Department of Planning, Housing and Infrastructure

Our ref: SSI-9687-PA-397

Christina McInally
Senior Environmental Advisor – Post Approvals
Snowy Hydro Limited
01/05/26

Subject: Snowy 2.0 Main Works - Talbingo Rock Platform Management Plan

Dear Mrs McInally,

I refer to the revised Talbingo Rock Platform Management Plan submitted in accordance with Condition 31, Schedule 3 of the infrastructure approval for Snowy 2.0 Main Works (SSI-9687) with a minor amendment to the approved methodology. I also acknowledge your response to the Department's review comments and request for additional information.

I note, in accordance with Condition 4(j), Schedule 3, Snowy Hydro Limited received approval on 10 February 2026 (PA-364) to conduct the Stage 1 Trial Emplacement of tunnel boring machine (TBM) material below full supply level in the Talbingo Reservoir for the temporary Talbingo Rock Platform works. The Talbingo Rock Platform Management Plan detailing the proposed works was also approved by the Planning Secretary on 10 February 2026 (PA-364) as an attachment to the existing Water Management Plan.

I note you have prepared the revised Talbingo Rock Platform Management Plan in consultation with the Environment Protection Authority (EPA) and National Parks and Wildlife Service (NPWS) with no further comments received from these agencies.

Following careful review, as nominee of the Planning Secretary, I approve the amended methodology for the Stage 1 Trial and confirm the Talbingo Rock Platform Management Plan (Rev I dated 8 April 2026) meets the requirements of the relevant conditions in approval SSI-9687.

As was detailed in the approval letter for the previous Talbingo Rock Platform Management Plan, you are required to submit a site-wide water balance incorporating spoil rinsing activities and a Trial Validation Report addressing Stage 1 outcomes. This information is to be submitted to the Department for review and approval prior to commencing the Stage 2 full-scale emplacement works.

You are reminded that if there are any inconsistencies between the Talbingo Rock Platform Management Plan and the conditions of approval, the conditions prevail. Please ensure you make the document publicly available on the project website at the earliest convenience.

If you wish to discuss the matter further, please contact Katie Weekes on 4927 3223.

Yours sincerely,

Nicole Brewer
Director Energy Assessments
As nominee of the Planning Secretary

future generation

webuild | clough | lane

MANAGEMENT PLAN

SNOWY 2.0 MAIN WORKS – TALBINGO ROCK PLATFORM MANAGEMENT PLAN

S2-FGJV-ENV-PLN-0392

REV I

APRIL 2026

ABSTRACT

The key objective of this Plan is to detail management measures and inform site procedures for implementation so that temporary subaqueous emplacement impacts are minimised and within the scope permitted by the Infrastructure Approval.

Revision Record

Rev.	Date	Reason for Issue	Responsible	Accountable	Endorsed
I	08/04/2026	Updated to address DPHI comments	C. Pedraza	E. Porter	F. Lazzarin D. Drummond

Document Verification

RACIE Record

R esponsible:	Name: Carolina Pedraza Job Title: Environmental Approvals Coordinator Signed: Signed by: Carolina 30352BF52C9B441... Date: 16 April 2026
A ccountable:	Name: Ellen Porter Job Title: Environmental Manager Signed: Signed by: Porter 4EDE3A8C971F416... Date: 16 April 2026
C onsulted:	See distribution list on Page 3.
I nformed:	See distribution list on Page 3.
E ndorsed:	Name: Fabrizio Lazzarin Job Title: Project Director Signed: Signed by: Kevin Dunning Kevin Dunning 263644C016BE40F..pp Date: 17 April 2026 Name: David Drummond Job Title: QHSE Director Signed: Signed by: Drue Drummond 5374F7DA03A54C2... Date: 16 April 2026

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Revision Tracking

Rev.	Date	Description of Revision
A	06.10.2024	Initial draft for FGJV review
B	20.03.2025	Issued to address agency and SHL comments
C	03.05.2025	Issued to address SHL comments
D	12.09.2025	Issued to address SHL and Agencies comments
E	22.10.2025	Issued to address SHL, EPA and NPWS comments
F	05.01.2026	Issued to address SHL comments
G	14.01.2026	Issued to address DPHI comments
H	10.03.2026	Updated trial methodology
I	08/04/2026	Updated to address DPHI comments

CONTENTS

TABLE OF TABLES

TABLE OF FIGURES

ABBREVIATIONS AND DEFINITIONS

Acronym	Definition
CoA	Conditions of Approval
Construction envelope	The envelope within which the disturbance area of the development may be located
CPESC	Certified Professional in Erosion and Sediment Control
CSSI	Critical State significant infrastructure
D&B	Drill & Blast
DEC	Department of Environment and Conservation (now Department of Planning, Housing and Infrastructure)
DECC	Department of Environment and Climate Change (now Department of Planning, Housing and Infrastructure)
Disturbance area	The area within the construction envelope where development may be carried out; the precise location of the disturbance area will be fixed within the construction envelope following final design
DGV	Default Guideline Value
DPHI	Department of Planning, Housing and Infrastructure
DPIE	NSW Department of Planning, Industry and Environment (now Department of Planning, Housing and Infrastructure)
EHC Act	*Environmentally Hazardous Chemicals Act 1985*
EIS	Environmental Impact Statement
Main Works EIS	*Snowy 2.0 Main Works - Environmental Impact Statement*
EMS	Environmental Management Strategy
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPA	NSW Environment Protection Authority
EPL	Environment Protection Licence
Exploratory Works	The development of an exploratory tunnel and associated infrastructure described in the Environmental Impact Statement for the Snowy 2.0 Exploratory Works (CSSI 9208) dated July 2018, and modified by the: • Submissions Report dated October 2018 and additional information provided to the Department on 17 October 2018, 19 November 2018 and 23 January 2019; • Modification Report dated 6 June 2019 and associated Submissions Report dated 2 September 2019 and amendment letter date 4 October 2019; and • Modification Report dated 17 October 2019 and associated Submissions Report dated 10 January 2020
FGJV	Future Generation Joint Venture
Future Generation PMS	Project Management System
KFH	Key Fish Habitat
Main Works	The development of an underground power station and associated infrastructure described in the Environmental Impact Statement for the Snowy 2.0 Main Works (CSSI 9687) dated September 2019, and modified by the: • Preferred Infrastructure Report and Response to Submissions – Snowy 2.0 Main Works, dated February 2020; and • Additional information provided to the Department by EMM on 24 March 2020 and 7 April 2020

Acronym	Definition
MB	Monitoring Buoy
NPWSN	National Park and Wildlife Service
POEO Act	*Protection of the Environment Operations Act 1997*
Project	Snowy 2.0 Main Works
Project area	The project area is the broader region within which Snowy 2.0 will be built and operated, and the extent within which direct impacts from Snowy 2.0 Main Works are anticipated. The project area does not represent a footprint for the construction works, but rather indicates an area that was investigated during environmental assessments.
REMMs	Revised environmental management measures
Rock Forest site	The development on the Rock Forest property, including the Rock Forest emplacement area, logistics laydown area and ancillary infrastructure including access roads.
SHL	Snowy Hydro Limited
Submissions Report or RTS	*Snowy 2.0 Main Works Response to Submission*
SWMP	Surface Water Management Plan
SSI	State Significant Infrastructure under EP&A Act
Talbingo Reservoir site	The development in and around the Talbingo Reservoir, including the Ravine Bay emplacement area; development at Middle Bay, including the water intake and associated structures, barge launch ramp, and construction facilities; and ancillary infrastructure, including access roads and utilities.
Tantangara Reservoir site	The development in and around the Tantangara Reservoir, including the Tantangara emplacement area; water intake and associated infrastructure; barge launch infrastructure; construction and laydown facilities, including workers' camp; fish screens; and ancillary infrastructure, including access roads and utilities.
TBM	Tunnel Boring Machine
TRPMP	Talbingo Rock Platform Management Plan
WQT	Water Quality Trigger

1. INTRODUCTION

1.1. Project Description

1.1.1. Overview

Snowy Hydro Limited (SHL) is constructing a pumped hydro-electric expansion of the Snowy Mountains Hydro-electric Scheme (Snowy Scheme), called Snowy 2.0. Snowy 2.0 will be built by the delivery of two projects: Exploratory Works and Snowy 2.0 Main Works, which commenced in May 2020.

Snowy 2.0 is a pumped hydro-electric project that will link the existing Tantangara and Talbingo reservoirs through a series of new underground tunnels and a hydro-electric power station. Most of the project's facilities will be built underground, with approximately 27 kilometres of concrete-lined tunnels constructed to link the two reservoirs and a further 20 kilometres of tunnels required to support the facility. Intake and outlet structures will be built at both Tantangara and Talbingo Reservoirs.

Snowy 2.0 will increase the generation capacity of the Snowy Scheme by an additional 2,200 MW, and at full capacity will provide approximately 350,000 MWh of large-scale energy storage to the National Electricity Market (NEM). This will be enough to ensure the stability and reliability of the NEM, even during prolonged periods of adverse weather conditions.

Webuild, Clough, and Lane have formed the Future Generation Joint Venture (FGJV) and have been engaged to deliver Stage 2 of Exploratory Works and Snowy 2.0 Main Works.

As part of the Snowy 2.0 main works, the Talbingo intake and access roads to the reservoir emplacement area are determined as critical infrastructure components of Snowy Hydro scheme. The intake is comprised of several infrastructure components in and around the Talbingo Reservoir, including the Talbingo emplacement area (Ravine Bay); submerged water intake and other infrastructure such as the entrance to the tailrace tunnel via adit portal. It will also consist of associated infrastructure critical to the project construction and operation such as, sediment basins; construction and laydowns facilities, including parking, access roads and utilities. The provision of this infrastructure will enable the intake to be constructed safely and maintain access across the full operating range of Talbingo Reservoir.

1.2. Project Approval

On 7 March 2018 the NSW Minister for Planning declared Snowy 2.0 to be State significant infrastructure (SSI) and critical State significant infrastructure (CSSI) under the Environmental Planning and Assessment Act 1979 (EP&A Act, 1979) on the basis that it is critical to the State for environmental, economic or social reasons.

An environmental impact statement for the first stage of Snowy 2.0, the Exploratory Works for Snowy 2.0 (Exploratory Work EIS) was submitted to the then Department of Planning and Environment in July 2018 and publicly exhibited between 23 July 2018 and 20 August 2018. Approval for the first stage of Snowy 2.0 was granted for Exploratory Works by the Minister for Planning on 7 February 2019. The purpose of Exploratory Works is primarily to gain a greater understanding of the underground geological conditions at the new power station. In accordance with section 5.25 of the EP&A Act 1979, the infrastructure approval for the Exploratory Works was modified on 2 December 2019 and on 27 March 2020.

An environmental impact statement for the second stage of Snowy 2.0, the Main Works for Snowy 2.0 (Main Work EIS) was submitted to Department of Planning, Industry and Environment (DPIE) in September 2019 and was publicly exhibited between 26 September 2019 and 7 November 2019. A total of 222 submissions were received during the public exhibition period, including 10 from government agencies, 30 from special interest groups and 182 from the general public. In February 2020, the response to submissions (RTS or Submissions Report) was issued to DPIE to address the public and agency submissions (Snowy 2.0 Main Works - Preferred Infrastructure Report and Response to Submissions, February 2020).

Following consideration of the Main Works EIS and RTS, approval was granted by the Minister for Planning and Public Spaces on 20 May 2020, through issue of Infrastructure Approval SSI 9687.

Further to the Infrastructure Approval, the Main Works RTS includes revised environmental management measures (REMMs) within Appendix C which will also be implemented for the project.

On 27 January 2022, a modification to SSI-9687 (SSI-9687-Mod-1) was granted under Section 2.22 and clause 20 of Schedule 1 of the EP&A Act, 1979. The scope of the modification included horizontal directional drilling (HDD) to establish water and electricity services between the Lobs Hole and Marica areas of the Project.

On 29 November 2023, a second modification to SSI-9687 (SSI-9687-MOD-2) was granted under Section 5.25 of the EP&A Act 1979, approving the undertaking of sinkhole rectification works near the Tantangara Adit Portal, inclusive of geotechnical investigations and remediation works.

A subsequent planning application (SSI-9687-MOD-3) was approved on 16 December 2024 to permit the construction of an additional adit and launching of a fourth tunnel boring machine at Marica West to facilitate excavation of a section of the headrace tunnel (HRT) through the long plain fault zone (LPFZ). The LPFZ is the most geologically complex section of the HRT and represented a significant risk to the overall project completion date. The application was approved in accordance with Section 5.25 of the EP&A Act, 1979.

In addition to the State approval, a referral (EPBC 2018/8322) was prepared and lodged with the Commonwealth Department of Agriculture, Water and the Environment (DAWE) under the Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act, 1999). The Commonwealth Minister’s delegate determined on 5 December 2018 that Snowy 2.0 Main Works is a “controlled action” under the EPBC Act, 1999. The EPBC Act referral decision determined that the project will be assessed by accredited assessment under Part 5, Division 5.2 of the EP&A Act, 1979.

1.3. Disturbance area

A key refinement following public exhibition of the Main Works EIS was a change to and clarification of disturbance area terminology. The revised disturbance area terminology as defined by the Infrastructure Approval and Submissions Report is outlined in Table 1-1.

Table 1-1: Disturbance area terminology

Term	Definition	Reasoning
Project area	The project area is the broader region within which Snowy 2.0 will be built and operated, and the extent within which direct impacts from Snowy 2.0 Main Works are anticipated.	The project area does not represent a footprint for the construction works but rather indicates an area that was investigated during environmental assessments.
Construction envelope	The envelope within which the disturbance area of the development may be located.	The Talbingo intake design is within the Construction envelope area. Site controls, such as rope and no-go zone demarcation, will be placed before work commences not to exceed the limits defined by the construction envelope.
Disturbance area	The disturbance area for the proposed works in this management plan is within the Construction envelope.	

1.4. Environmental Management System

The overall environmental management system for the project is described in the Environmental Management Strategy (EMS). The EMS forms part of the Project Management System (Future Generation PMS) and will include any requirements specified in the contract documents, where appropriate. All Future Generation PMS procedures will support, interface or directly relate to the development and execution of the plan.

This Talbingo Rock Platform Management Plan (TRPMP or plan) forms part of FGJV's environmental management framework as described in the EMS. This plan aims to transfer the relevant requirements of the Approval documents into a management plan which can be practically applied on the project site.

This document has been prepared for construction of the Snowy 2.0 Main Works project. It does not address the operational phase of the project.

1.5. Purpose and Objectives of this Plan

The purpose of this plan is to address the construction environmental management requirements detailed in:

- the Infrastructure Approval (SSI 9687) issued for Snowy 2.0 Main Works on 20 May 2020
- the Infrastructure Approval (SSI 9208) issued for Snowy 2.0 Exploratory Works on 07 February 2019;
- the Main Works Snowy 2.0 - Environmental Impact Statement;
- the Main Works Snowy 2.0 – Modification 1 Assessment Report;
- the Main Works Snowy 2.0 – Modification 2 Assessment Report
- the Main Works Snowy 2.0 – Modification 3 Assessment Report; and
- the revised environmental management measures (REMMs) within the Main Works RTS;
- the Exploratory Works for Snowy 2.0 - Environmental Impact Statement;
- the Exploratory Works for Snowy 2.0 – Modification 1 Assessment Report;
- the Exploratory Works for Snowy 2.0 – Modification 2 Assessment Report; and

- the REMMs within the Exploratory Works RTS.

The key objective of the TRPMP is to ensure that temporary subaqueous emplacement related impacts are minimised and within the scope permitted by the conditions of approval. To achieve this objective FGJV will:

- ensure appropriate measures are implemented during construction to minimise, and avoid or manage temporary subaqueous emplacement related impacts;
- ensure appropriate measures are implemented to address the revised environmental management measures;
- ensure appropriate measures are implemented to comply with all relevant legislation and other requirements as described in Section 2.1 of this plan.

This Management Plan commits to a staged approach for the proposed works. Development will proceed as follows:

- Stage 1 (Trial Phase): An initial trial emplacement of 5,000 m³.
- Stage 2 (Full-Scale Emplacement): Implementation of the remaining scope.

Progression of the Stage 2 is subject to the outcomes of the Stage 1 monitoring program. In accordance with the DPHI approval letter dated 10/02/2026, the following documents must be submitted to the Department for review and approval prior to the commencement of full-scale Stage 2 emplacement works:

- A Trial Validation Report addressing the findings and outcomes of the Stage 1.
- An update site-wide water balance that incorporates spoil rinsing activities.

This Management Plan will be updated as necessary to reflect these findings and any additional regulatory requirements to ensure compliance before full-scale operations begin.

1.6. Context

Talbingo Intake Stage 3 covers the removal of the existing rock plug to form the permanent intake approach channel.

The channel is approximately 155m long and features a constant slope of 10% from the mouth into the diffuser. The channel is approximately 120 m wide at the mouth at a design elevation of 531 m AHD, tapering down to approximately 40.8m at the intake diffuser at an elevation of 515 m AHD.

Immediately prior to the diffuser at an offset of approximately 20m is a sediment trap which represents the deepest part of the approach channel at a design elevation of 512 m AHD.

Figure 1-1 below shows the general layout of the Talbingo Intake approach channel.

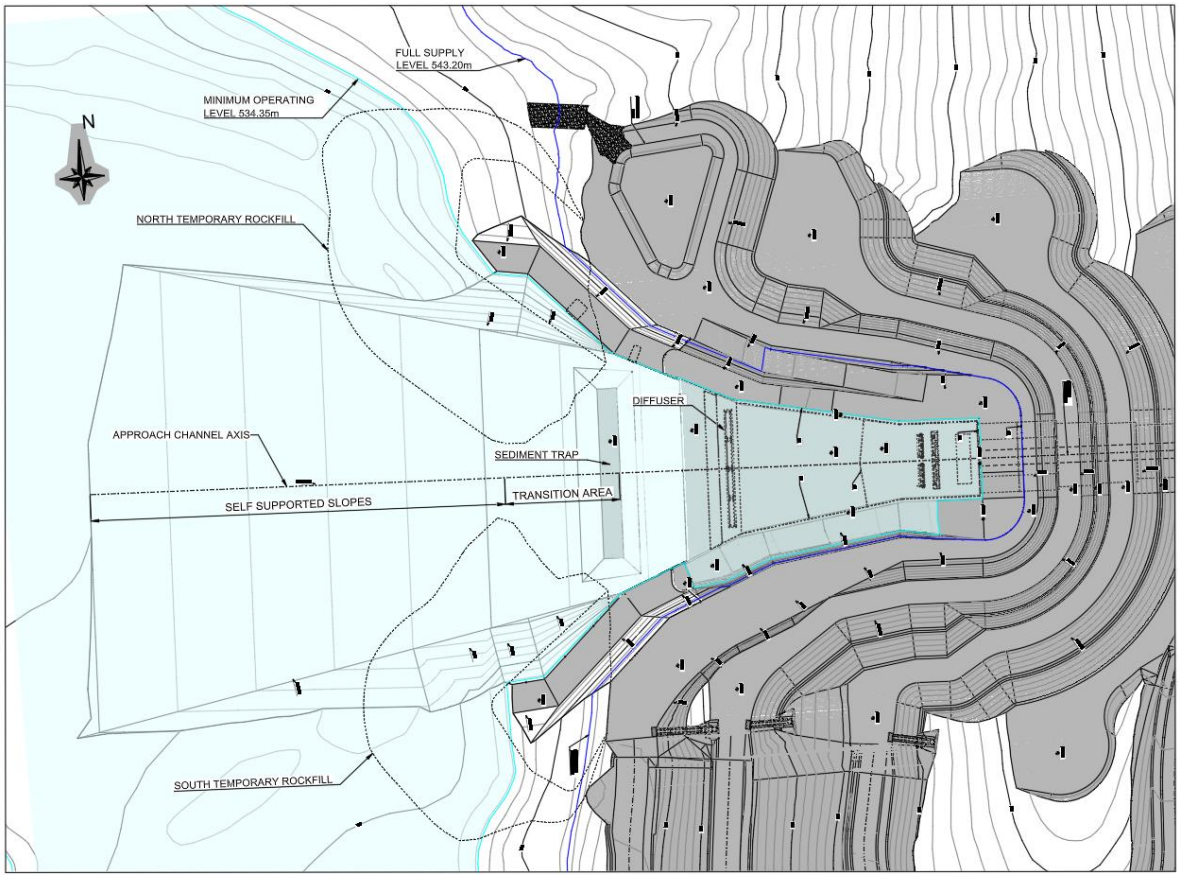


Figure 1-1: Talbingo Intake layout

The transition area, approx. 30m long, is required to shift from the vertical slopes and the self-supported slopes. The design has been optimised to minimise the length of supported slopes, thereby reducing the overall quantity of support elements and associated works required.

To ensure the stability and integrity of the channel's excavated profile, the vertical and transition slopes of the channel will be reinforced through the installation of micropiles, whilst the self-supported slopes, designed with an inclination which guarantees their stability, will require no supplementary support measures.

In order to get an extended dry work area to execute the installation of micro piles to support the vertical and transition slopes from elevation 546 m AHD and other activities related to the Stage 3 excavation of the approach channel, two temporary rockfill embankments will be executed on the north and south zones of the approach channel.

The two rockfill platforms are designed to facilitate safe, dry-condition access for drilling and pile installation operations. Safety bunds will be constructed along the platform perimeters.

This Management Plan covers the construction works for the two temporary rockfill embankments. They will be executed in dry conditions from the existing rock plug, using land-based equipment.

The EIS included minimal detail regarding how the intake works would be undertaken and therefore the plans required to be updated for these work fronts only included the Water Management Plan. To be conservative, and to ensure adequate control measures FGJV have prepared a site-specific management plan specific for the Talbingo intake Rock platform works. The temporary placement of material in the reservoir to facilitate the intake works will also be managed in accordance with the controls as laid out in the following approved management plans

- Spoil Management Plan (S2-FGJV-ENV-PLN-0019).

- Water Management Plan (S2-FGJV-ENV-PLN-0010).
- Surface Water Management Plan (S2-FGJV-ENV-PLN-0011).
- Aquatic Habitat Management Plan (S2-FGJV-ENV-PLN-0009).
- Nitrogen Management Plan (S2-FGJV-ENV-PLN-0367)

1.7. Consultation

On 6 October 2024 the plan was first issued to stakeholder agencies for review and comment. Comments from consultation will be incorporated into this plan where appropriate. Response to the comments will be provided back to the stakeholder agencies. Consultation is summarised in Table 1-2.

Table 1-2: Consultation Undertaken for this Plan

Date	Consultation	Outcomes
4 July 2024	EPA, NPWS, DPHI, DCCEEW	Initial meeting with agency representatives to discuss timelines, proposed works and management strategies to be employed.
13 August 2024	DPHI	On site meeting at Talbingo intake to view the proposed works
13 September 2024	EPA, NPWS, DPHI, DCCEEW	Meeting with agency representative to discuss Management Plan
March 2025	EPA, NPWS, DPHI, DCCEEW	Revision B of the plan was issued, addressing the comments provided by EPA and NPWS. The principal changes are summarised below • Turbidity was updated to reflect EPL triggers • Short-based equipment included in Section 5.4
19 May 2025	EPA, NPWS, DPHI, DCCEEW	Revision C of the plan issued addressing SHL comments.
July 2025	EPA, NPWS, DPHI Fisheries, DCCEEW	Presentation provided on the works
24 September 2025	EPA, NPWS, DPHI, DCCEEW	Revision D includes targeted clarifications and additions to key sections. Section 7 was updated to clarify requirements for inspections and the water monitoring program, with specific confirmation that the proposed monitoring points are adequate to cover the scope of the works. Additionally, the Trigger Action Response Plans (TARPs) were reviewed and enhanced to provide clearer timeframes and detailed steps. Finally, the revision incorporates the specific spoil rinsing methodology.
October 2025	EPA, NPWS, DPHI Fisheries, DCCEEW	Revision E of the plan issued addressing comments provided by SHL, EPA and NPSW
January 2026	DPHI	Revision G of the plan was issued addressing comments provided by DPHI
13 March 2026	DPHI, EPA, NPWS	Meeting held to discuss revisions to the trial methodology to ensure alignment with the full-scale emplacement methodology, enabling more representative results to support progression of approvals for full-scale works
09 April 2026	DPHI	Revision H of the Talbingo Management Plan has been updated to incorporate the comments from the DPHI.

Date	Consultation	Outcomes
		This revision is submitted for approval of the proposed construction methodology for the emplacement rock trial.

2. ENVIRONMENTAL REQUIREMENTS

2.1. Legislation

Legislation relevant to in-reservoir emplacement management includes:

- Environmental Planning and Assessment Act 1979 (EP&A Act);
- Environment Protection and Biodiversity Conservation Act 1999;
- National Parks and Wildlife Act 1974;
- Protection of the Environment Operations Act 1997 (POEO Act);
- Biodiversity Conservation Act 2016;
- Fisheries Management Act 1994; and
- Contaminated Land Management Act 1997.

Relevant provisions of the above legislation are explained in the register of legal and other requirements included in Appendix A2 of the EMS.

2.2. Guidelines

The key guidelines and standards relevant to this plan includes:

- EPL 21266 (extractive activities)
- *Acid Sulfate Soils Manual* (Stone et al 1998)
- *Waste Classification Guidelines Part 1: Classifying waste* (NSW EPA 2014)
- *Managing Urban Stormwater: Soils and Construction* (Landcom, 4th Edition March 2004 (reprinted 2006) (the Blue Book)) Volume 1 and Volume 2
- *Australian and New Zealand Guidelines for Freshwater and Marine Water Quality* (ANZECC 2000)
- *Guidelines for Controlled Activities on Waterfront Land* (Department of Primary Industries 2012)
- *NSW Office of Water Guidelines for working within riparian corridors*
- *Approved Methods for Sampling and Analysis of Water Pollutants in NSW* (March 2004)
- *NSW Water Quality and River Flow Objectives* (DECCW 2006)
- *Fisheries NSW Policy and Guidelines for Fish Habitat Conservation and Management* (Department of Primary Industries 2013)
- Survey guidelines for Australia's threatened fish. Guidelines for detecting fish listed as threatened under the Environment Protection and Biodiversity Conservation Act 1999 (DSWPaC 2011)
- *Policy for the Translocation of Threatened Fauna in NSW: Policy and Procedure Statement No. 9 Threatened Species Unit, Hurstville NSW* (NSW National Parks and Wildlife Service 2001)

- *DPI Policy and Guidelines: Aquatic Habitat Management and Fish Conservation* (NSW Fisheries 1999)

2.3. Conditions of Approval

Table 2-1 details the conditions from the Infrastructure Approval which are relevant to temporary in-reservoir emplacement to facilitate construction works and demonstrates where these conditions are addressed.

Table 2-1: Main Works Infrastructure Approval conditions relevant to in-reservoir emplacement management

Condition	Requirement	Where addressed
Main Works (CSSI 9687)		
Schedule 3, condition 4	The Proponent must: a) minimise the spoil generated by the development; b) test and classify the relevant physical and chemical characteristics of the spoil; c) manage, use or dispose of the spoil in accordance with its classification; d) develop and implement suitable procedures for handling, storing and disposing of any: • potentially acid forming material; • asbestiform mineral fibres; • contaminated material; e) only place non-reactive spoil, which has a low geochemical risk and is suitable for reuse, in the western emplacement area; f) maximise the reuse of non-reactive spoil on site and in other parts of the Kosciuszko National Park; g) maximise the use of the permanent spoil emplacement areas; h) minimise the spoil left at Lobs Hole and Marica for incorporation into the final landform; i) minimise the water quality impacts of the temporary and permanent emplacement areas; j) not place any spoil from the tunnel boring machines in the active storages or below the full supply level of either the Talbingo Reservoir or Tantangara Reservoir without the approval of the Planning Secretary; and k) not place any spoil from dredging, channel excavation or underwater blasting in the eastern and western emplacement areas, or in the active storages or below the full supply level of either the Talbingo Reservoir or Tantangara Reservoir without the approval of the Planning Secretary.	Spoil Management Plan (S2-FGJV-ENV-PLN-0019). Table 6-1 of this plan In accordance with the Spoil Management Plan, in-reservoir placement will consist of D&B material, unless otherwise approved by the Planning Secretary.
Schedule 3, condition 7	Prior to the commencement of construction, the Proponent must prepare a Spoil Management Plan for the development to the satisfaction of the Planning Secretary. This plan must: a) be prepared by a suitably qualified and experienced person in consultation with the NPWS, EPA, Water Group, NRAR, NSW DPI and TfNSW; b) provide an overarching framework for the management of all spoil generated on site - including the testing, classification, handling, temporary storage and disposal of spoil – that complies with the spoil management requirements in condition 4 above; c) include a detailed plan for managing the temporary spoil stockpiles of the development, which includes suitable triggers for remedial measures (if necessary) and describes the contingency measures that would be implemented to address any water quality risks;	Spoil Management Plan (S2-FGJV-ENV-PLN-0019) Table 6-1 of this plan

Condition	Requirement	Where addressed
	d) include a detailed plan for managing all the reactive or contaminated spoil generated on site, including the contingency measures that would be implemented if the volumes of this spoil are greater than expected and unsuitable for land disposal; e) detailed plans for each of the permanent spoil emplacement areas that have been prepared using both analogue and erosional-based methods, these plans must: • describe how the development of each emplacement area would be co-ordinated with the rehabilitation of the site in accordance with the approved Rehabilitation Management Plan; • describe the measures that would be implemented to comply with the spoil management requirements in condition 4 above and the design objectives in Table 2; • include a topsoil strategy, outlining the measures that would be implemented to ensure the surface of the emplacement area will be suitable to sustain the target PCTs in the long term, having regard to the approved strategy in the Rehabilitation Management Plan; • identify the key risks for the successful completion of each emplacement area and the contingency measures that would be implemented to address these risks; and • include detailed completion criteria and performance indicators for each emplacement area, including criteria for triggering remedial action (if necessary); f) include a program to monitor and publicly report on: • the management of spoil on site; • the implementation of each of the detailed plans, including the effectiveness of the proposed mitigation and contingency measures; and • progress against the detailed completion criteria and performance indicators of each permanent spoil emplacement area. *Note: The Proponent may stage the preparation of the Spoil Management Plan, including the preparation of detailed plans for each permanent spoil emplacement area. However, the detailed plans must be approved prior to any construction occurring in the relevant emplacement area.*	
Schedule 3, condition 20	The Proponent must: a) minimise the development-related biosecurity risks, including the movement and spread of weeds, pests and pathogens; b) minimise the impact of the development on threatened fish species and their habitat, particularly the Macquarie Perch, Stocky Galaxias and Murray Crayfish; and c) minimise the impact of the development on recreational fishing in Tantangara Reservoir and Lake Eucumbene.	Aquatic Habitat Management Plan (S2-FGJV-ENV-PLN-0009)
Schedule 3, condition 29	Water Pollution Unless an environment protection licence authorises otherwise, the Proponent must comply with Section 120 of the POEO Act. Note: Section 120 of the POEO Act makes it an offence to pollute any waters.	Surface Water Management Plan (S2-FGJV-ENV-PLN-0011)
Schedule 3, condition 30	The Proponent must: a) maximise the recycling and reuse of water on site; b) maximise the diversion of clean water runoff around the disturbance areas; c) minimise the flow rates and velocities of any clean water runoff diversions to adjoining watercourses;	Water Management Plan (S2-FGJV-ENV-PLN-0010) Table 6-1 of this plan

Condition	Requirement	Where addressed
	d) minimise the flooding impacts of the development; e) minimise groundwater take from the Gooandra Volcanics and Kellys Plain Volcanics using pre and post grouting of the tunnel, to minimise the loss of stream flows in the waterways above these geological formations, including Gooandra Creek and the headwaters of the Eucumbene River; f) minimise erosion and the generation and dispersion of sediment using suitable controls in accordance with the relevant requirements in the Managing Urban Stormwater: Soils and Construction guidance series; g) design all instream works, particularly the inlet and outlet works, to minimise scour and erosion; h) unless permitted by this approval, avoid carrying out of any development within 40 metres of any watercourse; i) carry out all instream works or development within 40 metres of any watercourse generally in accordance with the requirements in the Guidelines for Controlled Activities on Waterfront Land; j) treat all wastewater and surplus process water prior to discharging it at the approved discharge points at the Talbingo Reservoir or Tantangara Reservoir; k) reduce the number of diffuser points for low velocity discharges to the Talbingo Reservoir or Tantangara Reservoir; l) not discharge any surplus process water to the stormwater basins on site; m) minimise the surface water quality impacts of the development, including: • the development carried out in the vicinity of waterways, particularly the Talbingo Reservoir, Tantangara Reservoir and Yarrangobilly River; • all instream works, including dredging, channel excavations, underwater blasting, barge infrastructure, fish barriers and screens, culverts and bridges, and service crossings; • the temporary and permanent spoil emplacement areas; • development at the Marica, Plateau and Rock Forest sites; • road works; • the operation of the power station and associated infrastructure, including the operation of the inlets and outlets to minimise sediment disturbance risks and the dewatering of the tailrace tunnel; n) minimise the risk of spills or leaks on site, and clean up any spills or leaks as quickly as possible; o) minimise the groundwater quality impacts of the development, particularly through the design of the temporary and permanent spoil emplacement areas and all water storages on site; p) store chemicals and hydrocarbon products in bunded areas in accordance with the relevant Australian Standards.	
Schedule 3, condition 31	Prior to the commencement of construction, the Proponent must prepare a Water Management Plan for the development to the satisfaction of the Planning Secretary. This plan must: a) be prepared by a suitably qualified and experienced person in consultation with the EPA, NPWS, the Water Group, NRAR and NSW DPI; b) include a Site Water Balance for the development with a program to review and update this water balance each calendar year; c) include a Surface Water Management Plan, containing detailed plans for the Talbingo Reservoir, Lobs Hole, Marica, Plateau, Tantangara Reservoir, and Rock Forest sites, with:	Water Management Plan (S2-FGJV- ENV-PLN-0010) Table 6-1 of this plan

Condition	Requirement	Where addressed
	• detailed baseline data on surface water flows and quality in the watercourses that could be affected by the development, and a program to augment this baseline data over time; • detailed criteria for determining the surface water impacts of the development (flows, quality and flooding), including criteria for triggering remedial action (if necessary); • a description of the measures that would be implemented to minimise the surface water impacts of the development and comply with the relevant water management requirements in conditions 4, 6 and 30 above, including specific plans covering: – the temporary or permanent emplacement of spoil; – dredging, channel extraction and underwater blasting in the Talbingo Reservoir and Tantangara Reservoir; – operation of the discharge points; – the design of the inlets and outlets; and – dewatering of the tailrace tunnel during operations; • identify the key risks to the successful implementation of these measures, and describe the contingency measures that would be implemented to address these risks; • a program to monitor and publicly report on the surface water impacts of the development; d) include a Groundwater Management Plan with: detailed baseline data of groundwater levels, yield and quality on the aquifers that could be affected by the development, and a program to augment this baseline data over time; • a program to validate and calibrate the groundwater model for the development as new information is collected; • detailed criteria for determining the groundwater impacts of the development, including criteria for triggering remedial action (if necessary); • a description of the measures that would be implemented to comply with the water management requirements in condition 30 above; • a program to monitor and publicly report on: – groundwater inflows to the tunnel; – water take from the groundwater bores and connected water sources; – the impacts of the development on: ○ regional and local (including alluvial) aquifers; ○ base flow to surface water sources. *Note: The Proponent may stage the preparation of the Water Management Plan, including the preparation of each of the detailed plans required under the Surface Water Management Plan. However, the detailed plans must be approved prior to any construction occurring on the relevant site.*	
Schedule 3, condition 52	Excluding the spoil generated by the development, the Proponent must: (a) minimise the waste generated by the development; (b) maximise the reuse and recycling of any waste; (c) classify all waste generated on site in accordance with the Waste Classification Guidelines (NSW EPA 2014), or its latest version; (d) store and handle all waste generated on site in accordance with its classification; and (e) ensure all waste is disposed of off-site at facilities that are lawfully permitted to accept such waste.	Waste Management Plan - S2-FGJV-ENV-PLN-0048 Waste classification reports for potentially contaminated soil. Waste Tracking Register kept on internal FGJV server.

Condition	Requirement	Where addressed
Schedule 4, condition 6	Notification of Dates At least 1 week prior to the relevant notification date, the Proponent must notify the Department, NPWS and NSW DPI via the Major Projects Portal of the date of the: (a) commencement of the development of the Main Works; (b) commencement of development on the following sites under this approval: • Marica site; • Plateau site; • Tantangara site; and • Rock Forest site; (c) commencement and completion of the required road upgrades; (d) commencement and completion of construction; (e) commencement of commissioning and testing the power station; (f) completion of the initial rehabilitation of the site following construction; (g) completion of the ecological rehabilitation of the site, apart from the areas used for operations; (h) commencement and completion of operations; (i) commencement of decommissioning the development; (j) completion of the final rehabilitation of the site; and (k) completion of the ecological rehabilitation of the areas used for operations.	Letter S2-FGJV-DPIE-LET-0003 submitted in Aconex on 20/10/2020
Schedule 4, condition 7	Incident Reporting The Proponent must notify the Department and NPWS via the Major Projects Portal immediately after it becomes aware of an incident on site. This notice must set out the location and nature of the incident.	Environmental Management Strategy S2-FGJV-ENV-PLN-0007 Aquatic Habitat Management Plan S2-FGJV-PLN-0009

2.4. Revised Environmental Management Measures

Environmental safeguards and management measures are included in the EIS in Appendix G. During preparation of the Submissions Report, revised environmental management measures were developed and are included in Appendix C of the Submissions Report.

The REMMs relevant to this plan are listed in Table 2-2 below. If additional measures are cross-referenced from another section of the Main Works EIS or Submissions Report, these measures are also included.

Table 2-2: Main Works Infrastructure Approval revised environmental management measures relevant to in-reservoir emplacement management

Impact	Reference	Environmental management measures	Where addressed
General	WM02	A water monitoring program will be developed as part of the water management plan to monitor quality and quantity impacts to surface water, groundwater and reservoirs. The water monitoring program will incorporate and update the existing monitoring network and detail monitoring frequencies and water quality constituents.	Water Management Plan: S2-FGJV-ENV-PLN-0010 Surface Water Management Plan: S2-FGJV-ENV-PLN-0011 Surface Water Monitoring Program: S2-FGJV-ENV-PLN-0011 - Annexure A Trigger Action Response Procedure: S2-FGJV-ENV-PLN-0011 - Annexure B Spill Response Procedure: S2-FGJV-ENV-PLN-0011 - Annexure C Groundwater Management Plan: S2-FGJV-ENV-PLN-0012 Groundwater Monitoring Program: S2-FGJV-ENV-PLN-0012 - Annexure A Trigger Action Plan Appendix B of this Management Plan
Erosion and sediment	WM04	An Erosion and Sediment Control Plan (ESCP) will be prepared for each construction area that will include relevant information presented in the water management report (Annexure D to water assessment)	Progressive Erosion and Sediment Control Plan

Impact	Reference	Environmental management measures	Where addressed
Erosion and sediment	WM05	A suitably qualified erosion and sediment control professional(s) will be engaged to: • oversee the development of ESCPs; • inspect and audit controls; • train relevant staff; and progressively improve methods and standards as required.	Progressive Erosion and Sediment Control Plan have been prepared by a suitably qualified person (John Wright of T.R.E.E.S, Andrew Macleod and / or Liam O'Rourke of SEEC) in consultation with construction personnel and the Project Soil Conservationist to guide staff on the appropriate controls for specific work stages. The ESCPs will be updated as required based on the progression of new areas of ground disturbance and changing site conditions.
Impacts to aquatic habitats	AE01	An Aquatic Habitat Management Plan will be prepared and implemented to guide management of impacts to aquatic habitat. The plan will: • be prepared in consultation with NPWS and DPI-Fisheries; • include a description of measures that would be implemented to: – minimise impacts to aquatic habitat outside the approved disturbance areas; – minimise the loss of key aquatic habitat; – minimise the impacts of the development on threatened fauna species; – minimise the impact of the development on fish habitat; – relocate Murray crayfish from the shallower parts of the approved disturbance area in Talbingo Reservoir prior to disturbing these areas – notify DPI-Fisheries of any fish kills; • include a trigger action and response plan for the Murray crayfish, which would be implemented if monitoring shows the development is adversely affecting the species;	Aquatic Habitat Management Plan (S2-FGJV-ENV-PLN-0009)
Excavated rock waste management and transport	CONTAM04	Material which has been assessed as not suitable for reuse on land or for temporary subaqueous disposal or cannot be reused will be classified in accordance with the *Waste Classification Guidelines* (NSW EPA 2014). Depending on the classification of the material, a licensed waste transport company will be used to transport material which is required to leave the project, to an	Spoil Management Plan (S2-FGJV-ENV-PLN-0019)

Impact	Reference	Environmental management measures	Where addressed
		appropriately licensed facility. Excavated material may be subject to treatment and application on site.	
PAF rock	CONTAM07	An Excavated Rock Management Plan would be developed which would include measures identified in them Preliminary Site Investigation – Contamination (Table 9.1, Item 4 of Appendix N.1).	Spoil Management Plan (S2-FGJV-ENV-PLN-0019)

2.5. Licences and Permits

Environment Protection Licence (EPL) 21266 was issued for the Exploratory Works for the scheduled activity of extractive activities. The premises boundary for the Exploratory Works EPL was expanded to encompass both Exploratory Works and Main Works activities and the governing schedule activity for Main Works as Electricity Generation. The EPL details conditions which must be complied with when undertaking the extractive activities.

A Construction Lease and Works Access Licence has been established between SHL and NPWS in order to carry out relevant Snowy 2.0 Main Works.

3. EXISTING ENVIRONMENT

3.1. Water Levels

Water levels within the Talbingo Reservoir are detailed in Table 3-1.

Water levels within Talbingo Reservoir are managed by SHL in accordance with energy market demands and water levels can vary between MOL and FSL as presented below in Table 3-1.

Table 3-1: Reservoir water levels

Water Levels	Talbingo Reservoir
Minimum Operating Level	534.4 m AHD
Full Supply Level	543.2 m AHD

3.2. EIS baseline Water Quality

3.2.1. Talbingo Reservoir

Baseline water quality results for Talbingo Reservoir are included in the Surface Water Management Plan (S2-FGJV-ENV-PLN-0011), with median results detailed in Table 3-2.

Baseline water quality results were derived from the EMM Water quality assessment as presented in the project EIS (Appendices J.1 to J.4). Routine water quality monitoring within Talbingo Reservoir is undertaken in accordance with the Environment Protection Licence 21266 sampling requirements.

Table 3-2: Surface water median baseline values

Parameter	Talbingo Reservoir	
	Summer/ Autumn – Dry	Winter/ Spring - Wet
Field parameters		
Temperature	18.1	12.2
Dissolved oxygen (%)	101	100
Electrical conductivity (µS/cm)	27	22
pH	7.0	8
Turbidity (NTU)	1.4	1.1
Analytical results - general		
Suspended solids (mg/L)	2	<1
Total hardness (as $CaCO_3$) (mg/L)	7	5
Total alkalinity (as $CaCO_3$) (mg/L)	<20	10
Analytical results - nutrients		
Ammonia (mg/L)	<0.01	0.015
Oxidised nitrogen (mg/L)	<0.05	0.027
Total kjeldahl nitrogen (mg/L)	<0.2	0.09
Total nitrogen (mg/L)	<0.2	0.12
Reactive phosphorus (mg/L)	<0.05	0.002

Parameter	Talbingo Reservoir	
	Summer/ Autumn – Dry	Winter/ Spring - Wet
Total phosphorus (mg/L)	0.026	0.010
Total organic carbon (mg/L)	<5	1
Dissolved organic carbon (mg/L)	<5	2
Analytical results – metals		
Aluminium (Al) (mg/L)	<0.05	0.01
Arsenic (As) (mg/L)	<0.001	<0.001
Barium (Ba) (mg/L)	<0.02	0.005
Beryllium (Be) (mg/L)	<0.001	<0.001
Boron (B) (mg/L)	<0.05	<0.05
Cadmium (Cd) (mg/L)	<0.0002	<0.0001
Total chromium (Cr) (mg/L)	<0.001	<0.001
Cobalt (Co) (mg/L)	<0.001	<0.001
Copper (Cu) (mg/L)	<0.001	<0.001
Iron (Fe) (mg/L)	<0.05	<0.05
Lead (Pb) (mg/L)	<0.001	<0.001
Manganese (Mn) (mg/L)	<0.005	<0.001
Mercury (Hg) (mg/L)	<0.0001	<0.0001
Nickel (Ni) (mg/L)	<0.001	<0.001
Selenium (Se) (mg/L)	<0.001	<0.01
Silver (Ag) (mg/L)	<0.005	<0.001
Vanadium (V) (mg/L)	<0.005	<0.01
Zinc (Zn) (mg/L)	0.010	<0.005

3.3. Aquatic Habitat

As outlined the Aquatic Habitat Management Plan (S2-FGJV-ENV-PLN-0009), Talbingo and Tantangara Reservoirs and many other streams within the project area are designated Key Fish Habitat (KFH) by NSW DPI (Fisheries).

Talbingo Reservoir is classified as type 1 KFH due to the presence of Murray Crayfish, which is a threatened species in NSW under the Fisheries Management Act 1994. A Murray and Rieks Crayfish monitoring program has been established within Talbingo Reservoir and is guide by the Biodiversity Management Plan (S2-FGJV-ENV-PLN-0008)

Table 3-1 and Figure 3-1 of the Aquatic Habitat Management Plan (S2-FGJV-ENV-PLN-0009) details habitat features within each reservoir and catchment areas and occurrence of threatened aquatic species respectively. Threatened species are going to be managed according to the Aquatic Management Plan (S2-FGJV-PLN-0009) and Biodiversity Management Plan (S2-FGJV-ENV-PLN-0008).

4. ASPECTS, IMPACTS AND RISKS

4.1. Environmental Aspects and Impacts

An environmental aspect is an element of an organisation's activities, products, or services that has or may have an impact on the environment (ISO 14001 Environmental management systems). The relationship of aspects and impacts is one of cause and effect.

Key aspects of the project that could result in environmental impacts from in-reservoir placement are identified in Table 4-1. The extent of these impacts will depend on the nature, extent and magnitude of construction activities and their interaction with the natural environment (Column 2). This is further exacerbated by environmental factors (Column 3).

Table 4-1: Project aspects and impacts relevant to the Talbingo rock platform

Environmental Aspects (Key construction activities)	**Environmental Impacts**	**Environmental Factors** (Conditions)
Placement of excavated material to form two temporary dry working platforms necessary for the execution of the slope stabilisation for the approach channel at the Talbingo intake	Potential impacts due to the in-reservoir placement of excavated material within the reservoirs include: • changes hydrodynamics (water movement) within the reservoir • water quality impacts (localised and downstream) from sedimentation, turbidity generated, and nutrient loads • interaction of the excavated material with the water column and reservoir bed sediments • aquatic ecology impacts	**Excavated material (for placement)** – type, amount and characterisation **Weather** – Rainfall, wind **Reservoir** – Water levels **Sensitivity of aquatic environments** – Dispersion of contaminants is increased when working within aquatic environments

4.2. Environmental Risk Assessment

The environmental aspects and impacts for emplacement are addressed within the Environmental Aspects and Impacts Register located in Appendix A4 of the EMS. The risk assessment is based on (1) the likelihood of an impact occurring as a result of the aspect; and (2) the consequences of the impact if the event occurred.

Environmental risks are also captured and documented throughout specific risk workshops conducted as part of the pre-construction phase of the works and are to be embedded in the Construction Area Plan prior to works commencing.

4.3. EIS Review

The placement of spoil within the Talbingo Reservoir was investigated extensively by CSIRO during the planning and feasibility phase of Snowy 2.0.

- Stage 1 – The CSIRO investigated the placement of spoil in the reservoirs to determine potential impacts on reservoir water (see EIS Appendix L – Annexure C)
- Stage 2 – The CSIRO estimated the duration at which aluminium concentrations would return to background levels following spoil placement in the reservoirs (see EIS Appendix L – Annexure E)

4.3.1. Stage 1

To assess the impact of excavated rock placement on the Tantangara Reservoir rock samples from the various geological units which will be encountered on the project were selected. These samples were then mixed with the Tantangara Reservoir water.

An analysis was undertaken on the change in water quality associated with the release and attenuation of substances from the rock materials. The release of substances from the rock materials was assessed using a series of elutriate tests which covered a range of mixing scenarios and conditions including the following variables:

- Time
- Repeat successive leaching
- Rock particle size
- Temperature
- Attenuation of substances
- pH

The study focused on the Ravine Bay spoil emplacement area, initially planned partly underwater. It concluded that:

- Dissolved aluminium release was the only substance consistently identified as a Contaminant of Potential Concern (CoPC).
- Dissolved aluminium concentrations may exceed the reservoir Default Guideline Value (DGV)
- Sustained release of aluminium may occur from excavated rock materials
- Dissolved aluminium release was negligible in rock materials > 2 mm in size
- Dissolved aluminium release increases significantly with decreasing particle size <0.21 mm
- Dissolved aluminium release is markedly lower in waters with temperature of 6 °C than at 21 °C
- Dissolved As and Cr were infrequently identified as CoPC but only when waters contained >20 g/L fine solids (L/S <50).
- Resuspension of existing sediments within the reservoirs may buffer the pH closer to that of the reservoir waters, but significant attenuation of dissolved Al was not observed in tests.

The potential water quality risks associated with dissolved Al contamination associated with subaqueous filling are:

- Environmental risks including acute and chronic toxicity to aquatic fauna, particularly fish, tadpoles and macroinvertebrates.
- Increased sensitivity of ecosystems already from low pH or low alkalinity
- Elevated dissolved aluminium under acidic or poorly buffered conditions
- Interaction with turbidity and fine sediments, complicated impact detection and attribution.
- Mobilisation of other metals associated with acid generation
- Downstream accumulation affecting receiving water.

Dissolved aluminium is not routinely analysed in spoil materials onsite however, as part of the trial placement, dissolve aluminium will be included in the spoil testing suite and reported on accordingly.

4.3.2. Stage 2

As part of the EIS, CSIRO were engaged to undertake a desktop assessment to estimate where and after how much time in Talbingo Reservoir aluminium concentrations would return to below default guideline values and baseline concentrations. For the task, data from Section 4.3.1 were summarised and used to develop relationships between the concentration of fine excavated rock materials suspended in Talbingo Reservoir water (mg/L) and concentrations of dissolved aluminium (µg/L). The relationships considered the water temperature and duration that the excavated rock materials were suspended within the water. Using these relationships, the hydrodynamic model for Talbingo Reservoir was used to predict total suspended solids concentrations (TSS, mg/L) of excavated rock within surface, middle and bottom waters at ten locations within the reservoir. The study was applicable to the placement of spoil in the Ravine Bay spoil emplacement area, the results are presented in Figure 4-1.

The assessment indicates that dissolved aluminium concentrations may exceed the default guideline value of 55 µg/L within the placement area contained by the silt curtain (Location 1 in Figure 4-1). Outside the silt curtain, a gradient (mixing zone) is expected to develop, along which dissolved aluminium released in Location 1 will dilute and some further aluminium release from particles will occur.

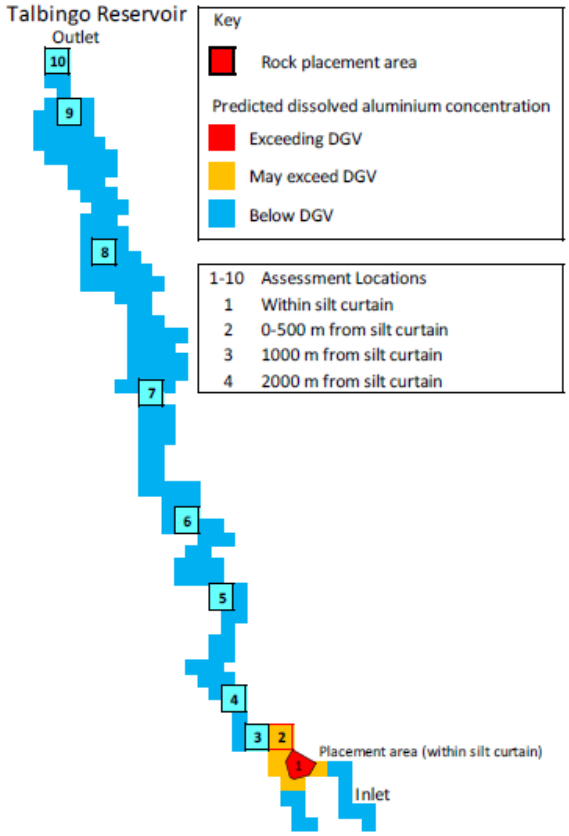


Figure 4-1 Dissolved Aluminium Concentrations in the Talbingo Reservoir

4.3.3. Applicability to Works

CSIRO estimated ~1,400,000 m³ of spoil at Ravine Bay versus ~50,000 m³ for this Plan. While Ravine Bay studies apply, impacts for the Talbingo rock platform are expected to be far less due to the smaller volume. FGJV will further reduce risk by removing fine-grained material where practicable as per Section 5.3.

4.4. GHD Report – Reservoir Intake Spoil Emplacement (S2-GHD-TEC-MEM-0026)

The EIS examined nitrogen input to Talbingo Reservoir from natural rock. To expand on the work undertaken in the EIS, FGJV contracted GHD to further assess D&B residue impact of the Talbingo Rock Platform on the Talbingo Reservoir relative to the background concentration of the Talbingo Reservoir (S2-GHD-TEC-MEM-0026).

GHD Report focused on the nitrogen impact and concluded the following:

- Any material placed in the reservoir will affect water quality
- D&B spoil will have a slightly higher impact than TBM spoil
- Fine material (<2mm) will have a greater impact than coarse material (>2mm)

Talbingo Rock Platform is expected to have a:

- Minor impact on short term reservoir water quality within the mixing zone
- Impact will be less outside the mixing zone
- Negligible long-term impact
- The impact is within the natural background fluctuation and lower than the EIS

It was concluded that the impact to environmental values can be reduced by using coarse material (>2mm) and minimising D&B spoil.

4.5. GHD Report – Review of Nutrient Risks to Aquatic Ecosystems (S2-GHD-TEC-MEM-0036)

FGJV engaged GHD to assess the potential water quality impacts of introducing spoil into the Talbingo and Tantangara reservoirs. The primary concern was how nitrogen compounds (nitrate, nitrite, ammonia, and total nitrogen) from proposed spoil emplacement could affect the aquatic environment. GHD's review of literature, data, and modelling led to the following conclusions:

- Direct Effects (Toxicity): The risk of direct toxicity from nitrogen compounds is low in most environmental conditions at both reservoirs. While ammonia concentrations can temporarily exceed toxicity thresholds within the silt curtain/mixing zone due to minimal dilution, this risk is negligible outside this immediate area because of rapid dispersion.
- Indirect Effects (Trophic Balance): While Total Nitrogen (TN) concentrations generally remain within natural variability in emplacement areas, Nitrogen Oxides (NOx) concentrations under some simulated scenarios significantly exceed water quality objectives (WQOs). This could potentially disrupt the trophic ecological balance within confined areas.
- Algal Bloom Risk: Direct causation of algal blooms by spoil emplacement is unlikely as phosphorus, the usual limiting factor for blooms, is not a significant concern from the spoil. However, given that algal blooms have occurred in both reservoirs (e.g., March-April 2025), nitrogen contributions from spoil could contribute to blooms if phosphorus levels are unusually high from other sources. The risk of blooms is lower during cooler periods with greater water movement and reduced stratification.

4.6. EPA Clean-Up Notice (SR-1638)

On 1 December 2023 the EPA issued a Clean-up notice (SR-1638) to the Licensee in relation to suspected groundwater contamination identified hydraulically downgradient of spoil emplacement areas. The contamination was likely due to D&B activities within the site.

For selected analytes the sample results exceeded the default trigger values for the relevant guidelines as detailed in Table 4-2.

Table 4-2 Potential Contamination Identified in Clean-up Notice (SR-1638)

Relevant Spoil Emplacement Area	Matrix	Analyte	Date
GF01	Surface Water and Groundwater	Ammonia Nitrogen (total) Nitrate + nitrite as N	Feb 2023 – June 2023
Lick Hole Gully	Groundwater	Nitrogen (total)	Oct 2023
Main Yard	Groundwater	Nitrogen (total)	Oct 2023

Several conditions were attached to this notice including the requirement to cease all further emplacement of waste sludge and filter cake material at all permanent and temporary spoil emplacement areas within Kosciuszko National Park until a date approved in writing by the EPA.

5. TEMPORARY SUB AQUEOUS EMPLACEMENT MANAGEMENT AND METHODOLOGY

5.1. Introduction

The overall framework for the management of in-reservoir emplacement includes the following:

- Introduce Environmental Controls – Environmental controls will be set up prior to works commencing. See Section 5.2.
- Process Spoil - The material will be screened, rinsed or processed to meet the Particle Size Distribution (PSD). See Section 5.3.
- Spoil Testing – Geochemical and geotechnical testing to confirm suitability of the material for in-reservoir emplacement. See Section 5.4.
- Spoil Acceptance – Results will be reviewed, and a permit shall be issued for the movement of the spoil. See Section 5.5.
- Vegetation removal and habitat tree salvage – See Section 5.6.
- Spoil Transport/Storage and Emplacement Methodology – Following acceptance of the material it will be transported to Talbingo and placed as part of the rock platform. See Section 5.7.
- Removal of rockfill material – Following the completion of works the rockfill material will be removed. See Section 5.8.

5.2. Environmental controls and pre-placement monitoring

All environmental controls outlined in Table 5-1 must be established before in-reservoir emplacement commences. These requirements apply equally to the initial placement trial phase.

Environmental controls must be installed as per the approved ESCP and site environmental plans (please refer to Project's EMS, and procedures) which has been reviewed by the project's Certified Professional in Erosion and Sediment Control (CPESC).

Table 5-1 Environmental Controls

Control	Description
Stockpiling of spoil material	Excavated spoil, prior to in-reservoir emplacement, will be stockpiled in accordance with the requirements of the Spoil Management Plan (S2-FGJV-ENV-PLN-0019).
Demarcation of in-reservoir emplacement area	Areas proposed for in-reservoir emplacement will be demarcated.
Installation of silt curtains	Double silt curtains will be installed around the proposed in-reservoir emplacement area to minimise the potential for sediment dispersion during in-water activities. Silt curtains will be suspended from booms on the surface. The location of the silt curtains are shown in Figure 7-3
Trigger Action Response Plans	In-reservoir monitoring will be undertaken as per the Surface Water Management Plan (S2-FGJV-ENV-PLN-0011) and the Aquatic Habitat Management Plan (S2-FGJV-ENV-PLN-0009) and Section 7.2.2. Where impacts are observed, the appropriate Trigger Action Response Plan (included in the above plans) will be followed. Refer Section 7.2.
Monitoring Buoys	To ensure comprehensive and proactive environmental management, real-time water quality monitoring is being implemented through the deployment of specialised buoys. These buoys are equipped with advanced sensors that continuously collect data on key water quality parameters. The system is designed to automatically trigger alerts when measured parameters exceed the predefined thresholds detailed in Table 7-2, enabling immediate assessment and response to potential water quality issues.

Control	Description
Aquatic disturbance permit	To actively protect and minimise impacts on threatened fish species during construction activities, a comprehensive Aquatic Disturbance Permit System has been developed. This system integrates best practice mitigation measures and stringent environmental safeguards, ensuring that all works within or near aquatic environments are rigorously assessed and approved.

5.3. Process Spoil

The material which will be used in the Talbingo Rock Platform will be sourced from the Ravine Bay PSE area and will be a mixture of hard durable MW or better bedrock excluding PAF and NOA. Processing trials have suggested that using the following screen setup will produce the requisite grainsize:

- 20 mm screen – Will remove material 20 mm minus as far as practicable; and
- 400 mm screen – Will remove material 400 mm plus as far as practicable.

This screening process will yield to the extent practicable a material with particle size between 20 and 400 mm, closer to the design upper bound of allowable size that still maintains rock platform stability. This coarse screening acts as an environmental control to reduce CoPC risks identified in the EIS as per Section 4.3 and the GHD report summarised in Section 4.4.

Screening is expected to yield ~70% D&B and 30% TBM spoil, maximising TBM use without compromising rock platform integrity. The use of TBM spoil reduces nitrogen input to the reservoir and lowers environmental risk relative to D&B spoil as per the conclusions reached in Section 4.4.

The requisite PSD is shown in Appendix A.

During or after material processing, spoil rinsing will be undertaken using one of the following options:

- Option 1: Water spraying system attached to the crusher or screen
- Option 2: Material sprayed with watercart, if option 1 not available

Rinse water with low nitrogen levels (e.g. reservoir/treated process water) will minimise cross-contamination. The rinse water will be captured in the existing leachate basin and rinsing activities will be coordinated with existing basin capacity and associated water discharges/inflows (e.g.: during rainfall events rinsing is not required), to ensure sufficient infrastructure support for this activity, an updated site water balance will be prepared and issued as a separate document for information to the EPA.

Prior to use, the material will be assessed for compliance in accordance with Section 5.4. If the material does not pass the assessment criteria further rinsing will be undertaken or the material will be discarded.

5.4. Sampling Analysis and Quality Procedure

The analytical suite was chosen based on Contaminants of Potential Concern (CoPC) which a suitably qualified individual would reasonably expect to be present within the material. Given the material will be screened to the extent practicable above 20 mm the CoPC which were identified in the EIS are not considered applicable to these works.

5.4.1. Geochemical Analytical Suite

Based on a review of the EIS it was determined that the analytical suite listed in Table 5-2 would be suitable to assess the material prior to placement in the Talbingo reservoir and addresses the CoPC for the rockfill material. Chemical testing of the material will be undertaken at an external National Association of Testing Authorities (NATA) laboratory.

Table 5-2 Analytical Suite Composition

Analytical Suite	Analytes
PAF Suite – Offsite[1,2]	Acid Neutralising Capacity Acid Production Potential Chromium Reducible Sulfur (SCr) Net Acid Production Potential (NAPP) pH After Oxidation (pH NAG)
Asbestos Suite[1]	Including but not necessarily limited to Phase Contrast Polarized Light Microscopy (PLM) and Transmission Electron Microscopy (TEM) to indicate Presence / Absence
Nutrient Suite	Total Kjeldahl Nitrogen (TKN) (leachable) Nitrate (leachable) Nitrite (leachable) Total Nitrogen (leachable) Ammonia (leachable)

Notes to Table
1 – If considered as a CoPC based on lithology
2 – Material may already have been assessed at the site of excavation

5.4.2. Geochemical Assessment Criteria

As per Section 5 and Section 4.4 the impact for the placement of material within the Talbingo reservoir is expected to remain within the natural background range. Despite this, assessment criteria will be adopted to assess spoil prior to its placement within the Talbingo reservoir as an additional control. The assessment criteria are provided in Table 5-3.

Table 5-3 Maximum Threshold Values of Material Prior to Placement

Key Parameter	Criteria
Naturally Occurring Asbestos (NOA)	No NOA
Potentially Acid Forming	No PAF
Total Leachable Nitrogen (mg/L)	<1.5 mg/L[1,2]

Notes to Table
1 –Background concentrations are based on values that would be reasonably expected in the surrounding lithology. The assessment criteria is based on the presumption that Talbingo reservoir is adapted to this level of Nitrogen.
2 – 95% UCL may be used as per ASC NEPM

Any proposed revisions of parameters and criteria would be subject to discussion with the relevant authorities.

Nitrogen (Total) has been chosen as an assessment criterion as it encompasses all CoPC from blasting including ammonia, nitrate and nitrite. Using the leachable concentration rather than the total concentration more accurately reflects the impact the analyte will have on the environment, as all major identified pathways of potential Nitrogen contamination migration are water-based as detailed in the Nitrogen Management Plan (S2-FGJV-ENV-PLN-0367). The nutrient criteria should be used as an initial guide only, each unique spoil sampling event should be assessed by a suitably qualified individual prior to sampling.

The geochemical assessment criteria are based on potential CoPC which may be encountered within the spoil materials to be placed in the Talbingo Reservoir. As noted in Section 4.3 aluminium was identified as a SoPC in a review of the EIS, however this was just in material with a grainsize less than 2 mm. As detailed in Section 5.3 a screen will be used to remove as far practicable the material which are less than 20 mm and as such aluminium is not considered a SoPC for these works.

5.4.3. Geochemical Sampling Density and Methodology

Material will be stockpiled following screening and it is expected that the stockpile size will be approximately 2,500 m^3, but is subject to construction operations and constraints. Nutrient samples will be taken of the stockpiled material at a rate of one sample per 250 m^3 in accordance with the sampling density prescribed in the NSW EPA Sampling Density Guidelines – Part 1. PAF and NOA samples (if required) will be taken at a rate of 1 sample per 1,000 m^3 in accordance with the Spoil Management Plan (S2-FGJV-ENV-PLN-0019).

Composite samples should be taken using a systematic grid pattern with a randomised offset such as that prescribed in the NSW EPA Sampling Design Part 1 - Application (2022) as per Figure 5-1. For each stockpile, samples will be taken across the range of available particle sizes (20mm to 400mm).

Samples will be taken from a range of depths within the stockpile with a minimum depth of 30 cm to prevent cross contamination.

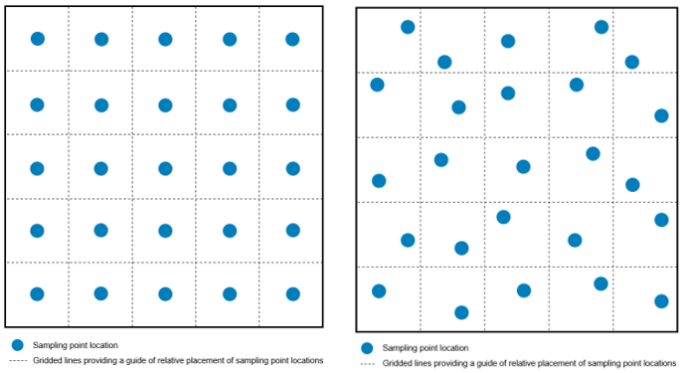


Figure 5-1 Systematic Sampling Pattern with Grid Sampling (left) and Randomised Offset (right)

5.4.4. Sample Labelling and Record Keeping

A sample register will be maintained along with the Sample Receipt Notifications (SRN), CoC and laboratory results. Sample results will be recorded on FGJV's internal record keeping software for future reference. Each sampling event will receive a unique identifier so that it can be appropriately tracked with an example of the sampling labelling used is provided in Figure 5-2 and explained below:

- RRN-PSE - refers to the work area, in this case Ravine Bay;
- SP-1 - refers to the sampling event, in this case the sampling event for stockpile 1
- 50 mm – refers to the particle size sampled, in this case 50 mm
- 34920 - refers to FGJV's internal QAQC demarcation for test request numbers
- S01 - refers to the sample number, in this case sample number 1

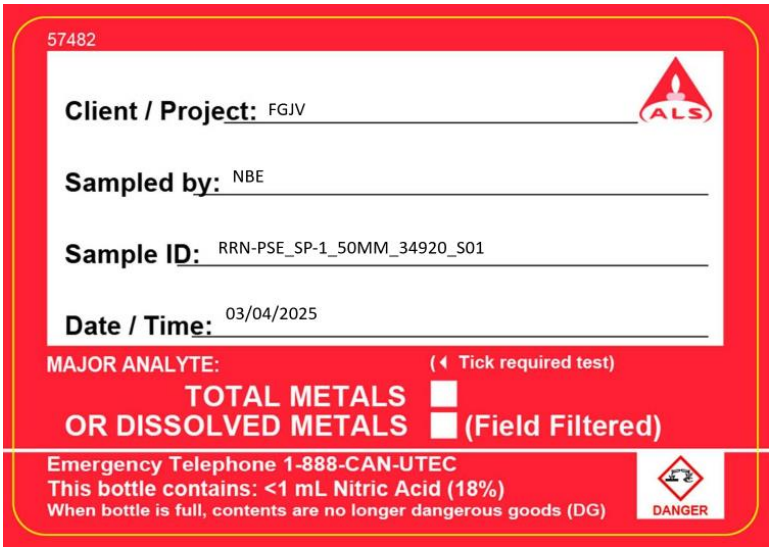


Figure 5-2 Sample Label

5.4.5. Geotechnical Sampling

Rockfill material will consist of a mixture of hard, angular, rock particles of moderately weathered to fresh rock. The PSD of the material is shown in Appendix A.

PSD samples will be collected at a rate of 1 per 10,000 m³, with increased sampling during the trial phase (refer to Section **5.7.2**). After trials and setup of screening and crushing, material consistency is expected with little to no variation in PSD. The PSD required for works is presented in Appendix A.

5.5. Material Acceptance Procedure

A material permit is required before the material is transported to the intake and placed in the reservoir. The review completed as part of the permit includes:

- Geochemical and geotechnical results
- Analytical results
- Visual Inspection
- Sampling density and methodology
- Reservoir impact assessment (TARP activation)

The permit will be signed by the following:

- Spoil Team
- Environmental Team
- Construction Team

5.6. Vegetation removal and habitat tree salvage

Significant submerged vegetation exists within the extents of the Talbingo intake approach channel as shown in 5-3 below. Part of the vegetation and trees within the footprint of the rockfills will be removed as far as practicable using land-based equipment.

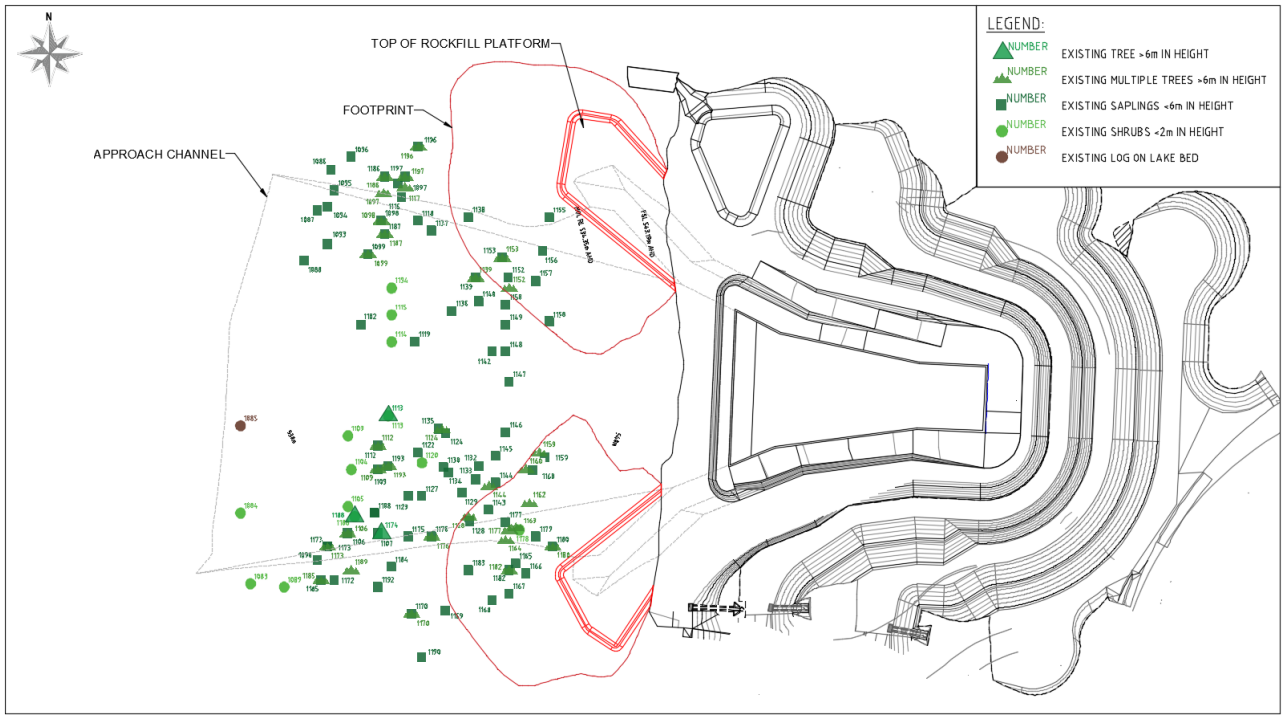


Figure 5-3 Surveyed vegetation within the construction area (rockfills in red lines)

Vegetation and tree removal will be undertaken in stages, in line with the development of each rockfill platform, using one of the following methodologies:

- Physical extraction: A long reach excavator equipped with a log grab will extract the tree and its root. Trees removed by this method will be subject to salvage for habitat reuse back in the reservoir.
- Breaking: The tree might break during the physical extraction process, and the broken trunk section will be extracted. The remaining trunk section and root mass will remain in place and will be extracted during future dredging works (Dredging Management Plan still to be developed).
- Laying down: Trees will be laid down within the vicinity of the rockfills, aided by boom and bucket of the excavator or by pushing the rockfill material over the trees. Trees laid down will remain in situ and will be extracted during future dredging works.

Trees or trunk sections recovered by excavator will be stockpiled on land prior to in reservoir placement. In reservoir placement opportunities to be outside of the intake area and subject to negotiation with SHL and NPWS. The trees or trunk sections will also be considered for terrestrial rehabilitation.

5.7. Spoil Transport/Storage and Emplacement Methodology

5.7.1. Overall methodology

Spoil material will be screened and tested within the Ravine Bay PSE area to confirm it meets placement specifications (refer to table 5-3).

Following testing and validation, rockfill material will be loaded onto trucks and delivered to the emplacement location. Rockfill material will be tipped from trucks into a stockpile located near the foreshore and a long reach excavator, standard excavator, dozer or loader will place the material into the reservoir, as close as possible to the natural ground until the final profile is achieved and the platform's top surface is above water level. Production rates in the order of 500-1,200 m^3 per day

are to be expected. Environmental monitoring will be undertaken during the emplacement works as detailed in Section 7.

The placement of material will be undertaken as a gradual staged approach owing to the overall depth of the reservoir bed in the footprint of the rock platforms. Initially excavation of unsuitable material (soil, organic, and muddy or loose soil) within the placement zone will be completed, to expose rock in the dry zone. Removal of unsuitable material within the dry zone only (as defined in the design) will be undertaken as far as practicable from the shore or from previously placed rock. An inspection will then be undertaken to confirm design requirements for rockfill placement are met. Once the ground conditions are considered suitable for rockfill placement, the next phase of rock placement will begin.

The unsuitable material excavated will be loaded by the excavator on the ADTs and sent to the spoil area for disposal in accordance with the Spoil Management Plan (S2-FGJV-ENV-PLN-0019).

As works progress, the rockfill would be used as an access platform above the water level, aiding the compaction process. When the required extents of the rockfill have been achieved, the remaining rockfill material would be placed and compacted above the FSL.

Estimated volume of rockfill material to be placed is approximately 50,000 m^3 with the breakdown as per Table 5-4 below. An error factor of approximately 10% has been applied to the total volumes required for each of the platforms to allow for potential discrepancies between the real vs modelled ground profile and designed vs as built rockfill profile). The volumes expressed in Table 5-4 should be seen as a conservative volume of material.

Table 5-4 Estimated Rock Fill Volumes

Location	Platform Volume (m^3)
Northern Rockfill Embankment	26,542
Southern Rockfill Embankment	18,870
Northern Embankment Gravel Fill	248
Southern Embankment Gravel Fill	200
Total	**45,860**

5.7.2. Trial Methodology

Prior to full construction of the rockfill platforms, an emplacement field trial will be conducted to confirm suitability and effectiveness of control measures.

Approximately 5,000 cubic meters of rockfill will be placed in the reservoir at the northern rockfill platform location for this trial as shown below.

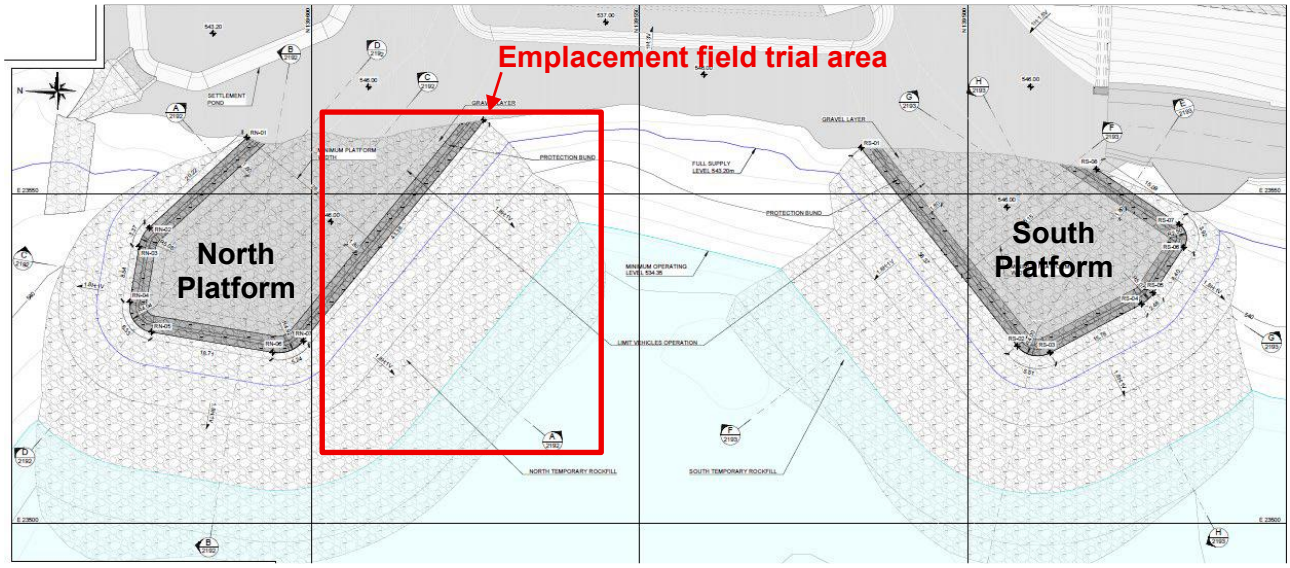


Figure 5-4 Emplacement field trial location

A 5,000m^3 spoil screening trial has been undertaken at Ravine Bay Spoil area with the proposed rockfill material sampled following processing.

- Geotechnical testing: Four samples were taken to analyse the PSD against design requirements presented in Appendix A and proposed methodology presented in Section 5.3. Results are in line with design requirement, with coarser material being produced and most of the fines being removed from the material.
- Geochemical testing: Thirty (30) samples of the material were obtained over a range of particle sizes representative of material to be placed as part of the Talbingo Rock Platform (20mm, 50mm, 100mm, 200mm and 400mm). The sampling density exceeds that listed in Section 5.4.3. The analytical results obtained are comparable with that used in the modelling undertaken by GHD in Reservoir Intake Spoil Emplacement (S2-GHD-TEC-MEM-0026), meaning that the input concentrations used for the nutrient load assessment are still representative.

The trial will be carried out during day shifts, under environmental supervision and will consist of the following steps:

a) Processed material during the screening trial will be analysed and provided with a material permit before the material is transported to the intake and placed in the reservoir.

b) Ensure environmental controls, including a double-layered silt curtain and monitoring buoys, are properly installed around the area of the trial.

c) The work area will be cleared of any obstructions.

d) Pre-clearance ecological survey and issue of the aquatic disturbance permit.

e) The work area will be surveyed, clearly marked, and fenced if required.

f) Removal of vegetation in the dry zone where the trial is to be conducted.

g) If required, tree extraction or laying down with long reach excavator as far as practicable.

h) Removal of topsoil, organic and unsuitable materials (muddy or loose soil) in the dry zone at the trial location.

i) Haul processed material with appropriate material permit from Ravine Bay to Talbingo Intake at the location of the trial.

j) Tipping material at the foreshore near the emplacement area.

k) Place the material in the reservoir using long reach excavator, standard excavator, dozer or loader, as close as possible to the natural ground.

l) Water quality will be monitored for the duration of the trial, as described in Section 5.7.3..

Daily environmental inspections and water quality monitoring will occur as described in Section 5.7.3 and Section 7 during the trial period and will be documented in a weekly environmental report.

Data collected during the trial will be used to assess that environmental effects are temporary, localised, and within acceptable limits, providing a robust dataset for environmental reporting and management. Lessons learnt collected during the trial will be implemented into the methodology for the remaining construction of the rockfills.

Pending a successful trial and subsequent approval of the Validation Report and Site-Wide Water Balance by the Department of Planning, Housing and Infrastructure (DPHI), construction of the full platforms will commence. Filling operations will proceed continuously, provided that established environmental thresholds are maintained. Should the trial indicate that adjustments are necessary, the methodology and associated controls will be re-evaluated in consultation with the stakeholder agencies.

5.7.3. Trial Emplacement Water Monitoring

The primary objective underpinning the proposed water quality monitoring program is to identify and quantify any possible impacts to the receiving water body and associated ecosystem resulting from placement activities. To do this, the Project will monitor the conditions within target locations considered representative of ambient conditions within the receiving water body, conditions at the point of disturbance and those further downgradient.

The monitoring program will span the duration of the trial and include a combination of visual site inspections, real-time multiparameter analyte monitoring (via monitoring buoys) and NATA-accredited laboratory analytical review. Following the completion of the trial, the results of the monitoring program will form the validation document, which is to be issued to relevant stakeholders agencies and approved by the Department of Planning, Housing and Infrastructure (DPHI).

Sampling will be conducted at strategic locations surrounding the works at upstream, within the work zone (inside the innermost silt curtain), and downstream for the duration of the trial. These locations were selected based on their representative characteristics, an assessment of safety requirements and logistical feasibility. Given that access to the selected sampling locations near the spoil emplacement trial area is only accessible via the Talbingo Reservoir, the sampling will be performed via vessel.

Throughout the trial phase, comprehensive water monitoring will be conducted twice a week during spoil emplacement activities, and these results will be reported to the relevant stakeholders, with a primary focus on the parameters listed in Table 5-6.

Table 5-5 Sample Locations

Sample location	Sample ID	Monitoring Type	GPS coordinates
Upgradient from the outermost silt curtain, above gradient to any potential trial-related impacts.	MB_US	Real-time data logging via a monitoring buoy. Comprehensive sampling and visual inspection.	35.772 S 148.378 E
Within Work Zone – inside the innermost silt curtain	Work zone	Comprehensive sampling. Visual inspection.	35.769 S 148.375 E
50m downgradient from the outermost silt curtain.	MB_DS	Real-time data logging via a monitoring buoy. Comprehensive sampling. Visual inspection.	35.769 S 148.373 E
Downgradient from the outermost silt curtain.	EPL107	Comprehensive sampling and visual inspection.	35.760 S 148.365 E

Figure 5-5 Sample Locations

Figure 5-6 Sample Locations

The monitoring parameters for the sampling locations are summarized in Table 5-6 below. This suite includes both in-situ measurements and NATA-accredited laboratory analyses. It is important to highlight that these parameters have been chosen according to our Environmental obligations.

Table 5-6 Analytical Suite

in-situ measurements	
Parameter	Units
Turbidity	NTU
pH	-
Electrical conductivity	µS/cm
Dissolved Oxygen	% saturation
Temperature	°C
Redox Potential	mV
Nitrate (as N)	mg/L
Laboratory Analysis	
Total suspended solids	mg/L
Ammonia as N	mg/L
Nitrite + Nitrate as N (NOx)	mg/L
Nitrogen Total	mg/L
Nitrate (as N)	mg/L
Nitrite (as N)	mg/L
Reactive Phosphorus	mg/L

Phosphorus (Total)	mg/L
Cyanide Total	mg/L
Oil and Grease	mg/L
Aluminium (dissolved)	mg/L
Arsenic (dissolved)	mg/L
Chromium (III+VI) (dissolved)	mg/L
Copper (dissolved)	mg/L
Iron (dissolved)	mg/L
Lead (dissolved)	mg/L
Manganese (dissolved)	mg/L
Nickel (dissolved)	mg/L
Silver (dissolved)	mg/L
Zinc (dissolved)	mg/L
Biochemical Oxygen Demand	mg/L
Chlorophyll A	mg/L
Faecal Coliforms	CFU/100mL

5.7.4. Reporting

Upon completion of the trial and data collection, FGJV and SHL will submit a written report to DPHI. This report will include:

- Process Description: Details of the screening and rinsing methods used for the spoil material.
- Testing Results: Full geotechnical and geochemical analysis of the material, plus water quality data from both inside and outside the silt curtain.
- Ecological Advice: A statement from an aquatic ecologist confirming that full-scale placement is unlikely to cause toxic nitrogen levels or algal blooms, accounting for cumulative project impacts.
- Continuous Improvement: Lessons learned and proposed refinements to the methodology to ensure all environmental thresholds are met during full-scale work.

Note: The specific operational procedures detailed in Sections 5.7.3 and 5.7.4 apply exclusively to the Trial Spoil Emplacement phase. Transition to full-scale emplacement is contingent upon DPHI approval of the Trial Completion Report. Once approved, works will proceed in accordance with the broader management measures and any methodology refinements identified during the trial period.

5.8. Removal Methodology

The temporary rockfill would stay in place until the slope supports (micropiles) are completed and then may be removed partially by land-based equipment or removed in accordance with the Dredging Management Plan (under development).

Removal of the Temporary Rockfill is anticipated to commence after approximately one year; however, the timeframe is contingent upon the procurement and availability of a suitable contractor and may be extended accordingly:

- Dry Areas: Rockfill will be removed using a long-reach excavator, in reverse order of placement, with the environmental controls and monitoring in place
- Wet Areas: Remaining rockfill will be excavated during the marine works phase (Q2 2027), managed under the Dredging Management Plan.

6. ENVIRONMENTAL MANAGEMENT MEASURES

6.1. Management Measures

A range of environmental requirements and control measures are identified in the Main Works EIS, Submissions Report and the Infrastructure Approval. Safeguards and management measures will be implemented to avoid, minimise or manage impacts from in-reservoir emplacement. This environmental best practice will be commensurate with the sensitive receiving environment of Kosciusko National Park. This includes implementing environmental controls to adhere to the National Water Quality Framework and NSW Water Quality Objectives aiming to restore or maintain the relevant environmental values and have no change in biodiversity beyond natural variability for both physical and chemical stressors within Kosciusko National Park.

Specific safeguards and management measures to address in-reservoir emplacement impacts of the project are identified in Table 6-1. These have been sourced from several other plans of relevance and retain the unique ID as detailed in the source document.

Table 6-1: Temporary sub aqueous emplacement management measures

ID	Measure / Requirement	When to implement	Responsibility	Source document
General				
SE01	Training will be provided to all project personnel, including relevant sub-contractors on emplacement management practices and the requirements of this plan through inductions, toolbox talks and targeted training.	Pre-construction	FGJV	Good practice
SM02	Management measures from this plan will be included in relevant site environmental documents including for example, Work Packs and/or Site Environmental Plans (SEPs).	Pre-construction	FGJV	Good Practice
Aquatic habitat				
AqH02	In the event that threatened species or endangered ecological communities are identified during construction the Threatened Aquatic Species Relocation Procedure included in Appendix A of the AqHMP will be followed.	Construction	FGJV	MW REMM AE01
AqH03	In the event of the discovery of any fish kills within or adjacent to the work area, DPI Fisheries are to be notified in accordance with Appendix D of the AqHMP. As required by Section 7.2 of the EMS, DPHI are to be notified in writing immediately after SHL becomes aware of an incident.	Construction	FGJV SHL	MW REMM AE01
AqH04	Prior to works commencing within shallow parts of the construction envelope such as Talbingo Reservoir, Yarrangobilly River and Wallace Creek, an ecologist will inspect the areas for Murray Crayfish as detailed in Section 5.1. If found, Murray crayfish will be translocated to adjacent habitats away from impacts in accordance with the translocation procedure included in Appendix A of the AqHMP. Semi-aquatic species, such as frogs, if found are to be managed in accordance with the Biodiversity Management Plan.	Pre-construction / Construction	FGJV SHL	MW REMM AE01
AqH05	Prior to works commencing, an ecologist will conduct a survey to document aquatic habitat condition and presence of threatened aquatic species in and surrounding the approved disturbance areas as detailed in Appendix B of the AqHMP.	Construction	FGJV SHL	MW REMM AE01 EW REMM ECO15
Spoil characterisation				
SM03	The spoil characterisation program in Appendix A of the Spoil Management Plan will be implemented. The program will enable adequate assessment of contaminated materials, NOA, acid metalliferous drainage (AMD)/neutral metalliferous drainage (NMD)/saline drainage (SD) material, and reduce the risk of material being misclassified as 'benign' and being managed inappropriately.	Construction	FGJV	Schedule 3 Condition 4 EW REMM CON02
SM05	Material which has been assessed as not suitable for reuse on land or for temporary subaqueous disposal or cannot be reused will be classified in accordance with the *Waste Classification Guidelines* (NSW EPA 2014).	Construction	FGJV	MW REMM CONTAM04 EW REMM CON03

ID	Measure / Requirement	When to implement	Responsibility	Source document
Spoil handling and management				
-	Where exceedances of nitrogen levels in spoil material occur, spoil rinsing will be undertaken until the criteria is met as per Section 5.4.2.	Construction	FGJV	Best practice
SM08	Spoil is to be only re-used, placed or disposed of in accordance with its classification as set out in Section 6.1 of the Spoil Management Plan (S2-FGJV-ENV-PLN-0019).	Construction	FGJV	Schedule 3 Condition 4
SM09	Apart from the spoil that is provided to the NPWS for use in other parts of the Kosciuszko National Park, sent off-site, used to construct temporary or permanent infrastructure for the development or used to rehabilitate the site, the Proponent must ensure that all the spoil generated by the development is disposed of in the following emplacement areas: • Ravine Bay; • GFO 1; • Lobs Hole; • Tantangara; or • Rock Forest.	Construction	FGJV SHL	Schedule 3 Condition 5
SM10	TBM spoil must not be placed in the active storages or below the full supply level of either the Talbingo Reservoir or Tantangara Reservoir without the approval of the Planning Secretary.	Construction	FGJV	Schedule 3 Condition 4
SM11	Spoil from dredging, channel excavation or underwater blasting must not be placed in the eastern and western emplacement areas, or in the active storages or below the full supply level of either the Talbingo Reservoir or Tantangara Reservoir without the approval of the Planning Secretary.	Construction	FGJV	Schedule 3 Condition 4
SM21	The Waste Management Plan (S2-FGJV-ENV-PLN-0048) will be implemented to ensure appropriate classification, use and disposal of waste from the project.	Construction	FGJV	MW REMM CONTAM04 EW REMM CON03
SM22	Material which is not suitable for reuse or placement or on onsite remediation, will be transported to a facility that is lawfully permitted to receive that material.	Construction	FGJV	EW REMM CON03
SM23	The Stockpile Procedure (Appendix C of the Spoil Management Plan) will be developed to ensure temporary stockpiling is appropriately managed and that any adverse impacts are controlled and rectified.	Construction	FGJV	Schedule 3 Condition 7 EW REMM CON02
SM24	The Surface Water Management Plan (S2-FGJV-ENV-PLN-0011) will be implemented to ensure impacts on surface waters as a result of spoil handling and placement are minimised.	Construction	FGJV SHL	Schedule 3 Condition 4

ID	Measure / Requirement	When to implement	Responsibility	Source document
SM38	The monitoring in Section 9 of the Spoil Management Plan will be implemented to identify and track the performance of: • the management of spoil on site; • the implementation of each of the detailed plans, including the effectiveness of the proposed mitigation and contingency measures; and • progress against the detailed completion criteria and performance indicators of each permanent spoil emplacement area.	Construction	FGJV	Schedule 3 Condition 7
SM39	Monitoring measures to be included as part of the Surface and Groundwater Monitoring Program, to monitor potential impacts from the placement of spoil.	Construction	FGJV	EW REMM CON02
Stormwater management				
SW03	Works will minimise erosion and the generation and dispersion of sediment using suitable controls in accordance with the relevant requirements in the *Managing Urban Stormwater: Soils and Construction guidance series*	Construction	FGJV	Schedule 3 Condition 30(f)
SW04	An Erosion and Sediment Control Plan (ESCP) will be prepared for each construction area. Each ESCP will: • apply the methods and principles provided in Managing Urban Stormwater: Soils and Construction: o Volume 1 – Soils and construction (Landcom 2004); and/or o Volume 2A – Installation of services (DECC 2008); and/or o Volume 2C – Unsealed roads (DECC 2008);	Construction	FGJV	Schedule 3 Condition 30(c)
SW11	Stockpiles will be managed in accordance with the Spoil Management Plan (S2-FGJV-ENV-PLN-0019)	Construction	FGJV	Schedule 3 Condition 7
SW19	Where possible, stockpiles will be located where they are not exposed to concentrated of flood flow. Flood flow is defined as the 20% Annual Exceedance Probability (AEP) flood event.	Construction	FGJV	Schedule 3 Condition 30(d)
Works on waterfront land and instream works				
SW51	Unless permitted by this approval, avoid carrying out of any development within 40 metres of any watercourse	Construction	FGJV	Schedule 3 Condition 30(h)
SW52	All instream works or development within 40 metres of any watercourse will be undertaken generally in accordance with the requirements in the Guidelines for Controlled Activities on Waterfront Land	Construction	FGJV	Schedule 3 Condition 30(i)
SW55	The disturbance area and extent to which soil and vegetation within the riparian zone are disturbed will be minimised where practicable.	Construction	FGJV	Project requirement

ID	Measure / Requirement	When to implement	Responsibility	Source document
SW56	Direct access to the rivers and creeks by construction vehicles and mechanical plant will be minimised and permitted only within the limits of clearing and designated areas of disturbance	Construction	FGJV	Project requirement
Monitoring				
SW66	A Surface Water Monitoring Program has been developed and is included in this plan. The Surface Water Monitoring Program (Annexure A) establishes monitoring requirements to assess the quality of discharge and receiving waters	Construction	FGJV	MW REMM WM02 EW REMM ECO15
SW70	Rainfall forecasts will be monitored daily and the works planned, and the site works managed to minimise the potential impact of heavy rainfall and flood events. Prior to heavy rain events erosion and sediment controls will be reviewed and improved where necessary to minimise impacts.	Construction	FGJV	Blue Book Good Practice
SW72	A Trigger Action Response Plan provides detail of the response actions that will be implemented in the event of an exceedance. This plan will be implemented.	Construction	FGJV	Schedule 3 Condition 31(c)

7. COMPLIANCE MANAGEMENT

7.1. Inspection

Daily environmental inspections will be conducted throughout spoil emplacement activities. In the event that any scenario outlined in Section 7.2.3 is observed, Trigger Action Response Plan (TARP) will be activated immediately (more details provided in Appendix B – TARP).The environmental or trained members of the construction team will undertake daily inspections, where erosion, sediment controls and water surface water quality will be assessed.

- Erosion and sediment control inspection: The Construction Team will partake in erosion and sediment control training provided by a third-party specialist, and specific training by the Environmental Team on the environmental controls in place and equipped to recognise potential issues, including signs of failure or compromise. The trained personnel will conduct the ERSED inspections to evaluate their compliance and effectiveness according to the Plan (PESCP). Any concerns or required improvements will be immediately raised with the construction and environment site teams for record and prompt action. The key items for assessment include:
    - The installation of rock, mulch and earth bunds
    - The integrity and placement of sediment fencing
    - The proper designation of “no-go zones” to minimize ground disturbance
    - The establishment and stabilization of stockpile areas
    - The correct deployment of silt curtains
- Water quality: Daily visual observation will be carried out. In this part of the inspection, colour and odour are the principal targets to be evaluated. If there is any significant change, such as a visible sediment, oil or grease, the Environmental Coordinator will be notified, and a TARP will be activated. It is important to note that the reservoir has algae bloom activity during different seasons of the year, and consequently, watercolour is expected to change. All changes will be subject to a comprehensive assessment and documented by a suitably qualified person.

The results of these inspections will be documented in the weekly environmental report (e.g., pictures and/or comments).

7.2. Monitoring

7.2.1. Background monitoring

Water quality will continue to be monitored for the duration of construction in accordance with the requirements of the EPL and the Surface Water Monitoring Program (S2-FGJV-ENV-PLN-0017). Table 7-1 identifies all the surface water sampling locations, including the additional background monitoring location that will be established for the duration of the works.

This additional background monitoring location has been included to characterise water quality parameters within the silt curtain and ensure this remains consistent with GHD's predicted conditions.

Figures 7.2 and 7.3 outline the locations of surface water sampling program.

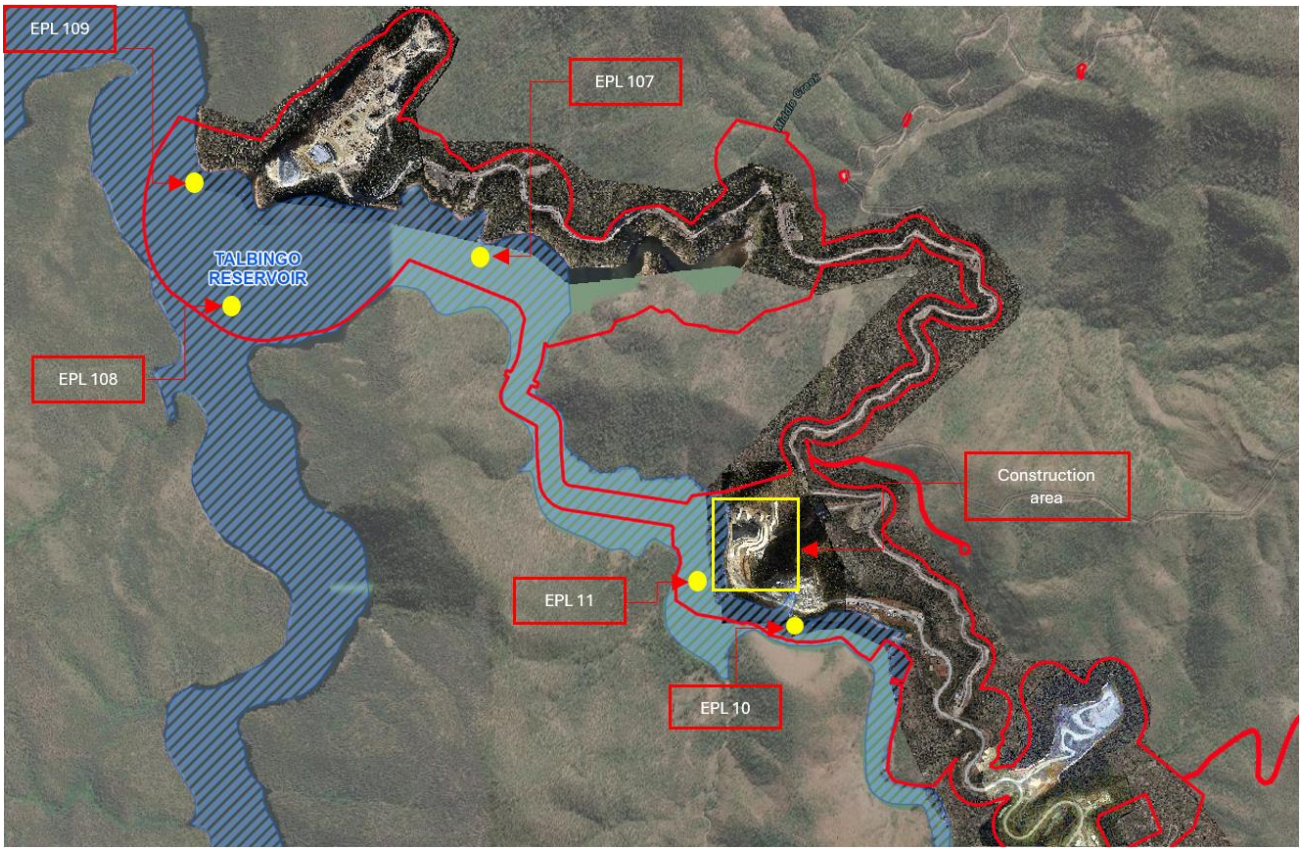


Figure 7-1 Surface water sampling locations

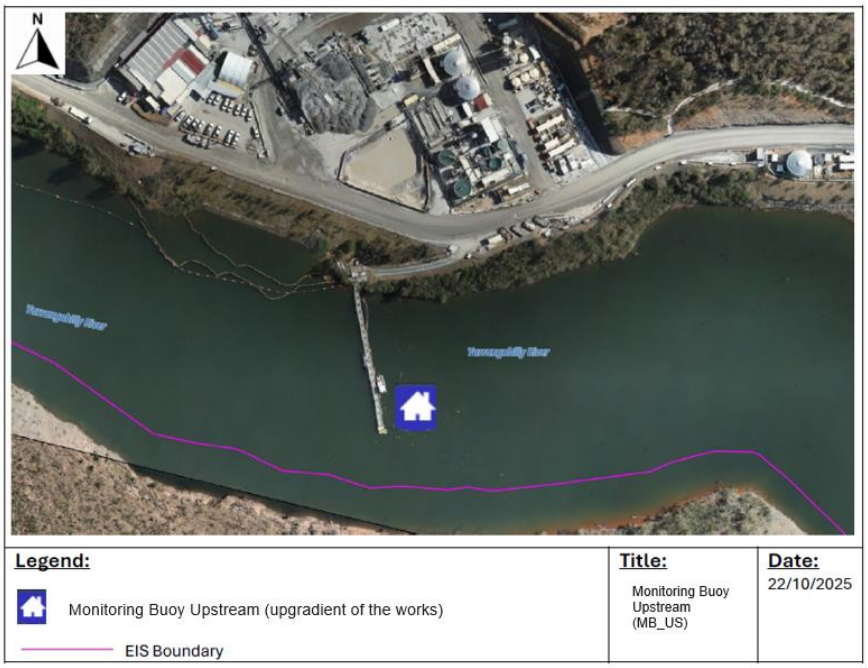


Figure 7-2 Upstream Monitoring Buoy Location

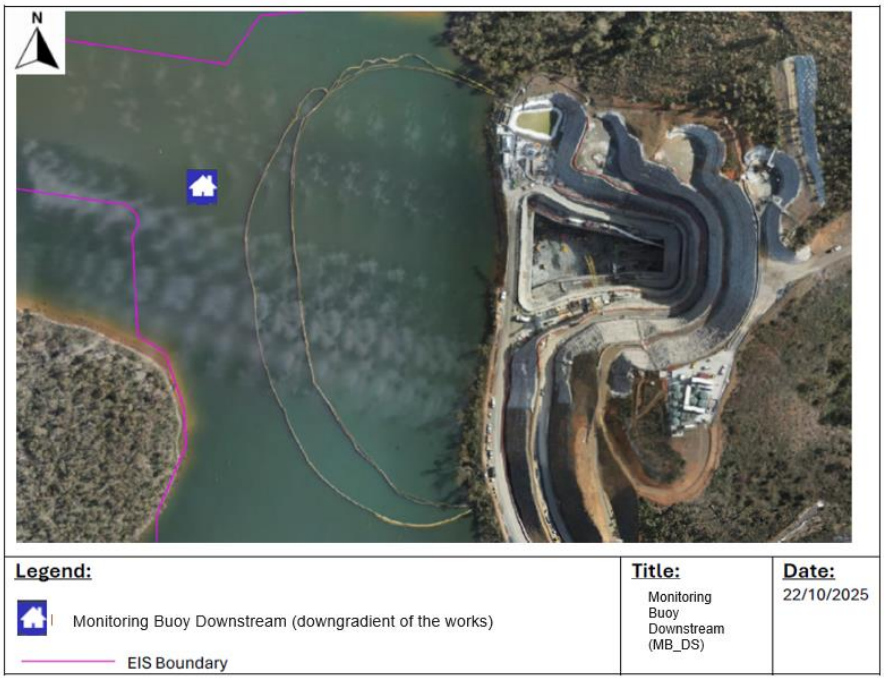


Figure 7-3 Downstream Monitoring Buoy Locations and Silt Curtain

Table 7--1: Surface Water Sampling Locations

Sample location	Sample ID	EPL	GPS coordinates
Downstream	EPL109	EPL 109	-35.7575076 148.3524600
Downstream	EPL108	EPL 108	-35.762692 148.355537
Downstream	EPL107	EPL 107	-35.760429 148.365751
Work Zone (within silt curtain)	Work Zone	Location to be installed and decommissioned for placement works only	-35.769373 148.375104 *Location subject to change following Validation works
Upstream	EPL 11	EPL 11	-35.771 148.375
Upstream	EPL 10	EPL 10	-35.773 148.38
50m Downgradient of Work Zone	MB_DS	Location to be installed and decommissioned for placement works only	-35.769 148.373
Upstream of Work Zone	MB_US	Location to be installed and decommissioned for placement works only	-35.772 148.378

The Water Quality Trigger (WQT) values were based on the FGJV historical data of the monthly EPL sampling from January 2021 to May 2025. The WQT for receiving waters 50 metres downstream of the outermost silt curtain are shown in Table 7-2.

In addition to the triggers noted in Table 7-2, continuous monitoring will be undertaken by telemetry monitoring equipment, installed at Monitoring Buoy locations (MB_US and MB_DS) at both upstream and downstream of the emplacement location.

The current EPL trigger values have been adopted as the default values; however, water quality in the Talbingo Reservoir is known to vary significantly with seasonal conditions. To account for the natural variability, a 10% threshold increase from ambient water quality is applied. Specifically, if real-time telemetry from the reservoir indicates that ambient water quality is already exceeding the EPL trigger value, a further 10% increase above the current ambient conditions is required before the trigger is activated.

Note there are no WQT's for within the innermost silt curtain.

Table 7-2: Physiochemical WQT

Parameter	Current WQT Value	Water Quality Trigger
Turbidity (NTU)	20	Current WQT value and + 10% of current ambient water quality if WQT is being exceeded in ambient water quality.
pH	6.5 - 8	Trigger is activated if downgradient (MB_DS) water quality sits outside Trigger Value Range and above gradient (MB_US) remains within. If ambient pH is reported outside WQT, the trigger is not activated.
Electrical conductivity (µS/cm)	30	Current WQT value and + 10% of current mean ambient water quality if WQT is being exceeded in ambient water quality
Dissolved oxygen (% saturation)	90 - 110	Trigger is activated if downgradient (MB_DS) water quality sits outside Trigger Value Range and above gradient (MB_US) remains within. If ambient DO is reported outside WQT, the trigger is not activated.
Temperature (°C)	No water quality objective	No water quality objective
Redox potential (mV)	No water quality objective	No water quality objective
Visible oil/grease	No visible oil/grease	Not detected
Nitrate (mg/L)	1	Current WQT value and + 10% of current mean ambient water quality if WQT is being exceeded in ambient water quality
Algal development	Observation Only	No water quality objective

Note: Ambient water quality represents the most recent comprehensive and real time monitoring results recorded from MB_US and EPL10 respectively.

7.2.2. Monitoring During Placement

Review and monitoring of water quality and controls will be undertaken during in-reservoir emplacement of rockfill material. The following will be recorded and communicated to, or where feasible, undertaken with the site Environmental Team daily:

- Work zone inspections. Inspections to include records of curtain condition and effectiveness, the inspection of marine oil and grease spill kits and other such controls. Must be supported by submerged and aerial drone inspections.
- Comprehensive monitoring of a location 50 m downstream of the outermost silt curtain to be located at an appropriate depth
- In-situ water quality monitoring via continuous, telemetry monitoring to be installed in appropriate locations across the work zone

The proposed frequency of the above activities are as follows:

- 24 hours prior to first related activity.
- Throughout the duration of the works at appropriate intervals as per Section 7.1.
- 24 hours after works conclude

- Upon triggering of TARP

Real-time monitoring through buoys will be conducted during the work duration. These buoys have been installed above and below the impact zone (MB_US and MB_DS) to determine both ambient conditions and measure potential impacts. The analytes and frequency specifications are as follows:

- **Analytes:** pH, EC, REDOX, temperature, DO, turbidity, nitrate and Chlorophyll-a.
- **Frequency:** Data provided every 30 minutes.

The following table shows the water quality monitoring details during the full-scale spoil emplacement:

Table 7-3 Water Quality Monitoring

Location	Monitoring Type	Purpose	Monitoring Frequency	Analytes
EPL 109 – Downgradient / Outside silt curtain	Grab	Background	Monthly	In situ Turbidity, pH, Electrical conductivity, Dissolved Oxygen, Temperature, Redox Potential and Nitrate (as N). Laboratory Analysis Total suspended solids, Amoni as N, Nitrite + Nitrate as N (NOx), Nitrogen Total, Nitrate (as N), Kjeldahl Nitrogen Total, Nitrite (as N), Reactive Phosphorus, Phosphorus (Total), Cyanide Total, Oil and Grease, Aluminium (dissolved), Arsenic (dissolved), Chromium (III+VI) (dissolved), Copper (dissolved), Iron (dissolved), Lead (dissolved), Manganese (dissolved), Nickel (dissolved), Silver (dissolved), Zinc (dissolved), Biochemical Oxygen Demand, Chlorophyll A1 and Faecal Coliforms
EPL 108 – Downgradient / Outside silt curtain	Grab	Background	Monthly	
EPL 107 – Downgradient / Outside silt curtain	Grab	Background	Monthly	
Location to be installed and decommissioned for placement works only – (inside the silt curtain)	Grab	Background	Monthly	
EPL 11 – Upgradient / Outside silt curtain	Grab	Background	Monthly	
EPL 10 – Upgradient / Outside silt curtain	Grab	Background	Monthly	In situ Turbidity, pH, Electrical conductivity, Dissolved Oxygen, Temperature, Redox Potential and Nitrate (as N). Laboratory Analysis Total suspended solids, Amoni as N, Nitrite + Nitrate as N (NOx), Nitrogen Total, Kjeldahl Nitrogen Total, Nitrate (as N), Nitrite (as N), Reactive Phosphorus, Phosphorus (Total), Cyanide Total, Oil and Grease, Aluminium (dissolved), Arsenic (dissolved), Chromium (III+VI) (dissolved), Copper (dissolved), Iron (dissolved), Lead (dissolved), Manganese (dissolved), Nickel (dissolved), Silver (dissolved), Zinc (dissolved), Biochemical Oxygen Demand, Chlorophyll A1 and Faecal Coliforms,
Monitoring Buoy Upstream (above gradient of the works)	Continuous	Compliance against TARP	Real-time	pH, EC, REDOX, temperature, DO, turbidity, nitrate and Chlorophyll-a
	Grab	Background	Monthly	In situ Turbidity, pH, Electrical conductivity, Dissolved Oxygen, Temperature, Redox Potential and Nitrate (as N). Laboratory Analysis

Location	Monitoring Type	Purpose	Monitoring Frequency	Analytes
				Total suspended solids, Amoni as N, Nitrite + Nitrate as N (NOx), Nitrogen Total, Kjeldahl Nitrogen Total, Nitrate (as N), Nitrite (as N), Reactive Phosphorus, Phosphorus (Total), Cyanide Total, Oil and Grease, Aluminium (dissolved), Arsenic (dissolved), Chromium (III+VI) (dissolved), Copper (dissolved), Iron (dissolved), Lead (dissolved), Manganese (dissolved), Nickel (dissolved), Silver (dissolved), Zinc (dissolved), Biochemical Oxygen Demand, Chlorophyll A1 and Faecal Coliforms,
Monitoring Buoy Downstream (outside the silt curtain / downgradient of the works)	Continuous	Compliance against TARP	Real-time	pH, EC, REDOX, temperature, DO, turbidity, nitrate and Chlorophyll-a
	Grab	Background	Monthly	In situ Turbidity, pH, Electrical conductivity, Dissolved Oxygen, Temperature, Redox Potential and Nitrate (as N). Laboratory Analysis Total suspended solids, Amoni as N, Nitrite + Nitrate as N (NOx), Nitrogen Total, Kjeldahl Nitrogen Total, Nitrate (as N), Nitrite (as N), Reactive Phosphorus, Phosphorus (Total), Cyanide Total, Oil and Grease, Aluminium (dissolved), Arsenic (dissolved), Chromium (III+VI) (dissolved), Copper (dissolved), Iron (dissolved), Lead (dissolved), Manganese (dissolved), Nickel (dissolved), Silver (dissolved), Zinc (dissolved), Biochemical Oxygen Demand, Chlorophyll A1 and Faecal Coliforms,

Results from water quality monitoring will be recorded as part of the monitoring reports. Where water quality monitoring detects an exceedance of the WQT (see Table 7-2) the appropriate Trigger Action Response Plan will be implemented (refer to Section 7.2.3).

If an algae bloom is observed near the work area, controls will be reviewed, and the situation will be assessed. The root cause will be investigated, and if it is related to placement activities, work will be stopped.

7.2.3. Trigger Action Response Plan

The Trigger Action Response Plan included as Appendix B will be implemented in the following scenarios:

- Scenario 1: Daily water quality monitoring indicates the in-situ parameters vary from ambient conditions in a manner consistent with potential works related impact.

- Scenario 2: Impacted water is observed migrating from the work zone.
- Scenario 3: Within Work Zone monitoring exceeds criteria.

7.3. Training

All site personnel will undergo site induction training relating to in-reservoir emplacement including surface water quality, erosion and sediment controls and threatened species and aquatic habitat protection management issues.

The induction training will address elements related to in-reservoir emplacement management including:

- Relevant legislation
- Roles and responsibilities for in-reservoir emplacement management
- In-reservoir emplacement mitigation and management measures.
- Unexpected finds procedures
- Aquatic biodiversity and Habitat protection
- Training exercises for activities such as deployment of marine booms etc.,
- Erosion and sediment controls

Targeted training in the form of toolbox talks or pre-start briefs will also be provided to personnel with a key role in in-reservoir emplacement. Further details regarding the staff induction and training are outlined in Section 5 of the EMS.

7.4. Incidents

Incidents will be managed in accordance with Section 7 of the EMS (S2-FGJV-ENV-PLN-0007).

Incidents related to Murray and Rieks Crayfish will be managed per Section 6.3 of the Aquatic Habitat Management Plan (S2-FGJV-PLN-0009).

As required, DPHI and other relevant agencies will be notified of incidents as detailed within Section 7.2 of the EMS (S2-FGJV-ENV-PLN-0007) and section 6.3 of the Aquatic Habitat Management Plan (S2-FGJV-PLN-0009).

7.5. Auditing

Audits will be undertaken to assess the effectiveness of the management measures and compliance with this TRPMP. Audit requirements are detailed in Section 8.3 of the EMS.

7.6. Reporting

Reporting will include monthly internal project reports. Reporting requirements and responsibilities are documented in Section 8.4 of the EMS.

To ensure a rapid and effective response to environmental issues, a multi-faceted communication and awareness strategy will be implemented.

- **On-Site Signage:** An environmental team sign, clearly detailing contact information, will be posted in all work areas for immediate reference.
- **Toolbox Briefings:** All site personnel will receive a comprehensive briefing during toolbox talks. This training will focus on the identification of potential erosion and sediment control issues and the immediate response required for any visible plumes in the reservoir.

- **Tiered Communication Protocol:** All teams will be trained on the established communication protocol. Any environmental observation must be immediately escalated to the on-site supervisor. The supervisor is then responsible for promptly notifying the site environmental team to ensure a swift and coordinated response and the activation of the Trigger Action Response Plan (TARP) if necessary.

Spoil data will be attached to FGJV Internal Data Management (GLASS), with analytical results available in ESDAT.

APPENDIX A – PARTICLE DISTRIBUTION CHART

GENERAL NOTES:

1. THESE GENERAL NOTES APPLY TO TALBINGO INTAKE ROCKFILL EMBANKMENTS.
2. THE TYPICAL DRAWINGS SHALL BE READ IN CONJUNCTION WITH RELATED REPORTS, SPECIFICATIONS NOTED BELOW, THE QUALITY ASSURANCE DOCUMENTATION, AND WITH OTHER SUCH WRITTEN INSTRUCTION THAT MAY BE ISSUED DURING THE COURSE OF THE PROJECT.
3. ALL DIMENSIONS, CHAINAGES, COORDINATES, LEVELS, METERAGES AND STATIONS ARE IN METERS (m) UNLESS NOTED OTHERWISE.
4. LEVELS ARE REFERRED TO AUSTRALIAN HEIGHT DATUM (AHD).
5. COORDINATES ARE EXPRESSED ON MAP GRID AUSTRALIA SSGL2020 UNLESS SPECIFIED OTHERWISE.
6. DRAWINGS ARE TO SCALE UNLESS NOTED OTHERWISE, REFER TO THE SPECIFIC DESIGN LOT FOR ACTUAL DIMENSIONS.
7. ALL DIMENSIONS, LOCATIONS, ORIENTATIONS AND LEVELS RELEVANT TO SETTING OUT SHALL BE VERIFIED BY THE CONTRACTOR BEFORE ANY WORK OF CONSTRUCTION OR FABRICATION COMMENCES.
8. THE NOTES ON SPECIFIC DRAWINGS / DOCUMENTS SHALL TAKE PRECEDENCE OVER THESE GENERAL NOTES.
9. WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH THE RELEVANT CURRENT AUSTRALIAN STANDARDS, INCLUDING ALL AMENDMENTS AND LOCAL STATUTORY AUTHORITIES REGULATION, EXCEPT WHERE MODIFIED BY THE DRAWINGS AND / OR SPECIFICATIONS.
10. THE CONTRACTOR SHALL CONSTRUCT THE WORKS ACCORDING TO THE DESIGN DOCUMENTATION. WHERE THERE ARE AMBIGUITIES OR OMISSIONS IN THE DRAWINGS OR SPECIFICATIONS THE CONTRACTOR SHALL REFER TO THE DESIGNER.
11. THE GEOTECHNICAL MODEL ADOPTED IN THE DESIGN IS BASED ON AVAILABLE GEOLOGICAL DATA.
12. NO WORKS ARE TO OCCUR OUTSIDE OF THE ENVIRONMENTAL DISTURBANCE BOUNDARY WITHOUT THE APPROVAL OF THE EMPLOYER.

EMBANKMENT ROCKFILL:

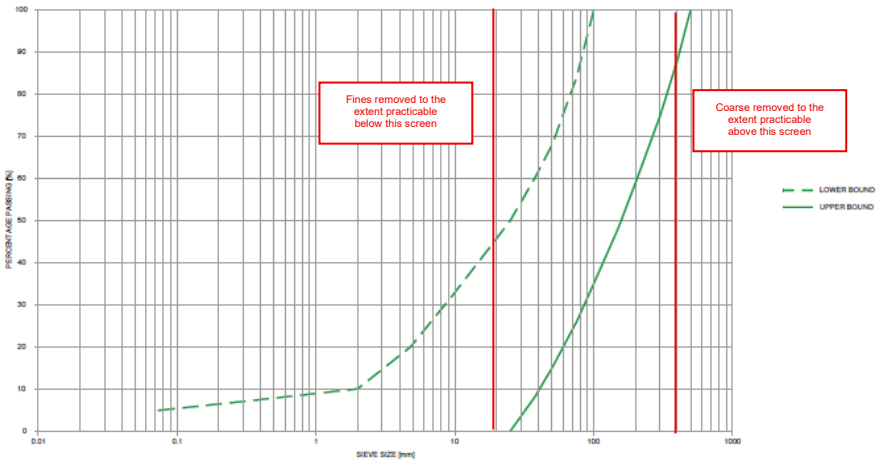
ALL ROCKFILL EMBANKMENTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CONSIDERATIONS INDICATED BELOW.

1. ROCKFILL SHALL CONSIST OF A MIXTURE OF HARD, ANGULAR, ROCK PARTICLES OF MODERATELY WEATHERED TO FRESH ROCK OBTAINED FROM REQUIRED DRILL AND BLAST EXCAVATIONS. IT SHALL BE FREE OF THE TOPSOIL, ORGANIC MATTER OR OTHER DEBRIS.
2. PARTICLE SIZE DISTRIBUTION SHALL BE AS SHOWN IN THE FOLLOWING TABLE.

SIEVE		PARTICLE SIZE DISTRIBUTION	
#	(mm)	LOWER BOUND % PASSING	UPPER BOUND % PASSING
200	0.075	5	-
10	2	10	-
4	4.76	20	-
3/8"	9.5	32	-
3/4"	19	45	-
1"	25	50	0
1 1/2"	37.5	60	8
2"	50	68	15
3"	75	84	26
-	100	100	35
-	150	-	48
-	200	-	59
-	300	-	75
-	400	-	88
-	500	-	100

3. FILL SHALL CONSIST OF A WELL-GRADED MIXTURE OF PARTICLES. IT SHALL BE FREE OF TOPSOIL, ORGANIC MATTER OR OTHER DEBRIS.
4. GRADING OF FILL SHALL BE SUCH THAT THE MATERIAL IS INTERNALLY STABLE, AND TO PREVENT SEGREGATION OF PARTICLES, A UNIFORMITY COEFFICIENT (D_{60}/D_{10}) OF C_u=20 SHALL BE CONSIDERED.
5. THE PERCENTAGE OF FINES PASSING THE No. 200 SIEVE CANNOT EXCEED 5%.
6. PARTICLE SIZE DISTRIBUTION MAY BE ADJUSTED, BASED ON THE OBTAINED MATERIAL, IN AGREEMENT WITH THE DESIGNER.
7. PERCENTAGE OF ≤100 mm FRACTION WITH I_{a50} < 1 MPa SHALL BE LESS THAN 10% (TEST METHOD T223).
8. TOP SOIL, ORGANIC AND UNSUITABLE MATERIALS (MUDDY OR LOOSE SOIL) SHALL BE REMOVED IN DRY ZONES.
9. IN DRY CONDITIONS, ABOVE WATER LEVEL, ROCKFILL SHALL BE PLACED IN LAYERS WITH MAXIMUM THICKNESS 500 mm AND COMPACTED BY MACHINE PASSES. UNDERWATER LEVEL, ROCKFILL SHALL BE LAUNCHED FROM THE SHORE.
10. COMPACTION SHALL BE A MINIMUM OF 5 VIBRATING SMOOTH ROLLER PASSES (VIBRATION FREQUENCY BETWEEN 1,400 AND 1,800 CYCLES/MIN, AND MINIMUM WEIGHT OF 50 kN/m).

ROCKFILL - GRAIN SIZE DISTRIBUTION



GENERAL GRAVEL FILL:

1. GENERAL GRAVEL FILL EMBANKMENTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH SURFACE EARTHWORKS SPECIFICATION S2-CIV-SF-GEN-SPC-5901 AND SPECIFICATION RMS R44 – EARTHWORKS, WITH THE CONSIDERATIONS INDICATED BELOW:
   - BE WELL GRADED.
   - HAVE A SOAKED CBR GREATER THAN 30%.
   - PARTICLE SIZE LIMITATION AND PREPARATION OF ROCK IN EARTH FILL MATERIAL ARE GIVEN IN THE FOLLOWING TABLE:

MAXIMUM LAYER THICKNESS (mm)	MINIMUM ROCK QUANTITY (BY VOLUME)	MAXIMUM PARTICLE DIMENSION (mm)	% MASS PASSING 37.5mm AS SIEVE (BY MASS)
300	Not specified	200	> 60%
500	25% > 200mm	300	> 60%

CONSTRUCTION SEQUENCE:

1. DURING THE INITIAL STAGES OF CONSTRUCTION, FOR ALL ROCKFILL PLACED UNDERWATER, ROCKFILL MATERIAL MAY BE DUMPED FROM A TRUCK OR FRONT-END LOADER.
2. IN THE SECOND STAGE OF CONSTRUCTION, FOR ALL ROCKFILL LAYERS PLACED ABOVE WATER LEVEL AND IN DRY CONDITIONS, THE ROCKFILL CAN BE PREFERENTIALLY PLACED BY AN EXCAVATOR IN ORDER TO PROPERLY FORM THE SLOPE OF THE PLATFORM.

TRAFFICABLE ACCESS:

1. THE PLATFORM SHALL BE ACCESSIBLE FOR INSPECTION AND MAINTENANCE.
2. THE PLATFORM SHALL BE COVERED WITH AN UNSEALED ROAD COURSE (GRAVEL FILL), WITH A MINIMUM THICKNESS OF 300 mm.

REFERENCES:

- S2-CIV-IG-TBI-2190
- S2-CIV-IG-TBI-2191
- S2-CIV-IG-TBI-2192
- S2-CIV-IG-TBI-2193
- S2-CIV-SF-GEN-SPC-5901

FOR CONSTRUCTION

REV	DETAILS	DRN	CHK	FG APP	DATE
01	ISSUED FOR CONSTRUCTION	F.F. / S.A.	R.P. / A.N.	C.O.	28.02.2025

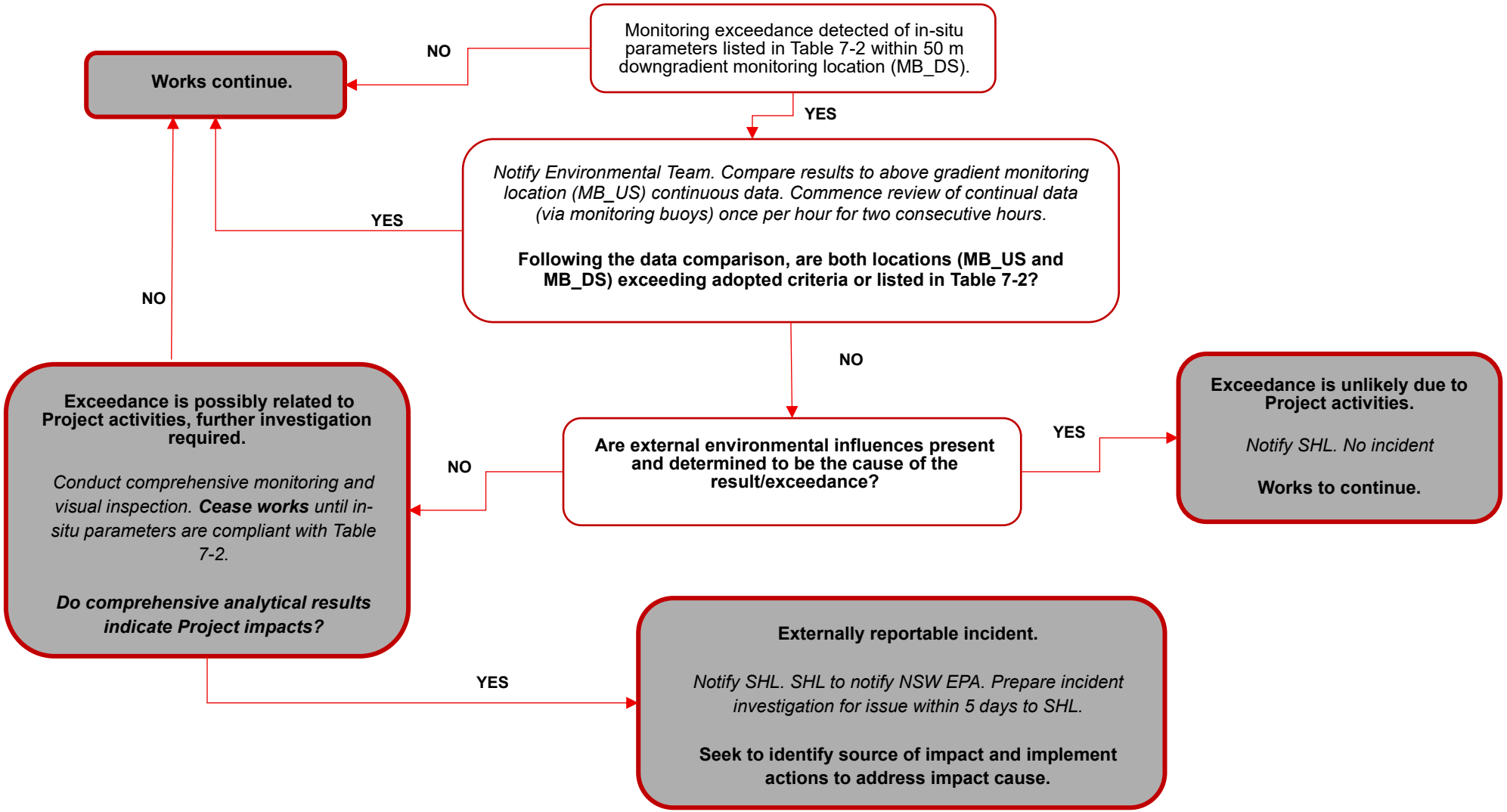
Design JV: TRACTEBEL ENGIE, Lombardi, coffey
Contractor: Future Generation Webuild • Clough • Lane
Employer: snowyhydro Limited renewable energy

SNOWY 2.0
DI01C.01 - TALBINGO INTAKE
OPERATIONAL STAGE - TEMPORARY ROCKFILLS
GENERAL NOTES & TECHNICAL SPECIFICATIONS

Scale	Date Stamp	Drawing No.	Rev.
AS SHOWN	28.02.2025	S2-CIV-IG-TBI-2195	01

APPENDIX B – TRIGGER ACTION RESPONSE PLANS

Trigger Action Response Plan – Talbingo Intake – Scenario 1



Scenario 1: Where monitoring 50 m downstream (MB_DS) of the outermost silt curtain reports an exceedance outside the WQT's listed in table 7-2 of the Talbingo Management Plan

Trigger action response plan initiation

- In situ parameters 50 m downstream exceeds those presented in Table 7-2 and is inconsistent with above gradient ambient conditions.

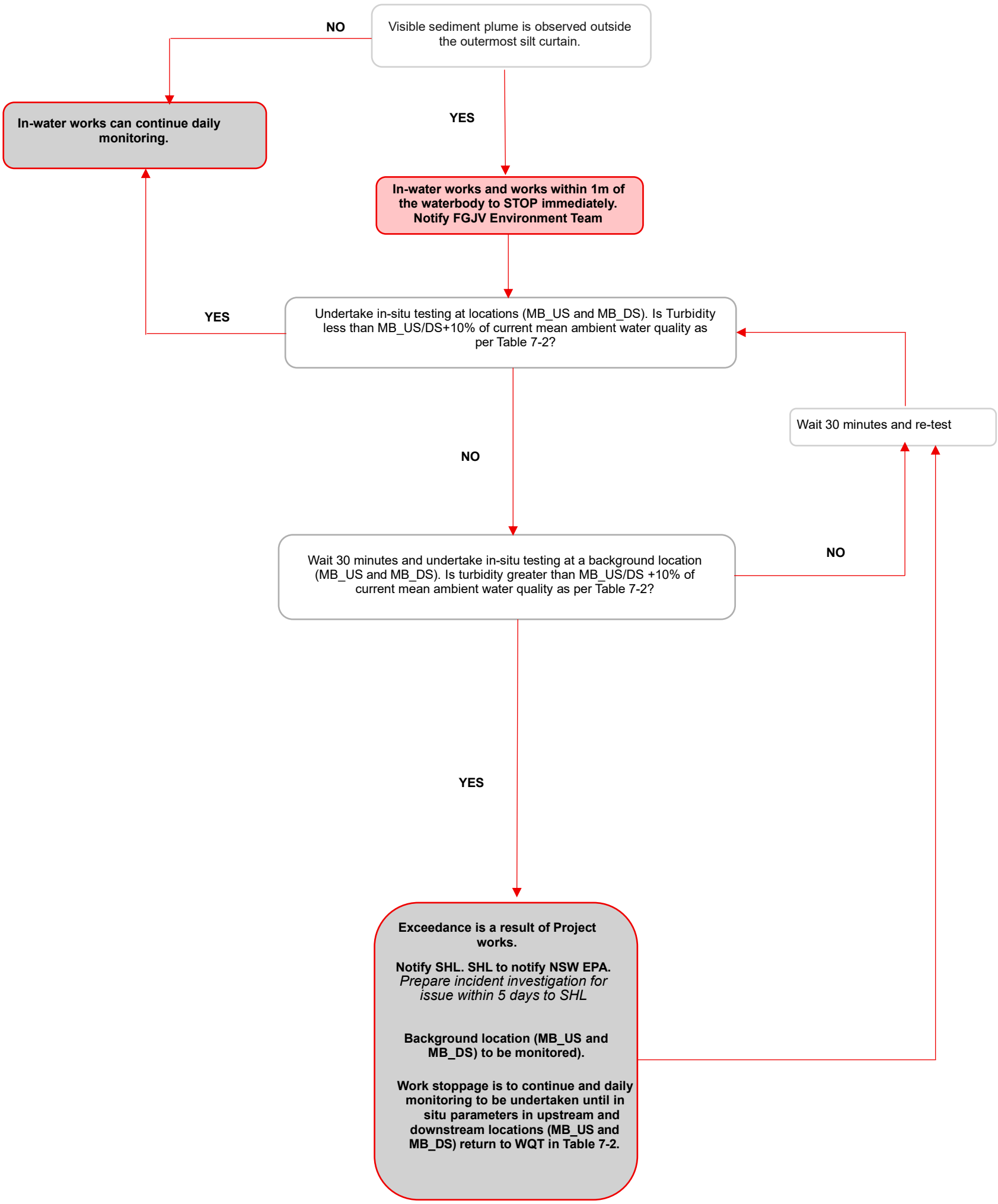
Monitoring details

- Monitoring includes visual inspection as per Section 7.1 of this Management Plan and measurement of in-situ parameters outside the outermost silt curtain, upstream and downstream locations.

Trigger action response plan objective

- To identify (where possible) if the exceedance is naturally occurring or due to placement activities.
- To establish actions to either improve water management or further investigate the exceedance mechanism (if required).

Trigger Action Response Plan - Talbingo Aquatic Disturbance – Scenario 2



Trigger action response plan initiation

- Visible sediment plume is observed outside the outermost silt curtain.

Monitoring details

- Monitoring includes visual inspection as per Section 7.1 of this Management Plan and measurement of in-situ parameters upstream and downstream locations (MB_US and MB_DS).

Trigger action response plan objective

- To identify (where possible) if the exceedance is naturally occurring or due to construction activities.
- To establish actions to either improve water management or further investigate the exceedance mechanism (if required).
- To reduce environmental pollution in the reservoir.

Trigger Action Response Plan - Talbingo Aquatic Disturbance – Scenario 3

Trigger Level	Description / Trigger Criteria	Management Actions & Responses
Level 1: Routine (Green)	Monitoring results are within background reservoir water quality fluctuations (Total Nitrogen concentrations consistent with simulated mass balance levels).	• Continue standard spoil screening, rinsing (if applicable) and placement. • Continue routine surface water monitoring both inside and outside the silt curtain.
Level 2: Investigation (Amber)	Nitrogen concentrations within the silt curtain show an increasing trend toward the upper bound of background fluctuations or exceed simulated averages. **TN** – 1.5 mg/L	• **Investigate Source:** Review the effectiveness of current spoil screening, rinsing (if applicable) and placement • **Sampling:** Review acceptable spoil sampling concentrations and ASLP/LEAF results for the material being placed. • **Operational Check:** Verify the integrity of the silt curtain and placement methodologies.
Level 3: Action (Red)	Nitrogen concentrations exceed maximum background concentration levels for two consecutive comprehensive analytical results (bi-weekly). Concentrations are listed as: **TN** – 2.5 mg/L*	• **Cessation:** Immediately cease spoil placement until disturbance inside stilt curtain dissipates. Conduct inspection of curtains to identify any breaches • **Refine Methodology:** Implement more rigorous rinsing/screening to remove adhering fines and readily-leachable nitrogen. Conduct comprehensive validation sampling every 24 hours until results indicate waters less than criteria. • **Selection criteria:** Select spoil with lower leachable concentrations for future placement. • **Timing:** Restrict future placement to periods of higher average reservoir flows to increase dilution. Allow works to resume once controls in place to address migration or comprehensive results indicate waters less than criteria.

- The primary constituent to be monitored is **Total Nitrogen**, as this is the main residues from drill and blast emulsions.
- This current TARP is to be applied ONLY during the trial emplacement works and is subject to validation of GHD modelling to be applied for the full -scale emplacement phase.
  *TN concentration levels taken from Table 22 GHD report – (Emplacement-Assessment of nitrogen blast residues S2-GHD-TEC-MEM-0026).
- Visual inspection to be undertaken according to Section 7.1 of this Management Plan.