giant Freshwater Crayfish habitat may be present in or adjacent to watercourses crossed by temporary or permanent access track infrastructure, particularly where waterways retain intact riparian vegetation, instream shelter habitat, low levels of fine sediment deposition, and natural bed and bank form. The current WCMP already recognises this species as a sensitive receptor and identifies risks associated with direct injury or mortality, habitat disturbance, loss of aquatic connectivity, sediment mobilisation and water quality degradation.

The Giant Freshwater Crayfish Recovery Plan[2] identifies land clearing, habitat disturbance and resulting siltation of waterways as among the most significant current threats to the species, including impacts arising from bank destabilisation, upstream erosion, runoff and disturbance of riparian zones. It also identifies modification to water flow, reduced habitat quality, and broader habitat loss or degradation as key threatening processes. These threat pathways are directly relevant to watercourse crossing construction, where instream works, approach formation, bank disturbance, crossing installation and inadequate erosion and sediment controls could damage instream refuge habitat, increase sediment deposition, alter local hydraulics or create barriers to fauna movement.

Accordingly, this Plan adopts a precautionary approach to Giant Freshwater Crayfish by requiring pre-construction ecological surveys, identification and demarcation of exclusion areas/EPZs, avoidance of works within sensitive habitat, minimisation of instream disturbance, retention of streamside vegetation and woody material outside the approved footprint, and design of crossings to maintain bed levels, flow continuity and aquatic connectivity. These measures are implemented through the existing controls for surveys, EPZ demarcation, riparian protection and crossing design listed in Section 7.7, together with the construction and water quality controls in Section 7.5.

5.2.2 Burnie Burrowing Crayfish (*Engaeus yabbimunna*)

The Burnie Burrowing Crayfish is a threatened species protected under the *Threatened Species Protection Act 1995* and is relevant to this Plan where works occur in known or potential habitat. The species is associated with burrow systems in moist soils, seepages, drainage lines and low-lying riparian areas adjacent to watercourses, and relies on stable soil moisture conditions and local hydrology to maintain burrow structure and function[3]. Its

[1] Conservation Advice - *Astacopsis gouldi* giant freshwater crayfish
[2] Recovery Plan for the Giant Freshwater Crayfish (*Astacopsis gouldi*), Commonwealth of Australia 2017.
[3] Burrowing crayfish group recovery plan 2001-2005 - DCCEEW

distribution overlaps with areas of agricultural land, riparian margins and disturbed landscapes in north-west Tasmania, where habitat may not always be directly within the active channel but is strongly connected to surrounding hydrological processes.

The species is highly sensitive to soil disturbance, compaction, excavation, vegetation removal and modification of surface or sub-surface hydrology, which can collapse burrows, alter moisture conditions, or render habitat unsuitable[4]. In particular, activities that change drainage patterns, groundwater connectivity or infiltration (e.g. culvert installation, track construction, batter reshaping or drainage works) may result in indirect impacts even where burrows are not physically disturbed. These threat pathways are consistent with those identified in the Burnie Burrowing Crayfish Threatened Species Profile[5], which highlights habitat disturbance and hydrological alteration as the primary risks to the species.

In the context of watercourse crossings, potential impacts arise during pre-construction clearance, access preparation, excavation, compaction from plant movement and alteration of local drainage conditions, particularly in seepage zones or saturated soils adjacent to watercourses. The current WCMP recognises these risks through the identification of Burnie Burrowing Crayfish as a sensitive receptor and through risk categories including habitat disturbance, hydrological change and machinery impacts.

To manage these risks, this Plan requires pre-construction surveys in known or potential habitat, identification and demarcation of burrows and exclusion zones (EPZs), and strict controls on works within a defined setback distance. Works within 10 m of burrows are prohibited unless undertaken in accordance with an approved Burnie Burrowing Crayfish Impact Management Plan, which must address burrow identification, extent of works, hydrological impacts, avoidance of compaction and dewatering, and monitoring requirements. These measures are implemented through controls listed in 7.7 and directly reflect the requirements of relevant MIDAA permit conditions and species management guidance.

5.2.3 Relevance to Watercourse Crossing Risks and Controls

The protected matters discussed in this section are susceptible to the core construction risk pathways identified in this WCMP, including sediment mobilisation, water quality degradation, habitat disturbance, loss of aquatic connectivity, hydrological change, and accidental contamination. These risks are most likely to arise during pre-construction clearing, instream works, crossing installation, and rehabilitation if not appropriately controlled.

The WCMP applies a mitigation hierarchy of avoidance, minimisation, management and rehabilitation to these risks, consistent with the objectives of the Giant Freshwater Crayfish recovery plan to protect habitat quality and address threatening processes. Management measures include ecological surveys, exclusion zones, crossing design controls, erosion and sediment management, water quality protection measures, and monitoring and adaptive management. These commitments are detailed in Section 7.2 and consolidated in the commitments table prepared in response to EPBC Condition 5.

[4] Conservation Advice - *Engaeus yabbimunna* Burnie burrowing crayfish
[5] Burnie Burrowing Crayfish - Threatened Species Link profile, NRE 2026

6. Potential environmental impacts and risks

A risk assessment of key aspects associated with watercourse crossing activities for the Project is summarised in Table 10. The assessment has been undertaken using the risk matrix presented in Table 6, which is aligned with the Environmental Management Plan Guidelines (DCCEEW, 2024).

Environmental risks are determined based on the likelihood and consequence of each aspect, with the categories and definitions of likelihood and consequence provided in Table 7, Table 8, and Table 9.

The risk assessment identifies the aspects and potential environmental impacts associated specifically with the planning, construction and rehabilitation of watercourse crossings, and the management measures required to avoid, minimise or mitigate those impacts. An inherent risk rating is assigned prior to the implementation of mitigation measures, and a residual risk rating is assigned following the application of environmental controls.

Table 6 Risk matrix based on DCCEEW EMP guidelines

Likelihood	Consequences				
	1 (Minor)	2 (Moderate)	3 (High)	4 (Major)	5 (Critical)
A (Highly likely)					
B (Likely)					
C (Possible)					
D (Unlikely)					
E (Rare)					

Table 7 Risk rating key and acceptability

Risk Rank	Description
Tolerable	Risk reduction not required
Risk reduction required	Risk reduction measures need to be implemented so that risk is as low as reasonably practicable
Unacceptable	Risk is too great for activity to proceed

Table 8 Likelihood of risk

Ranking	Qualitative measure of likelihood	Description
A	Highly likely	Is expected to occur in most circumstances
B	Likely	Will probably occur during the life of the project
C	Possible	Might occur during the life of the project
D	Unlikely	Could occur but considered unlikely or doubtful
E	Rare	May occur in exceptional circumstances

Table 9 Consequences of risk

Ranking	Qualitative measure of likelihood	Description
1	Minor	Minor incident of environmental damage that can be reversed
2	Moderate	Isolated but substantial instances of environmental damage that could be reversed with intensive efforts
3	High	Substantial instances of environmental damage that could be reversed with intensive efforts
4	Major	Major loss of environmental amenity and real danger of continuing
5	Critical	Severe widespread loss of environmental amenity and irrecoverable environmental damage

Table 10 Risk assessment summary

Major Environmental Hazard Event	Potential Risks to Watercourses, Habitat and Aquatic Species	Risk ranking Pre-management			Risk Mitigation Items and relevant management controls (Table 9)	Residual risk rating		
		Likelihood	Consequenc	Ranking		Likelihood	Consequence	Ranking
Disturbance of riparian vegetation and soils during clearing and site establishment at watercourse crossings	Increased erosion and sediment mobilisation, degradation of water quality, loss of riparian habitat, impacts to aquatic species habitat	C	3		See WC8 and WC9 in Table 14 (Management Controls), erosion and sediment controls in Section 7.5, Soil and Water Management Subplan	D	2	
Failure to identify protected aquatic species or habitat prior to works	Injury or mortality to Giant Freshwater Crayfish and Burnie Burrowing Crayfish, disturbance to burrows, impacts to State-listed freshwater snail habitat	C	4		See WC1, WC2 and WC5 in Table 14 (Management Controls), pre-construction ecological surveys and EPZ demarcation, Flora and Fauna Management Subplan, Stop Work – Fauna Injury and Death (Appendix C)	D	2	
Works within or adjacent to crayfish habitat	Injury or mortality to crayfish, disturbance of burrows, habitat degradation	C	4		See WC2–WC4 and WC5 in Table 14 (Management Controls), establishment of EPZs, prohibition of works within exclusion zones, implementation of species-specific management measures, Stop Work – Fauna Injury and Death (Appendix C)	D	2	
Earthworks, excavation and installation of crossings	Sediment mobilisation, increased turbidity, degradation of downstream water quality, impacts to aquatic habitat and freshwater snail habitat	B	3		See WC11 in Table 14 (Management Controls), erosion and sediment controls in Section 7.5, staged works, monitoring and corrective actions (Table 15), Soil and Water Management Subplan	D	2	

Major Environmental Hazard Event	Potential Risks to Watercourses, Habitat and Aquatic Species	Risk ranking Pre-management			Risk Mitigation Items and relevant management controls (Table 9)	Residual risk rating		
		Likelihood	Consequenc	Ranking		Likelihood	Consequence	Ranking
Installation of culverts or crossing structures	Creation of barriers to aquatic fauna movement; alteration of bed levels and flow conditions; loss of aquatic connectivity	C	3		See WC11 in Table 14 (Management Controls), design to maintain bed levels and flow, avoidance of perched structures, inspection and verification of connectivity	D	2	
Operation of machinery within riparian zones or near EPZs	Soil compaction, disturbance to burrows, degradation of riparian soils and habitat	C	4		See WC2–WC4 in Table 14 (Management Controls), access control, exclusion of machinery from EPZs, supervision and site controls	D	2	
Alteration of natural drainage and hydrology at crossings	Changes to water flow and soil moisture affecting crayfish burrows and freshwater snail habitat	C	3		Design and drainage controls in Section 7.5, avoidance of flow diversion into sensitive areas, monitoring of hydrological performance	D	2	
Fuel handling, chemical storage and concrete works near waterways	Contamination of watercourses; impacts to water quality and aquatic species	B	4		See water quality protection measures in Section 7.5, spill kits, exclusion of refuelling near waterways, spill response procedures in CEMP	D	2	
Failure or poor maintenance of erosion and sediment controls	Release of sediment to waterways; impacts to water quality and aquatic habitat	C	3		Routine inspection and maintenance (Section 7.5), monitoring and corrective actions (Table 15), Soil and Water Management Subplan	D	2	
Rehabilitation failure following construction	Ongoing erosion, instability of banks, delayed recovery of riparian vegetation	C	3		See Section 7.5, stabilisation and revegetation, rehabilitation monitoring and corrective actions (Table 15)	D	2	

7. Environmental Management Measures

7.1 Performance criteria

The performance criteria for this appendix subplan are listed in Table 11.

Table 11 Performance Criteria for Watercourse Crossing Management

Objective	Performance criteria
General fauna	
To minimise disturbance to fauna.	100% compliance with controls listed in Table 14 (Management Controls)
To not harm fauna.	Nil mortality from construction activities to fauna species, including species protected under *Threatened Species Protection Act 1995* (TSP) Act or EPBC Act not separately described below.
Threatened flora and vegetation communities	
To minimise the clearing of native and of threatened vegetation and vegetation communities.	No clearing of native or threatened vegetation outside of approved area. No removal of vegetation associated with watercourse crossings in streamside reserves, instream snags, and wood outside the crossing alignment.
Freshwater crayfish	
To not harm freshwater crayfish (including burrowing and giant species).	No harm (injury or mortality) to freshwater crayfish (including burrowing and giant species). A permit to take is required to be obtained prior to disturbing or removing crayfish or chimneys. Comply with crayfish EPZs
To minimise the disturbance of freshwater crayfish (including burrowing and giant species) habitat.	100% compliance with controls listed Table 14 (Management Controls)
Freshwater snails	
To not harm freshwater snails.	No harm (injury or mortality) to freshwater snails through impacts to snail habitats.
To minimise the disturbance of freshwater snail habitat.	100% compliance with controls listed in Table 14 (Management Controls)
Water quality	
To not impact on stream water quality.	Avoid degradation of surface water quality upstream and downstream of crossings.

7.2 Commitments

Table 12 presents the commitments established under this WCMP to achieve the identified environmental outcomes for Matters of National Environmental Significance, including the Giant Freshwater Crayfish and Burnie Burrowing Crayfish, in accordance with EPBC Act Approval Condition 5. The table also addresses environmental outcomes for State listed aquatic species (freshwater snails).

Table 12 Commitments to achieve environmental outcomes for MNES and state listed aquatic species and habitat

ID	Outcome	Commitment	Where addressed	Monitoring requirement	Trigger	Corrective Action	Evidence
C1	No mortality or injury to Giant Freshwater Crayfish or Burnie Burrowing Crayfish during works	Pre-construction surveys will be completed at all watercourse crossings within suitable habitat prior to any vegetation clearance or ground disturbance	WC1, WC2, WC5 in Table 14 (Management Controls)	M1, M2, M3 (Table 15) - Completion of surveys and confirmation of presence/absence	Failure to undertake survey prior to works OR confirmed presence within disturbance footprint	Stop works, engage suitably qualified ecologist, establish exclusion zone or redesign crossing to avoid impact	Pre-construction survey reports GIS mapping Inspection records
C2	No disturbance to crayfish individuals or burrows within defined exclusion zones	Environment Protection Zones (EPZs) will be established and clearly demarcated prior to works and maintained throughout construction	WC2, WC5 in Table 14 (Management Controls)	M2, M3 (Table 15) - Presence and integrity of EPZ demarcation (flagging, signage, GIS)	EPZ not installed, unclear, or encroached upon	Stop works, re-establish EPZ, retrain personnel, implement compliance checks	Site inspection checklists Photographic records
C3	No watercourse crossings to	Works within 10 m of Giant Freshwater Crayfish will not occur	WC, WC5 in Table 14	M1, M3 (Table 15) - Pre-construction survey to	Any disturbance within 10 m	Stop works, notify Environmental	Site inspection checklists Incident reports

ID	Outcome	Commitment	Where addressed	Monitoring requirement	Trigger	Corrective Action	Evidence
	be constructed within 10 m of Giant Freshwater Crayfish	unless a pre-construction survey by a suitably qualified ecologist has confirmed the presence/absence of the Giant Freshwater Crayfish. Where crayfish presence is confirmed, and a watercourse crossing cannot be relocated outside the 10 m buffer (e.g. due to fixed transmission line alignment within the easement, where alternative locations would require additional native vegetation clearing, or where trenchless or span methods are not feasible), a Permit to Take (under the TSP Act) will be obtained prior to works commencing. Removal and relocation will be	(Management Controls)	determine presence of individual crayfish Compliance with Permit to Take	of Giant Freshwater Crayfish without approval	Manager, reassess methodology, obtain approvals before recommencing	Pre-construction survey reports

ID	Outcome	Commitment	Where addressed	Monitoring requirement	Trigger	Corrective Action	Evidence
		undertaken by a suitably qualified aquatic ecologist in accordance with the Permit conditions. Reporting will be in accordance with Table 16.					
C4	No works will occur within 10 m of Burnie Burrowing Crayfish burrows or chimneys unless in accordance with a Burnie Burrowing Crayfish Impact Management Plan approved by the TPC.	Works within 10m of Burnie Burrowing Crayfish burrows or chimneys will not occur unless undertaken in accordance with approved management plan	WC4 in Table 14 (Management Controls)	M2, M3 (Table 15) - Compliance with approved mgmt. plan	Any disturbance within 10m of a burrow or chimney	Stop works, notify Environmental Manager, reassess methodology, obtain approvals before recommencing	Site inspection checklists Incident reports Pre-construction survey reports
C5	Avoid impacts to crayfish habitat from	Watercourse crossings will be designed and constructed to avoid instream disturbance	in Table 14 (Management Controls)	M3, M4, M8 (Table 15) - Visual assessment of habitat condition	Observable disturbance to bed, banks, or	Stop works, stabilise disturbed area, engage	Site inspections Photographic monitoring

ID	Outcome	Commitment	Where addressed	Monitoring requirement	Trigger	Corrective Action	Evidence
	crossing construction	and maintain natural bed and bank structure		pre- and post-works	woody habitat outside approved footprint	ecologist, revise methodology	
C6	Maintain aquatic connectivity for fauna passage	All crossings will be designed to maintain natural flow regimes and avoid perched or barrier-forming structures	WC11 in Table 14 (Management Controls)	M4 (Table 15) - Visual inspection of flow continuity and structure performance	Evidence of perched culverts, flow restriction, or barriers to passage	Modify crossing structure, install additional measures to restore connectivity	Design documentation Inspection reports
C7	No degradation of downstream water quality	Erosion and sediment controls will be installed prior to works and maintained throughout construction	Section 7.5.2, Surface Water Monitoring Program, and the SWMSP	M5, M6 (Table 15) - Visual turbidity downstream; condition of erosion and sediment controls	Visible sediment plume extending >10 m downstream OR failure of controls	Stop works, repair/upgrade controls, install additional measures	Inspection checklists, Photographic evidence
C8	No contamination of watercourses from fuels, chemicals or concrete	Fuel handling, storage and spill controls will be implemented in accordance with the CEMP	Section 7.5.4	M7 (Table 15) - Evidence of spills or contamination	Any spill or discharge entering a watercourse	Stop works, contain spill, implement spill response, notify regulator if required	Incident reports Spill response records

ID	Outcome	Commitment	Where addressed	Monitoring requirement	Trigger	Corrective Action	Evidence
C9	No disturbance to Burnie Burrowing Crayfish burrows or hydrology	Hydrological impacts (e.g. drainage changes, compaction) within EPZ will be avoided unless approved under a species-specific plan	WC4 in Table 14 (Management Controls)	M2, M3 (Table 15) - Observed integrity of burrows/chimneys and surrounding soil	Evidence of burrow collapse, compaction, or altered drainage	Stop works, engage ecologist, implement approved mitigation measures	Monitoring reports Ecological advice
C10	No impacts to freshwater snail habitat from sedimentation	Erosion and sediment controls will be implemented and maintained in snail habitat areas	WC6, WC7 in Table 14 (Management Controls)	M5, M9 (Table 15) - Visual change in sediment deposition downstream	Visible sediment accumulation in snail habitat areas	Inspect and upgrade erosion controls, stabilise disturbed areas	Inspection records Photo points
C11	No unauthorised clearing or disturbance in riparian zones	Clearing will be restricted to the approved footprint and managed in accordance with FPC requirements	WC8, WC9 in Table 14 (Management Controls)	M3 (Table 15) - Compliance with mapped disturbance footprint	Clearing outside approved area	Stop works, rehabilitate disturbed area, retrain personnel	GIS data Site inspections
C12	Works avoid sensitive seasonal constraints (e.g. platypus burrows)	Pre-clearance surveys will be undertaken where works occur in sensitive periods/locations	WC10 in Table 14 (Management Controls)	M3 (Table 15) - Completion of seasonal survey	Works undertaken without required survey	Stop works, undertake survey, adjust timing or method	Survey reports Approvals
C13	Effectiveness of controls is	Inspections and audits will be undertaken	Table 13	M10 (Table 15) - Completion of	Failure to undertake	Implement inspection,	Audit reports

ID	Outcome	Commitment	Where addressed	Monitoring requirement	Trigger	Corrective Action	Evidence
	verified through inspection and audit	during construction and post-construction		inspections and audits	required inspections	review controls, update management measures	Inspection records
C14	Monitoring detects impacts and triggers response	Monitoring will be undertaken upstream and downstream of all crossings during construction	Section 8.1	M1-M11 (Table 15) - Monitoring completed at required locations	Monitoring not undertaken OR impacts not detected	Implement monitoring, review methodology, increase frequency	Monitoring records GIS locations
C15	Impacts to MNES are reported to regulators in accordance with approval conditions	All incidents involving MNES (e.g. injury, mortality, habitat impact) will be reported to DCCEEW within specified timeframes	Table 16	All rows of Table 16 (reporting requirements) - Incident reporting records	Failure to report within required timeframe	Notify regulator immediately, review reporting procedures	Incident reports Correspondence

7.3 Design and planning framework

The WCMP incorporates design and planning controls intended to avoid significant impacts, and where avoidance is not practicable, mitigate and manage impacts on watercourses, aquatic habitat and Matters of National Environmental Significance (MNES), consistent with the EPBC Act Significant Impact Guidelines.

7.3.1 Crossing design principles

- Watercourse crossings are sited to avoid sensitive aquatic environments, riparian vegetation and known or potential habitat for EPBC and TSP-listed aquatic species
- The number of crossings is minimised through route selection and design optimisation, reducing habitat disturbance and fragmentation
- Crossings are avoided in locations with high erosion risk, unstable banks or significant floodplain interaction to prevent indirect downstream impacts
- Existing crossings requiring no significant construction upgrade (Type A) used where practical
- Crossing design which minimises the works area to the crossing alignment.

7.3.2 Timing constraints

- Works are planned to occur during favourable flow conditions to reduce turbidity and disturbance
- Seasonal or flow-based constraints are applied to minimise impacts on sensitive life-cycle stages of aquatic species
- Construction methods and staging are designed to limit the duration and spatial extent of instream disturbance

7.3.3 Crossing types

A range of watercourse crossing types may be used depending on channel characteristics, flow regime, environmental sensitivity and construction requirements. Crossing types are selected in accordance with the avoid–minimise–mitigate hierarchy to reduce the likelihood of significant impacts on water quality, aquatic habitat, aquatic connectivity and Matters of National Environmental Significance (MNES), where relevant.

Bridges (Permanent & Temporary)

- Span the watercourse and, where practicable, the bankfull channel where confirmed during design
- Typically avoid direct instream disturbance during construction and operation
- Maintain natural bed, banks and flow conditions beneath the structure
- Preferred crossing type in environmentally sensitive locations or where EPBC-listed aquatic species or habitat may be present

Culvert Crossings (Permanent & Temporary)

- Convey flows through the structure meeting conforming to requirements of Tasmania's Water Management Act 1999
- Designed to maintain bed levels, flow depth and velocities compatible with fauna (including Giant Freshwater Crayfish) passage
- Box culvert as the preference, if environmental values requiring protection are identified.
- Designed and constructed to accommodate a 1 in 10 year flood event.

Causeways

- Low-level crossings that may allow overtopping during higher flows. Impeding of flow requires licensing associated with Tasmania's Water Management Act 1999.
- Generally, involve instream works and direct interaction with the channel bed
- Typically limited to locations with intermittent or low-flow watercourses and lower environmental sensitivity

7.4 Pre-construction requirements

7.4.1 Surveys and inspections

A detailed ecological survey, including threatened flora and fauna assessment completed identifying location of EPBC and/or TSP listed threatened species and potential habitat. Prior to construction planning and design, water crossings potentially identified to contain either EPBC and/or TSP listed threatened species or potential habitat, confirmed and management actions recommended by a qualified aquatic ecologist.

Table 13 details the monitoring requirements for watercourses. Pre-design and construction site inspection including photos and observations are to be recorded, to aid in best practise design. Water crossing site inspection template is attached in Appendix B.

Table 13 Watercourse crossing monitoring requirements

ID	Monitoring requirement	Frequency	Record/evidence
Pre-con M1	The construction of the first two access track watercourse crossings and headwater vegetation clearance operations must be independently overseen by a certified Forest Practices Officer trained in compliance and auditing. The Forest Practices Officer will review the effectiveness of sediment and erosion controls, three months after the works have been completed. Any improvements identified will be implemented at subsequent watercourse crossings and headwater vegetation clearances.	During construction of first two watercourse crossings	Site inspection report, organised site photographs (Construction Manager and Site Supervisor)
Pre-con M2	10% of all new watercourse crossings in native vegetation will be audited by a certified Forest Practices Officer, until completion of the construction works.	Annual inspection	Site inspection report, organised site photographs (Construction Manager and Site Supervisor)
Pre-con M3	Works at watercourse crossings and in streamside reserves along class 1-3 streams must be avoided where there are known platypus burrows during December to April.	Initial crossing survey	Record stream class and report to Environment Manager

7.4.2 Approvals and permits

Additional permits may be required for watercourse crossings depending on the impacts identified through the ecological surveys and the instream construction requirements.

- If ecological surveys identify the presence of EPBC listed freshwater crayfish, a permit to take is required under the *Threatened Species Protection Act 1999* to capture and relocate threatened crayfish outside of the works area.
- If ecological surveys identify the presence of EPBC listed burrowing crayfish, a permit to take is required under the *Nature Conservation (Wildlife) Regulations 2021* to excavate burrows, in addition to the permit to take under the *Threatened Species Protection Act 1999*.

- If ecological surveys identify the presence of EPBC listed freshwater crayfish, an exemption permit is required under the *Inland Fisheries Act 1995* to capture, handle, trap and bait freshwater crayfish.
- A Division 3 dam permit may be required under the Tasmania's *Water Management Act 1999*, if stream flows are altered by the proposed crossing.

7.4.2.1 Notification requirements

Where monitoring or site inspections identify an impact or potential impact to water quality, aquatic habitat, or protected aquatic species, notification and reporting will be undertaken in accordance with the monitoring triggers defined in Table 15 and the reporting requirements outlined in Table 16.

Notification will be triggered by events including, but not limited to:

- detection of injured or dead Giant Freshwater Crayfish or Burnie Burrowing Crayfish,
- disturbance to crayfish burrows or Environment Protection Zones (EPZs),
- sediment release or water quality degradation downstream of works,
- contamination of watercourses (e.g. fuel, chemical or concrete spills),
- unauthorised disturbance within exclusion zones or sensitive habitat areas.

Where such events occur, works will be managed in accordance with the corrective actions specified in Table 15, including cessation of works, implementation of additional controls, and escalation to the Environmental Manager.

Where water quality exceedances are identified, an investigation will be undertaken in accordance with the Surface Water Monitoring Program (Appendix D) to determine the cause of the exceedance and whether it is attributable to construction activities.

Reporting timeframes and recipients are defined in Table 16, including notification to DCCEEW for incidents involving MNES, and to relevant Tasmanian regulators where State-listed species or environmental values may be affected.

All notifications, incident reports and corrective actions will be documented and managed in accordance with the CEMP incident reporting procedures and relevant approval conditions.

7.4.2.2 Integration with Raptor Nest Management Plan

Where watercourse crossing activities occur within or adjacent to raptor Environment Protection Zones (EPZs), this Watercourse Crossing Management Plan will be implemented in coordination with the NWTD Raptor Nest Management Plan (RNMP).

Crossing design, timing, access arrangements, exclusion zones and monitoring requirements will be aligned to ensure that works do not result in disturbance to active raptor nests and remain consistent with approval conditions and species-specific management measures

7.5 Construction management measures

Watercourse crossings will be constructed to minimise disturbance to watercourses, riparian vegetation and aquatic habitat, and to maintain water quality and aquatic connectivity. All works will be undertaken in accordance with the CEMP and relevant subplans, including the Soil and Water Management Subplan (SWMSP) and Surface Water Monitoring Program (SWMP, see Appendix D), and will implement the management controls specified in Table 14.

All watercourse crossings for access tracks will be designed and constructed in accordance with:

- *Forest Practices Code 2020 B3.3, B6 and D2.1*

- *Forest Practices Authority's Technical Note 15 "Guidelines for the design and maintenance of stream crossings for the passage of fish and other aquatic fauna – culverts", and*
- *Guideline 5: Siting and Design Stream Crossings, of the Waterways and Wetlands Works Manual – Environmental Best Practice Guidelines when Undertaking Works on Waterways and Wetlands in Tasmania (Department of Primary Industries Water and Environment, 2003).*

7.5.1 Installation methodology

Crossings will be installed using methods that minimise instream disturbance and maintain natural flow, bed and bank conditions. Works will be undertaken within approved disturbance limits and EPZs.

Construction methodology will be adapted to site conditions but will generally include:

1. Pre-construction inspection and ecological clearance confirmation
2. Installation of erosion and sediment controls
3. Establishment of temporary diversion or isolation measures
4. Installation or upgrade of the crossing structure in accordance with approved design
5. Stabilisation of bed and banks
6. Removal of temporary diversion measures and reinstatement of flow
7. Progressive rehabilitation of disturbed areas

7.5.2 Erosion and sediment controls

Erosion and sediment controls will be implemented, maintained and inspected in accordance with the SWMSP and SWMP (Appendix D).

Additional site-specific measures may be applied at watercourse crossings to manage localised erosion risk, disturbed soils or concentrated flow paths.

7.5.3 Maintenance and inspection

Erosion and sediment controls at watercourse crossings will be installed, maintained and inspected in accordance with the Soil and Water Management Subplan (SWMSP), with additional focus on crossing specific risks where works occur within or adjacent to waterways. All controls will be inspected during construction and following rainfall events, with maintenance, repair or replacement undertaken as required to maintain effectiveness.

7.5.4 Water quality protection

Water quality management, including turbidity control, spill prevention and contamination management, will be undertaken in accordance with the commitments in Table 12, and measures in the SWMP and CEMP.

7.6 Rehabilitation and decommissioning

Rehabilitation of temporary crossings will commence within 30 days of construction completion to ensure the fastest possible recovery and minimise habitat disruption. A staged rehabilitation and reinstatement program will be implemented throughout the construction phase, focusing on replacing or enhancing impacted habitat areas.

The NWTD Vegetation Rehabilitation Subplan and site-specific management plans will guide species selection, planting density, and long-term ecological recovery. Measures will also be in place to control invasive species, reinstate habitat structures, and protect young plants from herbivores.

Special consideration will be given to watercourse restoration and threatened species habitats, with rehabilitation tailored to site conditions. Monitoring will track progress to ensure rehabilitation objectives are met.

7.7 Management controls

Table 14 provides management controls intended to minimise impacts to watercourse crossings from the Project.

Table 14 Summary of watercourse crossing management controls

Item	Specific control	Relevant reference/guideline	Responsibility	Timing
WC1	Pre-construction survey for freshwater crayfish in areas of potentially suitable habitat by a suitably qualified ecologist. Surveys will include visual inspection of the watercourse and riparian zone for individuals, burrows/chimneys and associated habitat features, including inspection of banks, undercut areas, woody debris and instream refuges. Survey outcomes will be recorded and mapped, and used to define EPZs and inform crossing design and construction controls prior to commencement of works. Recommendations and follow-up actions from the pre-construction surveys will be implemented.	CM038 MIDAA permit condition 32, 33	Environmental Manager	Pre-construction – completed by a suitably qualified ecologist no more than 6 months prior to commencement of works in or within 50 m of any watercourse with potentially suitable habitat. Re-survey required if works are delayed by more than 6 months. Survey recommendations implemented prior to commencement of works at the relevant location.
WC2	Identification of Burnie burrowing crayfish (*Engaeus yabbimunna*) EPZs by a suitably qualified ecologist to be demarcated on mapping and with flagging tape or other noticeable barriers within the area: – 10 m around freshwater crayfish chimneys within Burnie burrowing crayfish range.	CM081 CM038 MIDAA permit condition 33, 34	Environmental Manager	Pre-construction – EPZs identified and demarcated (GIS mapping, flagging tape, signage) prior to mobilisation of construction plant to the relevant work area. Demarcation maintained for the full duration of works in the relevant area and removed only following ER sign-off.
WC3	Minor upgrading of existing tracks, including re-shaping/grading, re-gravelling, clearing existing batters and drains and managing adjoining native vegetation may occur within the freshwater crayfish EPZ, but must not disturb any freshwater crayfish chimneys.	CM081 CM038	Environmental Manager	Construction – applies for the full duration of any track upgrade activity within a freshwater crayfish EPZ. Pre-start briefing on chimney avoidance completed prior to

Item	Specific control	Relevant reference/guideline	Responsibility	Timing
				commencement of each shift in the relevant area.
WC4	Should construction works be required within a freshwater crayfish EPZ, a Burnie Burrowing Crayfish Impact Management Plan will be developed. The plan must be consistent with the Burnie Burrowing Crayfish (*Engaeus yabbimunna*): Species Management Profile for Tasmania's Threatened Species Link (NRE Tas, 2026) and must include: – identification of burrows/chimneys in a survey conducted by a suitably qualified ecologist – the extent of proposed works/operations and exclusion areas – the extent of works that may impact on hydrology/drainage patterns, including installation or upgrade of culverts and drains – the measures to be implemented to avoid compaction and dewatering of burrows – a requirement for ongoing monitoring. This plan must be submitted to and approved by the Tasmanian Planning Commission prior to commencement of construction works.	Burnie Burrowing Crayfish (*Engaeus yabbimunna*): Species Management Profile for Tasmania's Threatened Species Link CM081 CM038	Environmental Manager	Pre-construction – Plan prepared and submitted to and approved by TPC prior to commencement of construction works within any freshwater crayfish EPZ. Plan implemented for the full duration of works in the EPZ, with ongoing monitoring as specified in the approved plan.
WC5	Identification of Giant freshwater crayfish (*Astacopsis gouldi*) EPZs by a suitably qualified ecologist to be demarcated on GIS mapping and with flagging tape, signage or other noticeable barriers within the area:	CM030 CM038	Environmental Manager	Pre-construction – EPZs identified and demarcated (GIS mapping, flagging tape, signage) prior to mobilisation of construction plant to the relevant work area. Demarcation maintained for the full

Item	Specific control	Relevant reference/guideline	Responsibility	Timing
	10 m of riparian vegetation around waterways with suitable habitat for giant freshwater crayfish.			duration of works in the relevant area and removed only following ER sign-off.
WC6	Habitat for other freshwater invertebrate species such as the Cam River hydrobiid snail (*Beddomeia camensis*), Minnow River hydrobiid snail (*Beddomeia turnerae*), Claytons Rivulet freshwater snail (*Beddomeia waterhouseae*) will be identified during pre-construction surveys by a suitably qualified ecologist and demarcated on mapping. Erosion and Sediment controls within these areas are to be managed in accordance with controls as detailed in the soil and water management subplan.	CM028 Soil and Water Management Subplan		Pre-construction – habitat identified during pre-construction surveys and demarcated on GIS mapping prior to commencement of works in the relevant catchment. Erosion and sediment controls installed prior to ground disturbance and maintained per the SWMSP for the full duration of works.
WC7	Any watercourse crossings in tributaries of the Cam River, Dasher River, Claytons Rivulet and Little Claytons Rivulet will be surveyed by a suitably qualified ecologist prior to commencement of any works. Works in these waterways would be managed in accordance with any recommendations from the survey. Erosion and Sediment controls within these areas are to be managed in accordance with controls as detailed in the soil and water management subplan.	MIDAA permit condition 31	Environmental Manager	Pre-construction – survey completed by a suitably qualified ecologist prior to commencement of any works at each relevant crossing. Survey recommendations implemented for the full duration of works at that crossing. Erosion and sediment controls installed prior to ground disturbance and maintained per the SWMSP.
WC8	Clearing will be minimised to smallest extent practicable for riparian EPZs and clearing will be in accordance of the requirements under section C7 of the Forest Practices Code 2020 and CM043. – Removal or pruning of tall trees to be done by hand using chainsaws. Where mechanical felling is required	CM030 CM037 CM043 Forest Practices Code 2020	Environmental Manager Site Supervisor	Construction – applies for the full duration of any clearing activity within or adjacent to riparian EPZs. Limbs/branches entering the watercourse to be removed within 24 hours of falling. Pre-start briefing on felling direction completed

Item	Specific control	Relevant reference/guideline	Responsibility	Timing
	for safety reasons (e.g. tree lean, hazardous defects, proximity to live conductors), justification must be documented and approved by the Environmental Manager prior to felling – Fell trees and branches away from watercourse to minimise damage to riparian vegetation. – Remove limbs and branches that enter the watercourse as a result of construction.			prior to commencement of each clearing shift.
WC9	Streamside reserves/Riparian zones will be managed in accordance with Forest Practices Code (FPC) 2020, Sections C7 and D2. Clearance areas for waterway crossings / access tracks will be marked on site and on maps. No vegetation shall be removed outside the crossing alignment. Prior to works within streamside reserves/riparian zones, workers will be briefed at pre-start on the specific requirements for each site. Within the clearance area, streamside vegetation, snags or decaying wood from streams will be retained within the clearance area. Removal is only permitted where it presents a direct safety hazard to personnel or is required for the approved crossing alignment. In such cases, justification must be documented and approved by the Environmental Manager prior to removal.	CM034 CM055	Environmental Manager Site Supervisor	Pre-construction – clearance areas marked on site and on maps prior to mobilisation. Construction – pre-start briefing completed prior to commencement of each shift within streamside reserves/riparian zones. Controls maintained for the full duration of works at that location.
WC10	Where any works are necessary within class 1-3 streams between December and April, a pre-clearance survey will be undertaken by a suitably qualified ecologist to determine whether there are any platypus burrows present.	MIDAA permit condition 31	Environmental Manager	Pre-construction – platypus pre-clearance survey completed by a suitably qualified ecologist prior to commencement of works in any Class 1–3 stream between

Item	Specific control	Relevant reference/guideline	Responsibility	Timing
	Works will be timed to avoid works around known platypus burrows between December to April.			December and April. Works timed to avoid known platypus burrows for the full December–April period at each relevant location.
WC11	Any waterway crossings for access tracks will be designed and constructed in accordance with: – FPC 2020 B3.3, B6 and D2.1 – Forest Practices Authority's Technical Note 15 "Guidelines for the design and maintenance of stream crossings for the passage of fish and other aquatic fauna – culverts", and – Guideline 5: Siting and Design Stream Crossings, of the Waterways and Wetlands Works Manual – Environmental Best Practice Guidelines when Undertaking Works on Waterways and Wetlands in Tasmania (Department of Primary Industries Water and Environment, 2003). Key requirements for waterway crossings are outlined below: – Where waterway crossings are necessary, design so that they will be constructed at 90 degrees to the drainage line. – No removal of vegetation in streamside reserves, instream snags, and wood outside the crossing alignment	MIDAA permit condition 31		Design stage (pre-construction) – crossing designs completed in accordance with the listed standards prior to construction approval. Construction – design implemented at each crossing from first ground disturbance through to completion of crossing works, including reinstatement.

Item	Specific control	Relevant reference/guideline	Responsibility	Timing
WC12	Ramps must be installed on open excavations to allow fauna to escape. Works at open excavations must not commence while trapped fauna is present.	MIDAA permit condition 35	Site supervisor and Environmental Manager	Construction – ramps installed immediately upon opening of any excavation and maintained for the full duration the excavation remains open. Excavations inspected for trapped fauna prior to commencement of each shift before works recommence.
WC13	Use of pesticides, herbicides or other chemical treatments within Burrowing Crayfish groundwater exclusion zones (200 m) must be avoided. Vegetation management within these areas will be undertaken using mechanical methods (e.g. hand removal, slashing or cutting). Where chemical use is considered necessary, it must be justified, approved by the Environmental Manager, and implemented in accordance with the CEMP and relevant environmental controls to prevent any impact to groundwater or burrowing crayfish habitat.	CM081	Site supervisor Environmental Manager	Construction and operation – applies continuously within all mapped BBC groundwater exclusion zones for the full duration of construction and any subsequent vegetation maintenance activities. Any proposed chemical use to be approved by the Environmental Manager prior to application, with approval records retained.

8. Monitoring, reporting and review

Monitoring and inspections will be undertaken to measure the effectiveness of the implementation of this plan and to facilitate continuous improvement. General and species-specific monitoring and corrective actions are summarised in Section 6.1.

Monitoring data relevant to MNES, including surveys, maps, other spatial and metadata, and all species occurrence data (sightings and evidence of presences) will be maintained and submitted to DCCEEW. Monitoring data relevant to TSP, including surveys, maps, other spatial and metadata, and all species occurrence data (sightings and evidence of presences) will be maintained and submitted to NRE Tas.

8.1 Monitoring Extent and Locations

Water quality monitoring locations will be established upstream and downstream of each crossing in accordance with the Surface Water Monitoring Program (SWMP) developed in accordance with NRE Tas, including distances of no closer than 10 m and no greater than 200 m from the works area, and positioned relative to inflows.

Water quality monitoring frequency will be undertaken in accordance with the SWMP, including weekly inspections for standard works, increased monitoring frequency (e.g. twice weekly) for sites containing MNES, and additional ad hoc monitoring where triggered by observed turbidity, erosion, or spill events.

8.1.1 Monitoring Locations

All watercourse crossings with flowing water will, at a minimum, require both upstream and downstream monitoring locations meeting the following requirements.

Upstream monitoring locations must:

- Be located well upstream of all construction works
- Be positioned downstream of inflows (rivers, creeks, etc)
- Further than 10m from the site, but not beyond 200m from site

Downstream monitoring locations must:

- Be located downstream of all construction-related sediment inputs
- Be positioned upstream of inflows (rivers, creeks, etc)
- Further than 10m from the site, but not beyond 200m from site

Monitoring locations must be surveyed and recorded in the Inspection Checklist, available at Appendix B.

Table 15 *summarises the environmental monitoring parameters and corrective actions to be taken. Monitoring actions in* Table 15 *are explicitly linked to the commitments in* Table 12*(Section 7.2) and the management controls in* Table 14*(Section 7.7), and each monitoring action has a corresponding reporting requirement in* Table 16*. This monitoring program should be undertaken in accordance with the requirements of the Surface Water Monitoring Program (Appendix D).*

Table 15 Summary of environmental monitoring and corrective actions

ID	Aspect monitored	Indicator	Trigger Value	Corrective Action	Frequency	Record/evidence	Linked commitment(s) (Table 12)
M1	Fauna interaction with works area	Presence of injured or dead crayfish within or adjacent to works area	Any injured or dead individual observed	Stop works and implement Genus Stop Work Protocol – Fauna Injury and Death (Appendix C). Notify Environmental Manager within 4 hours, engage suitably qualified aquatic ecologist. Ecologist to isolate affected area (min. 5 m × 5 m or 10 m buffer for aquatic individuals), assess in-situ, and relocate recoverable individuals under the Permit to Take. Engage NRE Tas Wildlife Services or approved wildlife carer for significant injuries, retain dead individuals for verification. Photograph and record in Environmental Incident Register, notify DCCEEW within 24 hours. Implement corrective actions within 48 hours following incident review, recommence works only on	Daily during active works in or near watercourses	– Incident reports – Photographic records – Regulator notification records	C1, C3

ID	Aspect monitored	Indicator	Trigger Value	Corrective Action	Frequency	Record/evidence	Linked commitment(s) (Table 12)
				Environmental Manager sign-off			
M2	Exclusion zones (EPZs)	Condition and integrity of EPZ demarcation (flagging, signage, fencing)	EPZ not in place, unclear, or encroached upon, or evidence of burrow/chimney damage	Stop works in affected area, secure breach point. Notify Environmental Manager within 1 hour. Suitably qualified ecologist to inspect affected area within 24 hours to assess impact to crayfish or habitat features. Reinstate and reinforce demarcation prior to works recommencement. Re-induct affected personnel on EPZ requirements, record breach in Environmental Incident Register, report per Table 16. Recommence works only following Environmental Manager sign-off.	Daily during works in crayfish habitat	– Site inspection checklists – Photographic records	C1, C2, C4, C9
M3	Disturbance footprint relative to protected habitat	Alignment of works with approved disturbance limits and mapped EPZs	Works occurring within exclusion distances without approval	Stop works in affected area, notify Environmental Manager within 1 hour, ecologist to attend site within 24 hours. Rehabilitate affected area per WC14 and rehabilitation success criteria. Investigate	Pre-construction and verified prior to each crossing activity	– GIS mapping – Pre-start checklists – Inspection records	C1, C2, C3, C4, C9, C11, C12

ID	Aspect monitored	Indicator	Trigger Value	Corrective Action	Frequency	Record/evidence	Linked commitment(s) (Table 12)
				cause and correct relevant control before works recommence. Notify DCCEEW within 24 hours where breach affects MNES habitat. Recommence works only following Environmental manager sign-off.			
M4	Aquatic connectivity at crossings	Continuity of flow and absence of barriers to passage (e.g. perched culverts)	Evidence of flow restriction, perched structure, or barrier to fauna passage	Stop in-stream works at affected crossing, notify Environmental Manager within 1 hour, design engineer and ecologist to investigate within 24 hours. Implement temporary measures (e.g. bypass pumping, temporary low-flow channel) within 24 hours to restore connectivity. Review and modify crossing design or installation methodology as required. Recommence works only following Environmental Manager sign-off.	At installation and post-construction inspection	– Inspection reports – As-built records – Photographs	C5, C6
M5	Sediment control and	Visible turbidity downstream	Visible sediment plume extending >10m downstream OR	Stop in-stream works at relevant crossing, notify Environmental Manager within 1 hour. Inspect erosion	Daily during works and following rainfall events	– Inspection checklists	C7, C10

ID	Aspect monitored	Indicator	Trigger Value	Corrective Action	Frequency	Record/evidence	Linked commitment(s) (Table 12)
	erosion management	and condition of erosion and sediment controls	failure/overtopping of controls	and within 2 hours repair, replace or supplement any failed or undersized controls. Identify and rectify source of exceedance. Continue monitoring at 30-minute intervals until readings return to within trigger range for two consecutive readings before works recommence. Notify DCCEEW per Table 16 where MNES catchment is affected.		– Photographic records	
M6	Water quality	Upstream and downstream water quality parameters (including turbidity, EC, pH, DO and temperature) and visual comparison of water quality conditions	Visible increase in turbidity downstream compared to upstream conditions, OR Exceedance of water quality parameters in accordance with the SWMP	Isolate failed control, install temporary measures (sandbags, coir logs) within 4 hours. Repair or replace control within 24 hours. Investigate cause and update SWMSP where systemic improvement is required. Increase inspection frequency to twice daily in affected area until two consecutive inspections confirm performance. Record incident. Environmental Manager required sign-off prior to	During instream works and after rainfall events, and in accordance with the SWMP, including routine and increased monitoring at sites with MNES	– Monitoring records – Field measurements – Inspection records – Exceedance investigation forms	C7

ID	Aspect monitored	Indicator	Trigger Value	Corrective Action	Frequency	Record/evidence	Linked commitment(s) (Table 12)
				returning to normal inspection frequency.			
M7	Fuels, chemicals and concrete management	Evidence of spills or contamination within or near watercourse	Any spill entering or with potential to enter a watercourse	Stop works and contain spill using on-site spill kit within 15 minutes. Notify Environmental Manager immediately. Remove and dispose of contaminated material at licensed facility within 24 hours. Ecologist to assess affected area for habitat or fauna impact within 24 hours. Investigate cause, review and update refuelling/storage controls. Notify DCCEEW and EPA Tas per Table 16 and statutory requirements. Recommence works only following Environmental Manager sign-off.	Continuous during high-risk activities (refuelling, concrete works)	– Incident reports – Spill response records	C8
M8	Bank and channel stability	Condition of banks, bed and stabilised areas at crossing	Bank collapse, excessive erosion or instability observed	Design engineer and ecologist to inspect affected area within 5 working days. Design and implement stabilisation works within 20 working days. Investigate cause, update	During works and post-installation	– Site inspections – Photographic monitoring	C5

ID	Aspect monitored	Indicator	Trigger Value	Corrective Action	Frequency	Record/evidence	Linked commitment(s) (Table 12)
				crossing design or rehabilitation methodology. Increase monitoring frequency at affected location to monthly until two consecutive inspections confirm stability. Record incident and corrective measures.			
M9	State listed freshwater snail habitat condition (where relevant)	Presence of sediment deposition within identified habitat areas	Visible fine sediment accumulation within mapped habitat areas	Stop upstream works, notify Environmental Manager within 1 hour. Identify and rectify sediment source within 24 hours. Ecologist to assess extent of deposition within 5 working days, recommend remediation if required. Notify DCCEEW per Table 16. Recommence works only following Environmental Manager sign-off.	During works in identified catchments	– Inspection records – Photo points	C10
M10	Implementation of monitoring and inspections	Completion of required inspections and monitoring	Required monitoring not undertaken or recurring non-compliances identified	Reschedule and complete missed inspection within 5 working days. Environmental Manager to investigate cause, update inspection schedule or responsibility allocation. For repeat occurrences, escalate	As per inspection schedule (daily/weekly/audit-based)	– Audit reports – Inspection checklists	C13, C14

ID	Aspect monitored	Indicator	Trigger Value	Corrective Action	Frequency	Record/evidence	Linked commitment(s) (Table 12)
		activities		to Project Manager with internal audit within 20 working days. Record inspection completion and any corrective measures.			
M11	Rehabilitation and stabilisation	Establishment of vegetation and stability of rehabilitated areas	Evidence of erosion, instability or vegetation failure	Suitably qualified ecologist to investigate cause within 20 working days. Design and implement remedial works in next available planting season, or sooner where erosion is active. Extend rehabilitation monitoring period until success criteria are met for two consecutive monitoring events. Record remedial works and updated monitoring outcomes.	At completion and during post-construction period	– Rehabilitation reports – Photographic records	C5

8.2 Reporting

A full summary of reporting requirements for environmental management of the project is provided in Section 6 of the CEMP. The reporting and documentation inputs from this plan are provided in Table 16 below. These will be incorporated into CEMP reporting requirements (refer to Section 6 of the CEMP). Each reporting requirement in Table 16 is explicitly linked to a monitoring action in Table 15 and to one or more commitments in Table 12, ensuring that all monitoring outcomes are reported at the appropriate trigger and frequency, and that reporting obligations remain traceable to specific commitments and approval conditions. Reporting requirements are implemented in accordance with EPBC Condition 5.

Table 16 Watercourse crossing management plan reporting requirements

Reporting requirement	Trigger (linked to monitoring requirements in Table 15)	Type	Frequency	By who	To who	Evidence	Linked commitments (Table 12)
Injury or mortality of crayfish (MNES)	Detection of injured or dead crayfish (M1)	Incident report	Within 24 hours of detection	Environmental Manager	DCCEEW and NRE Tas	Incident report, photographic evidence, correspondence	C1, C3, C15
Disturbance to crayfish burrows or EPZ breach	EPZ disturbance or burrow damage observed (M2)	Incident report	Within 24 hours of detection	Environmental Manager	DCCEEW (if MNES impacted), NRE Tas	Incident report, site inspection records, photos	C2, C4, C9, C15
Unauthorised works within exclusion zones	Works within setback without approval (M3)	Non-conformance/incident report	Within 24 hours of detection	Environmental Manager	TasNetworks, DCCEEW (if MNES impacted)	NCR report, GIS records, inspection records	C3, C4, C11, C15
Failure of aquatic connectivity (barrier or perched crossing)	Evidence of connectivity impact (M4)	Inspection/ corrective action report	Within 48 hours of identification	Environmental Manager	TasNetworks, internal reporting	Inspection reports, as-built verification	C6
Sediment release or erosion control failure	Sediment plume >10 m downstream or control failure (M5)	Incident report	Within 24 hours if significant, otherwise recorded in daily log	Site Supervisor/ Environmental Manager	TasNetworks, DCCEEW if impact to MNES habitat	Inspection records, photos, corrective action records	C7, C10

Reporting requirement	Trigger (linked to monitoring requirements in Table 15)	Type	Frequency	By who	To who	Evidence	Linked commitments (Table 12)
Water quality exceedance	Downstream turbidity elevated above upstream (M6)	Monitoring report/incident report (if persistent)	Record daily, escalate within 24 hours if not resolved	Environmental Manager	TasNetworks, DCCEEW if MNES impacted	Monitoring data, field records, photos	C7, C15
Spill or contamination event	Spill entering or likely to enter watercourse (M7)	Incident report	Immediate notification, written report within 24 hours	Site Supervisor/ Environmental Manager	TasNetworks, DCCEEW if required	Spill reports, response records	C8, C15
Bank or channel instability	Bank collapse or significant erosion observed (M8)	Inspection/ corrective action report	Within 48 hours of identification	Environmental Manager	TasNetworks	Inspection records, photos	C5
Sedimentation of freshwater snail habitat	Sediment accumulation in identified habitats (M9)	Monitoring/ incident report	Within 48 hours if impact observed	Environmental Manager	TasNetworks, NRE Tas	Inspection records, photo points	C10
Failure to undertake required monitoring	Monitoring not completed or repeated non-compliance (M10)	Non-conformance report	Within 24 hours of identification	Environmental Manager	TasNetworks	Audit and inspection reports	C13, C14
Rehabilitation failure	Erosion or instability in rehabilitated areas (M11)	Inspection/ rehabilitation report	Within 5 business days of identification	Environmental Manager	TasNetworks	Rehabilitation monitoring reports, photos	C5

Reporting requirement	Trigger (linked to monitoring requirements in Table 15)	Type	Frequency	By who	To who	Evidence	Linked commitments (Table 12)
Annual monitoring data submission (MNES)	Collection of monitoring data and species records	Monitoring report submission	Within 20 business days of 30 September each year (unless otherwise specified)	Environmental Manager	DCCEEW	Monitoring datasets, GIS data, species records	C15

8.3 Review and plan revision

If monitoring determines that the controls outlined in this Plan are not effective, the process generating the adverse outcome will be paused. Alternative management controls will be determined in accordance with the CEMP and the management measures in Section 7.7. Once determined and approved by the Environmental Manager, works may resume. This Plan is not static and will be reviewed and updated to reflect new information, monitoring outcomes, and changes to management measures, in accordance with the CEMP.

8.3.1 Triggers for revision

A revision of this Plan will be undertaken in any of the following circumstances:

- Annually, as part of the scheduled review of EPBC-related management plans for the Project;
- Following any reportable incident involving the Giant Freshwater Crayfish (*Astacopsis gouldi*) or Burnie Burrowing Crayfish (*Engaeus yabbimunna*), or any exceedance of a trigger value listed in Table 15;
- Following the outcomes of any internal or external audit that identifies the need for changes to management controls, monitoring, or reporting;
- Following any change to the Project scope, methodology, or design that affects watercourse crossings, MNES habitat, or the assumptions underpinning this Plan;
- Following any amendment to relevant approvals, including the EPBC Approval (EPBC 2022/09247), the Tasmanian Approval, or any associated permits (including the *Permit to Take*); or
- Following any change to relevant statutory documents, recovery plans or conservation advice for the protected matters addressed by this Plan.

8.3.2 Submission to DCCEEW

Revised versions of this Plan will be submitted to DCCEEW in accordance with the following timeframes:

- Annual reviews – submitted to DCCEEW within 20 business days of completion of the annual review, regardless of whether material changes are required. Where no material changes are identified, a short statement confirming the outcome of the review will be submitted in lieu of a revised Plan.
- Incident- or audit-triggered revisions – submitted to DCCEEW within 20 business days of the triggering event or audit close-out.
- Scope, methodology, or approval changes – submitted to DCCEEW prior to implementation of the change, and in any event within 20 business days of the change being confirmed.

Revised Plans will be submitted to DCCEEW for written approval where required under Condition 19 of the EPBC Approval. The approval holder will not implement the revised Plan in respect of activities affecting the Giant Freshwater Crayfish or Burnie Burrowing Crayfish until the revised Plan has been approved in writing by the Minister, consistent with Condition 19.

All revisions will be tracked in the Revision history at the front of this Plan, including the date of revision, the trigger for revision, a summary of changes, and the date of DCCEEW approval (where applicable).

9. Reference documents

This WCMP has been prepared in accordance with regulations and guidance documents as shown in Table 17.

Table 17 Reference documents

Title	Reference
Regulator Permits	

Title	Reference
Major Infrastructure Project Planning Permit Granted under the *Major Infrastructure Development Approvals Act 1999* and the *Land Use Planning and Approvals Act 1993*	Permit number: MIPP-2026-01 North West Transmission Upgrades Project - Palmerston to Hampshire Section - Final Report and permit, 10 March 2026
Environmental Protection and Biodiversity Conservation Act 1999	EPBC 2022/09247
Forest Practices Authority Guidelines	
Forest Practices Code 2020	Forest Practices Authority 2020, *Forest Practices Code*, Forest Practices Authority, Hobart, Tasmania. Sections D1 and D2 - Forest Practices Code Forest Practices Authority. *Forest Practices Code*. Hobart, Tasmania: Forest Practices Authority, 2020. ISBN 978-1-921527-63-0
Fauna Technical Note No. 15:	Fauna Technical Note No. 15: Guidelines for the design and maintenance of stream crossings for the passage of fish and other aquatic fauna – culverts, Forest Practices Authority
Fauna Technical Note No. 16	Assessing juvenile giant freshwater crayfish habitat in Class 4 streams, Forest Practices Authority
Fauna documents	
Giant Freshwater Crayfish Recovery Plan	Recovery Plan for the Giant Freshwater Crayfish (Astacopsis gouldi), Commonwealth of Australia 2017
Burnie Burrowing Crayfish Threatened Species Link Profile	Burnie Burrowing Crayfish Threatened Species Link management profile, NRE 2026
Burrowing crayfish group recovery plan 2001-2005	Doran, N.E. (2000). Burrowing Crayfish Group Recovery Plan 2001-2005. Department of Primary Industries, Water and Environment, Hobart
Conservation Advice - *Engaeus yabbimunna* Burnie burrowing crayfish	*Engaeus yabbimunna* (Burnie burrowing crayfish) Conservation Advice, 2016, DCCEEW
Conservation Advice - *Astacopsis gouldi* giant freshwater crayfish	*Astacopsis gouldi* (giant freshwater crayfish) Conservation Advice, 2017, DCCEEW
Other relevant guidelines	
DCCEEW EMP Guidelines	Department of Climate Change, Energy, the Environment and Water, Environmental Management Plan Guidelines, Version 1.2 (2024)
International Erosion Control Association (IECA) Best Practice Erosion and Sediment Control Guideline	International Erosion Control Association (Australasia Chapter). Best Practice Erosion and Sediment Control. Brisbane: IECA Australasia, n.d. Accessed September 3, 2025. https://connect.ieca.org/austieca/resources/resources-list/bpesc-document
Erosion and Sediment Control – The Fundamentals for Development in Tasmania	Environment Protection Authority Tasmania. Erosion and Sediment Control – The Fundamentals for Development in Tasmania. Hobart: EPA Tasmania, July 2023. Accessed September 3,

Title	Reference
	2025. https://epa.tas.gov.au/environment/water/stormwater/erosion-and-sediment-control-on-building-sites
Australian and New Zealand Guidelines for Fresh and Marine Water Quality	ANZG 2018, Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand, Canberra.
Water Quality Guideline Values for Aquatic Ecosystems of Tasmania	EPA Tasmania. *Water Quality Guideline Values for Aquatic Ecosystems of Tasmania*. Hobart: Environment Protection Authority Tasmania. Accessed October 7, 2025. https://epa.tas.gov.au/environment/water/water-quality-guideline-values-for-tasmanian-aquatic-ecosystems. [epa.tas.gov.au]
Tasmania Water Management Act 1999	Tasmanian Government Legislation
State Policy on Water Quality Management 1997	View - Tasmanian Policy Online
Related project plans / CEMP subplans	
Flora and Fauna Management Subplan	NWTD Construction Environment Management Plan
Soil and Water Management Subplan	NWTD Construction Environmental Management Plan
Surface Water Management Program (SWMP)	Proposed Surface Water Monitoring Program, North West Transmission Project
North West Transmission Developments DA/EIS information	
Ecology Baseline Characterisation and Impact Assessment (NWTD EP-DA-502)	Entura 2025. Ecology Baseline Characterisation and Impact Assessment. Remaining North West Transmission Developments, Part E – Attachments and appendices, Appendix B. NWTD EP-DA-502
Chapter 6 – Potential impacts and their management	TasNetworks August 2025. Remaining North West Transmission Developments, Part C – Environmental Impact Statement, Chapter 6 – Potential impacts and their management. NWTD-EP-DA-306
Appendix H – Geomorphology and geology assessment report	TasNetworks March 2025. Remaining North West Transmission Developments, Part E – Attachments and appendices, Appendix H – Geomorphology and geology assessment report. NWTD-EP-DA-508
Appendix I – Surface water and flooding assessment reports	TasNetworks March 2025. Remaining North West Transmission Developments, Part E – Attachments and appendices, Appendix I – Surface water and flooding assessment reports, Appendix I.1 and Appendix I.2 – Surface water assessment report. NWTD-EP-DA-509
Appendix P – Groundwater assessment report	TasNetworks March 2025. Remaining North West Transmission Developments, Part E – Attachments and appendices, Appendix P – Groundwater assessment report. NWTD-EP-DA-516
Management Measures (NWTD-EP-DA-610)	TasNetworks 2025. Management measures. Remaining North West Transmission Developments, Part E – Attachments and appendices, Attachment 10. NWTD-EP-DA-610

10. Glossary

Term	Definition
Waterway / watercourse, *Forest Practices Authority (2020)*	A natural depression carrying perennial or intermittent flows of surface water for part of or all the year in most years. Consisting of a defined channel, with banks and a bed along which water may flow.
Water Crossing (temporary)	A non-permanent structure constructed to allow short-term vehicle or machinery access across a watercourse, which is installed for the duration of a specific operation and removed once works are complete, with the site rehabilitated to restore natural watercourse function.
Water Crossing (permanent)	A long-term or enduring structure constructed to provide ongoing access across a watercourse, intended to remain in place beyond the completion of a specific operation, and to withstand design flood events, forming part of the permanent road or access network.
Class 1–3 streams, *Forest Practices Authority (2020)*	Class 1 stream is a major permanent watercourse that: • Has a large upstream catchment, and • Is normally permanently flowing, and • Includes major rivers and large creeks, typically shown as named watercourses on maps. Class 2 stream is a moderate-sized watercourse that: • Has a moderate upstream catchment, and • Is permanently flowing or near-permanent, and • Has a clearly defined channel, bed and banks, but is smaller than a Class 1 stream Class 3 stream is a small permanent or near-permanent stream that: • Drains a small catchment, and • Has a defined bed and banks, and • May cease to flow during extended dry periods, but remains a defined watercourse.
Environmentally Sensitive Zones (ESZs)	EPZs that are managed under this plan include the following, - 5 m radius around locations of threatened flora species - 10 m radius around freshwater crayfish chimneys/burrows (burnie burrowing crayfish habitat) - 50 m radius around Tasmanian Devil, Quoll and Wombat burrows - 100 m radius around active Grey Goshawk nests - 150 m radius around active Tasmanian Masked Owl nest/active nesting hollows - 500 m around active Tasmanian Wedge-tailed Eagle and White-bellied Sea Eagle nests, and 1 km where works are within line-of-sight of an active nest during the management constraint period. Additional management areas may apply where known raptor nests occur within 500 m of construction activity, in accordance with advice prepared by a suitably qualified raptor specialist.
Environmentally Sensitive Zones (ESZs)	ESZs include the following:, - Formal reserves under the Nature Conservation Act 2002 (including Blythe River Conservation Area, Emu River Conservation Area and Mount Montgomery State Reserve)

Term	Definition
	- Patches of threatened vegetation communities including *Eucalyptus viminalis* wet forest, *Eucalyptus ovata* forest and woodland, *Melaleuca ericifolia* swamp forest. - Known nests of Tasmanian Wedge-tailed Eagle, White-bellied Sea Eagle, Grey Goshawk and Tasmanian Masked Owl within 500 m of construction activity
Low-flow period	A period when a watercourse is experiencing naturally low discharge, with minimal surface flow and runoff, such that the risk of erosion, sediment mobilisation, turbidity and downstream impacts is minimised.
Suitable habitat	For the purposes of this Plan, suitable habitat includes watercourses exhibiting characteristics described in Section 5.2 (Protected Matters).

Appendices

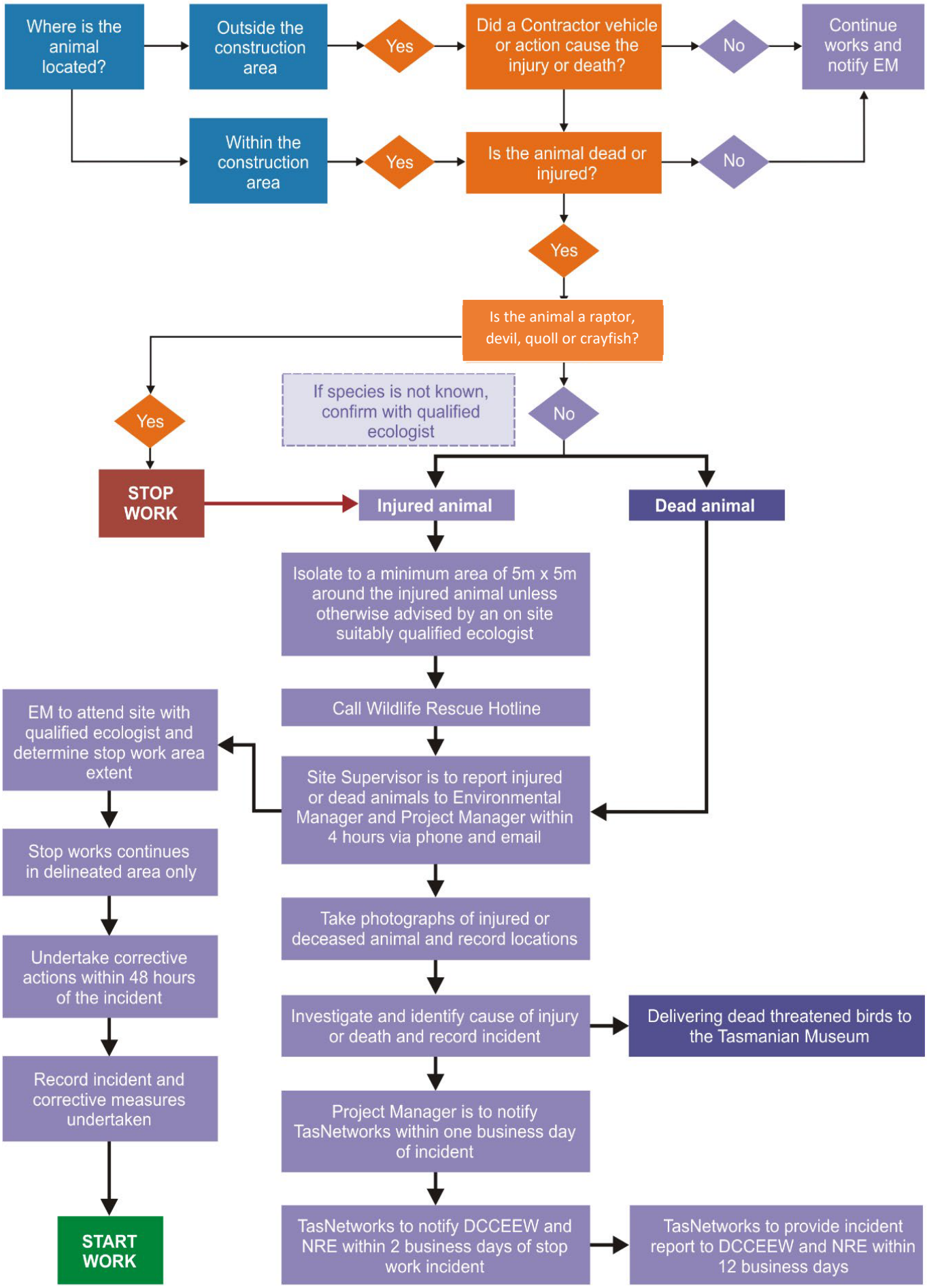
Appendix A Standard Crossing Plan

Appendix B Inspection templates

Appendix C

Stop Work Protocol: Fauna Injury and Death

Stop work protocol: Fauna injury and death



Appendix D

Surface Water Monitoring Program

Surface Water Monitoring Program

Stage 1 – North West Transmission Developments Project

Document history

Current document authoriser

Title	Name
Environmental Lead	Gina Goodman

Revision history

Rev	Date	Author	Authoriser	Details of Amendment
0	24/06/2026	EC	GG	Formalisation of proposed surface water monitoring program following NRE Tas endorsement

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1. Introduction

1.1 Purpose

The purpose of this document is to outline the endorsed surface water monitoring program (SWMP) for the North West Transmission Development.

This monitoring program has been developed in consultation with the Department of Natural Resources (NRE Tas) and provides a framework for the monitoring and evaluation of surface water quality within the project footprint.

2. Criteria for triggering the SWMP

Surface water quality monitoring will be undertaken by a suitably qualified member of the Genus Environmental team where the following criteria are identified.

Where construction activities have a direct impact on a watercourse, or have the potential to cause an impact, water quality will be monitored in accordance with the methodology detailed within section 3 of this program.

A direct impact is defined by the following,

- Construction of a waterway crossing
- Any works within a waterway
- Any works within a riparian buffer zone (based on creek classifications and FPC 2020 Table 7)
- Any works within 40m of an actively flowing waterway or waterbody (except where the only waterway within 40m of construction is upslope and therefore construction impacts are unlikely) – this will exclude farming dams unless landowner has raised this in their property management plan
- Use of a waterway crossing if interactions with water are still present or likely (e.g. ford crossings)

3. Methodology

3.1 Nominated parameters

Where a site meets the criteria outlined in section 2, the following will apply during each monitoring event.

Readings for following parameters will be recorded by use of a calibrated water quality probe and recorded on the field sheets and water quality monitoring register.

- Turbidity (NTU)
- Electrical Conductivity (µS/cm)
- pH
- Dissolved Oxygen (DO(mg/L))
- Temperature (°C) (ambient temperature will also be recorded)

With turbidity being the main parameter of concern, sediment load will be recorded based on visual observations, and field records will include geolocated images of watercourse at monitoring locations.

3.2 Monitoring Locations

Where monitoring is required at a site, the point of monitoring will be selected in accordance with the following.

- Upstream monitoring location
  - To be upstream of construction impacts (no further than 200m and no closer than 10m)
  - Be positioned downstream of inflows (rivers, creeks, etc)
- Downstream monitoring
  - To be taken downstream of construction footprint/impact (no further than 200m and no closer than 10m)
  - Be positioned upstream of inflows (rivers, creeks, etc)

Monitoring locations will be geolocated and captured in the project spatial data platform.

All reasonable measures will be taken to meet the above criteria for monitoring, however, due to certain constraints, Genus cannot guarantee that readings will always be able to be taken within >10 and <200m of the site. Constraints that may impact reading locations are detailed below

- Where meeting the above distances would require access to private property that are not impacted by the project, therefore, access is not granted
- Density of riparian vegetation impedes access to watercourse banks within the distances cited in this document
- No safe access to watercourse banks within cited distances

3.3 Monitoring frequency

3.3.1 General inspections

For sites that contain no other constraints, monitoring of water quality will be undertaken as part of the weekly environmental inspection as outlined in the project CEMP

It should be noted that site supervisors will be required to record any visible increase in turbidity in their site diaries, as well as reporting this to the environmental team so they can determine if ad hoc monitoring is required.

3.3.2 Matters of National Environmental Significance (MNES)

Where a site should have identified aquatic MNES, the frequency of water quality monitoring inspections will be increased to twice weekly.

If at any time a site supervisor notes and reports an increase in turbidity to the environmental team, works will be ceased until such time that an environmental advisor has been able to inspect the site and take water quality readings.

4. Ad Hoc monitoring and exceedances

4.1 Ad Hoc monitoring

Ad hoc water quality monitoring will be undertaken where the following conditions are met:

- Waterway or waterbody near a worksite shows clear signs of increased turbidity
- Where any erosion or sedimentation is observed on the banks of a waterway/waterbody and has resulted from a construction-based activity
- Where there has been a spill within a waterbody
- Where there has been a spill adjacent to a waterway/waterbody and there was clear risk of the spill entering the waterway/waterbody

The above parameters must be reported to the environmental team by the site personal for appropriate investigation.

4.2 Response to an exceedance of upstream parameters

Where it is flagged during the weekly inspection that water quality parameters have been exceeded, the environmental advisor onsite must complete an exceedance investigation form to identify and record if the exceedance is clearly due to a construction activity or can reasonably be explained by environmental factors.

Where an exceedance of the water quality parameters has been identified to have been the result of construction activities, works will be ceased until such time that erosion and sediment control measures are rectified.

The event will be logged as an incident in line with the project CEMP and reported to TasNetworks. TasNetworks have the responsibility for notifying regulatory authorities of incidents.

Appendices

Appendix A

Monitoring and Exceedance Forms

NWTD - Water Quality Monitoring Form

Site Information					
Date:		Time:		Site Identifier:	
Sampler:		Watercourse:		Run No:	

Sampling purpose:			Detail reason for Ad Hoc monitoring:
	Weekly Inspection		
	EPBC Bi Weekly		
	Ad Hoc		

Upstream Location - Physical Observations						
Sediment Load		**Stream Flow**		**Odour**	Yes	No
Clear		Nil (Dry/Iscolated Pools)		**Other Observations**		
Low		Low (below watermark)				
Med		Moderate (at watermark)				
High		Fast (above watermark)				
		Flood				

Downstream Location - Physical Observations						
Sediment Load		**Stream Flow**		**Odour**	Yes	No
Clear		Nil (Dry/Iscolated Pools)		**Other Observations**		
Low		Low (below watermark)				
Med		Moderate (at watermark)				
High		Fast (above watermark)				
		Flood				

Upstream Location - Measurement Readings					
Are readings able to be taken >1m and <200m from site			Yes	No	If no, detail reason:
Turbidity	NTU				
EC	µS/cm				
pH					
DO	mg/L				
Temp (water)	°C				
Temp (ambient)	°C				

Downstream Location - Measurement Readings					
Are readings able to be taken >1m and <200m from site			Yes	No	If no, detail reason:
Turbidity	NTU				
EC	µS/cm				
pH					
DO	mg/L				
Temp (water)	°C				
Temp (ambient)	°C				

Sampling Method:		
Probe suspended in watercourse		
Water collected in bucket *		

Sampling Method:		
Probe suspended in watercourse		*If water has been colected via bucket method, all reasonable steps have been taken to avoid artificially increasing turbidity
Water collected in bucket *		

Records:						
Upstream geolocated photo on Field Maps	Date:		By:		Signature:	
Downstream geolocated photo on Field Maps	Date:		By:		Signature:	
Results recorded in WQM Register	Date:		By:		Signature:	

Exceedance Investigation Form		
Site:	Date:	Time:
Person Conducting Investigation:		
Exceeding parameter	Value of exceeding parameter	Clearly caused by construction activity? (Y/N)
Turbidity		
EC		
Ph		
DO		
Temp		
Visual observations:		
Is there clear signs or evidence that the exceedance could be due to environmental factors or activities upstream of the worksite that are not construction related? (i.e. heavy rainfall upstream)		
If clearly caused by construction activity document the exact cause (i.e. failed site drainage, spill onsite, erosion from site etc.)		
Is it necessary to stop works to rectify the cause?		
Has the incident been reported to the client? (construction caused only)		
Signed by onsite Envio Advisor		

Appendix B

NRE Tas Endorsement Letter

Department of Natural Resources and Environment Tasmania
PRIMARY INDUSTRIES AND WATER

Hobart GPO Box 44, Hobart, Tasmania, 7001
Launceston PO Box 46, Kings Meadows, Tasmania, 7249
Devonport PO Box 303, Devonport, Tasmania, 7310
Ph 1300 368 550
Web nre.tas.gov.au

Inquiries: Bill Shackcloth
Phone : 6165 8957
Email : Bill.Shackcloth@nre.tas.gov.au
Our Ref : FR-FW-AV-226032-001.004

Tasmanian Government

Ms Gina Goodman

Environmental Lead
Genus Infrastructure Pty Ltd

Email: gina.goodman@genus.com.au

Re: Proposed Surface water Monitoring Program for North West Transmission Development.

Dear Ms Goodman

Thank you for your correspondence of 17 June 2026 outlining the proposed surface water monitoring plan for works associated with the North-West Transmission Development.

This correspondence follows discussions between Tasmanian Department of Natural Resources and Environment (NRE Tas) staff and your project team regarding the proposed monitoring arrangements. I note that the comments and suggestions provided during those discussions have been incorporated into the monitoring plan.

As Manager, Water Management and Assessment, NRE Tas, I endorse the monitoring program as outlined in the submitted documentation.

Should any questions or concerns arise during the course of the works, please do not hesitate to contact me or a member of the Water Management and Assessment team.

Yours sincerely

Bryce Graham
Manager
Water Management and Assessment
Agriculture and Water

19 June 2026

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