

# HASLIN

## Construction Environmental Management Plan Eurobodall Southern Water Supply Storage



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## Glossary/Abbreviations

Term / Abbreviation	Definition / Expanded text
Application Number	SSD 7089
CEMP	Construction Environmental Management Plan
CEMS	Contractors Environmental Management System
Compliance audit	Verification of how implementation is proceeding with respect to a Construction Environmental Management Plan (CEMP) (which incorporates the relevant approval conditions).
Construction	The demolition and removal of buildings or works, the carrying out of works for the purpose of the development, including bulk earthworks, and erection of buildings and other infrastructure permitted by the Development Consent
Council	Eurobodalla Shire Council
Development	The development described in the Eurobodalla Southern Water Supply Storage Environmental Impact Statement
Development Consent (DC)	The Minister for Planning's approval SSD 7089 dated 17 October 2019
Development Consent Conditions	The Minister for Planning's Minister's Development Consent Conditions contained in approval SSD 7089 dated 17 October 2019
DPE	Department of Planning and Environment
EIS	The Environmental Impact Statement titled Eurobodalla Southern Water Supply Storage Environmental Impact Statement, prepared by SMEC dated 27/08/2018
EEC	Endangered Ecological Community
Ecologically sustainable development	Using, conserving and enhancing the community's resources so that the ecological processes on which life depends are maintained and the total quality of life now and in the future, can be increased (Council of Australian Governments, 1992)
EPA	NSW Environment Protection Authority
EMS	Environmental Management System
Environmental aspect	Defined by AS/NZS ISO 14001:2015 as an element of an organisation's activities, products or services that can interact with the environment.
Environmental impact	Defined by AS/NZS ISO 14001:2015 as any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's environmental aspects.
Environmental incident	An unexpected event that has, or has the potential to, cause harm to the environment and requires some action to minimise the impact or restore the environment.
EMM	Environmental Management Measure as outlined in the project EIS documentation.

Environmental objective	Defined by AS/NZS ISO 14001:2015 as an overall environmental goal, consistent with the environmental policy, that an organisation sets itself to achieve.
Environmental policy	Statement by an organisation of its intention and principles for environmental performance.
Environmental target	Defined by AS/NZS ISO 14001:2015 as a detailed performance requirement, applicable to the organisation or parts thereof, that arises from the environmental objectives and that needs to be set and met in order to achieve those objectives.
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i> (NSW)
EPL	Environment Protection Licence
ESCP	Erosion and Sediment Control Plan
EWMS	Environmental work method statement
Incident	An occurrence or set of circumstances that causes or threatens to cause material harm and which may or may not cause a non-compliance
Material harm	Is harm that: <ul style="list-style-type: none"> <li>a) Involves actual or potential harm to the health or safety of human beings or to the environment that is not trivial or</li> <li>b) Results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding \$10,000 (such loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment).</li> </ul>
Minister, the	Minister of the NSW Department of Planning and Environment (or delegate)
Non-compliance	An occurrence, set of circumstances or development that is a breach of the Development consent
Non-conformance	Failure to conform to the requirements of Project system documentation including this CEMP or supporting documentation.
OEH	Office of Environment and Heritage
Operation	The operation of the water storage and associated infrastructure upon completion of construction excluding pre-commissioning activities
PESCP	Progressive Erosion and Sediment Control Plan
PIRMP	Pollution Incident Response Management Plan
Principal, the	Eurobodalla Shire Council
POEO Act	<i>Protection of the Environment Operations Act 1997</i> (NSW)
Project, the	Eurobodalla Southern Water Supply Storage
REMM	Revised Environmental Management Measures identified in Appendix 2 of the Development Consent
ROL	Road occupancy licence

SAP	Sensitive Area Plan
SEAR's	Secretary's Environmental Assessment Requirements
Site	Part of Lot 3 DP438839 and Lot 2 DP1168581 and an unnamed lot bounded by Bullockys Hut Road and Big Rock Road, Bodalla
SPIR	Submission and Preferred Infrastructure Report
SSD	State Significant Development
TRIPs	Tuross River Intake Pump Station

# Document Control and Records

Documentation and document control for this Plan, including issue of any amendments will be done generally in accordance with the contract. This Plan is maintained by Haslin Constructions (Haslin) and maintained throughout construction through regular reviews carried out on an initial 3 month of the project starting then on a biannually basis, or as changes require.

At all times an up-to-date copy of this plan shall be kept on site and made available to all employees and contractors involved in the project. Amendments that are made to this document are recorded on the register of amendments below and shall be approved by management staff. Superseded versions of this document shall be maintained for a period of 7 years to demonstrate record of environmental management and compliance.

This document shall be created and approved by the client. A controlled copy shall be supplied to all relevant parties, and distribution of controlled copies shall be recorded on the distribution register below (controlled hardcopy only). When changes are made to this document, parties listed below shall be provided with updates.

Register of Amendments				
Date:	Version No:	Description of Amendments:	Prepared by:	Approved by:
29/07/22	0	Draft for review	NF	AL
12/08/22	A	Responding to ESC feedback	NF	AL
09/09/22	B	Minor adjustments	NF	AL
18/10/22	C	Minor adjustments	NF	AL
21/10/22	D	Minor adjustments	KM	JM

Company Management Plan Authorisation			
	Name/Position	Date:	Signature
Prepared by:	Nicholas Francesconi Environmental Consultant	21/10/22	
Reviewed by:	Andrew Lynam Environmental Manager	21/10/22	
Approved by:	Colin Woods Managing Director	21/10/22	

Distribution Register	
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Version No.	Date of Issue:	Name of Recipient:	Position/Organisation
A	22/08/22	Ross Bailey	Principals Authorised Person
B	14/09/22	Ross Bailey	Principals Authorised Person
C	18/10/22	Ross Bailey	Principals Authorised Person
D	21/10/22	Ross Bailey	Principals Authorised Person

# 1. Introduction

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## 1.1 Purpose of this CEMP

This Construction Environmental Management Plan (CEMP) is the overarching document in the environmental management system for the Eurobodalla Southern Water Supply Storage project that includes a number of management documents. It is applicable to all staff and sub-contractors associated with the construction of the Project.

This Construction Environmental Management Plan (CEMP) and sub plans (hereafter referred to as plans) have been prepared to outline and describe how Haslin Constructions will comply with the NSW Minister for Planning's Development Consent (DC) during the construction of the Eurobodalla Southern Water Supply Storage project.

It outlines how Haslin Constructions will minimise the environmental risks and achieve environmental outcomes on the project by providing a structured approach to ensure appropriate controls are implemented.

Implementing the CEMP and plans effectively will ensure that the Project meets the requirements of the Minister's Development Consent, the statement of commitments made in the Environmental Impact Statement and all licences/approvals.

The CEMP has been prepared in accordance with:

- The Project approval SSD 7089.
- The requirements of the relevant EMP guidance as specified by the Department of Planning and Environment.
- AS/NZS ISO 14001.
- Haslin Constructions Environmental and Sustainability Policy (SEQ-POL-002).
- The project contract requirements.

This CEMP:

- Describes the construction activities to be undertaken and their timing
- Identifies the planning approval requirements, legal obligations, permits, licences, standards and guidelines that construction works are to adhere to
- Provides specific mitigation measures and controls to be implemented on-site to avoid or minimise adverse environmental impacts
- Describes the environmental management related roles and responsibilities including competence, training and awareness, effective communication and consultation processes

- Outlines a monitoring, auditing and reporting regime to ensure compliance with the requirements including incident investigation and action response.

The requirements of the Development Consent and where they are met in this CEMP are shown in Table 1-1, agency consultation requirements for each plan are outlined in Table 2-1.



**Table 1-1** Development consent requirements for CEMP

Condition No.	Requirement	Where addressed
C1	<p>Management required under this consent must be prepared in accordance with relevant guidelines, and include:</p> <p>(a) details of:</p> <ul style="list-style-type: none"> <li>(i) the relevant statutory requirements (including any relevant approval, licence or lease conditions)</li> <li>(ii) any relevant limits or performance measures and criteria</li> <li>(iii) the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures</li> </ul> <p>(b) a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria</p> <p>(c) a program to monitor and report on the:</p> <ul style="list-style-type: none"> <li>(i) impacts and environmental performance of the development</li> <li>(ii) effectiveness of the management measures set out pursuant to paragraph (b) above</li> </ul> <p>(d) a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible</p> <p>(e) a program to investigate and implement ways to improve the environmental performance of the development over time</p> <p>(f) a protocol for managing and reporting any:</p> <ul style="list-style-type: none"> <li>(i) incident and any non-compliance (specifically including any exceedance of the impact assessment criteria and performance criteria)</li> <li>(ii) complaint</li> <li>(iii) failure to comply with statutory requirements, and</li> </ul> <p>(g) a protocol for periodic review of the plan.</p>	Appendix B1, B2, B3, B4, B5, B6, B7.
C2	The applicant must prepare a Construction Environmental Management Plan (CEMP) in accordance with the requirements of C1	This document

Condition No.	Requirement	Where addressed
C3	<p>As part of the CEMP required under Condition C2 of this consent, the Applicant must include the following:</p> <ul style="list-style-type: none"><li>• Traffic Management Plan</li><li>• Flora and Fauna Management Plan</li><li>• Noise and Vibration Management Plan</li><li>• Soil and Water Management Plan</li><li>• Emergency Response Procedures in the event of flooding and bushfire</li></ul>	<ul style="list-style-type: none"><li>• Appendix B1</li><li>• Appendix B2</li><li>• Appendix B3</li><li>• Appendix B4</li></ul>

## **1.2 The Eurobodalla Southern Water Supply Storage project**

The Project consists of an off-stream water storage facility and associated ancillary facilities. Water would be extracted from the Tuross River, using a new river intake pump station, and transferred to the storage via the Storage Inlet Pipeline. As necessary, the storage volume would be supplemented by water extracted from an existing borefield adjacent the storage.

Key features of the Project include:

- a 3,000 megalitre storage capacity
- a 370 metre long embankment, 39 metres in height and a crest width of 20 metres located on an unnamed tributary of the Tuross River
- a spillway
- permanent erosion control structures located downstream of the spillway
- inlet works to convey and dissipate raw water transferred from the river intake pump station through a pipeline constructed along the left abutment to the proposed water storage facility
- outlet works to allow transfer of water from the storage to the existing southern water treatment plant (WTP)
- instrumentation to monitor seepage, reservoir levels and water quality
- a consequence category of “High C” for both flood and sunny day scenarios in accordance with the Australian National Committee on Large Dams (ANCOLD) Guidelines on the consequence categories of dams (2012)
- a thermal stratification control system
- a boat ramp at the storage for maintenance and water quality monitoring
- safety and perimeter fencing at the storage.

Key features of the ancillary facilities include:

- new river intake pump station with a total river extraction capacity made up of a combination of flows from the river intake (up to 26 megalitres) and the borefield (up to six megalitres)
- installation of the following new pipelines including:
  - a pipeline with a capacity of 26 megalitres per day to transfer raw water from the new river intake pump station to the storage inlet chute
  - a cross connection to the proposed water storage inlet pipeline with a capacity of six megalitres per day providing connection to supply water from the storage to the balance tank at the existing WTP

- a pipeline connection from the existing borefield pipeline to the river intake pump station.
- a new storage access road that is about one kilometre in length and extends from Eurobodalla Road opposite the existing WTP to the embankment crest
- basic right-turn and basic left-turn treatment at the intersection of the new storage access road and Eurobodalla Road would be provided
- a new access road that would provide a route for vehicles to access the new river intake pump station
- power supply including the construction of new sub-stations located near the storage and the river intake pump station.

The Eurobodalla Southern Water Supply Storage was approved by the Department of Planning and Environment (DPE) on 17 October 2019.

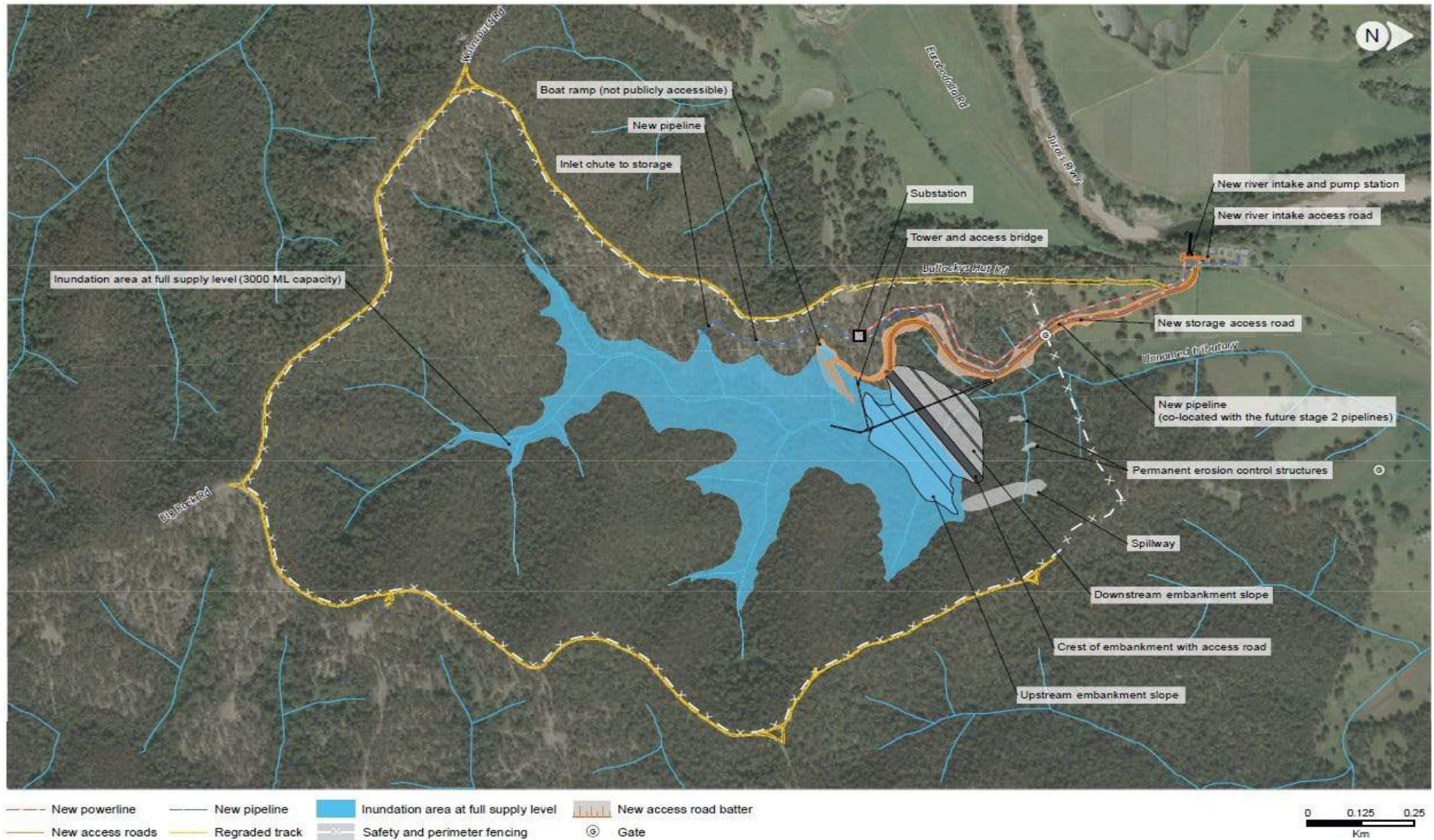


Figure 1.1 Eurobodalla Southern Water Supply Storage project overview



### **1.3 Scope of the CEMP**

With the approval of the Secretary of Planning, construction of the Eurobodalla Southern Water Supply Storage project is being constructed in the following stages:

- Stage 1: Tuross River Intake Pump Station clearing.
- Stage 2: Tuross River Intake Pump Station construction.
- Stage 3: Vegetation clearing and topsoil stripping of the access road, intersection works, construction of the access road and inlet pipeline to the forestry boundary.
- Stage 4: Partial clearing of the entire storage site.
- Stage 5: All other works.

Works in Stage 1, Stage 2 and Stage 4 are complete. Stage 3 works are partially complete and will continue to be delivered under the applicable CEMP. This Plan only applies to Stage 5 of the approved project, being the construction of all remaining works on site including the removal of the remaining vegetation within clearing boundary, construction of the embankment wall, spillway, permanent erosion control measures and all remaining works on site to enable the project to become operational. The scope of works is detailed in Figure 1.1 and the construction site boundary is detailed in Figure 1.2.

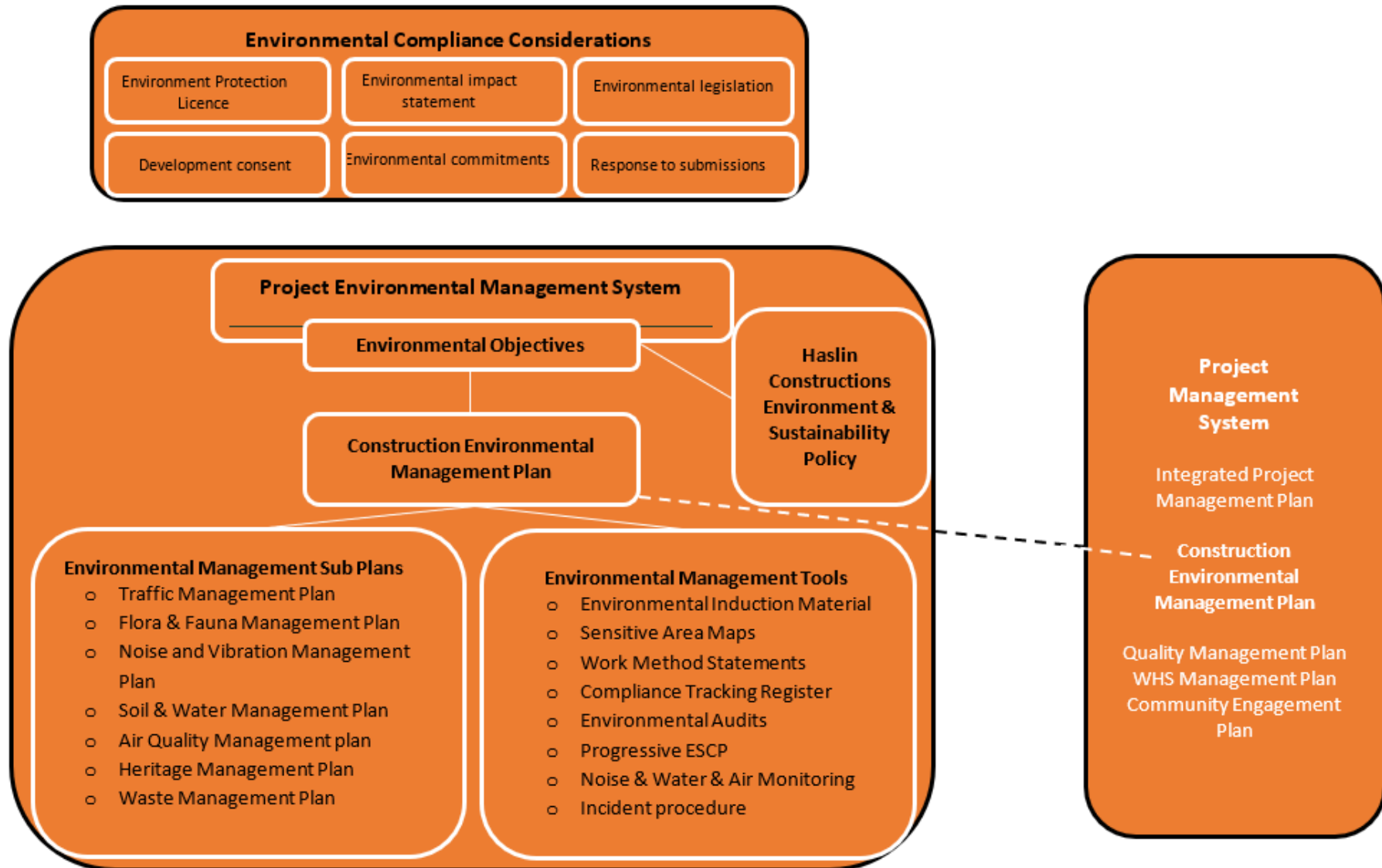
### **1.4 Environmental Management System Overview**

The Environmental Management System (EMS) is an integrated set of tools and resources that define how the project will manage environmental risks at all levels of the business. Haslin Constructions operates an environmental system compliant with AS/NZS ISO 14001.

This CEMP is part of the project EMS and describes how Haslin Constructions will manage environmental issues during the construction of the project. The structure of the project EMS, the structure of the CEMP and the related plans and procedures are summarised in Figure 1.3.

This CEMP shall be updated as necessary to ensure all components of the works construction are covered.





**Figure 1.3** Eurobodalla Southern Water Supply Storage EMS



## 2. Consultation, endorsement and approval

This CEMP and the associated plans were developed after detailed review of documentation by environment staff and construction managers. Relevant plans were reviewed by subject matter experts prior to being reviewed and approved by the Haslin Construction Senior Project Manager. The CEMP plans will be submitted to Eurobodalla Shire Council.

As part of the preparation of this CEMP and the plans, consultation with the government agencies identified in Table 2-1 has been undertaken.

**Table 2-1** CEMP and plan consultation

SSD-7089 Consent Condition	Plan	Agency Consultation	Approval
REMM 1.3	CEMP	DPI Fisheries	-
B3	Flora and Fauna Management Plan	DPI Fisheries	Planning Secretary
B13	Soil and Water Management Plan Erosion and Sediment Control Plan	EPA DPI Fisheries & NRAR	-

Evidence of agency consultation required by Development Consent B3 and B13 are provided in Appendix A5 of this CEMP.

### **3. Environmental Management Plan**

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#### **3.1 Preparation and availability of the CEMP**

This CEMP has been prepared in accordance with the 'Environmental Management Plan Guideline: Guideline for Infrastructure Projects' (DPIE 2020) and Haslin Constructions Environment and Sustainability Policy (SEQ-POL-002). It incorporates all requirements of the EIS documentation and all applicable approvals for the project.

Haslin Constructions Environmental and Sustainability Policy is displayed on their [website](#), at the site office and communicated to staff and other interested parties via inductions and ongoing awareness programs. A copy of the Policy is presented below.

**Haslin Environmental and Sustainability Policy**



**HASLIN**  
Civil Engineering + Infrastructure



**NSW**  
GOVERNMENT



buy.nsw



AS/NZS 9001:2015  
CERTIFIED



ISO 14001:2015  
CERTIFIED

## Environmental & Sustainability Policy

## SEQ-POL-002

Haslin Constructions Pty Ltd is fully aware of the impact of its business operations on the environment, its responsibilities towards the protection of the environment and the creation of better social and economic conditions for our present and future generations. Haslin management are committed to:

- Conducting business operations in an environmentally sensible manner with full regards to the sensitivities of the local and regional environment, enhancing the built and cultural heritage in the communities we work.
- Complying with all applicable environmental legislation, standards, guidelines and statutory policies
- Taking all practicable initiatives to minimise pollution of the environment.
- Considering whole of life environmental, social and economic aspects throughout project design, procurement and construction
- Applying best practice environmental solutions to the design and construction of building and infrastructure and supporting the principles of Ecologically Sustainable Development
- Managing resources and waste efficiently identifying opportunities to reduce our environmental footprint, minimize and recycle waste, and use recycled and low impact materials, minimizing risks in our supply chain
- Delivering infrastructure that is resilient to a changing climate, working collaboratively with clients and stakeholders
- Developing, implementing and maintaining an Environmental Management System incorporating specific objectives, measurable targets, programs and procedures considering whole of life considerations for continual improvement of our environmental and sustainability performance
- Monitoring performance against project specific environmental and sustainability objectives, programs, and procedures to identify opportunities for reward or improvement
- Providing appropriate training and instruction to employees and sub-contractors enhancing their environmental and sustainability awareness and skills
- Establishing and maintaining appropriate mechanisms for communication and consultation of relevant environmental and sustainability issues with employees, clients and stakeholders
- Creating better living conditions for future generations by enhancing environmental and social outcomes and leaving a net positive legacy
- Promoting a diverse and inclusive workforce
- Providing social benefits to the communities we work in by supporting local jobs, businesses and suppliers.

This Environmental and Sustainability Policy will be communicated to all employees, contractors and stakeholders and made available to company clients and the public.

**Colin Woods**  
Managing Director



1/07/2022

## **3.2 Planning**

### **3.2.1 Environmental Risk Assessment Workshop**

An environmental risk assessment workshop will be held before the main projects works commence. A preliminary desktop risk assessment has been provided in Appendix A2.

The environmental risk assessment workshop will involve the Senior Project Manager, Site Manager and the Environmental Site Representative. All activities will be assessed to identify the relevant steps in the activity and the associated environmental hazards, initial risk levels, mitigation measures and to avoid, manage and/or minimise the risks and residual risks. Each of these items will be documented in an environmental risk register. Where residual risk is assessed as high an Environmental Work Method Statement will be developed for that activity.

Where relevant, the requirements from the Principal, Development Consent and Environmental Management Measures (EMMS) will be incorporated into the environmental risk assessment, particularly in developing the agreed activity specific site controls. The risk assessment contains a list of environmental aspects and impacts including those identified in the risk assessment workshop.

### **3.2.2 Regulatory requirements and compliance**

#### **Legislation**

A register of legal and other requirements for the Project is contained in Appendix A1. This register is maintained as a checklist. The register will be reviewed prior to the commencing construction and at least annually as part of the management review. Any changes made to the legal requirements register will be communicated to the wider project team, including subcontractors where necessary through toolbox talks, specific training and other methods detailed in Section 3.4 of this CEMP.

#### **Approvals, permits and licences**

A number of approvals, permits and licenses have and/or will be obtained for the project. Appendix A1 contains a register of relevant environmental approvals, permits and licenses. The register will be reviewed prior to the commencing construction and at least annually as part of the management review. Any changes will be communicated to the wider project team, including subcontractors where necessary through toolbox talks, specific training and other methods detailed in Section 3.4 of this CEMP.

#### **Table 3-1 Anticipated approval and licence requirements**

Approval/Permit/Licence	Regulatory Authority	Timing	Status
Development consent under the EP&A Act	Department of Planning	Prior to commencing works	Approved 17/10/2019
Environment Protection Licence	EPA	Prior to undertaking activities listed in Schedule 1 of the POEO Act 1997	TBC
Road Occupancy Licences	Roads authority (Eurobodalla Shire Council)	Prior to undertaking works that are likely to impact traffic flow	As required

### 3.2.3 Environmental objectives and targets

As a means of assessing environmental performance during construction of the Project, environmental objectives and targets have been established. These objectives and targets have been developed with consideration of key performance outcomes for each key issue, as specified in the project Development Consent/EMM. The objectives and targets are consistent with the Haslin's Environmental and Sustainability Policy (section 3.1) policy and will assist in monitoring whether the commitments of the policy are being met.

The performance of the Project will be monitored against the objectives and targets. Project performance monitoring will be documented in the Project construction compliance reports and at least on an annual basis as part of the management review.

Environmental objectives and targets for the Project are incorporated into relevant environmental management plans and a summary is provided in Table 3-2 below.

**Table 3-2** Project environmental objectives and targets

Objectives	Targets
Construction of the Project in accordance with all environmental approvals and Principal requirements	Full compliance with statutory approvals and Principal Requirements
Compliance with all legal requirements	No regulatory infringements (Penalty Infringement Notices or prosecutions)
Implementation of a comprehensive EMS that meets the requirements of AS/NZS ISO 14001	Address non-conformances and corrective actions within specific timeframes

Objectives	Targets
Engage with the affected community, minimise avoidable complaints and respond to any complaints within a suitable timeframe	Disseminate project information prior to commencing construction and updates throughout construction  Record and respond to complaints within the timeframe specified
Continuously improve environmental performance	Develop and maintain a program of relevant environmental training.  Capture lessons learnt from environmental incidents to minimise repeat issues.  Encourage and reward innovation and effort throughout the works force
Maximise achievement of ecologically sustainable development outcomes in construction	Identify opportunities to minimise environmental impacts and minimise resource consumption

### 3.2.4 Environmental Work Method Statement

Environmental work method statements (EWMS) will be prepared to manage and control all high risk activities that have the potential to negatively impact on the environment. EWMS are specifically designed to communicate requirements, actions, processes and controls to construction personnel using plans, diagrams and simply written instructions. EWMS will incorporate mitigation measures and controls, including those from relevant management plans. EWMS will be prepared for high-risk activities outlined in the EIS and those identified through the Environmental Risk Assessment Workshop (see section 3.2.1. above).

EWMS will be prepared progressively in the lead up to and throughout construction in consultation with relevant members from the Project team.

The EWMS will include at least the following elements:

- Description of the work activity, including any plant and equipment to be used
- Outline of the sequence of tasks for the activity, including interfaces with other construction activities
- Identification of any environmental and/or socially sensitive areas, sites or places
- Identification of potential environmental risks/impacts due to the work activity
- Mitigation measures to reduce the identified environmental risk, including assigned responsibilities to site management personnel
- Process for assessing the performance of the implemented mitigation measures.

All construction personnel and sub-contractors undertaking a task governed by an EWMS must read and understand their obligations by signing an attendance record prior to commencing work.

Regular monitoring, inspections and auditing of compliance with the EWMS will be undertaken by Project management and environmental personnel to ensure that all controls are being followed and that any non-conformances are recorded and corrective actions implemented.

### **3.2.5 Sensitive Area Plans**

The project works traverses a range of environmental sensitive areas. To assist with construction planning and management, these site constraints are consolidated on a series of map-based sheets called Sensitive Area Plans (SAP).

The SAP include information pertaining, but not limited to:

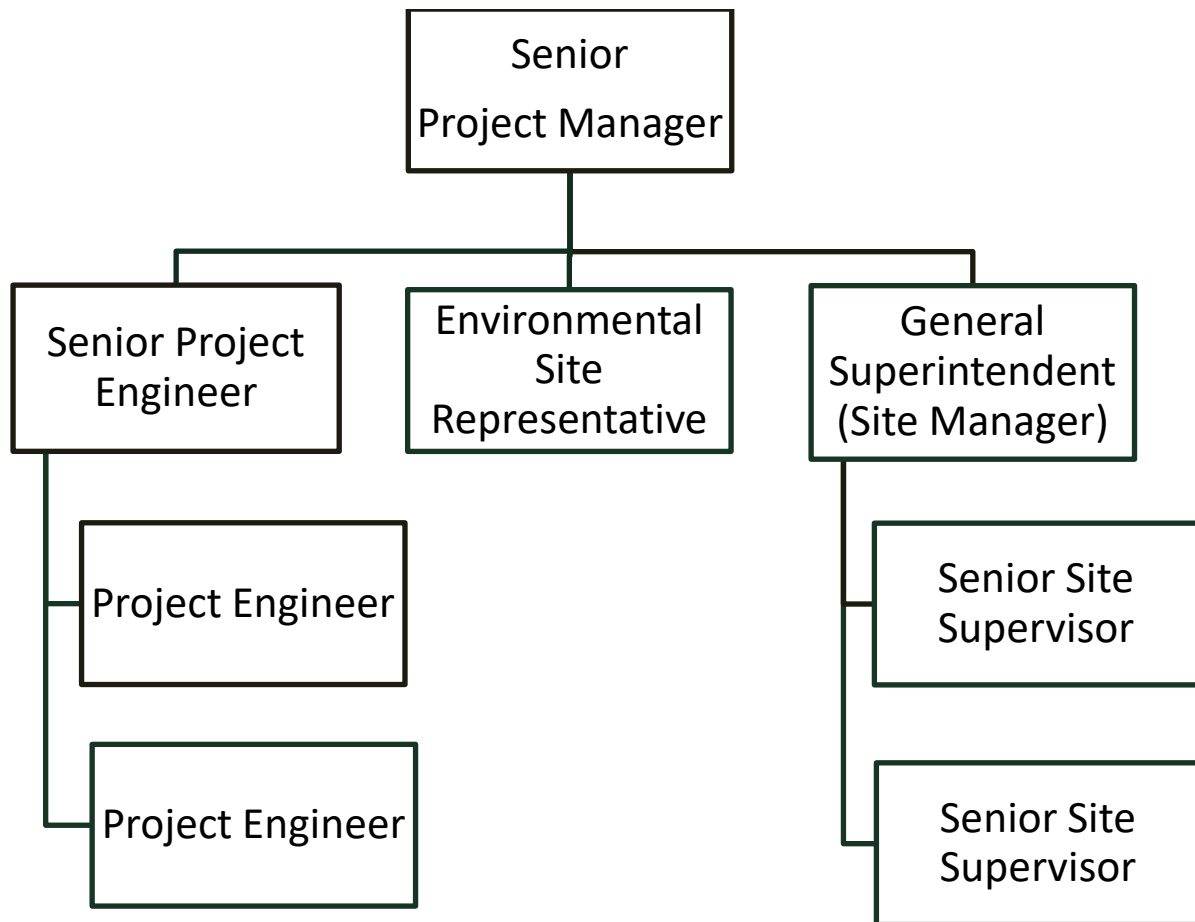
- Noise sensitive receivers (e.g. residential dwellings,)
- Flora features, including threatened species and endangered ecological communities Potential Aboriginal sites

The SAP will be used in conjunction with EWMS to help identify key risk areas and to promote ongoing communication to construction personnel during the Project. As part of this CEMP, a SAP has been developed for the site. As SAP are a working element of the CEMP, it will be regularly reviewed throughout construction to reflect true ground conditions and identify new environmentally sensitive areas. As part of the environmental induction, all staff and subcontractors working on site will be provided with an understanding of the risks associated with working in or near environmentally sensitive areas.

### **3.3 Resources, responsibilities and authority**

The key environmental management roles and responsibilities for the construction phase of the Project are described below.



**Figure 3.1** Project management structure**Table 3-3** Roles and responsibilities of project staff in relation to environment matters

Role	Responsibility
Senior Project Manager	<p>Be an emergency contact and available to be contacted by EPA, DPE and Eurobodalla Shire Council on a 24-hour basis</p> <p>Provide adequate resources (personnel, financial and technological) to ensure effective development, implementation and maintenance of this CEMP</p> <p>Plan and execute works in compliance with this CEMP, Project requirements and regulatory requirements</p> <p>Ensure the requirements of this CEMP are fully implemented and that environmental requirements are integrated with other construction requirements</p> <p>Assist in the implementation of Haslin Constructions Environment and Sustainability Policy (SEQ-POL-002)</p>



Role	Responsibility
	<p>Lead input into the preparation of environmental planning documents as required</p> <p>Issue instructions and provide adequate information to employees that relate to environmental risks on-site</p> <p>Stop work immediately if an unacceptable impact on the environment has or is likely to occur.</p> <p>Lead measures to minimise environmental risks</p> <p>Ensure that complaints are investigated to ensure effective resolution</p> <p>Key emergency response person during an environmental site emergency</p> <p>Take action in the event of an emergency and allocate the required resources to minimise the environmental impact</p>
Senior Project Engineer	<p>Provide input into the preparation of environmental planning documents as required</p> <p>Ensure that the works are carried out in accordance with the requirements of the CEMP and supporting documentation, including the implementation of all environmental controls</p> <p>Stop work immediately if an unacceptable impact on the environment has or is likely to occur.</p> <p>Take action in the event of an emergency and assist in the allocation of resources to minimise the environmental impact</p> <p>Report any activity that has resulted, or has the potential to result, in an environmental incident immediately to the Senior Project Manager and Environmental Site Representative.</p>
Project Engineer	<p>Provide input into the preparation of environmental planning documents as required</p> <p>Implement works in accordance with the requirements of the CEMP and supporting documentation, including all environmental controls</p> <p>Stop work immediately if an unacceptable impact on the environment has or is likely to occur</p>

Role	Responsibility
	<p>Take action in the event of an emergency to minimise the environmental impact</p> <p>Report any activity that has resulted, or has the potential to result, in an environmental incident immediately to the Senior Project Manager and Environmental Site Representative.</p>
General Superintendent (Site Manager)	<p>Communicate with all personnel and sub-contractors regarding compliance with the CEMP and site-specific environmental issues</p> <p>Ensure all site workers attend an environmental induction prior to the commencement of works</p> <p>Co-ordinate the implementation of the CEMP</p> <p>Coordinate the implementation of close out of actions from internal environmental inspections</p> <p>Co-ordinate the implementation and maintenance of pollution control measures</p> <p>Identify resources required for implementation of the CEMP</p> <p>Support the Environmental Site Representative in achieving environmental objectives, including on ground implementation of the EWMS and PESCP</p> <p>Stop work immediately if an unacceptable impact on the environment has or is likely to occur.</p> <p>Take action in the event of an emergency and assist in the coordination of resources to minimise the environmental impact</p> <p>Report any activity that has resulted, or has the potential to result, in an environmental incident immediately to the Senior Project Manager and Environmental Site Representative.</p>
Senior Site Supervisor	<p>Undertake any environmental duties as defined by the General Superintendent (Site Manager) or Environmental Site Representative</p> <p>Control field works and implement/maintain effective environmental controls</p> <p>Where required, undertake environmental risk assessment of works prior to commencement</p>

Role	Responsibility
	<p>Ensure site activities comply with EWMS and relevant records are kept</p> <p>Ensure all site workers are site inducted prior to commencement of works</p> <p>Attend to any spills or environmental incidents that may occur on-site</p> <p>Stop work immediately if an unacceptable impact on the environment has or is likely to occur.</p> <p>Report any activity that has resulted, or has the potential to result, in an environmental incident immediately to the Senior Project Manager and Environmental Site Representative.</p>
Environmental Site Representative	<p>Be accountable for the implementation of the CEMP and plans on the Project.</p> <p>Be an emergency contact and available to be contacted by EPA, Department of Planning or Eurobodalla Shire Council on a 24-hour basis</p> <p>Act as the main point of contact for the approval authorities</p> <p>Implementation, monitoring and updating of the CEMP and plans in accordance with ISO14001</p> <p>Oversee environmental complaint investigation responses</p> <p>Facilitating site inspections and close out of actions identified during site visits</p> <p>Review subcontractors' performance and compliance with Haslin constructions environmental requirements, including assessing their environmental capabilities and overseeing the submission of their environmental documents</p> <p>Ensure regular inspections, observations, monitoring and audits are conducted to check the effectiveness of controls and that compliance is maintained</p> <p>Identify, assess and leverage opportunities to achieve positive environmental outcomes</p> <p>Report to the Haslin Constructions Senior Project Manager on the performance and implementation of the CEMP</p>

Role	Responsibility
	<p>Stop work immediately if an unacceptable impact on the environment has or is likely to occur.</p> <p>Key emergency response person during an environmental site emergency</p> <p>Take action in the event of an emergency and assist in the coordination of actions to minimise the environmental impact</p>
Wider project team (including subcontractors)	<p>The environmental responsibilities of the wider project team (including subcontractors) include (but are not limited to) the following:</p> <ul style="list-style-type: none"> <li>• Comply with the relevant requirements of the CEMP, or other environmental management guidance as instructed by a member of the project's management</li> <li>• Participate in the mandatory project/site induction program</li> <li>• Report any environmental incidents to the Senior Project Manager and Environmental Site Representative immediately or as soon as practicable if reasonable steps can be adopted to control the incident</li> <li>• Stop activities where there is an actual or immediate risk of harm to the environment and advise the Senior Project Manager and Environmental Site Representative.</li> </ul>

### 3.4 Selection and management of subcontractors

All subcontractors are required to work in accordance with this CEMP.

Environmental requirements and responsibilities will be specified to subcontractors in the contract documentation. As part of the selection process, consideration will also to be given to their past environmental performance.

Haslin Constructions will ensure that all subcontractors selected to work on the project understand and have the capability to comply with their environmental management responsibilities. All sub-contractors are required to attend Project and/or site inductions where the requirements and obligations of the CEMP will be communicated.

High risk work to be performed by subcontractors will be reviewed by the Environmental Site Representative to determine whether it includes works for which Project planning and environmental risk assessments have been performed. If so, the subcontractor is formally informed of all relevant risks and existing Project documents,

systems and procedures to be followed prior to commencing works (having been informed of these during the tendering process). These may include the contents of the construction methodology and environmental plans in this CEMP.

If the scope of works includes activities not already adequately addressed in Project planning and risk assessment, then an appropriate risk assessment will be performed. Following this, existing documentation will either be revised, or new documentation will be produced.

Subcontractors are responsible for:

- Environmental requirements and responsibilities which are specified in their contract documentation
- Work in accordance with this CEMP, plans and procedure
- Attend inductions, toolbox meeting and other meetings as required where the requirements and obligations of the CEMP, -plans and procedures are communicated
- Reporting environmental incidents to their contact within the project (Site Manager and Environmental Site Representative) immediately
- Participating in investigation and/or risk assessments where necessary

### **3.5 Competence, training and awareness**

To ensure that this CEMP is effectively implemented, each level of management is responsible for ensuring that all personnel reporting to them are aware of the requirements of this CEMP. The Environmental Site Representative will coordinate the environmental training in conjunction with other training and development activities (eg safety).

#### **3.5.1 Environmental induction**

All personnel (including sub-contractors) are required to attend a compulsory site induction that includes an environmental component prior to commencement on-site. This is done to ensure all personnel involved in the Project are aware of the requirements of the CEMP and to ensure the implementation of EMS.

Short-term visitors to site undertaking inspections / entering the site (such as regulators) will be required to undertake a visitors induction and be accompanied by inducted personnel at all times.

The Environmental Site Representative (or delegate) will conduct the environmental component of the site inductions.

The environmental component of the induction will cover all elements of the CEMP and would include as a minimum:

- Relevant details of the CEMP including purpose and objectives
- Requirements of due diligence and duty of care
- Conditions of environmental licences, permits and approvals
- Potential environmental emergencies on Site and the emergency response procedures
- Reporting and notification requirements for pollution and other environmental incidents
- High risk activities and associated environmental safeguards
- Working in or near environmentally sensitive areas
- Weed management
- Fire management and prevention
- Flora and Fauna considerations and control measures
- Traffic Management including speed limits and allowable areas to park or access
- Cultural Heritage
- Unexpected finds procedure

A record of all environment inductions will be maintained and kept on-site. The Environmental Site Representative may authorise amendments to the induction at any time. Possible reasons for changes to the induction may be Project modifications, legislative changes or amendments to this CEMP or related documentation.

### **3.5.2 Toolbox talks, training and awareness**

Toolbox talks will be one method of raising awareness and educating personnel on issues related to all aspects of construction including environmental issues. The toolbox talks are used to ensure environmental awareness continues throughout construction.

Toolbox talks will include details of EWMSs for relevant personnel. Toolbox talks will also be tailored to specific environmental issues relevant to upcoming works.

- Relevant environmental issues include (but are not limited to):
- Threatened species, endangered ecological communities, clearing controls and vegetation protection
- Erosion and sedimentation control
- Dewatering
- Hours of work
- Emergency and spill response
- Aboriginal heritage
- Weed management

- Dust control
- Traffic Management

Toolbox talk attendance is mandatory and attendees of toolbox talks are required to sign an attendance form and the records maintained. Targeted environmental awareness training will be provided to individuals or groups of workers with a specific accountability, authority or responsibility for environmental management or those undertaking an activity with a high risk of environmental impact. Topics covered may include those detailed above, or others deemed necessary in the lead up to or during construction.

Another way to inform construction personnel will be through the development and distribution of awareness notes. These will typically take the form of a poster, booklet, or similar and will be distributed to engineers, leading hands and others with a responsibility for managing specific work locations or activities. This documentation will be used to inform the broader workforce through either daily pre-starts meeting or provision in worker crib sheds / break facilities.

### **3.5.3 Daily Pre-Start Meetings**

The pre-start meeting is a tool for informing the workforce of the day's activities, safe work practices, environmental protection practices, work area restrictions, activities that may affect the works, coordination issues with other trades, hazards and other information that may be relevant to the day's work.

The General Superintendent (or their delegate) will conduct a daily pre-start meeting with the site workforce before the commencement of work each day (or shift) or where changes occur during a shift. Daily pre-start meetings are generally succinct in nature and take approximately 10-15 minutes.

The environmental component of pre-starts will be determined by either the General Superintendent, Environmental Site Representative, or Senior Site Supervisors and will include any environmental issues that could potentially be impacted by, or impact on, the day's activities. All attendees will be required to sign on to the pre-start and acknowledge their understanding of the issues explained

## **3.6 Working hours**

The approved working hours on this project are identified in Development Consent B31.

Activity	Day	Time
Earthworks and construction (other than blasting)	Monday – Friday	7:00am to 6:00pm
	Saturday	8:00am to 1:00pm
	Not permitted on public holidays	-

Activity	Day	Time
Blasting	Monday – Friday	9:00am to 3:00pm
	Not permitted on public holidays	-

Development Consent B32 allows works to be undertaken outside of the above identified hours **only** in the following circumstances:

- Works are inaudible at the nearest sensitive receivers; or
- For the delivery of materials required outside these hours by the NSW Police Force or other authorities for safety reasons; or
- Where it is required in an emergency to avoid the loss of lives, property or to prevent environmental harm; or
- Where a variation is approved in advance in writing by the Planning Secretary or his nominee if appropriate justified is provide for the works.

All out of hours works, even when compliant with Condition B32 requires the Principal's approval beforehand.

### **3.7 Communication**

#### **3.7.1 Internal communication**

All site personnel including subcontractors will be made aware of the external and internal communications procedures and Haslin Constructions will ensure they are properly trained in their application.

Clear lines of communication throughout all levels and functions (e.g. management, staff and subcontracted service providers), are key to minimising environmental impacts and achieving continual improvements in environmental performance.

The Environmental Site Representative will regularly meet with the Project Manager, General Superintendent and Project Engineer to discuss environmental management on site, any amendments to plans that might be required or any new / changes to construction activities. The purpose of these meetings would be to communicate ongoing environmental performance and to identify any issues to be addressed.

In addition, the Environmental Site Representative (or delegate) will participate, as required, in toolbox talks, daily pre-start meetings or activity specific pre-start meetings to communicate environmental performance, management or issues with the wider construction team. This forum will provide an opportunity for the environment team members to advise on any upcoming sensitive environmental matters for future work areas and to receive feedback from on-site personnel.

Further internal communications regarding environmental issues and aspects will be through awareness training as described in Section 3.5.



### **3.7.2 Liaison with external stakeholders**

The Senior Project Manager has the responsibility to report on the ongoing environmental performance of the Project to Eurobodalla Shire Council in accordance with the requirements outlined in Table 3-4 unless otherwise agreed by Eurobodalla Shire Council.

The Senior Project Manager and the Environmental Site Representative are 24-hour contacts. They have the authority to halt the progress of the works if necessary. They are also key emergency response personnel during an environmental site emergency.

The Environmental Site Representative is the authorised contact person for communications with the Department of Planning & Environment and the EPA on environmental matters.

### **3.7.3 Community liaison and complaints management**

A Community and Stakeholder Engagement (CSE) plan will be prepared for the project that will include:

- Mechanisms to provide details and timing of activities to affected local residents, business and community facilities, including but not limited to changed traffic, access conditions, construction activities and noise mitigation.
- Contact name and number for making complaints.
- A complaints handling procedure and register.
- Mechanisms for reporting complaints to the Principal.

### **3.8 Emergency and Incident Notification**

An (environmental) incident is an occurrence or set of circumstances that causes or threatens to cause material harm and which may or may not be or cause a non-compliance. This may be as a consequence of which pollution (air, water, noise, and land) or an adverse environmental impact has occurred, is occurring, or is likely to occur.

Adverse environmental impact includes contamination, harm to flora and fauna (either individual species or communities), damage to heritage items and adverse community impacts.

Haslin Constructions is the person undertaking the activity and the occupier of the premises and is therefore responsible for incident notification. Haslin would therefore be required to immediately notify the EPA in the event of a 'material harm' Incident occurring.

The EPA will be notified of any pollution incidents on or around the site via the EPA Environment Line (telephone 131 555) in accordance with Part 5.7 of the *Protection of the Environment Operations Act 1997* (NSW) (POEO Act) when:

- i. it involves actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial, or
- ii. it results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding \$10,000 (or such other amount as is prescribed by the regulations)

Following notification to the EPA, Haslin Constructions would immediately notify the Minister of Health, Eurobodalla Shire Council, SafeWork NSW and Fire and Rescue NSW.

Once these verbal notifications occur, DPE would be provided with written notification (via email to: [compliance@planning.nsw.qov.au](mailto:compliance@planning.nsw.qov.au)). The latter requirement to undertake incident reporting and notification to DPE complies with Condition C9 Development Consent SSD-7089 and is the responsibility of Eurobodalla Shire Council. This written notification is required to be emailed to DPE immediately (but following the above verbal notifications) in the event of a potential material harm incident occurring.

### **3.9 Environmental non-compliance**

Any member of the Project team may raise a non-compliance or improvement opportunity. Eurobodalla Shire Council or any public authority may also raise a non-compliance or improvement opportunity using the same process.

A non-compliance is defined in the Development Consent as:

*an occurrence, set of circumstances or development that is in breach of this consent.*

Non-complying activities will be stopped, if necessary, by the Senior Project Manager, Environmental Site Representative, Site Manager or Senior Site Engineer following consultation with the Senior Project Manager or delegate. The works will not commence until a corrective / preventative action has been closed out.

For each non-compliance identified a corrective/preventative action (or actions) must be implemented. In addition, any environmental management improvement opportunities can be initiated as a result of incidents or emergencies, monitoring and measurement, audit findings or other reviews. Improvement opportunities may also result in the implementation of corrective/preventative actions.

Corrective/preventative actions and improvement opportunities will be entered into the contractor's quality system database and include detail of the issue, action required and timing and responsibilities. The record will be updated with date of close out and any necessary notes. The database will be reviewed regularly to ensure actions are closed out as required.

Procedures for rectifying any non-compliance identified during environmental auditing, review of compliance or incident management are also documented in the Compliance Tracking Program (see section 3.11).

### **3.10 Monitoring, inspections and auditing**

#### **3.10.1 Environmental inspections**

The Environmental Site Representative (or delegate) will undertake weekly site environmental inspections to assess the ongoing effectiveness and suitability of the Project's environmental controls. The site environmental inspections will cover the following:

- General environmental performance
- Compliance with the Development Consent
- High risk activities and processes
- Work in environmentally sensitive areas
- Site preparedness for adverse weather conditions, including adequacy of environmental controls and availability of emergency equipment.

Copies of all environmental inspection reports prepared by the Environmental Site Representative (or delegate) will be kept with the Project records and closed out within the agreed timeframes. These timeframes will be dependent on the nature of the required corrective action and the environmental risk associated with the outstanding action as determined by the relevant Environmental Site Representative. The outcomes of inspections will be captured on Environmental Inspection Checklists.

In general, the corrective action will concentrate on the environmental management system and its associated processes rather than on the perceived deficiencies of individual workers.

If any maintenance and/or deficiencies in environmental controls or in the standard of environmental performance are observed, they will be recorded in an environmental action list. Records will also include details of any maintenance required (environmental controls), the nature of the deficiency, any actions required and an implementation priority. The environmental action list will then be issued to the relevant leading hand for actioning.

When an observation is raised of a significant nature, and where deemed necessary by the Environmental Site Representative, an Environmental Improvement Notice (EIN) may be issued to either the Project Manager or the subcontractor supervisor in charge of the work activity and/or an individual. The engineer or individual receiving the improvement notice will be required to respond to the agreed corrective action as outlined on the notice.

The completed EIN must be reviewed and followed-up to ensure they are promptly completed. Repetitive observations that have significant hazards should be reviewed to check that a system failure is not occurring. The Environmental Site Representative will confirm close out of the EIN and report this to the Project Manager.

**3.10.2 Post rainfall site inspections**

The Environmental Site Representative would undertake post rainfall inspections of the work site to evaluate the effectiveness of environmental controls. Post rainfall inspections would be undertaken after more than 25mm of rain in a 24-hour period.

The Environmental Site Representative will record inspection findings on an inspection checklist form. If any maintenance and/or deficiencies in environmental controls or in the standard of environmental performance are observed, they will be recorded in an environmental action list.

**3.10.3 Environmental monitoring and reporting**

Monitoring will be undertaken to validate the impacts predicted for the Project, to measure the effectiveness of environmental controls and implementation of this CEMP and to measure performance against the project environmental objectives (identified in 3.2.3). The monitoring requirements for required aspects are included in the relevant environmental management plans and summarised in Table 3-4 below.

**Table 3-4** Environmental monitoring

Monitoring	Frequency
Site personnel environmental inductions	Monthly
Environmental incident close out	Monthly
Trial blasting monitoring	During each trial blast
Dust monitoring	Daily
Blast overpressure and vibration monitoring	During each blast
Construction noise monitoring	Quarterly of attended monitoring at nearest receivers
Traffic management (including noise)	One round of attended monitoring at nearest receivers
On-site water quality monitoring	Quarterly / When flows leave site at unnamed creekline
Off-site water quality monitoring	Quarterly / When flows leave site at unnamed creekline

The following environmental reporting will be presented to Eurobodalla Shire Council for the duration of the project, unless otherwise agreed to by Council.

**Table 3-5** Environmental reporting requirements to Eurobodalla Shire Council

Report	Frequency
List of inducted site personnel	The list shall be updated each time new staff arrive on-site
Environmental Management Report	Four-weekly
List of licences obtained	The list shall be updated each time a new license is obtained or renewed
Trial blasting report	Once, at the completion of each trial blast
Dust monitoring report	Four-Weekly
Blast overpressure and vibration monitoring report	Four-Weekly
Construction noise monitoring report	Four-Weekly
Traffic management (including noise) report	Four-Weekly
Water quality monitoring report	Fortnightly
Exceedance/Incident reports	Daily as incidents/exceedances occur
Outcomes of Internal (First Party) Audits	Four-Weekly
Actions taken in response to Second Party and Compliance Audits	Four-Weekly, or as audits occur
Community complaints and corrective actions	Monthly

### 3.10.4 Auditing

The project will be subject to a range of internal and external audits to verify compliance with the environmental objectives and regulatory requirements. The audits will include First Part (Internal audits), Second party audits and Compliance audits.

#### First party audits

Haslin Constructions will undertake First party audits monthly throughout the Project. The purpose of auditing is to verify compliance with the environmental criteria and to improve environmental performance.

#### Second Party Audits

Eurobodalla Shire Council will undertake second Party Audits of the project to ensure that Haslin Constructions are complying with the specified environmental criteria and procedures. The second party audit will cover both the implementation and documentation aspects of the Contract and be based on:

- This CEMP, plans and the environmental commitments.
- The procedures that Haslin is working under
- Accepted industry practice guidelines.

An audit checklist will be developed and amended as necessary to reflect changes to this CEMP, subsequent approvals and changes to Acts, regulations or guidelines.

### **Compliance audits**

Auditing will also be undertaken by an independent environment auditor to Haslin in accordance with ISO 19011:2014 - Guidelines for Quality and/ or Environmental Management Systems Auditing.

The compliance audits will examine whether the project complies with appropriate environmental standards, criteria and/or legislation.

- This CEMP, plans and the environmental commitments.
- The procedures that Haslin is working under

### **3.11 Construction Phase Compliance tracking**

A Compliance Tracking Program has been developed in accordance with the NSW Department of Planning and Environment *Compliance Reporting: Post Approval Requirements May 2020*.

The Compliance Tracking Program describes how the requirements of the Development Consent will be met and sets out a program and frequency for compliance reporting. The Compliance Tracking Program includes:

- Provisions for the notification of the Minister prior to the commencement of operation of the Project
- Provisions for periodic review of Project compliance with the requirements of this approval, EMMS and documents listed under Development Consent conditions C13 and C14.
- Provisions for periodic reporting of compliance status against the requirements of this approval, EMMS and documents listed in the Development Consent
- Mechanisms for reporting and recording incidents and actions taken in response to those incidents in accordance with Development Consent conditions C10 and C11

- Procedures for rectifying any non-compliance identified during environmental auditing, review of compliance or incident management.

### **3.12 Records of environmental activities**

#### **Environmental records**

The construction Environmental Site Representative (or delegate) is responsible for maintaining all environmental management documents and records as current at the point of use. Types of documents and records include:

- All monitoring, inspection and compliance reports/records
- Correspondence with public authorities
- Induction and training records
- Reports on environmental incidents, other environmental non-conformances, complaints and follow-up action
- Community engagement information
- Minutes of CEMP and construction environmental management system review meetings and evidence of any action taken
- CEMP and plans
- EWMS

All environmental management documents are subject to ongoing review and continual improvement. This includes times of change to scheduled activities or to legislative or licensing requirements.

Only the Environmental Site Representative, or delegate, has the authority to change any of the environmental management documentation.

#### **Document control**

Haslin Constructions will coordinate the preparation, review and distribution, as appropriate, of the environmental documents and records listed above. During the Project, the environmental documents and records will be stored at the main site compound.

The Contractor will implement a document control procedure to control the flow of documents within and between Transport for NSW, stakeholders and subcontractors.

The procedure will also ensure that documentation is:

- Developed, reviewed and approved prior to issue
- Issued for use
- Controlled and stored for the legally required timeframe

- Removed from use when superseded or obsolete
- Archived

### **3.13 Management review**

Management reviews of the Project's EMS will be undertaken as part of the continual improvement process. The purpose of the reviews is to periodically examine the effectiveness and proper implementation of the CEMP to ensure that the system is meeting the requirements of the standards, policies and objectives and, if not, to amend the CEMP to ensure compliance.

The Environmental Site Representative will review the CEMP and its operation and implementation at least every six months from construction commencement. Between the scheduled reviews, a register of issues will be maintained to ensure that any issue raised by internal and external personnel associated with the Project is recorded.

This review will be held at least every six months and will consider:

- Opportunities to improve documentation, processes and practices
- Reviewing key environmental risks
- Client and agency feedback
- Non-conformances and deficiencies, including those identified in environment inspections and audits
- An analysis and verification of the effectiveness of corrective and preventative actions
- Changes or developments in the Haslin Constructions EMS
- Highlighting any changes in procedures resulting from process improvement.
- Complaints
- Effectiveness of environmental management documentation implementation
- Adequacy of resources
- Environmental objectives and targets including sustainability performance
- Compliance with legal and other requirements
- Organisation changes
- Effectiveness of training and inductions.

### **3.14 CEMP / Plan revision and changes to the Project**

#### **CEMP Revision**



Continual improvement is achieved through regular measurement, evaluation, audit and review of the effectiveness of the CEMP, Project environmental outcomes and Haslin Constructions EMS. A review process ensures that environmental documentation is updated as appropriate for the specific works that are occurring on site. Reviews undertaken as described in Section 3.12 will provide specific opportunities to identify improvements in the environmental management system and/or this CEMP.

This CEMP, CEMP plans and Monitoring Programs will be updated as required:

- To take into account changes to the environment or generally accepted environmental management practices, new risks to the environment, any hazardous substances, contamination or changes in law
- In response to internal or external audits or six monthly management reviews.
- Following reportable environmental incidents
- Upon identification of new risks, including risks identified during risk register updates
- When non-compliances are identified
- Following environmental audits that identify matters that require attention
- In response to Project change (including modifications)
- Within three months of any of the above occurrences
- As part of a continuous improvement process

### **Changes to the Project**

Refinements to the Project may result from detailed design refinements or changed circumstances throughout construction. In these instances, Haslin Constructions Environmental Site Representative will undertake a review of the refinement to confirm that it is covered by the EIS.

It may be the case that a consistency assessment in consultation with Eurobodalla Shire Council will need to be undertaken to determine if a Project modification may be required following design changes or changes in scope.

If required, the CEMP and plans would be updated as required to incorporate any additional potential environmental impacts or mitigation or management measures that resulted from the proposed changes. Affected personnel will be made aware of changes before the relevant works commence through toolbox talks, daily pre-start meetings, or forums arranged to specifically address changes.

Should the consistency assessment determine that a Project modification may be required (i.e. the impacts are of a nature and scale that it is not considered consistent

with the Project approval), a modification application under the *EP&A Act 1979* would be lodged with the Secretary DPE for determination.

## 4. Construction control

As outlined in Section 1.4, Haslin Constructions will follow a project Environmental Management System that consists of this CEMP, a number of plans and environmental management tools throughout construction to manage environmental risk, ensure environmental compliance and drive environmental performance.

### 4.1 CEMP Plans

A number of environmental management plans support this CEMP. These documents are prepared to identify requirements and processes applicable to specific impacts or to address requirements of the Development Consent, REMMS and other measures identified in the environment assessment documentation.

Environmental strategies may also be developed as required throughout the Project. These will also guide environmental management of potential impacts on-site.

A list of construction plans for the Project, and their location are provided in Table 4-1.

**Table 4-1** Construction environmental management plans

Document name	Location
Traffic Management Plan	Appendix B1
Flora and Fauna Management Plan	Appendix B2
Noise and Vibration Management Plan	Appendix B3
Soil and Water Management Plan	Appendix B4
Air Quality Management Plan	Appendix B5
Heritage Management Plan	Appendix B6
Waste Management Plan	Appendix B7

#### Traffic Management Plan

A Traffic Management Plan (TMP) has been developed to manage the traffic and transport risks from construction of the Project. The TMP is located in Appendix B1 and has been developed in accordance with B28 of the Development Consent and Technical Specification CI 1.6.3.

#### Flora and Fauna Management Plan

A Flora and Fauna Management Plan (FFMP) has been developed to manage the risks to biodiversity and flora and fauna from construction of the Project. The FFMP is located in Appendix B2 and has been developed in accordance with condition B4 Development Consent and Technical Specification CI 3.6.1.

**Noise and Vibration Management Plan**

A Noise and Vibration Management Plan (NVMP) has been developed to manage the noise and vibration risks from construction of the Project. The NVMP is located in Appendix B3 and has been developed in accordance with B34 of the Development Consent and Technical Specification Cl 3.11.

**Soil and Water Management Plan**

A Soil and Water Quality Management Plan (SWMP) has been prepared to manage the environmental risks to soil and water on this Project. The SWMP is located in Appendix B4 and has been developed in accordance with condition B13 of the Development Consent and Technical Specification Cl 3.7 to manage the soil and surface water risks on this Project.

**Air Quality Management Plan**

An Air Quality Management Plan (AQMP) has been developed to manage the environmental risks to air quality on this project. The AQMP is located in Appendix B5 and has been developed to address Cl 3.10 of the project Technical Specification.

**Heritage Management Plan**

A Heritage Management Plan (HMP) has been prepared to manage the environmental risks to heritage items on this project. The HMP is located in Appendix B6 and has been developed to address Cl 3.16 of the project Technical Specification.

**Waste Management Plan**

A Waste Management Plan (WMP) has been prepared to guide in the management of waste and protection of resources on the project. The Waste Management Plan is located in Appendix B7 and has been developed to address Cl 3.13 of the project Technical Specification.

## **Appendix A1**

### **Eurobodalla Southern Water Supply Storage Project**

#### **Register of applicable legal requirements**

Legislation	Requirement	Authority
Environmental Planning and Assessment Act 1979	<p>The Project was approved on 17 October 2019 under Section 4.38 of the Environmental Planning and Assessment Act 1979.</p> <p>Modification of SSD-7089 would require ministerial approval under the <i>Environmental Planning and Assessment Act 1979</i> (EP&amp;A Act).</p>	Department of Planning and Environment
Protection of the Environment Operations Act 1997	<p>Any unauthorised pollution of waters is considered an offence under section 120 of the <i>Protection of the Environment Operations Act 1997</i> (POEO Act).</p> <p>Section 148 of the POEO Act requires that the Environment Protection Authority (EPA), the Minister of Health, SafeWork NSW, Fire and Rescue NSW and Eurobodalla Shire Council be notified immediately if a pollution incident occurs that may cause or threaten material harm to the environment (being environmental harm that is not trivial or would cost more than \$10,000 to rectify).</p> <p>The EPA is required to be notified verbally, immediately in these circumstances, prior to written notification being provided to DPIE (as per Condition C9 of Development Consent SSD-7089).</p>	EPA

	Sections 139 and 140 of the POEO Act set out offences relating to noise pollution.	
National Parks and Wildlife Act 1974	Protection of Aboriginal Objects and Places. Duty to notify Heritage NSW if an Aboriginal object is uncovered during the works.	Heritage NSW
Biosecurity Act 2015	<p>Priority weeds are regulated under the <i>Biosecurity Act 2015</i> with a general biosecurity duty to prevent, eliminate or minimize any biosecurity risk they may pose. Some priority weeds have additional management obligations which may apply generally, or under specific circumstances.</p> <p>Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised as far as is reasonably practicable.</p>	Department of Primary Industries (DPI)
Rural Fires Act 1997	Sections 63(1) and 63(2) of the <i>Rural Fires Act 1997</i> require public authorities and owners/occupiers of land to take all practicable steps to prevent the occurrence of bushfires on, and to minimise the danger of the spread of bushfires on or from, that land.	Rural Fire Service
Contaminated Land Management Act 2017	As per Section 6 of the Contaminated Land Management Act 2017, ensure only EPA-approved VENM and ENM are brought to site, keep records of the same and provide copies to DPIE if requested.	EPA



<p>Fisheries Management Act 1994</p>	<p>Section 37 of the <i>Fisheries Management Act 1994</i> requires a permit be obtained from DPI – Fisheries where fish are to be relocated during in-stream works.</p> <p>The EIS and Statement of Commitments for SSD-7089 also refer to the need to obtain a Section 219 permit for blocking fish passage during construction works where fish passage would become blocked. However, Section 4.41 of the EP&amp;A Act provides a blanket exemption for all SSD projects to obtain such a permit under Section 219 of the <i>Fisheries Management Act 1994</i>. This matter is to be resolved with DPI – Fisheries in the event that fish passage is to be blocked.</p>	<p>DPI Fisheries</p>
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## Eurobodalla Southern Water Supply Storage project

### Compliance Tracking Program

#### Purpose

This Compliance Tracking Program (CTP) will be used to monitor compliance with the Minister for Planning's Minister's Development Consent Conditions contained in approval SSD 7089 dated 17 October 2019.

This Compliance Tracking Program has been developed in accordance with the NSW Department of Planning and Environment *Compliance Reporting: Post Approval Requirements May 2020* and will be implemented throughout construction of the project .

#### Compliance Management

The environmental management system (EMS) is the primary system to manage and control the environmental aspects of the project during construction. It also provides the overall framework for the system and procedures to ensure environmental impacts are minimised and legislative requirements are fulfilled.

The project EMS is based on Haslin Constructions' EMS, which is a certified ISO14001 EMS.

The Construction Environmental Management Plan (CEMP) is the primary system to manage and control the environmental aspects of the project during construction. It also provides the overall framework for the system and procedures to ensure environmental impacts are minimised and legislative and other requirements are fulfilled.

The strategies defined in the CEMP have been developed with consideration of the Development Consent requirements, mitigation measures presented in the environmental impact statement and contract documents. The CEMP establishes the system for implementation, monitoring and continuous improvement to minimise impacts from the project on the environment.

This CTP forms part of the CEMP and will be administered by the Environmental Site Representative or delegate for the duration of the project.

#### **Site Surveillance and Monitoring**

A key component of compliance monitoring for the project will involve site surveillance and monitoring. Section 3.10.1 and 3.10.2 of the CEMP outline the weekly site environmental inspections that will be undertaken by the Environmental Site Representative (or delegate) that will identify amongst other things compliance with the CEMP (Development Consent, Contract Requirements and any licences or permits).

#### **Auditing**

In addition to the site surveillance and monitoring identified above, compliance will be determined through environmental audits (identified and described in CEMP section 3.9.4). The audit regime will includes:

- First party audits by Haslin Constructions on a monthly basis
- Second Party audits by Eurobodalla Shire Council
- Compliance audits by an independent environment auditor

For Second Party Audits and Compliance audits, the below compliance table will be used where possible.

Development Consent #	Compliance Requirement	Phase	Evidence / Comments	Compliance Status*
A6	Clearing of vegetation is not permitted outside the construction boundaries shown in Appendix 1	Construction	Clearing limits/maps	Compliant

#### Compliance status terminology

Compliant: Sufficient evidence has been presented to demonstrate that all elements of the requirement have been complied with

Non-Compliant: A non-compliance with one or more elements of the requirement

Not-triggered: The requirement has an activation or timing trigger that has not been met when the compliance assessment has been undertaken, therefore an assessment of compliance is not relevant.

## **Appendix A2**

### **Eurobodalla Southern Water Supply Storage Project**

#### **Environmental aspects and impacts register**

This Environmental Aspect and Impact Register has been prepared to supplement the Environmental Risk Analysis conducted as part of the EIS. The identification of significant construction activities and associated impacts that could eventuate during construction of the Project is central to the selection of appropriate environmental safeguards.

The risk management process involved an assessment of all specific project activities/aspects in or near environmentally sensitive areas and resulted in the development of a list of environmental risks (effects and impacts) and a corresponding risk mitigation strategy and risk ranking. Each environmental risk was categorised, based on the following:

- The environmental aspect.
- Relative scale of the potential impact.
- Type of potential impact.
- Likelihood of occurrence.

The identification of risks included a review of the proposed works, the Development Consent, REMM, and review of the environmental risks identified by the EA and subsequent Submissions Report.

#### Likelihood and consequence

The list of activities to be carried out, including any activities undertaken by subcontractors or other suppliers, together with the actual and potential environmental impacts associated with each activity, was considered to form the basis of the risk assessment.

The following terminology was used for determining likelihood.

Likelihood	Qualitative measure of likelihood (how likely is it that this event/issue will occur after control strategies have been put in place)
Highly likely	Is expected to occur in most circumstances
Likely	Will probably occur during the life of the project
Possible	Might occur during the life of the project
Unlikely	Could occur but considered unlikely or doubtful
Rare	May occur in exceptional circumstances

The following terminology was used for determining consequence.

Consequence	Qualitative measure of consequences (what will be the consequence/result if this issue does occur rating)
Minor	Minor incident of environmental damage that can be reversed
Moderate	Isolated but substantial instances of environmental damage that could be reversed with intensive efforts
High	Substantial instances of environmental damage that could be reversed with intensive efforts
Major	Major loss of environmental amenity and real danger of continuing
Critical	Severe widespread loss of environmental amenity and irrecoverable environmental damage

### Risk rating

The risk rating was determined using the likelihood and consequence rating and the below risk matrix to assess whether the environmental risk is low, medium, high or severe.

The risk rating will be used to identify and prioritise environmental management measures to mitigate the risks to an acceptable level.

### Consequence

Likelihood	Minor	Moderate	High	Major	Critical
Highly likely	Medium	High	High	Severe	Severe
Likely	Low	Medium	High	High	Severe
Possible	Low	Medium	Medium	High	Severe
Unlikely	Low	Low	Medium	High	High
Rare	Low	Low	Low	Medium	High



Table 1: Aspect and impact register

Issue	Construction activity/aspect	Potential impact	Risk level prior to mitigation	Indicative Mitigation Measures	Risk level following mitigation	Management Documents / Training Required
Air quality	<ul style="list-style-type: none"> <li>General earthworks</li> <li>Vegetation clearing and burning</li> </ul>	Complaints from neighbours, including loss of amenity, dust in living areas, swimming pools	Moderate	<ul style="list-style-type: none"> <li>Induct personnel on air quality issues and safeguards.</li> <li>Use water on unsealed surfaces and stockpiles.</li> <li>Utilise safe dust suppressants to reduce dust generation.</li> <li>Modify operations during high winds.</li> <li>All trucks on public roads to cover loads.</li> </ul>	Low	EWMS SWMP Complaints Procedure Induction
	<ul style="list-style-type: none"> <li>Open excavation works</li> </ul>	Potential adverse health effects	Low		Low	
	<ul style="list-style-type: none"> <li>Spoil handling</li> <li>Stockpiling</li> </ul>	Degradation of water quality and other aspects of the natural environment	Low		Low	
	<ul style="list-style-type: none"> <li>Vehicular movements on unsealed roads</li> </ul>	Health risks to neighbours and members of the public from release of	Low		Low	

	<ul style="list-style-type: none"> <li>• Material haulage</li> <li>• Quarrying</li> <li>• Vehicle emissions</li> <li>• Handling of chemicals, waste and hazardous goods.</li> </ul>	dust, gases and/or smoke		<ul style="list-style-type: none"> <li>• Vehicles, equipment, machinery used and all facilities – designed, operated and maintained to control the emission of smoke, dust, odours and fumes.</li> <li>• All disturbed areas stabilised, revegetated and/or landscaped as soon as practicable.</li> <li>• Minimise tracked mud/dust on public roads.</li> <li>• Visual dust monitoring.</li> <li>• Avoid “hot-work” during total fire bans and obtain any necessary permits/exemptions</li> </ul>	Low	
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				<p>from the Rural Fire Service.</p> <ul style="list-style-type: none"><li>• WorkCover licensing requirements will be complied with for the storage of hazardous substances and dangerous goods.</li><li>• Appropriately stocked spill kits will be readily available at all chemical storage locations and during chemical use.</li><li>• Material Safety Data Sheets (MSDSs) will be obtained, complied with and retained on site for all required chemicals.</li></ul>		
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Issue	Construction activity/aspect	Potential impact	Risk level prior to mitigation	Indicative Mitigation Measures	Risk level following mitigation	Management Documents / Training Required
				<ul style="list-style-type: none"> <li>Pesticide use will be in accordance with the Pesticides Act, 1999</li> </ul>		
Biodiversity	<ul style="list-style-type: none"> <li>General earthworks</li> <li>Road works</li> <li>Vegetation clearing</li> <li>Perimeter fencing</li> <li>Open excavation works</li> <li>Spoil handling</li> <li>Stockpiling</li> </ul>	Clearing outside of an approved area, including: <ul style="list-style-type: none"> <li>Accidental clearing outside of the project boundaries</li> <li>Accidental clearing beyond the requirements of the Project Approval</li> </ul>	Medium	<ul style="list-style-type: none"> <li>Induct personnel on flora and fauna issues and safeguards.</li> <li>Clearing limits delineated</li> <li>Preclearing checklist</li> <li>Project ecologist on call</li> <li>Staged clearing</li> </ul>	Low	Induction EWMS FFMP Inspection checklist
		Injuries to fauna	Medium		Medium	

Issue	Construction activity/aspect	Potential impact	Risk level prior to mitigation	Indicative Mitigation Measures	Risk level following mitigation	Management Documents / Training Required
		Spreading weeds via personnel, plant/equipment, topsoil / mulch	Low	<ul style="list-style-type: none"> <li>Preclearing surveys of hollow bearing trees</li> <li>Unexpected finds procedure</li> <li>Weed management plan and hygiene protocols</li> <li>Erosion and sedimentation control measures</li> <li>Two stage clearing process for known habitat trees</li> </ul>	Low	
		Introducing/spreading of Phytophthora cinnamomi	Medium		Low	
		Clearing of hollow bearing trees with nesting fauna	Medium		Medium	
		Sediment and erosion of downstream waterways	Medium		Low	
Soil and Water	<ul style="list-style-type: none"> <li>General earthworks</li> <li>Road works</li> </ul>	Uncontrolled erosion onsite leading to offsite movement of soil	High	<ul style="list-style-type: none"> <li>Induction</li> <li>Environmental Work Method Statement</li> </ul>	Medium	Induction

Issue	Construction activity/aspect	Potential impact	Risk level prior to mitigation	Indicative Mitigation Measures	Risk level following mitigation	Management Documents / Training Required
	<ul style="list-style-type: none"> <li>Vegetation clearing</li> <li>Perimeter fencing</li> <li>Open excavation works</li> <li>Spoil handling</li> <li>Stockpiling</li> </ul>	Discharge of dirty water from site causing: <ul style="list-style-type: none"> <li>Sedimentation of downstream waterways</li> <li>Impacts to downstream aquatic habitat</li> </ul>	High	<ul style="list-style-type: none"> <li>Soil and Water Management Plan</li> <li>Discharge water quality testing</li> <li>Inspection checklist</li> <li>Progressive erosion and sedimentation control plan</li> <li>Induct personnel on soil and water risks and safeguards.</li> </ul>	Medium	Environmental Work Method Statement  Soil and Water Management Plan  Inspection checklist  Progressive erosion and sedimentation control plan
		Tracking of soil and mud offsite	Medium		Low	

Issue	Construction activity/aspect	Potential impact	Risk level prior to mitigation	Indicative Mitigation Measures	Risk level following mitigation	Management Documents / Training Required
	<ul style="list-style-type: none"> <li>Concrete works</li> <li>Grouting</li> <li>Dewatering activities</li> <li>Crushing and screening</li> <li>Traffic movements to/from site</li> </ul>	Non-compliance with site water discharge limits	Medium	<ul style="list-style-type: none"> <li>Staged clearing</li> <li>Progressive erosion and sedimentation control plans</li> <li>Soil conservation specialist support</li> </ul>	Low	Dewatering plan
Noise and Vibration	<ul style="list-style-type: none"> <li>General earthworks</li> <li>Road works</li> </ul>	Complaints from neighbours, business due to loss of amenity	Medium	<ul style="list-style-type: none"> <li>Noise and vibration management plan</li> <li>Compliance with the approved working hours</li> </ul>	Low	Induction  Blast Management Plan



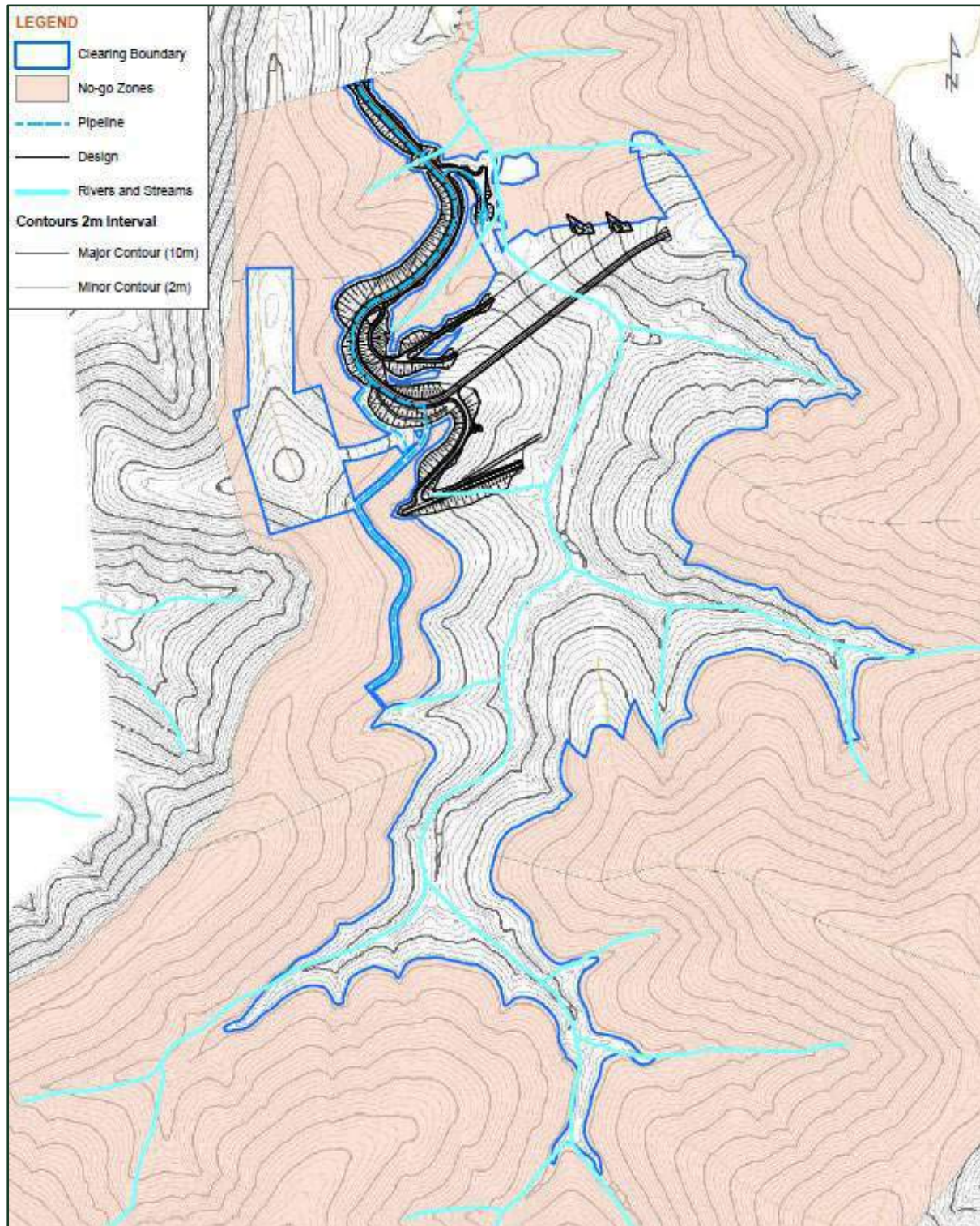
	<ul style="list-style-type: none"> <li>• Vegetation clearing</li> <li>• Blasting</li> <li>• Perimeter fencing</li> <li>• Open excavation works (including drilling)</li> <li>• Spoil handling</li> <li>• Stockpiling</li> <li>• Concrete works</li> <li>• Crushing and screening</li> <li>• Traffic movements to site</li> </ul>	Damage to private property from blasting activities	Low	<ul style="list-style-type: none"> <li>• Community notification</li> <li>• Blast management plan</li> <li>• Noise monitoring</li> </ul>	Low	<p>Noise and vibration management plan</p> <p>Noise monitoring</p>
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Issue	Construction activity/aspect	Potential impact	Risk level prior to mitigation	Indicative Mitigation Measures	Risk level following mitigation	Management Documents / Training Required
Traffic	<ul style="list-style-type: none"> <li>Traffic movements to/from site</li> </ul>	Delays or disruption to travelling public	Low	<ul style="list-style-type: none"> <li>Traffic management plan</li> <li>Compliance with the approved working hours</li> <li>Community notification</li> <li>Detail heavy vehicle routes</li> <li>Designated parking areas for site staff</li> </ul>	Low	Induction  Traffic Management plan  Speed limit compliance

## Appendix A3

Eurobodalla Southern Water Supply Storage Project

Sensitive area / No-go map



## Appendix A4

Eurobodalla Southern Water Supply Storage Project

Environmental non-compliance and incident procedure

This Environmental Non-Compliance and Incident Procedure aims to ensure Haslin Construction workers and contractors understand how to classify, respond to and report environmental non-compliance incidents that occur on the Eurobodalla Southern Water Supply Storage project.

This procedure is applicable to events that constitute an “environmental non-compliance” and/or an “environmental incident”. These are defined in the below table.

Term	Definition
Environmental non-compliance	An exceedance of environmental limits or contractual criteria or Development Consent or Environmental Laws
Environmental Incident	<p>An (environmental) incident is an occurrence or set of circumstances that causes or threatens to cause material harm and which may or may not be or cause a non-compliance. This may be as a consequence of which pollution (air, water, noise, and land) or an adverse environmental impact has occurred, is occurring, or is likely to occur.</p> <p>Material harm is defined as an event that:</p> <ul style="list-style-type: none"> <li>iii. involves actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial, or</li> <li>iv. results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding \$10,000 (or such other amount as is prescribed by the regulations)</li> </ul>

	Material Harm only relates to pollution incidents. Other environmental incidents, such as conservation, heritage and planning breaches, are not included in the definition of a pollution incident.
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Step	Action	Responsibility	Timeframe
1	Stop work in relevant area (if necessary) and take actions to prevent adverse impact to human health or the environment.  Note human health and safety is the primary concern, and no action should be taken if it is not safe to do so.	Person who identifies event	Immediate
2	Advise the Haslin Senior Project Manager <b>and</b> Haslin Environmental Site Representative	Person who identifies event	Immediate
3	Consider whether the event constitutes an Environmental Incident	Haslin Environmental Site Representative	Immediate
4	If the event is an “incident”, notify the Haslin Authorised Representative  If the event is not an incident proceed to Step 8	Haslin Environmental Site Representative	Immediate

5	<p>Immediately after becoming aware of an Environmental Incident, notify the Principal</p> <p>The Principal is to provide written notification to the Department of Planning (<a href="mailto:compliance@planning.nsw.gov.au">compliance@planning.nsw.gov.au</a>) as per the requirements of Development consent Condition C9</p>	<p>Haslin Authorized Representative</p> <p>Eurobodalla Shire Council</p>	<p>Immediate</p> <p>Immediate</p>
6	Follow the Material Harm Notification Requirements below	Haslin Environmental Site Representative & Haslin Senior Project Manager	Immediate
7	<p>If the event is an Environmental Incident, complete the Environment Incident Report and submit to the Principal</p> <p>Eurobodalla Shire Council is to provide the Department of Planning within a written incident notification <a href="mailto:compliance@planning.nsw.gov.au">compliance@planning.nsw.gov.au</a></p>	Haslin Environmental Site Representative & Haslin Senior Project Manager	<p>Within 4 days of an environmental event</p> <p>Within 7 days of an environmental incident</p>
8	If the event is a non-compliance, complete the Environment – Non compliance report	Haslin Environmental Site Representative	Within 4 days of the event



10	<p>Complete a detailed report on the incident addressing all requirements below;</p> <ul style="list-style-type: none"><li>• a summary of the incident;</li><li>• outcomes of an incident investigation, including identification of the cause of the incident;</li><li>• details of the corrective and preventative actions that have been, or will be, implemented to address the incident and prevent recurrence; and</li><li>• details of any communication with other stakeholders regarding the incident.</li></ul> <p>Provide the report to the Principle</p>	<p>Haslin Environmental Site Representative</p>          <p>Haslin Senior Project Manager</p>	<p>Within 21 days of the event</p>
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11	<p>Eurobodalla Shire Council is to provide the Department of Planning within a detailed written report that includes</p> <ul style="list-style-type: none"> <li>• a summary of the incident;</li> <li>• outcomes of an incident investigation, including identification of the cause of the incident;</li> <li>• details of the corrective and preventative actions that have been, or will be, implemented to address the incident and prevent recurrence; and</li> <li>• details of any communication with other stakeholders regarding the incident.</li> </ul>	Eurobodalla Shire Council	Within 30 days of an environmental incident
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### Material Harm Notification Requirements

Under Part 5.7 of the POEO Act, there is a duty to immediately notify (i.e. promptly and without delay) the following authorities of a pollution incident where material harm to the environment is caused or threatened.

Authorities to notify for Material Harm pollution incidents that present an immediate threat to human health or property		
Order	Authority	Contact Number
1	Fire and Rescue NSW	000

2	NSW EPA Environment Line	131 555
3	Ministry of Health Albury Public Health Unit (Murrumbidgee and Southern NSW LHD)	Business Hours 6053 4800 After hours 6053 4800 or 1300 066 055
4	SafeWork NSW	131 050
5	Eurobodalla Shire Council	4474 1000
6	Principles Representative	

**Authorities to notify for Material Harm pollution incidents that do NOT present an immediate threat to human health or property**

Order	Authority	Contact Number
1	NSW EPA Environment Line	131 555
2	Eurobodalla Shire Council	4474 1000
3	Ministry of Health Albury Public Health Unit (Murrumbidgee and Southern NSW LHD)	Business Hours 6053 4800 After hours 6053 4800 or 1300 066 055

4	SafeWork NSW	131 050
5	Fire and Rescue NSW	000
6	Principles Representative	

The relevant information to provide

It is important to avoid speculation on origin, causes or outcomes of a pollution incident in discussions with the authorities. Section 150 of the POEO Act provides the information that needs to be notified, being:

- a) The time, date, nature, duration and location of the incident
- b) The location of the place where pollution is occurring or is likely to occur, the nature, the estimated quantity or volume and the concentration of any pollutants involved, if known
- c) The circumstances in which the incident occurred (including the cause of the incident, if known)
- d) The action taken or proposed to be taken to deal with the incident and any resulting pollution or threatened pollution, if known
- e) Other information prescribed by the regulations.

Only known information should be provided when notifying of a Material Harm pollution incident. If further information becomes known after the initial notification, that information must immediately be notified to all authorities in accordance with Section 150 (see above). The immediate verbal notification is to be followed by written notification to each relevant authority within seven days of the date on which the incident occurred.

Complying with these notification requirements does not remove the need to comply with any other legislative requirements for incident notification (e.g. requirements under EPL conditions or the Work Health and Safety Act 2011).

## Haslin Eurobodalla Southern Water Supply Storage Project

## Environmental Non-compliance /Incident Report

Incident details		
Date and time	Date .....	Time.....
<p>Description</p> <p>Provide a brief factual description of what happened, include relevant details such as:</p> <ul style="list-style-type: none"> <li>• the estimated distance to nearest waterway or drainage lines</li> <li>• the estimated distance to the nearest sensitive receiver</li> <li>• the activity being undertaken when the incident occurred</li> </ul> <p>Sketches/diagrams/photos may be referenced and appended</p>		
<p>Exact location of the event</p> <p>(include chainage, landmarks, features, nearest cross street, etc. Maps and plans can be attached to the incident report if appropriate.</p>		
Quantity or volume of material escaped if known/applicable		
Who identified the event?		

What immediate actions/controls were taken to rectify or contain the event?		
Was it a Material Harm Incident?	Y / N	
Have the regulatory notifications taken place?	Date of notification	Reference numbers
• Fire and Rescue		
• NSW EPA		
• NSW Ministry of Health		
• NSW Department of Planning and Environment		
• SafeWorks NSW		
• Eurobodalla Shire Council		
What corrective actions have been taken to prevent a re-occurrence?		
Person making report		
Name		
Position		
Signature		
Date		



## Appendix A5

Eurobodalla Southern Water Supply Storage Project

Agency consultation





23 August 2022  
DOC22/739513

Mr Matthew Francesconi  
General Manager- Construction  
HASLIN CONSTRUCTIONS  
SUTHERLAND NSW 2232

By email: [nfrancesconi@strategicenvironmentalsupport.com.au](mailto:nfrancesconi@strategicenvironmentalsupport.com.au)

Attention: Nick Francesconi

Dear Mr Francesconi

**Eurobodalla Southern Water Supply Storage Project – Eurobodalla Shire Council**  
**Draft Soil and Water Management Plan**

I refer to the draft Soil and Water Management Plan (SWMP) developed by HASLIN Constructions for the Eurobodalla Southern Water Supply Storage Project and provided to the NSW Environment Protection Authority (EPA) on 8 August 2022.

Thank you for providing the EPA with the opportunity to review the draft SWMP associated with this stage of the project. The EPA does not approve or endorse environmental management plans; however, the EPA has taken the opportunity to note the following comments on the SWMP.

The EPA acknowledges that SWMP prioritised re-use of dirty water collected in sediment basins over discharge to receiving waters. However, the SWMP also proposes the use of several temporary sediment basins that appear to rely on chemical dosing to assist flocculation and discharge to the environment following significant wet weather events (uncontrolled discharges) or controlled discharges following treatment of sediment basin water.

The EPA reminds the proponent that Section 120 of the Protection of the Environment Operations Act 1997 applies to any discharges from the proposal site. In this regard the proponent must ensure that any discharge does not pollute the receiving waterway. The receiving environment for the project is Tuross River which flows into the high conservation value Batemans Bay Marine Park, as such the EPA considers a high standard of planning and implementation of sediment and erosion controls should be considered and implemented.

A thorough consideration and assessment of alternatives to direct discharge to the environment is preferred to the use of flocculants to protect the NSW Water Quality Objectives (NSW WQO) of the receiving environment. This may include measures such as temporary storage, dust suppression and irrigation onto land or dirt roads.

Where a chemical has potential to have non-trivial impacts on the environment, it is the responsibility of the person using that chemical to ensure that the potential impacts are fully identified, managed, and mitigated. Considering the potential water pollution risks associated with the use of flocculants and coagulants, all components of a potential discharge from the sediment basins that may impact receiving waters must be assessed.

Phone 131 555  
Phone 02 9995 5555  
(from outside NSW)

TTY 133 677, then  
ask for 131 155

Locked Bag 5022  
PARRAMATTA  
NSW 2124

4 Parramatta Square  
12 Darcy Street  
PARRAMATTA  
NSW 2150

[info@epa.nsw.gov.au](mailto:info@epa.nsw.gov.au)  
[www.epa.nsw.gov.au](http://www.epa.nsw.gov.au)  
ABN 43 692 285 758

In this regard, included to this letter at Attachment A, the EPA has provided some environmental assessment requirements which will assist the effectiveness and environmental risks of the use of the flocculant.

The EPA notes the management plans incorporate the advice the EPA has given during other stage of the project, in particular the development of Trigger Action Response Plan (TARP) which identifies numerous triggers, notifications, response actions and how to prevent a recurrence.

If you have any further questions about this issue, please contact Ms Nirmala Dharmarathne, Operations Officer, Regulatory Operations, on (02) 6229 7002 or at [info@epa.nsw.gov.au](mailto:info@epa.nsw.gov.au).

Yours sincerely



**Matthew RIZZUTO**  
Unit Head  
Regulatory Operation Regional

**ATTACHMENT A****Dose concentration calculations and sediment dam water characterisation**

Details of:

- The dose concentration(s) of the proposed flocculant
- A characterisation of the expected quality in terms of all pollutants present that pose a risk of non-trivial harm to the environment if an overflow to receiving water was to occur
- An assessment of the potential impact of discharges on the environmental values of the receiving waterway with reference to the Australian and New Zealand Guidelines for Fresh and Marine Water Quality guideline values (the Water Quality Guidelines)
- The degradation rate of the flocculant and the potential for accumulation in bed sediments of the receiving waterway.

**Management of materials from basins**

Provide details of proposed management of material accumulated in the sediment dam including testing and potential waste management.

**Storage**

Demonstrate flocculant material will always be appropriately stored on site.

**Ecotoxicology testing**

Ecotoxicology testing of the flocculant, by a NATA accredited lab, of representative test species across a range of taxonomic groups is required to provide data on the potential environmental risk.

Both the product concentrate/s and the treated sediment dam water should be tested. The current minimum number of species for toxicity data is at least five that belong to at least four taxonomic groups, as recommended by the Water Quality Guidelines, though the EPA encourages the use of more species and taxonomic groups for this high conservation environment. The selection of species in each taxonomic group should be representative and should include:

- Fish *Melanotaenia splendida* (vertebrate) – 96 hour imbalance test (or appropriate alternate test)
- Shrimp *Paratya australiensis* (invertebrate macrocrustacean) – 96 hour lethality test
- Cladoceran *Ceriodaphnia dubia* (invertebrate microcrustacean) – 48 hour immobilisation/survival test (or appropriate alternate test)
- Alga *Raphidocelis subcapitata* (microalga) – 72 hour growth inhibition test
- Bacterium *Vibrio fischeri* (bacterium) (Microtox) - bioluminescence inhibition test
- Duckweed *Lemna disperma* - growth inhibition test



## RE: Eurobodalla Southern Water Supply Storage project



Carla Ganassin &lt;carla.ganassin@dpi.nsw.gov.au&gt;

To: Nicholas Francesconi

Cc: Andrew Lynam

You forwarded this message on 29/07/2022 6:19 PM.

Reply Reply All Forward

Fri 29/07/2022 2:06 PM

Hi Nicholas,

Thanks for checking in with DPI Fisheries about this. We do not have an interest in reviewed the Flora & Fauna and Water Quality Sub-Plans for the dam construction works.

That said, please ensure best practice erosion and sediment control techniques are used during construction to manage and mitigate sedimentation inputs to the tributary and Tuross River downstream.

Regards,

**Carla Ganassin**

Senior Fisheries Manager, Coastal Systems

DPI Fisheries | Aboriginal Fishing &amp; Marine &amp; Coastal Environments

**Department of Regional NSW**T 4222 8342 M 0447 644 357 E [carla.ganassin@dpi.nsw.gov.au](mailto:carla.ganassin@dpi.nsw.gov.au)[regional.nsw.gov.au](http://regional.nsw.gov.au)

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**Department of Primary Industries**  
Department of Regional NSW

We stand on Country that always was and always will be Aboriginal land. We acknowledge the Traditional Custodians of the land and waters, and we show our respect for Elders past, present and emerging. We are committed to providing places in which Aboriginal people are included socially, culturally and economically through thoughtful and collaborative approaches to our work.



Department of Planning and Environment

DOC22/726023-2

The General Manager  
Eurobodalla Shire Council  
PO Box 99  
MORUYA NSW 2537

Attention: Harvey Lane

7 September 2022

By email: [Harvey.lane@esc.nsw.gov.au](mailto:Harvey.lane@esc.nsw.gov.au)

**Eurobodalla Southern Storage SSD 7089 Stage 5 CFFMP review**

Thank you for referring the Stage 5 Construction Flora and Fauna Management Plan (CFFMP) for our first review to Biodiversity and Conservation Division (BCD) for our review and comments.

We have reviewed the CFFMP and note the following:

- No timeframe is provided for the proposed clearing of remaining vegetation.
- All identified hollow bearing trees (HBTs) have been removed, however some may remain in uncleared areas
- Pre-clearance surveys will be carried out to identify any remaining HBTs.
- Remaining HBTs will be removed during February/first 2 weeks of March following the Habitat Tree Clearing process in the CFFMP.
- If a HBT is to be removed outside the February/March timeframe then *Table 7-1- Flora and fauna management and mitigation measures M10* states that the project ecologist will be consulted.
- Figures 4-2 - does not indicate where the clearing boundary is located in comparison to the current extent of clearing.

Following a conversation between yourself and Ms Lyndal Walters of BCD, we understand that clearing of the remainder of the vegetation is likely to commence late September or early October and take approximately 4 months.

BCD do not support the clearing of HBTs outside the February/March timeframe unless it can be clearly demonstrated that the hollows are not being occupied by threatened species.

As such, BCD recommend the CFFMP be updated to include the following:

- Include details on how additional HBTs identified in the pre clearance surveys will be managed if they need to be removed outside the consent timeframe of February and first 2 weeks of March.
- Table 7-1, M10 should be updated to include consultation with the Secretary of Planning and BCD.
- Figures 4-1 and 4-2 should be combined to clearly show the current extent of the clearing and clearing boundary.

**Attachment 1 – Detailed comments on BCD review of the Stage 5 CFFMP for SSD 7089**

BCD understands that this Plan applies to Stage 5 of the approved project, being the construction of all remaining works on site including the removal of the remaining vegetation within the clearing boundary, as well as grubbing works and removal of any remaining habitat trees identified during the pre-clearing inspections.

Whilst all identified HBTs have been removed during Stage 4, we note that there may be a possibility that additional HBTs will be located when clearing the remaining vegetation. Remaining HBTs may provide breeding habitat for threatened species on the site, which may be impacted if clearing is to occur outside the February/March timeframe.

These include;

- Gang-gang cockatoo - *Callocephalon fimbriatum*: Breeding - October to January
- Eastern Coastal Free-tailed bat - *Mormopterus norfolkensis*: Winter breeding, young in a crèche until autumn
- Yellow-bellied Sheath-tail-bat - *Saccolaimus flaviventris*: Winter breeding, young at foot until autumn
- Sooty owl - *Tyto tenebricosa*: Breeding - March to September.

The Conditions of consent require that all clearing of vegetation be carried out in February/March.

We note in this CFFMP that the possibility of clearing HBTs in winter has been raised, however given that winter is now over, it is unlikely to be an issue for the eastern pygmy possums who will be leaving torpor, particularly as we now understand that the clearing is due to commence in late September/early October and will continue for approximately 4 months. As such we recommend that the CFFMP be updated to include this timeframe.

In particular, the text below should be updated to include information on actual clearing timeframes and possible impacts on other threatened species as listed above.

*The remaining clearing works will be avoided in the mid-winter period of July and August to minimise impacts to threatened species breeding in hollows, however because the vast majority of hollow bearing trees have already been cleared it is considered that clearing of non-hollow bearing trees can be undertaken between July and August with no impact to threatened species. Should hollow bearing trees be identified on site that require clearing in winter, a targeted hollow bearing tree clearance report will be prepared by the ecologist and provided to the Secretary of Planning. The hollow bearing tree clearance report will outline whether fauna are occupying the hollow, procedures to safely remove hollows and manage tree clearing.*

In addition, Requirement M10 states that "Clearing of HBT to only occur between the start of February and first 2 weeks of March unless advised by the project ecologist." However, as it is a consent condition, it is not a decision that can be made by the project ecologist. BCD consider consultation is required with both BCD and the Department Secretary if this condition cannot be met. The CFFMP should detail how this situation will be managed including steps required to demonstrate that no threatened fauna is occupying the HBTs to be removed.

For more detailed comments please refer to Attachment 1.

If you have any further questions about this issue, please contact Ms Lyndal Walters, Senior Conservation Planning Officer, on 02 6229 7157 or at [roo.southeast@environment.nsw.gov.au](mailto:roo.southeast@environment.nsw.gov.au)

Yours Sincerely



Allison Treweek  
Senior Team Leader Planning  
South East, Biodiversity and Conservation

Enclosure: Attachment 1 – Detailed comments on BCD review of the Stage 5 CFFMP for SSD 7089

cc: Kyle Johannes and Mark Wisely – Department of Planning and Environment



# HASLIN

## Construction Environmental Management Plan Traffic Management Sub-Plan Eurobodalla Southern Storage Project



Construction  
Consultative  
Committee





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**Glossary/ Abbreviations**

Abbreviations / Ref.	Expanded text / Meaning
CEMP	Construction Environmental Management Plan
Contract	Contract No. 10018541; Eurobodalla Southern Storage Construction
Contractor	Haslin Constructions
EPA	NSW Environment Protection Authority
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EPBC Act	<i>Environmental Protection and Biodiversity Conservation Act 1999</i>
EWMS	Environmental Work Method Statements
GVM	Gross Vehicle Mass
Principal / ESC	Eurobodalla Shire Council
NSW PWA	New South Wales Public Works Advisory
PAP	Principal's Authorised Person
Project	Eurobodalla Southern Storage - Storage Construction
TCP	Traffic Control Plan
Technical Specification	Technical Specification; Eurobodalla Southern Storage - Storage Construction Contract No. 10018541; 14/01/2022
TfNSW	Transport for New South Wales, formerly Roads and Maritime Services (RMS)
TMP	Construction Traffic Management Sub Plan
OEH	Office of Environment and Heritage
RMS	Roads and Maritime Services
ROL	Road Occupancy Licence
Soc	Statement of Commitments
SWMS	Safe Work Method Statement
SZA	Speed Zone Authorisation
VMP	Vehicle Movement Plan
VMS	Variable Message Sign
WHS	Work, Health & Safety

## Document Control and Records

Documentation and document control for this Plan, including issue of any amendments will be done generally in accordance with the contract. This Plan is maintained by Haslin Constructions (Haslin) and maintained throughout construction through regular reviews carried out on an initial 3 month of the project starting then on a biannually basis, or as changes require.

At all times an up-to-date copy of this plan shall be kept on site and made available to all employees and contractors involved in the project. Amendments that are made to this document are recorded on the register of amendments below and shall be approved by management staff. Superseded versions of this document shall be maintained for a period of 7 years to demonstrate record of environmental management and compliance.

This document shall be created and approved by the client. A controlled copy shall be supplied to all relevant parties, and distribution of controlled copies shall be recorded on the distribution register below (controlled hardcopy only). When changes are made to this document, parties listed below shall be provided with updates.

Register of Amendments				
Date:	Version No.:	Description of Amendments:	Prepared by:	Approved by:
17/08/22	0	Draft for review	Andrew Berick	Justin McCarthy

Company Management Plan Authorisation			
	Name/Position	Date:	Signature
Prepared by:	Project Engineer – Andrew Berick	17/08/22	
Reviewed by:	Senior Project Engineer – Ben Lyons	17/08/22	
Approved by:	Senior Project Manager – Justin McCarthy	17/08/22	

Distribution Register			
Version No.	Date of Issue:	Name of Recipient:	Position/Organisation
0	17/08/22	Ross Bailey	PAP / NSW PWA

# 1. Introduction

---

## 1.1 Context

This Traffic Management Sub Plan (TMP or Plan) forms part of the Construction Environmental Management Plan (CEMP) for the Eurobodalla Southern Water Supply Storage (Project).

This TMP has been prepared to address the requirements of the Minister's Development Consent and the environmental management measures listed in the Eurobodalla Southern Water Supply Storage Environmental Impact Statement (EIS), including all applicable legislation and the Technical Specification for the Project.

## 1.2 The approved project

The Eurobodalla Southern Water Supply Storage (the Project) was granted Development Consent from the Department of Planning and Environment (DPE) on 17 October 2019. Development Consent is provided in Appendix A.

The Project consists of an off-stream water storage facility and associated ancillary facilities. Water would be extracted from the Tuross River, using a new river intake pump station, and transferred to the storage via the Storage Inlet Pipeline. As necessary, the storage volume would be supplemented by water extracted from an existing borefield adjacent the storage.

Key features of the Project include:

- a 3,000 megalitre storage capacity
- a 370 metre long embankment, 39 metres in height and a crest width of 20 metres located on an unnamed tributary of the Tuross River
- a spillway
- permanent erosion control structures located downstream of the spillway
- inlet works to convey and dissipate raw water transferred from the river intake pump station through a pipeline constructed along the left abutment to the proposed water storage facility
- outlet works to allow transfer of water from the storage to the existing southern water treatment plant (WTP)
- instrumentation to monitor seepage, reservoir levels and water quality
- a consequence category of "High C" for both flood and sunny day scenarios in accordance with the Australian National Committee on Large Dams (ANCOLD) Guidelines on the consequence categories of dams (2012)
- a thermal stratification control system
- a boat ramp at the storage for maintenance and water quality monitoring
- safety and perimeter fencing at the storage.

Key features of the ancillary facilities include:

- new river intake pump station with a total river extraction capacity made up of a combination of flows from the river intake (up to 26 megalitres) and the borefield (up to six megalitres)
- installation of the following new pipelines including:
  - a pipeline with a capacity of 26 megalitres per day to transfer raw water from the new river intake pump station to the storage inlet chute
  - a cross connection to the proposed water storage inlet pipeline with a capacity of six megalitres per day providing connection to supply water from the storage to the balance tank at the existing

**WTP**

- a pipeline connection from the existing borefield pipeline to the river intake pump station.
- a new storage access road that is about one kilometre in length and extends from Eurobodalla Road opposite the existing WTP to the embankment crest
- basic right-turn and basic left-turn treatment at the intersection of the new storage access road and Eurobodalla Road would be provided
- a new access road that would provide a route for vehicles to access the new river intake pump station
- power supply including the construction of new sub-stations located near the storage and the river intake pump station.

### **1.3 Scope of this plan**

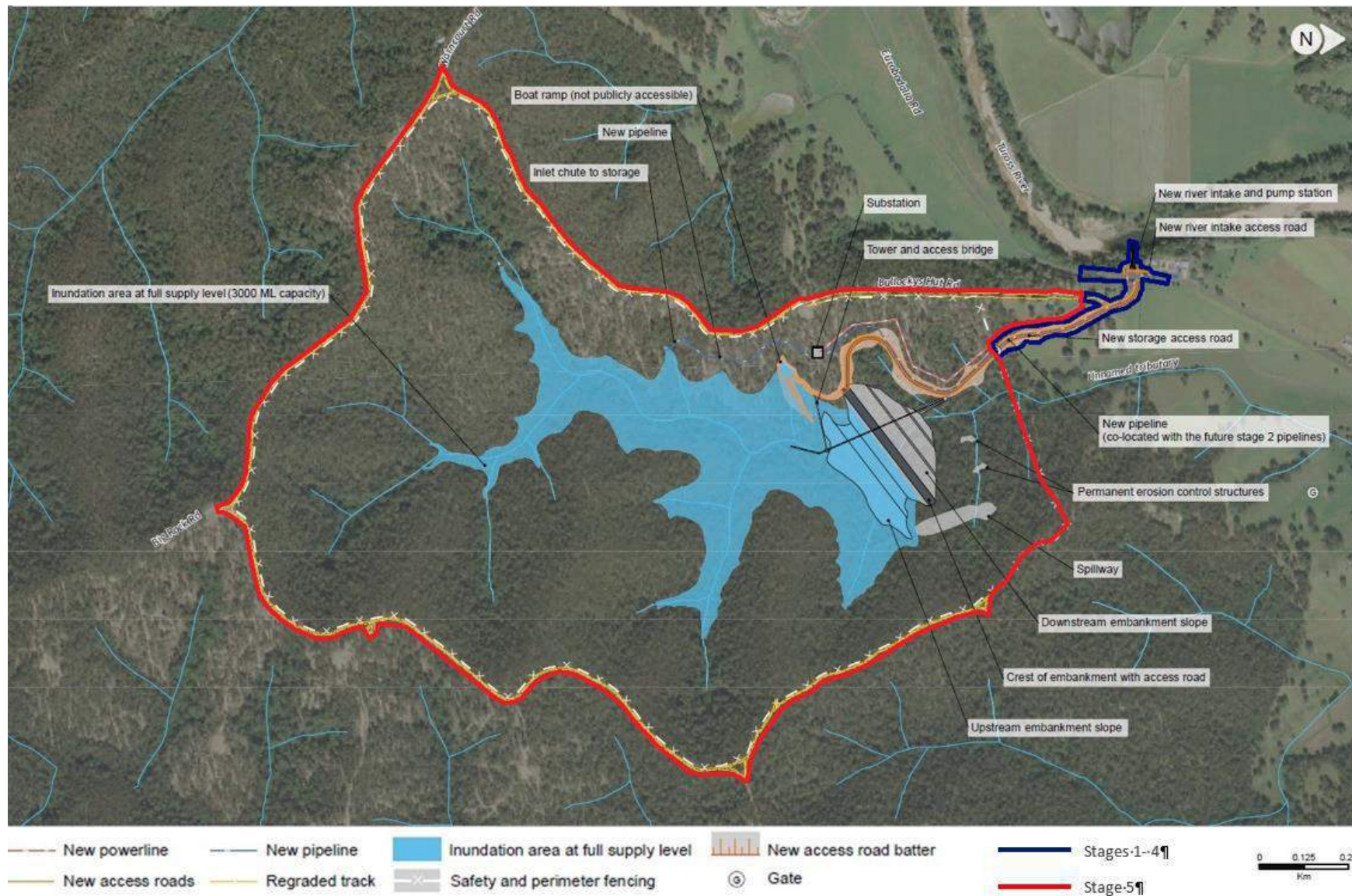
With the approval of the Secretary of Planning, construction of the project is being staged as follows:

- Stage 1: Tuross River Intake Pump Station clearing.
- Stage 2: Tuross River Intake Pump Station construction.
- Stage 3: Vegetation clearing and topsoil stripping of the access road, construction of the access road to the forestry boundary and construction of the inlet pipeline to the forestry boundary.
- Stage 4: Partial clearing of the entire storage site.
- Stage 5: All other works.

This Plan only applies to Stage 5 of the approved project, being the construction of all remaining works on site to enable the project to become operational. Works in Stage 1, Stage 2 and Stage 3 will continue in parallel with Stage 5 and be delivered under respective Construction Environmental Management Plans.

The scope of works is detailed in Figure 1.





**Figure 1:** Project overview and scope of works covered by this plan (Stage 5)

SEQ-TP-077 Rev 2

Date Issued: 27/06/18

Prepared by: Jeremy Wallis,  
HSEQ Manager

Page 8

Approved by: Colin Woods,  
Managing Director

## 2. Purpose and objectives

---

### 2.1 Purpose

The purpose of this Traffic Management Plan (TMP) is to describe how the Contractor will manage traffic during construction of the Project, including how to ensure compliance with the road management and safety requirements and provide for compliance obligations to the Technical Specification.

### 2.2 Objectives

The key objective of the TMP is to ensure all conditions of the Development Consent, environmental management measures, licence/permit and Technical Specification requirements relevant to traffic management are described, scheduled and assigned responsibility as outlined in:

- The Environmental Impact Assessment (EIA) prepared for Eurobodalla Southern Water Supply Storage (the Project)
- Submission Report for the Eurobodalla Southern Water Supply Storage Project
- Addendum Submissions Report for the Eurobodalla Southern Water Supply Storage Project
- Revised Secretary's Environmental Assessment Requirements (SEARs)
- Revised Management and Mitigation Measures
- Development Consent SSD 7089 (the Project) granted on 17 October 2019
- Technical Specification; Eurobodalla Southern Storage - Storage Construction

### 2.3 Targets

The following targets have been established for the management of traffic impacts during the project:

- ensure full compliance with the relevant legislative requirements, EIS, conditions of the Development Consent, and Technical Specification Section 1.6
- ensure safe and continuous traffic movement for construction workers and the general public
- maintain continuity of access to local roads and properties
- maintain the capacity of existing roads where possible
- implement traffic control operations to minimise delays to road users taking into consideration traffic volumes including peak times of the day and seasonal traffic
- avoid road occupancy where possible
- plan all construction vehicle movements to minimise disruption to traffic flow on roads within the Project area and surrounds
- minimise impacts on, and complaints from, the community and stakeholders.



## 2.4 Relationship to other Project Management Plans

The TMP governs how the Project will facilitate and manage traffic issues or concerns during the construction phase and is therefore an overarching document prescribing approach, protocol and execution of the overall planning function.

This TMP forms an attachment to the Project Management Plan.

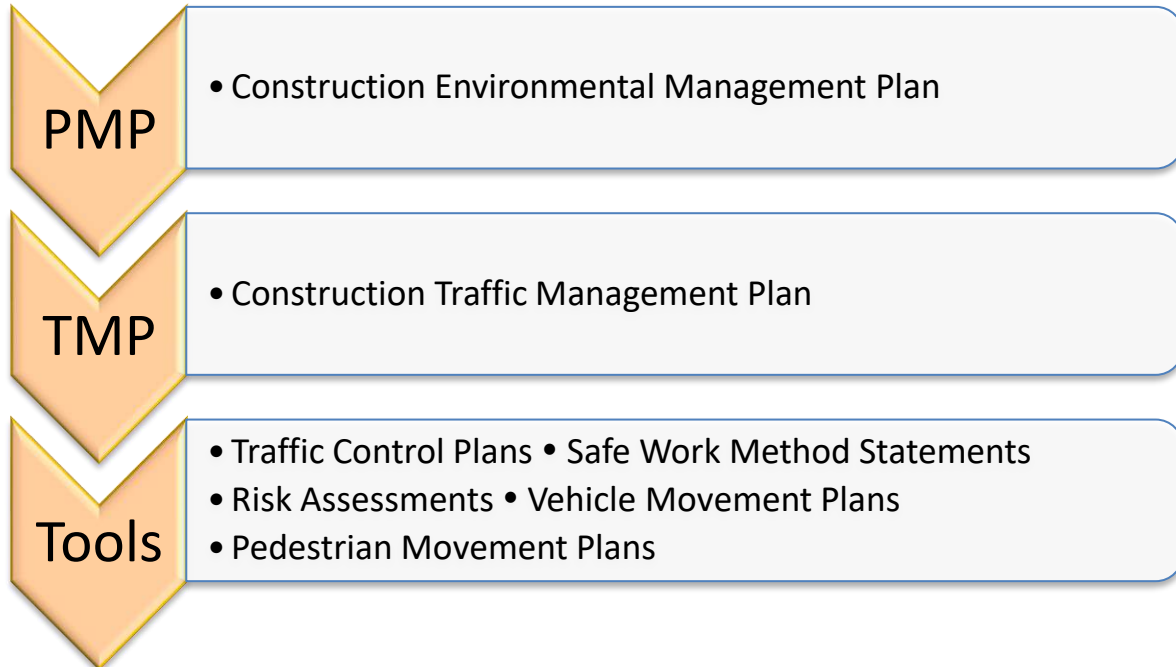


Figure 2: Traffic Management Documentation

## 2.5 Revision of the TMP

The processes described in the CEMP may result in the need to update or revise this TMP. This will occur as needed.

A copy of the updated plan and changes will be distributed to all relevant stakeholders in accordance with the approved document control procedure.

The TMP may also be updated as a result of the following:

- changes to the proposed design or construction methodology
- contract variations
- changes in law
- if the TMP does not address an element of design or construction of the works
- to prevent the recurrence of any compromise to the safety of road users and the public
- in response to incidents and traffic disruptions arising from the works

## 3. Environmental requirements

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### 3.1 Relevant legislation and guidelines

#### 3.1.1 Legislation and regulatory requirements

Legislation relevant to traffic management also includes the *Environmental Planning and Assessment Act 1979* (EP&A Act), under which the project approval was granted. Relevant provisions of the EP&A Act are explained in the register of legal and other requirements included in Appendix A1 of the CEMP.

All legislation relevant to this TMP is included in Appendix A1 of the CEMP.

A Road Occupancy Licence (ROL) is unlikely to be required for the works. However, if a ROL is required, it would be prepared in accordance with the RMS Road Occupancy Licence Manual.

#### 3.1.2 Guidelines and standards

The main guidelines, specifications, and policy documents relevant to this Plan include:

- Technical Specification Section 1.6
- Australian Road Rules.
- Roads and Maritime Traffic Control at Worksites Manual, Issue 6.0, Nov 2020.
- AUSTROADS Guide to Traffic Management 2020 – Parts 1-13
- AUSTROADS Guide to Road Design – Parts 1-7
- AUSTROADS Guide to Road Safety \_ Parts 1-9

### 3.2 Conditions of Development Consent

The conditions relevant to this Plan are listed in Table A below. A cross reference is also included to indicate where the condition is addressed in this Plan or other Project management documents.

**Table 1:** Minister's Conditions of Development Consent relevant to the TMP

Condition No.	Condition Requirements	Document Reference
B28	Prior to commencement of construction, the Applicant must prepare a Construction Traffic Management Plan for the development. The plan must form part of the CEMP required by Condition C2 and must:	Entire
	(a) be prepared by a suitably qualified and experienced person	Ben Lyons – SPE CERTIFICATE NO: 0052198071
	(b) Include a Road Safety Audit for the Eurobodalla Road/Nerrigundah Mountain Road intersection in accordance with the relevant Austroads guidelines	Undertaken as part of the Stage 3 works
	(c) Detail the measures that are to be implemented to ensure road safety during construction	Sections 4, 6, 7 and Appendix B
	(d) Detail heavy vehicle routes, access and parking arrangements; and	Section 3, 5, 6 and Appendix C
	(e) Include procedures for notifying residents of the duration and times when heavy vehicles are accessing the site via routes and in particular Waincourt Road	Section 4 and 6.5

### 3.4 Environmental Management Measures

Relevant EMM are listed in Table B below. This includes reference to required outcomes, the timing of when the commitment applies, relevant documents or sections of the environmental assessment influencing the outcome and implementation.

**Table 2:** Environmental management measures relevant to this TMP

Ref #	Commitment	TMP Reference
Appendix 2, Item 7.1	A Construction Traffic Management Plan (CTMP) would be prepared prior to construction and would be included in the CEMP. The CTMP would:	Entire
	identify the traffic management requirements during construction	Section 4
	describe the general approach and procedures to be adopted when producing specific traffic control plan	Section 6
	identify designated parking areas for construction workforce.	Section 5.2 and Appendix C
	determine temporary speed restrictions to ensure safe driving environment around work zones, including on unsealed roads, and at major intersections (e.g. Nerrigundah Mountain Road and Eurobodalla Road)	Section 6.1 and Appendix A
	identify any high-risk periods (such as during school bus operations), and whether delivery to site, and material haulage can be undertaken outside of these hours	Section 4.3, 6.4 and Appendix B
	identify opportunities to stagger heavy vehicle arrivals to site (e.g. use of minimum headways between arriving haul trucks), to avoid the potential for heavy vehicle convoys arriving on site	Section 4.3 and 6.4
	identify and provide temporary works, such as for site access, turn-around bays, parking areas for heavy vehicle dwelling, and minor site distance clearing around local road intersection sites (e.g. at the access points to the construction site)	Stage 3 of the project
	provide temporary warning and advisory signposting, such as during periods of material haulage, and at major intersections (e.g. Nerrigundah Mountain Road and Eurobodalla Road), where there will be increased traffic activity	Section 6.1 and Appendix A

Ref #	Commitment	TMP Reference
	where practicable, program deliveries of construction plant such as over-mass and over-dimension vehicles) outside peak traffic periods identify steps to minimise construction traffic, such as car-pooling by construction staff to site	Section 6.4
	regularly review and modify the CTMP (such as at changes of construction stages), to ensure the CTMP remains valid and appropriate	6.1
	document communication protocols amongst heavy vehicle operators, such as when approaching higher risk areas. This could be through the establishment of a call point system, whereby call point Signage is erected on the approach to higher risk areas, such as the intersection of Nerrigundah Mountain Road and Eurobodalla Road, or the single lane Tuross River (Tyrone) bridge, and access points to the construction site maintain access to private properties (and liaise with property owners), particularly that off Bullockys Hut Road, which may be used as a site access identify a contact person (and phone number) for liaison and complaints, by project stakeholders and the community.	Section 6.4 and Appendix C
	<p>Consultation with various stakeholders will also be undertaken in the development and periodic review of the Construction CTMP, including:</p> <p>ensuring all relevant requirements from emergency service providers are included, including from NSW Rural Fire Service, NSW Ambulance Service and NSW Police</p> <p>consultation with the respective road authorities including Roads and Maritime Services and Eurobodalla Shire Council</p> <p>consultation with other relevant parties including school bus operators</p> <p>periodic notification of construction activities and changes in traffic control arrangements would be publicly notified, including through local newspapers, community noticeboards, and through a letter box drop off for residents in proximity to the construction site as appropriate.</p>	Section 6.5
	<p>Detailed traffic control plans would be developed for each construction phase. These would include:</p> <p>provision for emergency services passage through construction zones</p>	Section 6.1 and Appendix A

Ref #	Commitment	TMP Reference
	Only accredited traffic controllers would be permitted to prepare and implement traffic control plans.	Section 6.1 and Appendix A
Appendix 2, item 7.2	Impacts to local roads during construction	Section 5.1
	Periodic surveys will be undertaken during construction activities to identify any road damage, with road damage to local roads being repaired by Council as soon as practical.	Section 6.3
	The construction contractor will also monitor the incidence of mud tracking off the construction site and onto local roads and will sweep or clean local roads to minimise mud tracking. The contractor will preferably install controls to minimise the incidence of mud-tracking in the first instance, such as by use of by grids at site access points.	Section 6.3
	Construction personnel will also be encouraged to report road hazards and road damage.	Section 6.2 Section 7.3

### 3.5 Technical Specification Requirements

**Table 3:** Technical Specification requirements relevant to this TMP

Ref #	Commitment	TMP Reference
Section 1.6.3.1	The Contractor shall prepare and submit a project specific Traffic Management Plan that details all activities as outlined in this clause and per the requirements of the Principal, RMS and any other relevant authority	Entire
Section 1.6.3.2	The Traffic Management Plan shall contain details of all modifications required to existing roads, new roads, bypasses, signage, speed limits and any other works required to ensure the continuous operation of normal traffic along all roads and pedestrian and vehicular access to ESC operations and to properties impacted by the works under the Contract	Section 6.1 and Appendix A
Section 1.6.3.3.A	The Traffic Management Plan must: be prepared by a suitably qualified and experienced person(s)	Ben Lyons – SPE CERTIFICATE NO: 0052198071
Section 1.6.3.3.B	The Traffic Management Plan must: detail the measures that are to be implemented to ensure road safety during construction	Sections 4, 6, 7 and Appendix B
Section 1.6.3.3.C	The Traffic Management Plan must: detail heavy vehicle routes, access and parking arrangements	Section 3, 5, 6 and Appendix C
Section 1.6.3.3.D	The Traffic Management Plan must: include procedures for notifying residents of the duration and times when heavy vehicles are accessing the site via particular routes and in particular via Waincourt Road	Section 4 and 6.5
Section 1.6.3.4	The Contractor shall submit the Traffic Management Plan not less than twenty-one (21) days prior to commencing works at site. Acceptance of the Traffic Management Plan by the Principal shall constitute a HOLD POINT	Note

Ref #	Commitment	TMP Reference
Section 1.6.3.5	The Contractor shall be held entirely responsible for the safety of all pedestrian and vehicular traffic and shall provide all necessary watchmen, lights, barriers, notices and signs and shall provide and maintain the same to the satisfaction of the Principal and RMS where applicable	Section 7.1, Appendix A & B
Section 1.6.3.6	The number, type and location of signs and devices shall be not less than the standards set out in AS 1742.3 and current ESC and RMS requirements as is applicable. Should circumstances arise which are not adequately covered by AS 1742.3 or ESC and RMS requirements, submit alternative proposals to the Principal for review prior to works proceeding	Appendix A
Section 1.6.3.7	Work shall not commence or continue at any location until all appropriate signs, devices, traffic control apparatus and the like are in place, side tracks have been constructed where required, line marking completed where required	Section 6.1 and Appendix B



## 4. Existing Environment

---

### 4.1 Road network

The project construction site would be accessed from the Princes Highway via Eurobodalla Road. It is anticipated that delivery of all major plant and equipment would be from the Princes Highway and then along Eurobodalla Road, along the Storage Access Road into site. This route is also expected to be used by the construction workforce. The existing conditions of each key road in the area is summarised below:

- Princes Highway serves as the major arterial (State) road connecting Bodalla with Sydney and south to Victoria. Between the towns of Moga and Bodalla, the Princes Highway generally has one lane in each direction with overtaking permitted through some sections. The posted speed limit along the Princes Highway varies between 80 to 100 kilometres per hour through rural areas, and down to 50 kilometres per hour within townships.
- Eurobodalla Road is a local road which operates as a two-lane sealed carriageway connecting to the Princes Highway at Bodalla. The posted speed limit along Eurobodalla Road is generally 80 kilometres per hour. Through the township of Bodalla, the posted speed of Eurobodalla Road is 50 kilometres per hour. The road is typically seven metres wide (3.5 metre travel lanes), with no sealed shoulders, typical of rural roads.
- The newly constructed storage access road is a 6.5m sealed carriageway with 2m wide shoulder on the cut side and a 1.5m shoulder on the fill side

The existing conditions of each key road intersection in the area is summarised below:

- Princes Highway forms a T-intersection with Eurobodalla Road, with widened shoulders provided for turning vehicles.
- Eurobodalla Road forms a T-intersection with Nerrigundah Mountain Road, with turning vehicles along Eurobodalla Road required to store in the travel lane before turning into Nerrigundah Mountain Road.
- A BAL/BAR intersection treatment has been developed for the intersection of Eurobodalla Road and the Storage Access Road. The Storage Access Road / Eurobodalla Road intersection works are Stage 5 of the Project.

### 4.2 Existing traffic

Appendix J of the Environmental Impact Statement identified and described the traffic volumes on the road network around the project site.

Traffic along the existing road network within the study area comprises of:

- local residential traffic
- local farm traffic, including trucks servicing local dairy farms
- trucks transporting materials from the nearby Rewlee soil extraction operation, the Cadgee Quarry and other extractive operations in the area
- trucks transporting forestry timber
- a school bus route operates on both Eurobodalla Road and Nerrigundah Mountain Road
- light and heavy vehicle traffic associated with the Eurobodalla Quarry operations.

Traffic counts were previously undertaken in 2006 (Masson Wilson Twiney, 2006). These included counts east and west of the Tyrone Bridge (Nerrigundah Mountain Road) intersection. Traffic counts were also sourced for the Princes Highway south of Bodalla (sourced from NSW Roads and Maritime permanent count station).

To provide the most recent analysis of traffic in the study area, additional traffic count information was sourced, and where traffic counts were unavailable, informed assumptions were made, to bring traffic counts to a 2017 basis, as shown in Table 4-1.

**Table 4:** Traffic count data from the road network near the project site

Road	Location	Count Type	2006	2017
Princes Highway	South of Bodalla	Average annual daily traffic	3672	5191 (10.8% HV)
Eurobodalla Road	East of Nerrigundah Road	Manual daily count	328 (17% HV)	464 (17% HV)
Eurobodalla Road	West of Nerrigundah Road	Automatic daily count	142	214 (17%)
Nerrigundah Road	North of Eurobodalla Road	Average annual daily traffic	-	250 (17%)

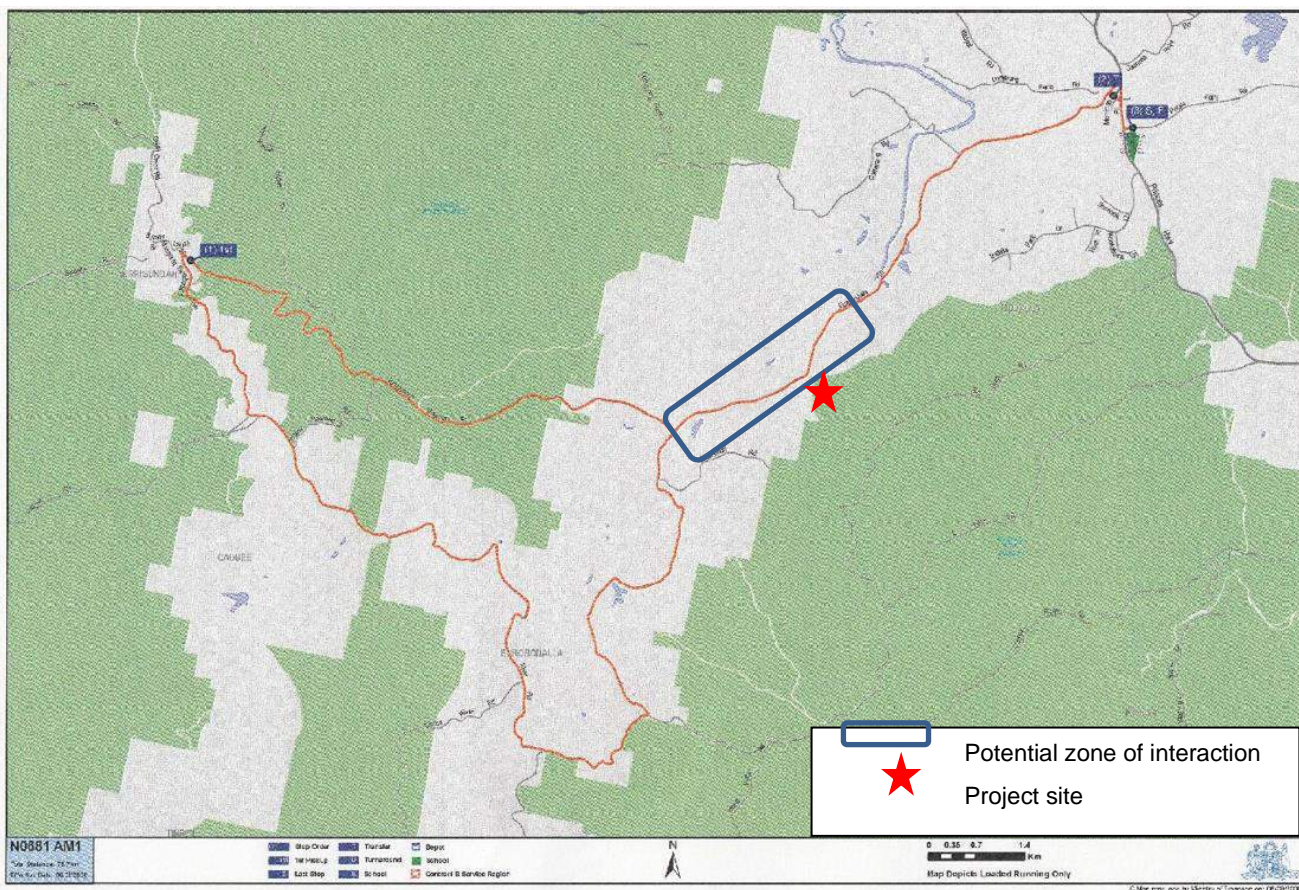
The EIS noted that most heavy vehicles using Eurobodalla Road and Nerrigundah Mountain Road relate to the operation of the existing Eurobodalla Quarry. The Eurobodalla Quarry recently received project approval for the expansion of existing quarrying operations, which sought to increase the maximum annual extraction from 100,000 tonnes to 175,000 tonnes. The future (approved) average heavy vehicle movement associated with the quarry haulage increased from 23 movements per day (two-way), to peak demand of 94 movements per day (two-way).

### 4.3 School bus movements

Marshall's Bus and Coach Company operates the S402 school bus route along Eurobodalla Road and Nerrigundah Mountain Road. The route starts at Nerrigundah and travels along the River Road, Cadgee and Eurobodalla Road, Cadgee into Bodalla to interchange with Symons Bus then to Narooma and then back out the Eurobodalla Road to Nerrigundah and returns back to Bodalla Public School. This route interacts with worker and heavy vehicle routes that will be used for deliveries and spoil movements.

**Table 5:** School bus movements near the project site

Route Number	Location	Time
Nerrigundah / S402	Opposite Waincourt on Eurobodalla Rd, Opposite 882 Eurobodalla Rd, Opposite 758 Eurobodalla Rd AM Pump Station	7:30am – 7:45am 4:00pm – 4:15pm



**Figure 3: School bus route S402**

## 4.4 Crash history

The five-year crash history (April 2012 to March 2017) for roads associated with access and haulage routes in the study area were sourced from NSW Roads and Maritime. Crash statistics included:

- Princes Highway (in vicinity of the Eurobodalla Road intersection): There were two crashes reported in the vicinity
- of Eurobodalla Road intersection, including a vehicle entering the highway from a driveway (non-casualty), and a loss of control (serious injury) crash
- Eurobodalla Road: There were two crashes (both casualty) involving a vehicle leaving the road, being one loss of control and one hit object
- Waincourt Road: no reported crashes along the length of the road
- Nerrigundah Mountain Road: no reported crashes along the length of the road
- Bullockys Hut Road: no reported crashes along the length of the road.

There were two left-road crashes reported on Eurobodalla Road. The locations of the reported run-off road crashes are included within the scope of works for a proposed upgrade of Eurobodalla Road, funded under the Federal Government's Blackspot program, where the road will be upgraded by 2018 to provide sealed shoulders, and protection (or removal) of roadside hazards



## 5. Construction traffic

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The potential construction traffic routes, the number of construction traffic movements and potential impacts were identified in the EIS (technical paper Appendix J).

### 5.1 Construction traffic routes and volumes

Construction vehicles would generally access the proposal from the Princes Highway and then to Eurobodalla Road, and Nerrigundah Mountain Road from Eurobodalla Quarry, resulting in a temporary increase in construction movements along these routes during the construction phase. Construction traffic would include light and heavy vehicles (including for fill material haulage), concrete trucks and over-dimension vehicles.

Most of the imported material required for the construction of the storage would potentially be sourced from nearby quarries, with 177,000 cubic metres to be sourced from the Eurobodalla Quarry (located about five kilometres from the proposal site), and 24,500 cubic metres sourced from the Springwater Quarry (located about 42 kilometres north from the proposal). The haulage of materials is anticipated to be over a 12-month duration.

Eurobodalla Quarry is located close to the proposal site, requiring a reduced heavy vehicle fleet to undertake the bulk of the fill material haul. The peak haulage (delivery) rate is expected to be 10 vehicles per hour from Eurobodalla Quarry, and five vehicles per hour from Springwater Quarry.

#### Springwater Quarry

The haulage route from Springwater Quarry at Mogo would be along Princes Highway and then along Eurobodalla Road. These roads are considered adequate to provide for the additional haulage traffic in terms of traffic efficiency and safety.

The intersection of Eurobodalla Road and Princes Highway is a T intersection with priority to traffic on Princes Highway and give way on Eurobodalla Road, which is considered an appropriate means of control for the additional haulage traffic volumes.

Summary of truck movements to and from site include;

- a) Quarry materials – approximate quantity of materials to be delivered for the project is 400,000 tonnes. Depending on availability quarry materials are to be sourced from local quarries including Blue Ridge Quarry, South East Quarries & Landscaping, Coastal Concrete & Quarries. Local quarries will use both Northbound and Southbound roads to access the Eurobodalla Southern Storage Project with total volume from each quarry to be determined. Quarry materials are to be delivered using truck & dogs
- b) Concrete – Approximately 7,500 cubic metres of concrete is to be supplied for the project with concrete trucks to access the site using the southbound lane on Eurobodalla Road via the Princess Highway
- c) Clearing Materials – Approximately 10,000 tonnes of material are required to be removed from site and taken ESC waste management facility at Surf Beach.

#### Other construction traffic

During peak construction phases the site is expected to receive two to three oversized vehicle loads per day. This would be for delivery of plant. Delivery of other materials to site, such as pipes, concrete (via agitator trucks) and fencing materials are expected to be up to 20 one-way vehicle movements per day during peak periods.

A workforce program was prepared for each of the proposal's main activities. Two-way light vehicle traffic volumes would be 1.2 employees per arriving vehicle to site. Up to 200 daily heavy vehicle

traffic movements would be attributable to the haulage of materials from the Eurobodalla Quarry to the proposal site, a haul distance of about five kilometres, along Nerrigundah Mountain Road and west along Eurobodalla Road. Waincourt Road would be used occasionally during construction of the project for delivery of oversized plant. These peak haulages would only be expected to occur over an 18 month duration.

An estimate of the additional traffic associated with the proposal on roads in the study area is below, with a figure of current and project light and heavy vehicle movements shown included

**Table 6:** Total two-way traffic volumes, project traffic and total traffic peaks

Road	AM/PM	Current (2017)		Peak proposal traffic		Total future peak traffic (% increase on current)	
		Total	HVs	Total	HVs	Total	HVs
Princes Highway (north of Bodalla Road)	Daily	5,191	560	240	140	5,431 (5%)	700 (25%)
	Peak	357	39	65	15	422 (18%)	54 (38%)
Princes Highway (south of Bodalla Road)	Daily	5,191	560	60	10	5,251 (1%)	570 (2%)
	Peak	357	39	30	5	387 (8%)	44 (13%)
Eurobodalla Road (east of Bullockys Road)	Daily	464	78	300	150	764 (65%)	228 (192%)
	Peak	65	11	95	20	160 (146%)	31 (182%)
Eurobodalla Road (west of Nerrigundah Mountain Road)	Daily	280	53	200	200	480 (71%)	253 (376%)
	Peak	30	5	20	20	50 (67%)	25 (400%)
Nerrigundah Mountain Road	Daily	257	80	200	200	457 (78%)	280 (251%)
	Peak	20	5	20	20	40 (100%)	25 (400%)

The EIS noted that traffic volume increases (both total and heavy vehicles) vary across the local and state road network, with large increases (overall and as a percentage) anticipated on Eurobodalla Road and Nerrigundah Mountain Road as a result of the project. These traffic volume increases (particularly heavy vehicles) are associated with the peak haulage of fill materials from Eurobodalla Quarry and Springwater Quarry.

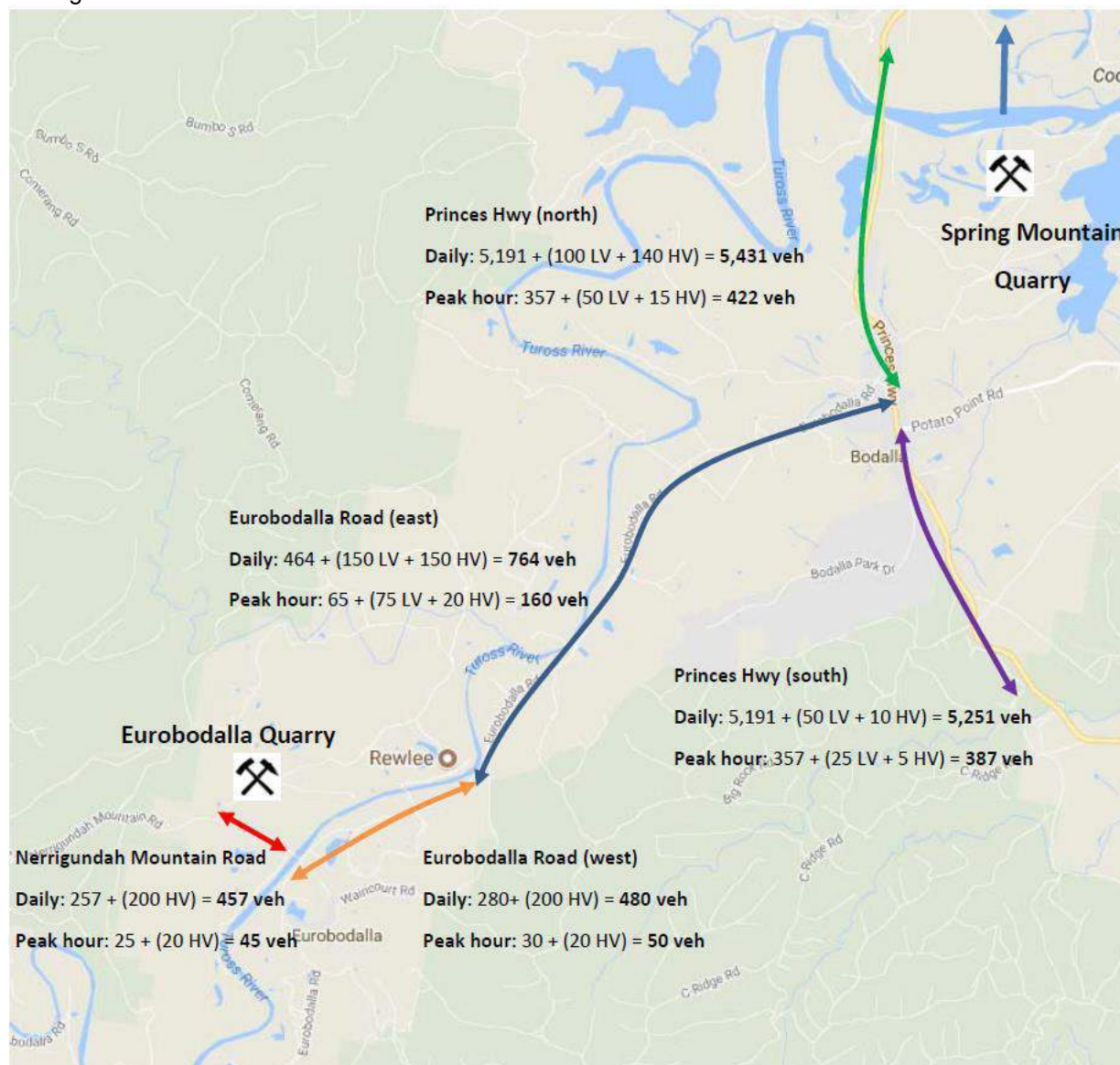
Despite the large increases in current traffic levels, the total peak projected traffic volumes, particularly on local roads remain relatively low, with no expected impacts on existing travel times or safety of the existing network. The standard of local roads would continue to be of a suitable standard for the increase in traffic associated with the proposal and is typical of local road standards in Eurobodalla Shire.

Where construction traffic turns to access the site, or at the intersection of Nerrigundah Mountain Road and Eurobodalla Road, there would be minor traffic flow impacts relating to turning construction vehicles, which may cause minor delays to existing road users.

The impact on the Princes Highway is less pronounced (due to the higher current traffic volumes including heavy vehicles). However, deliveries to site (including plant and materials) and the employment workforce are expected to travel along the Princes Highway to the site.

The increased number of vehicles (principally heavy vehicles) associated with construction of the proposal could have adverse impacts on road pavements on access routes. The magnitude and nature of these impacts would be influenced by the existing condition and standard of the road (including pavement design).

Construction compounds would be accessed by heavy vehicles, including oversized vehicles transporting plant and other large items. These movements would be conducted in a controlled manner with all necessary safety and traffic management measures in place. Planning for these movements would include consultation with Roads and Maritime and Council (as the respective road authorities) and preparation of a Construction Traffic Management Plan.



**Figure 4:** Existing and future estimated daily and peak hour traffic (additional construction traffic (in brackets))

## 5.2 Worker parking areas

The construction workforce is expected to peak at about 90 personnel per day. On either side of this peak period, daily workforce numbers would fluctuate between about 20 and 60 personnel at any given time during the construction period. The majority of the workforce are expected to travel to site from Tuross Head (~10km from site), Moruya (~22km) and Narooma (~20km from site) in their own vehicles. Car pooling would be encouraged and expected to occur for some of the workforce travelling from

Worker parking areas would all be contained within the boundary of the construction site, with the majority in the designated construction compounds identified. The number and timing of worker parking spaces in each compound would vary depending on the phase and sequencing of construction and the timing of the main construction compound establishment.

Where worker parking cannot be fully contained within the identified construction compounds, additional carparking would be nominated on site such as along the main storage access road or Bullockys Hut Rd.

### **5.3 Intersection / Early Works**

The Eurobodalla Road roadworks (the Early Works) adjacent to the site access point will be managed by staging the activities to maintain the existing capacity of the network with minimal delays.

Impacted intersections will be managed through effective traffic control under TCP's and progressive monitoring of their implementation.

Work shall not commence or continue at any location until all appropriate signs, devices, traffic control apparatus and the like are in place, side tracks have been constructed where required, line marking completed where required

#### **Site Access – Early Works**

Access to site for the early works will be Bullockys Hut Road via Eurobodalla Road. Onsite parking will be available on the complete sections of access road. Access to and from site will be managed as per TCP's presented in Appendix A, with onsite vehicle movements illustrated in Appendix C.

The following items will be delivered to site for the site establishment for the Early Works:

- 1 x 12.0 m x 3.0 m lunch shed
- 1 x 12.0 m x 3.0 m office
- 1 x 6 m Dual Toilets / Shower
- 1 x Generator
- 2 x Site Container
- 300 tonne of imported unbound road base

#### **Expected Impacts**

Minor delays are expected during the intersection widening works with one-way alternate traffic flow in place. Traffic controllers will monitor queue lengths and proactively minimise delays where possible. Priority will be given to emergency services at all times.

After the intersection widening is completed there will be minimal impact to traffic on Eurobodalla Road during construction of the Project due to the relatively low volume of traffic including local residents and surrounding businesses. With a newly constructed widening as part of the Early Works facilitating more seamless traffic movements part the site access point if trucks are waiting to turn into the project site.

## 6. Key management strategies

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The following sections outline the key management strategies that underpin this TMP:

- Development and implementation of Traffic Control Plans
- Competence, training and awareness
- Nominated worker parking areas
- Designated vehicle routes and speed limits
- Scheduling heavy vehicle movements
- Stakeholder consultation and notification

### 6.1 Development and implementation of Traffic Control Plans

Traffic Control Plans are diagrammatic plans describing the management of pedestrian, vehicle and local traffic required due to implementation of components of work where any of these are affected.

TCPs will be prepared to manage the Early Works, and to facilitate larger than expected Heavy Vehicle movements to and from the site.

Provision for emergency services passage through construction zones will be maintained, including manual override of traffic signal operations to facilitate emergency services movements.

TCPs shall be submitted to the Principal and other relevant authorities for review and approval, as applicable.

In relation to the Early Works, TCP's for the road widening works have been developed by Titanium Traffic Management and have been included in **Appendix A**.

A corresponding Risk Assessment is completed for a TCP, A Global Risk Assessment is included in **Appendix B**.

The Contractor is to regularly review and modify the CTMP (such as at changes of construction stages), to ensure the CTMP remains valid and appropriate to the works.

Quay Civil Pty Ltd are currently completing the pump station on Eurobodalla Road, who have been consulted during the planning and TCP development phase, and further coordination will be required during the implementation of TCP's for the road widening works.

### 6.2 Competence, training and awareness

An environmental/traffic induction as part of the main induction must be carried out by everyone working on the project site prior to works commencing. Details of the induction is discussed in Section 3.4.1 of the CEMP.

The induction will cover the following traffic management details:

- Roles and responsibilities for staff
- Nominated worker access routes for site
- Delivery times and scheduling considerations
- Site speed zones
- Identifying road hazards on site and on the adjoining local road network



- Identified worker parking areas
- Chain of Responsibility (CoR) requirements

### 6.3 Designated vehicle routes and speed limits

All worker access to and from the site would be via Eurobodalla Road and then either the Storage Access Road or Bullocky Hut Road to the nominated car parking areas.

All heavy vehicle movements to and from the site are identified in Figure 5-1. As per worker access routes, heavy vehicle access to the site would primarily be via the Storage Access Road, with Waincourt Road used for delivery of oversized plant.

#### Vehicle Movement Plans (VMP's)

Vehicle Movement Plans would be developed to safely manage vehicle movements on site and include details such as:

- how vehicles access and egress compounds,
- nominated heavy vehicle delivery routes or exclusions,
- car parking,
- designated hygiene areas
- vehicle washouts.

VMP's have been prepared to control the manner in which vehicles access and egress the Site. A driver induction will be prepared containing these plans that will be forwarded to all subcontractors and suppliers prior to their arrival at site.

These VMP's are attached in **Appendix C** of this TMP.

The Contractor will also monitor the incidence of mud tracking off the construction site and onto local roads and will sweep or clean local roads to minimise mud tracking. The Contractor will install controls to minimise the incidence of mud-tracking in the first instance, such as by use of grids and pollution rock at site access points.

#### Pre-condition dilapidation

A visual preconstruction condition survey will be undertaken by the Contractor, to include an assessment of the following roads;

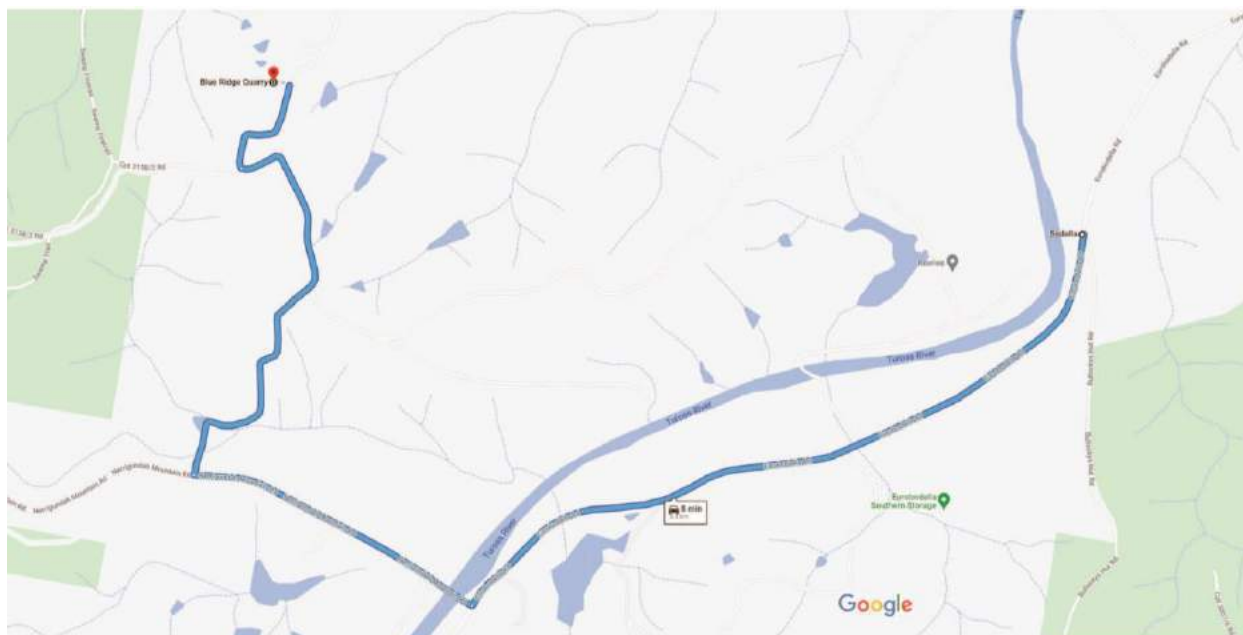
- Eurobodalla Rd from Cpt 3007/3 Rd to Waincourt Road;
- Waincourt Road in its entirety;
- Bullockys Hut Road in its entirety
- Big Rock Road from Bullockys Hut Road to Cpt 3007/3 Road;
- Cpt 3007/3, 3007/6 and 3007/7 Roads in their entirety
- From contract pint of intersection of Cpt3007 and Eurobodalla Road to Princess Highway
- Eurobodalla Rd (over bridge on Tuross River to entrance of Blue Ridge Quarry)

The pre-condition dilapidation survey is to be submitted prior to commencement of major construction activities and at the conclusion of the Project as a post-condition dilapidation survey.

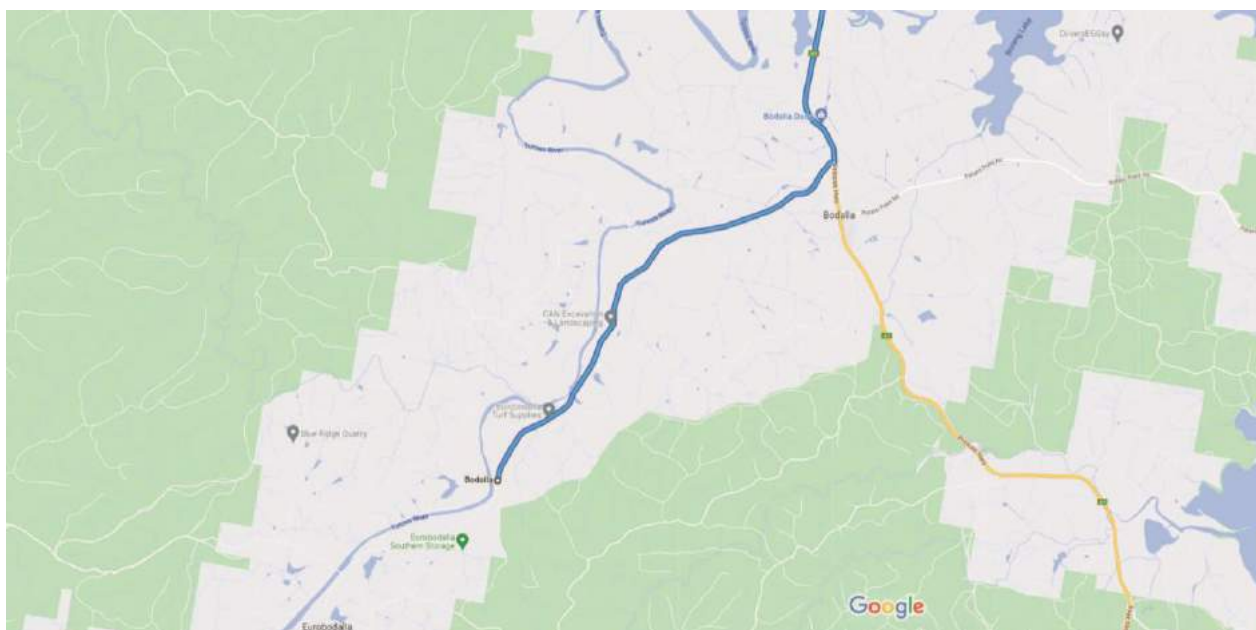
Periodic visual monitoring will be undertaken on the above roadways, to observe any effects during construction. An example of the Road Asset Inspection register is included in **Appendix B**.

## 6.4 Heavy vehicle movements and scheduling/timings

The following truck routes will be used for supply of major supplies of materials for the Project, including deliver of quarry materials and concrete. Alternative suppliers for supply of quarry products and concrete may be sourced throughout the lift of the project and not included in delivery routes reference below



**Figure 5:** Northbound Delivery Route on Eurobodalla Road



**Figure 6:** Southbound Delivery Route via Pacific Highway

Heavy vehicle movements to and from site would primarily occur between 7am to 6pm Monday to Friday, 8am to 1pm Saturday and not on public holidays or Sundays. If the TCP identifies the need for heavy vehicle movements to occur outside of this period (for example over mass vehicle deliveries) this would be subject to consultation with Eurobodalla Shire Council or the relevant roads authority.

Heavy vehicle movements would be scheduled to avoid convoys and to avoid the school bus route (S402) movements near the project site. The mechanisms to avoid convoys and the school bus would be developed by Haslin Constructions in consultation with the heavy vehicle and the bus operator (Marshall's) prior to commencing works on the project and documented in project vehicle movement plans.

Prior to commencing heavy vehicle movements under this TMP (Stage 5 of the project), the Contractor would engage with Marshall's Bus and Coach Company to understand the following:

- Processes to periodically update Marshall's Bus and Coach Company of the construction schedule, changes in traffic control arrangements and potential traffic implications
- Processes for Marshall's Bus and Coach to communicate changes or alterations to the bus school bus route or timetable
- Likely special events or specific considerations for safely managing school bus routes.

## **6.5 Stakeholder notification**

Prior to commencing traffic movements under this TMP, the Contractor would notify the following stakeholders of expected traffic changes, heavy vehicle routes or speed zone adjustments:

- Rural Fire Service,
- NSW Ambulance Services,
- NSW Police
- Marshall's Bus and Coach Company / other relevant bus companies
- Eurobodalla Shire Council
- Transport for NSW
- Local State Emergency Services
- Blueridge Quarry

Consultation would include provision of information about traffic and transport activities which have potential to cause disruption, such as abnormal load deliveries or alterations to traffic control arrangements on Eurobodalla Road. The telephone number of the Site Supervisor or delegate will be made available during construction operational hours, and construction traffic movements to respond to calls and resolve any issues.

## 7. Compliance management

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### 7.1 Roles and responsibilities

This TMP applies to all workers on the project. All workers will undertake a site induction, during which their responsibilities under this TMP will be explained.

The Project Team's organisational structure and overall roles and responsibilities are outlined in Section 3.3 of the CEMP. Specific responsibilities related to traffic management are identified below.

#### 7.1.1 Senior Project Manager (SPM)

The Senior Project Manager is responsible for overall management of the Project, including traffic management.

#### 7.1.2 Senior Project Engineer (SPE)

The Senior Project Engineer reports to the Senior Project Manager and has overall responsibility for planning and executing all construction activities, including traffic management. This includes;

- Maintaining current copies of the Traffic Management Plan, Traffic Control Plans, Vehicle Movement Plans, Pedestrian Movement Plans, Road Occupancy Licences (as required) and Speed Zone Authorisations (as required), and their controlled distribution
- Liaising with the Principal and other authorities such as ESC, TfNSW and New South Wales Police/Fire/Ambulance on traffic management matters for the Construction Site
- Facilitating traffic awareness and giving toolbox talks to site personnel
- Being able to stop work on any activity if it is considered to be necessary to prevent traffic accidents, or to comply with the directions of the Principal, ESC, TfNSW and/or NSW Police
- Report immediately to the Principal for the occurrence of unforeseen delays, including caused by incidents, to the free flow of traffic along Eurobodalla (or adjoining) Road
- Be contactable at all times (7 days per week and 24 hrs per day) during the construction phase of the Contractor's work to receive and answer traffic/incident related inquiries from the Principal or other interested parties
- Management of TMP Registers, including Key Personnel register, Incident register, variation register, complaints register and consultation register

#### 7.1.3 Project Engineer (PE)

The Project Engineer reports to the Senior Project Engineer and has overall responsibility for planning and executing all traffic management activities. This includes;

- Ensuring that the approved traffic management measures are implemented and maintained in accordance with the approved TCP's
- Carrying out regular inspections of the traffic control measures to ensure that they are compliant and effective
- Amending and updating the plans, as required, to ensure that they remain current as the work progresses
- Identifying situations where traffic congestion, or unsafe conditions for vehicles, cyclists, pedestrians and workers, are occurring and providing recommendations for improvement
- Planning and Co-ordinating traffic staging and the associated works
- Organising temporary traffic control devices and traffic controllers to carry out approved TCP's
- Applying for and keeping current road occupancy licences and speed zone reductions, as required

- Monitoring and quantifying the durations of traffic delays unsafe conditions for vehicles, cyclists, pedestrians and workers
- Maintaining and adjusting traffic control measures and devices to assist prevailing traffic flows, minimise lane and shoulder occupancies and any lost traffic flow capacity and minimise traffic delay durations and queuing
- Monitoring of over-dimension heavy vehicle movements

#### **7.1.4 The Site Manager (SM)**

The Site Manager is responsible for identifying any specific and additional TCP needs and to inform the Site team accordingly. The SM is to further ensure all activities described on the TMP and in the TCPs are fully resourced and implemented.

All construction personnel will also be encouraged to report road hazards and road damage to the SM, as soon as items become apparent.

#### **7.1.5 Traffic Control Supervisors (as required)**

- Management of daily traffic control operations including coordination of staff and resources on site
- Ensure correct TCPs are available and implemented as applicable
- Ensure sufficient staff and equipment are available and utilised for each VMP and TCP
- Assist with all traffic management planning such as checking ROLs
- Manage daily prestart safety and site coordination briefings
- Coordinate with the construction team on site for both project works and deliveries
- Inspect and audit all traffic management plans, personnel and devices and
- Collect and maintain site records.

#### **7.1.6 Traffic Controllers (as required)**

- Hold current TfNSW accreditations (Blue and Yellow Card)
- Implement TCPs under the supervision of the Traffic Control Supervisor
- Maintain traffic control signs and devices
- Assist during attendance to site of external stakeholders for both planned and emergency situations.

### **7.2 Training**

All employees and contractors working on site will undergo site induction training relating to traffic management considerations. Targeted training in the form of toolbox talks or specific training will also be provided to personnel with a key role in traffic management.

Further details regarding staff induction and training are outlined in Section 3.5 of the CEMP.

### **7.3 Monitoring and reporting schedule**

Monitoring to ensure compliance with this plan will consist of regular inspections undertaken in accordance with section 3.8.1 and 3.8.3 of the CEMP.

All construction personnel will be encouraged to report road hazards on site and on the adjoining local road network to the Senior Project Manager.

It is the Senior Project Engineer or their delegate that is responsible for ensuring the scheduled monitoring is undertaken in accordance with this TMP.

Monitoring will involve the following:

- HV compliance with the nominated haul route
- Compliance with VMP
- Road damage to local roads
- Worker compliance of site speed limits
- Mud tracking onto local roads

## **7.4 Auditing**

Audits (both internal and external) will be undertaken to assess the effectiveness of environmental controls, compliance with this sub plan, CoA and other relevant approvals, licenses and guidelines.

Audit requirements are detailed in Section 3.9.3 of the CEMP.

## **7.5 Site Inductions and toolbox talks**

All project construction personnel and contractors will an induction to the TMP. The induction will provide general awareness of the requirements and implementation of the TMP to ensure that personnel and contractors are aware of the need to comply with the TMP.

The induction would include an:

- overview of the permitted transport, access and egress routes for construction personnel, construction vehicles, construction deliveries
- adherence to local speed limits
- standard environmental, occupational health and safety driver protocols and emergency procedures.

Toolbox talks are to occur at the beginning of each day to highlight specific daily traffic and transport activities, and how these are to be managed. The toolbox talk would include a reminder of how drivers are to comply with TMP, provide details of TMP enforcement, and consequences for any breaches of the TMP or local traffic rules.

In addition, consultation with nearby construction sites and quarries has highlighted an opportunity to include the Project's specific daily traffic and transport activities within external toolbox talks, to ensure construction impacts disseminates to the local community and road users.

## **7.6 Chain of Responsibility (CoR) / NHVR**

CoR shall be managed in accordance with the Chain of Responsibility Management Plan (SEQ-TP-089) that has been developed for the Project.

The Contractor recognises its safety duties under the Heavy Vehicle National Law (HVNL) and the Work Health and Safety Act, to ensure the safety and wellbeing of its employees and the safety of its transport activities so far as is reasonably practicable.

The Contractor values the benefits of promoting and maintaining a safe transport operation for its employees, contractors, customers and other road users. It is committed to undertaking all transport activities in a way that is as safe as reasonably practicable.



This Chain of Responsibility Management Plan (CoRMP) details the safety management and control measures that are to be implemented in association with construction activities associated with the Project.

The Contractor understands our shared responsibility to ensure, so far as reasonably practicable, that business practices, requests or demands, delivery requirements, schedules, packing goods, loading or unloading practices do not directly or indirectly cause or encourage the driver to contravene the HVNL.

Main activities under the HVNL are:

- **Loading Manager:** The person who supervises the loading or unloading of a heavy vehicle or the premises where this occurs
- **Consignor:** Person who engages a heavy vehicle operator (either directly or through an agent) to transport goods for the person by road for commercial purposes
- **Consignee:** The person who has been named as the intended consignee of the goods at the completion of their road transport but does not include a person who unloads the goods.
- **Loader:** The person that loads goods into or onto a heavy vehicle for the purpose of transport to another location via the roadway
- **Unloader:** The person that unloads the goods transported by road upon arrival at their destination.

The CoRMP specifies actions, responsibilities, and protocol, and conformance, verification activities, to be followed by the Contractor before, during and on completion of construction.

## 7.7 Incident Management - Accident and Emergency response

In the event of an onsite accident or emergency, it shall be managed in accordance with the Emergency Plan (SEQ-TP-037) that has been developed as part of the Safety Management Plan. Part of the emergency response temporary traffic control measures may need to be implemented in order to facilitate the access of emergency services and the egress of personnel from the site. In these circumstances the traffic control measures to be implemented shall be at the discretion of the site management team up until the time control can be handed over to appropriate emergency personnel (e.g. Police).

Traffic accidents occurring at or near locations where the Contractor has implemented approved traffic control measures, in the initial stage will be managed by the company's Traffic Control personnel. Should the accident be severe enough to constitute an emergency event (i.e. caused or likely to endanger life, cause significant property or environmental damage) the Emergency Plan procedure will be implemented.

All other traffic accidents will be managed by the Contractor's Traffic Control personnel up until police or other responsible authority arrive on the site. The prime objectives will be to prevent or minimise risk of further accidents or injury to road users and any other nearby personnel, get assistance for any injured people. The secondary objective will be to facilitate the removal of obstructions to traffic and return the road to normal use.

All actions must at no time further endanger the safety of site personnel or members of the public.

Approved traffic control measures implemented by the Contractor will be removed where directed by Police or other responsible authority to facilitate the movement of emergency vehicles or to enable road traffic to return to normal. Such removal will be dependent upon action required not endangering the safety of Haslin personnel or members of the public.

Where implemented traffic control measures cause or contribute to excessive disruption of traffic the measures will be reviewed and changed where feasible and practical.



## 8. Review and improvement

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### 8.1 Continuous improvement

Continuous improvement of this Plan will be achieved by the ongoing evaluation of environmental management performance against environmental policies, objectives and targets for the purpose of identifying opportunities for improvement.

The continuous improvement process will be designed to:

- Identify areas of opportunity for improvement of environmental management and performance.
- Determine the cause or causes of non-conformances and deficiencies.
- Develop and implement a plan of corrective and preventative action to address any non-conformances and deficiencies.
- Verify the effectiveness of the corrective and preventative actions.
- Document any changes in procedures resulting from process improvement.
- Make comparisons with objectives and targets.

### 8.2 TMP update and amendment

The processes described in Section 3.9 to Section 3.13 of the CEMP may result in the need to update or revise this Plan. This will occur as needed.

Only the Environment Manager, or delegate, has the authority to change any of the environmental management documentation.

A copy of the updated plan and changes will be distributed to all relevant stakeholders in accordance with the approved document control procedure – refer to Section 3.11.2 of the CEMP.

## **9. Appendix A – Traffic Control Plans (TCP's)**

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# Eurobodalla Road, Bodalla

## Long-Term Signage (During Works)

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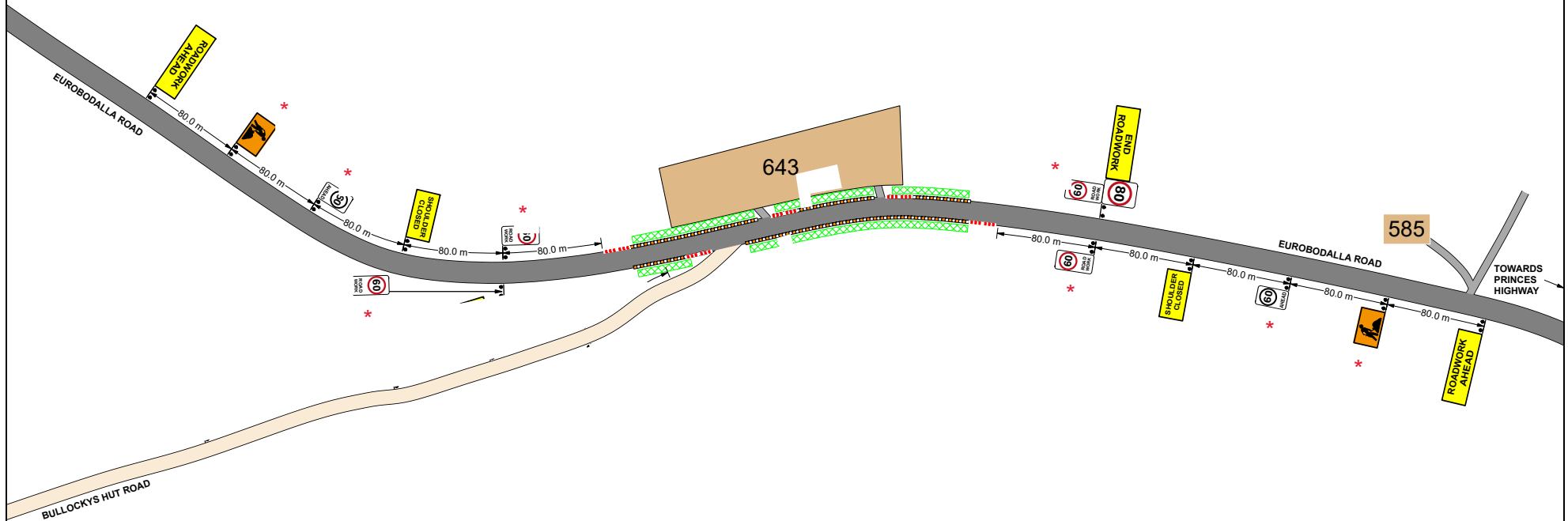
### NOTES:

- Relevant signage to be installed as per TCAWS/AS 1742.3 specification.
- Sign spacings may vary due to on-site constraints such as driveways and vegetation, etc.
- Signage marked as \* to be covered as construction site traffic aftercare

SIGN SPACINGS			Recommended sign height (m)		
SPEED LIMIT	TCAWS	AS 1742.3	Existing (recommended) speed limit (km/h)	Traffic control zone	Work zone
40 km/h	40M	5-15M	45 or less	15	15
50 km/h	50M	15M	46 to 55	15	15
60 km/h	60M	45M	56 to 65	20	20
70 km/h	70M	70M	66 to 75	N/A	25
80 km/h	80M	80M	76 to 85	N/A	30
90 km/h	90M	90M	86 to 95	N/A	35
100 km/h	100M	100M	96 to 105	N/A	40
110 km/h	110M	110M	Greater than 105	N/A	45

### Legend

- Barriers
- Work Area



PREPARED BY : Gregory Cocker  
SAFEWORK NSW  
CARD NO. : TCT0027509

*G. Cocker*

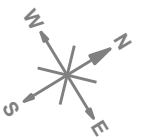
WORK SCOPE - Long-Term Signage  
PLAN NUMBER - TGS-001  
DATE DRAWN - 24/07/2022

ROAD SPEED - 80 km/h  
ROAD LAYOUT - 2-Lane, 2-Way Local Road

THIS TGS IS NOT  
DRAWN TO SCALE

TfNSW TGS'  
USED AS A GUIDE

TGS IMPLEMENTED/AMENDED BY :  
NAME - BEN LYONS  
CERT. NO. - 0052198071  
DATE - 10/08/2022  
SIGNED - *[Signature]*



THIS TGS SHALL BE SET-UP IN ACCORDANCE WITH THE TfNSW TRAFFIC CONTROL AT WORK SITES MANUAL V6 & AUSTRALIAN STANDARDS AS 1742.3-2019.

# Eurobodalla Road, Bodalla

## Day Works NB - Portable Traffic Signals

www.invarion.com

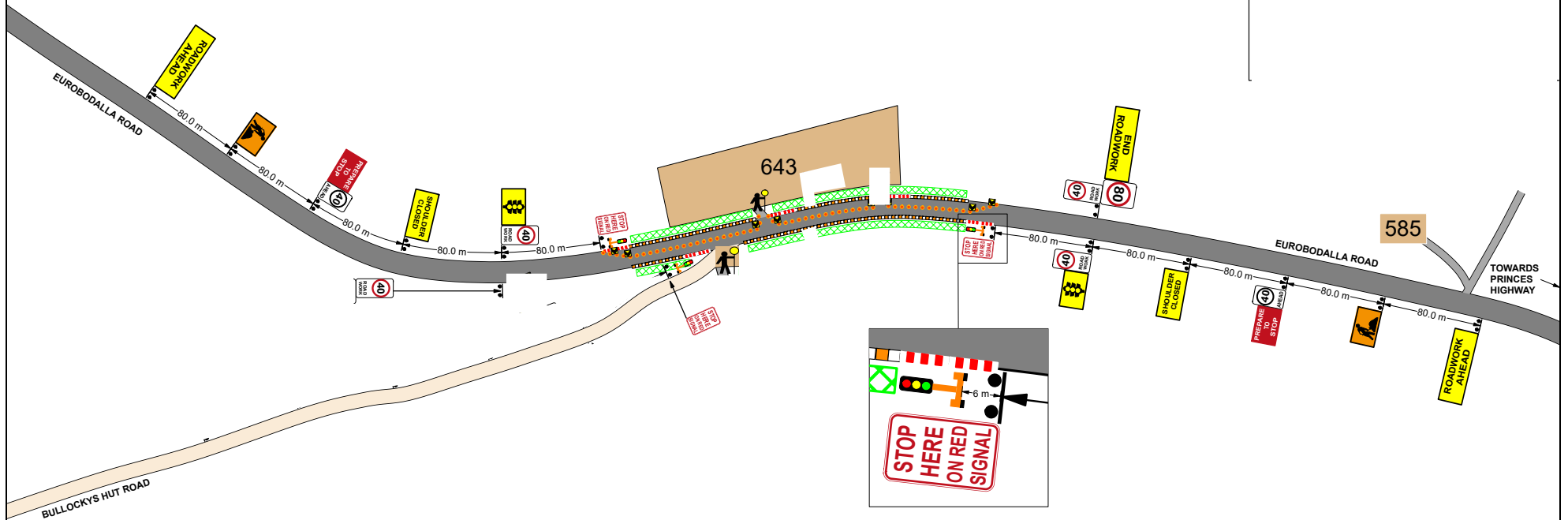
### NOTES:

- Relevant signage to be installed as per TCAWS/AS 1742.3 specification.
- Sign spacings may vary due to on-site constraints such as driveways and vegetation, etc.

SIGN SPACINGS			Recommended Sign Height (m)		
SPEED LIMIT	TCAWS	AS 1742.3	Existing (recommended) speed limit (km/h)	Traffic control zone	Work zone
40 km/h	40M	5-15M	45 or less	1.5	1.5
50 km/h	50M	15M	46 to 55	1.5	1.5
60 km/h	60M	45M	56 to 65	2.0	2.0
70 km/h	70M	70M	66 to 75	N/A	2.0
80 km/h	80M	80M	76 to 85	N/A	2.0
90 km/h	90M	90M	86 to 95	N/A	2.0
100 km/h	100M	100M	96 to 105	N/A	2.0
110 km/h	110M	110M	Greater than 105	N/A	2.0

### Legend

- Portable Traffic Signals
- Barriers
- Traffic Cones
- Traffic Cones/Bollards
- Traffic Controllers
- Work Area



PREPARED BY : Gregory Cocker  
SAFework NSW  
CARD NO. : TCT0027509

*G. Cocker*

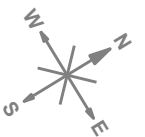
WORK SCOPE - Portable Signals NB  
PLAN NUMBER - TGS-002  
DATE DRAWN - 24/07/2022

ROAD SPEED - 80 km/H  
ROAD LAYOUT - 2-Lane, 2-Way Local Road

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TfNSW TGS'  
USED AS A GUIDE

TGS IMPLEMENTED/AMENDED BY :  
NAME - BEN LYONS  
CERT. NO. - 0052198071  
DATE - 10/08/2022  
SIGNED - *B. Lyons*



THIS TGS SHALL BE SET-UP IN ACCORDANCE WITH THE TfNSW TRAFFIC CONTROL AT WORK SITES MANUAL V6 & AUSTRALIAN STANDARDS AS 1742.3-2019.

# Eurobodalla Road, Bodalla

## Day Works SB - Portable Traffic Signals

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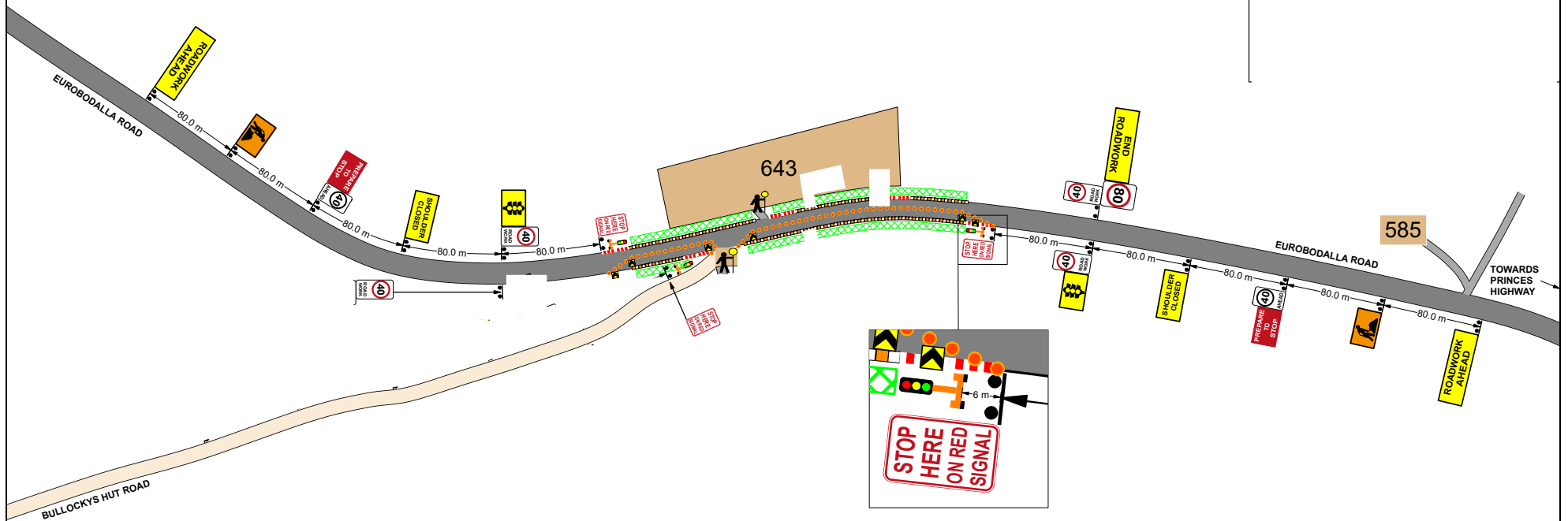
### NOTES:

- Relevant signage to be installed as per TCAWS/AS 1742.3 specification.
- Sign spacings may vary due to on-site constraints such as driveways and vegetation, etc.

SIGN SPACINGS			Recommended Sign Height (m)		
SPEED LIMIT	TCAWS	AS 1742.3	Existing (recommended) speed limit (km/h)	Traffic control zone	Work zone
40 km/h	40M	5-15M	45 or less	15	15
50 km/h	50M	15M	46 to 55	15	30
60 km/h	60M	45M	56 to 65	30	40
70 km/h	70M	70M	66 to 75	N/A	75
80 km/h	80M	80M	76 to 85	N/A	100
90 km/h	90M	90M	86 to 95	N/A	100
100 km/h	100M	100M	96 to 105	N/A	100
110 km/h	110M	110M	Greater than 105	N/A	100

### Legend

- Portable Traffic Signals
- Barriers
- Traffic Cones
- Traffic Controllers
- Work Area



PREPARED BY : Gregory Cocker  
SAFework NSW  
CARD NO. : TCT0027509

*G. Cocker*

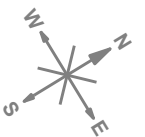
WORK SCOPE - Portable Signals SB  
PLAN NUMBER - TGS-002A  
DATE DRAWN - 24/07/2022

ROAD SPEED - 80 km/H  
ROAD LAYOUT - 2-Lane, 2-Way Local Road

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TfNSW TGS'  
USED AS A GUIDE

TGS IMPLEMENTED/AMENDED BY :  
NAME - BEN LYONS  
CERT. NO. - 0052198071  
DATE - 10/08/2022  
SIGNED - *[Signature]*



THIS TGS SHALL BE SET-UP IN ACCORDANCE WITH THE TfNSW TRAFFIC CONTROL AT WORK SITES MANUAL V6 & AUSTRALIAN STANDARDS AS 1742.3-2019.

## **10. Appendix B – TCP Risk Assessment**

---



## Workplace Health and Safety Risk Assessment

Workplace Address:

Eurobodalla Southern Storage Construction (Bodalla Dam)

Location Assessed:

Intersection Works – Bodalla Dam

Activity:

Traffic Management for Intersection Roadworks

Participants:

B. Lyons, J McCarthy, A. Berick, C. Wheeler

Risk Assessment Date:

10/08/2022

Facilitator:

Ben Lyons

Likelihood:		Maximum Reasonable Consequence:				
		Catastrophic A	Major B	Significant C	Moderate D	Minor E
Almost Certain	1	A1 High	B1 High	C1 High	D1 Medium	E1 Medium
Likely	2	A2 High	B2 High	C2 Medium	D2 Medium	E2 Medium
Possible	3	A3 High	B3 Medium	C3 Medium	D3 Medium	E3 Low
Unlikely	4	A4 Medium	B4 Medium	C4 Medium	D4 Low	E4 Low
Highly Unlikely	5	A5 Medium	B5 Medium	C5 Low	D5 Low	E5 Low

Work Process	Describe Hazard	Risk Ranking	Agreed Controls / Actions	Risk Ranking with controls	Responsibility
Moving Traffic	Traffic controllers or workers being hit by passing traffic	High	<ul style="list-style-type: none"> <li>No unplanned movements, all movements are to be planned and communicated between TC and sub-contractors</li> <li>Radio communication</li> <li>Shoulder lane closures</li> <li>Worker behind delineation or barriers</li> <li>Speed reductions as required</li> <li>All construction vehicles to enter through authorised gate locations</li> <li>Soft barricading to delineate pedestrian path from live traffic, where required.</li> <li>Traffic Signals or stop/slow traffic control</li> </ul>	Low	All
Queued Traffic	Traffic backed up beyond signage	High	<ul style="list-style-type: none"> <li>Minimise road occupation during peak travel times</li> <li>Ensure traffic stoppages do not exceed 4 minutes single road occupancy</li> <li>Stop works and move plant and workers to clear traffic if build up occurs</li> <li>Traffic must be monitored and queue length to be managed</li> </ul>	Low	All
Length of delay for road users	Drivers become frustrated and disobey rules	High	<ul style="list-style-type: none"> <li>TC to monitor and assess when to stop traffic stopping works if needed to clear traffic impact to minimise traffic flow</li> <li>TC to communicate with sub-contractors and stop work if traffic needs to be released</li> <li>Minimise stoppages wherever possible, especially during peak travel periods</li> </ul>	Low	All


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## Workplace Health and Safety Risk Assessment

			<ul style="list-style-type: none"> <li>A minimum weekly checks of signage must be conducted by TC supervisor and or Contractor Supervisor</li> </ul>		
Motorists non-compliance with TC Directions	Workers being struck by vehicles	High	<ul style="list-style-type: none"> <li>Delineation to define works zones</li> <li>Advanced warning signage in place</li> <li>Works to be behind physical barriers wherever possible</li> </ul>	Medium	All
Setting up controls & advanced warning signs	TC being struck by motorists		<ul style="list-style-type: none"> <li>Beacons and vehicle mounted arrow board must be used</li> <li>Use work vehicle to cover TC as they place signs and delineation</li> <li>TC's are not exit work vehicle on live traffic side</li> <li>Face traffic and have an escape route at all times</li> <li>No reversing without a spotter</li> </ul>		
Plant and work vehicles entering and exiting site	Traffic colliding with site vehicles as they enter/exit site		<ul style="list-style-type: none"> <li>Site vehicles to enter and exit with beacons lights on</li> <li>No unplanned movements</li> <li>No reversing without a spotter</li> <li>Work Vehicles are to exit merging traffic only when it's safe to do so</li> </ul>		
Long term site set up	Site becoming messy due to weather or vandalism		<ul style="list-style-type: none"> <li>Daily site check to be undertaken by Contractor supervisor and or TC supervisor</li> <li>Signs to be weighted down or on posts</li> </ul>		
Safety barriers lifts and placements (as required)	Motorist collision with safety barriers		<ul style="list-style-type: none"> <li>Cut excavation &gt;0.5m deep and within 3m of the edge line require hard safety barriers</li> <li>Move plant to dead lane to clear traffic if required TL to monitor and assess</li> <li>Communications / radios</li> <li>No unplanned movement and lifts</li> <li>Barriers can only be moved under stop slow traffic control</li> </ul>		
Safety barrier	Vehicle collision		<ul style="list-style-type: none"> <li>Edge clearance to be no less than 0.5m, unless risk assessed</li> <li>Cut excavation &gt;0.5m deep and within 3m of the edge line require hard safety barriers</li> <li>Line marking or stick/stomps must used to maintain edge clearances</li> <li>Barrier delineators or night tape flagging to be used for reflectivity for motorists</li> </ul>		
Reduced lane width / pinch points	Vehicle collisions		<ul style="list-style-type: none"> <li>Low speed environment</li> <li>Low traffic volumes</li> <li>Good site distance in both directions</li> </ul>		

Endorsed by: Ben Lyons

Signature: 

Date: 10/08/2022

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## **11. Appendix C – Site VMP**

---



LEGEND

COMPOUND / SITE PARKING

EARLY WORK AREAS

VEHICLE MOVEMENTS

Visitor Parking

Construction Laydown Area / Storage

No-Go Zone

X1

Gate: Vehicle Access/Egress

ACCESS INSTRUCTION

Any visitors to use visitor car park shown Compound

Ensure you site in on the Site upon arrival

All delivery/pick up vehicles to call up Traffic Control or Supervisor when approaching compound on UHF 30

Please contact the Site Supervisors if you have any queries.

GENERAL INSTRUCTIONS :

ALL DRIVERS MUST PROCEED WITH CAUTION AND ADHERE TO THE NSW ROAD RULES AT ALL TIMES

ONLY USE THE DESIGNATED GATE ACCESS POINTS.

ALL VEHICLE DRIVERS MUST FOLLOW THE INSTRUCTIONS OF THE SUPERVISORS.

NO REVERSING OF VEHICLES ON ANY ROADS WITHOUT APPROPRIATE CONTROLS.

NO PARKING OR STOPPING ON ANY ROADS UNLESS IN AN EMERGENCY OR UNDER TRAFFIC CONTROL.

REFER TO SITE SPECIFIC VMPS FOR SITE VEHICLE MOVEMENTS

SIGN ON TO PRESTART AT GATE

DRIVERS MUST WEAR APPROPRIATE PPE

DRIVERS TO CALL 24 HRS PRIOR TO DELIVERY

COMPANY/DRIVER TO COMPLY WITH HV NATIONAL LAW REQUIREMENTS AT ALL TIMES

VMP TO BE ENFORCED BY:

ALL PERSONNEL WORKING AT THE SITE AND DELIVERIES SCHEDULED TO COME TO THIS SITE

PERSONNEL RESPONSIBLE FOR ENFORCEMENT:

MANAGERS

ENGINEERS

SUPERVISOR

MOBILE FIRST AID KITS ARE AVAILABLE IN ALL WORK LIGHT VEHICLES

CONTACTS:

Ben Lyons (SPE) – 0403 712 204

Andrew Berick (PE) – 0488 510 065

Chris Wheeler (Supervisor) – 0400 388 599

BEFORE ENTERING ANY GATE:

ANNOUNCE ON THE TWO WAY RADIO

YOU ARE APPROACHING THE GATE

AND TURN YOUR FLASHING LIGHT ON

DESCRIPTION OF WORKS: PERIOD OF OPERATION:

SITE ACCESS – EARLY WORKS

7:00 TO 18:00 WEEKDAYS

8:00 TO 13:00 SATURDAYS

TYPE OF VEHICLES: (E.G. TRUCKS, PLANT)

LIGHT CONSTRUCTION VEHICLES, LIGHT CRANAGE, SEMI-TRAILERS, TRUCKS, HYDRO VAC TRUCKS, EXCAVATORS.

CREATED BY

NAME: Ben Lyons

SIGNED:

ISSUE DATE: 04/08/2022

REVISION: 01

## 12. Appendix D – Road Asset Inspection Record

[illegible]

# HASLIN

## Flora and Fauna Management Plan

**Eurobodalla Southern Water Supply Storage Project**



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## Glossary/ Abbreviations

Term / Abbreviation	Definition / Expanded text
Application Number	SSD 7089
CEMP	Construction Environmental Management Plan
CEMS	Contractors Environmental Management System
Compliance audit	Verification of how implementation is proceeding with respect to a Construction Environmental Management Plan (CEMP) (which incorporates the relevant approval conditions)
Construction	The demolition and removal of buildings or works, the carrying out of works for the purpose of the development, including bulk earthworks, and erection of buildings and other infrastructure permitted by the Development Consent
Council	Eurobodalla Shire Council
Development	The development described in the Eurobodalla Southern Water Supply Storage Environmental Impact Statement
Development Consent	The Minister for Planning's approval SSD 7089 dated 17 October 2019
DPE	Department of Planning and Environment
DPE Environment and Heritage	Department of Planning and Environment, Environment and Heritage
EIS	The Environmental Impact Statement titled Eurobodalla Southern Water Supply Storage Environmental Impact Statement, prepared by SMEC dated 27/08/2018
EEC	Endangered Ecological Community
Ecologically sustainable development	Using, conserving and enhancing the community's resources so that the ecological processes on which life depends are maintained and the total quality of life now and in the future, can be increased (Council of Australian Governments, 1992)
EPA	NSW Environment Protection Authority
EMS	Environmental Management System
Environmental aspect	Defined by AS/NZS ISO 14001:2015 as an element of an organisation's activities, products or services that can interact with the environment
Environmental impact	Defined by AS/NZS ISO 14001:2015 as any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's environmental aspects
Environmental incident	An unexpected event that has, or has the potential to, cause harm to the environment and requires some action to minimise the impact or restore the environment
EMM	Environmental Management Measure as outlined in the project EIS documentation



Environmental objective	Defined by AS/NZS ISO 14001:2015 as an overall environmental goal, consistent with the environmental policy, that an organisation sets itself to achieve
Environmental policy	Statement by an organisation of its intention and principles for environmental performance
Environmental target	Defined by AS/NZS ISO 14001:2015 as a detailed performance requirement, applicable to the organisation or parts thereof, that arises from the environmental objectives and that needs to be set and met in order to achieve those objectives
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i> (NSW)
EPL	Environment Protection Licence
ESCP	Erosion and Sediment Control Plan
EWMS	Environmental work method statement
Hold point	Is a verification point that prevents work from commencing prior to approval from Eurobodalla Shire Council
Incident	An occurrence or set of circumstances that causes or threatens to cause material harm and which may or may not cause a non-compliance
Minister, the	Minister of the NSW Department of Planning and Environment (or delegate)
Non-conformance	Failure to conform to the requirements of Project system documentation including this CEMP or supporting documentation
Operation	The operation of the water storage and associated infrastructure upon completion of construction excluding pre-commissioning activities
PESCP	Progressive Erosion and Sediment Control Plan
PIRMP	Pollution Incident Response Management Plan
Principal, the	Eurobodalla Shire Council
POEO Act	<i>Protection of the Environment Operations Act 1997</i> (NSW)
Project, the	Eurobodalla Southern Water Supply Storage
REMM	Revised Environmental Management Measures identified in Appendix 2 of the Development Consent
ROL	Road occupancy licence
SAP	Sensitive Area Plan
SEAR's	Secretary's Environmental Assessment Requirements
Site	Part of Lot 3 DP438839 and Lot 2 DP1168581 and an unnamed lot bounded by Bullockys Hut Road and Big Rock Road, Bodalla
SPIR	Submission and Preferred Infrastructure Report
SSD	State Significant Development
TRIPs	Tuross River Intake Pump Station



## Document Control and Records

Documentation and document control for this Plan, including issue of any amendments will be done generally in accordance with the contract. This Plan is maintained by Haslin Constructions (Haslin) and maintained throughout construction through regular reviews carried out on an initial 3 month of the project starting then on a biannually basis, or as changes require.

At all times an up-to-date copy of this plan shall be kept on site and made available to all employees and contractors involved in the project. Amendments that are made to this document are recorded on the register of amendments below and shall be approved by management staff. Superseded versions of this document shall be maintained for a period of 7 years to demonstrate record of environmental management and compliance.

This document shall be created and approved by the client. A controlled copy shall be supplied to all relevant parties, and distribution of controlled copies shall be recorded on the distribution register below (controlled hardcopy only). When changes are made to this document, parties listed below shall be provided with updates.

Register of Amendments				
Date:	Version No.:	Description of Amendments:	Prepared by:	Approved by:
29/07/22	0	Draft	NF	AL
09/08/22	B	Draft. Responding to ESC comments	NF	AL
12/08/22	C	Draft. Minor adjustments	NF	AL
19/09/22	D	Responding to BCD comments	NF	AL
27/09/22	E	Minor adjustments	NF	AL
18/05/23	F	Additional Vegetation zones	KM	AL
01/08/2023	G	Additional Vegetation zone	KM	AL
12/10/2023	H	Additional clearing zone	KM	AL

Company Management Plan Authorisation			
	Name/Position	Date:	Signature
Prepared by:	Nicholas Francesconi Environmental Consultant	27/09/2022	
Reviewed by:	Andrew Lynam Environment Manager	27/09/2022	
Approved by:	Colin Woods Managing Director	27/09/2022	

Distribution Register			
Version No.	Date of Issue:	Name of Recipient:	Position/Organisation
0	29/07/22	Ross Bailey	Principals Authorised Person
B	09/08/22	Ross Bailey	Principals Authorised Person

C	12/08/22	Ross Bailey	Principals Authorised Person
D	19/09/22	Ross Bailey	Principals Authorised Person
E	27/09/22	Ross Bailey	Principals Authorised Person
F	18/05/23	Ross Bailey	Principals Authorised Person
G	01/08/2023	Ross Bailey	Principals Authorised Person
H	09/11/2023	Ross Bailey	Principals Authorised Person

# 1 Introduction

---

## 1.1 Context

This Flora and Fauna Management Plan (FFMP or Plan) forms part of the Construction Environmental Management Plan (CEMP) for the Eurobodalla Southern Water Supply Storage (the Project).

This FFMP has been prepared to address the requirements of the Minister's Development Consent and the environmental management measures listed in the Eurobodalla Southern Water Supply Storage Environmental Impact Statement (EIS) and all applicable legislation.

## 1.2 The approved project

The Eurobodalla Southern Water Supply Storage (the Project) was granted Development Consent from the Department of Planning and Environment (DPE) on 17 October 2019. Development Consent is provided in Appendix A of the CEMP.

The Project consists of an off-stream water storage facility and associated ancillary facilities. Water would be extracted from the Tuross River, using a new river intake pump station, and transferred to the storage via the Storage Inlet Pipeline. As necessary, the storage volume would be supplemented by water extracted from an existing borefield adjacent the storage.

Key features of the Project include:

- a 3,000 megalitre storage capacity,
- a 370 metre long embankment, 39 metres in height and a crest width of 20 metres located on an unnamed tributary of the Tuross River,
- a spillway,
- permanent erosion control structures located downstream of the spillway,
- inlet works to convey and dissipate raw water transferred from the river intake pump station through a pipeline constructed along the left abutment to the proposed water storage facility,
- outlet works to allow transfer of water from the storage to the existing southern water treatment plant (WTP),
- instrumentation to monitor seepage, reservoir levels and water quality,
- a consequence category of "High C" for both flood and sunny day scenarios in accordance with the Australian National Committee on Large Dams (ANCOLD) Guidelines on the consequence categories of dams (2012),
- a thermal stratification control system,
- a boat ramp at the storage for maintenance and water quality monitoring, and
- safety and perimeter fencing at the storage.

Key features of the ancillary facilities include:

- new river intake pump station with a total river extraction capacity made up of a combination of flows from the river intake (up to 26 megalitres) and the borefield (up to six megalitres),
- installation of the following new pipelines including:
  - a pipeline with a capacity of 26 megalitres per day to transfer raw water from the new river intake pump station to the storage inlet chute,
  - a cross connection to the proposed water storage inlet pipeline with a capacity of six megalitres per day providing connection to supply water from the storage to the balance tank at the existing WTP,
  - a pipeline connection from the existing borefield pipeline to the river intake pump station,

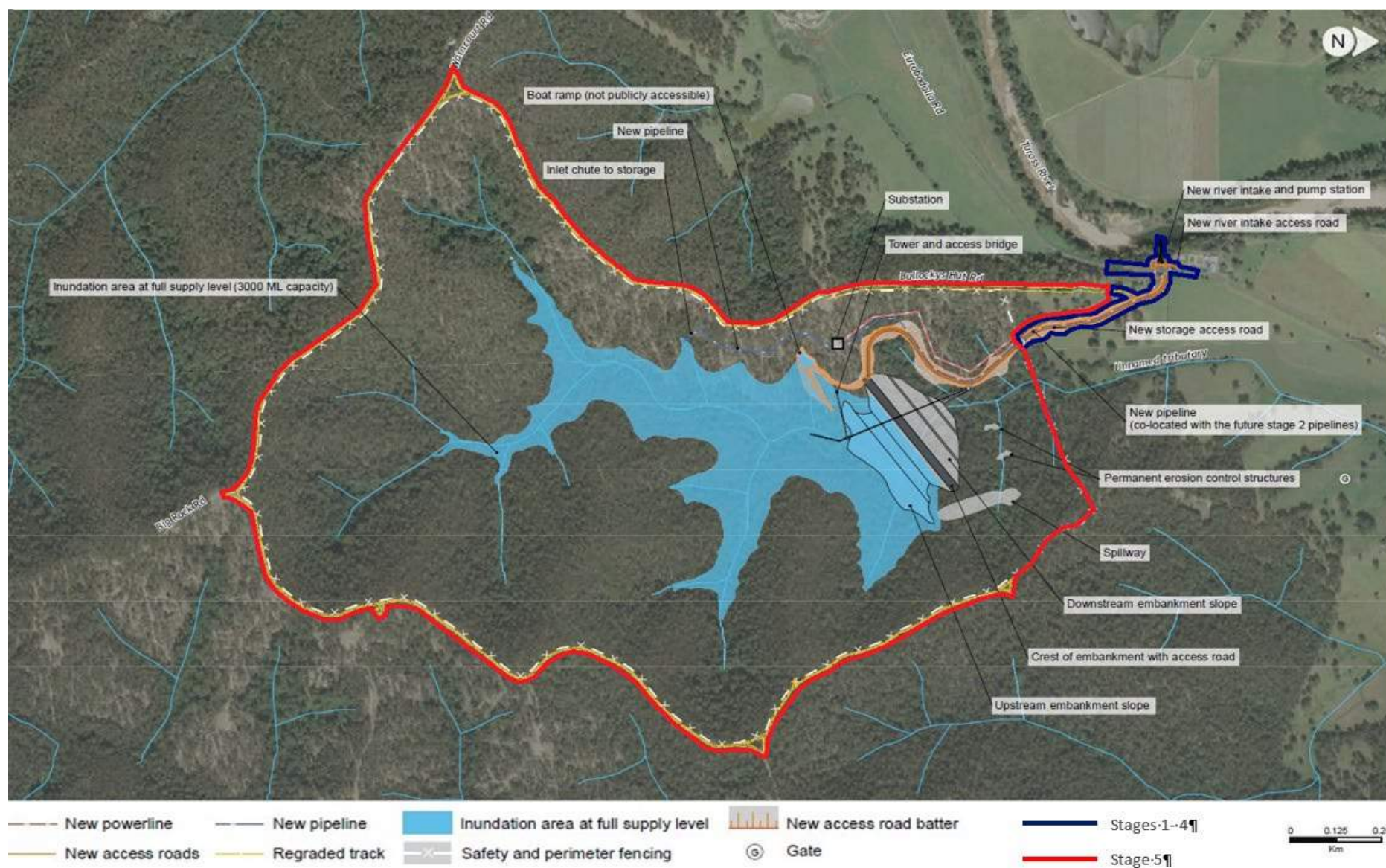
- a new storage access road that is about one kilometre in length and extends from Eurobodalla Road opposite the existing WTP to the embankment crest,
- basic right-turn and basic left-turn treatment at the intersection of the new storage access road and Eurobodalla Road would be provided,
- a new access road that would provide a route for vehicles to access the new river intake pump station, and
- power supply including the construction of new sub-stations located near the storage and the river intake pump station.

### **1.3 Scope of this plan**

With the approval of the Secretary of Planning, construction of the project is being staged as follows:

- Stage 1: Tuross River Intake Pump Station clearing.
- Stage 2: Tuross River Intake Pump Station construction.
- Stage 3: Vegetation clearing and topsoil stripping of the access road, construction of the access road to the forestry boundary and construction of the inlet pipeline to the forestry boundary.
- Stage 4: Partial clearing of the entire storage site.
- Stage 5: All other works.

Works in Stage 1, Stage 2 and Stage 4 are complete. Stage 3 works are partially complete and will continue to be delivered under the applicable CEMP. The scope of works covered by this plan does not involve any works within the Tuross River, however for completeness/context it is referred to throughout this FFMP. This Plan only applies to Stage 5 of the approved project, being the construction of all remaining works on site including the removal of the remaining vegetation within clearing boundary, as well as grubbing works and removal of any remaining habitat trees identified during the pre-clearing inspections. The scope of works is detailed in Figure 1-1 and the clearing boundary is detailed in Figure 2-1 and Figure 6-1.



## **2 Purpose and objectives**

---

### **2.1 Purpose**

The purpose of this Flora and Fauna Management Plan (FFMP) is to describe how construction of the Eurobodalla Southern Water Supply Storage project impacts on the flora and fauna contained within and surrounding the construction boundary and how these impacts will be minimised and managed.

### **2.2 Objectives**

The objective of the FFMP is to ensure that all avoidance, mitigation and management measures relevant to the protection of native flora and fauna including threatened species and endangered ecological communities referred to in:

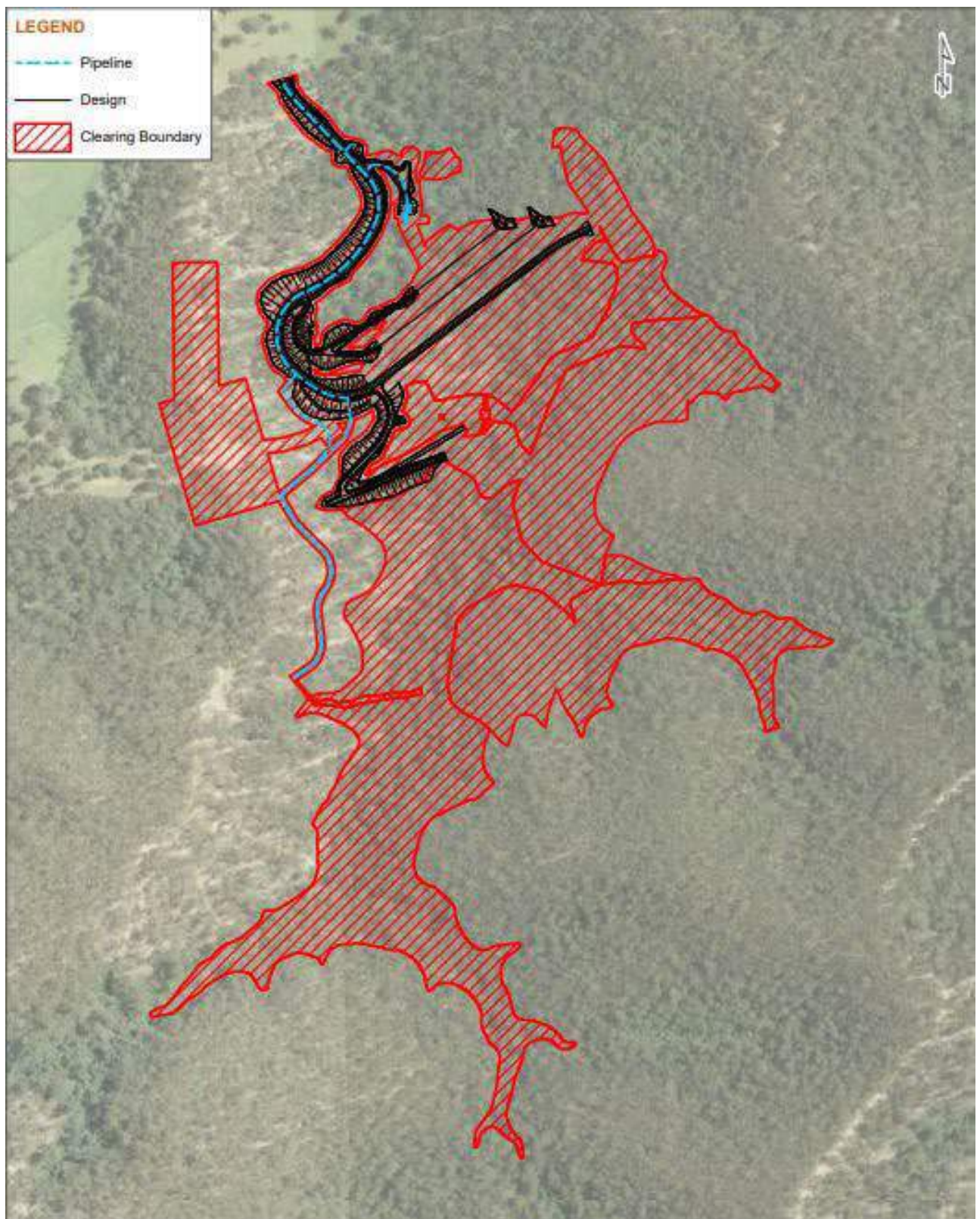
- The Environmental Impact Statement (EIS) prepared for Eurobodalla Southern Water Supply Storage (the Project).
- Submission Report for the Eurobodalla Southern Water Supply Storage Project.
- Addendum Submissions Report for the Eurobodalla Southern Water Supply Storage Project.
- Revised Management and Mitigation Measures.
- Conditions of Development Consent SSD 7089 (the Project) granted on 17 October 2019.

### **2.3 Targets**

The following targets have been established for the management of impacts to flora and fauna during the project:

- Ensure full compliance with the relevant legislative requirements, the EIS, and conditions of the Development Consent.
- No disturbance to flora and fauna outside the proposed construction footprint associated access tracks, safety and perimeter fencing, and site compounds (Figure 2-1 and Figure 6-1).
- No increase in distribution of weeds currently existing within the project areas.
- No new weeds introduced to the project areas.
- No transfer of plant diseases or pathogens to or from the project work areas.
- Effective rehabilitation / revegetation that meets its ecological and landscaping objectives.
- All fauna species encountered during construction are handled humanely and relocated in accordance with industry standards.
- No pollution or siltation of aquatic ecosystems, wetlands, endangered ecological communities or threatened species habitat.
- Minimise barriers to fauna and fish movement.





**Figure 2-1** Clearing boundary and proposed pipeline design layout



## 3 Environmental requirements

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### 3.1 Relevant legislation and guidelines

#### 3.1.1 Legislation and regulatory requirements

All legislation relevant to this FFMP is included in Appendix A1 of the CEMP.

#### 3.1.2 Guidelines

The main guidelines, specifications and policy documents relevant to this Plan include:

- Department of Primary Industries 'Policy and Guidelines for Fish Habitat Conservation and Management (DPI 2013).
- Fairfull, S. and Witheridge, G. (2003) Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings. NSW Fisheries, Cronulla, 16 pp.
- Fishnote – Policy and Guidelines for Fish Friendly Waterway Crossings – November 2003.
- DECCW. 2008. Hygiene protocol for the control of disease in frogs.
- Australian Standard AS 4373 Pruning of Amenity Trees.
- Australian Standard 4970 – 2009 Protection of Trees.
- Best Practice Management Guidelines for *Phytophthora cinnamomi* within the Sydney Metropolitan Catchment Management Authority Area (Botanic Gardens Trust 2008).
- New South Wales Weed Control Handbook (DPI 2018).
- NSW Biodiversity Offsets Policy for Major Projects (OEH 2014).

### 3.2 Development Consent Conditions

The Development Consent conditions relevant to this Plan are listed Table 3-1 below. A cross reference is also included to indicate where the condition is addressed in this Plan or other project management documents.

**Table 3-1** Minister's Development Consent conditions of relevant to the FFMP

Condition No.	Condition Requirements	Document Reference
B2	No more than 54.61 ha of native vegetation is to be cleared.	Section 5.1.1
B3	Prior to clearing of native vegetation, the Applicant must prepare a Construction Flora and Fauna Management Plan (CFFMP) in consultation with DPI Fisheries and to the satisfaction of the Planning Secretary.	This Plan
B4	The CFFMP must form part of the CEMP required by Condition C2 and, in addition to the general management plan requirements listed in Condition C1, the CFFMP must include the following:	This Plan (Appendix B2 of CEMP)
	(a) measures to ensure biodiversity values not intended to be impacted are delineated by mapping of 'no-go areas' and the installation of on-site measures such as temporary exclusion fencing prior to clearing;	Section 6.1.3
	(b) measures to minimise the risk of introducing weed species via construction vehicles, plant and equipment and control of pest and weed species existing at the site;	Section 6.1.2 Appendix A – Weeds and pathogens management plan
	(c) method of vegetation removal and measures to minimise impacts outside the storage site construction boundary and within the perimeter of the access road boundary as a result of the equipment used for clearing and general access for heavy vehicles and construction plant and equipment;	Section 6.1.8
	(d) options to reuse cleared vegetation, in preference to burning, such as relocation of hollow logs for habitat and mulch for use in areas to be revegetated within the site and use elsewhere within the local area;	Section 6.1.7

Condition No.	Condition Requirements	Document Reference
	(e) measures to minimise the impacts on fauna within the site including the installation of nest boxes prior to clearing, relocation of fauna to adjacent habitat, staged clearing and timing of clearing outside breeding seasons; and	Section 6.1.8 Appendix C - Nest box and connectivity management plan
	(f) details on rehabilitation and revegetation including: <ul style="list-style-type: none"> <li>i. use of locally indigenous plant species including collection of seed prior to clearing for this purpose</li> <li>ii. for construction areas outside the full supply level including the construction compounds, on-site quarry areas, the storage site wall and the new storage access road batters</li> <li>iii. for the construction area at the existing water treatment plant (WTP) including for the bed and banks of the Tuross River affected by the temporary cofferdam</li> </ul>	Section 7
B5	Prior to removing/clearing any vegetation or any demolition, pre-clearing surveys and inspections for threatened species must be undertaken. The surveys and inspections, and any subsequent relocation of species and associated management measures, must be undertaken under the guidance of a suitably qualified and experienced ecologist.	Section 6.1.6
B6	The Applicant must:	
	(a) not commence any clearing work until the CFFMP is approved by the Planning Secretary; and	Section 5.1.1
	(b) implement the most recent version of the CFFMP approved by the Planning Secretary for the duration of works.	This document

### 3.3 Environmental Management Measures

Relevant EMM listed in the EIS are listed in Table 3-2 below. This includes reference to required outcomes, the timing of when the commitment applies, relevant documents or sections of the environmental assessment influencing the outcome and implementation.

**Table 3-2** Environmental management measures relevant to this FFMP

Ref #	Commitment	Timing	FFMP Reference
3.1	<p>A Flora and Fauna Management Plan will be prepared and implemented as part of the CEMP. It will include, but not be limited to:</p> <ul style="list-style-type: none"> <li>plans showing areas to be cleared and areas to be protected, including exclusion zones, protected habitat features and revegetation areas</li> <li>pre-clearing survey requirements</li> <li>procedures for unexpected threatened species finds and fauna handling</li> <li>procedures addressing relevant matters specified in the Policy and guidelines for fish habitat conservation and management (DPI Fisheries, 2013).</li> </ul>	Pre-construction	This plan
3.2	Measures to further avoid and minimise the construction footprint and native vegetation or habitat removal will be investigated during detailed design and implemented where practicable and feasible.	Pre-construction During construction	
3.4	As part of the Flora and Fauna Management Plan, a management plan will be produced to establish pre-construction and construction mitigation measures to minimise the impacts on River plains EEC.	Pre-construction	This plan. Appendix B
3.5	Monitoring water quality during construction will be evaluated for potential impacts to threatened species and EEC, and corrective measures applied in consultation with Council.	During construction	Construction Soil and Water Management Plan
3.6	Pre-clearing surveys are to ensure exclusion zones (at the construction footprint boundary) are established prior to vegetation clearing.	During construction	This plan Section 6.1.3 Appendix D

Ref #	Commitment	Timing	FFMP Reference
3.7	<p>The Flora and Fauna Management Plan will include a Weed and Pathogens Management plan which will include, but not be limited to:</p> <ul style="list-style-type: none"> <li>• weed management controls for construction and post-construction (if required)</li> <li>• protocols to prevent introduction or spread of <i>Phytophthora cinnamomi</i></li> <li>• protocol to manage vehicle cleaning in accordance to reduce the potential for spread of noxious weeds, plant pathogens or animal diseases into retained forested habitats.</li> </ul>	Pre-construction	This plan Appendix A
3.8	<p>The Flora and Fauna Management Plan is to describe a process for:</p> <ul style="list-style-type: none"> <li>• pre-clearing surveys</li> <li>• supervision of vegetation clearing by a suitably qualified fauna ecologist/spotter</li> <li>• fauna handling including the capture of any injured fauna or fauna that does not naturally relocate, and identifying suitable services for the treatment of injured fauna, for example a local vet or local wildlife carer</li> <li>• identifying opportunities for further minimisation of native vegetation removal when developing construction methodologies, in order to retain the maximum amount of habitat for native fauna possible.</li> </ul>	Pre-construction	This plan Section 6.1.6 Section 6.1.8
3.9	<p>The Flora and Fauna Management Plan will:</p> <ul style="list-style-type: none"> <li>• identify hollow-bearing trees for retention and establish exclusion zones which will be mapped and clearly marked out on site prior to construction commencing</li> <li>• outline a staged approach to habitat removal of hollow-bearing trees and other established/ prominent trees that cannot be retained</li> <li>• include a nest box strategy would be implemented prior to vegetation removal.</li> </ul>	Pre-construction	This plan Section 6.1.8
3.10	<p>Ensure that fish passage is not blocked during construction. If blockage cannot be avoided, gain a permit from Fisheries prior to undertaking any activities that will cause blockage.</p>	Pre-construction	The works required under this FFMP will not result in any permanent obstruction of fish passage

Ref #	Commitment	Timing	FFMP Reference
3.12	<p>Temporary in stream structures will be constructed in accordance with the NSW DPI policy guideline and will:</p> <ul style="list-style-type: none"> <li>○ avoid spanning the full width of the waterway channel</li> <li>○ be inserted during low-flow periods with management plans being submitted to NSW DPI detailing how high flow events will be managed</li> <li>• dewatering of temporary in-stream structures should follow the following guidelines: <ul style="list-style-type: none"> <li>○ NSW DPI is to be notified seven days prior to any dewatering activities in order to organise potential fish rescue activities. A separate s.37 permit may be required from NSW DPI to relocate fish</li> <li>○ water is to be pumped a minimum of 30 m away from the waterway and should preferentially not re-enter the waterway. If water is to re-enter the waterway, ANZECC water quality guidelines need to be adhered to with the proponent being required to submit a detailed water quality monitoring program.</li> </ul> </li> </ul>	During construction	The works required under this FFMP will not result in any permanent obstruction of fish passage
3.13	<p>Should any large woody debris be required to be removed the following management guidelines would be followed in accordance with the removal of large woody debris from NSW rivers and streams Prime Fact 11 (DPI 2005b):</p> <ul style="list-style-type: none"> <li>• lopping (trimming) should be considered as a first option;</li> <li>• instream realignment should be considered as the next option;</li> <li>• if realignment is unfeasible, relocation within the river channel is preferable to removal;</li> <li>• removal should be considered as a last resort; and</li> <li>• removal/relocation of snags would be undertaken so as to cause the least disturbance to the bed or nearby sensitive aquatic habitat. An aquatic ecologist shall be present on site when working with snags that require lopping, realignment, relocation and/or removal.</li> </ul>	During construction	The works required under this FFMP will not result in any permanent obstruction of fish passage

## 4 Existing Environment

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The following sections summarise flora and fauna within and adjacent to the project area including species, communities and habitats that occurred on site before earlier stages of the project commenced. The key reference document being Chapter 8 as well as Appendix E, F and G of the Environmental Impact Statement (EIS).

The project boundary and relevant ecological data is shown on the sensitive area maps included in Appendix A8 of the CEMP.

### 4.1 Environmental aspects

#### 4.1.1 Vegetation communities

The area within the clearing boundary supports three vegetation types (Figure 4.1);

- Wet sclerophyll forest.
- Forested wetland.
- Dry rainforest.

Wet sclerophyll forest originally covered 27.81 hectares on site, however much of this has been cleared by Forestry in Stage 4 of the project as can be seen in Figure 4-2. The community occurs on the slopes between the valley floor and the ridgeline associated with Bullockys Hut Road. Commonly occurring canopy species include *Corymbia maculata* (Spotted Gum) and *Eucalyptus globoidea* (White Stringybark), with *E. longifolia* (Woollybutt), *E. agglomerata* (Blueleaved Stringybark), *E. muelleriana* (Yellow Stringybark), *E. tricarpa* (Mugga Ironbark) and *E. pilularis* (Blackbutt) occurring less frequently.

The forested wetland originally covered 6.20 hectares on site. The community occurs across the valley floor of the site. Some areas of this community have been cleared by Forestry in Stage 4 of the project. A slither of this community that follows the main gully that runs north/south through the centre of site was left in-situ by Forestry due to challenging access. Characteristic canopy species of this vegetation type includes *E. elata* (River Peppermint), *E. botryoides-saligna* intergrade, *E. baueriana* (Blue Box), *Angophora floribunda* (Rough-barked Apple) and the occasional *E. cypellocarpa* (Monkey Gum). This vegetation conforms to the endangered ecological community – under the Biodiversity Conservation Act – River Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South-East Corner Bioregions.

The dry rainforest originally covered 9.57 hectares on site. This community is restricted to the deeper gullies towards the south of the Storage Site and the majority has been left unaffected by Forestry clearing in the Stage 4. The dry rainforest was comprised primarily of *Backhousia myrtifolia* (Grey Myrtle) and *Acmena smithii* (Lilly Pilly).

#### 4.1.2 Threatened ecological communities

One (1) Threatened Ecological Community (TEC) listed as an Endangered Ecological Community (EEC) under Schedule 1 of the BC Act was recorded in the BAR as being located within the study area, this being:

- *River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South-east Corner Bioregions* (from here on in referred to as River-Flat Eucalypt Forest).

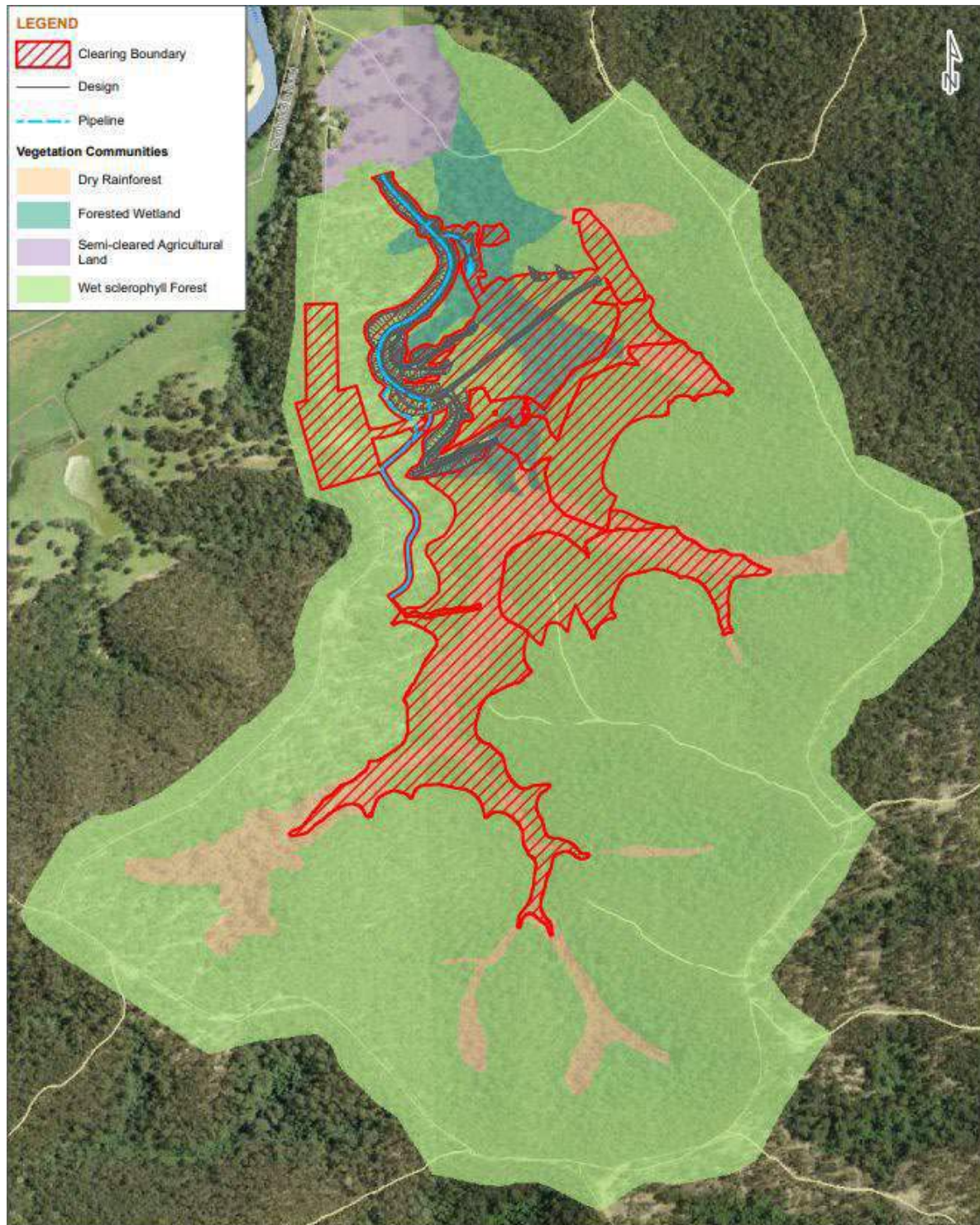
This EEC corresponds to the Forested wetlands vegetation community covering an area of approximately 6.20 hectares across the project. A specific management plan has been developed for this EEC and provided at Appendix B.



No Commonwealth EPBC Act listed threatened ecological communities (TEC) were identified in the study area.

#### 4.1.3 Threatened or otherwise significant flora species

No threatened flora species were recorded in the clearing boundary footprint during the targeted surveys conducted for the EIS. No threatened flora species were incidentally recorded during the pre-fire and post-fire habitat assessment (SMEC 2020).



**Figure 4.1** Clearing boundary and vegetation mapping



**Figure 4-2** Status of vegetation on site to 27/02/2023

#### 4.1.4 Terrestrial fauna habitat

Five (5) fauna habitat types were identified during surveys undertaken to inform the EIS. All five (5) habitat types occur within the clearing boundary footprint and are described in Table 4-1. The post-fire assessment (SMEC, 2020) concluded that all five (5) habitat types still occur in the clearing boundary footprint; however, the extents of 'shrubby mid-story' and 'fallen tree trunks, woody debris and deep leaf litter' habitat types have been reduced.

These are listed below and shown on the Sensitive Area Maps included at Appendix A3 of the CEMP.

**Table 4-1** Fauna habitat types

Name	Habitat features
Remnant vegetation	Foraging, nesting, roosting and sheltering for birds, reptiles, amphibians, arboreal and terrestrial mammals and bat species. High quality habitat available for species with large home ranges including, but not limited to <i>Dasyurus maculatus</i> (Spotted-tailed Quoll), <i>Tyto novaehollandiae</i> (Masked Owl), <i>Ninox strenua</i> (Powerful Owl) and <i>Ninox connivens</i> (Barking Owl).
Hollow bearing trees	Nesting, roosting and sheltering habitat for numerous threatened and non-threatened birds, arboreal mammals and microbats. Species predicted to occur that may utilise this resource on site include <i>Callocephalon fimbriatum</i> (Gang Cockatoo), <i>Tyto novaehollandiae</i> (Masked Owl) and various microbat species.
Shrubby midstory	Foraging, nesting, roosting, and sheltering for small and medium sized birds; reptiles; arboreal and terrestrial mammals and arboreal frogs.
Fallen tree trunks, woody debris and deep leaf litter	Sheltering habitat for small terrestrial mammals, amphibians, and reptiles.
Access roads and pathways	Foraging habitat and flyways for microbats.

#### 4.1.5 Threatened terrestrial fauna

Threatened fauna species identified during surveys undertaken to inform the EIS, as well as those predicted to occur using the Biobanking Calculator are listed in Table 4-2.

The breeding periods for species likely (and some previously recorded) within the construction boundary area are shown in Table 4-2. Five (5) of the six (6) species utilise hollows for breeding whereas the 6th species, Varied Sittella, builds a cup-shaped nest of plant fibres and cobwebs in an upright tree fork high in the living tree canopy, and often re-uses the same fork or tree in successive years.

**Table 4-2** Threatened fauna

Common name	Scientific name	EPBC Act	BC Act	Recorded	Breeding period listed in the EIS
Regent Honeyeater	<i>Anthochaera phrygia</i>	CE	CE	–	
Gang-Gang Cockatoo	<i>Callocephalon fimbriatum</i>	–	V	✓	October to January
Varied Sitella	<i>Daphoenositta chrysoptera</i>	–	V	✓	June to April
Sooted-tailed Quoll	<i>Dasyurus maculatus</i>	E	V	–	
Eastern False Pipistrelle	<i>Falsistrellus tasmaniensis</i>	–	V	–	
Little Lorikeet	<i>Glossopsitta pusilla</i>	–	V	–	
Little Eagle	<i>Hieraaetus morphnoides</i>	–	V	–	
Square-tailed Kite	<i>Lophoictinia isura</i>	–	V	–	
Eastern Coastal Free-tailed Bat	<i>Micronomus norfolkensis</i>	–	V	✓	Winter breeding, young in a crèche until autumn
Southern Myotis	<i>Myotis macropus</i>	–	V	–	
Turquoise Parrot	<i>Neophema pulchella</i>	–	V	–	
Barking Owl	<i>Ninox connivens</i>	–	V	–	
Powerful Owl	<i>Ninox strenua</i>	–	V	–	
Scarlet Robin	<i>Petroica boodang</i>	–	V	–	
Koala	<i>Phascolarctos cinereus</i>	V	V	–	
Yellow-bellied Sheathtail-bat	<i>Saccolaimus flaviventris</i>	–	V	✓	Winter breeding, young at foot until autumn



Common name	Scientific name	EPBC Act	BC Act	Recorded	Breeding period listed in the EIS
Greater Broad-nosed Bat	<i>Scoteanax rueppellii</i>	–	V	✓	Winter breeding, young at crèche until autumn
Diamond Firetail	<i>Stagonopleura guttata</i>	–	V	–	
Masked Owl	<i>Tyto novaehollandiae</i>	–	V	✓	Any time of year but generally winter

#### 4.1.6 Aquatic fauna

As noted in section 1.3, the scope of works covered by this plan does not involve any works within the Tuross River, however for completeness/context it is referred to below.

Surveys of the unnamed tributary and the Tuross River were completed to inform the EIS with the findings presented in Table 4.3 below. It was found that macroinvertebrate assemblages were similar for both waterways and the species collected are relatively widespread and common. Fish species were consistent between the two waterways with *Gobiomorphus australis* (Striped gudgeon) and introduced *Gambusia holbrooki* (Plague minnow).

There were no threatened aquatic fauna species recorded during the surveys however the fish species *Prototroctes maraena* (Australian Grayling) has been previously recorded in the Tuross River during surveys in 2003/04 by NSW Fisheries. This species is listed as vulnerable under the EPBC Act and endangered in NSW under the *Fisheries Management Act 1994* (FM Act). A significance of impact assessment determined that it is unlikely the project would result in a significant impact on *P. maraena* considering the required mitigation measures.

#### Stygofauna

Borehole surveys for Stygofauna, invertebrates inhabiting aquifers, identified four individuals representing three taxa. Of the taxa collected only Acarina (mite) is considered 'possible stygofauna' while the additional taxa, Araneae (spiders) and Hydrophilidae (water beetle) are likely from terrestrial, surface water or surface saturated soil habitats.

**Table 4.3** Aquatic fauna

Aquatic biodiversity	Unnamed tributary	Tuross River
Key fish habitat	Class 4 waterway and regarded as unlikely fish habitat	Class 1 waterway and major key fish habitat
Macroinvertebrates	80 individual macroinvertebrates from 11 species were found during sampling with the most dominant being acarina, followed by hydrophilidae and chironomidae. The results imply that the tributary site been subject to localised habitat degradation	590 individual macroinvertebrates from 29 taxa were collected from the Tuross River sites. The results imply the study area has been subject to some pollution or localised habitat degradation.

#### **4.1.7 Groundwater Dependent Ecosystems (GDE's)**

The EIS identified an area along the Tuross River at the proposed river intake that would be consistent with a GDE, this being either South Coast Swamp Forest and/or Ecotonal Coastal Swamp Forest however these areas of vegetation were noted to be highly degraded and not of ecological significance. All other potential GDE's have been previously cleared for agriculture.

#### **4.1.8 Wetlands**

No important or local wetlands occur within study area.

## 5 Environmental aspects and impacts

### 5.1 Construction activities

#### 5.1.1 Vegetation Clearing

Vegetation clearing resulting in the direct removal of native vegetation is required for construction of the project. The project approval conditions allow for a total 54.61 hectares of native vegetation to be cleared to facilitate the new Water Supply Storage infrastructure. Some areas of vegetation within the construction footprint have already been cleared under previous stages of the project. The staggered approach to vegetation clearing has been undertaken for the following reasons:

- Clear hollow bearing trees at a time that avoids impacting breeding periods for hollow dependent threatened species.
- Enable Forestry operations to harvest timber from site prior to the main works contractor commencing work.

The Hollow Bearing Trees (HBT) were removed on the project site under the Partial Clearing of Permanent Works and Inundation Area CEMP (SMEC 2022) from the 14th February 2022 and took a total of 13 days over a 5 week period by a Forestry Contractor and Arborist, engaged by ESC. On completion of this work, the harvesting (completion of the partial clearing) was undertaken by Forestry Corp, and was completed in June.

Forestry operations focused on harvestable timber removal, this being any tree greater than 15cm in diameter with the independent arborist focusing on HBT removal. Although the majority of trees greater than 15cm in diameter have been removed, some of these trees were left intact where difficult access could have presented a stability risk on site. All other vegetation clearing, including grubbing activities, will be undertaken under this FFMP in addition to any of the larger trees left in situ. In total 54.61 hectares of vegetation will be removed for the project, however as indicated above some of the clearing has already been undertaken. The total clearing areas for the project are outlined in Table 5-1 below.

**Table 5-1** Total project vegetation clearing

Vegetation Community	TEC equivalency	Approved clearing (hectares)	Anticipated clearing (hectares)
Spotted Gum - White Stringybark - Burrawang shrubby open forest on hinterland foothills, northern South East Corner Bioregion	NA	37.56	30.8
Grey Myrtle - Lilly Pilly dry rainforest in dry gullies of the Sydney Basin Bioregion and South East Corner Bioregion	N/A	9.57	9.57



Vegetation Community	TEC equivalency	Approved clearing (hectares)	Anticipated clearing (hectares)
River Peppermint - Rough-barked Apple moist open forest on sheltered sites, southern South East Corner Bioregion	River-Flat Eucalypt Forest	7.19	7.0
River Peppermint - Rough-barked Apple - River Oak herb/grass forest of coastal lowlands, southern Sydney Basin Bioregion and South East Corner Bioregion	River-Flat Eucalypt Forest	0.22	0.22
Coast Grey Box - Mountain Grey Gum - stringybark moist shrubby open forest in coastal gullies, southern South East Corner	N/A	0.07	0.07
<b>Total</b>		<b>54.61 ha</b>	<b>47.68 ha</b>

Clearing area adjustments have been updated based on each vegetation community to account for the following:

- Reduction in width of fence line from 20m to 5m (Vegetation Zone 1 & 2: 79247m<sup>2</sup>)
- Reduction in area allocated for the Main site compound (Vegetation zone 1: 3239m<sup>2</sup>)
- Reduction in area cleared (Vegetation Zone 4 1901m<sup>2</sup>)
- Increase width of inlet chute from 3m to 15m (Vegetation Zone 1: 427m<sup>2</sup>) (referenced as Area 1)
- Additional area to be cleared adjacent to Northern Quarry (Vegetation Zone 2: 6100m<sup>2</sup>) (referenced as Area 2)
- Additional area adjoining the Boat ramp to allow access to this site from the compound area (Vegetation Zone 1: 2551m<sup>2</sup>) (referenced as Area 4)
- Additional area to be cleared adjoining the downstream side of the Main Embankment to account for project design outside original clearing limits (Zone 2: 2620m<sup>2</sup>) (referenced as Area 3)
- Additional area to be cleared adjacent to the spillway to enable access to the base of the spillway for construction vehicles and heavy machinery access (Zone 2: 1029m<sup>2</sup>) (referenced as Area 5)

- Additional area to be cleared to accommodate the construction machinery required to trench and install the HDPE pipeline (Zone 1: 3275m<sup>2</sup>) (referenced as Area 6)

Note: due to the reduction to clearing within Zones 1, 2 & 4 the additional proposed vegetation clearing listed above, within the same vegetation community, remains below the original approved vegetation clearing limits for the same vegetation community.

Figure 6-1 has been updated to reflect the updated clearing limits

It should be noted the fenceline as represented in Figure 6-1 is indicative. Final alignment will be determined based on topographical constraints (gullies) and to reduce impact to habitat features such as hollow bearing trees, termite mounds and wombat burrows. The width of fenceline clearing will not exceed 5m and total clearing in Zone 1 & 2 will not exceed the areas represented in Table 5-1.

### **5.1.2 Works in Waterways**

The project will have direct and indirect impacts to riparian and aquatic vegetation during the construction phase due to the following:

- Direct clearing of riparian vegetation for construction.
- Temporary decreased water quality due to sediment runoff during earthworks phase.

The Work under the Tuross River Intake Pump Station CEMP has been completed and resulted in the direct impact to 400m<sup>2</sup> of Key Fish Habitat creating permanent loss due to construction of the river intake (subsurface pump inlet and dissipation structures).

The works required under this FFMP will not result in any permanent obstruction of fish passage.

### **5.1.3 Tree Hollow Loss**

The EIS identified sixty-six (66) Hollow Bearing Trees (HBT) within the development site and 17 outside of the Development Site. The HBTs supported of 'chimney-like', 'fissure' and 'cavity' type hollows. In addition, hollow and fallen logs that provide habitat for ground-dwelling fauna are scattered through the area requiring clearing.

A survey in January and February 2022 noted that of this original 83 HBTs, 35 were destroyed by the 2020 fires and a windstorm in January 2022. An additional 69 trees (65 within the development site, 4 outside the development site) that were considered HBTs or potential HBTs. Some of these trees were most likely created from fire activity, others may have been missed in original surveys due to the density of vegetation and scale of the site.

Hollow bearing tree (HBT) removal was undertaken in Stage 4 of the project with Partial Clearing of Permanent Works and Inundation Area CEMP. An ecologist report carried out by Southern Cross Environmental on 28 March 2022 reported that all 91 HBT with 97 hollows had been cleared by 22 March 2022.

Through active discussions during the clearing works 13 HBTs located on the edge of the inundation area were retained. These trees will be assessed for the opportunity of retainment during the main works stage of the project.

It was noted in the ecologist report that the gully system running through the site is old growth forest and contains numerous large trees of which were not marked as HBT. It was also noted in the report that Forestry and the ecologist made an agreement that any potential habitat trees would not be removed during harvestable timber removal until checked by the ecologist.

A pre-clearance survey undertaken by the project ecologist in early September 2022 concluded that there are no HBT within the clearing footprint. However, if any HBT are found, the details will be included in the (updated) nest box strategy.

Surveys by a suitably qualified ecologist for the additional vegetation areas 1, 2, 3 & 4 revealed two hollow bearing trees within the area assessed in Area 3 which is part of Vegetation Zone 2 community (PCT 1220 – Spotted Gum-White Stringy Bark-Burrawang shrubby open forest on hinterland foothills) (Figure 6-1). As these trees are inside the assessed area but outside the project design it is possible these trees can be avoided. If clearing is unavoidable pre-clearing surveys will be undertaken in accordance with this Flora and Fauna Management Plan.

## 5.2 Ecological impacts

Potential biodiversity impacts associated with project are discussed in the EIS, BAR and Aquatic Ecology Report. Impacts that relate to the clearing boundary footprint are summarised in Table 5-2 below.

**Table 5-2** Summary of potential impacts to biodiversity

Potential Impact	Details	Extent/Scale	Mitigation
Loss and fragmentation of native vegetation	Clearing of wet sclerophyll forest, dry rainforest and forested wetland	54.61 ha of native vegetation will be cleared	Delineation and no-go zones
Loss of threatened flora species and fragmentation of habitat	No threatened flora species were recorded.	No threatened flora species were recorded.	N/A
Loss of threatened ecological community	River Flat Eucalypt Forest on Coastal Floodplains.	7.41 Ha of EEC will be cleared	Delineation and no-go zones
Loss of fauna habitat	The clearing of wet sclerophyll forest, dry rainforest and forested wetland.	54.61 ha of native vegetation will be cleared.	Delineation and no-go zones Installation of nest boxes (Undertaken by ESC only) Relocation of fallen logs
Fauna habitat fragmentation	Vegetation clearing associated with the construction works will cause habitat fragmentation.	54.61 ha of vegetation providing potential fauna habitat will be cleared.	Installation of nest boxes (Undertaken by ESC only) Relocation of fallen logs

Potential Impact	Details	Extent/Scale	Mitigation
Fauna mortality	May result from clearance works, earthworks or collisions with vehicles or machinery.	Most likely during clearance activities.	Delineation and no-go zones Preclearance surveys Fauna management protocols
Impacts on fish passage	No important fish passage habitat is present within the development site.	None.	N/A
Sediment and erosion	Short-term changes in water quality, which in turn could impact on aquatic ecology.	Temporary and localised for the extent of the project	Erosion and Sediment Control Plans (ESCP)
Edge effects and weed invasion	Vehicles, plant and people may transport weed propagules into the development site. New edges will be created as a result of the development creating the potential for edge effects.	Most likely during clearance activities.	Implementation of hygiene control points during site set-up Weed control and management
Pests and pathogens	Vehicles, plant and people may transport pathogens into the development site. Clearing of native vegetation and increased human activity increase the risk of pest animal species increasing.	May occur during construction and operational phases.	Implementation of hygiene control points during site set-up

## 6 Environmental mitigation and management measures

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Mitigation and management measures to avoid or minimise impacts to flora and fauna during clearing within the clearing boundary include:

- Delineation of no-go zones (Vegetation Retention Zones (VRZ))
- Weed control and management (Appendix A)
- Pre-clearing surveys
- Staged clearing
- Reuse and relocation of fallen logs and bush-rock where possible
- Nest box management plan (Appendix C)
- River-Flat Eucalypt Forest management plan (Appendix B)

### 6.1 Flora and Fauna Management Strategies

#### 6.1.1 Competence, training and awareness

An environmental induction as part of the main induction must be carried out by everyone working on the project site prior to works commencing. Details of the induction is discussed in Section 3.4.1 of the CEMP.

To supplement the environmental induction, the following training and awareness mechanisms will be undertaken:

- Toolbox talks
- Daily pre-start meetings
- Ecological awareness tools

Toolbox talks will be one method of raising awareness and educating personnel on issues related to all aspects of construction including environmental issues. The toolbox talks are used to ensure environmental awareness continues throughout construction. Toolbox talks will include details of EWMSs for relevant personnel. Toolbox talks will also be tailored to specific environmental issues relevant to upcoming works.

The pre-start meeting is a tool for informing the workforce of the day's activities, safe work practices, environmental protection practices, work area restrictions, activities that may affect the works, coordination issues with other trades, hazards and other information that may be relevant to the day's work.

The Supervisor will conduct a daily pre-start meeting with the site workforce before the commencement of work each day (or shift) or where changes occur during a shift. Daily pre-start meetings are generally succinct in nature and take approximately 10-15 minutes.

The environmental component of pre-starts will be determined by relevant foreman and environmental personnel and will include any environmental issues that could potentially be impacted by, or impact on, the day's activities. All attendees will be required to sign on to the pre-start and acknowledge their understanding of the issues explained.

Ecological awareness tools (posters and information kits) will be used to show the construction staff what fauna species are likely to be found and site and what to do if fauna are spotted. They will include photos and diagrams to indicate where on site they are likely to be found. Posters will be displayed in site sheds and construction compounds.

### **6.1.2 Site Set up**

Site set up includes establishing site access points located off Eurobodalla Road. Hygiene control points will be established at all site access points for any vehicle, machinery or personnel entering site.

### **6.1.3 Delineation of No-go zones**

'No-go zones' are any areas of native vegetation outside the designated construction boundary in Figure 6-1. The physical clearing boundary is to be marked with high visibility bunting where the border of the no-go zones and project boundaries meet. The high visibility bunting will be kept in place for the duration of clearing works.

Trees for felling would be directed to fall within the clearance boundary where possible to minimise impacts on retained vegetation. Shrubby vegetation will be retained where possible (e.g. areas only cleared for temporary access) to assist in stabilizing the slope in the areas of native vegetation.

### **6.1.4 Weed Control and Management**

Weed control is to be carried out prior to vegetation clearing. Specific weed control measures are outlined in Appendix A.

### **6.1.5 Erosion and Sediment Control**

Specific erosion and sediment control measures are detailed within the SWMP (Appendix B4 of CEMP), including timing of implementation prior/during the clearing and grubbing works.

### **6.1.6 Pre-clearing Surveys**

Within the week prior to clearing of any vegetation, pre-clearing surveys and inspections for threatened and non-threatened fauna and their habitat (tree hollows, nests, rocky areas, hollow fallen logs) are to be conducted. The surveys and inspections, and any subsequent relocation of species and associated management measures, are to be undertaken under the guidance of a suitably qualified and experienced ecologist. If any new fauna habitat is identified, it is to be marked with high visibility flagging tape and spray painted with the letter "H" (Figure 6-3). If previously marked habitat has become difficult to identify (flagging tape may have fallen off or bark with spray paint may have shed) then flagging tape and/or spray paint is to be reapplied. The pre-clearing survey will identify sensitive areas and habitat trees which will require on-site supervision by an ecologist during staged clearing of vegetation.

In consultation with an appropriately trained ecologist, the pre-clearance surveys will also provide an opportunity to collect seeds of native species where possible. Where feasible, all mapped and additional hollows as identified in ecologist pre-clearing survey will be inspected for visual signs of recent use from the ground or by pole mounted camera. The information attained from ground or camera inspections will be used by an arborist to support the verification of hollow existence, assessment of potential for salvaging/repurposing, and identification of evidence of current/recent hollow use.

### **6.1.7 Reuse of logs and vegetation**

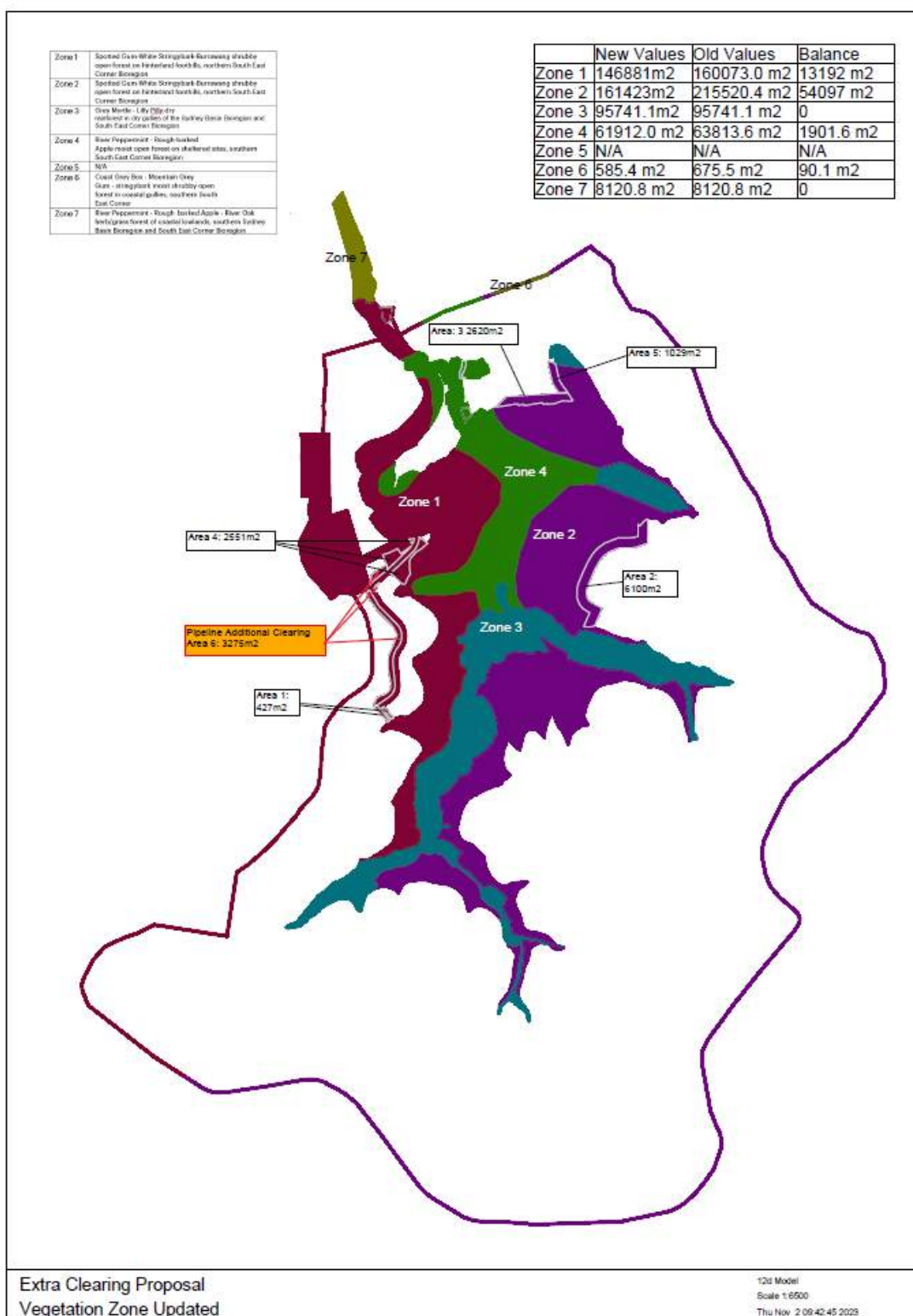
Where practicable, the following should be employed for reuse of logs and vegetation:

- Cleared vegetation and woody material will be re-used in habitat supplementation and restoration.
- The guidance of an ecologist should be sought to determine suitable capacity of fallen timber in the vegetation communities in accordance with NSW benchmarks. The aim is to use felled HBTs first before salvaging other logs.
- Identified fallen logs are to be put aside after felling for relocation into vegetation retention zones (VRZ) and revegetation areas. In consultation with ESC, opportunities to harvest sections of fallen hollow logs of a manageable size in order to repurpose as

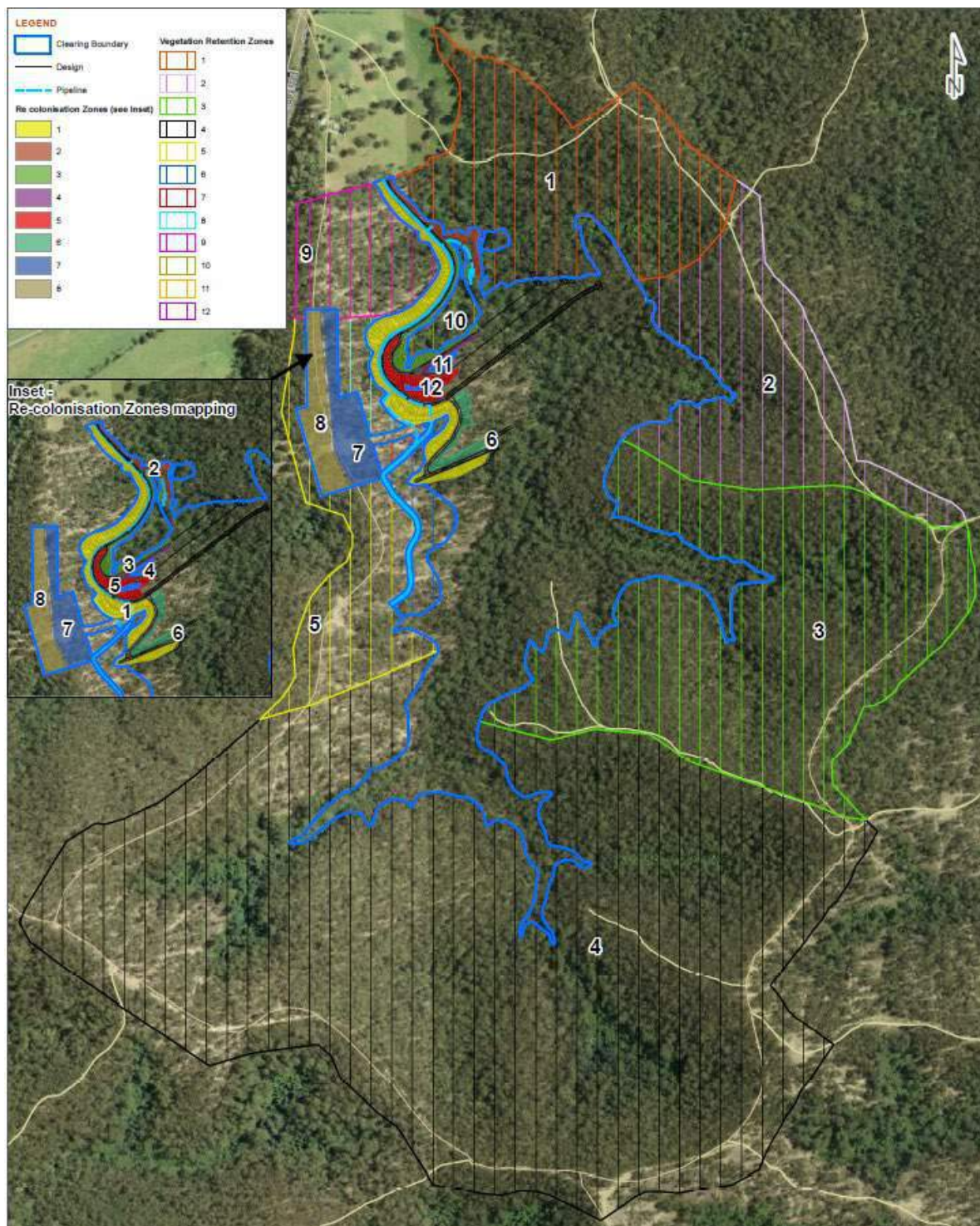
nest boxes will be explored and implemented where practical. Availability of fallen hollow log material for repurposing as nest boxes will be subject to guidance from an ecologist.

- Timber should only be moved into accessible retained vegetation areas where there are suitable routes in for machinery without causing significant damage.
- Logs can be placed into vegetation zones from the edge of no-go zones or short incursion made into the no-go zone under guidance of an ecologist.
- Management zones for the River Flat EEC (shown in Appendix B) should not be breached.
- Logs should be cut to a size practical for relocation without damaging hollow features where possible. Should any fauna be found during the relocation process, fauna is to be relocated in accordance with the protocols detailed in Section 6.2.3.





**Figure 6-1** Project clearing limits (updated to reflect clearing limits from 02/11/2023).



**Figure 6-2** Vegetation Recolonization and Retention Zones (VRZ)

### 6.1.8 Vegetation Clearing

#### Vegetation Clearing Strategy

The approach to clearing vegetation within the project site is to be staged in order to meet the objectives of minimising impact to threatened species, prevent erosion and salvageable timber resources.

Condition B4(e) of the conditions of consent requires staged clearing and timing of clearing outside of threatened fauna breeding seasons to minimise the potential impact from clearing (Table 4-2).

The EIS noted that all threatened fauna species on site breed within hollow bearing trees, with the exception of the Varied Sittella which builds a nest in upper branches. In keeping with the recommendation in Section 8.3.1 of the EIS, Forestry removed all known HBT by 22 March 2022. Large non-harvestable trees and trees along the main gully line in difficult to access areas were left in place. The timing of clearing by Forestry just missed the CFFMP window of “second week of March” but with the lack of threatened fauna seen over the site in previous weeks and consideration of the habitats left to clear, the ecologist concluded risk was low to fauna and works should press on to capitalise dry weather.

The pre-clearing checklist will be used prior to any clearing works to detect any additional nesting fauna or HBT's prior to vegetation clearing. A pre-clearing survey by the project ecologist in early September 2022 concluded that there are no HBT within the clearing footprint.

As noted above, Forestry has salvaged most of the harvestable timber and all known HBT from the site. The clearing under this FFMP will be the remaining vegetation including smaller trees, remaining shrubs, regrowth, vegetation along the main gully line and any as yet unidentified HBT. Clearing works will commence in late September/early October 2022 and is expected to take approximately four months.

Clearing will also be done in sections with erosion and sediment controls installed progressively to reduce the risk of erosion and runoff and ensure soil stability are detailed in the CSWMP.

The Eastern Pygmy Possum (*Cercartetus nanus*) was identified as being potentially present in the EIS. Although not found in survey, the survey results were considered inconclusive in being able to eliminate their potential presence on the Project site. Eastern Pygmy Possums undergo a period of winter torpor, a time during which they would be most vulnerable to clearing and may not respond to the disturbance of encroaching clearance. They may shelter in a variety of locations including tree hollows, rotten stumps, holes in the ground, abandoned bird-nests, Ringtail Possum dreys or thickets of vegetation, (e.g. grass-tree skirts). Potential habitat trees/features for this species, including potential foraging habitat (i.e. nectar-producing plants such as Banksias) have already been cleared during the February/March clearing works that occurred under the Partial Clearing works CEMP. Should further remaining potential habitat trees be located within the clearance zones, the habitat tree clearance procedures (described below), in addition to clearing commencing in late September/early October 2022 will reduce the risk to this species.

### **Habitat Tree Clearing**

As stated above, a pre-clearing survey by the project ecologist in early September 2022 concluded that there are no HBT within the clearing footprint. However it is possible that some HBT are still present at the site that were not previously cleared.

Should a HBT be identified within the clearing footprint, a targeted Hollow Bearing Tree Clearance Report will be prepared by the ecologist. The Hollow Bearing Tree Clearance Report will document:

- what actions have been undertaken to ensure that threatened fauna are not occupying the hollow,
- proposed tree clearance timing, and
- procedures to safely remove hollows and manage tree clearing.

If a subsequent HBT is identified on site, it will be marked with an 'H' and/or flagged with flagging tape (example shown in Figure 6 2). If tape or paint has been removed, it is to be re-



applied during pre-clearing works or prior to vegetation clearing machinery working through the site. The following best-practice vegetation clearing methodology is to be applied to any remaining HBTs within the clearing boundary being felled:

- The pre-clearing checklist (found in Appendix D) is to be addressed and all completed pre-clearing checklists submitted to the Proponent.
- Removal of all HBTs is to be undertaken between 1 February and the first two weeks of March (to the greatest extent practicable) to minimise impacts on breeding of threatened fauna. If clearing of HBT is required outside of this period, the Hollow Bearing Tree Clearance Report will be provided to the Secretary and Biodiversity Conservation Division for consultation prior to proposed clearing.
- The removal of HBT will occur in a staged manner. This first stage will involve the removal of trees surrounding HBTs and is to will occur at least 48 hours before HBTs are removed so that disturbance and reduction in surrounding habitat may encourage fauna sheltering in HBTs to self-relocate. "Surrounding" in this case is to include a clearing radius of at least 10m around the habitat tree, including the felling of smaller trees. More extensive clearing around HBTs is preferable with shrubs, roots and ground cover to be left in situ for erosion and sedimentation control.
- An ecologist will be present during both stages of HBT clearing and will also be present to inspect existing hollow fallen logs and rocks before they are moved. If fauna is found utilising this habitat it is to be relocated to suitable habitat outside the clearing boundary.
- The second stage of the HBT clearing will involve the felling of the identified HBT using the following method:
  - Undertake initial inspection of HBT to identify if any fauna present. If fauna seen, the HBT is to be knocked/shaken as described below to encourage the animal to self-relocate from the tree,
  - Prior to felling, the HBT is to be knocked or shaken with an excavator bucket or other machinery several times to encourage fauna to evacuate the tree during this time or immediately prior to felling,
  - pause and wait five minutes to give fauna the opportunity to escape,
  - repeat knocking or shaking HBT with excavator bucket,
  - pause and wait five minutes to give fauna the opportunity to escape, and
  - using the excavator bucket, slowly lower the tree to the ground. Where feasible, HBT should be lowered in a direction or position such that damage to hollows are minimised.
- Felled trees must be left for at least an hour and If possible overnight on the ground to give any fauna trapped in the trees an opportunity to escape before further processing of the trees.
- An ecologist will be present during this first stage of HBT clearing and will also be present to inspect any existing hollow fallen logs and rocks before they are moved. If fauna is found utilising this habitat it is to be relocated to suitable habitat outside the clearing boundary.
- Should fauna be observed either during the felling process or during the inspection by an ecologist and it can't be safely caught and relocated at the time, the tree should be retained in place for 24 hours to allow fauna the opportunity to move on during the night. The tree should be inspected again the next day to ensure the animal has vacated the tree. If the animal is still present and can't be caught the ecologist should

work with a skilled chain saw operator to access the animal so it can be safely relocated.

- Felled HBTs to be assessed by ecologist and/or arborist for potential for salvaging for either repurposing as nest box or use as ground habitat outside the clearing area, and subsequently salvaged and repurposed as practical.
- Results and outcomes of fauna rescued and or relocated during the clearing works will be documented and provided to the proponent.

All persons working on the vegetation clearing will be briefed in inductions and/or toolbox talks about the possible fauna present at the time of construction, and what procedures should be undertaken in the event of an animal being injured or disturbed.



**Figure 6-3** Hollow-bearing tree identification. Hollow-bearing tree were marked with an 'H' and with high-visibility flagging tape.

### **Clearing of all other vegetation**

For removal of all remaining vegetation including the understorey vegetation, non-hollow bearing trees, and trees not removed by Forestry, the following best-practice vegetation clearing methodology is to be applied where possible:

- The pre-clearing checklist (found in Appendix D) should be completed.
- A fauna handler or ecologist will be onsite during vegetation clearing within sensitive areas identified within the pre-clearing survey that require on-site surveillance by an ecologist (refer Section 6.1.8). Non-habitat vegetation clearing outside of sensitive areas does not require an ecologist to be present.
- The clearing process should be undertaken in a manner sensitive to the potential presence of fauna during the clearing process.

- Grubbing and soil disturbance should be avoided in the Vegetation Recolonization Zones where clearing is for temporary access. The eight Vegetation Recolonization Zones are identified in Figure 6-2. Retained roots can assist in soil stabilisation and some regrowth and coppicing can assist in the rehabilitation stage postconstruction.
- Weed and exotic vegetation in seed should be removed and disposed of appropriately to prevent spread as required under the Biosecurity Act 2015. This would namely include *Rubus fruticosus* spp. agg. (Blackberry), *Cenchrus clandestinus* (Kikuyu Grass), *Solanum pseudocapsicum* (Jerusalem Cherry) and *Sida rhombifolia*.
- Trees near the clearing boundary should be felled in a manner to minimise damage to retained vegetation. Felling into the clearing area is preferable when there are no other safety constraints.
- Hollow log habitat is to be relocated to a vegetation retention zone. The supervising ecologist should be consulted during this process.
- Should fauna be observed either during the felling process or during the inspection by an ecologist, the tree should be retained in place for 24 hours to allow fauna the opportunity to move on during the night.

## 6.2 Fauna Rescue and Release Procedure

### 6.2.1 General Protocols

Should fauna be observed on the site during vegetation clearing activities, and there is a risk these activities may harm the animal or pose risk to site personnel, the following steps are to be taken.

- stop all work in the vicinity of the fauna and immediately notify the Site Supervisor / Environmental Manager,
- if possible, allow fauna to leave the area without intervention (ie self-relocate), and
- if fauna cannot or will not leave the area without intervention, the fauna is to be removed by a suitably qualified ecologist, licensed fauna ecologist or wildlife carer with specific animal handling experience using the following methodology:
  - cover larger animals with a towel or blanket and place it in a cardboard box and/or canvas bag
  - place smaller animals in a cotton bag, tied at the top
  - keep the animal in a quiet, cool, ventilated and dark location away from noisy construction activities until it can be relocated
  - frogs will be transported in moistened plastic bags (1 frog/bag) with a small amount of leaf litter. The translocation of frogs shall be in accordance with the Hygiene Protocol for the Control of Disease in Frogs
  - if the animal cannot be handled (i.e., venomous reptiles):
    - exclude all personnel from the vicinity with fencing and/or signage
    - record the exact location of the animal/s and provide to the qualified ecologist or appropriate rescue agency (i.e., WIRES).

### 6.2.2 Injured Fauna

Should fauna be injured as part of the vegetation clearing works within the clearing boundary, the follow steps are to be taken:

- call the appropriate rescue agency immediately and follow any advice provided by the agency,

- once the rescue agency arrives at the site, they are responsible for the animal. Any decisions regarding the care of the animal will be made by the rescue agency, and
- in the event the rescue agency and/or local veterinary service cannot be contacted, the injured animal will be delivered to the nearest prequalified veterinary clinic for treatment where, if assessed by a vet as unlikely to survive, it will be humanely euthanized.

The relevant fauna rescue services and local veterinary surgeries contact details are listed in Table 6-1.

**Table 6-1** Fauna rescue services' contact details

Agency/Business	Contact Number
Vanessa Place (Southern Cross Environmental)	0437 431 625
WIRES	1300 094 737
Vet 1 – Narooma Veterinary Hospital	(02) 4476 1125
Vet 2 – Moruya Veterinary Hospital	(02) 4474 2532

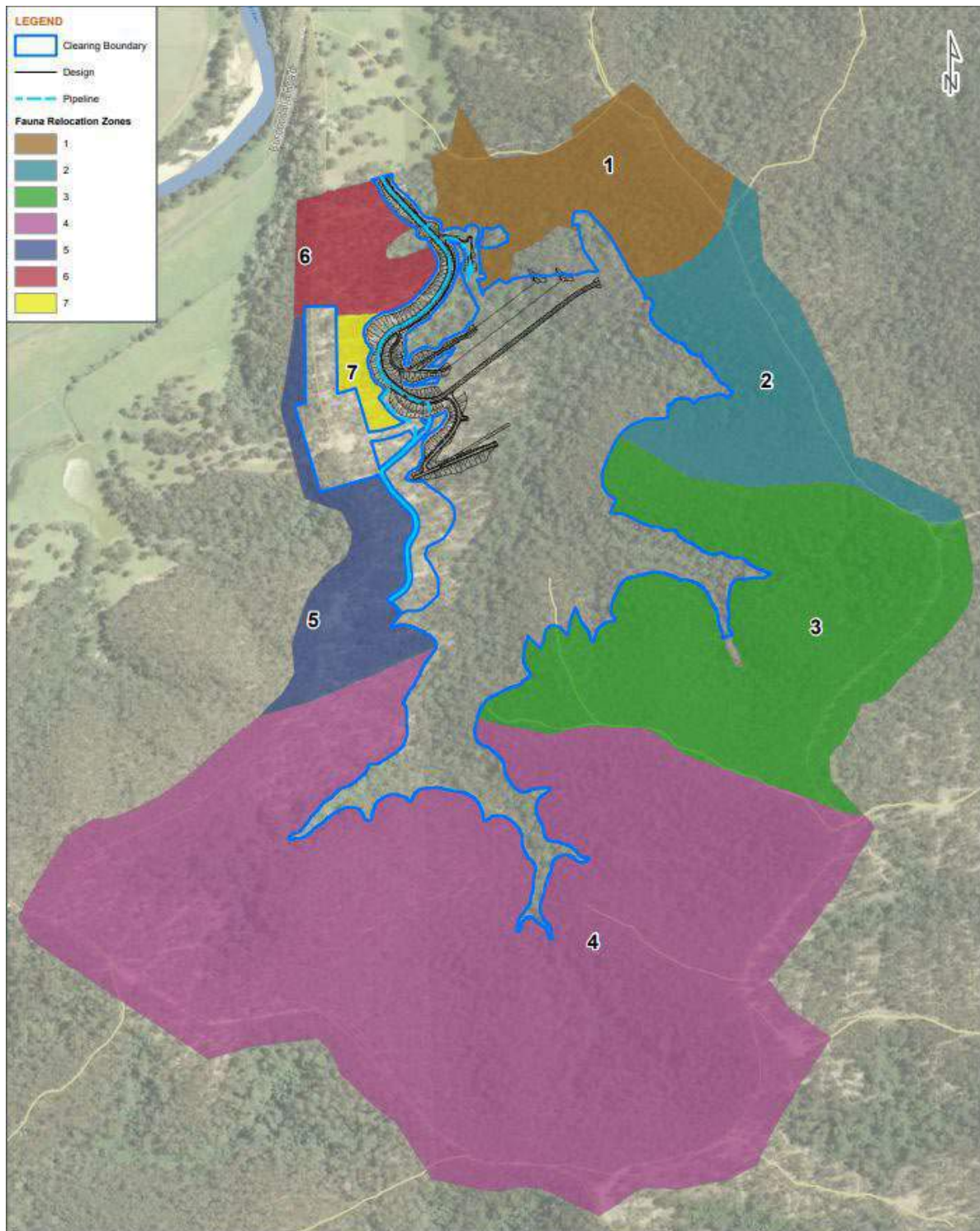
### 6.2.3 Relocation of Fauna

Relocation of fauna adjacent to the construction footprint is to be carried out where possible by a qualified ecologist or wildlife rescuer and is to be recorded as part of the pre-clearance reporting obligations. If the animal is not injured or stressed, it may be released nearby in an area that is not to be disturbed by the works and in accordance with the following procedures:

- site identified as a suitable release point by the qualified ecologist or wildlife rescuer,
- release site is to contain similar habitat (the same vegetation community if possible) and occur as close to the original capture location as possible without placing the animal in danger from the continuing constructing works,
- if the species is nocturnal, release is to be carried out at dusk or after nightfall to minimise the risk of predation by diurnal predators,
- release would generally not be carried out during periods of heavy rainfall, and
- hollow-dependent species, particularly those with dependent young, shall be released onto the trunk of a tree that has had a (temporary) nest box installed, or, if not feasible, onto the trunk of an identified (and retained) HBT.

The native vegetation adjacent to the clearing boundary on the eastern and western uphill slopes offers the best relocation sites for most species and shown as the 'Fauna relocation zones' in Figure 6-4. These areas of native vegetation are contiguous with the native vegetation of Bodalla State Forest and should provide any relocated fauna with an opportunity to disperse away from potential further danger associated with continuing construction activities at the site. The south of the water storage site also supports dry rainforest and rocky creek lines within the steeper gullies and may also be a suitable relocation site for fauna that may require such habitat.





**Figure 6-4** Fauna Relocation Zones

#### 6.2.4 Fauna handling information

Unless the welfare of the animal is under immediate risk and it is safe to do so, animals would only be handled by the project ecologist or a wildlife rescue organisation (WIRES representative).

### 6.3 Weed and Pathogen Control Procedure

Management of weeds, pathogens and disease risk is detailed in Appendix A – Weeds and pathogens management plan.

### 6.4 Unexpected threatened species finds

If any threatened species are observed within the site during the clearing activities, the following procedure is to be followed:

- immediately cease all work likely to affect the threatened species,
- the ecologist is to be contacted to determine the appropriate corrective actions and additional safeguards to be carried out,
- the adequacy of existing safeguards will be reviewed in consultation with the project ecologist, and
- the Environment Manager is to record the find using the Environmental Incident Reporting process. All relevant characteristics of the find should be recorded to the fullest extent practicable.

### 6.5 Biodiversity offsets

The project has been designed and developed in accordance with Principle 1 of the NSW Biodiversity Offsets Policy for Major Projects (NSW Government 2014a) that requires that project proposals consider all reasonable measures to avoid and minimise impacts on biodiversity.

After efforts to avoid and minimise impacts on biodiversity in line with the NSW Biodiversity Offsets Policy for Major Projects Policy, unavoidable impacts would require offsetting. The Biodiversity Offset Strategy (SMEC 2021) has been developed by Eurobodalla Shire Council to offset the impacts to native vegetation and species and populations.

Native vegetation impacts requiring offsetting:

- The removal of 37.56 hectares of SR643: Spotted Gum - White Stringybark - Burrawang shrubby open forest on hinterland foothills, northern South East Corner Bioregion.
- The removal of 9.57 hectares of SR551: Grey Myrtle - Lilly Pilly dry rainforest in dry gullies of the Sydney Basin Bioregion and South East Corner Bioregion.
- The removal of 7.19 hectares of SR609: River Peppermint - Rough-barked Apple moist open forest on sheltered sites, southern South East Corner Bioregion.
- The removal of 0.22 hectares of SR608: River Peppermint - Rough-barked Apple - River Oak herb/grass forest of coastal lowlands, southern Sydney Basin Bioregion and South East Corner Bioregion.
- The removal of 0.07 hectares of SR533: Coast Grey Box - Mountain Grey Gum - stringybark moist shrubby open forest in coastal gullies, southern South East Corner.

Species and populations requiring offsetting

- Impacts to 0.07 hectares of *Correa baeuerlenii* habitat within SR533.

- Impacts to 37.56 hectares of *Genoplesium vernale* habitat within SR643.
- Impacts to 0.07 hectares of *Persicaria elatior* habitat within SR533.
- Impacts to 0.22 hectares of *Galium astralale* habitat within SR608.
- Impacts to 0.22 hectares of Southern Myotis habitat within SR608.
- Impacts to 54.39 hectares of Giant Burrowing Frog habitat within SR643, SR551, SR609 and SR533.
- Impacts to 54.39 hectares of Eastern Pygmy-possum habitat within SR643, SR551, SR609 and SR533.
- Impacts to 0.22 hectares of Koala habitat within SR608.
- Impacts to 0.07 hectares of Southern Brown bandicoot habitat within SR533.

Eurobodalla Shire Council has developed a Biodiversity Offset Strategy (29 November 2021) for the entire Project that has been approved by Secretary of Planning 9 December 2021.

## 7 Rehabilitation and re-vegetation

The goal of rehabilitation and re-vegetation is to manage vegetation through on-site weed and disease risk mitigation measures (see Appendix A: Weeds and pathogens management plan), temporary vegetation in disturbance areas as well as maintaining and improving vegetation retention areas.

Rehabilitation of temporary construction areas will be undertaken using a combination of natural regeneration and rehabilitation. Regeneration is expected to occur via soil bourn seeds and seed rain from neighbouring zones of retained vegetation. Where regeneration is ineffective, rehabilitation such as active topsoil replacement, sowing of seeds, mulching, hydro mulching and by return of brush/branches/logs will be investigated.

Management of weeds and invasive species reduces competition and displacement pressures in the revegetation and recolonization zones, therefore promoting the likelihood of successful recolonisation of local native flora species. If natural recolonisation is not successful as determined during monitoring, supplementary planting may be required.

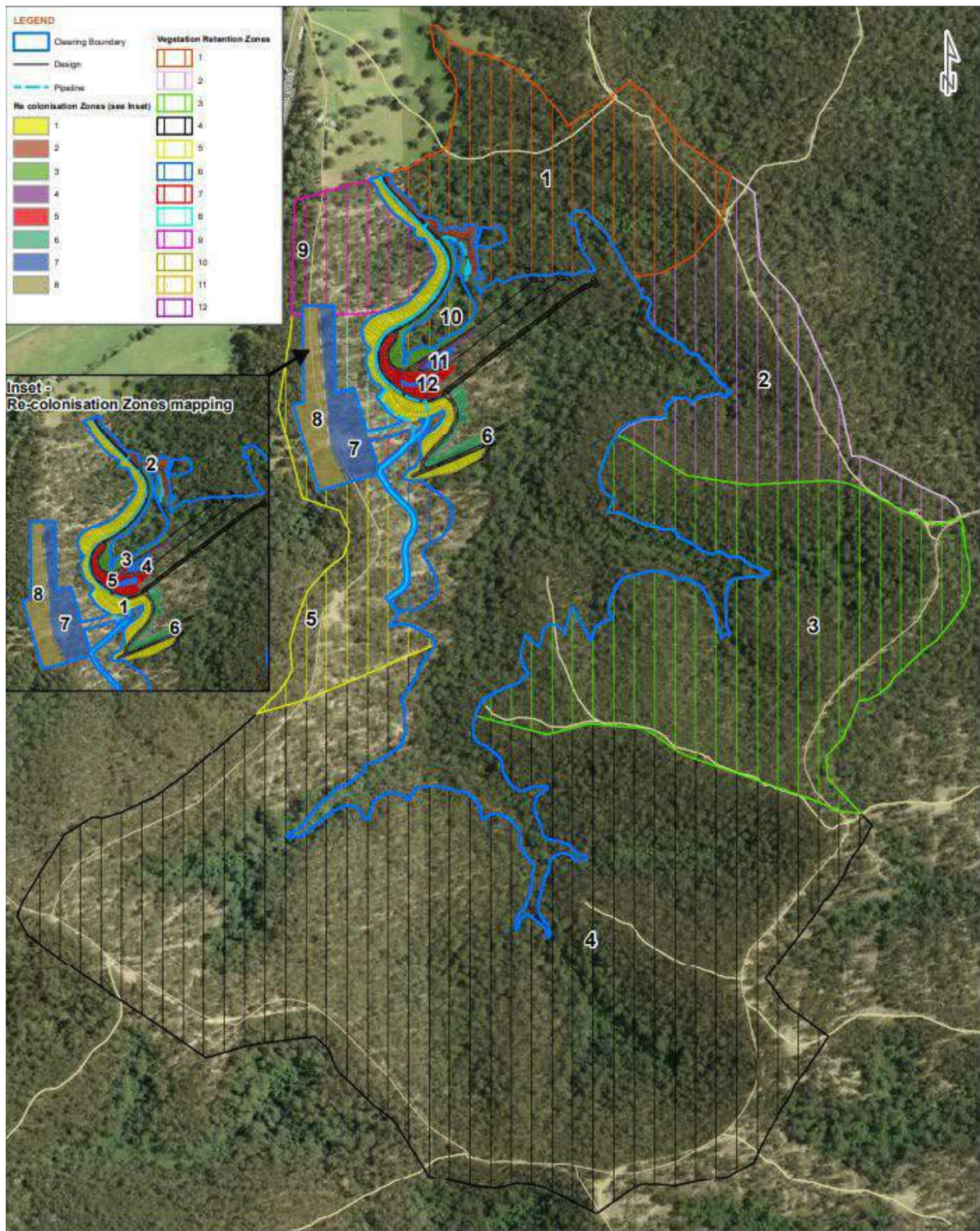
### 7.1 Retention and recolonisation of vegetation

Eurobodalla Shire Council has identified twelve (12) vegetation retention zones (VRZs) that are beyond the construction boundary of the project and committed to long term management measures in each zone. The main management objectives is the prevention of weed and invasive species colonising the revegetation and recolonization zones as a result of vegetation clearing works. The VRZs correspond to the no-go zones outlined in Section 6.1.3 and are to be appropriately managed as no-go zones for the duration of the project.

Within the construction footprint, eight (8) revegetation and re-colonisation zones have been identified. These are areas that will be impacted during construction but are not identified for permanent clearing as part of the inundation area.

Management Zones	Management Objective	Action	Timing / Responsibility
Recolonisation Zones 1 -8	Promote the re-colonisation of locally native flora species	Control the weeds and invasive flora species. This may include physical removal and/or the use of herbicide.	After construction Eurobodalla Shire Council
	Prevent the colonisation of weed and invasive flora species		





**Figure 7-1 Vegetation Retention Zones and Re-colonisation Zones**

\*Note that the northern and eastern edge of Area 1, where the Lot changes, is not ESC owned land and does not form part of the project boundary or scope.

**Table 7-1** Flora and fauna management and mitigation measures

ID	Measure/Requirement	Resources needed	When implement to	Responsibility	Reference	Evidence
<b>GENERAL</b>						
M1	An unexpected finds procedure has been developed	Induction Procedure /	During project	Project team	REMM 3.1	Unexpected finds report
M2	Erosion and sediment controls will be established.	ESCP	Pre-and during project	Project team		EWMS
M3	Investigate measures throughout design phase to reduce vegetation removal impact.	Design meetings	Pre-clearing and during project	Project and design team	REMM 3.2 and 3,8	Project meeting minutes
M4	A Biodiversity Offset Strategy for offset impact to vegetation clearing.	Offset Strategy	During and after project completion	Eurobodalla Shire Council	REMM 3.3	Biodiversity Offset Strategy
<b>VEGETATION CLEARING</b>						
M5	Pre-clearing checklist to be completed identifying sensitive areas, weeds and habitat trees.	Pre-clearing Checklist	Prior to clearing	Environment Manager	B5 and REMM 3.1	Pre-clearing Checklist
M6	Incorporate discussion on flora and fauna impacts and mitigation measures into Site Induction.	Induction	During induction	Project Team	B5	Induction record

ID	Measure/Requirement	Resources needed	When implement to	Responsibility	Reference	Evidence
M7	Ensure no-go areas are delineated.	Flagging / Bunting fencing	Prior to clearing	Project Team	B4 (a) and REMM 3.1 and 3.6	No-go zone maps and photos
M8	Ensure habitat trees are marked.	Sign and / or bunting	Prior to clearing	Ecologist / Environment Manager	B4 (e)	Habitat tree location map and ecologist report
M9	Clearing of HBT will be a two-staged process where non-habitat trees are removed first allowing fauna time to move to other areas and then following a minimum duration period of one (1) night, habitat trees are removed.	Pre-start/EWMS	During clearing works	Ecologist / Project Team	B4 (e) and REMM 3.9	Ecologist report / Environmental Inspection Checklist
M10	Removal of all HBTs is to be undertaken between 1 February and the first two weeks of March (to the greatest extent practicable) to minimise impacts on breeding of threatened fauna. If clearing of HBT is required outside of this period, the Hollow Bearing Tree Clearance Report will be provided to the Secretary and Biodiversity Conservation Division for consultation prior to proposed clearing.	Program	During clearing works	Ecologist / Project Team	B4 (e)	Ecologist report / Environmental Inspection Checklist



ID	Measure/Requirement	Resources needed	When implement to	Responsibility	Reference	Evidence
M11	Trees to be removed adjacent to the boundary will be felled in such a way as to avoid falling into and damaging adjacent vegetation outside the construction footprint.	Pre-start EWMS /	During clearing	Arborist	B4 (c)	Environmental Inspection Checklist
M12	Prior to felling, trees will be 'tapped' by the excavator bucket (or other clearing equipment apparatus) to provide an opportunity for animals to escape.	Pre-start/ EWMS	During clearing	Arborist	B4 (e)	Environmental Inspection Checklist
M13	If fauna is observed in trees whilst felling, then clearing work is to cease and personnel fall back to allow fauna a chance to vacate the area.	Pre-start/ EWMS	During clearing	Clearing contractor	B (e)	
M14	Felled habitat trees will remain on the ground for a short period to allow time for any trapped fauna to escape. All hollows will be left on the ground for 24 hours immediately after felling and prior to further processing of the tree.	Pre-start/ EWMS	During clearing	Arborist / Ecologist	B4 (e)	Ecologist report / Environmental Inspection Checklist

ID	Measure/Requirement	Resources needed	When implement to	Responsibility	Reference	Evidence
M15	If fauna are found to be utilising the site, or a nest, hollow or roost is found, the animals will be relocated by a qualified ecologist or other authorised person to outside the construction footprint.	Pre-start/ EWMS	During clearing	Ecologist	B5	Ecologist report / Environmental Inspection Checklist
M16	In consultation with ESC and their Nest Box Management plan, salvage any suitable hollows from HBT that are removed.	EWMS	Pre- and during clearing	Ecologist / Arborist	B4 (e)	Ecologist report / Environmental Inspection Checklist
M17	Relocate any appropriate habitat logs into the no-go zones (VRZs).	EWMS	During clearing	Ecologist / Arborist	B4 (d)	Ecologist report / Environmental Inspection Checklist
<b>FAUNA HANDLING</b>						
M18	Capture and relocation of fauna to be carried out by a qualified ecologist or WIRES.	Pre-start EWMS	/ During clearing	Ecologist / WIRES	REMM 3.8	
<b>WEED MANAGEMENT</b>						
M19	Undertake weed management of areas of identified weed infestations.	EWMS	Pre-clearing and during project	Project team / Ecologist	B4 (C)	Environmental Inspection Checklist
<b>REHABILITATION AND REVEGETATION</b>						

ID	Measure/Requirement	Resources needed	When implement to	Responsibility	Reference	Evidence
M20	Utilise locally collected seed or as close as possible for revegetation works.	EWMS	Post construction	Environment Manager	B4 (f) (i)	Ecologist Report/Rehabilitation Strategy

## **8 Compliance management**

---

### **8.1 Roles and responsibilities**

The Haslin Project Team's organisational structure and overall roles and responsibilities are outlined in Section 3.3 of the CEMP. Specific responsibilities for the implementation of environmental controls are detailed in Section 6 of this Plan.

### **8.2 Training**

To ensure that this management plan is effectively implemented, each level of management is responsible for ensuring that all personnel reporting to them are aware of the requirements of this plan. The Environment Manager will coordinate the environmental training in conjunction with other training and development activities (eg safety) in accordance with Section 3.4 of the CEMP.

### **8.3 Monitoring and inspections**

Inspections of sensitive areas and activities with the potential to impact flora and fauna will occur for the duration of the project.

Requirements and responsibilities in relation to monitoring and inspections are documented in Section 3.8 of the CEMP.

### **8.4 Reporting**

Environmental monitoring and reporting will be undertaken in accordance with section 3.8.3 of the CEMP. There are no specific reporting requirements for Flora and Fauna, though the following will be recorded by the Environment Manager and provided to Council at the completion of clearing:

- Fauna injuries.
- HBT's and hollows removed.
- Habitat logs relocated.

## **9 Review and improvement**

---

### **9.1 Continuous improvement**

Continuous improvement of this plan will be achieved by the ongoing evaluation of environmental management performance against environmental policies, objectives and targets for the purpose of identifying opportunities for improvement. The continuous improvement process will be designed to:

- Identify areas of opportunity for improvement of environmental management and performance.
- Determine the cause or causes of non-conformances and deficiencies.
- Develop and implement a plan of corrective and preventative action to address any non-conformances and deficiencies.
- Verify the effectiveness of the corrective and preventative actions.
- Document any changes in procedures resulting from process improvement.
- Make comparisons with objectives and targets.

### **9.2 FFMP update and amendment**

The processes described in Section 3.9 to Section 3.13 of the CEMP may result in the need to update or revise this Plan. This will occur as needed.

Any revisions to the FFMP will be in accordance with the process outlined in Section 3.13 of the CEMP.

# Appendix A – Weeds and Pathogens Management Plan

## Overview

Measures to manage the current weeds within the project area and to prevent the colonisation of weeds are to be addressed throughout the project from pre-construction through to operation. For the purposes of this CFFMP this includes the initial removal of existing weeds within the clearing boundary and undertaking measures to reduce the risk of introduction and spread of weeds.

General hygiene measures are detailed and will be followed throughout the clearing period. Follow up weed treatment and monitoring are also outlined in this plan.

## Hygiene measures and protocols

The following general weed and hygiene management measures are to be adopted for the project:

- light vehicles and road trucks should be brought to site in clean condition to prevent the introduction of new weeds or pathogens,
- a wash bay equipped with a hose and backpack or handheld sprayer containing disinfectant solution will be established on site,
- light vehicles and road trucks, that enter areas on site where topsoil has not been removed, should have soil and plant material cleaned before leaving the site in order to prevent the transport of weeds into areas outside the development site, and
- all mobile plant arriving on site would be washed and treated in the wash down bay before commencing work. The plant (namely wheels, chassis, undercarriage) would be cleaned to remove loose soil and weed propagules and then disinfected for pathogens using the disinfectant solution.

## Priority Weed Control

Weeds that are listed as 'priority weeds' for Eurobodalla LGA must be removed from the site or controlled depending on the category of weed and according to the provisions of the Biosecurity Act. Priority weed control is to be carried out across the entire site for the duration of the project. Works will be undertaken according to industry best practices.

## Primary Weeding

Primary weeding, which was undertaken prior to HBT harvesting, is the first round of weeding activity and involves the removal of most of the weed biomass present (shown in Figure A-1). Primary weeding methods include:

- 'cut-and-paint', 'frill and fill', long stem scrape or target spraying of woody weeds (e.g., *Grevillea robusta*),
- hand-removal and spot spraying of smaller woody, vine and herbaceous weeds, and
- spot-spraying and hand-weeding of annuals (e.g., Blackberry, Fireweed and *Bidens pilosa*).

## Secondary Weeds

Secondary weeding will occur approximately one to three months after the commencement of works, depending on the amount of regrowth of herbaceous annuals (and other weeds that have an abundant seed source present in the soil). The site will be inspected at regular monthly intervals by the Environment Manager to determine the need and appropriate timing of secondary weeding. This will vary according to the timing of the primary weeding, insofar as regrowth will be stronger if primary weeding occurs during spring and summer, and slower during autumn and winter. The need for secondary weeding will also depend on climatic conditions in the intervening period (e.g., periods of sustained rainfall will promote germination of weed seeds and require secondary weeding to occur sooner than it would under dry conditions).

Secondary weeding will involve the targeted removal of priority weed regrowth and hand removal and spot spraying of exotic grasses, herbaceous weeds and seedlings of woody weeds.

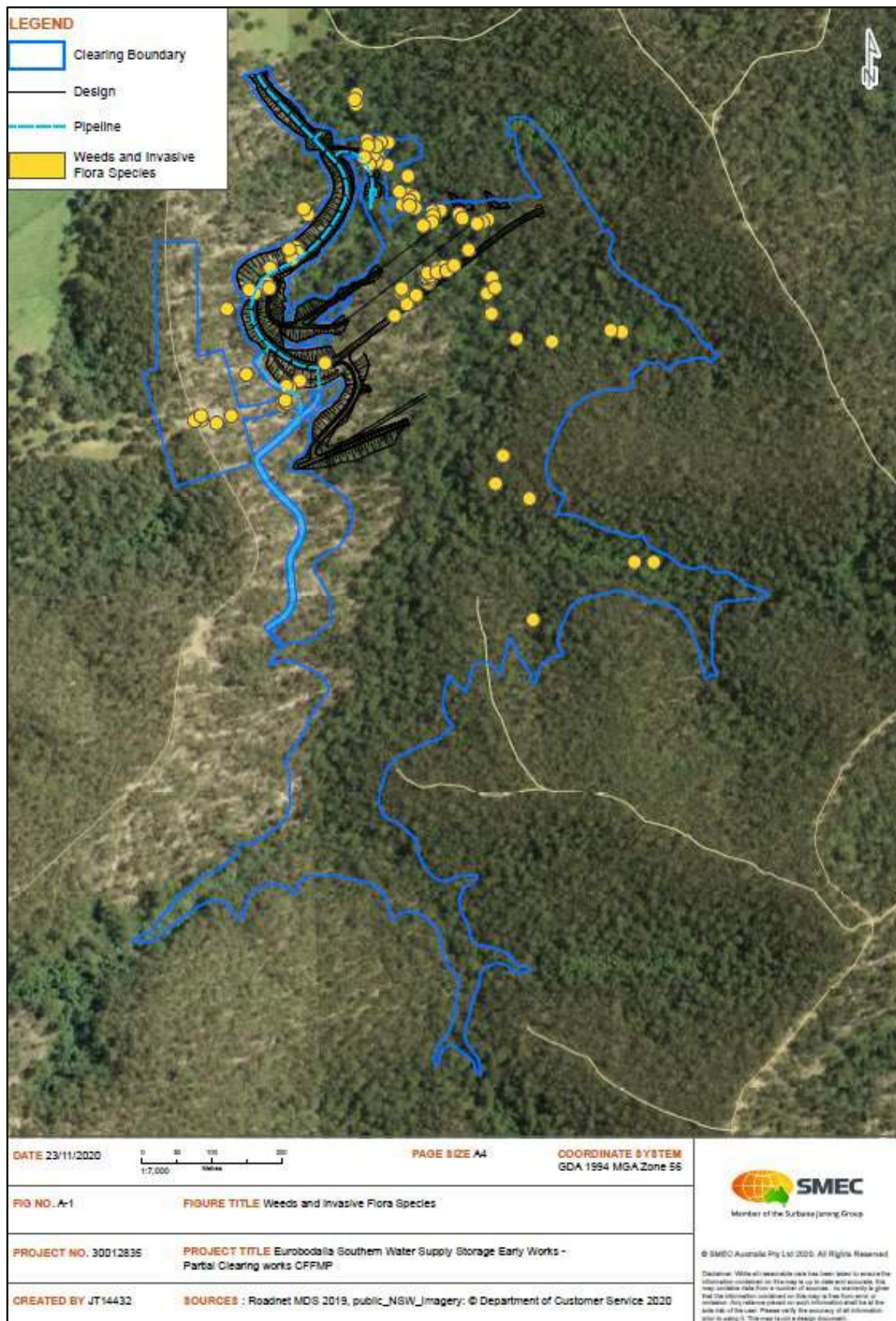
### **Maintenance Weeding**

Maintenance weeding will occur throughout construction as required. This will involve the removal and management of weeds throughout the project area where required, including the revegetation zones. The River Flat Eucalypt Forest that occurs adjacent to the Storage Site Clearing Boundary is also required to be monitored for weeds and invasive flora species throughout construction.

### **Herbicide application**

Herbicide applications by cut and paint, frill and fill, long stem scrape or spray will mainly use Glyphosate (or equivalent). Treatment of some noxious weeds species or grass weeds may require selective or residual herbicides. The use of herbicides on the site must be in accordance with labelling instructions and MSDS's and comply with the NSW Pesticides Act 1999. Herbicides should generally be applied when wind speeds are low. Where possible herbicide application should take place after two consecutive days with no rain; application should be delayed if rain is forecasted. Appropriate PPE should be worn during herbicide application.





**Figure A1** Known weed locations on site

## Appendix B – River Flat Eucalyptus Forest Management Plan

River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South-East Corner Bioregions (River Flat Eucalypt Forest) is an endangered ecological community listed under the Biodiversity Conservation Act 2016. River Flat Eucalypt Forest occurs throughout the bottom of the valley within the Eurobodalla Southern Storage Site being associated with alluvial soils and higher levels of groundwater compared to the surrounding slopes and ridges. Approximately 7.68 hectares of River Flat Eucalypt Forest has been mapped in the Eurobodalla Storage Site. This management plan aims to protect areas of River Flat Eucalypt Forest not occurring within the Storage Site clearing boundary and regenerate the areas that are only temporarily impacted by the construction works.

### Management Actions

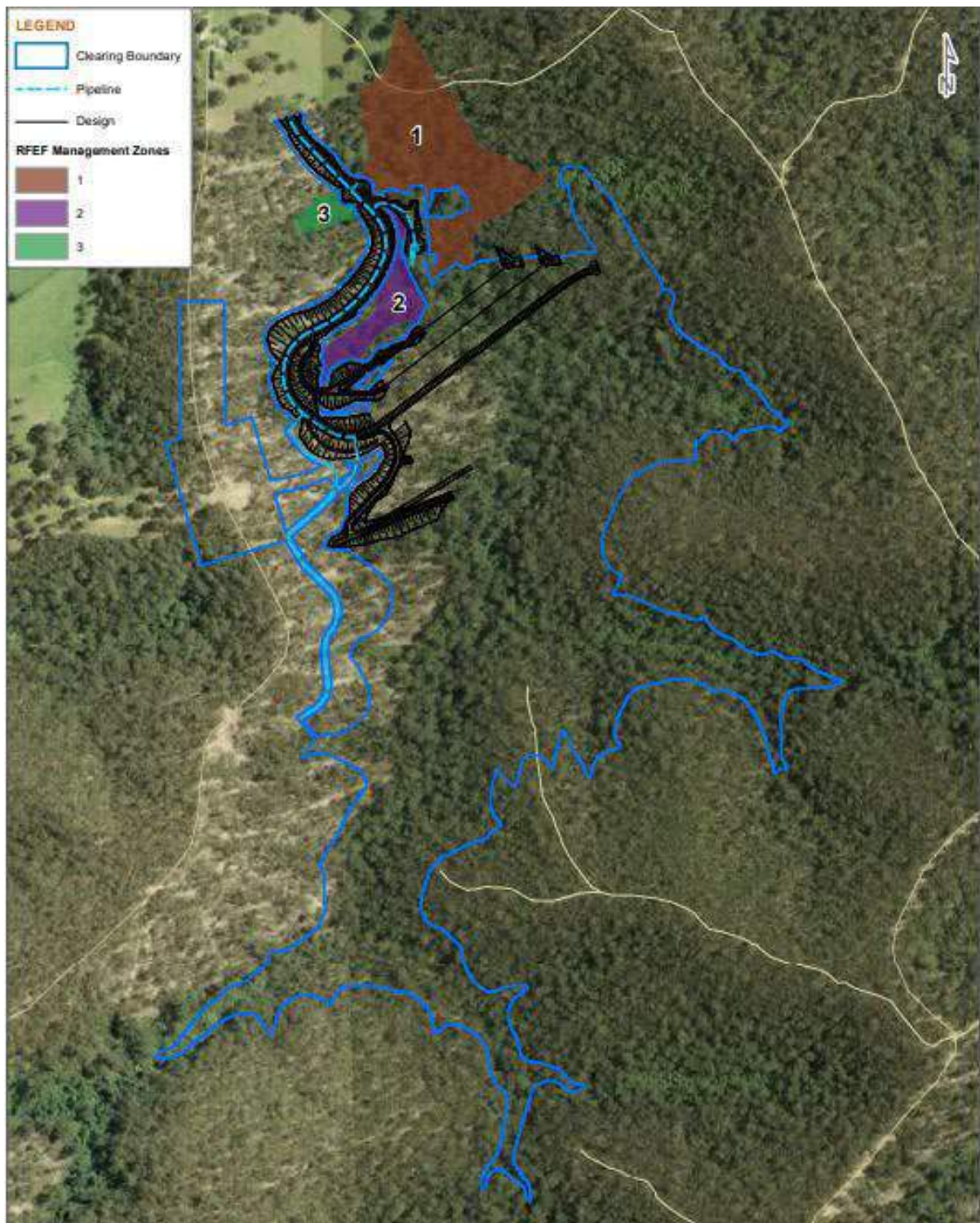
This management plan describes management actions which are required to conserve and maintain the remnant stands of River-Flat Eucalypt Forest. Table B-1 outlines the purpose and outcomes of these management actions applied to the River Flat Eucalypt Forest within and immediately adjacent to the Storage Site Construction Footprint.

**Table B-1** River Flat Eucalypt Forest management actions

Management Action	Purpose	Timing
Sediment control measures (detailed in the SWMP)	To minimise sediment-laden run-off from the construction works entering into the waterways that support River Flat Eucalypt Forest.	Pre-construction
	To minimise the spread of weed and invasive flora seed and material into the adjacent River Flat Eucalypt Forest.	
	To prevent temporary and permanent changes in hydrology that impacts groundwater availability.	
Delineate Storage Site Clearing Boundary. Areas are to be marked with high-vis flagging rope.	To prevent the accidental clearing	Pre-construction
	To prevent the spread of weed and invasive flora seed and material	

Management Action	Purpose	Timing
Hygiene controls (see Appendix A: Weeds and pathogens management plan)	To prevent the spread of weed and invasive flora seed and material via plant, machinery and personnel into the adjacent River Flat Eucalypt Forest.	During pre-construction and construction
Weed control (see Appendix A: Weeds and pathogens management plan)	To promote the regeneration of River Flat Eucalypt Forest temporarily cleared during the construction works.	Pre-construction, during construction and post-construction.
	To prevent the spread of weed and invasive flora species into adjacent areas of River Flat Eucalypt Forest.	
	To assess the presence of weeds and invasive species in the temporarily cleared and recovering area of River Flat Eucalypt Forest.	
	To assess the presence of recolonising native species in the temporarily cleared and recovering area of River Flat Eucalypt Forest.	
Water quality monitoring	Monitoring water quality during construction will be conducted to determine potential impacts on the EEC. Corrective measures will be applied in consultation with the Environment Manager	During construction





**Figure B-1 River-Flat Eucalypt Forest Management Zones**

## Appendix C – Nest Box and Connectivity Management Plan

The EIS for this project stated that 'equivalent nest boxes should be erected for each natural hollow that is removed during the construction phase. Replacement nest boxes should be suitable for the threatened and non-threatened fauna inhabiting the development site.

Initial clearing works for removal of habitat (hollow bearing trees) and salvageable timber was carried out under the Partial Clearing CEMP (SMEC 2022). A Nest Box Strategy was included in the CEMP and nest boxes were erected before removal of hollow bearing trees by Eurobodalla Shire Council (Section 6.1.8). In total 91 hollows were removed during the Partial Clearing stage which focused on HBT removal. These works allowed for any suitable hollows to be salvaged and repurposed for hollows. In total there were 20 hollows salvaged for reuse as nest boxes.

If additional HBT clearing is identified during the main clearing works, the number and type of hollows will be recorded and provided to Eurobodalla Shire Council. The need for further nest boxes will be determined by Eurobodalla Shire Council with reference to Nest Box and Connectivity Management Plan 2022.

## Appendix D – Pre-clearing Checklist

#	Control Measure	Y/N/NA	Comments/Corrective Actions
1	Has the extent of works been clearly delineated and is consistent with the approved limit?		
2	Have clearing boundary limits been established and clearly marked with demarcation rope or fenced off? Please comment on how the limit has been identified on the ground.		
3	Has the project ecologist completed the pre-clearing inspection?		
4	Do all habitat trees have clear visible marking with "H" or flagging tape?		
5	Were any native animals or active nests and habitat features other than the habitat trees observed and marked, or fauna relocated?		
6	Were any threatened flora species identified during preclearance survey? If yes, was this translocated (with appropriate approvals) from the clearing area or fenced off for protection prior to clearing?		
7	Have areas of weed infestation been identified and are measures in place for removal and appropriate disposal?		
8	Have sediment control measures been installed before clearing as required by the Soil and Water Management Plan?		
9	Have sensitive areas requiring on-site supervision by an ecologist/fauna catcher during clearing activities been identified?		
10	Is an ecologist/fauna catcher available to be onsite during clearing of identified sensitive areas?		
11	Has WIRES / local licenced wildlife carer or fauna handler been notified of the intention to commence clearing?		
12	Have the relevant personnel been briefed on the staged clearing process including that for habitat trees		
13	Have all relevant staff and contractors been briefed during toolbox talks on the clearing limits, no go areas, clearing process, descriptions of fauna that may be present and fauna handling procedures?		



## Appendix E – Consultation

**From:** Nicholas Francesconi <[nfrancesconi@strategicenvironmentalsupport.com.au](mailto:nfrancesconi@strategicenvironmentalsupport.com.au)>

**Sent:** Friday, 29 July 2022 10:02 AM

**To:** Carla Ganassin <[carla.ganassin@dpi.nsw.gov.au](mailto:carla.ganassin@dpi.nsw.gov.au)>

**Cc:** Andrew Lynam <[alynam@haslin.com.au](mailto:alynam@haslin.com.au)>

**Subject:** Eurobodalla Southern Water Supply Storage project

Morning Carla,

Haslin Constructions has been contracted by Eurobodalla Shire Council to construct the Eurobodalla Southern Water Supply Storage project near Bodalla. I'm supporting Haslin Constructions with their environmental approvals (CEMP/Sub plans and EPL).

I'm mindful that the Development Consent requires the Construction Soil and Water Management Plan plus the Construction Flora and Fauna Management Plan to be developed in consultation with DPI Fisheries. I can see that you reviewed the Soil and Water / Flora and Fauna plans in December 2021 for Council and wanted to understand whether DPI Fisheries was interested in reviewing the Haslin Constructions CEMP/Sub Plans cover.

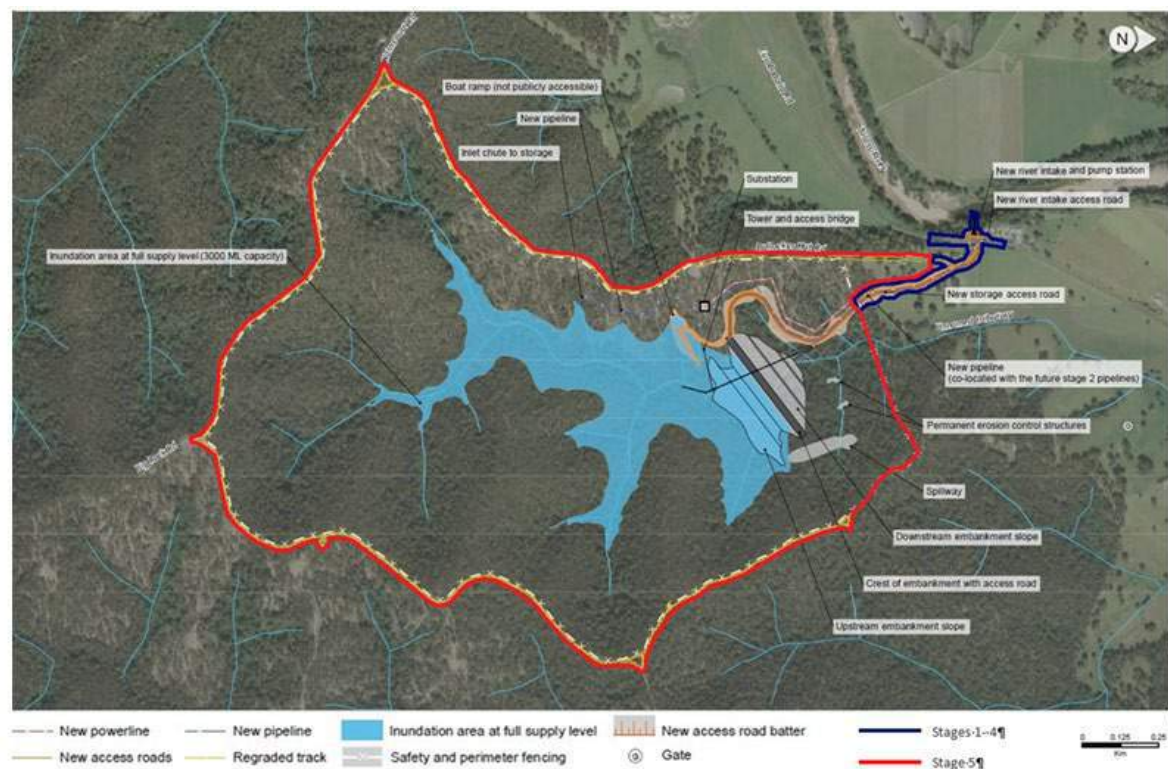
The reason I ask is because there is no requirement for Haslin Constructions to work in/around the Tuross River (which I can appreciate is the key focus of DPI Fisheries) as this has already been delivered for Council. The works in the Tuross River identified in blue on the map below have been delivered by Quay Civil already. Eurobodalla Shire Council has commenced constructing the access road into the site and Haslin Constructions will finish these works off under the already approved CEMP and sub plans.

Therefore the CEMP and Sub plans I've developed for Haslin Constructions only cover the inundation area (identified in red below). The key focus for the Haslin Constructions CEMP/Sub Plans is minimising impacts of terrestrial biodiversity and protecting water quality impacts to the unnamed tributary.

In light of the above, can you please let me know whether or not DPI Fisheries has interest in reviewing the Flora and Fauna Sub Plan/Soil and Water Sub Plan.

Please feel free to call me if you'd like to discuss, I've left a voicemail on your mobile this morning.

regards





## RE: Eurobodalla Southern Water Supply Storage project



Carla Ganassin <carla.ganassin@dpi.nsw.gov.au>

To: Nicholas Francesconi

Cc: Andrew Lynam

Reply

Reply All

Forward



Fri 29/07/2022 2:06 PM

You forwarded this message on 29/07/2022 6:19 PM.

Hi Nicholas,

Thanks for checking in with DPI Fisheries about this. We do not have an interest in reviewed the Flora & Fauna and Water Quality Sub-Plans for the dam construction works.

That said, pleas ensure best practice erosion and sediment control techniques are used during construction to manage and mitigate sedimentation inputs to the tributary and Tuross River downstream.

Regards,

**Carla Ganassin**

Senior Fisheries Manager, Coastal Systems

DPI Fisheries | Aboriginal Fishing & Marine & Coastal Environments

**Department of Regional NSW**

**T** 4222 8342   **M** 0447 644 357   **E** [carla.ganassin@dpi.nsw.gov.au](mailto:carla.ganassin@dpi.nsw.gov.au)

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Block E Level 3, 84 Crown St (PO Box 5106) Wollongong NSW 2520



**Department of Primary Industries**

Department of Regional NSW

We stand on Country that always was and always will be Aboriginal land. We acknowledge the Traditional Custodians of the land and waters, and we show our respect for Elders past, present and emerging. We are committed to providing places in which Aboriginal people are included socially, culturally and economically through thoughtful and collaborative approaches to our work.

# HASLIN

## Noise and Vibration Management Plan

Eurobodalla Southern Water Supply Storage Project



Construction  
Consultative  
Committee

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## Glossary/ Abbreviations

Term / Abbreviations	Definition / Expanded Text
Ambient noise	The all-encompassing noise associated within a given environment at a given time, usually composed of sound from all sources near and far
Attenuation	The reduction in the level of sound or vibration.
CEMP	Construction Environmental Management Plan
Council	Eurobodalla Shire Council
Development	The development described in the Eurobodalla Southern Water Supply Storage Environmental Impact Statement
Development Consent	The Minister for Planning's approval SSD 7089 dated 17 October 2019
Development Consent Conditions	The Minister for Planning's Minister's Development Consent Conditions contained in approval SSD 7089 dated 17 October 2019
dBA	Decibels using the A-weighted scale measured according to the frequency of the human ear
DPE	NSW Department of Planning and Environment
EIS	Environmental Impact Statement
EMS	Environmental management system
Environmental aspect	Defined by AS/NZS ISO 14001:2015 as an element of an organisation's activities, products or services that can interact with the environment
Environmental impact	Defined by AS/NZS ISO 14001:2015 as any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's environmental aspects
EMM	Environmental Management Measure
Environmental objective	Defined by AS/NZS ISO 14001:2015 as an overall environmental goal, consistent with the environmental policy, that an organisation sets itself to achieve
Environmental target	Defined by AS/NZS ISO 14001:2015 as a detailed performance requirement, applicable to the organisation or parts thereof, that arises from the environmental objectives and that needs to be set and met in order to achieve those objectives
EPA	NSW Environment Protection Authority

Term / Abbreviations	Definition / Expanded Text
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EWMS	Environmental Work Method Statements
Feasible and reasonable	Consideration of best practice taking into account the benefit of proposed measures and their technological and associated operational application in the NSW and Australian context. Feasible relates to engineering considerations and what is practical to build. Reasonable relates to the application of judgement in arriving at a decision, taking into account mitigation benefits and cost of mitigation versus benefits provided, community views and nature and extent of potential improvements
LAeq (15min)	The A-weighted equivalent continuous (energy average) A-weighted sound pressure level of the construction works under consideration over a 15-minute period and excludes other noise sources such as from industry, road, rail and the community.
LA (max)	the A-weighted maximum noise level only from the construction works under consideration, measured using the fast time weighting on a sound level meter
OEH	Office of Environment and Heritage
REMM	Revised Environmental Management Measures
RBL	The Rating Background Level for each period is the medium value of the ABL values for the period over all of the days measured. There is therefore an RBL value for each period (day, evening and night)
SWP	Sound Power Level
SPL	Sound Pressure Level

## Document Control and Records

Documentation and document control for this Plan, including issue of any amendments will be done generally in accordance with the contract. This Plan is maintained by Haslin Constructions (Haslin) and maintained throughout construction through regular reviews carried out on an initial 3 month of the project starting then on a biannually basis, or as changes require.

At all times an up-to-date copy of this plan shall be kept on site and made available to all employees and contractors involved in the project. Amendments that are made to this document are recorded on the register of amendments below and shall be approved by management staff. Superseded versions of this document shall be maintained for a period of 7 years to demonstrate record of environmental management and compliance.

This document shall be created and approved by the client. A controlled copy shall be supplied to all relevant parties, and distribution of controlled copies shall be recorded on the distribution register below (controlled hardcopy only). When changes are made to this document, parties listed below shall be provided with updates.

Register of Amendments				
Date:	Version No.:	Description of Amendments:	Prepared by:	Approved by:
29/07/22	0	Draft for review	NF	AL
10/08/22	A	Draft responding to ESC comments	NF	AL
30/09/22	B	Minor editorial	NF	AL
17/10/2022	C	Minor editorial	KM	JM
21/10/2022	D	Minor editorial	KM	JM

Company Management Plan Authorisation			
	Name/Position	Date:	Signature
Prepared by:	Nicholas Francesconi Environmental Consultant	21/10/2022	
Reviewed by:	Andrew Lynam Environment Manager	21/10/2022	
Approved by:	Colin Woods Managing Director	21/10/2022	

Distribution Register			
Version No.	Date of Issue:	Name of Recipient:	Position/Organisation
0	02/08/22	Ross Bailey	Principals Authorised Person
B	30/09/22	Ross Bailey	Principals Authorised Person
C	17/10/22	Ross Bailey	Principals Authorised Person
D	21/10/2022	Ross Bailey	



# 1 Introduction

---

## 1.1 Context

This construction Noise and Vibration Management Plan (NVMP or Plan) forms part of the Construction Environmental Management Plan (CEMP) for the Eurobodalla Southern Water Storage Supply (the Project).

This NVMP has been prepared to address the requirements of the Minister's Development Consent and the environmental management measures listed in the Eurobodalla Southern Water Storage Supply Environmental Impact Statement (EIS) and all applicable legislation.

## 1.2 The approved project

The Eurobodalla Southern Water Supply Storage (the Project) was granted Development Consent from the Department of Planning and Environment (DPE) on 17 October 2019. The Development Consent is provided in Appendix A of the CEMP.

The Project consists of an off-stream water storage facility and associated ancillary facilities. Water would be extracted from the Tuross River, using a new river intake pump station, and transferred to the storage via the Storage Inlet Pipeline. As necessary, the storage volume would be supplemented by water extracted from an existing borefield adjacent the storage.

Key features of the Project include:

- a 3,000 megalitre storage capacity,
- a 370 metre long embankment, 39 metres in height and a crest width of 20 metres located on an unnamed tributary of the Tuross River,
- a spillway,
- permanent erosion control structures located downstream of the spillway,
- inlet works to convey and dissipate raw water transferred from the river intake pump station through a pipeline constructed along the left abutment to the proposed water storage facility,
- outlet works to allow transfer of water from the storage to the existing southern water treatment plant (WTP),
- instrumentation to monitor seepage, reservoir levels and water quality,
- a consequence category of "High C" for both flood and sunny day scenarios in accordance with the Australian National Committee on Large Dams (ANCOLD) Guidelines on the consequence categories of dams (2012),
- a thermal stratification control system,
- a boat ramp at the storage for maintenance and water quality monitoring, and
- safety and perimeter fencing at the storage.

Key features of the ancillary facilities include:

- new river intake pump station with a total river extraction capacity made up of a combination of flows from the river intake (up to 26 megalitres) and the borefield (up to six megalitres)
- installation of the following new pipelines including:
  - a pipeline with a capacity of 26 megalitres per day to transfer raw water from the new river intake pump station to the storage inlet chute
  - a cross connection to the proposed water storage inlet pipeline with a capacity of six megalitres per day providing connection to supply water from the storage to the balance tank at the existing WTP
  - a pipeline connection from the existing borefield pipeline to the river intake pump

station.

- a new storage access road that is about one kilometre in length and extends from Eurobodalla Road opposite the existing WTP to the embankment crest
- basic right-turn and basic left-turn treatment at the intersection of the new storage access road and Eurobodalla Road would be provided
- a new access road that would provide a route for vehicles to access the new river intake pump station
- power supply including the construction of new sub-stations located near the storage and the river intake pump station.

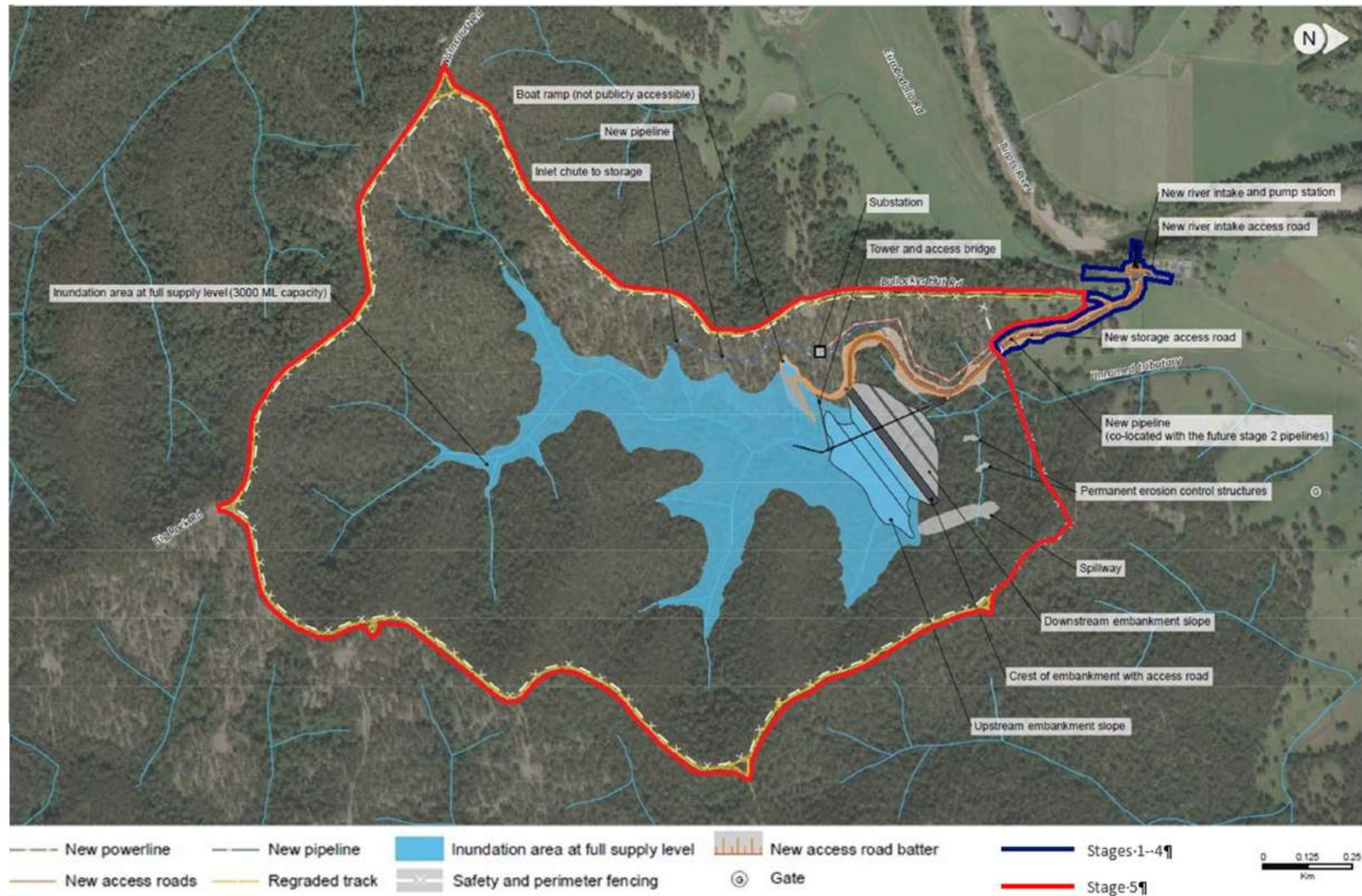
### **1.3 Scope of the Plan**

With the approval of the Secretary of Planning, construction of the approved project is being staged as follows:

- Stage 1: Tuross River Intake Pump Station clearing.
- Stage 2: Tuross River Intake Pump Station construction.
- Stage 3: Vegetation clearing and topsoil stripping of the access road, construction of the access road to the forestry boundary and construction of the inlet pipeline to the forestry boundary.
- Stage 4: Partial clearing of the entire storage site.
- Stage 5: All other works.

Works in Stage 1, Stage 2 and Stage 4 are complete. Stage 3 works are partially complete and will continue to be delivered under the applicable CEMP. This Plan only applies to Stage 5 of the approved project, being the construction of all remaining works on site including the removal of the remaining vegetation within clearing boundary, construction of the embankment wall, spillway, permanent erosion control measures and all remaining works on site to enable the project to become operational. The scope of works is detailed in Figure 1-1.

This CNVMP does not cover blasting works. Prior to commencing blasting, a specialist blasting contractor will be engaged who will have input on the development of a Blasting Management Plan.



**Figure 1-1** Project overview and scope of works covered by this plan

## **2 Purpose and objectives**

---

### **2.1 Purpose**

The purpose of this Noise and Vibration Management Plan is to describe how Haslin Contractors proposes to manage potential noise and vibration impacts during construction of the Project.

### **2.2 Objectives**

The key objective of the NVMP is to ensure all development consent conditions, environmental management measures and licence/permit requirements relevant to noise and vibration are described, scheduled and assigned responsibility as outlined in:

- The Environmental Impact Statement (EIS) prepared for Eurobodalla Southern Water Supply Storage (the Project).
- Submission Report for the Eurobodalla Southern Water Supply Storage Project.
- Addendum Submissions Report for the Eurobodalla Southern Water Supply Storage Project.
- Revised Management and Mitigation Measures.
- Conditions of Development Consent SSD 7089 (the Project) granted on 17 October 2019.
- Contract Technical Specifications Construction Contract No. 10018541 14/01/2022

### **2.3 Targets**

- Full compliance with the relevant legislative requirements, consent conditions and environmental management measures.
- Implement feasible and reasonable noise mitigation measures with the aim of achieving the construction noise management levels detailed in the Interim Construction Noise Guideline (DECC, 2009).
- Complaints from the community and stakeholders are minimised.

## **3 Environmental requirements**

---

### **3.1 Relevant legislation**

#### **3.1.1 Legislation**

All legislation relevant to this NVMP is included in Appendix A1 of the CEMP.

#### **3.1.2 Guidelines**

The main guidelines, specifications and policy documents relevant to this Plan include:

- NSW Interim Construction Noise Guideline (ICNG), Department of Environment and Climate Change 2009.
- NSW Assessing Vibration – a technical guideline (AVTG), Department of Environment and Conservation 2006.
- Australian Standard AS2436-1981 Guide to Noise Control on Construction, Maintenance and Demolition Sites.
- Standards Australia AS1055-1997™ (AS1055) - Description and Measurement of Environmental Noise, Parts 1, 2 and 3.
- British Standard BS 6472-2008, 'Evaluation of human exposure to vibration in buildings (1-80Hz).
- British Standard 7385: Part 2-1993 'Evaluation and measurement of vibration in buildings.
- German Standard DIN4150-1999 Structural vibration Part 3: Effects of vibration on Structures.
- Roads and Maritime Construction Noise Guidelines.
- Noise Policy for Industry (NPI) (EPA,2017).

### 3.2 Minister's Development Consent Conditions

The development consent conditions relevant to this Plan are listed Table 3-1 below. A cross reference is also included to indicate where the condition is addressed in this Plan or other project management documents.

**Table 3-1:** Minister's Development Consent conditions

Condition No.	Condition Requirements	Document Reference										
B31	<p>The Applicant must comply with the hours in Table 3, unless otherwise agreed in writing by the Planning Secretary.</p> <p><i>Table 3 – Hours of Work</i></p> <table> <tr> <th>Activity</th><th>Day</th><th>Time</th></tr> <tr> <td rowspan="3">Earthworks and construction (other than blasting)</td><td>Monday – Friday</td><td>7am – 6pm</td></tr> <tr> <td>Saturday</td><td>8am – 1pm</td></tr> <tr> <td>No work on Sundays or public holidays</td><td></td></tr> </table>	Activity	Day	Time	Earthworks and construction (other than blasting)	Monday – Friday	7am – 6pm	Saturday	8am – 1pm	No work on Sundays or public holidays		Section 5.1.1
Activity	Day	Time										
Earthworks and construction (other than blasting)	Monday – Friday	7am – 6pm										
	Saturday	8am – 1pm										
	No work on Sundays or public holidays											
B32	<p>Work outside of the hours identified in Condition B31 may be undertaken in the following circumstances:</p> <ul style="list-style-type: none"> <li>a) Works that are inaudible at the nearest sensitive receivers; or</li> <li>b) For the delivery of materials required outside these hours by the NSW Police Force or other authorities for safety reasons; or</li> <li>c) Where it is required in an emergency to avoid the loss of lives, property or to prevent environmental harm; or</li> </ul>	Section 5.1.2										



Condition No.	Condition Requirements	Document Reference
	d) Where a variation is approved in advance in writing by the Planning Secretary or his nominee if appropriate justification is provided for the works.	
B33	The development must be constructed to achieve the construction noise management levels detailed in the Interim Construction Noise Guideline (DECC, 2009) (as may be updated or replaced from time to time). All feasible and reasonable noise mitigation measures must be implemented and any activities that could exceed the construction noise management levels must be identified and managed in accordance with the management and mitigation measures in Appendix 2 of the Development Consent SSD 7089.	Section 5
B34	<p>The Applicant must prepare a Construction Noise and Vibration Management Plan for the development. The Plan must form part of the CEMP in accordance with Condition C2 and must:</p> <p>a) Be prepared by a suitable qualified and experienced noise expert;</p> <p>b) Describe procedures for achieving the noise management levels in EPA's Interim Construction Noise Guideline (DECC, 2009) (as may be updated or replaced from time to time);</p> <p>c) Describe the measures to be implemented to manage high noise generating works such as blasting, in close proximity to sensitive receivers; and</p> <p>d) Include strategies that have been developed with the affected sensitive receivers for managing high noise generating works.</p>	This Plan
B35	<p>The Applicant must:</p> <p>a) Not commence construction of any relevant stage until the Construction Noise and Vibration Management Plan is prepared in accordance with Condition B34; and</p> <p>b) Implement the most recent version of the Construction Noise and Vibration Management Plan for the duration of construction.</p>	Section 11.2



### 3.3 Environmental Management Measures

Relevant Revised Environmental Management Measures (REMM) are listed Table 3 2 below. This includes reference to required outcomes, the timing of when the commitment applies, relevant documents or sections of the environmental assessment influencing the outcome and implementation.

**Table 3-2:** Environmental management measures relevant to this NVMP

Ref #	Commitment	Timing	Document Reference
8.1	<p>A Construction Noise and Vibration Management Plan (NVMP) will be prepared and implemented as part of the CEMP. The NVMP will generally follow the approach in ICNG (DECC, 2009a) and will consider the following as a minimum:</p> <ul style="list-style-type: none"> <li>• identify nearby residences and other sensitive land uses</li> <li>• develop noise management levels consistent with the ICNG</li> <li>• assess the potential impact from the proposed construction methods</li> <li>• where management levels are exceeded examine feasible and reasonable noise mitigation and develop associated noise monitoring program</li> <li>• develop reactive and proactive strategies for dealing with any noise complaints</li> <li>• identify a site contact person to follow up complaints.</li> </ul>	Pre-construction / Construction	This Plan

Ref #	Commitment	Timing	Document Reference
8.2	<ul style="list-style-type: none"> <li>where feasible and reasonable, works would be undertaken within ICNG recommended working hours</li> <li>where works are required to be undertaken outside of recommended working hours, an Out of Hours procedure as described in the NVMP must be followed and all appropriate approvals would be obtained prior to works, and all affected receivers would be notified of the works</li> <li>noisy activities that cannot be undertaken during standard construction hours would be scheduled as early as possible during the evening and/or night-time periods</li> <li>any out of hours works would comply with the Roads and Maritime Construction Noise Guidelines.</li> </ul>	During construction	Section 5.1.1
8.4	<p>The environmental induction program would include specific noise and vibration issues awareness training including, but not limited to, the following:</p> <ul style="list-style-type: none"> <li>avoiding use of radios during work outside normal hours</li> <li>avoiding shouting and slamming doors</li> <li>where practical, operating machines at low speed or power and switching off</li> <li>when not being used rather than left idling for prolonged periods</li> <li>minimising reversing</li> <li>avoiding dropping materials from height and avoiding metal to metal contact.</li> </ul>	During construction	Section 8.3
8.5	All plant and equipment is to be maintained to ensure optimum running conditions, with periodic monitoring.	During construction	Table 8-1 NV5

Ref #	Commitment	Timing	Document Reference
8.6	Consider construction compound layout so that primary noise sources are at a maximum distance from sensitive receivers (primarily residential receivers), with solid structures (sheds and containers) placed between sensitive receivers and noise sources (and as close to the noise sources as is practical).	Pre-construction / during construction	Table 8-1 NV18
8.7	<ul style="list-style-type: none"><li>• locate compressors, generators, pumps and any other fixed plant as far from residences as possible and behind site structures.</li><li>• alternatives to reversing alarms would be considered for site compound equipment subject to OHS compliance requirements and risk assessments.</li><li>• avoid and limit the use of engine compression brakes at night and in residential areas</li><li>• delivery times would be scheduled, where feasible, to the recommended construction hours to minimise noise impacts from heavy vehicle movements.</li></ul>	Pre-construction / during construction	Table 8-1 NV11, NV13, NV14

Ref #	Commitment	Timing	Document Reference
8.8	<ul style="list-style-type: none"> <li>• use quieter and less noise/vibration emitting construction methods, where feasible and reasonable</li> <li>• plant and equipment would be selected to ensure only necessary size and power plant and equipment are used</li> <li>• plant used intermittently would be throttled down or shut off when not in use</li> <li>• simultaneous operation of noisy plant within discernible range of a sensitive receiver is to be limited/avoided where possible</li> <li>• the offset distance between noisy plant and adjacent sensitive receivers is to be maximised where practicable.</li> <li>• noise-emitting plant to be directed away from sensitive receivers where possible.</li> <li>• stage work to limit high noise impacts to sensitive receivers.</li> </ul>	Pre-construction / during construction	Table 8-1 NV15, NV16
8.9	<p>The following approach would be adopted with regard to noise monitoring procedures during the construction works:</p> <ul style="list-style-type: none"> <li>• where potential noise impacts are predicted to be 20 to 30 dB(A) above the RBL, the potential construction noise nuisance is considered to be moderate. Noise monitoring would be carried out to confirm predicted noise impacts within two weeks of commencement of construction. Feasible and reasonable noise reduction measures would be investigated, where necessary.</li> <li>• where potential noise impacts are predicted to be more than 30 dB(A) above the RBL, the potential construction noise nuisance is considered to be high. All feasible and reasonable noise control measures would be implemented prior to the commencement of the noisy activity.</li> </ul>	During construction	Section 9.1

Ref #	Commitment	Timing	Document Reference
8.10	<p>A blast management plan will be developed prior to construction. The blast management plan will include:</p> <ul style="list-style-type: none"><li>• limiting criteria</li><li>• identified blast sensitive receivers</li><li>• performance indicators</li><li>• monitoring protocols</li><li>• roles and responsibilities</li><li>• blasting controls</li><li>• protocols for community consultation, incidents and complaints</li><li>• contingency protocols</li><li>• reporting requirements.</li></ul>	Pre-construction / during construction	-
8.11	<p>The blast management plan will consider the following with regard to overpressure and ground vibration:</p> <ul style="list-style-type: none"><li>• restriction of blasting to between the hours of 9.00am to 5.00pm Monday to Fridays, except Public Holidays</li><li>• blast monitoring and inspection including:<ul style="list-style-type: none"><li>○ blast monitoring at key sensitive sites</li><li>○ trial blasts to assist in the development of “site laws” based on monitoring data.</li></ul></li></ul>	During construction	-

## 4 Existing environment

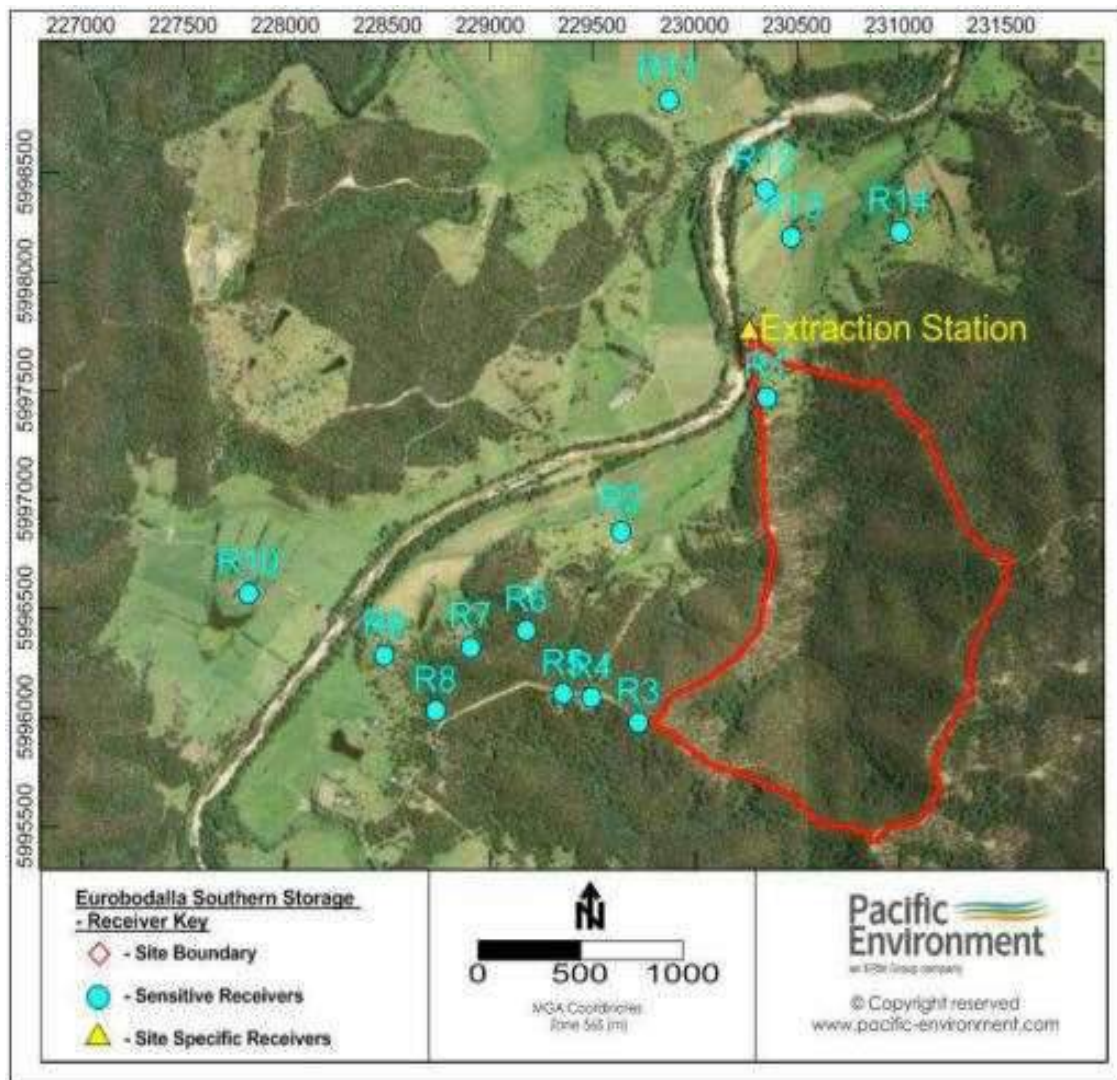
### 4.1 Sensitive receivers

The nearest sensitive receivers are located to the west and north of the proposal. The closest residence is located approximately 440 metres to the west of the proposal. The receivers are summarised in Table 4-1 and presented in Figure 4-1.

**Table 4-1** Nearest sensitive receivers

Receiver ID	Address	Receiver type	Approximate closest distance to the site boundary (metre)
1*	644 Eurobodalla Road	Residence	Within boundary
2	758 Eurobodalla Road	Residence	700
3	198 Waincourt Road	Residence	60
4	168 Waincourt Road	Residence	310
5	156 Waincourt Road	Residence	450
6	818-820 Eurobodalla Road	Residence	740
7	818-820 Eurobodalla Road	Residence	940
8	97 Waincourt Road	Residence	1050
9	93 Waincourt Road	Residence	1340
10	51-53 Nerrigundah Mountain Road	Residence	2050
11	350 Comerang Forest Road	Residence	1120
12	585 Eurobodalla Road	Residence	640
13	586 Eurobodalla Road	Residence	450
14	530 Eurobodalla Road	Residence	820

\*This council owned property will be in use by the project and has been included in the EIS assessment for comparative purposes.



1. This figure has been extracted from the Eurobodalla Southern Storage Water Supply Noise Impact Assessment report prepared by Pacific Environment in 3 November 2017.

**Figure 4-1 Sensitive receiver locations**

## 4.2 Acoustic Environment

The existing acoustic environment was characterised by review of historical monitoring and short term (attended) noise measurements. The proposal is located in a rural noise amenity area. The primary activities which dominate the local noise environment are local traffic on Eurobodalla Road, farming activities and seasonal cicada noise.

According to the EIS Eurobodalla Southern Storage Water Supply Noise Impact Assessment (NIA) prepared by Pacific Environment, the rating background noise levels (RBL) are expected to be low (30 dB(A) or below) and therefore the NIA adopted minimum RBLs of 35 dB(A) and 30 dB(A) were adopted for the noise assessment for the daytime/evening and night-time periods respectively in accordance with AS1055:1 Acoustics – Description Environmental Noise Part 3.



### **4.3 Ambient noise**

Attended noise monitoring was undertaken at the boundary of the existing WTP on 30 August 2017 by Pacific Environment as part of the EIS. Measurements were undertaken over 15 minute intervals and indicated the noise environment was influenced by occasional vehicles passing by. Background noise levels were observed to be between 31 to 32 dB(A), the existing WTP at 35 dBA with no other industrial influences audible.

## 5 Noise and vibration criteria for NSW

The EPA recommends management levels and goals when assessing construction noise and vibration. These are outlined in:

- The Interim Construction Noise Guideline (ICNG), Assessing Vibration: a technical guideline.
- The ANZECC, Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration.

### 5.1 Construction noise and assessment objectives

The DECC Interim Construction Noise Guideline (ICNG, July 2009) provides guidelines for the assessment and management of construction noise. The ICNG focuses on applying a range of work practices to minimise construction noise impacts rather than focusing on achieving numeric noise levels.

The main objectives of the ICNG are to:

- Identify and minimise noise from construction works.
- Focus on applying all 'feasible' and 'reasonable' work practices to minimise construction noise impacts.
- Encourage construction during the recommended standard hours only, unless approval is given for works that cannot be undertaken during these hours.
- Reduce time spent dealing with complaints at the project implementation stage.
- Provide flexibility in selecting site-specific feasible and reasonable work practices to minimise noise impacts.

#### 5.1.1 Standard Construction Hours

The approved working hours on this project are identified in Development Consent B31.

Activity	Day	Time
Earthworks and construction (other than blasting)	Monday – Friday	7:00am to 6:00pm
	Saturday	8:00am to 1:00pm
	Not permitted on public holidays	-
Blasting	Monday – Friday	9:00am to 3:00pm
	Not permitted on public holidays	-

Development Consent B32 allows works to be undertaken outside of the above identified hours **only** in the following circumstances:

- Works are inaudible at the nearest sensitive receivers; or
- For the delivery of materials required outside these hours by the NSW Police Force or other authorities for safety reasons; or
- Where it is required in an emergency to avoid the loss of lives, property or to prevent environmental harm; or
- Where a variation is approved in advance in writing by the Planning Secretary or his nominee if appropriate justified is provide for the works.

If out of hours works are required and meet the requirements of Development Consent Condition B32, Haslin will prepare a noise management plan for Eurobodalla Shire Council

consideration >14days prior to commencing the work. The Noise Management Plan will identify:

- the need for work
- the type of work
- predicted noise levels
- control measures
- whether any noise or vibration monitoring is proposed
- complaint response procedure

All nearby residents shall be advised by Haslin of out of hours at least 24 hours before it commences.

**Table 5-1** Noise management levels for residential land uses

Time of day	NML, LAeq 15min	Application notes
Recommended Standard Hours: Monday to Friday 7am to 6pm	Noise affected: RBL + 10dBA	May be some community reaction to noise. <ul style="list-style-type: none"> <li>• Where the predicted or measured construction noise level exceeds the noise affected level, all feasible and reasonable work practices should be applied to meet the noise affected level</li> <li>• All residents potentially impacted by the works should be informed of the nature of the works, the expected noise levels and duration, and provided with site contact details</li> </ul>
Saturday 8am to 1pm  No work on Sundays or public holidays	Highly noise affected: 75dBA	May be strong community reaction to noise. <ul style="list-style-type: none"> <li>• Where construction noise is predicted or measured to be above this level, the relevant authority may require respite periods that restrict the hours that the very noisy activities can occur</li> <li>• Respite activities would be determined considering times identified by the community when they are less sensitive to noise, and if the community is prepared to accept a longer period of construction to accommodate respite periods</li> </ul>

Time of day	NML, LAeq 15min	Application notes
Outside recommended Standard Hours	Noise affected: RBL + 5 dBA	<ul style="list-style-type: none"> <li>A strong justification would typically be required for works outside the recommended standard hours</li> <li>The proponent should apply all feasible and reasonable work practices to meet the affected noise level.</li> <li>Where all feasible and reasonable practices have been applied and noise is more than RBL + 5 dB(A) above the affected noise level, the proponent should negotiate with the affected community.</li> </ul>

### 5.1.2 Project specific noise management levels

The project shall be constructed with the aim of achieving the construction noise management levels detailed in Table 5-2 which summarises the NMLs applicable to sensitive land uses around the site during the construction phase. The NMLs are based on the assumed background noise levels as presented in the NIA.

**Table 5-2** Project Specific Noise Management Levels

NML LAeq,15min for time period, dB(A)		
Standard Hours	Outside of Standard Hours	
Day	Day/Evening	Evening/Night
45	40	35
75 (highly noise affected)	75 (highly noise affected)	Evening/Night

## 5.2 Road traffic noise

The principle guidance for assessing the impact of road traffic noise associated with the construction of the project on surrounding residential receivers is in the NSW EPA's Road Noise Policy (RNP).

It is anticipated that road trucks will deliver all equipment and material. The vehicle movement route would generally be limited to Eurobodalla Road, the new Storage Access Road and Nerrigundah Mountain Road from Tyrone Bridge to Blue Ridge Quarry.

The project shall be constructed with the aim of achieving the construction road traffic noise goals as detailed in Table 5-3. Table 5-3 presents the road noise assessment criteria for these road categories and are reproduced from Table 3 of the RNP. It should be noted that such criteria apply to permanent situations and is therefore conservative for the temporary nature of the construction activities proposed as part of the project. Further assessment is typically conducted where existing noise levels are increased by more than 2 dB due to the construction related traffic.

**Table 5-3** Road traffic noise criteria for residential land uses

Road category	Type of project/development	Noise criteria dBA	
		Day (7am – 10pm)	Night (10pm – 7am)
Freeway/arterial/sub-arterial roads	Existing residences affected by additional traffic on existing freeway/arterial/sub-arterial roads generated by land use developments	LAeq,15 hour 60 (external)	LAeq,9 hour 55 (external)
Local roads	Existing residences affected by additional traffic on existing freeway/arterial/sub-arterial roads generated by land use developments	LAeq,1 hour 55 (external)	LAeq,1 hour 50 (external)

### 5.3 Vibration criteria

Ground vibration generated by construction can have a range of effects on buildings and building occupants. The main effects are generally classified as:

- human disturbance – disturbance to building occupants: vibration which inconveniences or interferes with the activities of the occupants or users of the building
- effects on building structures – vibration which may compromise the condition of the building structure itself.

Construction vibration criteria have been adopted from the following sources:

- Cosmetic and structural damage to buildings: German Standard DIN 4150-3, 1999, Structural Vibration – Part 3: Effects of vibration on structures
- Human comfort: Assessing Vibration – A Technical Guideline (the Vibration Guideline)

The project shall be constructed with the aim of achieving the construction vibration goals as detailed in Sections 5.3.1 and 5.3.2

#### 5.3.1 Cosmetic structural damage

DIN 4150-3 summarises structural and cosmetic damage assessment criteria for different types of buildings, which are presented in Table 5-4, which are widely used for the assessment of construction vibration effects on buildings in Australia. The criteria are specified as Peak Particle Velocity (PPV) levels measured in any direction at or adjacent to the building foundation.

**Table 5-4** DIN 4150-3 vibration cosmetic and structural damage criteria

Structure type	Peak Particle Velocity (PPV), mm/s			
	Foundation of structure			Vibration at horizontal plane of highest floor at all frequencies
	<10 Hz	10-50 Hz	50 – 100 Hz	
Buildings used for commercial, industrial purposes, industrial buildings and buildings of similar design	20	20 to 40	40 to 50	40
Dwelling and buildings of similar design and/or use	5	5 to 25	15 to 25	15
Structures that, because of their particular sensitivity to vibration, do not correspond to those listed in rows 1 and 2, and are of great intrinsic value (e.g. heritage-listed buildings)	3	3 to 8	8 to 10	8

DIN 4150-3 states that exposing buildings to vibration levels higher than that recommended would not necessarily result in damage. Rather, it recommends these values as maximum levels of short-term construction vibration at which experience has shown damage reducing the serviceability of structures will not occur due to vibration effects.

DIN 4150-3 is considered to be suitable for the assessment of both structural and cosmetic damage as it considers a reduction in serviceability of the structure is deemed to have occurred if:

- cracks form in plastered surfaces of walls
- existing cracks in the building are enlarged
- partitions become detached from loadbearing walls or floors.

### 5.3.2 Human comfort

The ICNG recommends that vibration from construction works be assessed under Assessing Vibration – a technical guideline (the Vibration Guideline).

The vibration assessment criteria defined in the Vibration Guideline are for human comfort and represent goals that, where predicted or measured to be exceeded, require the application of all feasible and reasonable mitigation measures. Where the maximum value cannot be feasibly and reasonably achieved, the operator would need to negotiate directly with the affected community.

The Vibration Guideline defines vibration assessment criteria for continuous, impulsive and intermittent vibration. Vibration can be classified according to the following definitions:

- Continuous vibration: continues uninterrupted for a defined period. Applies to continuous construction activity such as tunnel boring machinery.
- Impulsive vibration: rapid build-up to a vibration peak followed by a damped decay or the sudden application of several cycles of vibration at approximately the same

magnitude providing that the duration is short. Applies to very occasional construction activities that create distinct events such as the occasional dropping of heavy equipment.

- Intermittent vibration: interrupted periods of continuous vibration (such as a drill) or repeated periods of impulsive vibration (such as a jackhammer).

The majority of construction activities as part of the proposed works would be expected to be continuous or intermittent in nature.

Table 5-5 presents the management levels for continuous and impulsive vibration at different land uses. The management levels specified are as overall unweighted RMS vibration velocity levels. The Vibration Guideline specifies the management levels as suitable for vibration sources predominantly in the frequency range 8-80 Hz as would be expected for construction vibration.

For intermittent vibration, the Vibration Dose Value (VDV) is used as the metric for assessment as it accounts for the duration of the source, which will occur intermittently over the assessment period. The VDV management levels at different land uses for intermittent vibration sources are presented in Table 5-6.

**Table 5-5** Vibration velocity management levels for continuous and impulsive vibration

Land use	Continuous vibration – RMS vibration velocity mm/s		Impulsive vibration – RMS vibration velocity mm/s	
	Preferred	Maximum	Preferred	Maximum
Residence – daytime #	0.2	0.4	6.0	12.0
Residence – night-time ^	0.14	0.28	2.0	4.0

# - Daytime is defined by the Vibration Guideline to be 7 am to 10 pm.

^ - Night time is defined by the Vibration Guideline to be 10 pm to 7 am.

**Table 5-6** VDV management levels for intermittent vibration

Land use	VDV – intermittent vibration, m/s <sup>1.75</sup>	
	Preferred	Maximum
Residence and hospital wards – daytime#	0.2	0.4
Residence and hospital wards – night-time^	0.13	0.26

# - Daytime is defined by the Vibration Guideline to be 7 am to 10 pm.

^ - Night time is defined by the Vibration Guideline to be 10 pm to 7 am.

### 5.3.3 Safe working distances

Safe working distances for typical vibration inducing equipment are listed in Table 5-7 below.



**Table 5-7** Examples of safe working distances for typical vibration intensive plant

Plant item	Rating / Description	Safe working distance – cosmetic damage	Safe working distance – human comfort
Vibratory roller	< 50 kN (Typically 1-2 tonnes)	5m	15 to 20m
	< 100 kN (Typically 2-4 tonnes)	6m	20m
	< 200 kN (Typically 4-6 tonnes)	12m	40m
	< 300 kN (Typically 7-13 tonnes)	15m	100m
	> 300 kN (Typically 13-18 tonnes)	20m	100m
	> 300 kN (> 18 tonnes)	25m	100m
Small hydraulic hammer	(300 kg – 5 to 12 t excavator)	2m	7m
Medium hydraulic hammer	(900 kg – 12 to 18 t excavator)	7m	23m
Large hydraulic hammer	(1,600 kg – 18 to 34 t excavator)	22m	73m
Vibratory pile driver	Sheet piles	2 to 20m	20m
Pile boring	≤800 mm	2m	NA
Jackhammer	Handheld	1m (nominal)	Avoid contact with structure

The nearest residential receiver (excluding Receiver 1 644 Eurobodalla Road that has been acquired for the project by Eurobodalla Shire Council) to the construction site is Receiver 3, 198 Waincourt Road. The residence is approximately 60m from the inundation area site boundary where works are limited to fencing. The receiver is approximately 600m from the extent of clearing works on site.

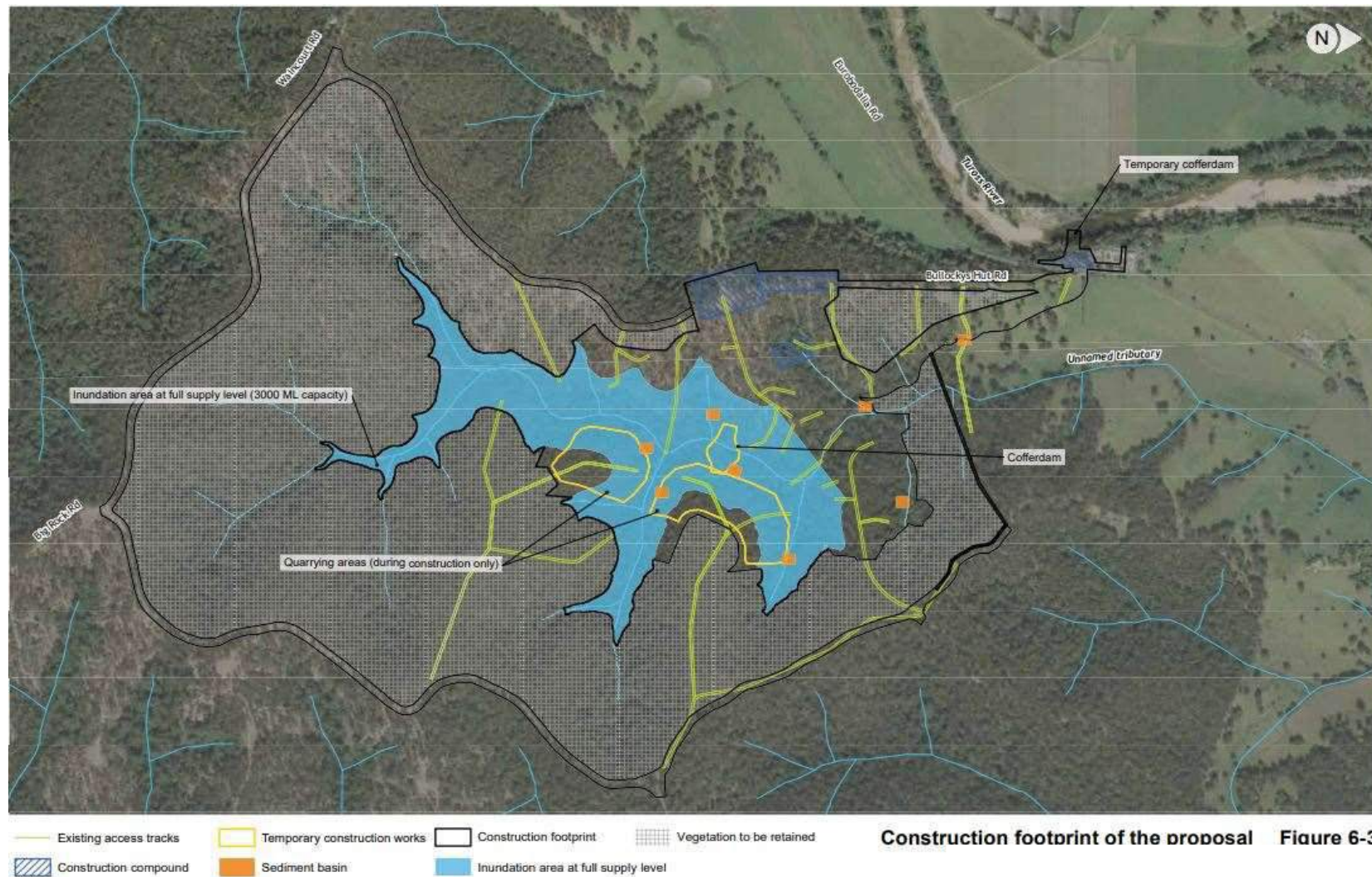
## **6 Environmental aspects and impacts**

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### **6.1 Construction overview**

The Project will involve a range of activities requiring various plant and equipment as shown in Figure 6-1. The construction activities to be undertaken as part of Stage 5 is detailed below to provide an understanding of the potential noise and vibration impacts to sensitive receivers:

- Clearing and grubbing
- Construct coffer dam and diversion pipeline
- stripping and foundation excavation
- foundation grouting and treatment
- operation of on-site quarry including drill and blast (blasting covered in Blast Management Plan)
- embankment construction including fill placement, crest pavement and instrumentation
- construct spillway and erosion control structures
- outlet works (including tower and bridge)
- regrading of catchment boundary roads
- testing and commissioning
- rehabilitation
- demobilizing



**Figure 6-1** Proposed construction activities and their locations

### 6.1.1 Pre-construction activities

The following pre-construction activities would be required to be undertaken as part of the Project construction program:

- Fencing and delineation of works area
- Clearing and grubbing of vegetation
- Establishment of construction compounds
- Installation of temporary erosion and sediment controls
- Construction of access roads

#### Establishment of construction compounds and ancillary facilities

Preliminary community consultation was undertaken for properties surrounding the potential compound sites identified below in Table 6-1 and shown in Figure 6-1. The locations of ancillary sites were selected as they met the following requirements:

- Access to the road network or direct access to the construction corridor
- Minimise environmental impact
- Minimise impacts to adjacent properties
- Located above the 20 year AEP flood level unless a contingency plan to manage flooding is prepared and implemented
- Provide sufficient area for the storage of raw materials to minimise the number of deliveries required outside standard construction hours
- Areas of flat topography

If additional ancillary sites are required for the Project these would be assessed against the above requirements.

**Table 6-1** Ancillary site assessed in the EIS

Ancillary site	Suitable activities	Size (ha)
Construction compound 1 – Bullocky Hut Road	• batch plant	0.7
	• stockpiling	
	• parking	
	• construction equipment, plant and vehicle storage	
	• material storage	
	• waste storage	
	• refuelling	
	• vehicle washdown	
	• inspections, maintenance and repairs	
	• stockpiling	1.5

Ancillary site	Suitable activities	Size (ha)
Construction compound 2 – Bullocky Hut Road	<ul style="list-style-type: none"> <li>batch plant</li> </ul>	
	<ul style="list-style-type: none"> <li>parking</li> </ul>	
	<ul style="list-style-type: none"> <li>construction equipment, plant and vehicle storage</li> </ul>	
	<ul style="list-style-type: none"> <li>material storage</li> </ul>	
	<ul style="list-style-type: none"> <li>waste storage</li> </ul>	
	<ul style="list-style-type: none"> <li>refuelling</li> </ul>	
	<ul style="list-style-type: none"> <li>vehicle washdown</li> </ul>	
	<ul style="list-style-type: none"> <li>inspections, maintenance and repairs</li> </ul>	
Construction compound 3 – New storage access road	<ul style="list-style-type: none"> <li>stockpiling</li> </ul>	0.4
	<ul style="list-style-type: none"> <li>batch plant</li> </ul>	
	<ul style="list-style-type: none"> <li>parking</li> </ul>	
	<ul style="list-style-type: none"> <li>construction equipment, plant and vehicle storage</li> </ul>	
	<ul style="list-style-type: none"> <li>parking</li> </ul>	
	<ul style="list-style-type: none"> <li>material storage</li> </ul>	
Site offices – existing building	<ul style="list-style-type: none"> <li>site office</li> </ul>	NA

### 6.1.2 Construction activities

Key construction activities considered to be of relevance to this construction noise and vibration management plan are described below.

#### Cofferdam construction

A permanent cofferdam would be constructed upstream of the embankment with a diversion pipeline located through the cofferdam from the outlet tower as shown in Figure 6-1.

The anticipated construction methodology for the cofferdam is:

- clearing and stripping in cofferdam footprint
- construction of the cofferdam embankment using site sourced earthfill
- construction of the outlet conduit:
  - excavation of conduit trench
  - placement and welding of steel pipeline



- backfill of trench with concrete to above the top of the conduit
- backfill of the remainder of the trench with earthfill

**On-site quarrying**

To provide material for the embankment wall, material (rock) would be quarried from two locations within the inundation area. Quarrying within these areas would generally involve the following:

- stripping of topsoil
- excavation and stockpiling of earth and soil
- conditioning of suitable material with a grader , excavator and watercart
- loading of quarried material into a crusher
- final screening

**Embankment construction**

Embankment construction would comprise the following key elements:

- stripping and foundation excavation
- foundation treatment and grouting
- fill placement including installation of monitoring instrumentation
- construction of the crest road.

The foundation excavation would use excavators, dozers and articulated haulers to move an estimated 100 000 to 150 000m<sup>3</sup> of material. The unsuitable material removed to be reused for other construction purposes. Following the completion of excavation, the foundation will be grouted with construction of a grout cap and grout curtain. Then fill placement to create the embankment wall will be carried out using suitable fill from the quarry.

**Outlet works and bridge**

Construction of the outlet works, excluding the outlet conduit would involve:

- excavation for the outlet tower foundation
- construction of the outlet tower foundation with mass concrete
- construction of the outlet tower shaft with in-situ concrete and using slip forms
- excavation for the downstream valve pit
- construction of downstream concrete valve pit
- installation of mechanical components (gates, valves)
- construction of bridge including:
  - construction of concrete bridge pier/s
  - construction of abutment connection including reinforced earth retaining wall
  - delivery and assembly of steel bridge beams
  - installation of steel bridge beams
  - installation of pre-cast concrete deck planks.

**Spillway and erosion and control structures**

Spillway construction would involve the following steps:

- stripping of topsoil,
- excavation to design levels using dozers, excavators and articulated dump trucks. It is possible that some drill and blasting would be required during excavation. The excavated material would be used as rockfill for construction of the embankment,

- lining of the concrete chute and construction of cast-in situ concrete walls,
- anchoring of chute and walls as required, and
- construction of downstream erosion control structures likely using gabion baskets.

## 6.2 Construction plant and equipment

A list of likely plant and equipment to be used on the Project is provided in Table 6-1. All plant and equipment used throughout the works should have an operating sound power level less than or equal to those in Table 6-1. These sound power levels have been extracted from the NIA.

**Table 6-2** Construction plant and equipment maximum sound level

Plant and equipment item	Sound power level – dBA
Excavator	110
Roller	103
Articulated haulers	108
Watercart	107
Bulldozer	114
Light vehicle	98
Piling rig	110
Truck	104
Mulcher	115
Compressor	103
Generator	103
Concrete truck	103
Concrete pump	103
Concrete mixer	105
Crane	104
Grader	107
Shotcrete	106
Sheet piling*	116
Concrete batching	113
Drilling rig	110



An indicative list of likely plant and equipment required for each activity is provided in Table 6-3. Additional equipment may be required to be used and would be assessed using its relative sound power level.

**Table 6-3** Peak activity workforce and peak traffic

Activity	Plant	Peak activity workforce	Daily trips (two-way)
Site establishment	Rollers, bulldozers, water carts, articulated haulers, graders, flat-bed trucks, crane, concrete agitator trucks	10-20	16-32
Clearing	Bulldozer, excavator, grader, water cart	5-10	8-16
On-site quarrying	Excavators, articulated haulers, drill rig, water cart, bulldozers	5	8
Cofferdam	Bulldozer, excavators, rollers, water carts, articulated haulers, graders, concrete agitator trucks, water carts, crane	15	24
Inlet/outlet works	Excavators, trucks, articulated haulers, concrete agitator trucks, concrete pumps, crane, cherry picker	10-15	16-24
Embankment	Excavators, articulated haulers, bulldozers, scrapers, front end loaders, graders, compactors, rollers, drill rigs, concrete batching plant	25-35	42-58
Spillway	Excavators, articulated haulers, concrete agitator trucks, concrete pump	10	16
Fencing	Trucks, backhoe	5-10	8-16
Power supply	Crane, cherry picker, excavator, concrete agitator truck	10	16
Peak construction activities		60-90	100-150

### 6.3 Construction program and period

It is expected that vegetation clearing and grubbing and other pre-construction activities will take approximately 3 months with construction activities to build the permanent infrastructure taking approximately two years for completion.

### 6.4 Impacts

The predicted noise levels indicate that the primary contributors to exceedances are combined noise impacts when all plant are operating concurrently such as potential on-site concrete

batching, dozers and heavy vehicles. Activities will be scheduled to ensure potential noise impacts is reduced as a result of concurrently operating machinery.

The EIS assessed construction noise impacts based on the key construction activities presented in Table 6-4. Table 6-4 shows the activity type, the sound power level of the machinery that will be operating for that activity and the number of pieces of equipment required at maximum capacity,

**Table 6-4** Construction equipment sound power levels per construction scenario, dB(A)

Construction equipment and plant	Sound power level Leq dbA	Site Establishment	Clearing	Quarrying	Storage
Excavator	110	6	6	2	6
Roller	103	4	-	-	4
Articulated haulers	108	2	-	12	12
Water cart	107	3	3	-	1
Bulldozer	114	2	2	2	2
Light vehicle	98	2	2	2	2
Piling rig	110	-	-	-	-
Truck	104	5	-	-	5
Mulcher	115	-	1	-	-
Compressor / generator	103	1	-	-	1
Concrete truck & pump	103	1	-	-	1
Concrete mixer	105	-	-	1	1
Crane	104	1	-	-	1
Grader	107	-	2	-	-
Shotcrete	106	-	-	-	-
Sheet piling	116	-	-	-	-
Concrete batching	113	-	-	-	1
Drilling rig	110	-	-	-	3

Construction equipment and plant	Sound power level Leq dbA	Site Establishment	Clearing	Quarrying	Storage
Concrete pump	103	-	-	-	1

#### 6.4.1 Noise impacts on receivers – standard hours

Using the scenarios in Table 6-4 above the predicted noise level for each sensitive receiver was modelled and is presented in Table 6-5 below. Using the daytime noise criterion of 40 dBA LAeq it is predicted that there will be some minor exceedances at receivers R2, R12, R13 and R14 during site establishment works.

Noise levels are not predicted to exceed the highly noise affected noise level of 75 dB(A) at any receiver for any of the construction scenarios modelled in the EIS.

**Table 6-5** Predicted construction noise

Receiver ID	Criteria LAeq 15min dBA	Predicted Noise Level LAeq 15min dBA for each activity			
		Site Establishment	Clearing	Quarrying	Storage
R1	40	69	49	45	52
R2	40	46	<20	22	40
R3	40	32	27	26	31
R4	40	26	24	27	28
R5	40	36	32	29	35
R6	40	40	38	34	41
R7	40	<20	<20	<20	<20
R8	40	<20	<20	<20	<20
R9	40	<20	<20	<20	<20
R10	40	<20	<20	<20	<20
R11	40	32	26	<20	30
R12	40	41	30	31	33
R13	40	41	36	34	39
R14	40	43	21	21	32

#### 6.4.2 Construction vibration

The EIS did not present any predicted vibration impacts. The nearest sensitive receiver (R1) is 100m from the boundary and vibration generated from construction works would vary depending on the level and type of activity. The primary piece of plant that will be used during construction that could cause vibration impacts being the vibratory roller. Vibration impacts as a result of blasting will be covered in the Blast Management Plan.

#### 6.4.3 Construction related traffic noise

The average construction vehicle movement (one way) is predicted to be 175 per day (at maximum operation) which would be limited to the daytime period. There would be limited construction traffic at night and this would be restricted to oversized vehicles and emergency use only, however this work would be scheduled to not occur on consecutive nights.

Assuming all vehicle movements occur within a one-hour period during the day and night, a worst-case scenario of road noise impact was completed at the nearest receivers to the proposal (R1 and R13) and is presented in Table 6-6.

**Table 6-6** Predicted (worst case) construction traffic impacts on local roads

Receiver ID	Distance to receiver	Day dBA		Night dBA	
		Criteria LAeq1h	Noise level LAeq1h	Criteria LAeq1h	Noise level LAeq1h
R1	8	55	55	50	48
R13	38	55	54	50	43

## **7 Construction noise and vibration assessment**

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### **7.1 Construction noise**

Based on the construction noise assessment undertaken in the EIS and presented in Table 6-5, the project's construction noise levels have been assessed to satisfy the recommended NML at most receiver locations during ICNG standard hours. The exception to this is R1, R2, R6, R12, R13 and R14, where exceedances of the recommended day standard hours NML could occur.

The assessment of NML compliance at some receivers and exceedances at others is not an uncommon finding for construction projects. As such feasible and reasonable mitigation practices will be applied to minimise the impact of noise.

Further, given that the predictions assume simultaneous operation of plant and equipment at the nearest locations to the relevant sensitive receptors, it is likely that actual construction noise levels would be less than those predicted. Notwithstanding, noise mitigation measures and application of good practice noise management will be implemented and are presented in Section 8 of this plan.

### **7.2 Construction vibration**

Based on the construction vibration assessment undertaken in the NIA, construction vibration impact is unlikely to occur throughout the construction of the project as vibration intensive plant are not expected to be working within 100 m of any residential property.

Given the distances between the development footprint and any sensitive items and buildings the distance greatly exceeds the minimum safe working distance for cosmetic damage and human comfort. The NIA predicts that no vibration impacts will occur throughout the construction of the project. Notwithstanding, the plan provides safe working distances inside of which management measures are triggered. A complaints management procedure is also provided which would include those relating to construction vibration.

### **7.3 Road traffic during construction**

Based on the road traffic noise assessment undertaken in the EIS, road traffic noise levels during construction works are predicted to be below the relevant criteria at all of the affected residential dwellings along the construction route of Eurobodalla Road, Nerrigundah Mountain Road and Bullockys Hut Road.

## 8 Environmental control measures

This section outlines noise and vibration management measures that will be implemented as part of the construction works, including consultation and complaint handling procedures.

It may not be feasible to adopt all management measures at all times during construction, and identification of all reasonable and feasible mitigation methods will be conducted by the general superintendent Environmental Site Representative on a regular basis during noisy works.

In relation to the implementation of mitigation measures, feasibility addresses engineering consideration regarding what is practical to build. Reasonableness relates to the application of judgment in arriving at a decision, considering the following factors:

- work hours
- noise reduction achieved
- number of people or other uses benefited
- cost of the measure
- delay to schedule and whether the measure will prolong exposure to noise
- community views
- pre-construction noise levels at receivers.

While the management measures presented will not necessarily result in mitigating all noise impacts at all times, they are expected to reduce impacts to levels most stakeholders should find acceptable considering the anticipated benefits of the completed project as a whole.

### 8.1 Controls

The controls to be implemented during the construction of the project are provided in Table 8-1.

**Table 8-1** Noise and vibration mitigation measures

Control ref #	Environmental management controls
NV1	All potentially affected residences as identified in Figure 4-1 will be informed by letterbox drop of the construction works including working hours to be adhered to, and the level and duration of noise to expect during construction.
NV2	All potentially affected residences as identified in Figure 4-1 will be kept informed of any significant changes to construction activities or if out of hours of work is required.
NV3	Any complaints received related to noise or vibration will be dealt with in accordance with Section 10.
NV4	All site personnel will be instructed during a general induction as to their responsibilities in minimising noise and adhering to the noise minimisation measures.
NV5	Equipment operators are to report any faulty equipment to the General Superintendent.

Control ref #	Environmental management controls
NV6	<p>Unless the works meet Development Condition B32 and are approved by the Principal, works will be undertaken during the hours of:</p> <p>a) 7:00am to 6:00pm Mondays to Fridays;</p> <p>b) 8:00am to 1:00pm Saturdays; and</p> <p>c) at no time on Sundays and public holidays.</p>
NV7	<p>Unless agreed with the impacted sensitive receivers, impulsive or tonal noise emission activities (such as rock breaking, pile driving) that exceed the applicable NML should only be undertaken:</p> <p>a) 7:00am to 6:00pm Mondays to Fridays;</p> <p>b) 8:00am to 1:00pm Saturdays;</p> <p>c) at no time on Sundays and public holidays; and</p> <p>d) in continuous blocks not exceeding three hours each with a minimum respite from those activities and works of not less than one hour between each block.</p>
NV8	<p>If out of hours works are required and meet the requirements of Development Consent Condition B32, Haslin will prepare a noise management plan for Eurobodalla Shire Council consideration &gt;14days prior to commencing the work. The Noise Management Plan will identify:</p> <ul style="list-style-type: none"> <li>• The need for work.</li> <li>• The type of work.</li> <li>• Predicted noise levels.</li> <li>• Control measures.</li> <li>• Whether any noise or vibration monitoring is proposed.</li> <li>• Complaint response procedure.</li> </ul>
NV9	The noise levels of plant and equipment must have operating Sound Power or Sound Pressure Levels compliant with the levels detailed in Table 6-2
NV10	Vibration intensive activities should not be located closer to sensitive receptors than the safe working distances allowable, where possible.
NV11	Construction equipment will be fitted with adequate noise and vibration control equipment where possible. Measures include earth moving equipment fitted with residential class mufflers, and acoustic enclosures for any diesel generators and/or air compressors.
NV12	Any equipment not in use for extended periods during construction work will be switched off.
NV13	Deliveries would be scheduled during standard hours of works where possible.



Control ref #	Environmental management controls
NV14	Wherever practicable, noisy equipment that results in an exceedance of the NML will be: a) Positioned behind structures that act as barriers to identified receptors b) Positioned at the greatest distance from identified receptors c) Oriented to directed noise emissions away from identified receptors
NV15	“Quiet” practices will be employed wherever practicable when operating equipment
NV16	Any noisy construction activities will be completed in the shortest time possible.
NV17	There will be no dropping of materials from heights, throwing of metal items, or slamming of doors.
NV18	The layout of construction compounds would consider noise impacts and attenuation. Where activities at construction compounds are likely to have noise impacts on sensitive receivers, measures to mitigate impacts would be implemented.
NV19	Heavy vehicles are not to use engine brakes on Eurobodalla Road unless in an emergency
NV20	Heavy vehicles are not to use Waincourt Road
NV21	The storage access road is to have a posted speed limit of 40km/h
NV22	Heavy vehicles used on the project are to have airbag/pneumatic suspension systems where possible and comply with ADR 28/01

## 8.2 Roles and responsibilities

Section 3.4 of the overarching CEMP provides details of the roles and responsibilities relevant to this CNVMP and all plans. The roles and responsibilities relevant for the CNVMP are consistent with the overarching CEMP.

## 8.3 Training and awareness

All Project personnel, subcontractors, consultants and visitors will receive inductions into the project environmental obligations prior to commencing on site. All environmental inductions will be conducted as part of the site's Environmental Management System.

Project induction and training will fall under the following categories:

- general project induction
- visitor induction
- job specific environmental training.

Information specific to construction noise and vibration will be included in the general project induction and will include:

- all relevant project specific and standard noise and vibration mitigation measures;

- relevant licence and approval conditions;
- permissible hours of work;
- location of nearest receptors;
- designated loading/unloading areas and procedures;
- site opening/closing times (including deliveries); and
- environmental incident and complaint procedures.

All inductions will be recorded in the training register.

#### **8.4 Community and stakeholder consultation**

At least 14 days prior to construction, all potentially affected residences will be informed by letterbox drop and/or email of the construction works including working hours to be adhered to, and the level and duration of noise to expect during construction. They will also be informed if there are any changes to construction activities and timing, including out of hours work.

## 9 Compliance management

### 9.1 Monitoring and reporting schedule

Monitoring to ensure compliance with this plan will consist of regular inspections undertaken in accordance with section 3.9.1 and 3.9.3 of the CEMP. It is the Environmental Site Representative that is responsible for ensuring the scheduled monitoring is undertaken in accordance with this CNVMP.

The Environmental Site Representative or delegate will include a summary of the results of the daily and weekly inspections, results of the attended noise monitoring and summary of any complaints to the overall weekly and monthly environmental report.

**Table 9-1** Construction noise monitoring regime

Monitoring	Frequency
Trial blasting monitoring	Once, at the completion of each trial blast
Blast overpressure and vibration monitoring	During each blast
Construction noise monitoring	Quarterly or attended at nearest receivers
Traffic management (including noise)	One round of attended at nearest receiver

The following sections provide details specific to attended noise monitoring which is part of the monitoring program for this CNVMP

#### 9.1.1 Attended noise monitoring procedure

Given the lack of predicted construction noise impacts identified in the EIS, attended monitoring is only planned to validate the predictions or in response to a significant change in construction equipment or methodology.

The following equipment measurements will be undertaken:

- Noise emission levels of critical items of mobile plant and equipment will be checked for compliance by the site environmental representative or delegate for compliance with noise limits
- For equipment and mobile plant used for construction works, LAeq measurements will be taken at an appropriate distance, normally 7m and converted to a Sound Power Level

The equipment sound power levels will be compared to the levels contained in Table 6-2. If noise checks on any equipment result in a prediction of non-compliance, noise mitigation strategies to achieve compliance will be developed.

**Table 9-2** Construction noise monitoring regime

Monitoring schedule	Action	Reporting
Monthly duration project	for of Document and investigate any community noise complaints from the project site	Reporting as detailed in Section 9.1 included in monthly report.

Monitoring schedule	Action	Reporting
Quarterly during construction	Complete one round of operator-attended 15-minute noise monitoring on separate days at site boundaries and nearest receivers	
Bi-annually	Carry out equipment noise level checks on all critical items of plant and cross-check compliance with Table 6-2	

The measurements will be conducted in accordance with the procedures outlines in Australian Standard AS 1055 Acoustics – Description and measurement of environmental noise and in accordance with methods outlined in the NPI.

## 9.2 Auditing

Audits (both internal and external) will be undertaken to assess the effectiveness of environmental controls, compliance with this plan, CoA and other relevant approvals, licenses and guidelines.

Audit requirements are detailed in Section 3.9.3 of the CEMP.

## 9.3 Non-compliance and corrective actions

Non-compliances identified through inspections should be responded to with a corrective action. Corrective actions should be documented in the inspection checklist.

The Senior Project Manager is responsible for the initial reporting of significant non-compliances with this CNVMP or relevant legislation to the Eurobodalla Shire Council's Project Manager. Eurobodalla Shire Council will be responsible for reporting such events to the relevant statutory authorities in accordance with legislative requirements.

## 10 Complaints Management

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All environment related complaints on the project will be managed by Haslin in accordance with Section 3.7.3 of the CEMP.

The details of the complaint will be recorded on the complaints record and the complaint will be captured on the complaints register.

Where applicable, completed complaints records should detail the following:

- the date and time of the complaint
- the method by which the complaint was made
- any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect
- the nature of the complaint
- description of noise source that is the subject of complaint, duration of event
- location of complainant during time of incident, and general area in which the noise source was located
- identification of project related noise activities and locations that could have or are known to have contributed to the incident
- if known, identification of non-project related noise emission activities and location at time of incident;
- meteorological conditions at the time of the incident
- the action taken in relation to the complaint
- any follow-up contact with the complainant
- if no action was taken, the reason why no action was taken

If the complainant wishes to be contacted, Haslin will aim to respond to the complainant within 24 hours. All records are to be kept in a legible form, or in a form that can readily be reduced to a legible form and kept for at least 4 years after the complaint or event to which they relate took place.

# 11 Review and improvement

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## 11.1 Continuous improvement

Management reviews of the Project's EMS will be undertaken as part of the continual improvement process. The purpose of the reviews is to periodically examine the effectiveness and proper implementation of the CEMP to ensure that the system is meeting the requirements of the standards, policies and objectives and, if not, to amend the CEMP to ensure compliance. The Environmental Site Representative will review the CEMP and its operation and implementation at least every six months from construction commencement. Between the scheduled reviews, a register of issues will be maintained to ensure that any issue raised by internal and external personnel associated with the Project is recorded.

This plan will be updated as required:

- To take into account changes to the environment or generally accepted environmental management practices, new risks to the environment, any hazardous substances, contamination or changes in law.
- In response to internal or external audits or six-monthly management reviews.
- Following reportable environmental incidents.
- Upon identification of new risks, including risks identified during risk register updates.
- When non-compliances are identified.
- Following environmental audits that identify matters that require attention.
- In response to Project change (including modifications).
- Within three months of any of the above occurrences.
- As part of a continuous improvement process.

# HASLIN

# Soil and Water Management Plan

**Eurobodalla Southern Water Supply Storage Project**





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**Appendix A** Erosion and sediment control plan Trigger Action Response Plan

**Appendix B** Preliminary Construction RUSLE Calculations / Erosion and Sedimentation Control Plan

**Appendix C** Soil and Water Management Plan Agency Consultation

**Appendix D** Surface Water Quality Monitoring and Sampling Plan

## Glossary/ Abbreviations

Abbreviations	Expanded text
ASS	Acid Sulfate Soil
CEMP	Construction Environmental Management Plan
CLMP	Contaminated Land Management Plan
Construction	The demolition and removal of buildings or works, the carrying out of works for the purpose of the development, including bulk earthworks, and erection of buildings and other infrastructure permitted by the Development Consent
Council	Eurobodalla Shire Council
Development	The development described in the Eurobodalla Southern Water Supply Storage Environmental Impact Statement
Development Consent (DC)	The Minister for Planning's approval SSD 7089 dated 17 October 2019
Development Consent Conditions	The Minister for Planning's Minister's Development Consent Conditions contained in approval SSD 7089 dated 17 October 2019
DPE	NSW Department of Planning and Environment
DPI	NSW Department of Primary Industries
EIS	Environmental Impact Statement
EMM	Environmental Management Measure as outlined in the project EIS documentation.
ESCP	Erosion and Sediment Control Plan
EPA	NSW Environment Protection Authority
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EWMS	Environmental Work Method Statements
Material harm	Is harm that: <ul style="list-style-type: none"> <li>a) Involves actual or potential harm to the health or safety of human beings or to the environment that is not trivial or</li> <li>b) Results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding \$10,000 (such loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment).</li> </ul>

Abbreviations	Expanded text
OEH	Office of Environment and Heritage
PESCP	Progressive Erosion and Sediment Control Plan
PIRMP	Pollution Incident Response Management Plan
POEO Act	Protection of the Environment Operations Act 1997
REMM	Revised Environmental Management Measures identified in Appendix 2 of the Development Consent
RUSLE	Revised Universal Soil Loss Equation
Site	Part of Lot 3 DP438839 and Lot 2 DP1168581 and an unnamed lot bounded by Bullockys Hut Road and Big Rock Road, Bodalla
SSD	State Significant Development
SWMP	Soil and Water Management Plan

## Document Control and Records

Documentation and document control for this Plan, including issue of any amendments will be done generally in accordance with the contract. This Plan is maintained by Haslin Constructions (Haslin) and maintained throughout construction through regular reviews carried out on an initial 3 month of the project starting then on a biannually basis, or as changes require.

At all times an up-to-date copy of this plan shall be kept on site and made available to all employees and contractors involved in the project. Amendments that are made to this document are recorded on the register of amendments below and shall be approved by management staff. Superseded versions of this document shall be maintained for a period of 7 years to demonstrate record of environmental management and compliance.

This document shall be created and approved by the client. A controlled copy shall be supplied to all relevant parties, and distribution of controlled copies shall be recorded on the distribution register below (controlled hardcopy only). When changes are made to this document, parties listed below shall be provided with updates.

Register of Amendments				
Date:	Version No.:	Description of Amendments:	Prepared by:	Approved by:
29/07/22	0	Draft for review	NF	AL
10/08/22	A	Draft responding to ESC comments	NF	AL
29/09/22	B	Editorial updates	NF	AL
07/10/22	C	Editorial updates	NF	AL
21/10/2022	D	Editorial updates	KM	JM

Company Management Plan Authorisation			
	Name/Position	Date:	Signature
Prepared by:	Nicholas Francesconi Environmental Consultant	21/10/2022	
Reviewed by:	Andrew Lynam Environment Manager	21/10/2022	
Approved by:	Colin Woods Managing Director	21/10/2022	

Distribution Register			
Version No.	Date of Issue:	Name of Recipient:	Position/Organisation
A	10/08/22	Ross Bailey	Principals Authorised Person
B	30/09/22	Ross Bailey	Principals Authorised Person
C	07/10/22	Ross Bailey	Principals Authorised Person
D	21/10/2022	Ross Bailey	Principals Authorised Person

# 1 Introduction

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## 1.1 Context

This Soil and Water Management Plan (SWMP or Plan) forms part of the Construction Environmental Management Plan (CEMP) for the Eurobodalla Southern Water Supply Storage (the Project).

This SWMP has been prepared to address the requirements of the Minister's Development Consent and the environmental management measures listed in the Eurobodalla Southern Water Supply Storage Environmental Impact Statement (EIS) and all applicable legislation.

## 1.2 The approved project

The Eurobodalla Southern Water Supply Storage (the Project) was granted Development Consent from the Department of Planning and Environment (DPE) on 17 October 2019. Development Consent is provided in Appendix A.

The Project consists of an off-stream water storage facility and associated ancillary facilities. Water would be extracted from the Tuross River using a new river intake pump station and transferred to the storage via the Storage Inlet Pipeline. As necessary, the storage volume would be supplemented by water extracted from an existing borefield adjacent the storage.

Key features of the Project include:

- a 3,000 megalitre storage capacity,
- a 370 metre long embankment, 39 metres in height and a crest width of 20 metres located on an unnamed tributary of the Tuross River,
- a spillway,
- permanent erosion control structures located downstream of the spillway,
- inlet works to convey and dissipate raw water transferred from the river intake pump station through a pipeline constructed along the left abutment to the proposed water storage facility,
- outlet works to allow transfer of water from the storage to the existing southern water treatment plant (WTP),
- instrumentation to monitor seepage, reservoir levels and water quality,
- a consequence category of "High C" for both flood and sunny day scenarios in accordance with the Australian National Committee on Large Dams (ANCOLD) Guidelines on the consequence categories of dams (2012),
- a thermal stratification control system,
- a boat ramp at the storage for maintenance and water quality monitoring, and
- safety and perimeter fencing at the storage.

Key features of the ancillary facilities include:

- new river intake pump station with a total river extraction capacity made up of a combination of flows from the river intake (up to 26 megalitres) and the borefield (up to six megalitres),

- installation of the following new pipelines including:
  - a pipeline with a capacity of 26 megalitres per day to transfer raw water from the new river intake pump station to the storage inlet chute
  - a cross connection to the proposed water storage inlet pipeline with a capacity of six megalitres per day providing connection to supply water from the storage to the balance tank at the existing WTP
  - a pipeline connection from the existing borefield pipeline to the river intake pump station.
- a new storage access road that is about one kilometre in length and extends from Eurobodalla Road opposite the existing WTP to the embankment crest,
- basic right-turn and basic left-turn treatment at the intersection of the new storage access road and Eurobodalla Road would be provided,
- a new access road that would provide a route for vehicles to access the new river intake pump station, and
- power supply including the construction of new sub-stations located near the storage and the river intake pump station.

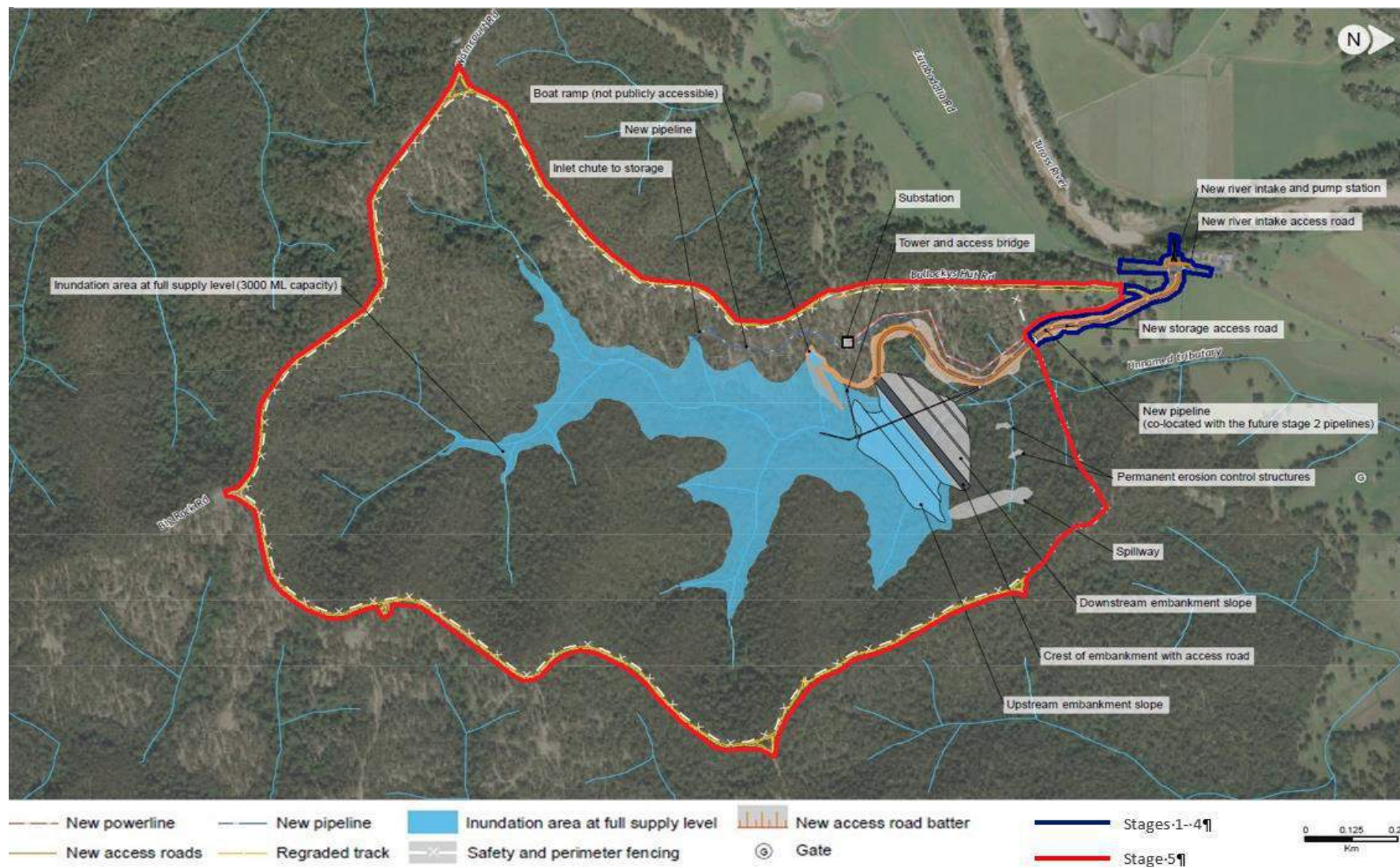
### **1.3 Scope of this plan**

With the approval of the Secretary of Planning, construction of the project is being staged as follows:

- Stage 1: Tuross River Intake Pump Station clearing.
- Stage 2: Tuross River Intake Pump Station construction.
- Stage 3: Vegetation clearing and topsoil stripping of the access road, construction of the access road to the forestry boundary and construction of the inlet pipeline to the forestry boundary.
- Stage 4: Partial clearing of the entire storage site.
- Stage 5: All other works.

Works in Stage 1, Stage 2 and Stage 4 are complete. Stage 3 works are partially complete and will continue to be delivered under the applicable CEMP. This Plan only applies to Stage 5 of the approved project, being the construction of all remaining works on site including the removal of the remaining vegetation within clearing boundary, construction of the embankment wall, spillway, permanent erosion control measures and all remaining works on site to enable the project to become operational. The scope of works is detailed in Figure 1-1 and the construction site boundary is detailed in Figure 2-1.





**Figure 1-1** Project overview and scope of works covered by this plan (Stage 5)

## **2 Purpose and objectives**

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### **2.1 Purpose**

The purpose of this Soil and Water Management Plan (SWMP) is to describe how water quality will be protected during construction of the Project.

### **2.2 Objectives**

The key objective of the SWMP is to ensure all conditions of the Development Consent, environmental management measures and licence/permit requirements relevant to water quality are described, scheduled and assigned responsibility as outlined in:

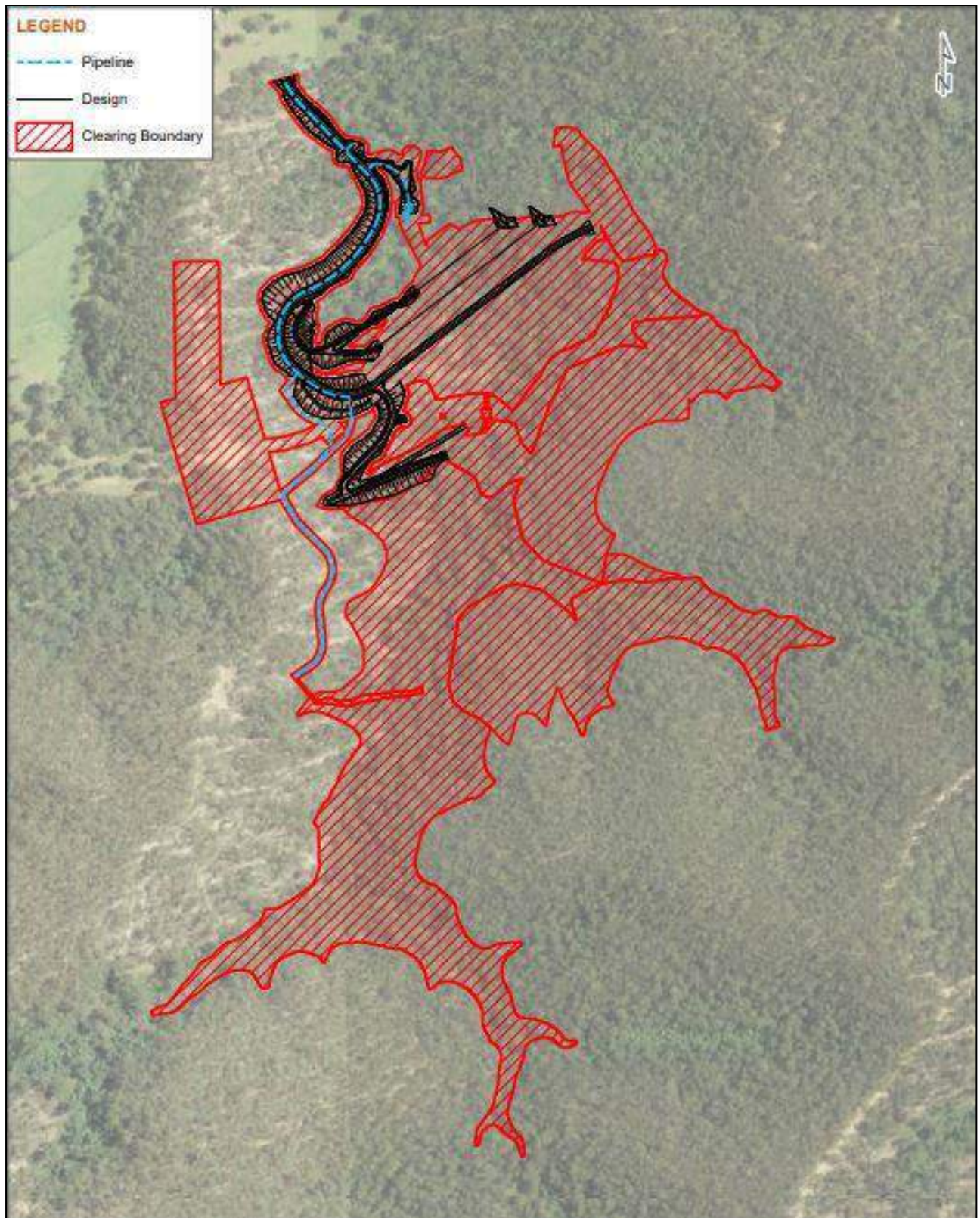
- The Environmental Impact Assessment (EIA) prepared for Eurobodalla Southern Water Supply Storage (the Project).
- Submission Report for the Eurobodalla Southern Water Supply Storage Project.
- Addendum Submissions Report for the Eurobodalla Southern Water Supply Storage Project.
- Revised Secretary's Environmental Assessment Requirements (SEARs).
- Revised Management and Mitigation Measures.
- Development Consent SSD 7089 (the Project) granted on 17 October 2019.

### **2.3 Targets**

The following targets have been established for the management of soil and water impacts during the project:

- Ensure full compliance with the relevant legislative requirements, EIS and conditions of the Development Consent.
- Minimise erosion of soil on the project site during construction.
- Manage downstream water quality impacts attributable to the project (ie maintain water waterway health by avoiding the introduction of nutrients, sediment and chemicals outside of that permitted by the environmental protection licence and/or ANZECC guidelines).
- Ensure training on best practice soil and water management is provided to all construction personnel through site inductions.
- Re-use dirty water collected in sediment basins with reuse prioritised over discharge to receiving waters.





**Figure 2-1** Clearing boundary and proposed pipeline design layout

## 3 Environmental requirements

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### 3.1 Relevant legislation and guidelines

#### 3.1.1 Legislation and regulatory requirements

All legislation relevant to this SWMP is included in Appendix A1 of the CEMP.

#### 3.1.2 Guidelines and standards

The main guidelines, specifications and policy documents relevant to this plan include:

- Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC and ARMCANZ 2000).
- Department of Environment and Conservation (DEC): Bunding & Spill Management. Insert to the Environment Protection Manual for Authorised Officers - Technical section "Bu" November 1997.
- Managing Urban Stormwater: Soils and Construction. Landcom, (4th Edition) March 2004 (reprinted 2006) (the "Blue Book"). Volume 1 and Volume 2.
- Volume 2A Installation of Services (DECCW 2008).
- Volume 2C Unsealed Roads (DECCW 2008).
- Fairfull, S. and Witheridge, G. (2003) Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings. NSW Fisheries, Cronulla, 16 pp.
  - NSW Fisheries, November 2003. Fishnote – Policy and Guidelines for Fish Friendly Waterway Crossings (Ref: NSWFW – 1181).
- Guidelines for controlled activities on waterfront land NRAR May 2018.
- RMS Dewatering Guideline.
- RTA's Code of Practice for Water Management – Road Development and Management (1999).
- Approved Methods for the Sampling and Analysis of Water Pollutants in NSW – EPA, March 2004.
- RMS Environment Direction Management of Tannins from Vegetation Mulch.
- Stockpile Site Management Guideline, RMS 2011.
- Environmental Best Management Practice Guideline for Concreting Contractors, DEC, 2004.

#### 3.1.3 Environment Protection Licence

Construction of the project triggers the need for an Environment Protection Licence (EPL) under the *Protection of the Environment Operations Act 1997* for the scheduled activities of Extractive Industries and Crushing and Screening. The EPL will be held by Haslin Constructions and remain outside of this Plan.

### 3.2 Conditions of Development Consent

The conditions relevant to this Plan are listed in Table 3-1 below. A cross reference is also included to indicate where the condition is addressed in this Plan or other Project management documents.

**Table 3-1** Minister's Conditions of Development Consent relevant to the SWMP

Condition No.	Condition Requirements	Document Reference
B13	Prior to commencement of any surface disturbance the Applicant must prepare a Construction Soil and Water Management Plan to the satisfaction of the Planning Secretary as part of the CEMP required by Condition C2. The Construction Soil and Water Management Plan must be prepared by a suitable qualified person(s) in consultation with the EPA and include:	This document Prepared by Appropriately qualified person and reviewed by a Soil Conservation Specialist
	(a) guidelines and procedures to reuse dirty water collected in sediment basins with reuse prioritised over discharge to receiving waters;	Section 2-3 Section 6.1.4
	(b) an assessment of cumulative risks associated with sediment pond settling agents;	Section 6.1.4
	(c) discharge criteria based on an assessment of potential impacts against the NSW Water Quality Objectives (WQO) for receiving waters;	Section 4.4
	(d) identification and implementation of mitigation measures to avoid pollution including, but not limited to, dosing procedures, discharge procedures, direct ecotoxicology testing;	Section 6
	(e) a detailed Erosion and Sediment Control Plan prepared in consultation DPI Fisheries and DPI Water in addition to the EPA; and	Appendix B
	(f) evidence of consultation with the EPA and DPI Fisheries and Water.	Appendix C



Condition No.	Condition Requirements	Document Reference
B14	Erosion and sediment control measures must: (a) be in accordance with the relevant requirements of Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom, 2004) and mitigation measures outlined in the Policy and guidelines for fish habitat conservation and management (DPI 2013); and	Section 6.1.4
	(b) have sediment basins sized to a 90th or 95th percentile 5-day rainfall depth or as otherwise agreed with the EPA during the preparation of the Erosion and Sediment Control Plan referred to in Condition B13(e).	Section 6.1.4
B15	The development must comply with section 120 of the POEO Act, which prohibits the pollution of waters, except as expressly provided for in an EPL.	Section 2.3
B16	The Applicant must store all chemicals, fuels and oils used on-site in accordance with: (a) the requirements of all relevant Australian Standards; and (b) the NSW EPA's Storing and Handling of Liquids: Environmental Protection – Participants Manual if the chemicals are liquids.	Section 6.2.1
B18	The applicant must: (a) design and manage stormwater runoff from access roads so that it does not result in erosion and pollution of receiving waters;	Section 6.1.1
	(b) maintain erosion control measures downstream of the spillway, storage outlet works and at the river intake; and	Section 6.2.2
	(c) use natural materials, such as rock rip rap, for erosion and river bank protection.	Section 6.2.2
B30	The Applicant must ensure that public access is managed to prevent erosion or damage to native vegetation by restricting access through site fencing to pedestrians.	Section 6.0

### 3.3 Environmental Management Measures

Relevant EMM are listed in table 3-2 below. This includes reference to required outcomes, the timing of when the commitment applies, relevant documents or sections of the environmental assessment influencing the outcome and implementation.

**Table 3-2** Environmental management measures relevant to this SWMP

Ref #	Commitment	Timing	SWMP Reference
2.2	Construction planning would consider flood risk for all compounds and work sites.	Pre-construction	Section 4.7
	The site layout and staging of construction activities would avoid or minimise obstruction of overland flow paths and limit the extent of flow diversion required.	During construction	
2.3	Measures to further avoid and minimise the construction footprint will be investigated during detailed design and implemented where practicable and feasible.	Detailed design	Section 6.1
		During construction	
2.4	Additional assessment of scour potential would be undertaken as necessary during detailed design. This would include development of appropriate mitigation measures.	Detailed design	Section 6.1.2
		During construction	
2.5	Works within or near watercourses would be undertaken with consideration given to the DPI Water's guidelines for controlled activities.	During construction	Section 6.1.1



Ref #	Commitment	Timing	SWMP Reference
2.6	Water quality control systems would be incorporated into the detailed design to ensure that relevant WQOs can be met during water discharge.	Detailed design  During construction	Section 6.1.3  Section 6.1.4  Section 7.3
2.7	<p>The current SWMP will be revised (as necessary) and implemented during construction and operation of the proposal. The plan will specify:</p> <ul style="list-style-type: none"> <li>• Sampling locations relevant to assessing potential impacts and/or the effectiveness of control measures.</li> <li>• The frequency of monitoring and sampling and the triggers for event-based monitoring / sampling.</li> <li>• The monitoring and sampling methodology in accordance with relevant guidelines, and the parameters to be monitored and sampled.</li> <li>• General and reactive management and mitigation measures.</li> <li>• Procedures addressing relevant matters specified in relevant legislation and guidelines.</li> </ul>	During construction	Section 6.1.7  Section 6.1.4  Section 7.3
2.8	Erosion and sediment mitigation measures would be installed and maintained for the duration of the construction period.	During construction	Section 6

Ref #	Commitment	Timing	SWMP Reference
2.9	Discharges would be monitored to ensure compliance with WQOs and discharge criteria in the environment protection licence.	During construction	Section 6.1.4 Section 6.1.7 Section 7.3 SWQMP
2.10	During construction a coffer dam will be in place to cater for medium level events and a sediment and erosion control plan in place to minimise risks of sediment-laden water escaping from the site.	During construction	Section 6.1.1
2.11	<p>Several temporary sediment basins (suited to Type D dispersive soils) are proposed to be located in the main storage construction footprint. The location of the basins is down-gradient of ground disturbance areas. These would be operated as 'wet basins' which are designed to retain sediment laden water for extended periods allowing adequate time for the gravitational settlement of fine sediment particles. These basins would rely on chemical dosing to assist flocculation; the basins would not be drained until suitable water quality is obtained.</p> <p>Discharge from the sediment basins to the environment would only occur during:</p> <ul style="list-style-type: none"> <li>Uncontrolled discharges following significant wet weather events leading to basin overflow via spillway (incidental frequency)</li> <li>Controlled discharges following treatment of sediment basin water (periodic frequency).</li> </ul>	During construction	Section 6.1.4 Section 6.1.7 Section 7.3

Ref #	Commitment	Timing	SWMP Reference
2.12	The coffer dam would be constructed early in the program, upslope of the main embankment and is designed to capture and divert stormwater runoff (up to approximately 32 megalitre capacity, suited for flood capacity design criteria of 1 in 10 Annual Exceedance Probability) for the duration of construction. The coffer dam is designed to facilitate up-gradient 'clean water' diversion through the site.	During construction	Section 6.1.1
2.13	Sediment basins would discharge soon after rainfall events, avoiding discharges during periods of low flows. Treatment of sediment basins would commence soon after rainfall events using chemical dosing (coagulants and/or flocculants) using either an automatic or manual chemical dosing system. Prior to treatment, jar testing would be used to determine the chemical dosing requirements of the sediment basins.	During construction	Section 6.1.4 Section 6.1.7 Section 7.3
2.14	The water quality of 'clean water' would be maintained through implementation of appropriate erosion and sediment controls and staged vegetation clearing in upslope areas. The coffer dam outlet will connect to the diversion pipe constructed through the base of the embankment, diverting 'clean' flow through the site to the outlet works.	During construction	Section 6.1 Section 6.1.2 Section 6.1.5

Ref #	Commitment	Timing	SWMP Reference
2.17	<p>Water quality impacts from uncontrolled discharges (i.e. significant wet weather) would be reduced by ensuring adequate size, location and operation &amp; maintenance requirements of the temporary sediment basins. This includes:</p> <ul style="list-style-type: none"> <li>Sizing of the basins would account for a minimum of 5-day rainfall depth, 80th percentile rain events in accordance with published guidelines for extended construction period (&gt; 6 months)</li> <li>A series of Progressive Erosion and Sediment Control Plans (PESCP) would be prepared which detail construction sediment basin location and sizing with respect to each individual construction stage (refer to Section 3.3.6)</li> <li>Nomination of an environmental representative on site to complete audits and monitor PESCPs. Independent audits would be carried out by a soil conservationist or accredited erosion and sediment control professional</li> <li>Operation and maintenance of sediment basins would refer to available guidance within the industry practice (e.g. Blue Book, 2004 and IECA,2018).</li> </ul>	During construction	<p>Section 6.1.4</p> <p>Section 6.1.7</p> <p>Section 7.3</p>
2.19	<p>Discharge by either the spillway or outlet works (if it occurs) would have erosion protection (i.e. stabilised outlets consisting of rock rip rap) to reduce water velocities and minimise the risk of additional erosion downstream of the storage.</p>	<p>During construction</p> <p>During operation</p>	<p>Section 6.1</p>

Ref #	Commitment	Timing	SWMP Reference
2.20	<p>Water quality impacts from controlled discharges would also be reduced by adequate selection, dosing and management of chemical coagulants and flocculants. This includes:</p> <ul style="list-style-type: none"><li>• Consideration would be given to the selection of suitable chemical coagulants and/or flocculants by the contractor's environmental representative. Reference would be made to Safety Data Sheets for chemical specific ecotoxicity information. The use of biodegradable products and/or non-hazardous would be considered first preference.</li><li>• Chemical dosing and operation of discharges from sediment basins would be managed by suitably qualified and experienced persons. A detailed plan for management, storage and use of chemical coagulants and/or flocculants would be prepared as part of PESCPs.</li><li>• Operation and maintenance of sediment basins would refer to available guidance within the industry practice (e.g. Blue Book, 2004 and IECA, 2018).</li></ul>	During construction	Section 6.1.4 Section 6.1.7 Section 7.3

## 4 Existing Environment

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The following sections summarise what is known about factors influencing soils and water within and adjacent to the Project corridor and are extracted from the Environmental Impact Statement.

### 4.1 Topography

The Project area includes moderate to steep gradients within valley slopes where terrain remains densely forested, undulating foothills and flats, and riverbanks along the Tuross River. The upper and mid valley areas remain densely forested with minimal clearing for fire trails only. The lower foothills and flats comprise cleared and vacant pastures. Drainage from the Project area is expected to follow existing ephemeral streams through valley areas and discharge to low lying areas within pasturelands.

The Project itself intercepts an unnamed third order ephemeral stream and this minor catchment area comprises the Bodalla State Forest. The catchment area for the water storage land usage consists of semi-dense forested areas at the upper reaches of the valley with a transition to cleared pasturelands towards the lower reaches. During recent monitoring by Eurobodalla Council, ephemeral streams have been observed to flow in certain high rainfall conditions (i.e. after rainfall events of approximately 30 millimetres/day or more).

### 4.2 Soil characteristics

Soil landscapes have been identified from the Soil Landscapes of the Narooma 1:100 000 Sheet (Talau, 2002) within the Permanent Works Area. A summary of relevant soil landscapes within the project area is as follows:

- **Murrah (mu)** – This soil landscape occurs on rolling low hills to hills on Ordovician sediments and metasediments, siltstones, greywackes, shales and fine sandstone and is mostly used for dairy cattle grazing on improved pasture. Soils in this landscape have a very high erosion hazard and have commonly abundant surface gravels to cobbles. At the site of the proposal, this soil landscape occurs within the mid and upper valley slopes and currently comprises native forest vegetation. The current land use is designated for production forestry activities. Majority of the Storage Site Clearing works are located within this landscape.
- **Tanja (tj)**– This soil landscape occurs on low hills on Ordovician sediments and metasediments, siltstones, greywackes, shales and fine sandstone and is mostly used for dairy cattle grazing on improved pasture. Severe sheet and rill erosion have occurred where soils have been disturbed by road construction.
- **Tuross River (ts)** – This soil landscape occurs on floodplains, levees and channels of the Tuross River. Soils are described as quaternary alluvium comprising coarse sand and sandy loams, to sandy clay loams, with gravel and cobble layers common. Soils in this landscape have limitations associated with high energy flooding, and extensive

streambank erosion. The current land use is for grazing on cultivated and improved pastures.

The construction site area has not been identified in the Eurobodalla Local Environmental Plan (2012) or coastal Acid Sulfate Soils Risk Mapping (NSW OEH, as viewed on eSpade website) as having the potential for Acid Sulfate Soils to be present.

Geotechnical investigations have been carried out within the Permanent Works Area to inform detailed design phase of works, the details of which are presented within the Geotechnical Investigations Factual Report (SMEC, 2018a) and Geotechnical Investigations Interpretive Report (SMEC, 2018b). The investigations were required to gain a better understanding of the subsurface geology to inform the detailed design of the storage embankment and related ancillary structures.

The geology encountered during the geotechnical investigations was found to be consistent with the published geology of the Early to Middle Ordovician age rocks from the undifferentiated Adaminaby Group. In general, a thin cover of topsoil and slopewash colluvium is found overlying residual soils developed on rocks from the undifferentiated Adaminaby Group. Sequences of Quaternary alluvial sediments in excess of 5 m depth ranging from gravelly clay/silt through to imbricated clast supported cobble deposits were encountered in the creek bed.

Geotechnical investigations were carried out for key features of the Permanent Works Area. Further details are presented within the Geotechnical Investigations Factual Report (SMEC, 2018a) and Geotechnical Investigations Interpretive Report (SMEC, 2018b). Figure 4-1 details the location of geotechnical investigations discussed below.

- Emerson aggregate testing (Emerson Class AS1289.3.8.1) was carried out to assess soil dispersion properties at twelve test pits locations as shown in Figure 3-3.
- From engineering logs, subsurface conditions typically comprised 0.3-0.6 m thick layer of topsoil comprising gravelly and clayey silt, overlying sedimentary rock described as siltstone, brown-red-orange and grey, extremely to highly weathered.

Relevant geotechnical testing included particle size gradings (% gravel, sand and silt/clay), Atterberg limits (Liquid Limit, Plastic Limit and Plasticity Index) and Emerson class. AS1289.3.8.1 - 2006 Methods of testing soils for engineering purposes Soil classification tests Dispersion – Determination of Emerson class number of a soil, was carried out on up to twelve sampling locations, targeting various depth intervals within extremely to highly weathered sedimentary rock material (between 0.5 m and 2.0 m below ground level).

With respect to this erosion and sediment control plan, an interpretation of the results are as follows:

- the Emerson class results indicate the extremely to highly weathered siltstone sedimentary rock as having either a slight to moderate dispersion potential (Class 3 or Class 5) or moderate to very high dispersion potential (Class 2). Negligible dispersion potential (Class 7) was noted at six locations (TP-US1, TP-US2, TP-US8, TP-D4, TP-D10 and TP-D11) which were located on steep valley slopes above 25 m AHD.



- in general, exposed soils with Emerson Class 1 to 4 (in particular class 1 and 2) need to be treated with extra caution in dam construction (Fell et al “Geotechnical Engineering of Dams, 2nd edition”, (2015), London, Taylor and Francis Group). On a preliminary level, the Emerson test results indicate there is a risk the exposed rock in some areas is dispersive, thus presenting some risks to earthworks if subjected to water flow and/or if not treated or managed.
- a site-specific assessment of soil erodibility factor (K-factor) was carried out using the derivation methods outlined in the Bluebook (Appendix A, pA6-A7 & Figure A3, Landcom, 2004) and the results of geotechnical investigations and testing. Required input parameters include particle size analysis, organic matter (%), soil structure, (i.e. very granular, fine granular, medium and coarse granular, or blocky, platy and massive) and profile permeability (Ksat). The soil erodibility factor (K-factor) was calculated using the above geotechnical laboratory test data (test location TP-US1) within the proposed northern quarry area. As a conservative assumption, the percentage of sand, silt and clay was adopted (i.e. % passing the 2.36 mm sieve). A K-factor of 0.042 was estimated based on assumed very fine granular soil structure and slow permeability materials.

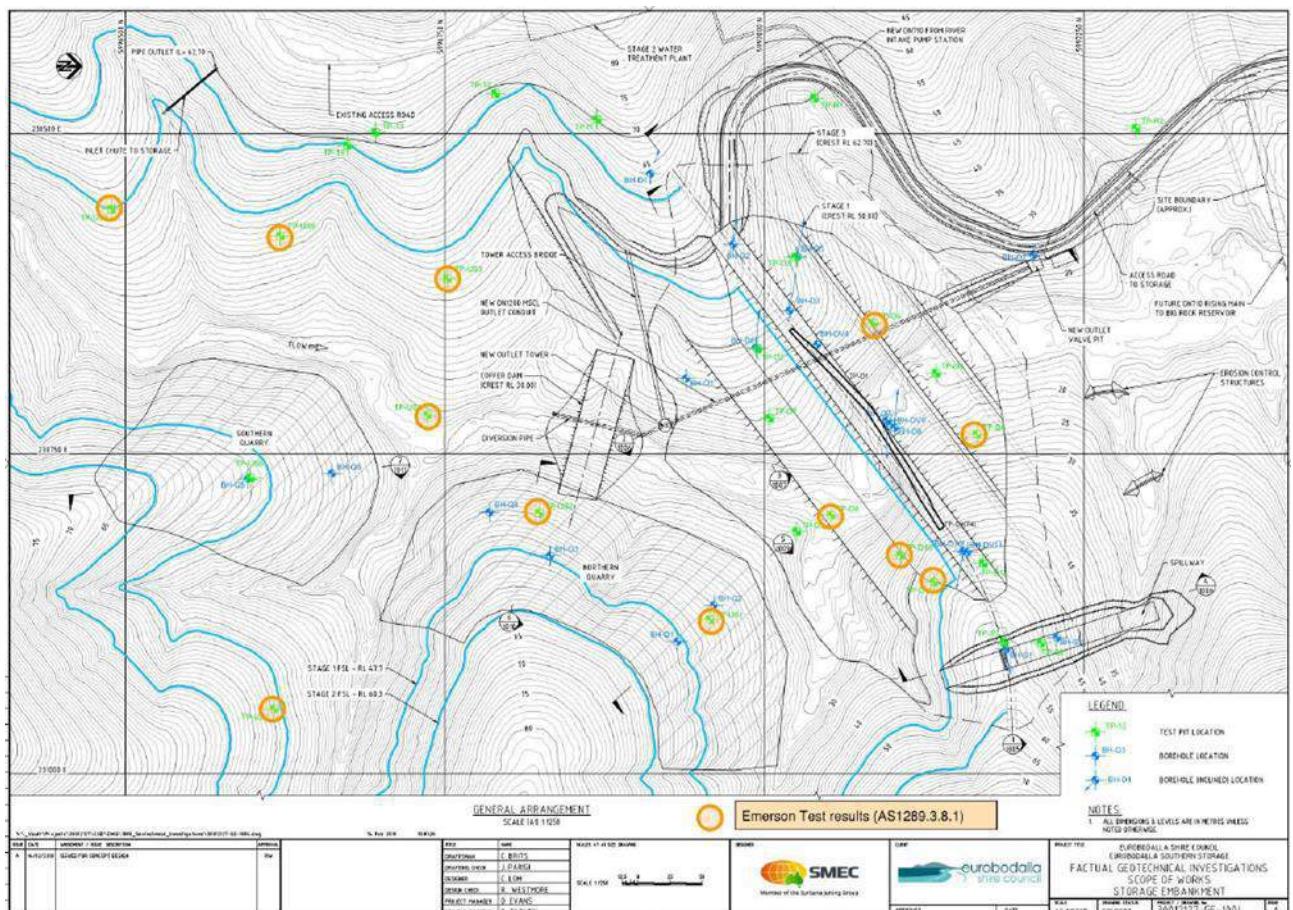


Figure 4-1 Geotechnical investigation locations

### 4.3 Erosion Hazard

An erosion hazard assessment that was carried out as part of the Conceptual Erosion and Sediment Control Plan (CESCP, Ref: 30012127\_R10) for the Partial Clearing works (stage 4), using the Revised Universal Soil Loss Equation (RUSLE). The conceptual construction catchments used for RUSLE calculations are shown at Figure 4-3 and the erosion hazard assessment calculations are provided at Appendix B. The assessment considered the erosion hazard associated with the water storage facility construction and highlighted the need to appreciate the erosion hazard on site. The outcome has been used to inform this CSWMP.

The Conceptual Erosion and Sediment Control Plan (CESCP, Ref: 30012127\_R10) for the Partial Clearing works will be considered by the Soil Conservation Specialist in the development of progressive erosion and sedimentation control plans and in determining the need and sizing of sedimentation basins.

### 4.4 Surface water

Maintaining the surface water quality in the Tuross River has been identified as being a primary water quality objective for the Project. Existing water quality conditions, and potential risks to water quality posed by the proposal are discussed in the Addendum Submissions Report.

Water Quality Objectives (WQO) for this section of the Tuross River relate to the protection of:

- aquatic ecosystems
- visual amenity
- primary contact recreation
- secondary contact recreation
- livestock water supply
- irrigation water supply
- homestead water supply
- drinking water at point of supply (disinfection only, clarification and disinfection, groundwater)
- aquatic foods (cooked).

A Water Quality Monitoring and Sampling Plan (WQMSP) was developed and has been implemented for the Project. Baseline water quality monitoring included scheduled (monthly) and event based (e.g., immediately after rainfall) sampling carried out within several locations along this section of the Tuross River for various water quality parameters including total dissolved solids (TDS), total suspended solids (TSS), turbidity, pH, nutrients, heavy metals, various organic pollutants and microbial parameters.

Baseline water quality data indicated that the Tuross River is characterised by:

- elevated turbidity, nutrients and chlorophyll and selected heavy metals (aluminium and zinc), following wet weather events

- other pollutants such as heavy metals (excluding aluminium and zinc), petroleum hydrocarbons, pesticides and other contaminants were below adopted assessment criteria.

Monitoring of construction water discharges will be undertaken throughout the construction of the Project. This will enable a comparison of water quality during works to the pre-construction baseline water quality. The baseline monitoring program methodology and findings are provided in Appendix D. Appendix D also include site specific trigger values for comparison during construction water quality monitoring, in accordance with Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG 2018).

Water quality monitoring of the un-named ephemeral drainage line that dissects the project area was undertaken when flows were observable. The monitoring showed that water quality in the drainage line was quite variable with exceedances of pH, electrical conductivity and dissolved oxygen observed over the monitoring period.

## **4.5 Climate and rainfall**

Climate monitoring data for the project were sourced from the following weather and river monitoring stations:

- Daily river flows and rainfall monitoring data at 'Tuross River @ Eurobodalla (Station ID 218008)', located immediately adjacent to the proposal within the existing southern water treatment plant sourced from the Department of Primary Industries, Office of Water website (DPI, 2017).
- Rainfall monitoring data at 'Bodalla Post Office (Station ID 069036)' located approximately six kilometres north-east of the proposal sourced from the Bureau of Meteorology website (BOM, 2017).
- Source 3: Weather including temperature and wind data at 'Narooma (Marine Rescue) (Station ID 069022)' located approximately 15 kilometres south-east of the proposal sourced from the Bureau of Meteorology website (BOM, 2017).

Temperatures are typically mild to warm (ranging between 6.7 degrees Celsius in June and 16.8 degrees Celsius in February).

Prevailing summer winds are typically from the south, south-west and west (reaching 16.1 kilometres per hour recorded at 3 pm in the month November). Prevailing winter winds are typically from the east in the mornings, with varied wind direction in the afternoon (west, south west, north and south) (reaching 13.1 kilometres per hour in the month of August). It is noted that weather statistics from Source 3 may overestimate wind speed and direction at the proposal site which is located approximately 10 kilometres inland from the coast.

Cumulative annual rainfall appears a relatively stable trend over the past 40 years. Moderate to high rainfall occurs throughout the year (871 millimetres annually), with a slight summer dominance (118 millimetres in February). The lowest rainfall occurs in spring (41 millimetres in September). SMEC considered that rainfall data at Source 1 is typically less than Source 2 and may provide a better estimate of actual rainfall expected at the site.

## 4.6 Rainfall erosivity factor

The rainfall erosivity factor is a measure of the ability of rainfall to cause erosion (referred to as “R” in the Revised Universal Soil Loss Equation RUSLE). The rainfall erosivity factor is used to determine the soil loss in tonnes per hectare over one year and is used in calculations when sizing construction sediment basins.

The Project has a Rainfall Erosivity Factor of 4500 SI. Bodalla Post Office is the closest location with detailed R-factor data and is detailed below in Table 4-1 below.

**Table 4-1** Monthly rainfall %

Monthly rainfall %													
	Dec	Jan	Feb	Mar	Apr	Mar	Jun	July	Aug	Sep	Oct	Nov	Year
%	9	10	11	11	8	8	9	5	6	6	8	8	972mm

As part of the Environmental Impact Statement, SMEC prepared a Conceptual Erosion Sediment Control Plan for each of the catchments within the project area.

Figure 4-3 is taken from the Conceptual Erosion Sediment Control Plan (CESCP) (SMEC, 2018c) and outlines the location and expected surface flow behaviours of the Project Site. It also identifies conceptual construction catchments for the major elements of the Project in accordance with the proposed design. The construction catchments outlined in the CESCP would be subject to further refinement as detailed erosion hazard assessments are carried out in future stages of the Project.

## 4.7 Flooding

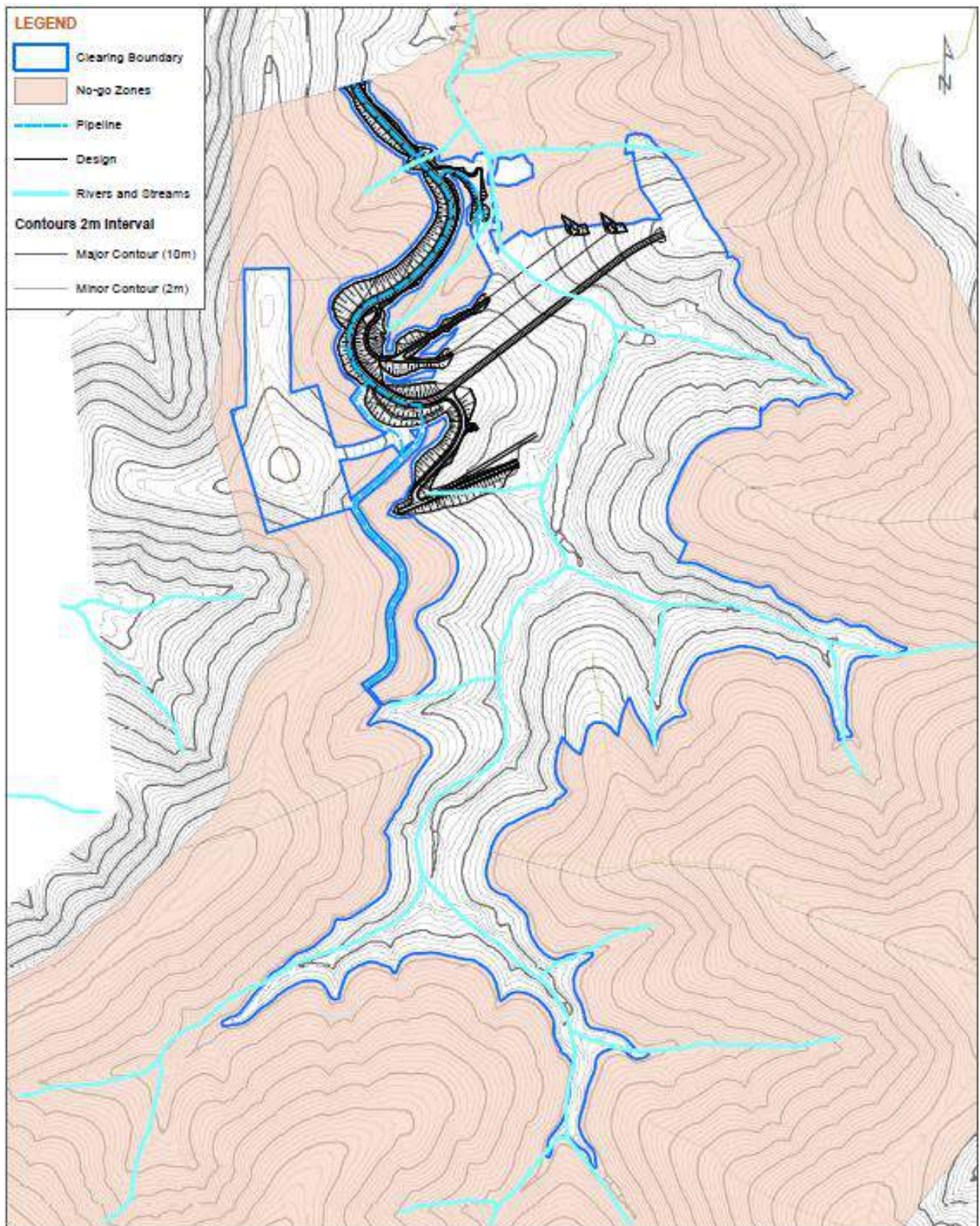
The Tuross River is subject to significant flood events, which have occurred in 1978, 1991 and 1992 (with three large floods in this two-year period), 2010 and 2011. In each of these events peak daily flows exceeded 150,000 megalitres per day at the Eurobodalla gauging station. More recent floods have occurred in December 2014 (130,000 megalitres per day), January 2015 (120,000 megalitres per day), June 2016, and December 2017. The flood variability within the Tuross River is among the highest of all rivers in southeast NSW (Rustomji, 2003).

The relevant emergency management plan for the study area is the Eurobodalla Shire Local Disaster Plan, which includes the Eurobodalla Shire Flood Emergency Sub-plan. This covers preparedness measures, response operations and coordination of recovery from flooding within the Eurobodalla LGA. Flood maps prepared for the Hydrology and Consequence Assessment (refer to Appendix C) indicates that flood prone land is primarily restricted to the floodplains adjacent the unnamed tributary and Tuross River, particularly around the township of Bodalla.

Ancillary facilities and construction compounds were identified in the environmental impact statement. The main construction compound is located on the western edge of the project site

on a spur with elevations of approximately 70m AHD. If alternate construction compounds are required, the potential impacts of flooding would be considered.





**Figure 4-2** Creeks and drainage lines within the construction site



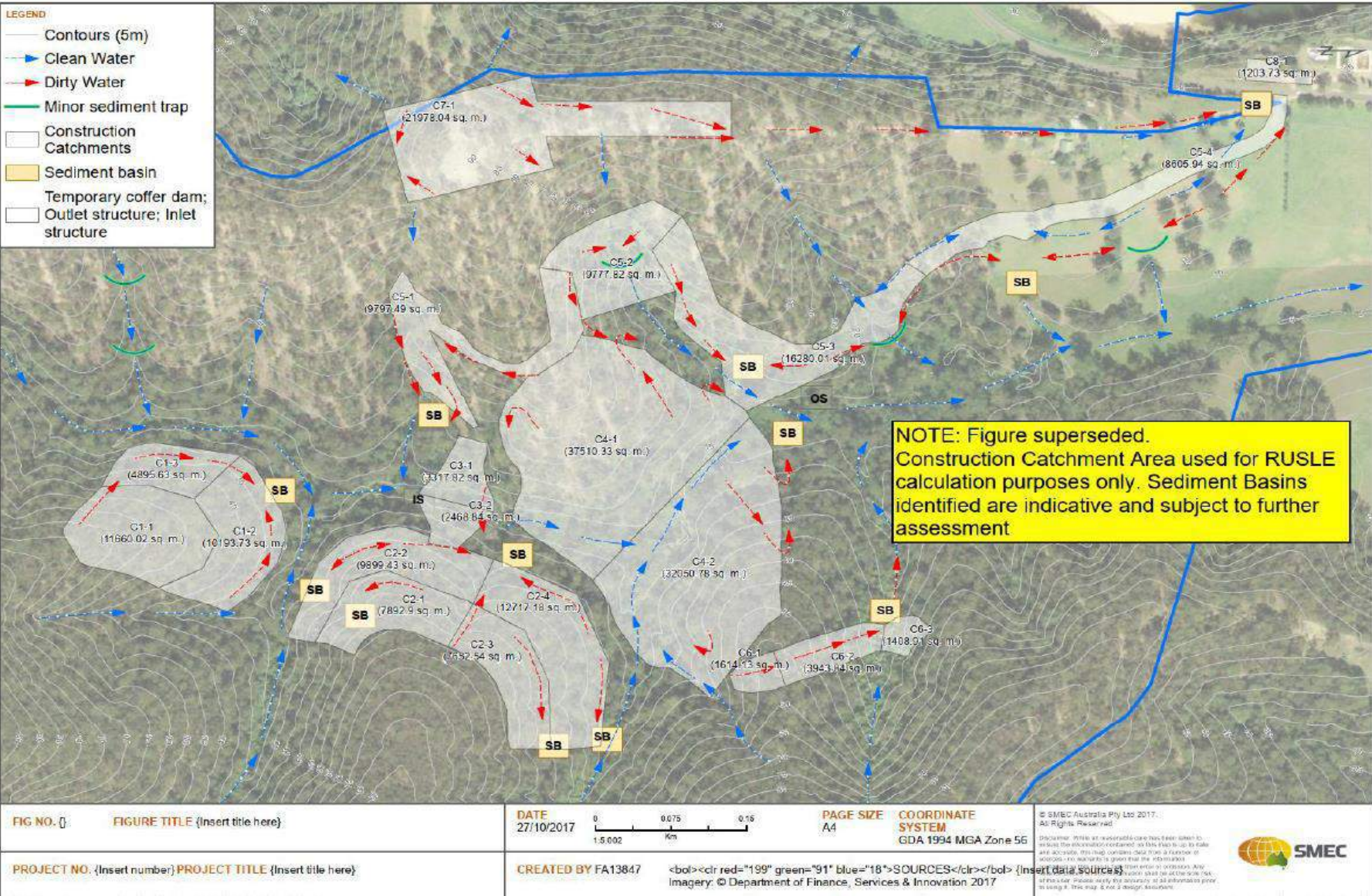


Figure 4-3 Conceptual construction catchments used for RUSLE calculation



## 5 Environmental aspects and impacts

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### 5.1 Construction activities

Key aspects of the Project that could result in adverse impacts to soils and water include:

- Vegetation clearing, grubbing and topsoil stripping.
- Bulk earthworks.
- Works within ephemeral creek and steep valley slopes
- Temporary creek crossings
- Site access including temporary waterway crossings.
- Cofferdam and drainage works.
- Material stockpiles.
- Concrete works.
- Water use / extraction.
- Compounds operation including fuel and chemical storage, refuelling and chemical handling.
- Weed treatment.

### 5.2 Impacts

The potential for impacts on soil and water will depend on a number of factors. Primarily impacts will be dependent on the nature, extent and magnitude of construction activities and their interaction with the natural environment. Potential impacts attributable to construction might include:

- increased sediment loads due to:
  - erosion, spills or dust generation during minor earthworks
  - exposed soil transported during rain events discharging to the Tuross River
- increased concentrations of nutrients, metals, and other pollutants transported via sediment-laden (i.e., dirty water) discharge to Tuross River
- chemicals, oils, grease and petroleum hydrocarbon spills or leaks from storage containers or directly from construction machinery entering and polluting Tuross River
- gross pollutants (e.g., litter) from construction activities entering and polluting Tuross River
- stockpiles of cleared vegetation could leach or be washed directly in the Tuross River.
- Impacts to water quality that may result from these activities include:
  - smothering of aquatic life and/or inhibiting critical processes (e.g., photosynthesis) of aquatic and riparian flora
  - reduction of fish passage area from instream activities and erosion and sediment controls
  - impacts to breeding and spawning conditions of aquatic fauna

- changes to water temperature due to reduced light penetration, or from discharge of water that is not at ambient temperature
- impacts to downstream ecosystems such as wetlands, floodplains and coastal estuaries
- increased turbidity / nutrient concentrations causing a proliferation of nuisance aquatic flora
- pollutant runoff in surface water from herbicide application
- runoff high in tannins can increase the biological oxygen demand (BOD) of the receiving environment, which in turn would decrease the availability of dissolved oxygen. Tannins may also reduce light penetration and alter the pH of receiving waters. These impacts may affect aquatic ecosystems in receiving environments.

Some impacts on soil and water attributable to the Project are anticipated. Section 6 provides mitigation measures that will be implemented to avoid or minimise those impacts.

## 6 Environmental control measures

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### 6.1 Key management strategies

The following sections outline the key management strategies that underpin this CSWMP that have been developed from the Blue Book principles. Depending on the construction phase and location on site, a selection of the following measures will be used, including:

- progressive Erosion and Sediment Control Plans (PESCP) reviewed by a soil conservationist
- delineation of 'no-go zones' with the installation of high-visibility bunting to clearly mark these areas
- staged clearing of existing vegetation within the clearing boundary to prevent soil destabilisation
- minimising extent and duration of disturbance
- preserving groundcover and smaller trees as much as practicable, with complete grubbing and clearing of areas minimised
- diversion berms to divert water into vegetated areas
- utilisation of intact vegetation and non-harvestable organic matter to provide soil stability in areas of ground disturbance
- use erosion control measures to prevent onsite damage
- use sediment control measures to prevent off site damage
- stabilise disturbed areas quickly and progressively throughout construction stage
- regular inspection and maintaining controls measures, with on-going monitoring and assessment of erosion and sediment controls by to be performed by a suitably qualified independent erosion and sediment control specialist.
- scheduling construction activities outside of inclement heavy rainfall periods or high river flows.
- works carried out under Environmental Work Method Statements (EWMS) prepared by Haslin Constructions, including effective consultation and implemented by construction personnel (including independent arborist contractor).

### Detailed design

Although this plan is primarily focussed on the construction phase, a key consideration of the project is to design and deliver a facility that will maintain the water quality in the Tuross River catchment.

A key design component to assist in achieving the water quality objectives in operation is the spillway. The project includes construction of a spillway on the upper right abutment of the storage area. During operational periods when the water storage facility is at full capacity, additional water entering the storage from the source catchment would be directly released from the spillway to the existing downstream unnamed tributary. The release would mimic natural ephemeral flows with all water indirectly flowing out to follow the existing tributary flow entering the Tuross River at the existing confluence.

The spillway would be excavated into rock with a trapezoidal shaped concrete crest and a concrete lined chute located downstream of the concrete crest. Water from the storage would discharge into the concrete lined chute and then flow into a concrete dissipater structure which would dissipate the water flow energy before directing the flow into an existing unnamed tributary downstream of the storage. Two erosion control structures are proposed downstream of the spillway stilling basin to reduce erosion to the existing unnamed tributary during spillway flows.

### **6.1.1 High risk areas**

The work areas encompasses several construction catchments that are located within or near existing ephemeral creek lines and on steep valley slopes (refer to Figure 4-2).

The work within these areas are likely to include:

- vegetation clearing,
- coffer dam construction,
- main embankment wall construction,
- construction of storage access road, temporary haul routes and temporary creek crossings,
- creek bank stabilisation, and
- construction of temporary and permanent erosion control structures.

The following erosion and sediment control measures would be considered:

- providing controls in accordance with Section 4. Management of Sites of High Erosion Hazard (Bluebook). This includes:
  - using pipes or other engineering devices as last resort
  - Ensure that road crossings are designed to maintain clean water flow through the site.
- early installation of 'temporary creek crossings' along the haul route to ensure clean water diversions are effective. Temporary crossings should be made with reference to Figure SD5-1 of the Blue Book.
- Guidelines for controlled activities on waterfront land NRAR May 2018
- buffer zone of 5m for machinery access from ephemeral creeks/major gullies, with removal of vegetation to be carried out by machinery reaching in from outside the buffer zone.

### **6.1.2 Erosion and sediment control**

Temporary erosion and sediment control measures will be installed to protect water quality on the Project. Controls and management measures will be designed (stability, location, type and size), constructed, operated and maintained in accordance with Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom, 2004).

The concept ESCP (Appendix B) will be reviewed and Progressive Erosion and Sediment Control Plans (PESCPs) will provide details of location, design and maintenance of erosion and sediment control measures for each key work zone on site. The PESCPs will be prepared

by a suitably qualified person, reviewed by a Soil Conservationist and implemented prior to commencing activities.

The PESCPs will be progressively modified and revised with changes in the construction program, change in work methods, or whenever the work methods and control structures are found to be ineffective or are no longer required.

The PESCPs will identify erosion and sediment control risks and describe how these will be addressed during construction. The PESCP will include details of the following where relevant:

- Erosion and sediment control measures required as construction progresses including:
  - Before clearing and grubbing
  - Before removal of topsoil and commencement of earthworks within a given catchment area.
- How clean upstream water will be managed and diverted around or through disturbed areas, so it is not polluted by the construction activities and to minimise potential discharges of dirty construction water.
- Method of tree removal in intermittent watercourses, leaving grasses and small understorey species undisturbed wherever possible scour protection measures for haul roads and access tracks when these are an erosion hazard due to either their steepness, soil erodibility or potential for concentrating runoff flow
- Measures for promptly stabilising disturbed areas and temporary drains
- Measures to minimise erosion during construction of embankments
- Measures to minimise erosion and control sedimentation from stockpiles
- Measures at site access points to minimise mud tracking on roads
- Methods of constructing batters to assist the retention of topsoil on the batter slopes
- Measures to temporarily trap sediment at regular intervals
- Controls in runoff flow paths to reduce flow velocities and minimise the potential for erosion
- Measures for controlling waste water discharge on or around the site from dewatering, washing, saw cutting, drilling, washing vehicles and plant and any other activities which add pollutants to water
- Measures to be put in place during an extended shut-down of the site or where more than a 50% chance of 10 mm of rainfall or greater is predicted
- Maintenance of erosion and sediment control structures including measures to restore their capacity
- Progressive regeneration of completed construction works areas
- Inspection and auditing program for all erosion and sediment controls to ensure that no disturbed area is left without adequate erosion and sediment controls.
- The ESCPs will include drawings showing all controls required to avoid erosion and sedimentation of the site. Drawings will be regularly updated as the site conditions change during construction.
- The drawings will include all ancillary activities and/or areas and activities that may impact on water quality, such as:
  - Access and haulage tracks
  - Borrow pits

- Stockpile and storage areas
- Temporary work areas
- Materials processing areas
- Compound areas
- Concrete batching areas and location or concrete washouts

Further, due to the identified erosion risk and dynamic nature of works, a risk based approach is proposed whereby management strategies outlined in this ESCP would be implemented on a “Trigger Action Response” basis. A “Trigger Action Response Plan” (TARP) has been developed and informed by this ESCP and is attached in Appendix A to define the implementation of erosion and sediment management strategies.

### **6.1.3 Environmental Work Method Statements (EWMS)**

Haslin Constructions will prepare Environmental Work Method Statements (EWMS) for activities that have a moderate risk or high risk to water quality. The EWMS should detail the:

- proposed activities to be undertaken
- identify environmental hazards and assess initial risk ranking
- nominated proposed control measures with reference to this CSWMP
- assess residual risk ranking and responsible personnel to implement controls.

Prior to works, the EWMS will require review and approval by the Environmental Site Representative (or delegate) and Senior Project Manager and consultation / induction with all construction personnel involved in the activity. External input or review may be carried out by a soil conservation consultant or accredited erosion and sediment control professional.

### **6.1.4 Sediment basin management**

Temporary sediment basins will be required throughout the Project during construction. The location and size of the sediment basins has been developed with reference to the construction staging plans and Guidelines in Managing Urban Stormwater: Soils and Construction (Landcom, 2004).

Water captured in the basins would be prioritised for re-use onsite (such as dust suppression or compaction). Temporary sediment basins will be cleaned out whenever the accumulated sediment exceeds 60% of the sediment storage zone. Accumulated sediment from sediment basins and traps will be removed in such a manner as not to damage the structures. Temporary sediment basins will remain in place until upstream areas have been stabilised in accordance with the Blue Book and have a C-Factor of 0.05 (Landcom, 2004).

By default, gypsum would be used to treat basin water prior to discharge. Prior to selecting flocculants or coagulants other than gypsum to treat basin water, the Haslin Environmental Site Representative will complete a flocculant/coagulant assessment that documents:

- Why and when an alternative product is required
- The flocculation methodology
- Safeguards for use of the flocculant/coagulant
- Ecotoxicity Information

- Record keeping

### **6.1.5 Staged vegetation clearing**

Vegetation clearing, including tree felling and slashing within the clearance boundary is required. In addition to requirements specified elsewhere in the CEMP and plans, Haslin constructions will adopt the following control measures when undertaking vegetation clearing activities to prevent topsoil destabilisation, along steep embankment slopes:

- delineation of 'no-go zones' with the installation of high-visibility bunting to clearly mark these areas
- preserving groundcover and smaller/non-harvestable trees as much as practicable
- utilisation of intact vegetation and non-harvestable organic matter to provide soil stability in areas of ground disturbance (e.g. spread over disturbed earth).
- trees are to be felled into the clearing boundary to minimise damage to retained vegetation. Trunks and roots are to be left in situ to minimise soil erosion. Where localised grubbing has occurred, grubbed organic matter (tree stumps, roots) will be spread over the disturbed area to provide soil stability.
- no vegetation clearing is to be carried out in "No-go" zones.

Elevated risks are present on site up-gradient of the proposed temporary coffer dam, to the limits of vegetation clearing. If unmanaged, there is potential for destabilised topsoil properties and steep land slopes following land clearing of vegetation to pose 'very high erosion risks' through exposure to raindrop impact (sheet, rill erosion) and concentrated water flows within gullies and wind erosion. Destabilised soils have the potential to wash into the construction area, increasing the volume of sediment laden water requiring treatment and management.

Proposed activities within the inundation are likely to include:

- vegetation clearing, tree felling
- installation of temporary erosion and sediment controls and batter stabilisation measures
- haul routes

The following with respect to erosion and sediment control measures should be considered:

- staged vegetation clearing and progressive stabilisation measures are to occur where appropriate within exposed slopes of this catchment to prevent erosion and sediment risks during construction phase
- 'tree stumps' remain in the ground where possible. This will assist in the stabilisation of soils from potential wind and water erosion on exposed cleared areas and batter slopes
- cleared areas should be protected using standard erosion and sediment control measures for slopes (i.e. use of non-harvestable organic material- as cover, breaking up slope length with berm catch drains and/or material windrows, or installation of sediment fencing).

### **6.1.6 Stockpile Management**

Stockpiles will be managed to minimise the potential for mobilisation and transport of dust and sediment in runoff in accordance with the Blue Book (Landcom, 2004) (refer Section 6.1). This will include:



- Minimising the number of stockpiles, area used for stockpiles, and time that they are left exposed
- Locating stockpiles away from drainage lines, waterways and areas where they may be susceptible to wind erosion
- Stabilising stockpiles, establishing appropriate sediment controls and suppressing dust as required
- Locating stockpiles outside of the tree protection zone of trees or native vegetation identified for retention. The tree protection zone will be delineated in accordance with AS 4970
- Locate stockpiles at least 10m from likely areas of concentrated water flows/waterways
- Covering, or otherwise protecting from erosion, stockpiles that will be in place for more than 20 days as well as any stockpiles that are susceptible to wind or water erosion, within 10 days of forming each stockpile
- Keeping topsoil that is not contaminated by noxious weeds in stockpiles for later spreading on fill batters and other areas. Other material may also be stockpiled but kept separated from the topsoil stockpiles
- Protecting topsoil stockpiles that will be on site for more than 3 months with sterile cover crop and preventing weed growth.

#### **6.1.7 Dewatering management**

Dewatering is any activity that involves the removal of ponded stormwater or infiltrated groundwater from any location within the Project area (including from sediment basins and excavations) and the subsequent reuse or discharge of that water.

Haslin Constructions aims to avoid and minimise discharges as much as practicable and undertake dewatering activities in a manner to minimise erosion and pollution of the environment. A Dewatering Management Plan with a Trigger Action Response Protocol (TARP) to outline disposal options will be prepared.

## **6.2 Contingency measures**

### **6.2.1 Refuelling, washdowns and chemical storage**

All fuels, chemicals and liquids will be stored in bunded areas on site at least 50m away from the unnamed creek or other identified drainage lines or any water source.

The storage, handling and use of dangerous goods and hazardous substances will be in accordance with the Work Health Safety Act 2011, the Storage and Handling of Dangerous Goods Code of Practice (WorkCover NSW 2005) and all relevant legislation and Australian standards.

The refuelling and maintenance of plant and equipment or any other activity which may result in spillage of chemical fuel or lubricant will be undertaken in a designated sealed bunded area where spill kits are available. Refuelling will not be undertaken within 50 m of any waterway. Refuelling activities will be supervised at all times. Plant and vehicle maintenance, including washdown, will be undertaken in designated areas to minimise the potential for offsite discharge and mud tracking.

### **6.2.2 Wet weather preparation and review**

Where a wet weather event is predicted, the Environmental Site Representative and/or General Superintendent will undertake a review of site erosion and sediment controls. Wet weather events are defined as more than a 50% chance of 10 mm of rainfall or greater triggering the requirement to prepare the site for wet weather.

The erosion and sediment control review will include:

- Inspection of the site to ensure that all erosion/sedimentation and stabilisation controls are in place and in effective working order
- Actions to be taken to prevent any environmental incidents such as potential pollution incidents
- Measures to be implemented to protect disturbed ground from erosion.

Following the wet weather event, a post wet weather inspection will be undertaken to review site performance and repair controls as required. Details regarding the timing and responsibilities of all inspections relevant to this Plan are included in Section 7.3.

## **7 Compliance management**

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### **7.1 Roles and responsibilities**

Haslin Constructions Project Team's organisational structure and overall roles and responsibilities are outlined in Section 3.3 of the CEMP. Specific responsibilities for the implementation of environmental controls are detailed in Section 6 of this Plan.

### **7.2 Training**

All employees, contractors and utility staff working on site will undergo site induction training relating to soil and water management issues. Targeted training in the form of toolbox talks or specific training will also be provided to personnel with a key role in soil and water management.

Further details regarding staff induction and training are outlined in Section 3.5 of the CEMP.

### **7.3 Monitoring and inspection**

Monitoring will include, but not be limited to:

- Monitoring of site weather conditions using the onsite weather station and BOM website.
- Construction sediment basin water quality prior to discharge.
- Regular visual monitoring of local water quality (i.e. for plumes of turbidity and hydrocarbon spills/slicks) to identify any potential spills or deficient controls when working in or near waterways.
- Monitoring and management of spoil, fill and materials stockpile sites including details of how spoil, fill or material will be handled, stockpiled, reused and disposed.
- Inspections by an accredited soil conservationist or accredited erosion and sediment control professional.

Additional requirements and responsibilities in relation to inspections are documented in Section 3.9.1 and Section 3.9.2 of the CEMP.

### **7.4 Auditing**

Audits (both internal and external) will be undertaken to assess the effectiveness of environmental controls, compliance with this plan, CoA and other relevant approvals, licenses and guidelines.

Audit requirements are detailed in Section 3.9.3 of the CEMP.

## **8 Review and improvement**

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### **8.1 Continuous improvement**

Continuous improvement of this Plan will be achieved by the ongoing evaluation of environmental management performance against environmental policies, objectives and targets for the purpose of identifying opportunities for improvement.

The continuous improvement process will be designed to:

- Identify areas of opportunity for improvement of environmental management and performance.
- Determine the cause or causes of non-conformances and deficiencies.
- Develop and implement a plan of corrective and preventative action to address any non-conformances and deficiencies.
- Verify the effectiveness of the corrective and preventative actions.
- Document any changes in procedures resulting from process improvement.
- Make comparisons with objectives and targets.

### **8.2 SWMP update and amendment**

The processes described in Section 3.9 to Section 3.13 of the CEMP may result in the need to update or revise this Plan. This will occur as needed.

Only the Environmental Site Representative, or delegate, has the authority to change any of the environmental management documentation.

A copy of the updated plan and changes will be distributed to all relevant stakeholders in accordance with the approved document control procedure – refer to Section 3.11.2 of the CEMP.

## **Appendix A**

### **Erosion and sediment control plan**

### **Trigger Action Response Plan (TARP)**

Aspect	Trigger	Action/Response	Notifications
Water diversion	Clean water passes through dirty water areas	<p>Inspect and repair clean water diversions (earth banks, berms)</p> <p>Review CSWMP and design capacity of clean water diversion structures (earth banks, berms)</p> <p>Where review of the sediment and erosion controls is undertaken, additional controls be recommended, where relevant, to prevent a recurrence</p>	Alert Site Superintendent / Environmental Site Representative
Water diversion	Haul route, track or construction area use is finished and no longer needed	<p>Establish clean water diversion structures (earth banks, berms) of disturbed areas to divert water into vegetated areas.</p> <p>Develop and implement rehabilitation measures</p>	Alert Site Superintendent / Environmental Site Representative
Creek Crossings	Planned access track to be established over creek	<p>Implement Standard Control Temporary waterway crossing (SD 5-1, Blue Book 5-14)</p> <p>Creek mapping (Figure 4-2) should be referenced to confirm the presence of creek</p>	Alert Site Superintendent / Environmental Site Representative
Wet Weather	Forecast of inclement wet weather flooding or extreme precipitation event	<p>Establish clean water diversion structures (earth banks, berms) on tracks/upstream of disturbed areas to divert water into vegetated areas</p> <p>Inspection of erosion and sediment control structures to ensure integrity</p>	Alert Site Superintendent / Environmental Site Representative

Aspect	Trigger	Action/Response	Notifications
General Erosion and Sediment Control	One (1) or more areas have indicated surface erosion in the form of movement of sediment from an area of disturbance/clearing	Review the effectiveness of current erosion and sediment controls implemented and seek to stabilise the area to stop the erosion process. This can include the use of further non-harvestable organic matter as groundcover or other standard control measures outlined in CSWMP Section 6.3.2.	Alert Site Superintendent / Environmental Site Representative
Erosion and Sediment Control in higher risk catchments	One (1) or more areas within higher risk catchments (i.e. steeper embankments and slopes or creeks) have indicated surface erosion in the form of movement of sediment from an area of disturbance/clearing	<p>Review the effectiveness of current erosion and sediment controls implemented and seek to stabilise the area to stop the erosion process. This can include the use of further non-harvestable organic matter as groundcover or other standard control measures outlined in CSWMP Section 6.3.2.</p> <p>Reduce slope lengths breaking up the slope along the contour with the use of sediment fencing or berm drains are proposed to be used (at least every 25 m where practical)</p> <p>Installation of rock check dams within creek and gully channels as per standard control measures outlined in CSWMP Section 6.3.2.</p> <p>Where review of the sediment and erosion controls is undertaken, additional controls be recommended, where relevant, to prevent a recurrence</p>	Alert Site Superintendent / Environmental Site Representative

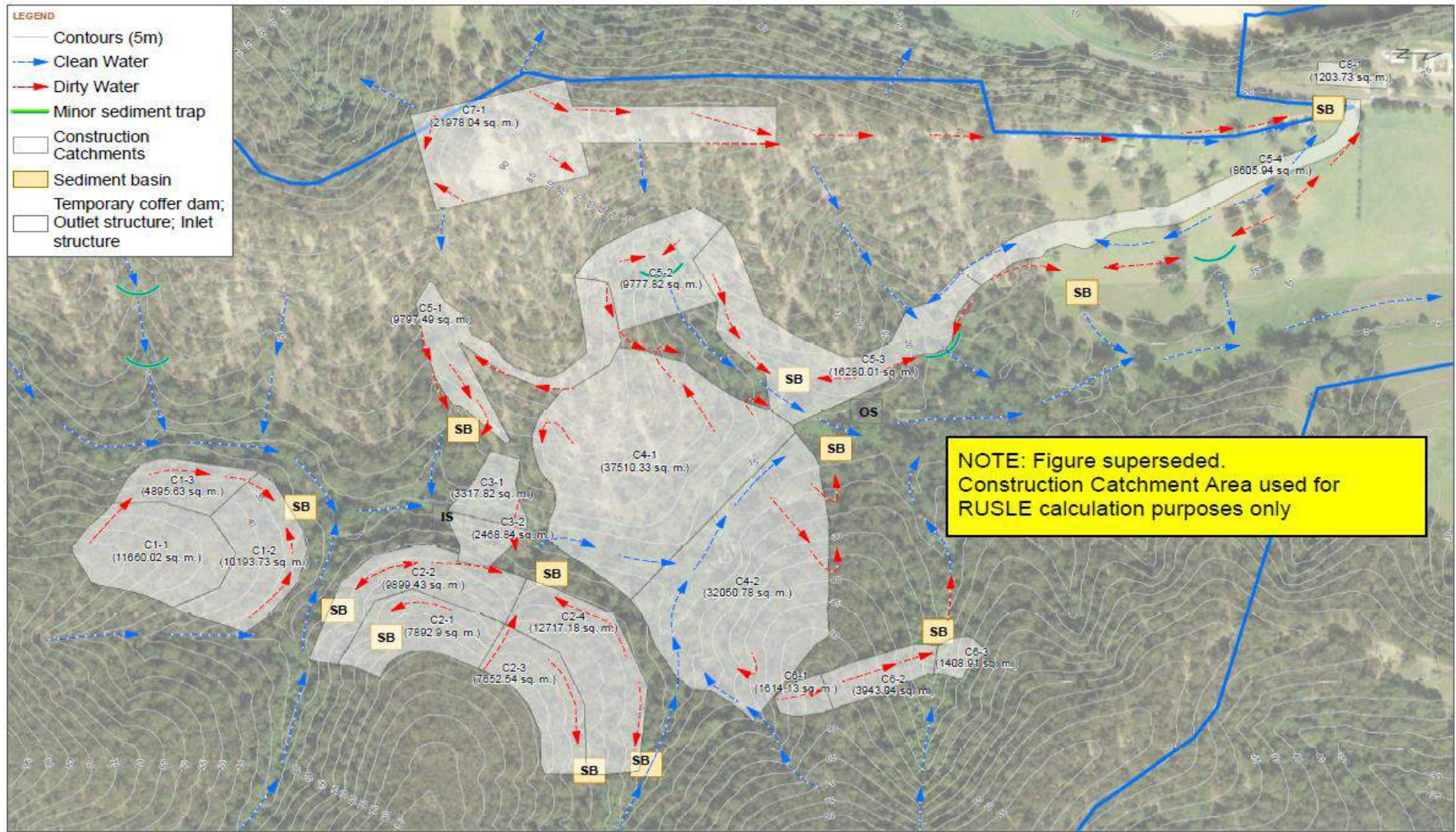


Aspect	Trigger	Action/Response	Notifications
Discharges from Clearing Boundary	Observed or suspected discharges of dirty/sediment laden water from the clearing boundary	<p>Investigate source of discharge and whether it is sourced from areas of disturbance/clearing</p> <p>Review the effectiveness of current erosion and sediment controls implemented and seek to stabilise the area to stop the erosion process. This can include the implementation of controls outlined the ESCP (CSWMP Section 6.3) or standard control measures outlined in CSWMP Section 6.3.2.</p> <p>Where review of the sediment and erosion controls is undertaken, additional controls be recommended, where relevant, to prevent a recurrence</p>	Alert Site Superintendent / Environmental Site Representative

Aspect	Trigger	Action/Response	Notifications
Discharges to the Tuross River	Observed turbid plumes forming within the river	<p>Investigate source of discharge and whether it is sourced from areas of disturbance/clearing within the Partial Clearing works clearing boundary</p> <p>Temporarily stopping works (where appropriate and where observed turbid plumes are as a result of the Partial Clearing Works)</p> <p>Review and amendment to Environmental Work Method Statements</p> <p>Inspecting and maintaining erosion and sediment control measures</p> <p>Review the effectiveness of current erosion and sediment controls implemented and seek to stabilise the area to stop the erosion process. This can include the implementation of controls outlined the ESCP (CSWMP Section 6.3) or standard control measures outlined in CSWMP Section 6.3.2.</p> <p>Where review of the sediment and erosion controls is undertaken, additional controls be recommended, where relevant, to prevent a recurrence</p> <p>Incident investigations and reporting of notifiable incidents (where appropriate)</p>	<p>Alert Site Superintendent / Environmental Site Representative</p> <p>Immediate notification to the NSW EPA upon applicant becoming aware of a material harm incident</p> <p>Written Notification to DPE within seven days after applicant becomes aware of a material harm incident</p>

## **Appendix B**

### **Preliminary Construction RUSLE Calculations and Erosion Sedimentation Control Plan**





## 1. Erosion Hazard and Sediment Basins

Site Name: Eurobodalla Southern Storage

Site Location: Eurobodalla, NSW

Precinct/Stage: Stage 1

Other Details: Construction phase only - Quarry Areas 1 and 2

Site area	Sub-catchment or Name of Structure						Notes
	C1-1	C1-2	C1-3	C2-1	C2-2	C2-3	
Total catchment area (ha)	1.166	1.019	0.49	0.789	0.99	0.765	
Disturbed catchment area (ha)	1.166	1.019	0.49	0.789	0.99	0.765	

### Soil analysis (enter sediment type if known, or laboratory particle size data)

Sediment Type (C, F or D) if known:	D	D	D	D	D	D	From Appendix C (if known)
% sand (fraction 0.02 to 2.00 mm)	42	42	42	42	42	42	Enter the percentage of each soil fraction. E.g. enter 10 for 10%
% silt (fraction 0.002 to 0.02 mm)	16	16	16	16	16	16	
% clay (fraction finer than 0.002 mm)	14	14	14	14	14	14	
Dispersion percentage	54.0	54.0	54.0	54.0	54.0	54.0	E.g. enter 10 for dispersion of 10%
% of whole soil dispersible	11.88	11.88	11.88	11.88	11.88	11.88	See Section 6.3.3(e). Auto-calculated
Soil Texture Group	D	D	D	D	D	D	Automatic calculation from above

### Rainfall data

Design rainfall depth (no of days)	5	5	5	5	5	5	See Section 6.3.4 and, particularly, Table 6.3 on pages 6-24 and 6-25.
Design rainfall depth (percentile)	80	80	80	80	80	80	
x-day, y-percentile rainfall event (mm)	35	35	35	35	35	35	
Rainfall R-factor (if known)	4500	4500	4500	4500	4500	4500	Only need to enter one or the other here
IFD: 2-year, 6-hour storm (if known)							

### RUSLE Factors

Rainfall erosivity (R-factor)	4500	4500	4500	4500	4500	4500	Auto-filled from above
Soil erodibility (K-factor)	0.042	0.042	0.042	0.042	0.042	0.042	
Slope length (m)	132.1	66.1	66.2	42.9	36.4	45.7	RUSLE LS factor calculated for a high hill/interrill ratio.
Slope gradient (%)	15.14	15.1286	15.1057	34.965	41.2088	32.8228	
Length/gradient (LS-factor)	7.40	4.45	4.45	8.20	8.30	8.13	
Erosion control practice (P-factor)	1.3	1.3	1.3	1.3	1.3	1.3	
Ground cover (C-factor)	1	1	1	1	1	1	

### Sediment Basin Design Criteria (for Type D/F basins only. Leave blank for Type C basins)

Storage (soil) zone design (no of months)	12	12	12	12	12	12	Minimum is generally 2 months
Cv (Volumetric runoff coefficient)	0.35	0.35	0.35	0.35	0.35	0.35	See Table F2, page F-4 in Appendix F

### Calculations and Type D/F Sediment Basin Volumes

Soil loss (t/ha/yr)	1819	1094	1093	2015	2039	1996	
Soil Loss Class	7	6	6	7	7	7	See Table 4.2, page 4-13
Soil loss (m <sup>3</sup> /ha/yr)	1399	841	841	1550	1569	1536	Conversion to cubic metres
Sediment basin storage (soil) volume (m <sup>3</sup> )	1632	858	412	1223	1553	1175	See Sections 6.3.4(i) for calculations
Sediment basin settling (water) volume (m <sup>3</sup> )	143	125	60	97	121	94	See Sections 6.3.4(i) for calculations
Sediment basin total volume (m <sup>3</sup> )	1775	983	472	1320	1674	1269	

NB for sizing of Type C (coarse) sediment basins, see Worksheet 3 (if required).

**1. Erosion Hazard and Sediment Basins**

Site Name: Eurobodalla Southern Storage

Site Location: Eurobodalla, NSW

Precinct/Stage: Stage 1

Other Details: Construction phase only - Coffe Dam and Storage Embankment

Site area	Sub-catchment or Name of Structure						Notes
	C3-1	C3-2	C4-1	C4-2		C2-4	
Total catchment area (ha)	0.332	0.247	3.751	3.205		1.272	
Disturbed catchment area (ha)	0.332	0.247	3.751	3.205		1.272	

Soil analysis (enter sediment type if known, or laboratory particle size data)

Sediment Type (C, F or D) if known:	D	D	D	D		D	From Appendix C (if known)
% sand (fraction 0.02 to 2.00 mm)	42	42	42	42		42	Enter the percentage of each soil fraction. E.g. enter 10 for 10%
% silt (fraction 0.002 to 0.02 mm)	16	16	16	16		16	
% clay (fraction finer than 0.002 mm)	14	14	14	14		14	
Dispersion percentage	54.0	54.0	54.0	54.0		54.0	E.g. enter 10 for dispersion of 10%
% of whole soil dispersible	11.88	11.88	11.88	11.88		11.88	See Section 6.3.3(e). Auto-calculated
Soil Texture Group	D	D	D	D		D	Automatic calculation from above

**Rainfall data**

Design rainfall depth (no of days)	5	5	5	5		5	See Section 6.3.4 and, particularly, Table 6.3 on pages 6-24 and 6-25.
Design rainfall depth (percentile)	80	80	80	80		80	
x-day, y-percentile rainfall event (mm)	35	35	35	35		35	
Rainfall R-factor (if known)	4500	4500	4500	4500		4500	Only need to enter one or the other here
IFD: 2-year, 6-hour storm (if known)							

**RUSLE Factors**

Rainfall erosivity (R-factor)	4500	4500	4500	4500		4500	Auto-filled from above
Soil erodibility (K-factor)	0.042	0.042	0.042	0.042		0.042	
Slope length (m)	64	53.8	182.7	159.6		54.4	RUSLE LS factor calculated for a high hill/interrill ratio.
Slope gradient (%)	15.625	27.881	19.1571	21.9298		27.6	
Length/gradient (LS-factor)	4.54	7.85	12.97	13.91		7.83	
Erosion control practice (P-factor)	1.3	1.3	1.3	1.3	1.3	1.3	
Ground cover (C-factor)	1	1	1	1	1	1	

**Sediment Basin Design Criteria (for Type D/F basins only. Leave blank for Type C basins)**

Storage (soil) zone design (no of months)	12	12	12	12		12	Minimum is generally 2 months
Cv (Volumetric runoff coefficient)	0.35	0.35	0.35	0.35		0.35	See Table F2, page F-4 in Appendix F

**Calculations and Type D/F Sediment Basin Volumes**

Soil loss (t/ha/yr)	1115	1928	3188	3418		1924	
Soil Loss Class	6	7	7	7		7	See Table 4.2, page 4-13
Soil loss (m <sup>3</sup> /ha/yr)	857	1483	2452	2629		1480	Conversion to cubic metres
Sediment basin storage (soil) volume (m <sup>3</sup> )	284	366	9198	8427		1883	See Sections 6.3.4(i) for calculations
Sediment basin settling (water) volume (m <sup>3</sup> )	41	30	460	393		156	See Sections 6.3.4(i) for calculations
Sediment basin total volume (m <sup>3</sup> )	325	396	9658	8820		2039	

NB for sizing of Type C (coarse) sediment basins, see Worksheet 3 (if required).

## 1. Erosion Hazard and Sediment Basins

Site Name: Eurobodalla Southern Storage

Site Location: Eurobodalla, NSW

Precinct/Stage: Stage 1

Other Details: Construction phase only - Storage access road

Site area	Sub-catchment or Name of Structure						Notes
	C5-1	C5-2	C5-3	C5-4			
Total catchment area (ha)	0.98	0.978	1.628	0.861			
Disturbed catchment area (ha)	0.98	0.978	1.628	0.861			

Soil analysis (enter sediment type if known, or laboratory particle size data)

Sediment Type (C, F or D) if known:	D	D	D	D			From Appendix C (if known)
% sand (fraction 0.02 to 2.00 mm)	42	42	42	42			Enter the percentage of each soil fraction. E.g. enter 10 for 10%
% silt (fraction 0.002 to 0.02 mm)	16	16	16	16			
% clay (fraction finer than 0.002 mm)	14	14	14	14			
Dispersion percentage	54.0	54.0	54.0	54.0			E.g. enter 10 for dispersion of 10%
% of whole soil dispersible	11.88	11.88	11.88	11.88			See Section 6.3.3(e). Auto-calculated
Soil Texture Group	D	D	D	D			Automatic calculation from above

### Rainfall data

Design rainfall depth (no of days)	5	5	5	5			See Section 6.3.4 and, particularly, Table 6.3 on pages 6-24 and 6-25.
Design rainfall depth (percentile)	80	80	80	80			
x-day, y-percentile rainfall event (mm)	35	35	35	35			
Rainfall R-factor (if known)	4500	4500	4500	4500			Only need to enter one or the other here
IFD: 2-year, 6-hour storm (if known)							

### RUSLE Factors

Rainfall erosivity (R-factor)	4500	4500	4500	4500			Auto-filled from above
Soil erodibility (K-factor)	0.042	0.042	0.042	0.029			
Slope length (m)	422.1	95.6	344	431			RUSLE LS factor calculated for a high rill/interrill ratio.
Slope gradient (%)	4.73821	20.9205	8.72093	1.16009			
Length/gradient (LS-factor)	2.84	8.86	5.96	0.36			
Erosion control practice (P-factor)	1.3	1.3	1.3	1.3	1.3	1.3	
Ground cover (C-factor)	1	1	1	1	1	1	

### Sediment Basin Design Criteria (for Type D/F basins only. Leave blank for Type C basins)

Storage (soil) zone design (no of months)	12	12	12	12			Minimum is generally 2 months
Cv (Volumetric runoff coefficient)	0.35	0.35	0.35	0.35			See Table F2, page F-4 in Appendix F

### Calculations and Type D/F Sediment Basin Volumes

Soil loss (t/ha/yr)	698	2177	1464	62			
Soil Loss Class	5	7	6	1			See Table 4.2, page 4-13
Soil loss (m <sup>3</sup> /ha/yr)	537	1675	1126	47			Conversion to cubic metres
Sediment basin storage (soil) volume (m <sup>3</sup> )	526	1637	1834	41			See Sections 6.3.4(i) for calculations
Sediment basin settling (water) volume (m <sup>3</sup> )	120	120	199	105			See Sections 6.3.4(j) for calculations
Sediment basin total volume (m <sup>3</sup> )	646	1757	2033	146			

NB for sizing of Type C (coarse) sediment basins, see Worksheet 3 (if required).



## 1. Erosion Hazard and Sediment Basins

Site Name: Eurobodalla Southern Storage

Site Location: Eurobodalla, NSW

Precinct/Stage: Stage 1

Other Details: Construction phase only - Spillway, compounds and river intake pump station

Site area	Sub-catchment or Name of Structure						Notes
	C6-1	C6-2	C6-3	C7-1	C8-1		
Total catchment area (ha)	0.161	0.394	0.141	2.198	0.12		
Disturbed catchment area (ha)	0.161	0.394	0.141	2.198	0.12		

Soil analysis (enter sediment type if known, or laboratory particle size data)

Sediment Type (C, F or D) if known:	D	D	D	D	D		From Appendix C (if known)
% sand (fraction 0.02 to 2.00 mm)	42	42	42	42	42		Enter the percentage of each soil fraction. E.g. enter 10 for 10%
% silt (fraction 0.002 to 0.02 mm)	16	16	16	16	16		
% clay (fraction finer than 0.002 mm)	14	14	14	14	14		
Dispersion percentage	54.0	54.0	54.0	54.0	54.0		E.g. enter 10 for dispersion of 10%
% of whole soil dispersible	11.88	11.88	11.88	11.88	11.88		See Section 6.3.3(e). Auto-calculated
Soil Texture Group	D	D	D	D	D		Automatic calculation from above

### Rainfall data

Design rainfall depth (no of days)	5	5	5	5	5		See Section 6.3.4 and, particularly, Table 6.3 on pages 6-24 and 6-25.
Design rainfall depth (percentile)	80	80	80	80	80		
x-day, y-percentile rainfall event (mm)	35	35	35	35	35		
Rainfall R-factor (if known)	4500	4500	4500	4500	4500		Only need to enter one or the other here
IFD: 2-year, 6-hour storm (if known)							

### RUSLE Factors

Rainfall erosivity (R-factor)	4500	4500	4500	4500	4500		Auto-filled from above
Soil erodibility (K-factor)	0.042	0.042	0.042	0.042	0.029		RUSLE LS factor calculated for a high rill/interrill ratio.
Slope length (m)	48.5	107.1	49.1	272.3	31.4		
Slope gradient (%)	20.6186	28.0112	40.7332	7.34484	31.8471		
Length/gradient (LS-factor)	5.18	13.57	10.48	4.06	5.85		
Erosion control practice (P-factor)	1.3	1.3	1.3	1.3	1.3	1.3	
Ground cover (C-factor)	1	1	1	1	1	1	

Sediment Basin Design Criteria (for Type D/F basins only. Leave blank for Type C basins)

Storage (soil) zone design (no of months)	12	12	12	12	12		Minimum is generally 2 months
Cv (Volumetric runoff coefficient)	0.35	0.35	0.35	0.35	0.35		See Table F2, page F-4 in Appendix F

### Calculations and Type D/F Sediment Basin Volumes

Soil loss (t/ha/yr)	1274	3335	2576	997	992		
Soil Loss Class	6	7	7	6	6		See Table 4.2, page 4-13
Soil loss (m <sup>3</sup> /ha/yr)	980	2566	1982	767	763		Conversion to cubic metres
Sediment basin storage (soil) volume (m <sup>3</sup> )	158	1012	279	1686	92		See Sections 6.3.4(i) for calculations
Sediment basin settling (water) volume (m <sup>3</sup> )	20	48	17	269	15		See Sections 6.3.4(i) for calculations
Sediment basin total volume (m <sup>3</sup> )	178	1060	296	1955	107		

NB for sizing of Type C (coarse) sediment basins, see Worksheet 3 (if required).

## **Appendix C**

### **Eurobodalla Southern Water Supply Storage Project Soil and Water Management Plan Agency Consultation**



23 August 2022  
DOC22/738513

Mr Matthew Francesconi  
General Manager- Construction  
HASLIN CONSTRUCTIONS  
SUTHERLAND NSW 2232

By email: [nfrancesconi@strategicenvironmentalsupport.com.au](mailto:nfrancesconi@strategicenvironmentalsupport.com.au)

Attention: Nick Francesconi

Dear Mr Francesconi

**Eurobodalla Southern Water Supply Storage Project – Eurobodalla Shire Council**  
**Draft Soil and Water Management Plan**

I refer to the draft Soil and Water Management Plan (SWMP) developed by HASLIN Constructions for the Eurobodalla Southern Water Supply Storage Project and provided to the NSW Environment Protection Authority (EPA) on 8 August 2022.

Thank you for providing the EPA with the opportunity to review the draft SWMP associated with this stage of the project. The EPA does not approve or endorse environmental management plans; however, the EPA has taken the opportunity to note the following comments on the SWMP.

The EPA acknowledges that SWMP prioritised re-use of dirty water collected in sediment basins over discharge to receiving waters. However, the SWMP also proposes the use of several temporary sediment basins that appear to rely on chemical dosing to assist flocculation and discharge to the environment following significant wet weather events (uncontrolled discharges) or controlled discharges following treatment of sediment basin water.

The EPA reminds the proponent that Section 120 of the Protection of the Environment Operations Act 1997 applies to any discharges from the proposal site. In this regard the proponent must ensure that any discharge does not pollute the receiving waterway. The receiving environment for the project is Tuross River which flows into the high conservation value Batemans Bay Marine Park, as such the EPA considers a high standard of planning and implementation of sediment and erosion controls should be considered and implemented.

A thorough consideration and assessment of alternatives to direct discharge to the environment is preferred to the use of flocculants to protect the NSW Water Quality Objectives (NSW WQO) of the receiving environment. This may include measures such as temporary storage, dust suppression and irrigation onto land or dirt roads.

Where a chemical has potential to have non-trivial impacts on the environment, it is the responsibility of the person using that chemical to ensure that the potential impacts are fully identified, managed, and mitigated. Considering the potential water pollution risks associated with the use of flocculants and coagulants, all components of a potential discharge from the sediment basins that may impact receiving waters must be assessed.

Phone 131 555  
Phone 02 9995 5555  
(from outside NSW)

TTY 133 677, then  
ask for 131 155

Locked Bag 5022  
PARRAMATTA  
NSW 2124

4 Parramatta Square  
12 Darcy Street  
PARRAMATTA  
NSW 2150

[info@epa.nsw.gov.au](mailto:info@epa.nsw.gov.au)  
[www.epa.nsw.gov.au](http://www.epa.nsw.gov.au)  
ABN 43 692 285 758

In this regard, included to this letter at Attachment A, the EPA has provided some environmental assessment requirements which will assist the effectiveness and environmental risks of the use of the flocculant.

The EPA notes the management plans incorporate the advice the EPA has given during other stage of the project, in particular the development of Trigger Action Response Plan (TARP) which identifies numerous triggers, notifications, response actions and how to prevent a recurrence.

If you have any further questions about this issue, please contact Ms Nirmala Dharmarathne, Operations Officer, Regulatory Operations, on (02) 6229 7002 or at [info@epa.nsw.gov.au](mailto:info@epa.nsw.gov.au).

Yours sincerely



**Matthew RIZZUTO**  
Unit Head  
Regulatory Operation Regional

**ATTACHMENT A****Dose concentration calculations and sediment dam water characterisation**

Details of:

- The dose concentration(s) of the proposed flocculant
- A characterisation of the expected quality in terms of all pollutants present that pose a risk of non-trivial harm to the environment if an overflow to receiving water was to occur
- An assessment of the potential impact of discharges on the environmental values of the receiving waterway with reference to the Australian and New Zealand Guidelines for Fresh and Marine Water Quality guideline values (the Water Quality Guidelines)
- The degradation rate of the flocculant and the potential for accumulation in bed sediments of the receiving waterway.

**Management of materials from basins**

Provide details of proposed management of material accumulated in the sediment dam including testing and potential waste management.

**Storage**

Demonstrate flocculant material will always be appropriately stored on site.

**Ecotoxicology testing**

Ecotoxicology testing of the flocculant, by a NATA accredited lab, of representative test species across a range of taxonomic groups is required to provide data on the potential environmental risk.

Both the product concentrate/s and the treated sediment dam water should be tested. The current minimum number of species for toxicity data is at least five that belong to at least four taxonomic groups, as recommended by the Water Quality Guidelines, though the EPA encourages the use of more species and taxonomic groups for this high conservation environment. The selection of species in each taxonomic group should be representative and should include:

- Fish *Melanotaenia splendida* (vertebrate) – 96 hour imbalance test (or appropriate alternate test)
- Shrimp *Paratya australiensis* (invertebrate macrocrustacean) – 96 hour lethality test
- Cladoceran *Ceriodaphnia dubia* (invertebrate microcrustacean) – 48 hour immobilisation/survival test (or appropriate alternate test)
- Alga *Raphidocelis subcapitata* (microalga) – 72 hour growth inhibition test
- Bacterium *Vibrio fischeri* (bacterium) (Microtox) - bioluminescence inhibition test
- Duckweed *Lemna disperma* - growth inhibition test



## RE: Eurobodalla Southern Water Supply Storage project



Carla Ganassin &lt;carla.ganassin@dpi.nsw.gov.au&gt;

To: Nicholas Francesconi

Cc: Andrew Lynam

Reply

Reply All

Forward



Fri 29/07/2022 2:06 PM

You forwarded this message on 29/07/2022 6:19 PM.

Hi Nicholas,

Thanks for checking in with DPI Fisheries about this. We do not have an interest in reviewed the Flora & Fauna and Water Quality Sub-Plans for the dam construction works.

That said, please ensure best practice erosion and sediment control techniques are used during construction to manage and mitigate sedimentation inputs to the tributary and Tuross River downstream.

Regards,

**Carla Ganassin**

Senior Fisheries Manager, Coastal Systems

DPI Fisheries | Aboriginal Fishing &amp; Marine &amp; Coastal Environments

**Department of Regional NSW**T 4222 8342 M 0447 644 357 E [carla.ganassin@dpi.nsw.gov.au](mailto:carla.ganassin@dpi.nsw.gov.au)[regional.nsw.gov.au](http://regional.nsw.gov.au)

Block E Level 3, 84 Crown St (PO Box 5106) Wollongong NSW 2520

**Department of Primary Industries**

Department of Regional NSW

We stand on Country that always was and always will be Aboriginal land. We acknowledge the Traditional Custodians of the land and waters, and we show our respect for Elders past, present and emerging. We are committed to providing places in which Aboriginal people are included socially, culturally and economically through thoughtful and collaborative approaches to our work.

## **Appendix D**

### **Surface Water Quality Monitoring and Sampling Plan**



# HASLIN

## Surface Water Quality Monitoring and Sampling Plan

Eurobodalla Southern Water Supply Storage Project



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## Appendix A: Investigation levels

# 1. Introduction

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## 1.1 Context

This Surface Water Quality Monitoring and Sampling Plan forms part of the Soil and Water Management Plan for the Eurobodalla Southern Water Supply Storage (the Project).

Maintaining the surface water quality in the Tuross River has been identified as being a primary water quality objective for the Project. Existing water quality conditions, and potential risks to water quality posed by the proposal are discussed in the Addendum Submissions Report.

This Plan has been prepared to address the requirements of the Minister's Development Consent, the environmental management measures listed in the Eurobodalla Southern Water Supply Storage Environmental Impact Statement (EIS) and all applicable legislation.

## 1.2 Background and project description

The Eurobodalla Southern Water Supply Storage (the Project) was granted Development Consent from the Department of Planning and Environment (DPE) on 17 October 2019. Development Consent is provided in Appendix A of the CEMP.

The Project consists of an off-stream water storage facility and associated ancillary facilities. Water would be extracted from the Tuross River, using a new river intake pump station, and transferred to the storage via the Storage Inlet Pipeline. As necessary, the storage volume would be supplemented by water extracted from an existing borefield adjacent the storage.

- Key features of the Project include:
- a 3,000 megalitre storage capacity,
- a 370 metre long embankment, 39 metres in height and a crest width of 20 metres located on an unnamed tributary of the Tuross River,
- a spillway,
- permanent erosion control structures located downstream of the spillway,
- inlet works to convey and dissipate raw water transferred from the river intake pump station through a pipeline constructed along the left abutment to the proposed water storage facility,
- outlet works to allow transfer of water from the storage to the existing southern water treatment plant (WTP),
- instrumentation to monitor seepage, reservoir levels and water quality,
- a consequence category of "High C" for both flood and sunny day scenarios in accordance with the Australian National Committee on Large Dams (ANCOLD) Guidelines on the consequence categories of dams (2012),
- a thermal stratification control system,
- a boat ramp at the storage for maintenance and water quality monitoring, and
- safety and perimeter fencing at the storage.

Key features of the ancillary facilities include:

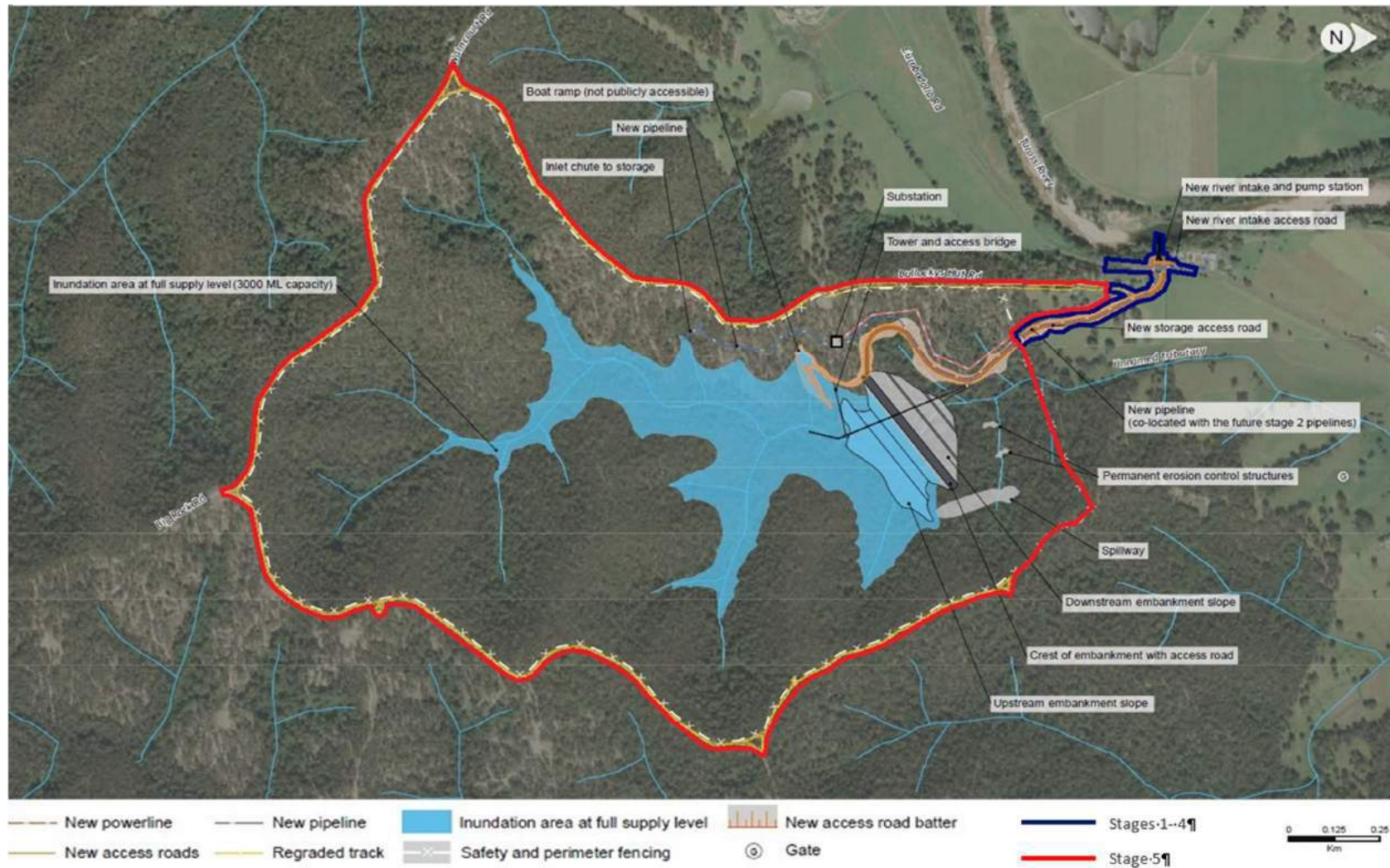
- new river intake pump station with a total river extraction capacity made up of a combination of flows from the river intake (up to 26 megalitres) and the borefield (up to six megalitres)
- installation of the following new pipelines including:
  - a pipeline with a capacity of 26 megalitres per day to transfer raw water from the new river intake pump station to the storage inlet chute
  - a cross connection to the proposed water storage inlet pipeline with a capacity of six megalitres per day providing connection to supply water from the storage to the balance tank at the existing WTP
  - a pipeline connection from the existing borefield pipeline to the river intake pump station.
- a new storage access road that is about one kilometre in length and extends from Eurobodalla Road opposite the existing WTP to the embankment crest basic right-turn and basic left-turn treatment at the intersection of the new storage access road and Eurobodalla Road would be provided a new access road that would provide a route for vehicles to access the new river intake pump station,
- power supply including the construction of new sub-stations located near the storage and the river intake pump station.

### **1.3 Scope of this plan**

With the approval of the Secretary of Planning, construction of the project is being staged as follows:

- Stage 1: Tuross River Intake Pump Station clearing.
- Stage 2: Tuross River Intake Pump Station construction.
- Stage 3: Vegetation clearing and topsoil stripping of the access road, construction of the access road to the forestry boundary and construction of the inlet pipeline to the forestry boundary.
- Stage 4: Partial clearing of the entire storage site.
- Stage 5: All other works.

Works in Stage 1, Stage 2 and Stage 4 are complete. Stage 3 works are partially complete and will continue to be delivered under the applicable CEMP. This Plan only applies to Stage 5 of the approved project, being the construction of all remaining works on site including the removal of the remaining vegetation within clearing boundary, construction of the embankment wall, spillway, permanent erosion control measures and all remaining works on site to enable the project to become operational. The scope of works is detailed in Figure 1-1.



**Figure 1-1** Project overview and scope of works covered by this plan (Stage 5)



## 2. Purpose and objectives

---

### 2.1 Purpose

The purpose of this Plan is to describe how water quality will be monitored during construction of the Project in order to meet the water objectives and targets.

### 2.2 Objectives

The key soil and water objectives of the project is to ensure all conditions of the Development Consent, environmental management measures and licence/permit requirements relevant to water quality are described, scheduled and assigned responsibility as outlined in:

- The Environmental Impact Assessment (EIA) prepared for Eurobodalla Southern Water Supply Storage (the Project).
- Submission Report for the Eurobodalla Southern Water Supply Storage Project.
- Addendum Submissions Report for the Eurobodalla Southern Water Supply Storage Project.
- Revised Secretary's Environmental Assessment Requirements (SEARs).
- Revised Management and Mitigation Measures.
- Development Consent SSD 7089 (the Project) granted on 17 October 2019.

### 2.3 Targets

Section 2.3 of the Soil and Water Management Plan identified five targets in relation to soil and water. This plan supports Haslin Constructions in addressing the following two targets:

- Ensure full compliance with the relevant legislative requirements, EIS and conditions of the Development Consent.
- Manage downstream water quality impacts attributable to the project (ie maintain water waterway health by avoiding the introduction of nutrients, sediment and chemicals outside of that permitted by the environmental protection licence and/or ANZECC guidelines).

## 3. Existing Environment

---

### 3.1 Baseline Surface Water Quality Monitoring

A baseline water quality monitoring program was undertaken by SMEC on behalf of Eurobodalla Shire Council between October 2017 and September 2018. The location of the monitoring is shown in Figure 4-1 below.

The baseline water quality monitoring included monthly sampling and event based (e.g., immediately after rainfall) sampling carried out within several locations along a section of the Tuross River for various water quality parameters including:

- total dissolved solids (TDS),
- total suspended solids (TSS),
- turbidity,
- pH,
- nutrients,
- heavy metals,
- various organic pollutants, and
- microbial parameters.

The baseline water quality data was assessed against the adopted Investigation Levels that were derived from the following:

- ANZG (2020) Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Australian and New Zealand Governments and Australian state and territory governments;
- ANZECC & ARMCANZ (2000) Australian and New Zealand Guidelines for Fresh and Marine Water Quality for 95% species protection; and
- NHMRC (2011) Australian Drinking Water Guidelines.

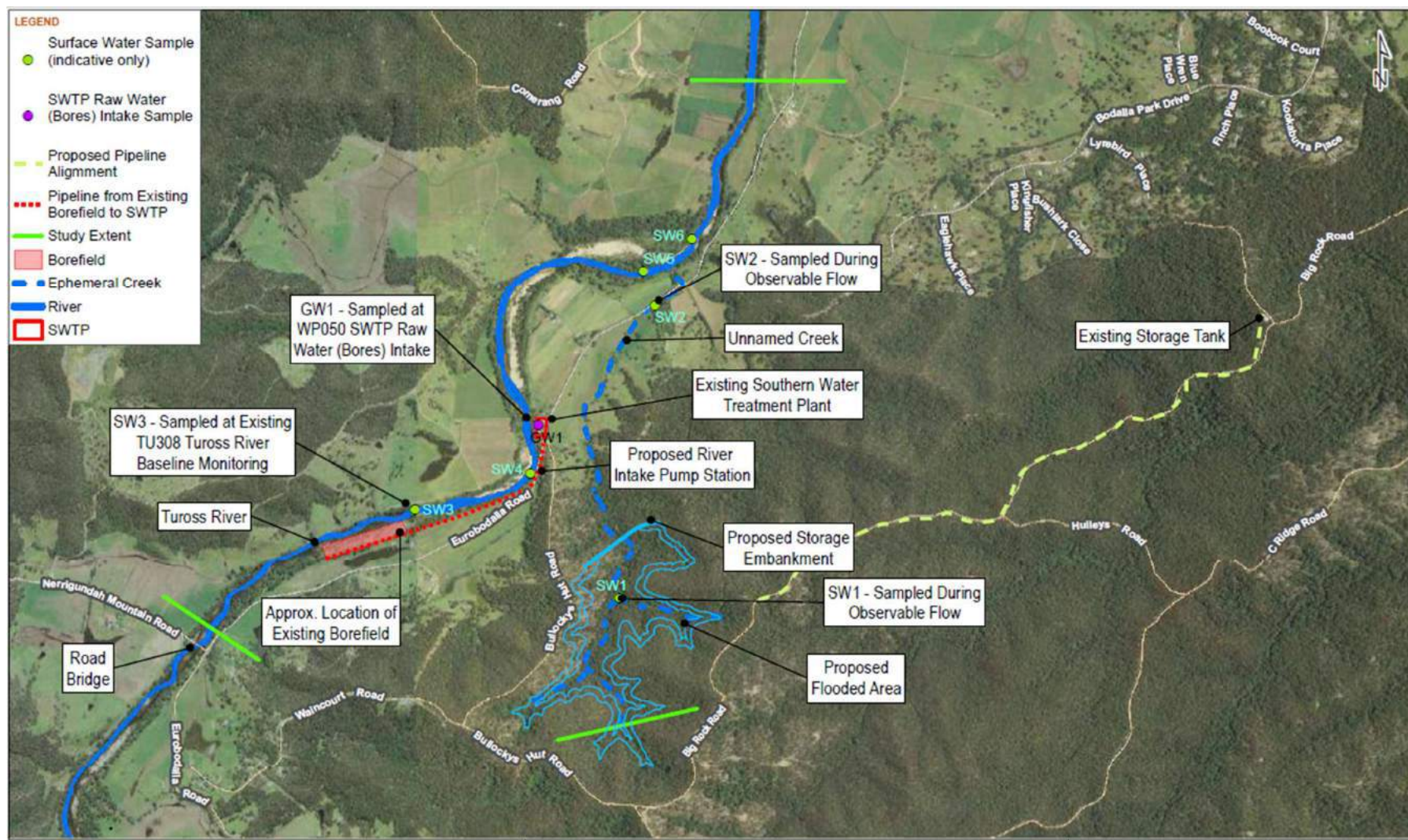
Baseline water quality data indicated that the Tuross River is characterised by:

- elevated turbidity, nutrients and chlorophyll and selected heavy metals (aluminium and zinc) following wet weather events,
- other pollutants such as heavy metals (excluding aluminium and zinc), petroleum hydrocarbons, pesticides and other contaminants were below adopted assessment criteria.

Water quality monitoring of the un-named ephemeral drainage line that dissects the project area was also undertaken when flows were observable, although the monitoring report noted that SW1 (upstream of the project site) is regularly dry and limited results were available.

The monitoring showed that water quality in the drainage line was quite variable with exceedances of pH, electrical conductivity and dissolved oxygen observed over the monitoring period.





**Figure 3-1** Baseline surface water monitoring locations

## 4. Construction Water Quality Monitoring

The construction water quality and sampling plan has been developed to align with the methodology used for establishing the baseline water quality of the Tuross River.

### 4.1 Monitoring location

Where possible, construction water quality monitoring locations have been chosen to align with those used for the baseline surface water quality monitoring program. The two locations in the Tuross River (CSW4 and CSW5) replicate those monitored by Council as part of the baseline water quality monitoring program. The five surface water quality monitoring sites and rationale for their selection are identified in Table 4.1. These sites may be further adjusted during construction in response to changing access or as a result of the shifting construction footprint (in the case of control sites). Where changes are required, they would be captured in an update to this plan.

**Table 4.1** Monitoring network location and summary

Location ID	Easting (MGA94)	Northing (MGA94)	Type (Catchment)	Location description & rationale	Control / impact
CSW1	230208	5996017	Unnamed Creek	Upstream of construction site	Control
CSW2	230545	5997706	Unnamed Creek	Site boundary at unnamed creekline	Impact
CSW3	231083	5998635	Unnamed Creek	Downstream of construction site immediately before entering Tuross River	Impact
CSW4	230086	5998136	Tuross River	Upstream of construction site	Control
CSW5	231446	5998780	Tuross River	Approx 100m downstream of Tuross River and Unnamed Creek confluence	Impact





**Figure 4-1** Construction surface water quality monitoring locations

## 4.2 Monitoring parameters and frequency

At each of the five surface water monitoring locations the following monitoring parameters would be tested quarterly.

The quarterly frequency has been selected as it aligns with the recommended frequency in Section 6.7 of the Baseline Water Quality Monitoring Report (SMEC May 2020). This frequency is considered appropriate to identify project impacts to water quality in the Tuross River. It is worth noting that in addition to the scheduled quarterly monitoring events, wet weather monitoring would be triggered when flows are leaving the site boundary at the unnamed creekline.

Monitoring will also include records of daily flows at the Eurobodalla gauging station relevant to sampling days.

Parameter	Field or laboratory method	Frequency / event
pH	Field	Quarterly / when flows leave site at unnamed creekline
Electrical conductivity	Field	Quarterly / when flows leave site at unnamed creekline
Turbidity	Field	Quarterly / when flows leave site at unnamed creekline
Dissolved oxygen	Field	Quarterly / when flows leave site at unnamed creekline
Temperature	Field	Quarterly / when flows leave site at unnamed creekline
Salinity	Field	Quarterly / when flows leave site at unnamed creekline
Biochemical oxygen demand	Laboratory	Quarterly
Nitrogen (as N) including Nitrate NO <sub>3</sub> Ammonia NH <sub>3</sub> , Ammonium NH <sub>4</sub> Total Kjeldahl Nitrogen and Total Nitrogen	Laboratory	Quarterly
Phosphorus (as P) including total phosphorus, and plant-available phosphate (PO <sub>4</sub> )	Laboratory	Quarterly
Chlorophyll	Laboratory	Quarterly
Total dissolved solids (TDS)	Laboratory	Quarterly
Total suspended solids (TSS)	Laboratory	Quarterly
Major anions (Cl, F, SO <sub>4</sub> , total alkalinity)	Laboratory	Quarterly
Major Cations (Ca, K, Mg, Na, Hardness)	Laboratory	Quarterly
True colour	Laboratory	Quarterly
Total organic carbon	Laboratory	Quarterly
Dissolved organic carbon	Laboratory	Quarterly

Parameter	Field or laboratory method	Frequency / event
Total Metals (Al, As, B, Cd, Co, Cr, Cu, Fe, Pb, Mn, Mo, Hg, Ni, Se, Zn)	Laboratory	Quarterly

### 4.3 Monitoring methodology

The construction water quality sampling program would involve in-situ field monitoring and collection of samples for laboratory analysis.

#### 4.3.1 In situ water quality monitoring

Physio-chemical measurements are taken using a fully calibrated multi-parameter water quality meter for:

- Temperature (°C)
- pH (pH units)
- Electrical Conductivity (µS/cm)
- Dissolved Oxygen (mg/L and % saturation) and
- Turbidity (NTU).

Relevant site descriptions and notes are taken for each site and visual observations made of:

- Visual oil and grease
- Occurrence of algal scum
- Streamflow
- Water clarity
- Water colour, odour and any other notable observations.
- Photos are taken to record the visual appearance of each water quality sample site at the time of sampling. Where appropriate, photos of the stream bank are also taken to provide a record of bank stability, geomorphology and riparian vegetation condition.

#### 4.3.2 Surface water sampling

In general methodology of sampling is understood to comprise:

- Record sample time on bottles and COC;
- Spray denatured ethanol around sample jug;
- Rinse sample jug out downstream from sample point;
- Place bottles into head of swing pole to collect samples below surface mid depth of the water;
- Collect samples in laboratory supplied bottles;
- Add HNO<sub>3</sub> to C9 bottle;
- Attach sample jug and collect sample for field meter readings;
- Place bottles in esky with ice bricks;

- Complete field readings and field data sheet; and
- Spray sample bottle with ethanol and wipe with paper towel at completion of each site sampling.
- Water quality samples are transported in ice in an esky to a National Association of Testing Authorities (NATA) accredited laboratory, under Chain of Custody (CoC) requirements.

## **5. Response and mitigation actions for construction**

---

During construction the water quality monitoring results would be reviewed against the Investigation Levels (IL) identified in Appendix A. These investigation levels were recommended by SMEC in their second year baseline water quality monitoring exercise.

When an IL is exceeded the first response protocol is to review the available information to assess if a construction impact is a likely source of the exceedance. If a construction impact is assessed as a likely source the second response protocol is to review the CEMP mitigation measures to establish if they are adequate and in place or require remediation works, such as a collapsed sediment control fence.



## Appendix A Investigation levels

Analyte group	Analyte	Units	Value / Range		Reference
In-Situ	pH Surface Water	pH units	<6.5 >8.0		ANZECC (2000)
	pH Groundwater	pH units	<6.0 >8.0		Site Specific (20 <sup>th</sup> Percentile) ANZECC (2000)
	Electrical conductivity	µS/m	Level 1:	>300	Site Specific (1STV on the 95 <sup>th</sup> percentile) ANZECC (2000)
	Turbidity	NTU	Level 2:	>2200	ANZECC (2000)
			Level 1:	>5	Drinking Water Guidelines (Aesthetic)
			Level 2:	>50	ANZECC (2000)
	Dissolved Oxygen	% Sat	<80% Sat		ANZECC (2000)
Microbial parameters	Temperature	°C	No Criteria		
	Salinity	%	No Criteria		
	E. coli	no./100mL	No Criteria		
	Thermotolerant coliforms	cfu/100mL	No Criteria		
	Protozoa – Cryptosporidium	no./L	No Criteria		
	Bacteria – Campylobacter	no./L	No Criteria		
	Viruses – Norovirus or other cultivable human enteric virus, such as adenoviruses	no./L	No Criteria		
Nutrients	Ammonia (as NH <sub>3</sub> -N)	µg/L	Level 1:	500	Drinking Water Guidelines (Aesthetic)
			Level 2:	900	ANZECC (2000)
	Ammonium (as NH <sub>4</sub> <sup>+</sup> )	µg/L	220		Site Specific (95 <sup>th</sup> Percentile)
	Nitrate (as N)	µg/L	Level 1:	90	ANZG (2018)
			Level 2:	50,000	Drinking Water Guidelines (Health)
	Nitrite (as N)	µg/L	Level 1:	9	ANZECC (2000)
			Level 2:	3,000	Drinking Water Guidelines (Health)
	Total Kjeldahl Nitrogen	µg/L	No Criteria		

Analyte group	Analyte	Units	Value / Range		Reference
Inorganics, Anions and Cations	Total Nitrogen	µg/L	350		ANZECC (2000)
	Total Phosphorus (as P)	µg/L	25		ANZECC (2000)
	Filterable reactive Phosphate (as PO <sub>4</sub> )	µg/L	61		ANZECC (2000)
	Chlorophyll a	µg/L	3		ANZECC (2000)
	Chloride	mg/L	175		ANZECC (2000)
	Fluoride	mg/L	1.5		Drinking Water Guidelines (Health)
	Sulphate (as SO <sub>4</sub> )	mg/L	250		Drinking Water Guidelines (Aesthetic)
			1000		ANZECC (2000)
	Total alkalinity	mg/L	No Criteria		-
	Calcium	mg/L	1000		ANZECC (2000)
	Potassium	mg/L	No Criteria		-
	Magnesium	mg/L	No Criteria		-
	Sodium	mg/L	180		Drinking Water Guidelines (Aesthetic)
	Hardness (as CaCO <sub>3</sub> )	mg/L	Level 1:	200	Drinking Water Guidelines (Aesthetic)
			Level 2:	350	ANZECC (2000)
Physical & chemical Properties	True colour	HU	Level 1:	15	Drinking Water Guidelines (Aesthetic)
			Level 2:	25	
	Particle Size Distribution		No Criteria		
	Total Dissolved Solids	mg/L	Level 1:	600	Drinking Water Guidelines (Aesthetic)
			Level 2:	1,200	
			Level 3: 2,000		ANZECC (2000)
	Total Suspended Solids	mg/L	No Criteria		
	Total organic carbon	mg/L	No Criteria		
Metals	Dissolved organic carbon	mg/L	No Criteria		
	Biochemical oxygen demand	mg/L	No Criteria		
Metals	Aluminium	µg/L	Level 1:	55	ANZECC (2000)
			Level 2:	200	Drinking Water Guidelines (Health)
	Arsenic	µg/L	10		Drinking Water Guidelines (Health)
	Barium	µg/L	2000		Drinking Water Guidelines (Health)
	Boron	µg/L	Level 1:	370	ANZECC (2000)
			Level 2:	4,000	Drinking Water Guidelines (Health)
	Cadmium	µg/L	Level 1:	0.2	ANZECC (2000)
			Level 2:	2	Drinking Water Guidelines (Health)
	Chromium (Total)	µg/L	Level 1:	1.0	ANZECC (2000)
			Level 2:	50	Drinking Water Guidelines (Health)
	Cobalt	µg/L	1.4		ANZG (2018)
	Copper	µg/L	Level 1:	1.4	ANZECC (2000)
			Level 2:	1000	Drinking Water Guidelines (Aesthetic)
	Iron	µg/L	Level 1:	200	ANZECC (2000)
			Level 2:	300	Drinking Water Guidelines (Aesthetic)
	Lead	µg/L	Level 1:	3.4	ANZECC (2000)
			Level 2:	10	Drinking Water Guidelines (Aesthetic)
	Manganese	µg/L	Level 1:	100	Drinking Water Guidelines (Aesthetic)

Analyte group	Analyte	Units	Value / Range		Reference
	Mercury	µg/L	Level 2:	200	ANZECC (2000)
			1		Drinking Water Guidelines (Health)
	Molybdenum	µg/L	Level 1:	34	ANZG (2018)
			Level 2:	50	Drinking Water Guidelines (Health)
	Nickel	µg/L	Level1:	11	ANZECC (2000)
			Level2:	20	Drinking Water Guidelines (Health)
	Selenium	µg/L	Level 1:	5	ANZECC (2000)
			Level 2:	10	Drinking Water Guidelines (Health)
Total Recoverable Hydrocarbons (TRH)	Zinc	µg/L	Level 1:	8	ANZG (2018)
			Level 2:	3,000	Drinking Water Guidelines (Aesthetic)
	TPH C6 - C10 less BTEX (F1)	mg/L		20	Limit of Reporting
	TRH C6 - C10	mg/L		20	Limit of Reporting
	TRH >C10 - C16 less Naphthalene (F2)	mg/L		100	Limit of Reporting
	TRH >C10-C16	mg/L		100	Limit of Reporting
	TRH >C16-C34	mg/L		100	Limit of Reporting
Benzene, Toluene, Ethylbenzene, Xylenes (BTEX)	Benzene	µg/L		1	Drinking Water Guidelines (Health)
				950	ANZECC (2000)
	Ethylbenzene	µg/L		3	Drinking Water Guidelines (Aesthetic)
				80	ANZG (2018)
	Toluene	µg/L		800	Drinking Water Guidelines (Aesthetic)
				180	ANZG (2018)
	o-xylene	µg/L		350	ANZECC (2000)
	m and p-xylene	µg/L		75	ANZECC (2000)
	Xylene (Total)	µg/L		20	Drinking Water Guidelines (Aesthetic)
	Naphthalene	µg/L		16	ANZECC (2000)
Polycyclic Aromatic Hydrocarbons (PAHs)	Anthracene	µg/L		0.4	ANZG (2018)
	Phenanthrene	µg/L		0.6	ANZG (2018)
	Fluoranthene	µg/L		1.0	ANZG (2018)
	Benzo(a)pyrene	µg/L		0.01	Drinking Water Guidelines (Health)
				0.1	ANZG (2018)
Organochlorine Pesticides (OCP)	Total PAHs	µg/L		No Criteria	
	Aldrin	µg/L		0.01	ANZG (2018)
	chlordan	µg/L		0.03	ANZECC (2000)
	DDE	µg/L		No Criteria	-
	DDT	µg/L		0.006	ANZECC (2000)
	Dieldrin	µg/L		0.01	ANZG (2018)
	Endosulfan	µg/L		0.03	ANZECC (2000)
	Endrin	µg/L		0.01	ANZECC (2000)
	Heptachlor	µg/L		0.01	ANZECC (2000)
	Hexachlorobenzene (HCB)	µg/L		No Criteria	
				0.2	ANZECC (2000)
	Lindane	µg/L		0.2	ANZECC (2000)
	Methoxychlor	µg/L		0.01	ANZG (2018)

## Air Quality Management Plan

Eurobodalla Southern Water Supply Storage Project



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## Glossary/ Abbreviations

Term / Abbreviation	Definition / Expanded text
Application Number	SSD 7089
AQMP	Air Quality Management Plan
BOM	Australian Government Bureau of Meteorology
CEMP	Construction Environmental Management Plan
Consent Conditions	The Minister for Planning's Minister's Development Consent Conditions contained in approval SSD 7089 dated 17 October 2019
Council	Eurobodalla Shire Council
Development	The development described in the Eurobodalla Southern Water Supply Storage Environmental Impact Statement
Development Consent	The Minister for Planning's approval SSD 7089 dated 17 October 2019
Development Consent Conditions	The Minister for Planning's Minister's Development Consent Conditions contained in approval SSD 7089 dated 17 October 2019
DPE	NSW Department of Planning and Environment
DPI	NSW Department of Primary Industries
EIS	Environmental Impact Statement
ESCP	Erosion and Sediment Control Plan
EEC	Endangered Ecological Community
EPA	NSW Environment Protection Authority
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EWMS	Environmental Work Method Statements
GREP	Government Resource Efficiency Policy
OEH	Office of Environment and Heritage
PESCP	Progressive Erosion and Sediment Control Plan
POEO Act	<i>Protection of the Environment Operations Act 1997</i>



Term / Abbreviation	Definition / Expanded text
REMM	Revised Environmental Management Measures identified in Appendix 2 of the Development Consent

## Document Control and Records

Documentation and document control for this Plan, including issue of any amendments will be done generally in accordance with the contract. This Plan is maintained by Haslin Constructions (Haslin) and maintained throughout construction through regular reviews carried out on an initial 3 month of the project starting then on a biannually basis, or as changes require.

At all times an up-to-date copy of this plan shall be kept on site and made available to all employees and contractors involved in the project. Amendments that are made to this document are recorded on the register of amendments below and shall be approved by management staff. Superseded versions of this document shall be maintained for a period of 7 years to demonstrate record of environmental management and compliance.

This document shall be created and approved by the client. A controlled copy shall be supplied to all relevant parties, and distribution of controlled copies shall be recorded on the distribution register below (controlled hardcopy only). When changes are made to this document, parties listed below shall be provided with updates.

Register of Amendments				
Date:	Version No.:	Description of Amendments:	Prepared by:	Approved by:
02/08/22	0	Draft	NF	AL
10/08/22	A	Addressing ESC comments	NF	AL
29/09/22	B	Minor edits	NF	AL

Company Management Plan Authorisation			
	Name/Position	Date:	Signature
Prepared by:	Nicholas Francesconi Environmental Consultant	29/09/2022	
Reviewed by:	Andrew Lynam Environment Manager	29/09/2022	
Approved by:	Colin Woods Managing Director	29/09/2022	

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A	22/08/22	Ross Bailey	Principals Authorised Person
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# 1 Introduction

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## 1.1 Context

This Air Quality Management Plan (AQMP or Plan) forms part of the Construction Environmental Management Plan (CEMP) for Eurobodalla Southern Water Supply Storage (the Project).

This AQMP has been prepared to address the requirements of the Minister's Development Consent, the environmental management measures listed in the Eurobodalla Southern Water Supply Storage Environmental Impact Statement (EIS) and all applicable legislation.

## 1.2 Background and project description

The Eurobodalla Southern Water Supply Storage was granted Development Consent from the Department of Planning and Environment (DPE) on 17 October 2019. Development Consent is provided in Appendix A of the CEMP.

The Project consists of an off-stream water storage facility and associated ancillary facilities. Water would be extracted from the Tuross River, using a new river intake pump station, and transferred to the storage via the Storage Inlet Pipeline. As necessary, the storage volume would be supplemented by water extracted from an existing borefield adjacent the storage.

Key features of the Project include:

- a 3,000 megalitre storage capacity,
- a 370 metre long embankment, 39 metres in height and a crest width of 20 metres located on an unnamed tributary of the Tuross River,
- a spillway,
- permanent erosion control structures located downstream of the spillway,
- inlet works to convey and dissipate raw water transferred from the river intake pump station through a pipeline constructed along the left abutment to the proposed water storage facility,
- outlet works to allow transfer of water from the storage to the existing southern water treatment plant (WTP),
- instrumentation to monitor seepage, reservoir levels and water quality,
- a consequence category of "High C" for both flood and sunny day scenarios in accordance with the Australian National Committee on Large Dams (ANCOLD) Guidelines on the consequence categories of dams (2012),
- a thermal stratification control system,
- a boat ramp at the storage for maintenance and water quality monitoring, and
- safety and perimeter fencing at the storage.

Key features of the ancillary facilities include:

- new river intake pump station with a total river extraction capacity made up of a combination of flows from the river intake (up to 26 megalitres) and the borefield (up to six megalitres),
- installation of the following new pipelines including:
  - a pipeline with a capacity of 26 megalitres per day to transfer raw water from the new river intake pump station to the storage inlet chute,
  - a cross connection to the proposed water storage inlet pipeline with a capacity of six megalitres per day providing connection to supply water from the storage to the balance tank at the existing WTP,
  - a pipeline connection from the existing borefield pipeline to the river intake pump station.

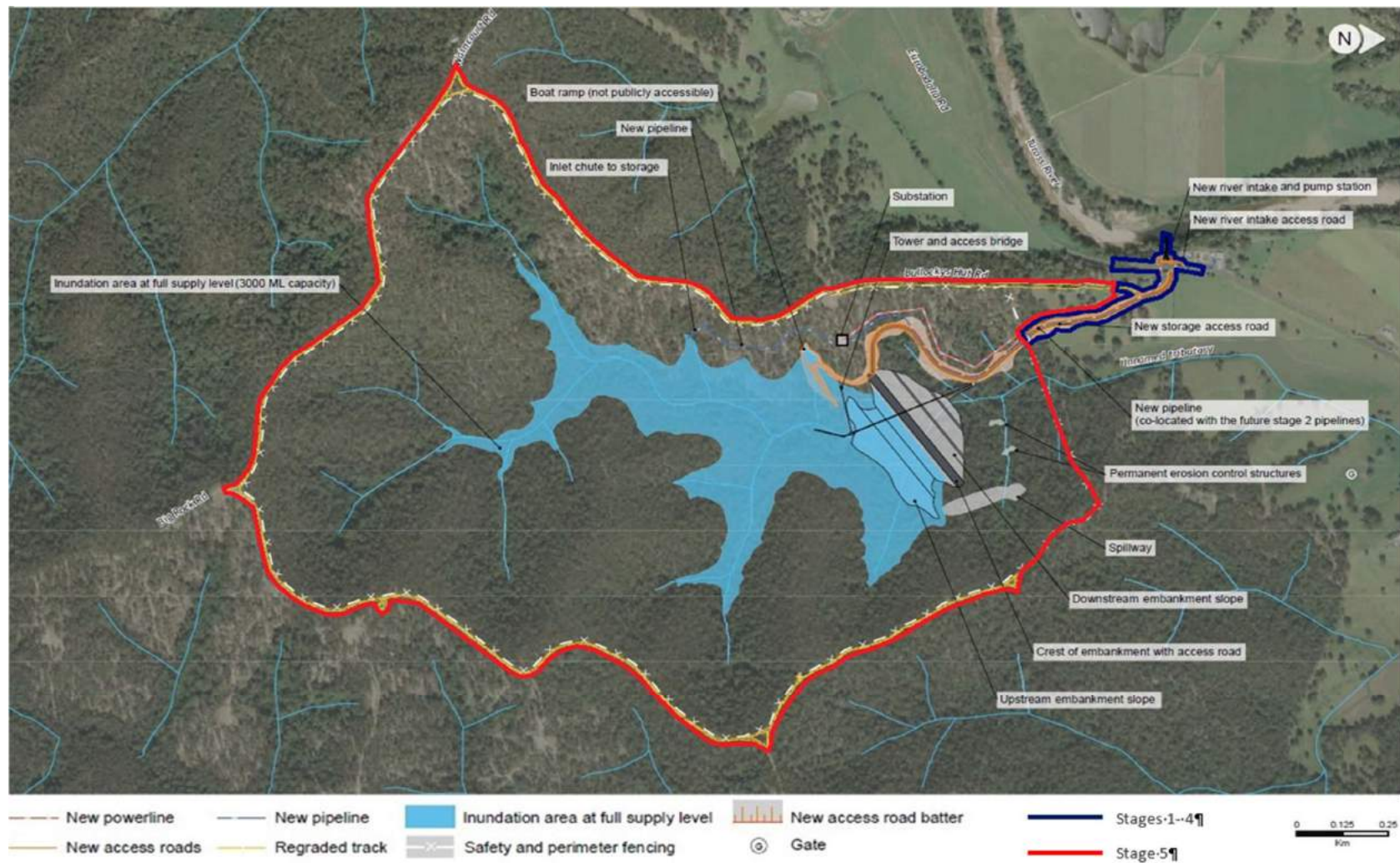
- a new storage access road that is about one kilometre in length and extends from Eurobodalla Road opposite the existing WTP to the embankment crest basic right-turn and basic left-turn treatment at the intersection of the new storage access road and Eurobodalla Road would be provided a new access road that would provide a route for vehicles to access the new river intake pump station, and
- power supply including the construction of new sub-stations located near the storage and the river intake pump station.

### **1.3 Scope of this plan**

With the approval of the Secretary of Planning, construction of the project is being staged as follows:

- Stage 1: Tuross River Intake Pump Station clearing.
- Stage 2: Tuross River Intake Pump Station construction.
- Stage 3: Vegetation clearing and topsoil stripping of the access road, construction of the access road to the forestry boundary and construction of the inlet pipeline to the forestry boundary.
- Stage 4: Partial clearing of the entire storage site.
- Stage 5: All other works.

Works in Stage 1, Stage 2 and Stage 4 are complete. Stage 3 works are partially complete and will continue to be delivered under the applicable CEMP. This Plan only applies to Stage 5 of the approved project, being the construction of all remaining works on site including the removal of the remaining vegetation within clearing boundary, construction of the embankment wall, spillway, permanent erosion control measures and all remaining works on site to enable the project to become operational. The scope of works and the construction site boundary is detailed in Figure 1-1.



**Figure 1-1** Project overview and scope of works covered by the plan (Stage 5)

## 2 Purpose and objectives

---

### 2.1 Purpose

The purpose of this Air Quality Management Plan (AQMP) is to describe how Haslin Constructions will manage dust and protect air quality during construction of the Project.

### 2.2 Objectives

The key objective of the AQMP is to ensure all conditions of the Development Consent, environmental management measures, contract and licence/permit requirements relevant to air quality are described, scheduled and assigned responsibility as outlined in:

- The Environmental Impact Assessment (EIA) prepared for Eurobodalla Southern Water Supply Storage (the Project).
- Submission Report for the Eurobodalla Southern Water Supply Storage Project.
- Addendum Submissions Report for the Eurobodalla Southern Water Supply Storage Project.
- Revised Secretary's Environmental Assessment Requirements (SEARs).
- Revised Management and Mitigation Measures.
- Development Consent SSD 7089 (the Project) granted on 17 October 2019.
- Contract Technical Specifications No. 10018541 14/01/2022.
- This AQMP also incorporates the requirements for a 'Dust Management Plan' which is required under REMM 12.2 to ensure that air quality impacts, particularly dust generation that may result from Project works area are minimised.

### 2.3 Targets

The following targets have been established for the management of air quality impacts during the construction of the project:

- Achieve full compliance with relevant legislative requirements and the Conditions of Consent.
- Ensure training on best practice air quality management is provided to all construction personnel through site inductions.
- Undertake appropriate consultation with impacted residents, businesses and stakeholders.
- Minimise impacts on, and complaints from the community and stakeholders.

To achieve the above objectives and targets, the following Key Performance Indicators (KPIs) have been proposed for the management of air quality matters during construction of the project as outlined in Table 2-1 below.



**Table 2-1** Proposed Key Performance Indicators (KPIs) associated with the management of air quality

Measure	Target	Timeframe	Responsibility	Documentation
Visible dust emissions	Visible dust is minimised.	At all times	General Superintendent	Environmental inspection checklist Daily checklist
Spillage or track-out onto public roads	Any spillage or track-out on public roads is cleaned immediately.	At all times	General Superintendent	Environmental inspection checklist Daily checklist



## 3 Environmental requirements

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### 3.1 Relevant legislation and guidelines

#### 3.1.1 Legislation and regulatory requirements

Legislation relevant to air quality management for this Project include:

- *Environmental Planning and Assessment Act 1979* (EP&A Act).
- *Protection of the Environment Operations Act 1997* (POEO Act).
- *Protection of the Environment Operations (Clean Air) Regulation 2010* (POEO Clean Air Regulation).

Relevant provisions of the above legislation are explained in the legal and compliance tracking register included in Appendix A1 of the CEMP.

#### 3.1.2 Guidelines

The main guidelines, specifications and policy documents relevant to this plan include:

- National Environment Protection Councils (NEPC) – National Environment Protection Measure (NEPM) for Ambient Air Quality Guidelines.
- AS 3580.1.1-2007 Methods of Sampling Analysis of Ambient Air. Part 1.1 Guide to Siting Air Monitoring Equipment.
- AS 3580.10.1-2003 Methods of Sampling Analysis of Ambient Air. Determination of Particulate Matter – Deposited Matter - Gravimetric Method.
- Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (NSW EPA, 2017).
- Managing Urban Stormwater: Soils and Construction, Volume 1 (Landcom 2004) and Volume 2 (DECC 2008) (the “Blue Book”).
- Air Quality Monitoring Criteria for Deposited Dust (DEC Guideline).
- NSW EPA Local Government Air Quality Toolkit – Air Quality Guidance Note – Construction sites (NSW EPA, 2017).
- Government Resource Efficiency Policy (OEH 2014).
- Guidance on the assessment of dust from demolition and construction (IAQM, 2014).

### 3.2 Conditions of Development Consent

The conditions of development consent relevant to this Plan are listed in Table 3-1 below. A cross reference is also included to indicate where the condition is addressed in this Plan or other Project management documents.

**Table 3-1** Minister's Development Consent Conditions

Condition No.	Condition Requirements	Document Reference
DUST MINIMISATION		
B25	The Applicant must take all reasonable steps to minimise dust generated during all works authorised by this consent.	This plan Section 6
B26	During construction, the Applicant must ensure that:	
	<ul style="list-style-type: none"> <li>unsealed roads used for truck access and exposed surfaces and stockpiles within the construction area are regularly watered to suppress dust;</li> </ul>	Table 6-1 AQ9, AQ14
	<ul style="list-style-type: none"> <li>all trucks entering or leaving the site with loads have their loads covered;</li> </ul>	Table 6-1 AQ17
	<ul style="list-style-type: none"> <li>trucks associated with the development do not track dirt onto the public road network;</li> </ul>	Table 6-1 AQ11, AQ12
	<ul style="list-style-type: none"> <li>public roads used by these trucks are kept clean; and</li> </ul>	Table 6-1 AQ12
	<ul style="list-style-type: none"> <li>measures are implemented to minimise dust from exposed surfaces following vegetation clearing and until transfer of storage water to the WTP</li> </ul>	Table 6-1 AQ14, AQ15
AIR QUALITY DISCHARGES		

Condition No.	Condition Requirements	Document Reference
B27	The Applicant must install and operate equipment in line with best practice to ensure that the development complies with all load limits, air quality criteria/air emission limits and air quality monitoring requirements as specified in the EPL applicable to the site.	Table 6-1 AQ7, AQ8

### 3.3 Environmental Management Measures

Relevant EMM are listed in table 3-2 below. This includes reference to required outcomes, the timing of when the commitment applies, relevant documents or sections of the environmental assessment influencing the outcome and implementation.

**Table 3-2:** Environmental management measures relevant to this AQMP

Ref #	Commitment	Timing	AQMP Reference
REMM	The CEMP would include a number of sub plans identified in the safeguards and management measures and include: Air quality management plan	Pre-construction	This Plan
REMM 12.1	Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment site representative/engineer or the site manager	During construction	Table 6-1 AQ1
REMM 12.2	A Dust Management Plan will be prepared and implemented as part of the CEMP. The DMP will include, but not be limited to: <ul style="list-style-type: none"> <li>• potential sources of air pollution and dust</li> <li>• air quality management objectives consistent with any relevant published EPA and/or OEH guidelines</li> <li>• mitigation and suppression measures to be implemented</li> <li>• methods to manage work during strong winds or other adverse weather conditions</li> <li>• a progressive rehabilitation strategy for exposed surfaces.</li> </ul>	Pre-construction	This Plan
REMM 12.3	Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken	During construction	Table 6-1 AQ3 Section 7.5

## 4 Existing Environment

The following sections summarise what is known about factors influencing air quality impacts and management associated with the project, within and adjacent to the Project area.

The key reference documents being Chapter 17 and Appendix L of the Environmental Impact Statement (EIS).

### 4.1 Background Air Quality

The air quality experienced at any location will be a result of emissions generated by natural and anthropogenic sources on a variety of scales (local, regional and global). The relative contributions of sources at each of these scales to the air quality at a location will vary based on a wide number of factors including the type, location, proximity and strength of the emission source(s), prevailing meteorology, land uses and other factors affecting the emission, dispersion and fate of those pollutants.

When assessing the impact of any particular source of emissions on the potential air quality at a location, the impact of all other sources of an individual pollutant, should also be assessed. These 'background' (sometimes called 'baseline') air quality conditions will vary depending on the pollutants to be assessed and can often be characterised by using representative air quality monitoring data.

As noted in the Air Quality Impact Assessment (AQIA) performed to support the Project (Pacific Environment, 2018) the Project site is located at a significant distance from any air quality monitoring stations (AQMS). The locations of the nearest AQMS are briefly summarised in **Table 4-1**.

**Table 4-1.** Locations of nearest AQMS

AQMS location	Source	Approximate distance to Project site (km)	Measurement		
			PM10*	PM2.5*	TSP
Monash (ACT)	ACT Health	114	✓	✓	X
Albion Park South	DPE	188	✓	✓	X
Kembla Grange	DPE	200	✓	✓	X

\*PM10 is particulate matter 10 micrometres in size

\*PM2.5 is particulate matter 2.5 micrometres in size

The closest representative AQMS is noted to be located at Monash, ACT approximately 114 km northwest of the Project site and is operated by ACT Health. Notwithstanding the large distances between the Project site and the available AQMS, this is considered to be the monitoring location most reflective of the conditions of the Project site. The adoption of air quality monitoring data often collected at significant distances from proposed projects, to represent conditions at those locations is a routinely adopted approach in NSW.

In summary, infrequent exceedances of both PM<sub>10</sub> and PM<sub>2.5</sub> were observed between 2015 and 2019 at Monash AQMS. However, in general particulate measurements were predominantly below the NSW EPA air quality criteria. It should be noted that particulate levels across many AQMS in NSW in late 2019 showed measurements above the EPA criterion due to increased smoke levels from widespread bushfires and the measured exceedances at Monash AQMS were primarily observed during this period.

## 4.2 Sensitive Receptor Locations

To ensure that the selection of discrete receptors for the AQMP are reflective of the locations in which the population of the area surrounding the Project site reside, population-density data has been examined. Population-density data based on the 2016 census, have been obtained from the Australian Bureau of Statistics (ABS) for a 1 square kilometre (km<sup>2</sup>) grid, covering mainland Australia (ABS, 2017).

The Project site and receptors are located in an area of 'very low' population density (<500 persons km<sup>2</sup>), which would be expected given the largely rural activities of the immediate area (refer to Figure 4-1). It was found that 12 identified sensitive receptors are located within a radius of 3km relative to the Project site as illustrated in **Figure 4-1**.

In accordance with the requirements of the NSW EPA, several receptors have been identified and the receptors adopted for use within this AQMP are presented in **Table 4-2**.

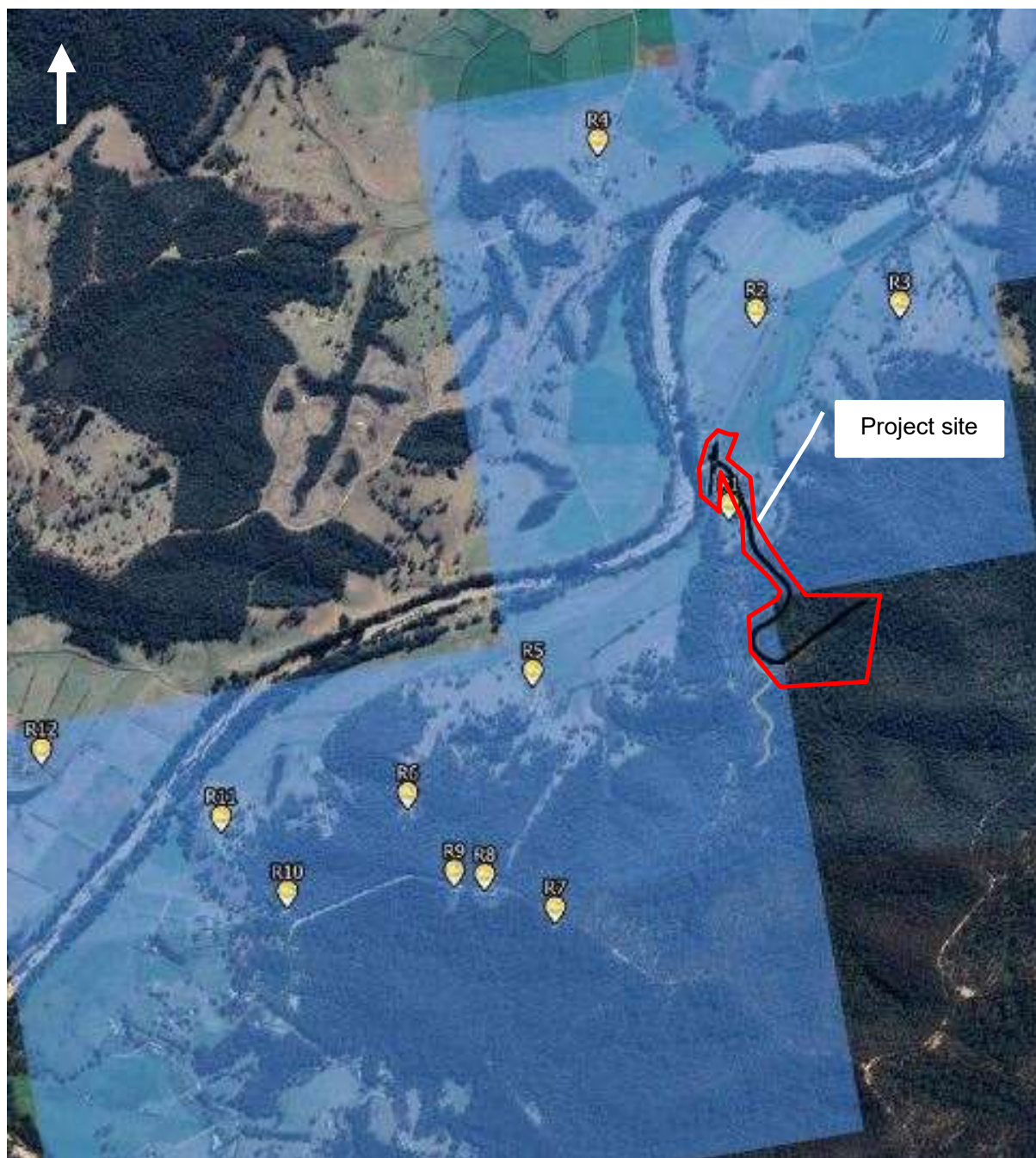
**Table 4-2** is not intended to represent a definitive list of sensitive land uses, but a cross section of available locations, that are used to characterise larger areas, or selected as they represent more sensitive locations, which may represent people who are more susceptible to changes in air pollution.

**Table 4-2** Receptor locations

Receptor ID	Location	Land Use	Location (UTM)	
			mE	mS
R2	585 Eurobodalla Road, Bodalla	Residential	230 450	5 998 188
R3	530 Eurobodalla Road, Bodalla	Residential	230 981	5 998 216
R4	350 Comerang Forest Road, Bodalla	Residential	229 868	5 998 817
R5	758 Eurobodalla Road, Eurobodalla	Residential	229 626	5 996 854
R6	818-820 Eurobodalla Road, Eurobodalla	Residential	229 164	5 996 402
R7	198 Waincourt Road, Eurobodalla	Residential	229 710	5 995 979

Receptor ID	Location	Land Use	Location (UTM)	
			mE	mS
R8	168 Waincourt Road, Eurobodalla	Residential	229 449	5 996 100
R9	156 Waincourt Road, Eurobodalla	Residential	229 337	5 996 114
R10	97 Waincourt Road, Eurobodalla	Residential	228 720	5 996 037
R11	93 Waincourt Road, Eurobodalla	Residential	228 475	5 996 315
R12	51-53 Nerrigundah Mountain Road, Eurobodalla	Residential	227 813	5 996 564





**Figure 4-1** Locations of sensitive receivers (population density is <500 persons km<sup>2</sup>)

Location R1 was identified as a sensitive receiver in the EIS. The receiver property has been bought and is now part of the project construction site.

## Meteorology

The meteorology experienced within an area, can govern the generation (in the case of wind-dependent emission sources), dispersion, transport and eventual fate of pollutants in the atmosphere. Meteorological observations are made by the Australian Government Bureau of Meteorology (BoM) at a number of locations surrounding the Project site. Data is collected on varying timescales (e.g. one minute, hourly, daily and monthly) and to appropriately

characterise the varying wind conditions at the Project site, the closest automatic weather station (AWS) collecting wind speed and direction data on an hourly basis has been identified as Montague Island Lighthouse AWS.

Montague Island Lighthouse AWS station is located on a small island off the mainland where the meteorological conditions may not accurately represent the conditions at the Project site due to significant differences in terrain and surrounding environment. Therefore, measurements from Moruya Airport AWS, the next closest station, have been adopted for the purposes of this AQMP.

Although air quality is affected by other meteorological variables such as rainfall and temperature, the primary parameters which may impact dust generation at the Project site are wind speed direction which determine the direction and distance that particulate emissions may be transported.

The location of the nearest AWS collecting data on appropriate timescales are provided in Table 4-3 below.

**Table 4-3.** Meteorological monitoring stations surrounding the Project site

Site Name	Source	Approximate location (UTM)		Approximate Distance
		mE	mS	km
Montague Island Lighthouse	BoM	Residential	230 350	5 997 469
Moruya Heads AWS	BoM	Residential	230 450	5 998 188

Details associated with the prevailing meteorological conditions at Moruya Airport AWS between 2015 and 2019 is presented in Appendix A.

In summary, from 2015 to 2019 winds at Moruya Airport AWS show similar patterns across each of the years, with a predominant westerly wind component on each of the assessed years. The majority of wind speeds experienced at Moruya Airport AWS over the 5-year period are generally in the range  $<0.5 \text{ ms}^{-1}$  to  $5.5 \text{ ms}^{-1}$  with the highest wind speeds (i.e. greater than  $8 \text{ ms}^{-1}$ ) occurring from a north-easterly direction. Winds of this speed are not frequent, occurring 2.3 % of the observed hours over the 5-year period. Calm winds (i.e.  $<0.5 \text{ ms}^{-1}$ ) occur during the 8.7% of hours on average across the 5-year period.

## 5 Environmental aspects and impacts

---

### 5.1 Construction activities

In constructing the project, the following activities have the potential to generate emissions to air:

- Earthworks including clearing and grubbing, stripping and stockpiling of topsoil, excavation, crushing, blasting and concrete works.
- Movement of plant and equipment on the Project site and heavy vehicles on unpaved areas.
- Burning of vegetation.

The construction activities identified above have the potential to generate emissions of particulate matter (dust) and also gaseous emissions through the combustion of fuel in vehicles, plant and machinery. The controls outlined in this AQMP consider all potential sources of emissions (refer Section 5).

A risk assessment performed as part of the EIS identified that there would be air quality risks to nearby receptors from the following activities:

- Dust soiling impacts
  - during earthworks and construction activities
  - associated with track-out from the Project site.
- Human health impacts
  - during earthworks and construction activities
  - associated with track-out from the Project site
- Impacts on ecological receptors
  - during earthworks and construction activities and associated with track-out from the Project site.

The air quality management and mitigation measures identified in the AQIA (Pacific Environment, 2018) of relevance to the construction of the project are presented in Section 6.

The management and mitigation measures outlined in this AQMP include methods previously identified in the AQIA, additional best practice management measures for dust control and staff training induction. Key Performance Indicators have also been determined to measure the success of the mitigation methods provided in this AQMP.

## **6 Environmental mitigation and management measures**

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Environmental requirements and management measures relating to air quality impacts were identified in the AQIA and EIS, the Development Consent (SSD 7089) and other relevant documents as specified in this AQMP. Specific measures and requirements to address air quality impacts are provided in Table 6-1.

### **6.1 Key Management Strategies**

The air quality management measures to be adopted during the construction of the project will be adopted for the Project in order to manage potential air emissions from the most significant potential sources.

Measures outlined in Table 6-1 have been identified through review of (Countess Environmental, 2006), (Katestone Environmental, 2011) and (US EPA, 2011) and provide guidance on best practice management methods for dust control which are generally accepted by NSW EPA. Management and mitigation measures as outlined in the AQIA have also been reviewed and included in this AQMP.

Measures outlined in Table 6-1 include categorisation based on whether they are a proactive or reactive measure, and whether the aim of the measure is to prevent, control, or minimise impacts associated with air pollutants.

### **6.2 Dust Minimisation**

As discussed in Section 5, the project may potentially result in dust emissions, which may be associated with earthworks and heavy vehicle movement on unpaved roads. Table 6-1 outlines a number of mitigation methods to reduce dust generation.

### **6.3 Air Quality Discharges**

The air quality risks associated with the project are primarily driven by dust emissions. However, gaseous emissions are also anticipated to be generated through the combustion of fuel in vehicles and equipment to be used onsite.

To minimise air quality impacts arising from vehicle and plant exhaust emissions, all equipment will be operated and maintained in accordance with the requirements of the POEO Act and POEO (Clean Air) Regulation (refer Section 3.1.1)

### **6.4 Contingency Measures**

Targets and Key Performance Indicators (KPIs) have been previously outlined in Section 2.3, and the success of the AQMP will be determined through compliance with the KPIs. Should complaints continue to be received, a campaign of particulate monitoring at the site boundary would be implemented for a period of three (3) months to quantify those potential impacts. After a period of three (3) months the particulate concentrations would be reviewed and the requirement for continuation (or otherwise) of that monitoring program determined.

### **6.5 Training**

All personnel, including employees, contractors and sub-contractors, are required to complete an induction containing relevant environmental information before they are authorised to work on the Project.

Air quality specific information to be covered in the project induction will include:

- Obligations under the Project Development Consent conditions (including the AQMP), including the identification of potential sources of air pollutants of concern and the

mitigation measures to be implemented. This includes specific measures during weather conditions where high levels of dust are probable (e.g. use of water and covering exposed areas to suppress dust propagation).

- Responsibilities relating to the management of air quality under this plan.
- Identification of typical construction activities that may impact air quality, responsibilities and associated environmental safeguards.
- Incident response procedures.

**Table 6-1.** Air quality management and mitigation measures

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Reference	Evidence
COMMUNICATIONS						
AQ1	Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary.	Signage	Pre- and during Construction	Environmental Site Representative General Superintendent	REMM 12.1	Weekly Environmental Checklist
AQ2	<p>A Dust Management Plan will be prepared and implemented as part of the CEMP. The DMP will include, but not be limited to:</p> <ul style="list-style-type: none"> <li>• potential sources of air pollution and dust</li> <li>• air quality management objectives consistent with any relevant published EPA and/or OEH guidelines</li> <li>• mitigation and suppression measures to be implemented</li> <li>• methods to manage work during strong winds or other adverse weather conditions</li> </ul>	This plan	Pre- and during Construction	Environmental Site Representative	REMM 12.2	This plan



ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Reference	Evidence
	<ul style="list-style-type: none"> <li>a progressive rehabilitation strategy for exposed surfaces.</li> </ul>					
<b>SITE MANAGEMENT</b>						
AQ3	Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.	Complaints register	During construction	Environmental Site Representative General Superintendent	REMM 12.3	Complaints register
AQ4	Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation	Daily observations	During Construction	Environmental Site Representative General Superintendent	Consent Condition B25	Daily site diary
AQ5	Develop and implement a depositional dust monitoring program.	Monthly Monitoring Register	During construction	Environmental Site Representative	Consent Condition B25	Monthly monitoring register
AQ6	Good housekeeping practises are to ensure that waste material does not accumulate and lead to generation of dust.	Induction / Toolbox	During construction	Environmental Site Representative General Superintendent	Technical Specification 3.10 (3E)	Weekly environmental checklist
<b>PREPARING AND MAINTAINING THE SITE</b>						



ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Reference	Evidence
AQ7	Schedule and undertake site works to minimise generation of dust on site (consideration of soil moisture, wind and rainfall).	Induction / Toolbox	During construction	General Superintendent	Consent Condition B25 Tech Specification 3.10 (3)	Daily diary, Weekly environmental checklist
AQ8	Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible	Site layout plan	Pre-construction	Senior Project Manager General Superintendent Environmental Site Representative	Consent Condition B25	Site layout plan
AQ9	Regularly water unsealed roads, quarry site and stockpiles to suppress dust	Induction / Pre-start / toolbox	During Construction	General Superintendent	Consent Condition B26 (a)	Daily diary, Weekly environmental checklist
AQ10	Impose and signpost a maximum-speed-limit of 40 km/h on surfaced and unsurfaced haul roads and in work areas.	Induction / Pre-start / toolbox / signage	During Construction	General Superintendent	Consent Condition B25	Daily diary, weekly environmental checklist Signs
AQ11	Install and maintain measures on unsurfaced site egress points to minimise offsite tracking	ESCP	During Construction	General Superintendent	Consent Condition B26 (c)	Weekly environmental checklist

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Reference	Evidence
AQ12	Maintain the entry / exit point and public road network to ensure there is no dirt tracking from the site.	Works Program	During construction	General Superintendent	Consent Condition B26 (c) and (d)	Daily diary, Weekly environmental checklist
AQ13	If required, apply chemical suppressants to the road surface to reduce wheel generated dust emissions.	Induction / Toolbox	During construction	General Superintendent	Consent Condition B26 (a)	Daily diary, Weekly environmental checklist
<b>OPERATIONS</b>						
AQ14	Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, including haul roads and any borrow areas	Water cart/sprinklers Induction / Toolbox	During construction	Senior Project Manager General Superintendent	Consent Condition B25 Technical Specification 3.10 (3D/G)	Daily diary, Weekly environmental checklist
AQ15	Stabilise earthworks and exposed areas/soil stockpiles and reduce wind erosion as soon as practicable.	ESCP Revegetation and Rehabilitation Plan	During and Post Construction	General Superintendent	Consent Condition B26 (e)	Weekly environmental checklist ESCP
AQ16	Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in closed containers with suitable emission	Toolbox	During construction	Senior Project Manager	Consent Condition B25	Weekly environmental checklist

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Reference	Evidence
	control systems to prevent escape of material and overfilling during delivery			General Superintendent		
AQ17	All trucks entering or leaving the site are to have their loads covered	Induction / Toolbox	During construction	General Superintendent	Consent Condition B26 (b)	Daily Site Diary Weekly environmental checklist
AQ18	Minimise stockpile heights to reduce wind velocity over surfaces and wind erosion.	Induction / Toolbox	During construction	General Superintendent	Consent Condition B25	Daily Site Diary Weekly environmental checklist
AQ19	Weather conditions (such wind speed, wind direction) will be considered prior to commencing any air curtain incineration and monitored throughout incineration.	Induction / Toolbox	During construction	General Superintendent	Technical Specification 3.10	Daily Site Diary
AQ20	The operation of air curtain incinerator will be optimised to minimise smoke generation	Induction / Toolbox	During construction	General Superintendent	Technical Specification 3.10	Daily Site Diary

## **7 Compliance management**

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### **7.1 Roles and responsibilities**

The Haslin Project Team's organisational structure and overall roles and responsibilities are outlined in section 3.3 of the CEMP. Specific responsibilities for the implementation of environmental controls are detailed in section 6 of this Plan.

### **7.2 Training**

All employees, contractors and utility staff working on site will undergo site induction training relating to air quality management issues. The induction training will address elements related to air quality management including:

- Haul road and stockpile management
- High wind days
- Use of water as a dust suppressant
- Covering vehicle loads

Targeted training in the form of toolbox talks or specific training will also be provided to personnel with a key role in air quality management.

Further details regarding staff induction and training are outlined in section 3.5 of the CEMP

### **7.3 Monitoring and inspections**

Daily inspections of activities occurring on the worksite will be undertaken by the General Superintendent and the Environmental Site Representative. Observations will be captured in a daily site diary.

Monitoring will focus on the following:

- whether visible dust is being generated on site,
- whether measures are in place to effectively reduce visible dust from being generated,
- whether sufficient controls are in place to prevent tracking of material from the site boundary.

### **7.4 Auditing**

Audits (both internal and external) will be undertaken to assess the effectiveness of environmental controls, compliance with this plan, CoA and other relevant approvals, licenses and guidelines.

Audit requirements are detailed in Section 3.8.4 of the CEMP.

### **7.5 Complaint Register**

The Project team will keep a record of any complaint made to the development site or any employee or any agent of the development in relation to air quality from the development site. A complaint register will be maintained and will be produced to any authorised officer of the EPA if requested.

Records of individual complaints will include:

- date and time of complaint

- method by which the complaint was made
- personal details of the complainant (if provided)
- nature of the complaint
- the details of an initial response to the complaint
- action taken and any follow up actions
- if no action was taken, the reason why no action was taken
- weather conditions corresponding to the time of the complaint will also be noted in the logbook for assessment purposes

## **7.6 Reporting**

Reporting will be performed in accordance with section 3.8.3 of the CEMP.

Monthly reporting to Eurobodalla Shire Council of dust monitoring activities identified in sections 7.3, 7.4 and 7.5 will occur for the duration of the project unless otherwise agreed by Council.

## **8 Review and improvement**

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### **8.1 Continuous improvement**

Continuous improvement of this plan will be achieved by the ongoing evaluation of environmental management performance against environmental policies, objectives and targets for the purpose of identifying opportunities for improvement.

The continuous improvement process will be designed to:

- Identify areas of opportunity for improvement of environmental management and performance
- Determine the cause or causes of non-conformances and deficiencies
- Develop and implement a plan of corrective and preventative action to address any non-conformances and deficiencies
- Verify the effectiveness of the corrective and preventative actions
- Document any changes in procedures resulting from process improvement
- Make comparisons with objectives and targets.

### **8.2 AQMP update and amendment**

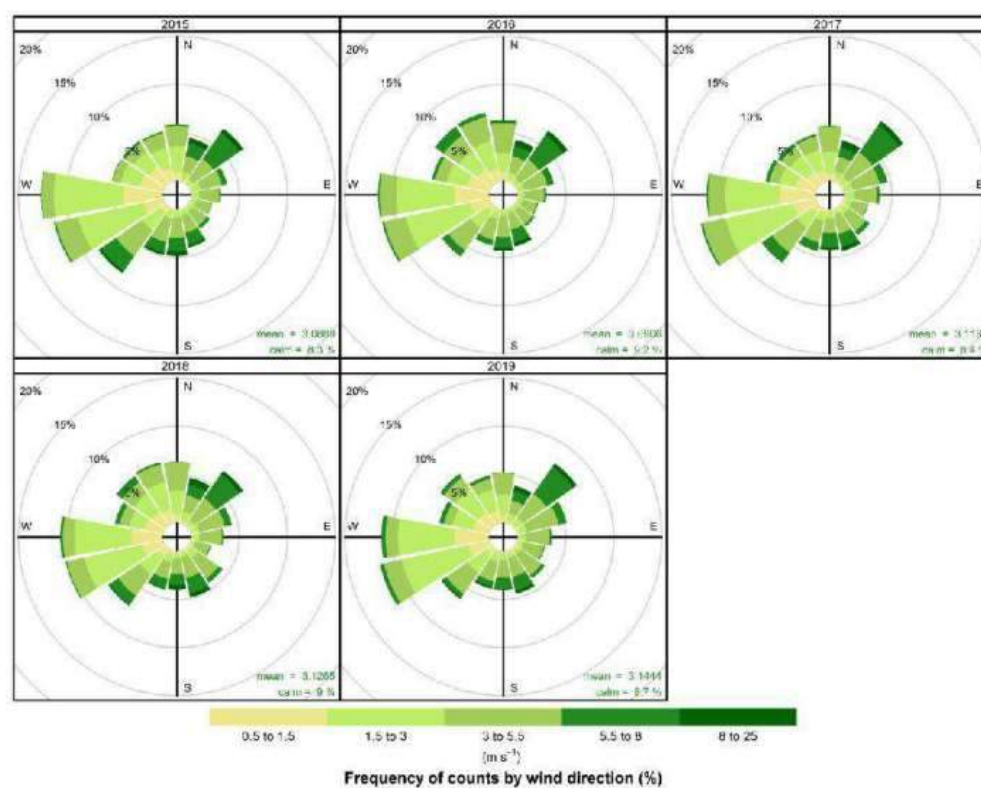
The processes described in Section 3.9 to Section 3.13 of the CEMP may result in the need to update or revise this Plan. This will occur as needed.

Only the Environmental Site Representative, or delegate, has the authority to change any of the environmental management documentation.

A copy of the updated plan and changes will be distributed to all relevant stakeholders in accordance with the approved document control procedure – refer to Section 3.11.2 of the CEMP.

## Appendix A – Meteorology

As discussed in Section 0, the meteorology of the area surrounding the Project site was characterised through the use of observations collected at the BoM Automatic Weather Station (AWS) located at Moruya Airport, approximately 28 km from the Project site. Wind roses showing the frequency of wind speed and direction from 2015 to 2019 are shown in Figure A-1



The wind roses indicate that from 2015 to 2019, winds at Moruya Airport AWS show similar patterns across the years, with a predominant westerly wind direction. The majority of wind speeds experienced at Moruya Airport AWS over the 5-year period, 2015 to 2019 are generally in the range



## Heritage Management Plan

Eurobodalla Southern Water Supply Storage Project



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## **Appendix A: Unexpected Finds Procedure**

## Glossary/ Abbreviations

Term / Abbreviation	Definition / Expanded text
Aboriginal place	An Aboriginal Place is an area declared by the Minister administering the Act to be of special significance with respect to Aboriginal culture.
Aboriginal objects	Aboriginal objects include any deposit, object or material evidence (not being a handicraft made for sale), including Aboriginal remains, relating to the Aboriginal habitation of NSW, before or concurrent with occupation by non-Aboriginal people, as defined in section 5 of the NPW Act
CEMP	Construction Environmental Management Plan
Development	The development described in the Eurobodalla Southern Water Supply Storage Environmental Impact Statement
Development Consent	The Minister for Planning's approval SSD 7089 dated 17 October 2019
Development Consent Conditions	The Minister for Planning's Minister's Development Consent Conditions contained in approval SSD 7089 dated 17 October 2019
DPE	NSW Department of Planning and Environment
DPI	NSW Department of Primary Industries
EIS	Environmental Impact Statement
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EWMS	Environmental Work Method Statements
Heritage Act	<i>Heritage Act 1997</i>
HMP	Heritage Management Plan
PAD	Potential Archaeological Deposit
REMM	Revised Environmental Management Measures identified in Appendix 2 of the Development Consent

## Document Control and Records

Documentation and document control for this Plan, including issue of any amendments will be done generally in accordance with the contract. This Plan is maintained by Haslin Constructions (Haslin) and maintained throughout construction through regular reviews carried out on an initial 3 month of the project starting then on a biannually basis, or as changes require.

At all times an up-to-date copy of this plan shall be kept on site and made available to all employees and contractors involved in the project. Amendments that are made to this document are recorded on the register of amendments below and shall be approved by management staff. Superseded versions of this document shall be maintained for a period of 7 years to demonstrate record of environmental management and compliance.

This document shall be created and approved by the client. A controlled copy shall be supplied to all relevant parties, and distribution of controlled copies shall be recorded on the distribution register below (controlled hardcopy only). When changes are made to this document, parties listed below shall be provided with updates.

Register of Amendments				
Date:	Version No.:	Description of Amendments:	Prepared by:	Approved by:
02/08/22	0	Draft	NF	AL
10/08/22	1	Responding to ESC comments	NF	AL
30/09/22	B	Minor updates	NF	AL

Company Management Plan Authorisation			
	Name/Position	Date:	Signature
Prepared by:	Nicholas Francesconi Environmental Consultant	30/09/2022	
Reviewed by:	Andrew Lynam Environmental Manager	30/09/2022	
Approved by:	Colin Woods Managing Director	30/09/2022	

Distribution Register			
Version No.	Date of Issue:	Name of Recipient:	Position/Organisation
0	02/08/22	Ross Bailey	Principals Authorised Person
B	30/09/22	Ross Bailey	Principals Authorised Person

# 1 Introduction

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## 1.1 Context

This Heritage Management Plan (HMP or Plan) forms part of the Construction Environmental Management Plan (CEMP) for Eurobodalla Southern Water Supply Storage (the Project).

This HMP has been prepared to address the requirements of the Minister's Development Consent (CoA), the environmental management measures listed in the Eurobodalla Southern Water Supply Storage Environmental Impact Statement (EIS) and all applicable legislation.

## 1.2 The approved project

The Eurobodalla Southern Water Supply Storage (the Project) was granted Development Consent from the Department of Planning and Environment (DPE) on 17 October 2019. Development Consent is provided in Appendix A of the CEMP.

The Project consists of an off-stream water storage facility and associated ancillary facilities. Water would be extracted from the Tuross River, using a new river intake pump station, and transferred to the storage via the Storage Inlet Pipeline. As necessary, the storage volume would be supplemented by water extracted from an existing borefield adjacent the storage.

Key features of the Project include:

- a 3,000 megalitre storage capacity,
- a 370 metre long embankment, 39 metres in height and a crest width of 20 metres located on an unnamed tributary of the Tuross River,
- a spillway,
- permanent erosion control structures located downstream of the spillway,
- inlet works to convey and dissipate raw water transferred from the river intake pump station through a pipeline constructed along the left abutment to the proposed water storage facility,
- outlet works to allow transfer of water from the storage to the existing southern water treatment plant (WTP),
- instrumentation to monitor seepage, reservoir levels and water quality,
- a consequence category of "High C" for both flood and sunny day scenarios in accordance with the Australian National Committee on Large Dams (ANCOLD) Guidelines on the consequence categories of dams (2012),
- a thermal stratification control system,
- a boat ramp at the storage for maintenance and water quality monitoring, and
- safety and perimeter fencing at the storage.

Key features of the ancillary facilities include:

- new river intake pump station with a total river extraction capacity made up of a combination of flows from the river intake (up to 26 megalitres) and the borefield (up to six megalitres)
- installation of the following new pipelines including:
  - a pipeline with a capacity of 26 megalitres per day to transfer raw water from the new river intake pump station to the storage inlet chute
  - a cross connection to the proposed water storage inlet pipeline with a capacity of six megalitres per day providing connection to supply water from the storage to the balance tank at the existing WTP
  - a pipeline connection from the existing borefield pipeline to the river intake pump station.
- a new storage access road that is about one kilometre in length and extends from

Eurobodalla Road opposite the existing WTP to the embankment crest basic right-turn and basic left-turn treatment at the intersection of the new storage access road and Eurobodalla Road would be provided,

- a new access road that would provide a route for vehicles to access the new river intake pump station, and
- power supply including the construction of new sub-stations located near the storage and the river intake pump station.

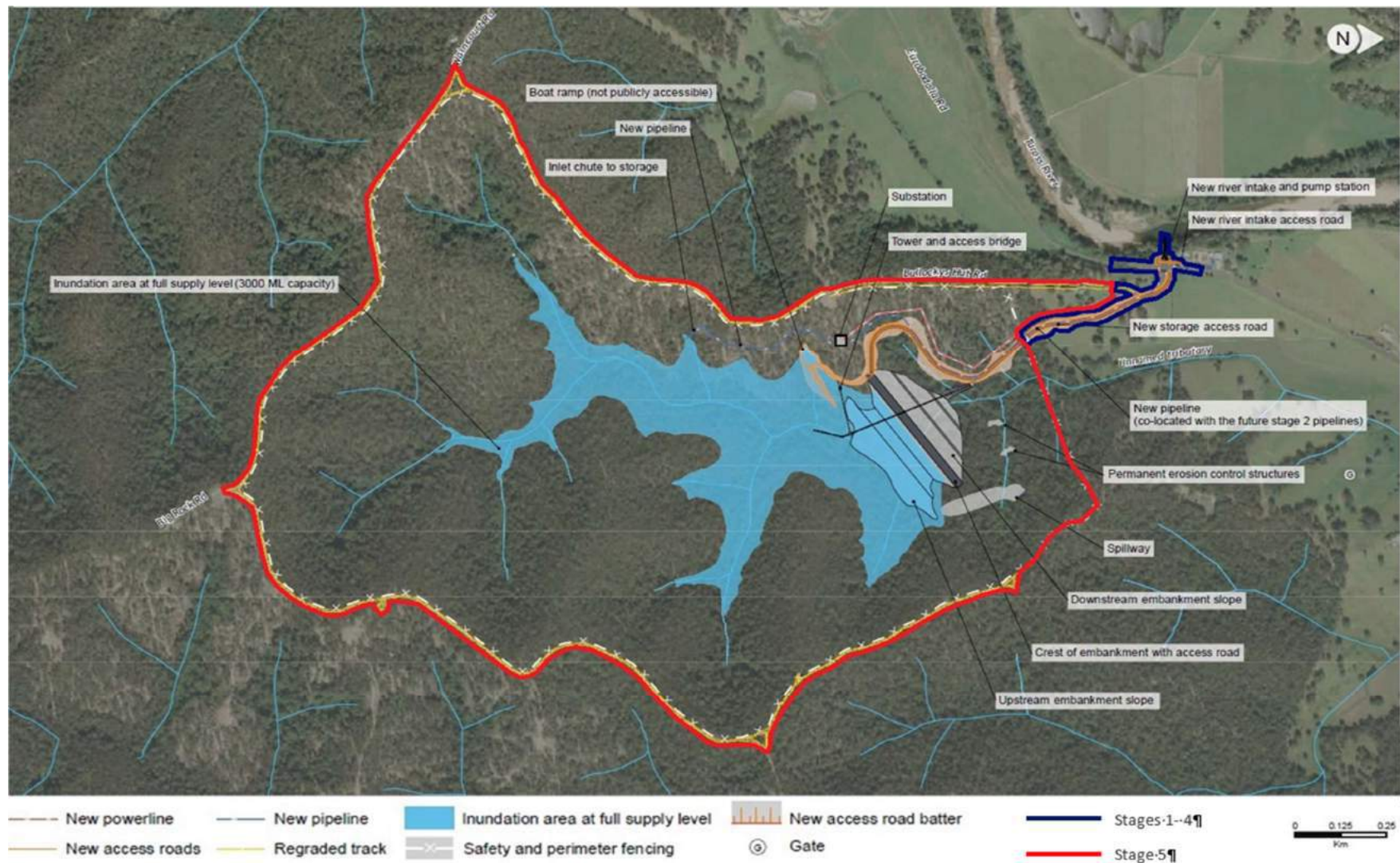
### **1.3 Scope of this Plan**

With the approval of the Secretary of Planning, construction of the project is being staged as follows:

- Stage 1: Tuross River Intake Pump Station clearing.
- Stage 2: Tuross River Intake Pump Station construction.
- Stage 3: Vegetation clearing and topsoil stripping of the access road, construction of the access road to the forestry boundary and construction of the inlet pipeline to the forestry boundary.
- Stage 4: Partial clearing of the entire storage site.
- Stage 5: All other works.

Works in Stage 1, Stage 2 and Stage 4 are complete. Stage 3 works are partially complete and will continue to be delivered under the applicable CEMP. This Plan only applies to Stage 5 of the approved project, being the construction of all remaining works on site including the removal of the remaining vegetation within clearing boundary, construction of the embankment wall, spillway, permanent erosion control measures and all remaining works on site to enable the project to become operational. The scope of works and the construction site boundary is detailed in Figure 1-1.





## **2 Purpose and objectives**

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### **2.1 Purpose**

The purpose of this Heritage Management Plan (HMP) is to describe how Haslin Constructions proposes to manage and protect Aboriginal heritage and historic heritage items during construction of the Project.

### **2.2 Objectives**

The key objective of the HMP is to ensure all conditions of the Development Consent, environmental management measures and licence/permit requirements relevant to heritage are described, scheduled and assigned responsibility as outlined in:

- The Environmental Impact Assessment (EIA) prepared for Eurobodalla Southern Water Supply Storage (the Project)
- Submission Report for the Eurobodalla Southern Water Supply Storage Project
- Addendum Submissions Report for the Eurobodalla Southern Water Supply Storage Project
- Revised Secretary's Environmental Assessment Requirements (SEARs)
- Revised Management and Mitigation Measures
- Development Consent SSD 7089 (the Project) granted on 17 October 2019

### **2.3 Targets**

The following targets have been established for the management of Aboriginal heritage or historic heritage impacts during the construction of the project:

- Achieve full compliance with relevant legislative requirements and the Conditions of Consent
- Minimise or avoid impacts on known Aboriginal and non-Aboriginal heritage sites.
- Follow correct procedure and ensure notification of any Aboriginal heritage objects/places uncovered during construction.

## **3 Environmental requirements**

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### **3.1 Relevant legislation and guidelines**

#### **3.1.1 Legislation and regulatory requirements**

All legislation relevant to this HMP is included in Appendix A1 of the CEMP.

#### **3.1.2 Additional approvals, licences, permits and requirements**

Refer to Appendix A1 of the CEMP

#### **3.1.3 Guidelines**

The main guidelines, specifications and policy documents relevant to this plan include:

- Aboriginal cultural heritage consultation requirements for proponents 2010 (DECCW 2010) (for reference only).
- Altering Heritage Assets (Heritage Office and DUAP 1996).
- Assessing Heritage Significance (NSW Heritage Office 2001).
- Archaeological Assessment Guidelines (NSW Heritage Office and NSW Department of Urban Affairs and Planning 1996).
- *NSW Government Policy on Aboriginal Participation in Construction* (released 1 May 2015, updated 1 August 2016)
- How to Prepare Archival Recording of Heritage Items (Heritage Branch 1998).

### 3.2 Ministers Development Consent Conditions

The CoA relevant to this Plan are listed Table 3- below. A cross reference is also included to indicate where the condition is addressed in this Plan or other project management documents.

**Table 3-1** Minister's Conditions of Approval

Condition No.	Condition Requirements	Document Reference
B40	If any item or object of Aboriginal heritage significance is identified on site:	Appendix A Unexpected Finds Procedure
	(a) all work in the immediate vicinity of the suspected Aboriginal item or object must cease immediately	
	(b) a 10m wide buffer area around the suspected item or object must be cordoned off, and	
	(c) the EESG must be contact immediately	
B41	Work in the immediate vicinity of the Aboriginal item or object may only commence in accordance with the provisions of Part 6 of the National Parks and Wildlife Act 1974	Appendix A Unexpected Finds Procedure
B42	If any unexpected archaeological relics are uncovered:	Appendix A Unexpected Finds Procedure
	(a) all work in the immediate vicinity of the suspected Aboriginal item or object must cease immediately	
	(b) the Heritage Division DPC must be notified	
	(c) a suitably qualified and experienced archaeologist must record and assess the significance of the find with the results reported to the Planning Secretary and the Heritage Division DPC	
	(d) where required by Heritage Division DPC, a Management Strategy is to be developed and implemented in consultation with the Heritage Division DPC	

Condition No.	Condition Requirements	Document Reference
B43	Work in the immediate vicinity of the find may only recommence on the advice of the archaeologist	Appendix A Unexpected Finds Procedure

### 3.3 Environmental Management Measures

Relevant EMM are listed in Table 3-2 below. This includes reference to required outcomes, the timing of when the commitment applies, relevant documents or sections of the environmental assessment influencing the outcome and implementation.

**Table 3-2:** Environmental management measures relevant to this HMP

Ref #	Commitment	Timing	HMP Reference
REMM 5.1	A construction Aboriginal heritage management plan will be prepared for the project. The plan would provide details of management measures and procedures to be carried out during construction to minimise and manage impacts on Aboriginal heritage, and includes an unexpected finds procedure	Pre-construction	This Plan
REMM 5.2	Aboriginal cultural awareness training for all relevant staff and contractors would be carried out prior to commencing work onsite.  All relevant staff, contractors and subcontractors will be made aware of their statutory obligations for heritage under the National Parks and Wildlife Act 1974 through an on-site induction	Pre-construction	Table 6-1

Ref #	Commitment	Timing	HMP Reference
REMM 6.1	<p>The following protocol for unexpected finds would be undertaken in accordance with the requirements of the NSW Heritage Manual (OEH 1996):</p> <ul style="list-style-type: none"><li>Should an item of historic heritage be identified, works in the vicinity of the find would cease. The Heritage Division (NSW Office of Environment and Heritage) would be contacted prior to further work being carried out in the vicinity of the find.</li></ul>	During construction	Table 6-1 H4  Appendix A Unexpected Finds Procedure



## 4 Existing Environment

The following sections summarise what is known about factors influencing heritage values of the project area. The key reference documents being Chapters 10,11 and Appendices I and J of the Environmental Impact Statement (EIS).

### 4.1 Aboriginal history

The traditional custodians of the land surrounding the Bodalla area are the Yuin. This area extends from the Shoalhaven River in the north to Cape Howe in the south. The majority of Aboriginal archaeological sites located in this region date to the last 6,000 years, when the sea levels stabilised to the present level (the Holocene still-stand).

Sites older than 6,000 are rare, as most of them would have been submerged by rising seas. Two coastal sites, Bass Point and Burrill Lake, provide evidence of Pleistocene Aboriginal occupation dating to 17,000BP and 20,000BP (years Before Present) respectively. Prior to the rise in sea levels these sites would have been located some 14 kilometres inland.

The Tuross River would have been a major focus for Aboriginal occupation and use, for its abundant natural resources. The river and its tributaries would have supported abundant plant and animal species during the mid to late Holocene, when climatic conditions were similar to the present day.

Fresh water drainage located in the study area has been the focus for non-marine resources such as macropods and tuber type plants. During the field assessments WLALC made a number of observations about the past resources of the study area:

- small edible shrubs were likely cultivated along past walking tracks (spur crests and ridges), for easily accessed sustenance during travel
- some edible plants that were in the steep gullies and suggested these species would have been more prolific in the past, due to Aboriginal cultivation practices.

### 4.2 Potential Aboriginal Deposits

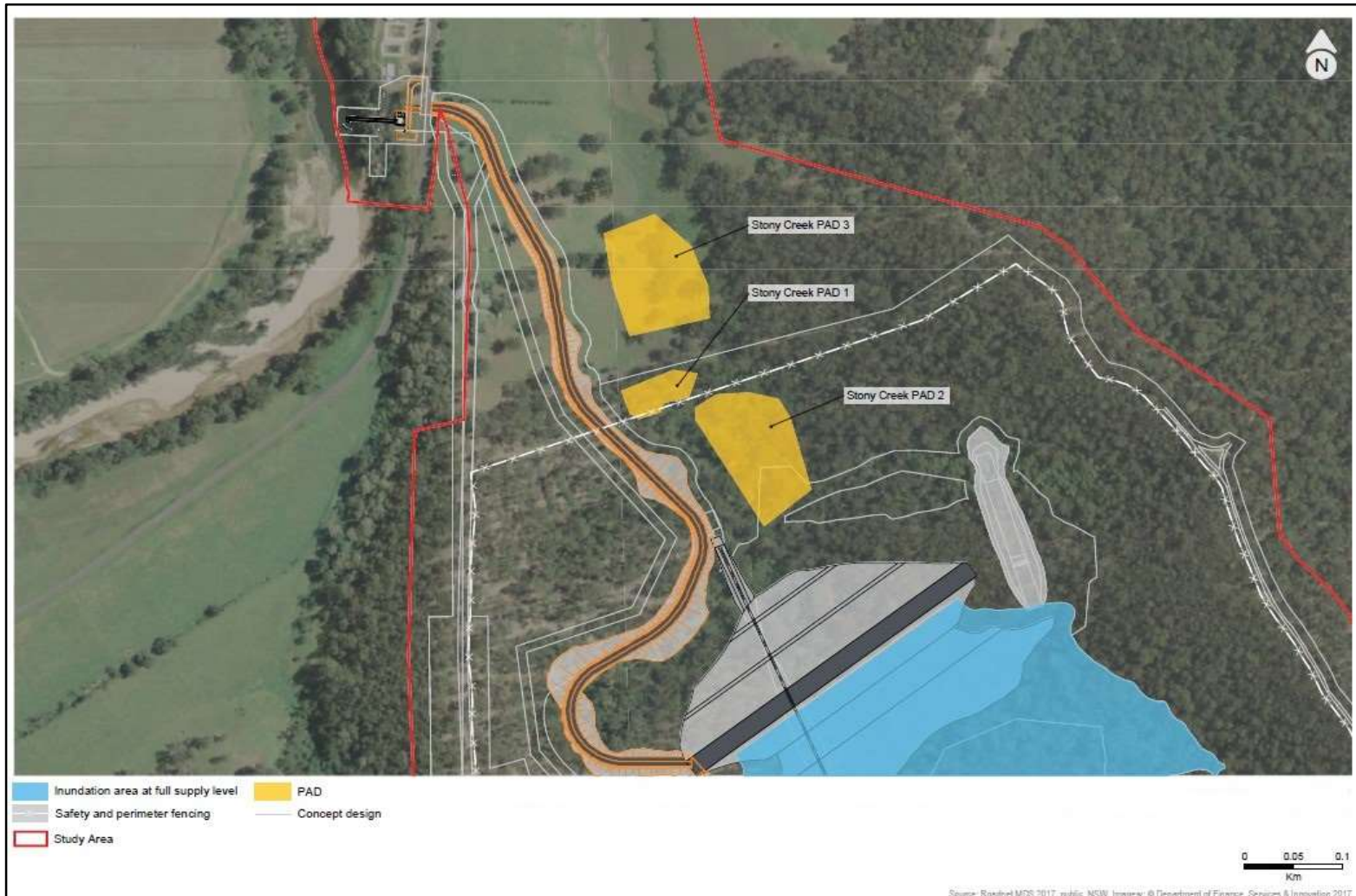
A PAD is defined as any location where the potential for subsurface archaeological material is considered to be moderate or high, relative to the surrounding study area landscape. Initial investigations of the project area undertaken as part of the EIS Aboriginal heritage assessment identified the following three Potential Aboriginal Deposits (PADS).

**Table 4-1** Potential Aboriginal Deposits

Recording name	GDA Reference	Lot/DP Number
Stony Creek PAD 1	230508.5997362 to 230579.5997363	Lot 3 DP 438839
Stony Creek PAD 2	230646.5997225 to 230693.5992623 to 230663.5997365 to 230581.599354 230511.5997437 to 230593.5997457 to 230538.5997567 to 23086.5997548	Lot 3 DP 438839
Stoney Creek PAD3	230511.5997437 to 230593.5997457 to 230538.5997567 to 23086.5997548	Lot 2 DP 1168581

The location of the three PADS is shown in **Figure 4-1**.





**Figure 4-1** Potential Aboriginal Deposits

Further archaeological assessment and field surveys were undertaken due to the potential for direct and indirect impacts on Stony Creek PAD 1 and Stony Creek PAD 2. Given the location of Stony Creek PAD 3 outside of the project footprint it was not necessary to undertake further assessment.

### **Stony Creek PAD 2**

During archaeological test excavations, it was determined that the permanent erosion control structures and operation of the spillway would not impact Stony Creek PAD 2 (refer to Figure 4-2).

### **Stony Creek PAD 1**

Three artefacts were recovered from two of the seven excavated pits along the transect. Two artefacts were recovered from pit 4 and one from pit 2. The artefacts consisted of one unretouched flake, one retouched flake, and one core.

The results of the survey and archaeological test excavation indicate that the areas next to the unnamed tributary and the locally elevated areas were used by Aboriginal people in the past. The artefact density encountered during the test excavations indicates that the study area was used intermittently, possibly for short-term occupation.

Stony Creek PAD 1 includes a scatter of stone artefacts that are currently sitting on the ground surface and in shallow subsurface deposits immediately beneath the surface.

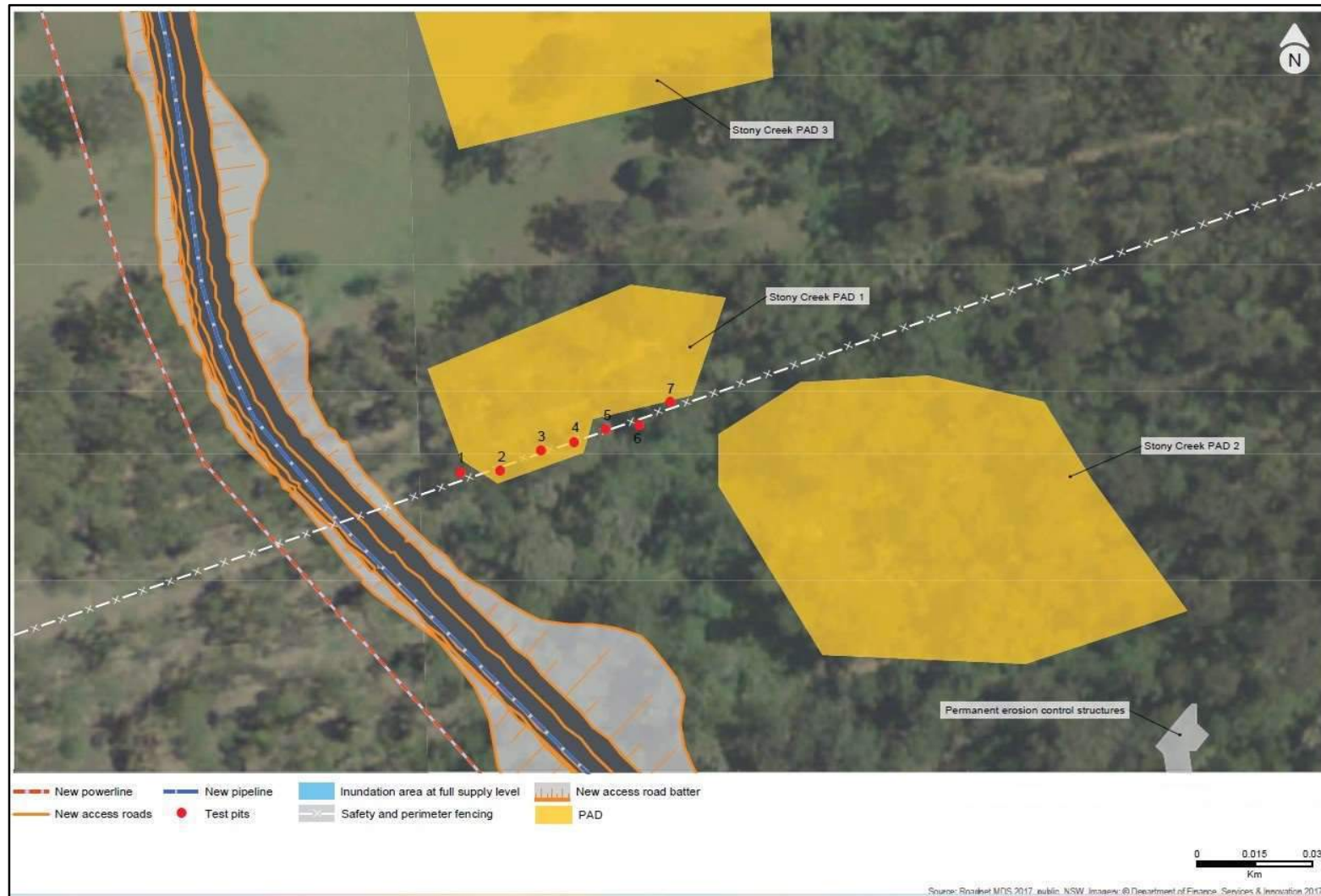
## **4.3 Historic Heritage**

Historic heritage investigations undertaken as part of the EIS determined that there were no historic land grants within the study area and that the project area had been left as forest and fauna reserves before being formally incorporated into the State Forest system in 1966.

The terrain and the lack of arable land means that evidence of settlers is unlikely to be found within the proposed water storage facility area.

The study area has been subjected to surface sheet erosion, especially the moderate to steep slopes impacted by intermittent logging of the State Forest. The low sloping spurs, valley floors, and terraces in the north of the proposal area are relatively stable geomorphically, due to the topographic nature of these landform.

Although the EIS identified four historic heritage sites listed on Eurobodalla LEP, no heritage items or heritage conservation areas were found within or immediately adjacent to the project footprint.



**Figure 4-2** Test excavation locations

## 5 Environmental aspects and impacts

### 5.1 Impacts on Aboriginal heritage items

A summary of the impacts to Aboriginal heritage is provided in Table 5-1 and described below

Stony Creek PAD 1 would be directly impacted by installation of the fence line where surface and subsurface Aboriginal artefacts may be harmed if encountered. If any artefacts are encountered during construction these would be collected prior to the installation of the fence line by a qualified archaeologist.

The Stony Creek PAD 2 would not be directly or indirectly impacted by the project as it is outside of the project construction footprint.

**Table 5-1** Impacts to Aboriginal heritage items

PAD number	Type of harm	Degree of harm	Consequence of harm
Stony Creek PAD1	Will be partially harmed Harm from fence line installation	Partial	Partial Loss of value
Stony Creek PAD2	Will not be harmed Inadvertent harm possible	Nil	No harm
Stony Creek PAD3	Will not be harmed Inadvertent harm possible	Nil	No harm

### 5.2 Impacts on historic heritage items

As determined in Chapter 11 of the EIS and Section 4.3 above, there are no historic heritage sites or items in or immediately adjacent to the construction footprint that would be impacted by construction of the project.



## 6 Environmental management measures

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Environmental management measures relating to Aboriginal and Historic Heritage were identified in the EIS and the Development Consent (SSD 7089). Specific measures and requirements to manage heritage are described below.

### 6.1 Key Management Strategies

The following sections outline the key management strategies to avoid impacts to Aboriginal and historic heritage items during construction of the project and have been developed to align with the objectives identified in Section 2.2. The key management strategies include:

- Training and awareness.
- Delineation and identification of no-go zones.
- Implementation of an unexpected finds procedure.

### 6.2 Training and awareness

An environmental induction as part of the main induction must be carried out by everyone working on the project site prior to works commencing. Details of the induction is discussed in Section 3.4.1 of the CEMP.

To supplement the environmental induction, the following training and awareness mechanisms will be undertaken:

- Toolbox talks.
- Daily pre-start meetings.
- Heritage awareness tools.

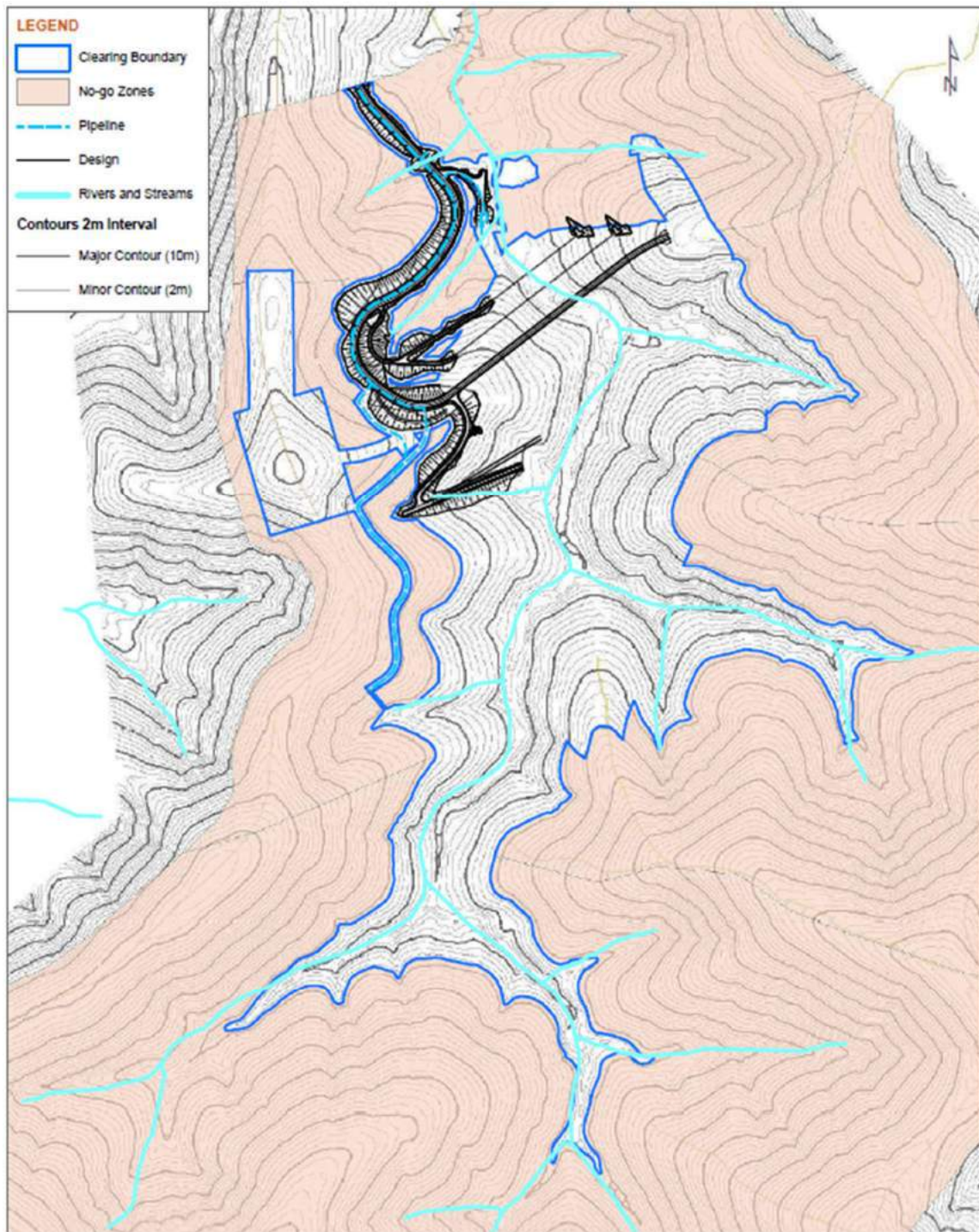
Toolbox talks will be one method of raising awareness and educating personnel on issues related to all environmental issues. The toolbox talks are used to ensure environmental awareness continues throughout construction. Toolbox talks will also be tailored to specific environmental issues relevant to upcoming works. Prior to the installation of fencing in the vicinity of Ston

The pre-start meeting is a tool for informing the workforce of the day's activities, safe work practices, environmental protection practices, work area restrictions, activities that may affect the works, coordination issues with other trades, hazards and other information that may be relevant to the day's work.

Heritage awareness tools (posters and information kits) will be used to show the construction staff what heritage items could be found on site and what to do if items are spotted. They will include photos and diagrams to indicate where on site they are likely to be found. Posters will be displayed in site sheds and construction compounds.

### 6.3 Delineation and identification of no-go zones

'No-go zones' are any areas outside the designated clearing boundary and full supply level as indicated in Figure 6-1. The physical extent of the construction site boundary is to be marked with high visibility bunting and kept in place for the duration of the Project.



**Figure 6-1** Project no-go zones

**Table 6-1.** Heritage management and mitigation measures

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Reference	Evidence
H1	'No-go zones' are any areas outside the designated clearing boundary and full supply level as indicated in Figure 6-1. The physical extent of the construction site boundary is to be marked with high visibility bunting and kept in place for the duration of the Project. PADs will be delineated with star pickets at 3m intervals and flag bunting.	Signage	Pre- and during Construction	General Superintendent	REMM 5.1	Signage in place
H2	Aboriginal cultural awareness training for all relevant staff and contractors would be carried out prior to commencing work through an onsite induction.	Induction	Pre- and during Construction	Site Environmental Representative	REMM 5.2	Training records
H3	All relevant staff, contractors and subcontractors will be made aware of their statutory obligations for heritage under the <i>National Parks and Wildlife Act 1974</i> .	Induction	Pre- and during Construction	Site Environmental Representative	REMM 5.2	Training records
H4	The unexpected finds procedure (Appendix A) prepared in accordance with the requirements of the NSW Heritage Manual (OEH 1996) will be implemented on site.	Procedure	Pre- and during Construction	Site Environmental Representative	Conditions of Consent B40, B41, B42, B43	Record of development



ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Reference	Evidence
H5	Opportunities to adjust the alignment of the site boundary fencing to avoid Stony Creek PAD 1 will be investigated in consultation with Eurobodalla Shire Council during detailed design.	Detailed design planning	Detailed design	Senior Project Manager Site Environmental Representative	Conditions of Consent A1	Records of communication

## **7 Compliance management**

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### **7.1 Roles and responsibilities**

The Haslin Project Team's organisational structure and overall roles and responsibilities are outlined in Section 3.3 of the CEMP. Specific responsibilities for the implementation of environmental controls are detailed in Section 6 of this Plan.

### **7.2 Training**

All employees, contractors and utility staff working on site will undergo site induction training relating to heritage management issues.

Targeted training in the form of toolbox talks or specific training will also be provided to personnel with undertaking activities with potential to uncover heritage items (eg boundary fencing).

Further details regarding staff induction and training are outlined in Section 3.5 of the CEMP

### **7.3 Monitoring and inspections**

Daily inspections of activities occurring on the worksite will be undertaken by the site supervisor and the environmental manager and site. Observations will be captured on a daily site diary.

Monitoring will focus on the compliance with the requirements of this Plan.

### **7.4 Auditing**

Audits (both internal and external) will be undertaken to assess the effectiveness of environmental controls, compliance with this plan, CoA and other relevant approvals, licenses and guidelines.

Audit requirements are detailed in Section 3.9.4 of the CEMP.

### **7.5 Reporting**

Reporting will be performed in accordance with section 3.9.3 of the CEMP.

## **8 Review and improvement**

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### **8.1 Continuous improvement**

Continuous improvement of this plan will be achieved by the ongoing evaluation of environmental management performance against environmental policies, objectives and targets for the purpose of identifying opportunities for improvement.

The continuous improvement process will be designed to:

- Identify areas of opportunity for improvement of environmental management and performance
- Determine the cause or causes of non-conformances and deficiencies
- Develop and implement a plan of corrective and preventative action to address any non-conformances and deficiencies
- Verify the effectiveness of the corrective and preventative actions
- Document any changes in procedures resulting from process improvement
- Make comparisons with objectives and targets.

### **8.2 HMP update and amendment**

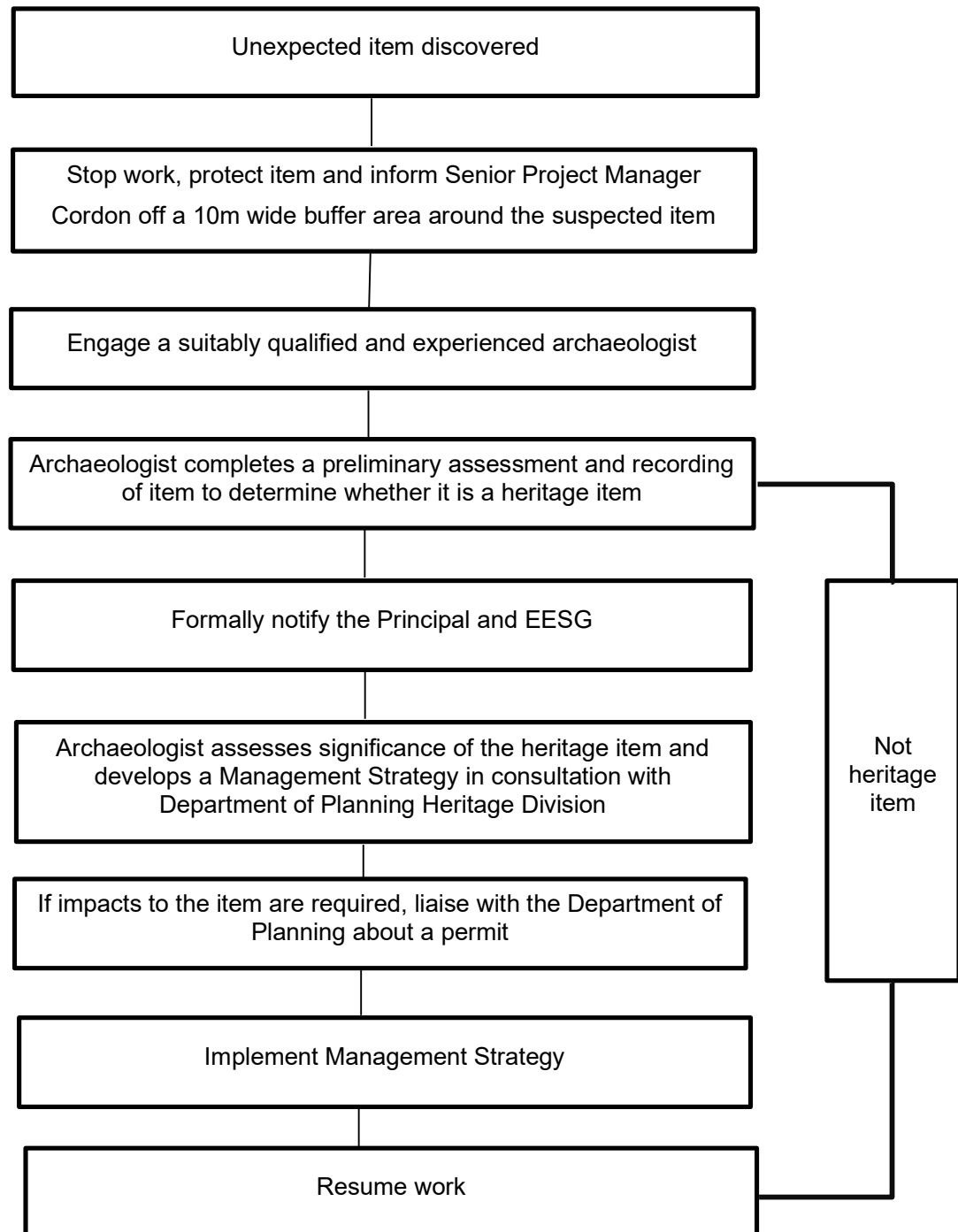
The processes described in Section 3.9 to Section 3.13 of the CEMP may result in the need to update or revise this Plan. This will occur as needed.

Only the Environmental Site Representative or delegate, has the authority to change any of the environmental management documentation.

A copy of the updated plan and changes will be distributed to all relevant stakeholders in accordance with the approved document control procedure – refer to Section 3.11.2 of the CEMP.

## Appendix A

### Unexpected finds procedure



# HASLIN

## Waste Management Plan

Eurobodalla Southern Water Supply Storage Project



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## Glossary/ Abbreviations

Term / Abbreviation	Definition / Expanded text
Application Number	SSD 7089
CEMP	Construction Environmental Management Plan
CEMS	Contractors Environmental Management System
Compliance audit	Verification of how implementation is proceeding with respect to a Construction Environmental Management Plan (CEMP) (which incorporates the relevant approval conditions).
Construction	The demolition and removal of buildings or works, the carrying out of works for the purpose of the development, including bulk earthworks, and erection of buildings and other infrastructure permitted by the Development Consent
Council	Eurobodalla Shire Council
Development	The development described in the Eurobodalla Southern Water Supply Storage Environmental Impact Statement
Development Consent (DC)	The Minister for Planning's approval SSD 7089 dated 17 October 2019
Development Consent Conditions	The Minister for Planning's Minister's Development Consent Conditions contained in approval SSD 7089 dated 17 October 2019
DPE	NSW Department of Planning and Environment
DPI	NSW Department of Primary Industries
EIS	Environmental Impact Statement
EMM	Environmental Management Measures
ENM	Excavated Natural Material, as defined in <i>The excavated natural material exemption</i>
EPA	NSW Environment Protection Authority
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EPL	Environmental Protection Licence
EWMS	Environmental Work Method Statement
Hazardous material/substance	A material or substance with the potential to cause harm to human health and/or the environment. Typical hazardous substances are toxic, corrosive, ignitable, explosive or chemically reactive.

Term / Abbreviation	Definition / Expanded text
PESCP	Progressive Erosion and Sediment Control Plan
Resource	Resource covers energy, fuel, oil, water and other materials used for construction of the project.
REMM	Revised Environmental Management Measures identified in Appendix 2 of the Development Consent
VENM	Virgin Excavated Natural Material
WARR Act	<i>Waste Avoidance and Resource Recovery Act 2001</i>
WRAPP	Waste Reduction and Purchasing Policy
WMP	Waste Management Plan

## Document Control and Records

Documentation and document control for this Plan, including issue of any amendments will be done generally in accordance with the contract. This Plan is maintained by Haslin Constructions (Haslin) and maintained throughout construction through regular reviews carried out on an initial 3 month of the project starting then on a biannually basis, or as changes require.

At all times an up-to-date copy of this plan shall be kept on site and made available to all employees and contractors involved in the project. Amendments that are made to this document are recorded on the register of amendments below and shall be approved by management staff. Superseded versions of this document shall be maintained for a period of 7 years to demonstrate record of environmental management and compliance.

This document shall be created and approved by the client. A controlled copy shall be supplied to all relevant parties, and distribution of controlled copies shall be recorded on the distribution register below (controlled hardcopy only). When changes are made to this document, parties listed below shall be provided with updates.

Register of Amendments				
Date:	Version No.:	Description of Amendments:	Prepared by:	Approved by:
02/08/22	0	Draft for review	NF	AL
10/08/22	A	Draft responding to ESC comments	NF	AL
15/09/22	B	Minor amendments	NF	AL

Company Management Plan Authorisation			
	Name/Position	Date:	Signature
Prepared by:	Nicholas Francesconi Environmental Consultant	15/09/2022	
Reviewed by:	Andrew Lynam Environmental Manager	15/09/2022	
Approved by:	Colin Woods Managing Director	51/09/2022	

Distribution Register			
Version No.	Date of Issue:	Name of Recipient:	Position/Organisation
A	19/08/22	Ross Bailey	Principals Authorised Person
B	16/09/22	Ross Bailey	Principals Authorised Person

# 1 Introduction

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## 1.1 Context

This Waste Management Plan (WMP or Plan) forms part of the Construction Environmental Management Plan (CEMP) for the Eurobodalla Southern Water Supply Storage (the Project).

This Plan has been prepared to address the requirements of the Minister's Development Consent and the environmental management measures listed in the Eurobodalla Southern Water Supply Storage Environmental Impact Statement (EIS) and all applicable legislation.

## 1.2 The approved project

The Eurobodalla Southern Water Supply Storage (the Project) was granted Development Consent from the Department of Planning and Environment (DPE) on 17 October 2019. Development Consent is provided in Appendix A.

The Project consists of an off-stream water storage facility and associated ancillary facilities. Water would be extracted from the Tuross River, using a new river intake pump station, and transferred to the storage via the Storage Inlet Pipeline. As necessary, the storage volume would be supplemented by water extracted from an existing borefield adjacent the storage.

Key features of the Project include:

- a 3,000 megalitre storage capacity
- a 370 metre long embankment, 39 metres in height and a crest width of 20 metres located on an unnamed tributary of the Tuross River
- a spillway
- permanent erosion control structures located downstream of the spillway
- inlet works to convey and dissipate raw water transferred from the river intake pump station through a pipeline constructed along the left abutment to the proposed water storage facility
- outlet works to allow transfer of water from the storage to the existing southern water treatment plant (WTP)
- instrumentation to monitor seepage, reservoir levels and water quality
- a consequence category of "High C" for both flood and sunny day scenarios in accordance with the Australian National Committee on Large Dams (ANCOLD) Guidelines on the consequence categories of dams (2012)
- a thermal stratification control system
- a boat ramp at the storage for maintenance and water quality monitoring
- safety and perimeter fencing at the storage.

Key features of the ancillary facilities include:

- new river intake pump station with a total river extraction capacity made up of a combination of flows from the river intake (up to 26 megalitres) and the borefield (up to six megalitres)
- installation of the following new pipelines including:
  - a pipeline with a capacity of 26 megalitres per day to transfer raw water from the

new river intake pump station to the storage inlet chute

– a cross connection to the proposed water storage inlet pipeline with a capacity of six megalitres per day providing connection to supply water from the storage to the balance tank at the existing WTP

– a pipeline connection from the existing borefield pipeline to the river intake pump station.

- a new storage access road that is about one kilometre in length and extends from Eurobodalla Road opposite the existing WTP to the embankment crest
- basic right-turn and basic left-turn treatment at the intersection of the new storage access road and Eurobodalla Road would be provided
- a new access road that would provide a route for vehicles to access the new river intake pump station
- power supply including the construction of new sub-stations located near the storage and the river intake pump station.

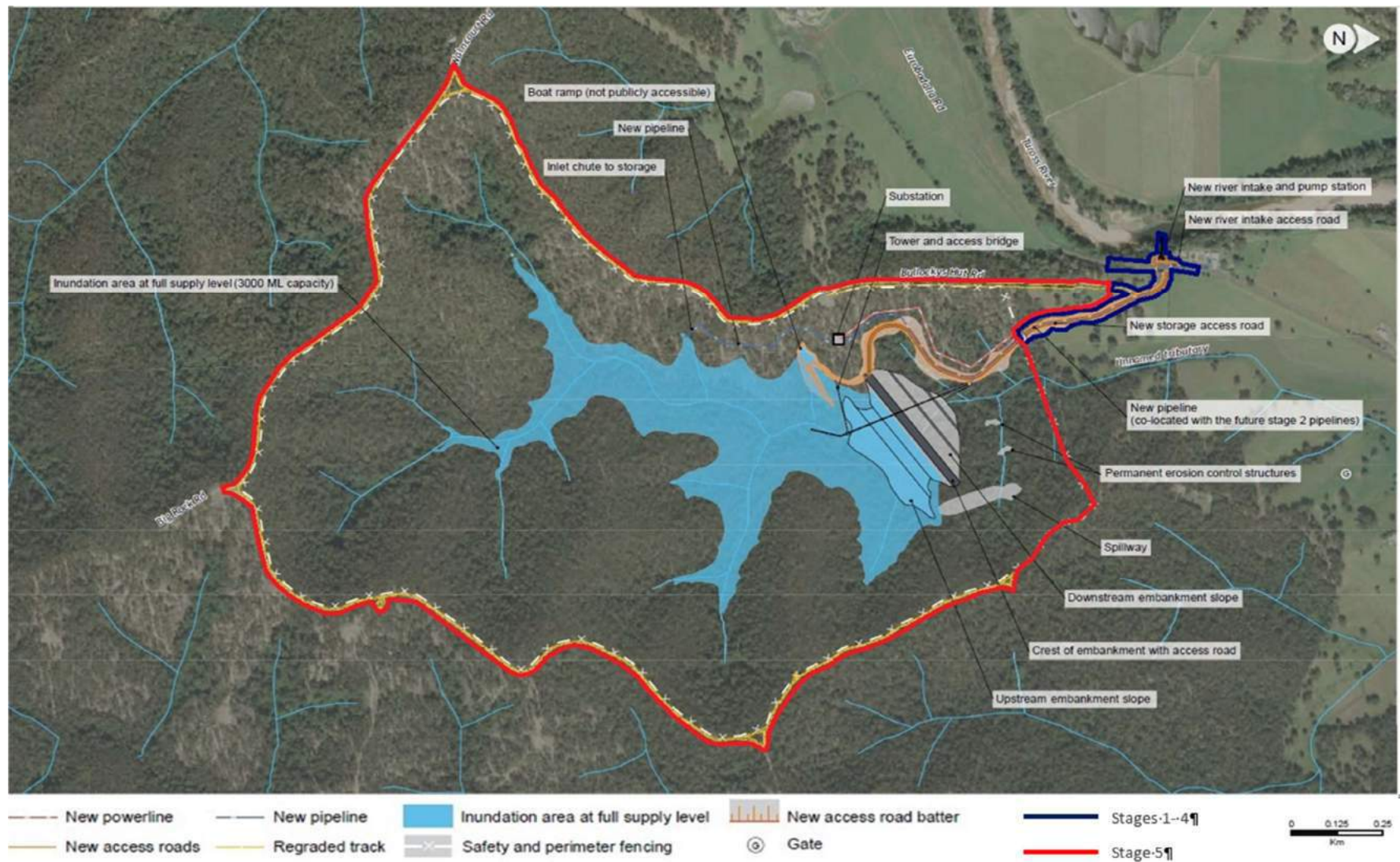
### **1.3 Scope of this plan**

With the approval of the Secretary of Planning, construction of the project is being staged as follows:

- Stage 1: Tuross River Intake Pump Station clearing.
- Stage 2: Tuross River Intake Pump Station construction.
- Stage 3: Vegetation clearing and topsoil stripping of the access road, construction of the access road to the forestry boundary and construction of the inlet pipeline to the forestry boundary.
- Stage 4: Partial clearing of the entire storage site.
- Stage 5: All other works.

Works in Stage 1, Stage 2 and Stage 4 are complete. Stage 3 works are partially complete and will continue to be delivered under the applicable CEMP. This Plan only applies to Stage 5 of the approved project, being the construction of all remaining works on site including the removal of the remaining vegetation within clearing boundary, construction of the embankment wall, spillway, permanent erosion control measures and all remaining works on site to enable the project to become operational. The scope of works and the construction site boundary is detailed in Figure 1-1.





**Figure 1-1** Project overview and scope of works covered by this plan (Stage 5)

## **2 Purpose and objectives**

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### **2.1 Purpose**

The purpose of this Waste Management Plan (WMP) is to describe how Haslin Constructions will manage and protect waste and resources during construction of the Project.

### **2.2 Objectives**

The key objective of the WMP is to ensure all conditions of the Development Consent, environmental management measures and licence/permit requirements relevant to waste management are described, scheduled and assigned responsibility as outlined in:

- The Environmental Impact Assessment (EIA) prepared for Eurobodalla Southern Water Supply Storage (the Project)
- Submission Report for the Eurobodalla Southern Water Supply Storage Project
- Addendum Submissions Report for the Eurobodalla Southern Water Supply Storage Project
- Revised Secretary's Environmental Assessment Requirements (SEARs)
- Revised Management and Mitigation Measures
- Development Consent SSD 7089 (the Project) granted on 17 October 2019

### **2.3 Targets**

The following targets have been established for the management of soil and water impacts during the project:

- Ensure full compliance with the relevant legislative requirements, EIS and conditions of the Development Consent.
- Avoid the unnecessary production of waste where practical to do so
- Dispose of waste materials in accordance with legislative requirements
- Minimise / reduce the quantities of resources to be used



## **3 Environmental requirements**

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### **3.1 Relevant legislation and guidelines**

#### **3.1.1 Legislation and regulatory requirements**

All legislation relevant to this WMP is included in Appendix A1 of the CEMP.

#### **3.1.2 Guidelines and standards**

The main guidelines, specifications and policy documents relevant to this plan include:

- NSW Waste and Resource Recovery Strategy 2014-21 (EPA, 2014)
- NSW Government Resource Efficiency Policy (GREP) (OEH 2014)
- Waste Classification Guidelines (EPA 2014)
- NSW EPA's Storing and Handling of Liquids: Environmental Protection – Participants Manual (DECC, 2007)
- Australian Standards
- Occupational Health and Safety Guidelines

### 3.2 Conditions of Development Consent

The conditions of development consent relevant to this Plan are listed in Table 3-1 below. A cross reference is also included to indicate where the condition is addressed in this Plan or other Project management documents.

**Table 3-1** Conditions of Development Consent relevant to the WMP

Condition No.	Condition Requirements	Document Reference
B12	The applicant must: a) ensure that only VENM, ENM or other material approved in writing by EPA is brought onto the site; b) keep accurate records of the volume and type of fill to be used; and c) make records available to the Development upon request.	Table 6-1 W10
B16	The applicant must store all chemicals, fuels and oils used on-site in accordance with: a) The requirements of all relevant Australian Standard; and b) The NSW EPA's <i>Storing and Handling of Liquids: Environmental Protection – Participants Manual</i> 'if the chemicals are liquids	Section 5.1 Table Table 6-1 W21
B44	The CEMP must detail the quantities of each waste type generated during construction and the proposed reuse, recycling and disposal locations	Table 5-1
B45	The Applicant must assess and classify all liquid and non-liquid wastes to be taken off site in accordance with the latest version of EPA's Waste Classification Guidelines Part 1: Classifying Waste (EPA, 2014) and dispose of all wastes to a facility that may lawfully accept the waste.	Table 6-1 W11
B46	The Applicant must retain all sampling and waste classification data for the life of the development in accordance with the requirements of the EPA.	Table 6-1 W19

### 3.3 Environmental Management Measures

Relevant EMM are listed in table 3-2 below. This includes reference to required outcomes, the timing of when the commitment applies, relevant documents or sections of the environmental assessment influencing the outcome and implementation.

**Table 3-2** Environmental management measures relevant to this WMP

Ref #	Commitment	Timing	WMP Reference
9.4	Excavated material that is not suitable for on-site reuse or recycling, such as contaminated material should be transported to a site legally able to accept that material.	During construction	Table 5-2
	A classification system will be used to control the excavation, stockpiling and disposal of all potentially contaminated materials. Soils should be classified (where possible) in-situ prior to excavation or when stockpiled during excavation, depending on the time available and room for stockpile areas. Any unexpected finds should follow the same procedures.	Pre-construction Construction	Table 5-2 Section 6
	If groundwater is encountered during construction, it will be managed and disposed of in accordance with the CEMP	During construction	Table 6-1 W17
9.5	Vehicles and machinery will be properly maintained to minimise the risk of fuels/oil leaks. Routine inspections of all construction vehicles and equipment should be undertaken for evidence of fuel/oil leaks	During construction	Table 6-1 W5
	All fuels, chemicals and hazardous liquids will be stored within an impervious bunded area in accordance with Australian Standards and EPA guidelines	During construction	Section 6.1.2 Table 6.1 W21
9.6	Any dewatering activities will be undertaken in accordance with the Technical Guidelines: Environmental management of construction site dewatering (RTA, 2011b) in a manner that prevents pollution of waters	During construction	Table 5-2 Table 6-1

Ref #	Commitment	Timing	WMP Reference
9.7	A waste management plan would be developed as part of the CEMP and will take into account the waste hierarchy	Pre-construction	

## 4 Environmental aspects and impacts

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### 4.1 Construction waste streams and resource use

The following construction related waste streams have been identified:

- Overburden from on-site quarrying activities
- Green waste from the removal of shrubs, trees and weeds
- Excavation wastes
- Concrete waste (washout waste)
- Packaging materials associated with items delivered to site such as pallets, crates, cartons, plastics and wrapping materials
- Wastes produced from the maintenance of various heavy construction equipment including liquid hazardous wastes from cleaning, repairing and maintenance
- Non-hazardous wastes would be generated through the use of worker's facilities such as toilets
- Refuelling activities
- General wastes including office wastes, scrap materials and biodegradable wastes

The following sources of construction related resource consumption (fuel and power) have been identified:

- Procurement and delivery of materials to site
- Vegetation removal
- Site establishment, including compound set up
- Earthworks including earth and rock cuttings and retaining walls
- Removal, relocation and compaction of excavated material in fill embankments
- Operation of batching plants, site compounds and lighting
- Construction plant including cranes, rollers, excavators, bulldozers, graders and water trucks

### 4.2 Impacts

The potential environmental impacts associated with construction waste generation include:

- Generation of construction waste, such as excavated soil and rock
- Generation of vegetation waste from catchment clearing
- Generation of domestic waste from construction personnel
- Inappropriate storage and disposal of hazardous waste
- Generation or spread of contaminated waste/soils, e.g. groundwater, used or expired chemicals, or construction materials
- Water pollution due to sediment runoff from soil excavation and excess spoil storage
- Spills or leaks of fuels and chemicals
- Weed infestation from dispersion of seeds and so forth during clearing and access upgrading activities

## 5 Waste management

### 5.1 Waste management hierarchy

#### 5.1.1 Reuse and recycling

Waste separation and segregation will be promoted on-site to facilitate reuse and recycling as a priority of the waste management program as follows:

Waste segregation onsite – Waste materials, including spoil and demolition waste, will be separated onsite into dedicated bins/areas for either reuse onsite or collection by a waste contractor and transport to offsite facilities.

Waste separation offsite at an appropriately licenced facility – Wastes to be deposited into one bin where space is not available for placement of multiple bins, and the waste is to be sorted offsite by a waste contractor.

**Figure 5-1** Waste management hierarchy. NSW Waste Avoidance and Resource Recovery Strategy 2014-2021 (EPA 2014)



#### Waste handling and storage

Where waste is required to be handled and stored onsite prior to onsite reuse or offsite recycling/disposal, the following measures apply:

- Spoil, topsoil and mulch are to be stockpiled onsite in allocated areas, where appropriate, and mitigation measures for dust control and surface water management will be implemented as per the Air Quality Management Plan and the Soil and Water Management Plan.
- Liquid wastes are to be stored in appropriate containers in bunded areas until transported offsite. Bunded areas will have the capacity to hold 110 per cent of the liquid waste volume for bulk storage or 120 per cent of the volume of the largest container for smaller packaged storage
- Hazardous waste will be managed by appropriately qualified and licensed contractors, in accordance with the requirements of the *Environmentally Hazardous Chemicals Act 1985* and the EPA waste disposal guidelines.

- All other recyclable or non-recyclable wastes are to be stored in appropriate covered receptacles (eg bins or skips) in appropriate locations onsite and contractors commissioned to regularly remove/empty the bins to approved disposal or recycling facilities.

### **5.1.2 Waste disposal**

Waste (and spoil) disposal is to be in accordance with the *Protection of the Environment Operations Act 1997* and the *Waste Avoidance and Resource Recovery Act 2001*. Wastes that are unable to be reused or recycled will be disposed of offsite to an appropriately licenced waste management facility following classification (refer to section 5.2).

Locations of waste management/disposal facilities are included in Appendix A. Details of waste types, volumes and destinations are to be recorded in the Waste Management Register and made available to Eurobodalla Shire Council no later than the fifth (5<sup>th</sup>) business day of every second month (Appendix B).

## **5.2 Classification of waste streams**

Where waste cannot be avoided, reused or recycled it will be classified and appropriate disposal will then occur. The classification of waste is undertaken in accordance with the *EPA Waste Classification Guidelines Part 1: Classifying Waste (2014)*.

This document identifies six classes of waste: Special, Liquid, Hazardous, Restricted Solid, General Solid (putrescible) and General Solid (non-putrescible) and describes a six-step process to classifying waste. Management of waste streams

The types of wastes which may be generated during construction are outlined within classifications in Table 5-1 below.



**Table 5-1** Waste streams and volumes

Waste Type	Waste Classification	Approx. quantity	Proposed reuse/recycling/disposal methods	Reuse / Recycle Target
Spoil from quarrying activities including VENM or ENM	If material is taken off site, classification will be carried out based on soil tests carried out prior to construction and in accordance with the EPA Waste Classification Guidelines: Parts 1 and 2 (DECC, 2009)	80,000m <sup>3</sup>	Re-use as construction material for access roads and access ramp. Re-used to rehabilitate quarry areas (refer Appendix C)	90%
Green waste (logs, timber and weeds) from vegetation clearing	General solid waste (putrescible)	Unknown	<p>Separate native and weed species and stockpile in clearly delineated areas where possible, or load the weed material directly to skips/trucks for offsite disposal</p> <p>Re-use of suitable cleared vegetation (such as hollow logs) within rehabilitated areas on site or relocation to immediately adjacent areas</p> <p>On-site reuse as mulch to stabilise disturbed areas of site where possible.</p> <p>All residual wood and vegetative waste will be burnt on site using an air curtain incinerator. All ash and BioChar shall be disposed of at the Surf Beach Landfill green waste area or an alternative subject to review by Eurobodalla Shire Council</p>	<p>10%</p> <p>5%</p> <p>85%</p>
Building waste from construction activities	General solid waste (non-putrescible)	Unknown	Classification, stockpiling and potential re-use under formation of the access road and ramps. Material that cannot be re-used will be disposed off site to an appropriately approved site.	10%

Waste Type	Waste Classification	Approx. quantity	Proposed reuse/recycling/disposal methods	Reuse / Recycle Target
Wastewater Stormwater runoff collected in excavations or basins	Stormwater	Unknown	Prioritise collected waste water for onsite dust suppression activities where possible. Where on-site re-use is not possible, treat the water in accordance with the dewatering procedure prior to offsite discharge.	30%
Office waste General wastes from site offices such as putrescibles, paper, cardboard, plastics, glass and printer cartridges	General solid waste	Unknown	General wastes from site offices such as putrescibles, paper, cardboard, plastics, glass and printer cartridges will be separated and collected for recycling off-site wherever practicable.	20%
Potentially contaminated Soils	If material is taken off site classification will be carried out, based on soil tests carried out prior to construction and in accordance with the EPA Waste Classification Guidelines: Parts 1 and 2 (DECC, 2009)	Unknown	Haslin would ensure that all soil, earth or rock, which is scheduled for removal off-site, is appropriately classified, prior to disposal. Disposal shall be to an appropriately licensed landfill, in accordance with instructions issued by the Department of Environment, Climate Change and Water and/or ESC. The Contractor shall liaise with ESC or a specialist approved by Council for disposal of contaminated soil.	-
Empty oil and other drums	General solid waste (non-putrescible)	Unknown	Return to supplier where possible Offsite disposal at an approved facility	10%

Waste Type	Waste Classification	Approx. quantity	Proposed reuse/recycling/disposal methods	Reuse / Recycle Target
Construction Wastes: Packaging Materials, including wood, plastic, cardboard and metals	General solid waste (non-putrescible)	Unknown	Return to supplier where possible. Separate skip bins for plastics, timber, metals, cardboard or construction waste bin for offsite segregation	10%

### 5.3 Waste exemption

Clause 51 Protection of the Environment Operations (Waste) Regulation 2005 enables the EPA to grant exemptions to the licensing and payment of levies for the land application or use of waste. The EPA has issued general exemptions for a range of commonly recovered, high volume and well characterised waste materials that allow their use as fill or fertiliser at unlicensed, off-site facilities. The general Resource Recovery Exemptions and Orders may be applicable to this project are defined in Table 5-2 below. These are general gazette exemptions that do not require approval. A specific exemption may be granted where an application is made to the EPA.

**Table 5-2:** EPA Resource Recovery Exemptions and Orders, and associated conditions relevant to the project

Exemption/Order	General Conditions
<p>The excavated natural material exemption 2014</p> <p>The excavated natural material order 2014</p>	<p>The chemical concentration or other attributes of the excavated natural material listed in the Excavated Natural Material Exemption must not be exceeded.</p> <p>The excavated natural material can only be applied to land as engineering fill or used in earthworks.</p> <p>ENM handling, processing and testing requirements are outlined in detail in the exemption.</p>
<p>The excavated public road material exemption 2014</p> <p>The excavated public road material order 2014</p>	<p>The excavated public road material can only be stored within the road corridor at the site where it is to be applied to land.</p> <p>The excavated public road material can only be applied to land within the road corridor for public road related activities including road construction, maintenance and installation of road infrastructure facilities. This exemption does not apply to the land application of excavated public road material on any land outside the road corridor.</p> <p>The excavated public road material cannot be applied on private land.</p> <p>The consumer must land apply the relevant waste within a reasonable period of time.</p>
<p>The mulch exemption 2016</p> <p>The mulch order 2016</p>	<p>The raw mulch can only be applied to land for the purposes of filtration or as a soil amendment material or used either singularly or in any combination as input material(s) to a composting process.</p> <p>The consumer must land apply the raw mulch within a reasonable period of time.</p>

## 6 Environmental control measures

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Specific measures and requirements to meet the objectives of this WMP and to address contract specifications, Conditions of Development Consent and EMM's are outlined below and in Table 6-1.

### 6.1 Key Management Strategies

The following sections outline the key management strategies to avoid generating waste, appropriately store waste, accurately categorise waste into the respective waste stream, recycle and dispose of waste from the project.

- Competence training and awareness
- Appropriate segregation and storage of waste
- Tracking necessary waste streams
- Implementation of an unexpected finds procedure

#### 6.1.1 Competence, training and awareness

An environmental induction as part of the main induction must be carried out by everyone working on the project site prior to works commencing. Details of the induction is discussed in Section 3.4.1 of the CEMP.

To supplement the environmental induction, the following training and awareness mechanisms will be undertaken:

- Toolbox talks
- Daily pre-start meetings

Toolbox talks and pre-start meetings will raise awareness and educate personnel on issues related to environmental issues including waste minimisation and management.

#### 6.1.2 Appropriate segregation and storage of waste

A key component in managing waste on site is to have clearly separated and labelled temporary storage areas or zones after the material has been classified.

Any waste material that is temporarily going to be stockpiled on site must be in its own delineated stockpile with clear labelling/signposting to avoid co-mingling or contamination of other classified waste streams.

#### 6.1.3 Tracking of waste streams

Consistent with the Protection of the Environment Operations (Waste) Regulation 2014 the following wastes potentially encountered/generated are required to be tracked within NSW:

- Hazardous Wastes as defined by Table 3 in the NSW EPA 'Waste that must be tracked' guideline
- Liquid Waste (Category 1 trackable waste)
- More than 100 kilograms of asbestos waste or more than 10 square meters of asbestos sheeting in any single load
- More than 200kg of waste tyres, or 20 tyres (whichever is heavier)
- Waste oil/water, hydrocarbon/water mixtures emulsions
- Wastes listed in Table 1 of the NSW EPA 'Waste that must be tracked' Guideline.

Details of waste types, volumes and destinations will be recorded in the project Waste Management Register for all waste movements off site. A template Waste and Spoil Management Tracking Register is included for reference in Appendix A of this plan.

The NSW EPA WasteLocate system will be used to track asbestos waste and waste tyres, whilst the online waste tracking system developed by EPA will be utilised to track all other trackable waste.

**Table 6-1.** Waste and hazardous material management measures

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Reference	Evidence
General Project Requirements						
W1	<p>Waste generated during construction of the project will be dealt with in accordance with the following waste hierarchy priorities:</p> <ul style="list-style-type: none"> <li>waste generation is to be avoided and where avoidance is not reasonably practicable, waste generation is to be reduced</li> <li>where avoiding or reducing waste is not possible, waste is to be re-used, recycled, or recovered on-site or off-site including the re-use of spoil for construction works and</li> <li>where re-using, recycling or recovering waste is not possible, waste is to be treated or disposed of at a waste management facility or premise lawfully permitted to accept the materials or in accordance with a Resource Recovery Exemption or Order issued under the Protection of the Environment Operations (Waste) Regulation 2014, or to any other place that can lawfully accept such waste.</li> </ul>	Waste Management Plan, Waste and Spoil Management Register	Construction	Environmental Site Representative General Superintendent	B44	Waste and Spoil Management Register records Waste Avoidance and Recovery Reporting



ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Reference	Evidence
W2	The relevant licenses of waste facilities utilised for the disposal of project waste will be obtained (on a regular basis if necessary) to ensure they are legally able to accept that waste.	N/A	Construction	Environmental Site Representative General Superintendent	Best Practice	Relevant licence records
W3	All staff and subcontractors will undergo a site induction and ongoing toolbox talks that will detail waste and resource management measures (including the waste management hierarchy) and energy consumption	N/A	Construction	Environmental Site Representative General Superintendent	Best Practice	Induction records Toolbox talk records
Management of Waste – General						
W4	A Construction Waste Management Sub-Plan has been prepared as part of the CEMP and will be regularly updated during detailed design and construction. It will include mitigation strategies to manage and minimise the generation of waste and encourage reuse of materials.	Project Team	Prior to construction	Environmental Site Representative	Consent condition C2	This Plan
W5	All site vehicles and plant would be maintained in accordance with the manufacturer's requirements. Pre-start inspections of the equipment would be undertaken by the operator	Project Team	During construction	General Superintendent	Best Practice	Vehicle/Plant maintenance evidence. Pre-start checklist/records

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Reference	Evidence
W6	Sewage and grey water from on-site facilities will be contained and removed offsite to an appropriately licenced waste facility	N/A	Construction	Environmental Site Representative	Best practice	
W7	Waste will be managed and disposed of in accordance with the POEO Act.	N/A	Construction	Environmental Site Representative	Condition of Development Consent B12	This Plan
W8	Waste management measures from this WMP will be included in relevant Environmental Work Method Statements to be developed prior to the commencement of specific activities.	EWMS	Prior to construction /Construction	Environmental Site Representative	Best practice	EWMS in the CEMP
W9	Wastes generated onsite must be stored to prevent unauthorised access and uncontrolled release.	Waste receptacles	Construction	Environmental Site Representative General Superintendent	Best practice	Designated waste storage areas
W10	Waste generated outside the site will not be received at the site for storage, treatment, processing, reprocessing, or disposal on the site, except as expressly permitted by a licence or waste exemption under the Protection of the Environment Operations Act 1997, if such a licence is required in relation to that waste.	N/A	Construction	Senior General Superintendent Environmental Site Representative	Best practice	N/A

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Reference	Evidence
W11	<p>All waste generated during construction and operation must be classified in accordance with the Waste Classification Guidelines Part 1: Classifying waste (EPA 2014).</p> <p>Waste sampling and testing to be guided by the Waste Classification Guidelines</p>	EPA's Waste Classification Guidelines	Construction	Environmental Site Representative	REMM 9.4 Best practice	Waste Classification Reports
W12	<p>Disposal of weeds and the recycling and disposal of all other materials from clearing and grubbing operations must be managed in accordance with the Flora and Fauna Management Sub-plan (FFMP) and Weed Management Protocol.</p>	Clearing and Grubbing plan	Construction	Environmental Site Representative	<p>Flora and Fauna Management Plan</p> <p>Weed Management Protocol</p> <p>Technical Specification CI 6.2.4</p>	Waste and Spoil Management Tracking Register records
W13	<p>Suitable areas will be identified to allow for contingency management of unexpected waste materials, including contaminated materials. Suitable areas will be required to be hardstand or lined areas that are appropriately stabilised and bunded, with sufficient area for stockpile storage.</p>	Suitable areas for contaminated material stockpiling	Prior to Construction / Construction	Environmental Site Representative Engineers	REMM 9.4	Site layout plans in the CEMP

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Reference	Evidence
W14	Waste stockpiles will be managed to control combustibility, dust, odour and cross contamination.  Mulch in excess of the quantity required for landscape planting must not be stockpiled on Construction Site.	N/A	Construction	Environmental Site Representative  General Superintendent	REMM 9.5	
W15	Concrete washout areas with hardstand and earth bunds will be established. Concrete agitators will only washout on-site in the nominated locations. The locations will be communicated to all agitator drivers.		Construction	Environmental Site Representative	Technical specification 3.15	Site layout plans
W16	All surplus concrete will be disposed at the onsite concrete washout areas. At the completion of works, concrete waste will be buried.	N/A	Construction	Environmental Site Representative	Technical specification 3.15	Site layout plans
W17	Any groundwater encountered on site would be tested on site prior to disposal or discharge in accordance with the Soil and Water Management Plan. Any contaminated groundwater would be contained on site prior to disposal at a registered landfill	Dewatering procedure	Construction	Environmental Site Representative	Best practice	Soil and Water Dewatering procedure
W18	Adequate garbage bins will be provided at site facilities for food scraps, cigarette butts and other waste.		Construction	General Superintendent	Best Practice	

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Reference	Evidence
Management of Waste - Spoil						
W19	Unsuitable material excavated from the on-site quarries shall be disposed in designated on site areas where possible	N/A	Construction	Environmental Site Representative General Superintendent	Technical specification CI 9.9	Spoil Management records
W20	Material requiring off-site disposal will be assessed prior to off site disposal. Sampling and waste classification data will be retained.	N/A	Construction	Environmental Site Representative General Superintendent	Technical specification Section 9.9	Spoil Management records
W21	Fuels and liquid waste will be stored in appropriate containers in bunded areas >50m from the stream line. Bunded areas will have the capacity to hold 110 per cent of the liquid waste volume for bulk storage or 120 per cent of the volume of the largest container for smaller packaged storage	N/A	Construction	Environmental Site Representative General Superintendent	Technical specification Section 1.4.1	Site plans
W22	Contaminated wash water and rain water from bunded areas shall be captured and pumped into waste holding tanks that shall be removed off-site and disposed of at an appropriate waste disposal facility.	N/A	Construction	Environmental Site Representative General Superintendent	Technical specification Section 1.4.1	Site plans

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Reference	Evidence
Management of Waste - Hazardous or special waste						
W23	Ensure hazardous substances, dangerous goods and hazardous materials (e.g. fuels, oils, chemicals, solvents, pesticides and fertilisers) are not stored on-site except for small volumes stored within a well-ventilated, purpose built structure with roof cover. The store must have a concrete sealed or equivalent impervious floor with bunding, isolated drainage, signage and security fencing. Position hazardous substances and dangerous goods storage locations away from high traffic areas, pedestrian zones and environmentally sensitive areas such as waterways or natural habitats.	N/A	Construction	General Superintendent	Best practice	Site plans
W24	The discovery of previously unexpected contaminated land or asbestos be excavated or otherwise will be managed and disposed of in accordance with an Unexpected Finds Procedure located in the SWMP. Any contaminated waste will be handled, separated, contained, managed and disposed of to prevent migration and further contamination.	Unexpected Contaminated Lands Management Procedure	Construction	Environmental Site Representative General Superintendent		Unexpected Contaminated Lands and Asbestos Management Procedure

ID	Measure/Requirement	Resources needed	When to implement	Responsibility	Reference	Evidence
W25	If hazardous waste is to be handled, e.g. healthcare facilities, safe and secure collection, storage and disposal facilities will be available.	Hazardous waste management facilities	Construction	Environmental Site Representative	Best practice	
Resource Consumption – General						
W26	<p>Resource recovery will be applied to the management of construction waste and will include:</p> <ul style="list-style-type: none"> <li>Recovery of resources for reuse-reusable materials generated by the project will be segregated for reuse on site, or off site where possible, including the reuse of the major waste streams (VENM)</li> <li>Recovery of resources for recycling - recyclable resources (such as metals, plastics and other recyclable materials) generated during construction and demolition</li> <li>Resources will be segregated for recycling and sent to an appropriate recycling facility for processing</li> </ul> <p>Recovery of resources for reprocessing - cleared vegetation will be mulched or chipped on-site and used for landscaping, in the absence of a higher beneficial use being identified.</p>	N/A	Construction	Environmental Site Representative General Superintendent	REMM RW5 SEARs – Waste 16.1	Appendix A - Waste and Spoil Management Tracking Register records Waste Avoidance and Recovery Report



## **7 Compliance management**

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### **7.1 Roles and responsibilities**

The Haslin Constructions Project Team's organisational structure and overall roles and responsibilities are outlined in Section 3.3 of the CEMP. Specific responsibilities for the implementation of environmental controls are detailed in Section 6 of this Plan.

### **7.2 Training**

All employees, contractors and utility staff working on site will undergo site induction training relating to waste and resource management issues.

Targeted training in the form of toolbox talks or specific training will also be provided to personnel with a key role in waste and resource management.

Further details regarding staff induction and training are outlined in Section 3.5 of the CEMP.

### **7.3 Monitoring and inspection**

Monitoring to ensure compliance with this plan will consist of regular inspections undertaken in accordance with section 3.8.1 and 3.8.3 of the CEMP.

Additional requirements and responsibilities in relation to inspections are documented in Section 3.9.1 and Section 3.9.2 of the CEMP.

All construction personnel will be encouraged to report suggestions for how the project can minimise the generation of waste and better manage what waste does get generated.

It is the Environmental Site Representative or their delegate that is responsible for ensuring the scheduled monitoring is undertaken in accordance with this WMP.

### **7.4 Auditing**

Audits (both internal and external) will be undertaken to assess the effectiveness of environmental controls, compliance with this plan, Conditions of Development Consent and other relevant approvals, licenses and guidelines.

Audit requirements are detailed in Section 3.9.3 of the CEMP.

## **8 Review and improvement**

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### **8.1 Continuous improvement**

Continuous improvement of this Plan will be achieved by the ongoing evaluation of environmental management performance against environmental policies, objectives and targets for the purpose of identifying opportunities for improvement.

The continuous improvement process will be designed to:

- Identify areas of opportunity for improvement of environmental management and performance.
- Determine the cause or causes of non-conformances and deficiencies.
- Develop and implement a plan of corrective and preventative action to address any non-conformances and deficiencies.
- Verify the effectiveness of the corrective and preventative actions.
- Document any changes in procedures resulting from process improvement.
- Make comparisons with objectives and targets.

### **8.2 WMP update and amendment**

The processes described in Section 3.9 to Section 3.14 of the CEMP may result in the need to update or revise this Plan. This will occur as needed.

Only the Environmental Site Representative, or delegate, has the authority to change any of the environmental management documentation.

A copy of the updated plan and changes will be distributed to all relevant stakeholders in accordance with the approved document control procedure – refer to Section 3.12 of the CEMP.

## Appendix A - Unexpected Hazardous Materials Find

### Introduction

There is the potential for previously unidentified contaminants to be uncovered during construction of the Eurobodalla Southern Water Supply Storage Project. This procedure describes how to manage unexpected encounters of land that contains (or is suspected of containing) substances that are actually (or potentially) hazardous to health or the environment.

Unexpected finds may include the discovery of hazardous materials, such as:

- Hydrocarbons
- Polycyclic aromatic hydrocarbons
- Polychlorinated biphenyls (PCBs) and pesticides
- Heavy metals such as lead, arsenic, cadmium and mercury
- Asbestos containing material (ACM)
- Biologically pathogenic materials and waste

This procedure has been prepared to meet the requirements of the EIS, the Response to Submissions and contractual requirements.

This procedure will be used for all construction activities that occur on site.

### Training

All personnel on site, including employees, contractors and sub-contractors, will be trained and made aware of the requirements of this procedure in accordance with the CEMP/SWMP during the Project induction and in toolbox talks where relevant. Key personnel will be trained in the identification and management procedures of unexpected potentially contaminated or asbestos containing materials.

### Reporting

A record of the unexpected finds will be maintained by Haslin Constructions and will include the following details:

- Date, time and location of unexpected find, including depth,
- Details regarding assessment by Environmental Site Representative (and advice from suitably qualified contamination specialist),
- Monitoring results,
- Neutralisation and treatment processes used,
- Time of excavation, reuse or disposal of material,
- Volume of material excavated, and
- Destination of treated material (i.e. offsite or onsite disposal), including a record on a site plan.

If treated material is to be disposed of offsite, material tracking would be undertaken in accordance with the Protection of the Environment Operations Act 1997. Transport and disposal undertaken in accordance with the Protection of the Environment Operations (Waste)

Regulation 2005 and the Waste Classification Guidelines (EPA 2014). All contractors transporting waste from the site must be licenced to transport the classification of waste and must only dispose of the waste at a facility that is licenced to accept the waste classification.

### **Personal Protective Equipment (PPE)**

Prior to any contamination investigation or management, appropriate personal protective equipment (PPE) is to be worn as per the relevant Material Safety Data Sheet(s). This may include, but not be limited to:

- Eye goggles
- Face mask
- Rubber boots
- Rubber gloves
- Appropriate work clothes (i.e. long sleeve shirt/pants and steel capped boots).

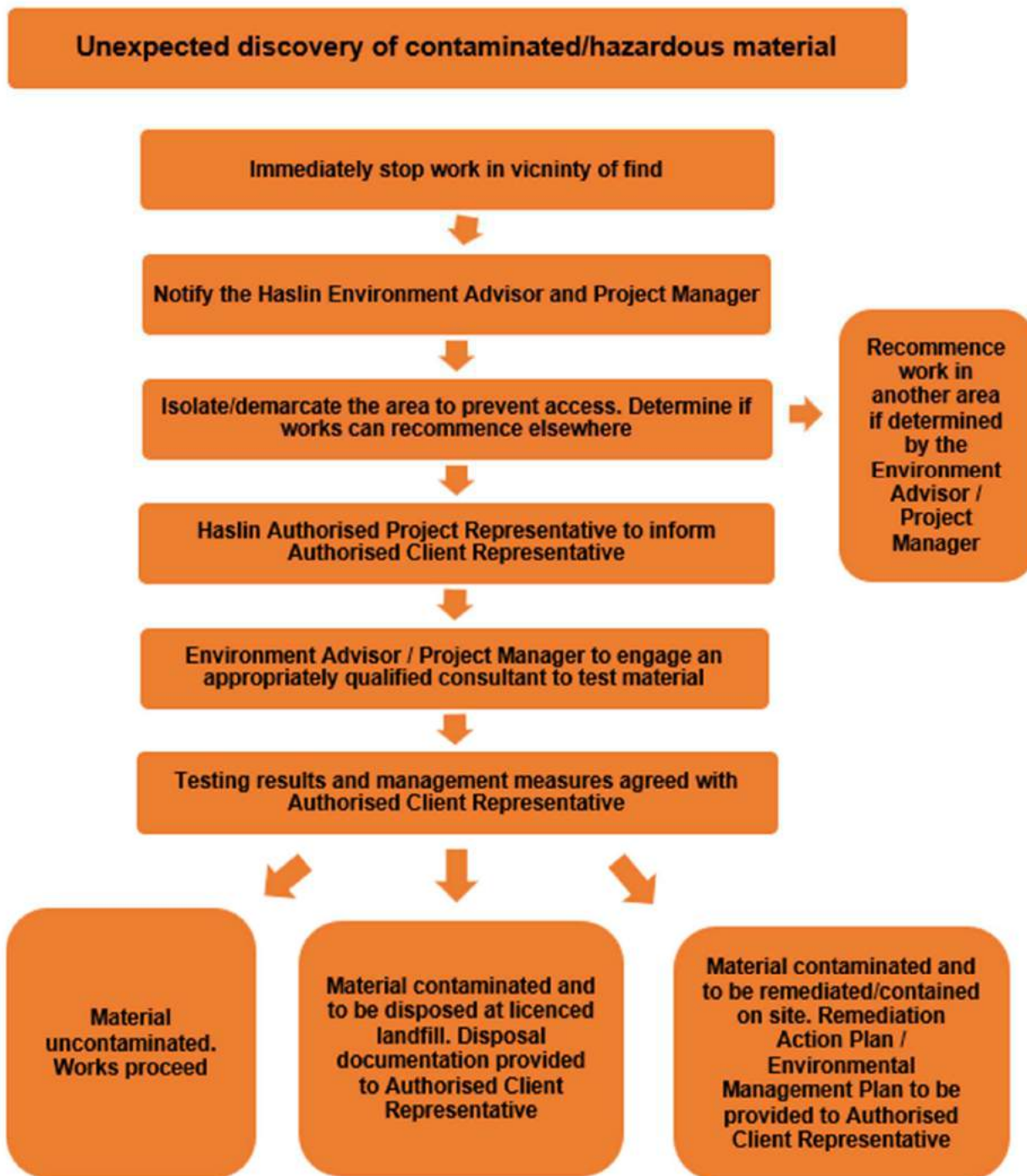
### **Notification and Reporting**

If Haslin Constructions uncover any suspected or potential contamination exposed during construction activities the General Superintendent will notify Eurobodalla Shire Council accordance with the requirements of Section 3.14 of the ESS Storage Technical Specifications.

Records containing details of the unexpected finds will be maintained by Haslin Constructions and stored appropriately.

If material is to be disposed of offsite, material tracking would be undertaken in accordance with the Protection of the Environment Operations Act 1997 and the measures outlined in the Waste Management Plan.

Notification and reporting to authorities such as the EPA will be undertaken in accordance with the NSW EPA Guidelines on the Duty to Report Contamination (2009) and CLM Act 1997 where relevant.



## Appendix B – Waste Disposal Locations

Council operates two waste management facilities at Surf Beach and Brou, and a transfer station at Moruya.

### **Surf Beach waste management facility**

311 George Bass Drive at the roundabout at the Surf Beach bypass.

Phone: 4471 2462

Opening hours:

- Monday to Friday: 7am to 4.45pm
- Saturday, Sunday and public holidays: 8am to 3.45pm
- Closed: Christmas Day, New Years Day, Good Friday and Easter Sunday
- Contactless payment preferred.

### **Moruya Transfer Station**

21 Yarragee Road, Moruya.

Phone: 4474 5924

Opening hours:

- Monday, Thursday, Friday, Saturday, Sunday and public holidays: 8am to 3.45pm
- Closed: Tuesdays, Wednesdays, Christmas Day, New Years Day, Good Friday and Easter Sunday
- Contactless payment preferred.

### **Brou Waste Management Facility**

1 Brou Lake Road, Dalmeny (north of Dalmeny, off Princes Highway).

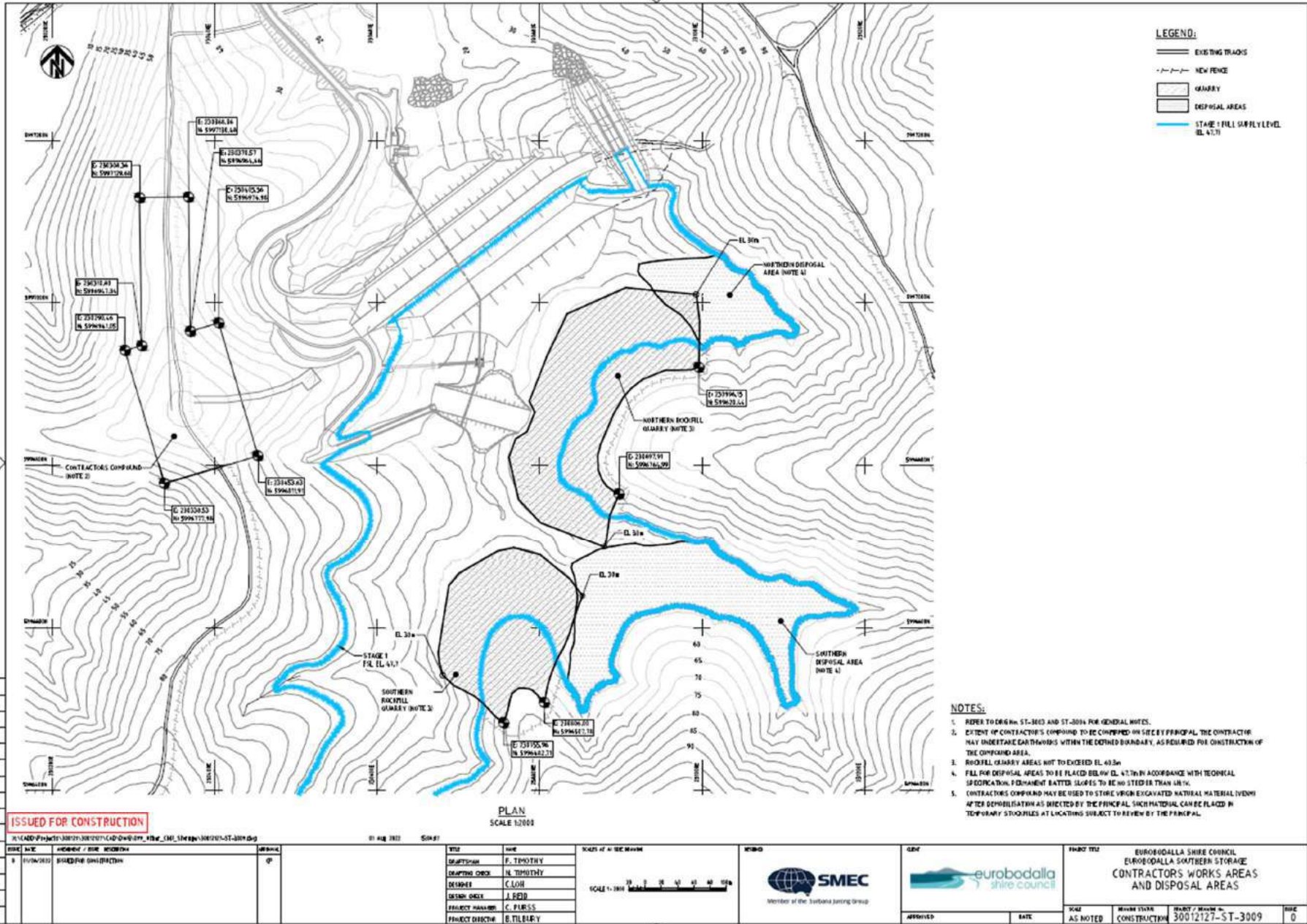
Phone: 4476 8310

Opening hours:

- Monday to Friday: 7am to 4.45pm
- Saturday, Sunday and public holidays: 8am to 3.45pm
- Closed: Christmas Day, New Years Day, Good Friday and Easter Sunday
- Contactless payment preferred.

## **Appendix C - Quarry Rehabilitation Areas**





## **Appendix D - Hazardous Materials Management Plan**

# Hazardous Materials Management Plan

## 1. PURPOSE

The purpose of this Hazardous Materials Management Plan is to identify all hazardous materials, including goods and/or substances that will be used during the Eurobodalla Southern Water Supply Storage project so as to prevent adverse environmental impacts or harm to people due to handling, use, storing and transporting of such substances.

The main aim of this Plan is to ensure hazardous materials are handled, used, stored, transported and removed from the site in an appropriate manner that minimizes environmental impact and risk of harm to people.

## 2. SCOPE

This Hazardous Materials Management Plan shall be applied to all product, chemical or material with hazardous properties brought to by Haslin Constructions or any of its Subcontractors during the construction of the Eurobodalla Southern Water Supply Storage project.

## 3. HAZARDOUS SUBSTANCES / MATERIALS

The Environmental Impact Statement (EIS) noted that there are no registered sites on the contaminated sites register within the construction footprint. As such the conclusion in the EIS was that there was a low potential to encounter areas of contamination during construction. Nonetheless an Unexpected Hazardous Materials Find procedure has been developed and is included in Appendix A of the Waste Management Plan.

The construction of the project would require the use and storage of hazardous substances and materials. The table below identifies the expected hazardous substances and materials required for the Eurobodalla Southern Water Supply Storage project.

**Table 1.** Expected hazardous materials for the Eurobodalla Southern Water Supply Storage project

Material Name	Location on site	Expected volume	Comment
Acetylene	Main site compound	2 x 50 Litre Bottles	Only required two large bottles at time in short term for site welding for earthing and metal works. To be stored in main site compound in Hazardous Goods Container
Diesel fuel	Main site compound	500L	Plant and other major items will be serviced by a fuel truck directly into each item. Only small amount fuel pod (300 Litres) is to be onsite for filling up small items
Epoxy resins	Main site compound	50L	Only small amounts to be store at any time. To be stored in main site compound in Hazardous Goods Container
Glues	Main site compound	20 – 40 tubes	To be stored in main site compound in Hazardous Goods Container
Grease	Main site compound	20-40 tubes	To be stored in original containers in hazardous goods container
Hydraulic oil	Main site compound	50-100L	To be stored in hazardous goods container

Pesticides	Main site compound	40L	Only small amounts to be kept on site for spot-weed spraying purposes. To be stored in Hazardous Goods Container
Solvents / paints / thinners	Main site compound	80L	Only small amounts to be store at any time. To be stored in main site compound in Hazardous Goods Container

The information in the above table is based on an understanding of the project at a point in time. Haslin Constructions will keep an up to date Hazardous Chemicals Register and Risk Assessment that identifies the hazardous substances on the project site, safety data sheet validity, hazards / first aid comments.

#### **4. POTENTIAL IMPACTS**

The potential impacts from the improper use and storage of hazardous materials and substances includes the following:

- Increased waste from improper storage and use of materials.
- Spills/leaks or release of hazardous emissions from incorrect storage
- Contaminated or hazardous waste not being correctly disposed.
- Release of contaminants from construction plant and equipment into the environment.
- Health impact to workers on site from exposure to incorrectly used/stored materials or substances.
- Movement of contaminated sediment from spills into waterways.

#### **5. KEY MANAGEMENT STRATEGIES**

The key management strategies applicable to the identified potential impacts are the following:

- Competence training and awareness for staff using hazardous materials and substances on site
- Hazardous materials register
- Appropriate storage, labelling and disposal of materials
- Spill response plan

#### **Competence training and awareness**

All workers with potential for exposure to hazardous materials, involved in the use, storing, transport and handling of any hazardous material present on the Eurobodalla Southern Water Supply project will be trained on the identification and use of such material, risks and hazards and, especially, on what to do in case of abnormal conditions or emergency situation of any kind.

#### **Hazardous materials register**

A hazardous material register will keep details of all hazardous materials on site. The register will consist of a list of all hazardous materials and chemicals in the site, reference to where it is stored and used, reference to its Safety Data Sheet and information on first aid considerations. The register will be available to the first aid officer and other team members at all times.

#### **Appropriate storage, labelling and disposal**

The storage, handling and use of dangerous goods and hazardous substances will be in accordance with the Work Health Safety Act 2011, the Storage and Handling of Dangerous Goods Code of Practice (WorkCover NSW 2005) and all relevant legislation and Australian standards.

All hazardous materials will be stored in a bunded Hazardous Goods Container at least 50m away from the unnamed creek. The container will be in a sound condition, safely contain the material and be compatible with the material. Prior to storing any hazardous material on site, the safety data sheet will be reviewed to consider the compatibility of the product with other materials/substances.

Handling of all hazardous materials will be carried out by properly trained workers and supervisors in accordance with the Work Health Safety Act 2011, the Storage and Handling of Dangerous Goods Code of Practice (WorkCover NSW 2005) and all relevant legislation and Australian standards. No handling will be allowed prior to undertaking the appropriate training or induction session. All manufacturers' recommendations, directions for use and safe practices shall be followed according to provided information. No material will be used for a different purpose than the one for which it was designed and manufactured.

All approved hazardous materials entering the site will be identified on the container or package or any containment device in which the product is presented by means of an appropriate label. Minimum information that shall be contained in such a label is:

- Product name and chemical composition
- Risk phrase
- First aid basics
- Reference to the Safety Data Sheet
- Expiry date (if applicable)

Personal protective equipment identified on the Safety Data Sheet will be worn at all times by workers using and handling the hazardous materials.

### **Spill response plan**

Any spills of hazardous materials are to be managed in accordance with the applicable Safety Data Sheet and Environmental Non-Compliance and Incident Procedure (Appendix A4 of the CEMP).

